City Of Wildwood

Utility System

MASTER PLAN

Prepared for

WILDWOOD
EST 1877
FLORIDA

Prepared by

Kimley»Horn

142173163.15

Utility System Master Plan

City of Wildwood

Sumter County, Florida

Prepared for:
The City of Wildwood

Prepared by:
Kimley-Horn and Associates, Inc.

142173163
September 2015
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EXECUTIVE SUMMARY

The City of Wildwood is anticipating significant growth in the Wildwood area over the next 20 years. This growth will provide the City with the opportunity to expand the existing utility systems to provide potable water and sanitary sewer services to new customers. In response to this anticipated future demand, the City is planning to improve and expand the utility infrastructure to adequately meet future demands.

This master plan and accompanying hydraulic modeling was assembled to assist the City in identifying and selecting capital improvement projects to efficiently and cost-effectively meet the demands of current and future residents.

For future population projections, growth was broken down and analyzed in three broad classifications: 1) Population growth within the areas currently connected to City utilities (no physical expansion), 2) Existing population in areas around the City that can be added to the City's utility system making new connections or by physically expanding the system, and 3) Population growth occurring in new developments planned around the City.

Water System Analysis:

The City currently operates three water treatment plants in the City with the Ashley water treatment coming online in 2016. All three of the water treatment plants are operating within their respective FDEP permitted capacities based on average and maximum daily flows.

A base hydraulic model was developed and calibrated for the City's existing water systems. Calibration of the model was done using fire flow data recorded in the field. The existing system was modeled using present day maximum daily demands.

The results of the base model were used to identify capital improvement projects (i.e. – water main extensions, water main looping, and water treatment plant expansions) that would improve the hydraulic performance of the City's existing, 5-year, 10-year, and 20-year water system. These improvements were added to the model and simulations were run to analyze the effectiveness of the improvement.

Wastewater and Reclaimed System Analysis:

The City currently operates one wastewater treatment plant. The wastewater treatment plant is operating within the FDEP permitted capacity.

A flow based and pump based hydraulic model was developed and calibrated for the City's existing wastewater systems. Calibration of the model was done using lift station drawdown tests recorded in the field. The existing system was modeled using present day flows.

The results of the flow and pump model were used to identify capital improvement projects (i.e. – force main extensions, lift station improvements, and wastewater treatment plant expansions) that would improve the performance of the City's existing, 5-year, 10-year, and 20-year wastewater system. These improvements were added to the model and simulations were run to analyze the effectiveness of the improvement.

Capital Improvements:

Based on the modeling, field observations, and discussions with City staff, a comprehensive list of capital improvements was developed for implementation over the next 20 years. The list includes items that are hydraulically necessary, maintenance items, service and reliability upgrades, and improvements to aging infrastructure. That list includes a planning level cost estimate for budgeting purposes. The list consists of major water and wastewater projects and is provided for guidance to assist the City in developing a sustainable capital improvement plan.

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3MRADF	Three-Month Rolling Average Daily Flow
AADF	Annual Average Daily Flow
AAFF	Average Available Fire Flow
AWS	Alternative Water Supply
BEBR	Bureau of Economic and Business Research
BOD	Biological Oxygen Demand
CIP	Cast Iron Pipe
CR	County Road
DIP	Ductile Iron Pipe
DMR	Discharge Monitoring Report
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FLUM	Future Land Use Map
fps	Feet Per Second
Ft	Feet
GIS	Geographic Information System
gpcd	Gallons per Capita Day
GPD	Gallons per Day
gpm	Gallons per Minutes
GST	Ground Storage Tank
HOA	Homeowners Association
hp	Horsepower
HSP	High Service Pump(s)
HSPS	High Service Pump Station(s)
ISO	Insurance Services Office
LDC	Land Development Code
LOS	Level of Service
LOSS	Level of Service Standard
LSSA	Lift Station Service Area
MFLs	Minimum Flows and Levels
MG	Million Gallons
mg/L	Milligram per Liter
MGD	Million Gallons per Day
MOR	Monthly Operating Report
NE	Northeast

NW	Northwest
PAR	Public Access Reuse
psi	Pounds per square inch
PVC	Polyvinyl Chloride
PWS	Potable Water System
PS	Pump Station
RAS	Return Activated Sludge
RIB	Rapid Infiltration Basin
SCADA	Supervisory Control and Data Acquisition
SE	Southeast
SW	Southwest
SWFWMD	Southwest Florida Water Management District
TDS	Total Dissolved Solids
TMADF	Three Month Average Daily Flow
TN	Total Nitrogen
TP	Total Sulfur
VFD	Variable Frequency Drive
VTP	Vertical Turbine Pump
WMD	Water Management District
WRAMS	Water Resources Assessment and Management Study
WRF	Water Reclamation Facility
WSEL	Water Surface Elevation
WTP	Water Treatment Plant
WUP	Water Use Permit
WWTF	Wastewater Treatment Facility

INTRODUCTION

Background

The City of Wildwood is anticipating significant growth in the Wildwood area over the next 20 years. This growth will increase the potable water and sanitary sewer demands within the City's utility service area. In response to the anticipated future demands, the City will need to improve and expand the existing utility infrastructure to adequately meet future demands. This master plan and accompanying hydraulic modeling was assembled to assist the City in identifying and selecting capital improvement projects to efficiently and cost-effectively meet the demands of current and future residents.

Scope and Objectives

The primary objective of this utility master plan is to assess the performance of the existing potable water, sanitary sewer, and reclaimed water systems currently owned and operated by the City of Wildwood and plan for system improvements/expansions that are needed to meet the anticipated 5-year, 10-year, and 20-year demands.

Water System Objectives:

- Develop hydraulic standards for City's water distribution system.
- Identify the water supply, treatment, and storage capacity of the City's existing system.
- Develop potable water demand projections (5-year, 10-year, and 20-year)
- Gather existing system information and develop a master computer model of the City's potable water system.
- Evaluate the water distribution system under present year conditions and for 5-year, 10-year, and 20-year growth projections.
- Identify necessary improvements within the water supply, treatment, and storage capacity under the present year, 5-year, 10-year, and 20-year demand projections.

Wastewater System Objectives:

- Create a system inventory of the existing wastewater lift stations.
- Develop hydraulic standards for the City's sanitary sewer system.
- Identify the wastewater treatment and effluent disposal capacity of the City's existing wastewater treatment system.
- Develop wastewater flow projections (5-year, 10-year, and 20-year)
- Evaluate affected portions of City's existing lift station infrastructure under present year conditions and for the 5-year, 10-year, and 20-year growth projections.
- For each demand projection (present year, 5-year, and 20-year), make collection system improvement recommendations that are required for the system to meet the hydraulic standards under the scenarios above.

Reclaim Water System Objectives:

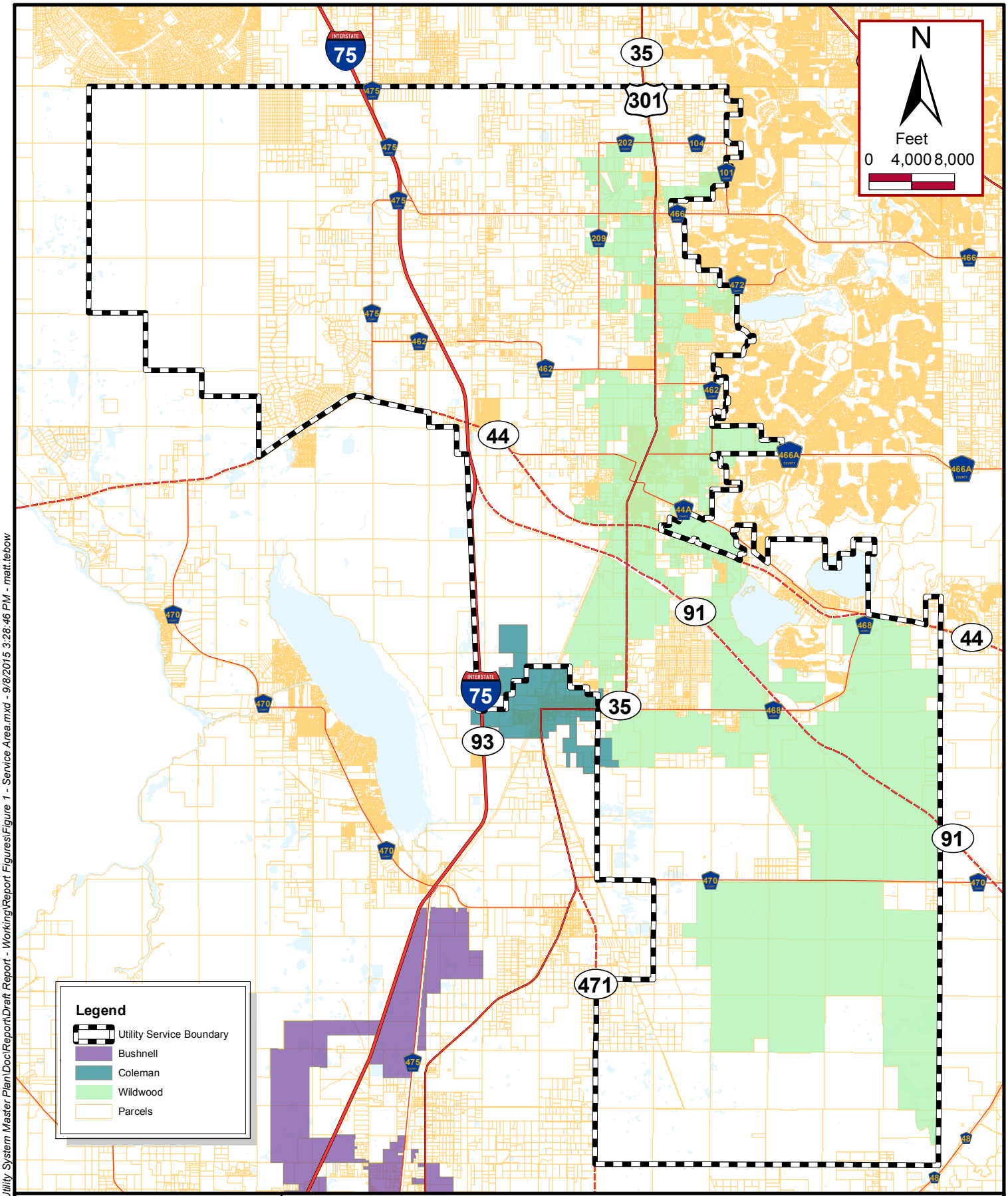
- Develop hydraulic standards for the City's reclaim water system.
- Make distribution system improvement recommendations that are required for the system to meet the hydraulic standards.
- Evaluate the ability of the existing reclaimed water transfer pump station to convey reclaimed water directly to the North Sumter Utilities effluent pond.

SERVICE AREA DESCRIPTION

The City of Wildwood and Sumter County entered into an Interlocal Service Boundary (ISB) and Joint Planning Area (JPA) Agreement pursuant to F.S. § 171, Part II. The City adopted the agreement by ordinance (Ordinance 02009-10) on April 13, 2009 and the City and County amended their respective comprehensive plans to include the JPA.

F.S. § 171.203(11) requires the City to amend the Comprehensive Plan to include a boundary map of the municipal service area, establish population projections, and demonstrate the ability to service the area with public facilities and services. The state land planning agency is required to review the amendment under F.S. § 163, Part II.

The Municipal Service Area Boundary is shown on Figure 1. The amendments to the City's Comprehensive Plan include incorporation of the Municipal Service Area Boundary, the Joint Planning Area Land Use Map and text amendments to the Future Land Use Element concerning urban sprawl, land uses within the JPA, annexation, and provisions of services.



K:\OCA_Civil\142173163 - Utility System Master Plan\Doc\Report\Draft Report - Working\Report Figures\Figure 1 - Service Area.mxd - 9/8/2015 3:28:46 PM - matt.tebow

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WILDWOOD UTILITY SERVICE AREA

UTILITY MASTER PLAN
CITY OF WILDWOOD

Project No: 142173163	Scale: As Noted	AUGUST 2015	Figure 1

POPULATION GROWTH PROJECTIONS

Introduction

This section presents a discussion of the projected population growth within the City's utility service area. Population growth is a key element in evaluating the utility system because it provides the basis for the demands that will be placed on the utility infrastructure. Identifying, quantifying and locating these demands allows for proper analysis and planning of capital improvements that can efficiently and cost-effectively service existing and new customers. These population projections then provide the basis for the water demand projections and the wastewater flow projections.

Changes in demands served by the City of Wildwood are anticipated to occur in three ways. First, there will be fluctuations in demands within the areas currently served by the City resulting from population fluctuations and new connections in areas where infrastructure exists (infill demands). Secondly, there will be increased demands from the physical expansion of the utility system to bring existing non-served customers onto the network (expansion demands). And finally, there will be demand increases driven by new development (new development demands).

Methodology for Determining Population Growth

For the areas that are currently served, the basis for determining the future population growth was a model developed by the Southwest Florida Water Management District (SWFWMD). SWFWMD's growth model is based in ArcGIS and is a combination of the population projections made by the University of Florida's Bureau of Economic and Business Research (BEBR) and the US Census block-level data. The SWFWMD model has population data at the parcel level for all of Sumter County, which allows for projecting populations for any service area. The populations are projected by SWFWMD for the following years: 2015, 2020, 2025, 2030, 2035, and 2040. For a further discussion of the methodologies used by the SWFWMD in developing the parcel level growth projections, see Appendix A.

Existing Areas Served (Infill)

To establish the basic demand growth, no physical expansion of the City's network or connection of new customers was assumed (meaning that only current customers would be considered). For this classification, the parcel level data provided by the SWFWMD was reduced to the parcels that had billing data associated with the parcel during 2014. The growth rate for the 5-year, 10-year and 20-year periods are based on these parcels. The existing number of ERUs being served was estimated using the total number of existing meters that are connected to the system (4,446). The ERUs for 5-year, 10-year, and 20-year were then estimated by multiplying the existing ERUs by the resulting growth rate calculated from the SWFWMD population model.

The Coleman Federal prison ERUs were estimated by taking the average daily usage (1,038,551 gpd) and dividing by the City's level of service for water use (300 gpd per ERU). No growth was assumed for the prison ERU estimate. See Appendix B for the complete existing and prison population and ERU allocation and calculation summary. Table 1 summarizes the projected existing ERUs from Appendix B.

Table 1: Existing Service Area ERU Projections

	Present (2015)	5-year (2020)	10-year (2025)	20-year (2035)
Existing Service Areas	4,446	4,935	4,984	5,608
Coleman Federal Prison	3,462	3,462	3,462	3,462
Total =	**7,908**	**8,397**	**8,446**	**8,530**

Expansion Areas

A second important contributor to increased demands can be realized through physically expanding the system and connecting parcels that are not currently connected. The City worked with Kimley-Horn to develop a plan for how and when the City would pursue expanding the utility system to provide water and wastewater service to presently non-served properties in and around the City. A total of seven areas were identified for possible expansion in the future. See Figure 2 for a map showing the City's expansion service areas. The expansion areas exclude any known future developments. For a discussion of known future developments see the next section.

The expansion parcels are classified in one of two categories: parcels with a City designated future land use (as documented by the City's FLUM from the Comprehensive Plan) and parcels without a City designated future land use.

- For the expansion parcels without a City designated future land use, the SWFWMD model was used to estimate the present, 5-year, 10-year, and 20-year population projections for the seven areas. The ERUs within the expansion area was then estimated by dividing the population by the persons per household (2.37) from the U.S. Census Bureau (2009-2013).
- For the parcels that have City designated future land use, the City FLUM was used to estimate a number of ERUs for the parcel. For each parcel, the land use was determined from the future land use shapefile which was provided by the City. The allowable density and/or maximum floor area ratio (FAR) was then used to calculate the number of units allowed on the parcel. If a density and FAR were given in the land use, the number of ERUs was calculated for both and then the maximum of the two was selected to represent the future condition of the parcel.

See Appendix B for the complete future expansion ERU allocation and calculation summary. Table 2 summarizes the projected expansion ERUs from Appendix B.

Table 2: Expansion Area ERU Projections

	Present (2015)	5-year (2020)	10-year (2025)	20-year (2035)
Infill Area 1 (North)	0	400	476	682
Infill Area 2 (West)	0	267	374	609
Infill Area 3 (East)	0	464	563	789
Infill Area 4 (West SR 44)	0	15	42	93
Infill Area 5 (East SR 44)	0	900	1,120	1,727
Infill Area 6 (US 301)	0	411	560	937
Infill Area 7 (CR-501)	0	431	540	856
Total ERU =	**0**	**2,888**	**3,675**	**5,693**

Future Developments

A third contributor to increased demands are planned developments. The City developed a list of Residential Unit and Non-Residential Unit projections based on known project entitlements anticipated to start within 20 years. A total of 40 future developments were identified within the City's service area. The City's service area was broken down into three sub-areas consisting of the North Service Area, Central Service Area, and the South Service Area. See Figure 3 and 4 for a map showing the future developments and service areas.

The City provided the estimated number of anticipated units for each development for the 5-year, 10-year and 20-year timelines. The development entitlements were given in units of ERUs for single family and multi-family units, bed counts for the ALF/ILF, and square feet for commercial, industrial, and institutional

facilities. ERUs were estimated by using the ERU factors from the City's Land Development Code. See Appendix B for the future development entitlement allocation matrix, narrative for the residential and non-residential unit projections, population projection, ERU projection, and the calculation summary. Table 3 through 5 summarizes the projected ERUs to be served in the respective time frame from Appendix B.

Table 3: ERU Projections – Future Developments in the Northern Service Area

	Developments	Present (2015)	5-year (2020)	10-year (2025)	20-year (2035)
NORTHERN SERVICE DEVELOPMENTS	Parkwood	-	-	-	-
	Lakeside Landings	-	250	250	250
	Oxford Oaks	51	563	563	563
	Autozone	-	2	2	2
	Goodwill Piedmont	-	9	9	9
	Compass Storage	-	33	33	33
	Miryala Office Complex	-	4	4	4
	Oxford Mower Shop	-	1	1	1
	Baltic Properties	-	-	-	-
	Sumter Retirement Residence	-	110	110	110
	Oxford Crossings	-	-	63	568
	Oxford Crossings Apartments	-	-	48	432
	Grand Oaks Manor	-	200	300	400
	Elim Senior Care	-	-	20	184
	Mission Oaks Memory Care	-	-	-	-
	Lake Andrews Preserve	-	16	32	114
	Leatherman Property	-	5	11	38
	Subtotal	**51**	**1,194**	**1,447**	**2,707**

Table 4: ERU Projections – Future Developments in the Central Service Area					
	Developments	Present (2015)	5-year (2020)	10-year (2025)	20-year (2035)
CENTRAL SERVICE DEVELOPMENTS	O'Dell Planned Development	-	125	125	125
	Wildwood Retirement Residence	-	55	55	55
	Rosecastle ALF	-	93	93	93
	Triumph South	-	93	161	229
	Hughes Brothers Construction Office	-	1	1	1
	Pepper Tree Village	-	106	177	248
	Pepper Tree Plaza	-	10	10	10
	Duke Energy Expansion	-	10	10	10
	Providence II	-	58	58	58
	Traffic Control Products	-	2	2	2
	Turkey Run	-	175	175	175
	Trailwinds Village	-	451	902	902
	Elliot: My Garage	-	-	-	-
	Monarch Ranch	-	180	360	1,259
	Lee Capital	-	69	138	484
	Project Horizon	-	16	33	114
	Subtotal		**1,444**	**2,324**	**3,986**

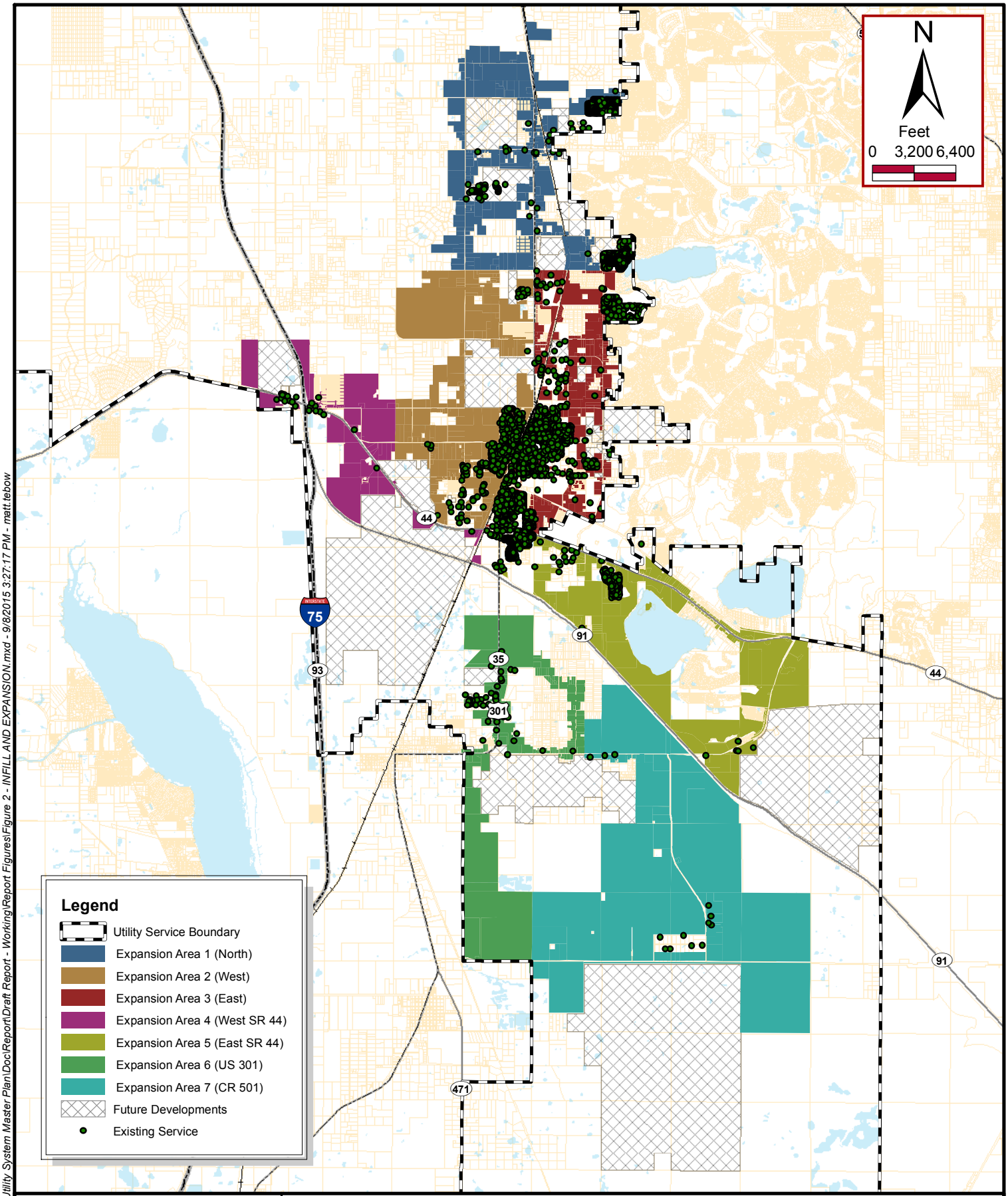
Table 5: ERU Projections – Future Developments in the Southern Service Area					
	Developments	Present (2015)	5-year (2020)	10-year (2025)	20-year (2035)
SOUTHERN SERVICE DEVELOPMENTS	Nash Modular Expansion	-	0.3	0.3	0.3
	Wildwood Entertainment Park	-	0.5	0.5	0.5
	Harry Harmer Parcel 2, Block B	-	1	1	1
	Landstone DRI	-		670	6,031
	Wildwood Springs DRI	-	-	246	2,214
	Southern Oaks DRI	-	-	338	3,039
	Wildwood Crossings	-	-	24	220
	Subtotal	-	**2**	**1,256**	**11,287**

Summary of Growth Projections

Below is the summary table for the projected utility system total ERU growth over the next 20 years.

Table 6: ERU Growth Projection Summary

	Present (2015)	5-year (2020)	10-year (2025)	20-year (2035)
Existing Services	**7,908**	**8,397**	**8,446**	**8,530**
Infill/Expansion Areas	**-**	**2,888**	**3,675**	**5,693**
Future Developments	**51**	**2,547**	**4,984**	**17,987**
Total =	**7,959**	**13,925**	**17,148**	**32,203**



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WILDWOOD UTILITY SERVICE AREA INFILL AND EXPANSION AREAS

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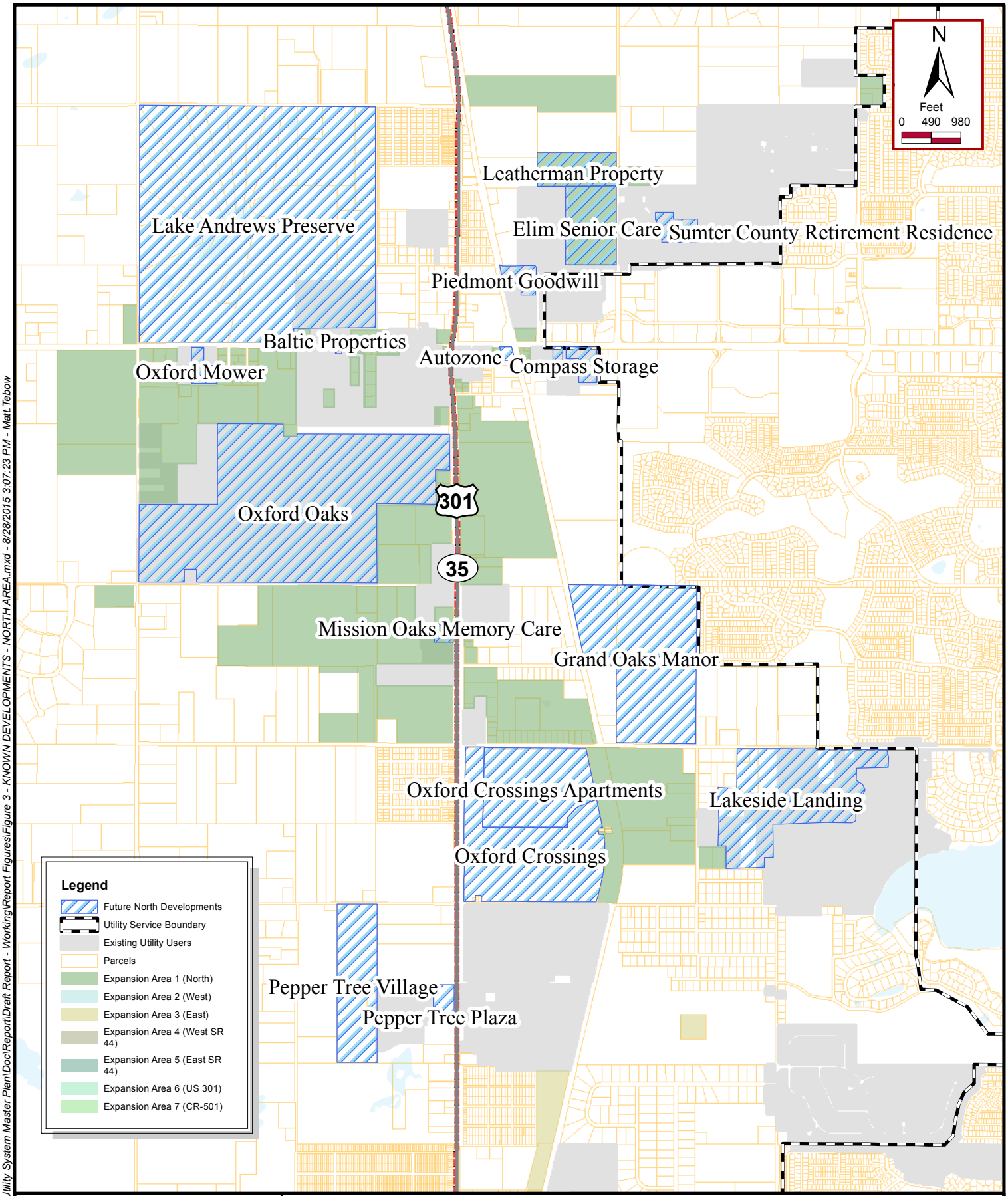

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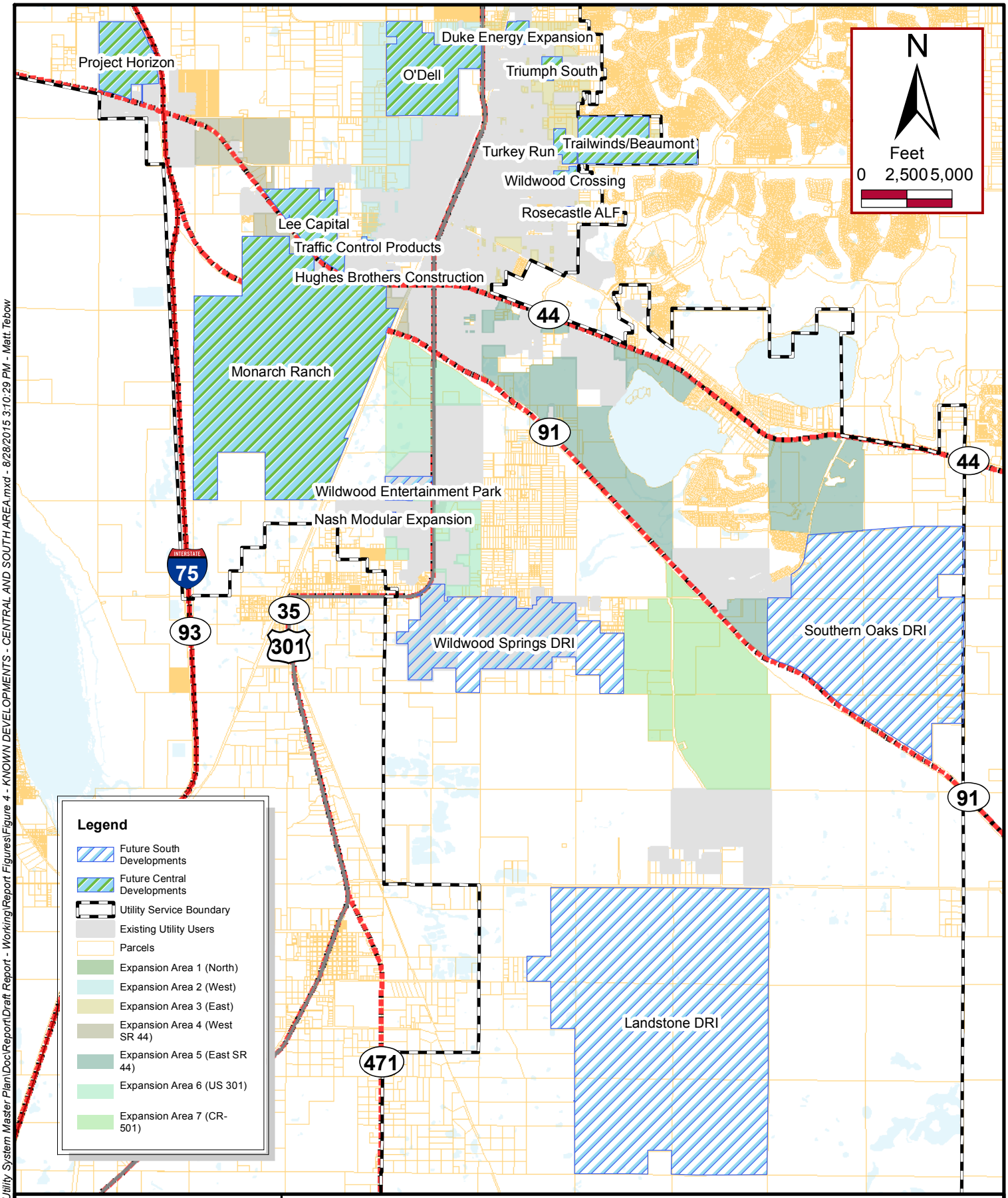
CITY OF WILDWOOD NORTH SERVICE AREA KNOWN DEVELOPMENTS

UTILITY MASTER PLAN
CITY OF WILDWOOD

Project No: 142173163	Scale: As Noted	AUGUST 2015	Figure 3



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CITY OF WILDWOOD CENTRAL AND SOUTH SERVICE AREA KNOWN DEVELOPMENTS

UTILITY MASTER PLAN
CITY OF WILDWOOD

Project No: 142173163	Scale: As Noted	AUGUST 2015	Figure 4

EXISTING WATER SYSTEM

Introduction

This section discusses the location, condition, and capacity of the existing potable water systems owned and operated by the City. Also included is a summary of the current permitting status and regulatory issues affecting water systems, including treatment limitations and regulatory concerns.

Water Supply Permitting Agencies

Florida Department of Environmental Protection (FDEP)

The Florida Department of Environmental Protection is responsible for permitting the design and construction of new potable water supply systems that provide water to 25 or more people for at least 60 days each year or serves 15 or more service connections. Very small water systems that do not fit the above description are regulated by the Florida Department of Health and individual county health departments. The construction of water wells, both public and private, and the quantities of water that may be extracted, are regulated by the Water Management Districts.

After water treatment plants have been built, FDEP is responsible for monitoring the plant for conformance with drinking water standards. Most notably, the FDEP inspects the plants at regular times and generates a Sanitary Survey Report. All the components of the plant are inspected during the sanitary survey, including the well heads, disinfection systems, storage facilities, high service pumps, treatment components (i.e. - aeration equipment), and the records that are required on-site. Any deficiencies observed during the inspection are noted and included in the Sanitary Survey Report.

Southwest Florida Water Management District (SWFWMD)

SWFWMD is responsible for permitting and monitoring the quantities of groundwater pumped to potable water supply systems. The City of Wildwood has one water use permit (WUP) issued by SWFWMD. All active wells and facilities are permitted under this single WUP (Permit #20008135.010). A total of 6,444,800 gpd annual average and 9,345,900 gpd peak monthly flows are permitted for this system. Table 7 below summarizes information regarding the City's water use permit issued by SWFWMD.

According to the SWFWMD website, none of the wells owned and operated by the City fall within a Water Use Caution Area (WUCA). Water Use Caution Areas are defined by the district as "a geographic region within the District which exhibits resource problems, or is predicted to exhibit resource problems, and for which special regulations are enacted by the Governing Board.

Table 7: Water System Permit

Permit Number	Permit Type	Issuing Agency	Wells	Date of Issue	Date of Expiration
20008135.010	Individual Water Use Permit	SWFWMD	8	3/31/2015	3/31/2035

Existing Water Distribution System

The City of Wildwood's water distribution system is identified by the FDEP as PWS-ID No. 6600331. According to the June 2015 MOR, the total population served by the system is 13,883 with approximately 3,670 connections to the distribution system. The design treatment capacity of the system is 3.6 MGD MDD. According to the FDEP Sanitary Survey Report dated December 7, 2011, no significant deficiencies were observed for the City's PWS.

The existing distribution system covers a large area measuring approximately 7.0 miles wide (east to west) and 15 mile long (north to south). With the anticipated future development, the distribution system will

increase to approximately 9.5 miles wide (east to west) and 17.5 miles long (north to south). The following is a summary of the existing distribution system pipe size (diameter) and lengths. The pipe materials include PVC, galvanized, asbestos-cement, and ductile iron pipe.

Table 8: Existing Pipe Lengths

Pipe Size (diameter)	Total Length of Pipe (feet)
16 – inch	5,200
12 –inch	140,100
10 – inch	44,200
8 – inch	195,200
8 – inch (dry)	6,200
6 - inch	34,700
4 – inch	9,200
2 - inch	60,500

Existing Water Treatment and Storage Facilities

This section contains a detailed discussion of the existing water treatment plants. The discussion includes a capacity analysis of each plant as a whole as well as a capacity analysis of the component systems (wells, storage systems, disinfection systems, and high service pumps).

Establishing the production limitation of each plant is important and will help the City understand the hydraulic contribution of each WTP. To determine the existing utilization of each water treatment plant, the monthly operating reports (MOR) were reviewed for the 2014 calendar year. The capacity of the entire system and the individual plants were calculated using the rules established by the Florida Administrative Code Section 62-555.

The individual plant capacities were determined by applying strict conformance with FDEP Rule 62-555. Therefore, the single well WTP were determined to have “0” capacity because they were not able to provide firm pumping capacity, defined as the largest pump out of service, and still meet the maximum day plus fire flow demands or peak hour flow for 4 consecutive hour demands. However, FDEP allows a combined WTP PWS to be rated with only one of the largest pumps on the system out of service. Therefore, the actual combined capacity of the system is greater than the sum of the individually WTP firm capacity. See Appendix C for further discussion.

The City’s water system is currently operating with three water treatment plants and one re-pump station. However, the City in 2015/2016 is constructing the Ashley WTP located near the northwest corner of the intersection of SR 44 and CR 231. The new facility will have a capacity of 0.720 MGD MDD. Each of the three existing water treatment plants and the re-pump station are discussed in the following sections.

CR-501 (Coleman) WTP

The Coleman WTP is located along CR 501 near the Coleman Federal Prison. According to the 2014 MOR’s, the plant produces an average of 1.56 MGD for the system. The maximum daily production for this plant in 2014 was 2.12 MGD. The FDEP permitted MDD capacity is 2.16 MGD.

The raw water source for the Coleman WTP is ground water from the upper Floridan aquifer (UFA). Ground water is pumped into the plant using two ground water wells. See Table 9 for a summary of the wells and well pumps.

Table 9: Coleman WTP Wells								
Well Number	Dia. (in.)	Total Depth (ft.)	Casing Depth (ft.)	Well Yield (gpm)	Pump Type	Pump Horse-power	Pump Capacity (gpm)	Pump Capacity (gpd)
SE 1	12	360	128	900	Vertical Turbine	25	1,000	1,440,000
SE 2	12	360	176	600	Vertical Turbine	25	750	1,080,000

Treatment of the raw ground water is by a cascading tray aeration system and liquid chlorination. This plant is equipped with two aerators (one mounted on each of the ground storage tanks) with a combined treatment capacity of 5,300 gpm (7.6 MGD). Currently, only the aerator on the 500,000 gallon tank is in operation. The treatment capacity of this unit is 3,500 gpm. The second aerator, which has a treatment capacity of 1,800 gpm, is not currently in operation.

Finished water storage is provided by two on-site concrete ground storage tanks. The first storage tank is a 500,000 gallon circular concrete tank equipped with a cascading tray aeration system for hydrogen sulfide removal. The second tank is a 1,000,000 gallon circular tank equipped with a cascading tray aeration system for hydrogen sulfide removal.

Disinfection is provided by flow proportional sodium hypochlorite injection. Storage of the liquid chlorine is provided on-site. A stand-alone chlorine storage/dosing room pre-chlorinates the water before it enters the high service pump room. In addition to chlorine, polyphosphate is injected into the water system at this plant for iron sequestration and corrosion control within the distribution system.

High service pumps provide final delivery of water into the distribution. The plant is equipped with three high service pumps plus a jockey pump. See Table 10 below for a summary of the pump capacities.

Table 10: Coleman Pump Capacities			
Pump Number	Pump Type	Horsepower	Capacity (gpm)
HSP 1	Centrifugal	60	1,100
HSP 2	Centrifugal	60	1,100
HSP 3	Centrifugal	60	1,100
Jockey	Centrifugal	20	400

A capacity evaluation of Coleman WTP was performed using the data above. The evaluation was conducted with Coleman WTP as a stand-alone facility. The evaluation is shown in Appendix C.

As required by FAC 62-555.320 (15)(c), the capacity evaluation must be performed with the assumption that one of the well pumps are out of service (firm capacity). The calculated firm capacity of this plant is 1.56 MGD. The limiting capacity of this plant appears to be the production capabilities of the ground water wells. The storage capacity of the plant can compensate for the difference between the outflow and inflow, but only for a finite period of time.

Huey Street WTP

The Huey Street WTP is located at 801 Huey Street, Wildwood. According to 2014 MOR's, the plant produces an average of 0.370 MGD. The maximum daily production for this plant in 2014 was 0.680 MGD. The FDEP permitted MDD capacity is 0.720 MGD.

The raw water source for the Huey Street WTP is ground water from the UFA. Ground water is pumped into the plant using a single ground water well. See Table 11 for a summary of the well and well pump capacity. No redundant pumping system is provided at this site.

Table 11: Huey WTP Well

Well Number	Dia. (in.)	Total Depth (ft.)	Casing Depth (ft.)	Well Yield (gpm)	Pump Type	Pump Horse-power	Pump Capacity (gpm)	Pump Capacity (gpd)
11	12	202	168	500	Vertical Turbine	40	500	720,000

The quality of the ground water at the Huey Street WTP is such that no treatment, other than disinfection, is required. Disinfection for this plant is provided by flow proportional sodium hypochlorite liquid injection. On-site chemical storage consists of a 500 gallon storage tank. In addition to chlorine, polyphosphate is injected into water system at this plant for iron sequestration and corrosion control within the distribution system.

The on-site storage for this plant is provided by a 500,000 gallon elevated steel storage tank. This storage tank is the only elevated storage tank on the system. It contains fully treated water and floats on the distribution system to help maintain pressure and support local fire flows.

A capacity evaluation of Huey WTP was performed using the data above. The evaluation was conducted with Huey WTP as a stand-alone facility. The evaluation is shown in Appendix C.

As required by FAC 62-555.320 (15)(c), the capacity evaluation must be performed with the assumption that one of the well pumps are out of service (firm capacity). With this assumption, the Huey WTP has an individually rated capacity of 0.0 MGD. Without the firm capacity assumption, the calculated capacity of this plant is 600,000 gpd (417 gpm). With only one source for raw water for the plant, the limiting capacity factor for this plant is the well production.

Fairways WTP

The Fairways WTP is located at 5124 CR 125B-1, Wildwood. According to 2014 MOR's, the plant produces an average of 0.125 MGD. The maximum daily production for this plant in 2014 was 0.676 MGD. The FDEP permitted MDD capacity is 0.720 MGD.

The plant is equipped with a hydropneumatic tank and one ground water well that pumps from the UFA. See Table 12 for a summary of the well and well pump.

Table 12: Fairways WTP Well

Well Number	Dia. (in.)	Total Depth (ft.)	Casing Depth (ft.)	Well Yield (gpm)	Pump Type	Pump Horse-power	Pump Capacity (gpm)
FW 1	10	160	70	500	Vertical Turbine	50	700

On-site storage for this plant is provided by a 10,000 gallon hydro-pneumatic tank. Disinfection for this plant is provided by a flow proportional sodium hypochlorite liquid injection. The wells pump raw groundwater into one 10,000 gallon hydropneumatic tank.

A capacity evaluation of Fairways WTP was performed using the data above. The evaluation was conducted with Fairways WTP as a stand-alone facility. The evaluation is shown in Appendix C.

As required by FAC 62-555.320 (15)(c), the capacity evaluation must be performed with the assumption that one of the well pumps are out of service (firm capacity). With this assumption, the Fairways WTP has a rated capacity of 0.0 MGD. Without the firm capacity assumption, the calculated capacity of this plant is 720,000 gpd (500 gpm). With only one source for raw water for the plant, the limiting capacity factor for this plant is the well production.

Ashley WTP

The Ashley WTP will be operational in late 2015 or early 2016. It is located near the northwest corner of the intersection of SR 44 and CR 231. The FDEP permitted MDD capacity will be 0.720 MGD MDD.

The plant will be equipped with two 10,000 gallon hydropneumatic tanks and one ground water well that pumps from the UFA. See Table 13 for a summary of the well and well pump.

Table 13: Ashley WTP Well

Well Number	Dia. (in.)	Total Depth (ft.)	Casing Depth (ft.)	Well Yield (gpm)	Pump Type	Pump Horse-power	Pump Capacity (gpm)
Ashley 1	10	133	114	500	Vertical Turbine	40	500

On-site storage for this plant will be provided by two 10,000 gallon hydro-pneumatic tanks. Disinfection for this plant will be provided by a flow proportional sodium hypochlorite liquid injection. The well pumps raw groundwater into the two 10,000 gallon hydropneumatic tanks.

A capacity evaluation of Ashley WTP was performed using the data above. The evaluation was conducted with Ashley WTP as a stand-alone facility. The evaluation is shown in Appendix C.

As required by FAC 62-555.320 (15)(c), the capacity evaluation must be performed with the assumption that one of the well pumps are out of service (firm capacity). With this assumption, the Ashley WTP has a rated capacity of 0.0 MGD. Without the firm capacity assumption, the calculated capacity of this plant is 720,000 gpd (500 gpm). With only one source for raw water for the plant, the limiting capacity factor for this plant is the well production.

CR-214 Re-Pump Station

The CR 214 re-pump station consists of a ground storage tank and high service pumps. It does not currently have wells on-site. All water that enters this re-pump facility comes from a 12” water main that comes from the City water system. The on-site storage for this plant is provided by a 500,000 gallon concrete ground storage tank. The ground storage tank is equipped with a top mounted cascade tray aerator.

Table 14: CR 214 Re-Pump Station Pump Capacities

Pump Number	Pump Type	Horsepower	Capacity (gpm)
HSP 1	Centrifugal	40	750
HSP 2	Centrifugal	60	1,100
HSP 3	Centrifugal	60	1,100

The 214 station was designed to increase the system pressure in the northern section of the City’s distribution system. An isolation valve is located at the 214 station to create two separate pressure zones (North and South) within the City’s system. The three existing WTP’s provide water supply and system

pressure for the southern system. The isolation valve is equipped with a motor operator that will open the valve if system pressure falls below the set point in the south pressure zone.

Flow Data

The water demands for each of the existing water treatment plants were determined from the MOR data submitted to the FDEP for the period of January 2014 to December 2014. See Table 15 below for a summary of the City's average daily flow and maximum daily flow for this time period.

Table 15: Existing Potable Water Flows

WTP	Base Flows (gpd)		Permitted Flows (gpd)	Percentage of Permitted Flow	Percent of System Flow
	Average	Maximum	Maximum		
Huey Street	369,726	680,000	720,000	94.4	19.5
CR-501	1,562,279	2,117,000	2,160,000	98.0	61.0
Fairways	125,205	676,000	720,000	94.0	19.5
Total =	2,057,210	3,473,000	3,600,000	-	-

WATER SYSTEM ANALYSIS AND METHODOLOGY

Introduction

This section provides an overview of the methodologies that were used in developing the hydraulic model. The hydraulic model allows for the analysis of the existing system and the system as it might exist in the future. The future system is likely to be different from the existing system because of increased demands and/or changes in the water treatment plant configuration or distribution system configuration. An analysis of the distribution system was performed to assess the improvements that will be necessary to accommodate the changes in demand and system configuration.

Also included in this section is a detailed analysis of the existing distribution system for the Present, 5-Year, 10-Year, and 20-Year planning time lines. In analyzing the improvements and system configurations over time, it allows for selecting projects and configurations that make sense for the long term and most efficiently utilize funds for capital improvements.

Hydraulic Model Development

The software used for the model development was Bentley WaterCAD V8i (SELECTseries 1). WaterCAD is a computer based program that, with user input, calculates a wide variety of system parameters. The most useful output from the calculations is the pressure and available fire flow results. These results assist designers in identifying locations in the system where the pressures or available fire flows are below minimum acceptable values. The model can be used to assess the existing system as it is to date and how the system will respond to future increases in demand. It also allows the designer to modify or add/remove system components and establish how the water system responds to the changes. This feature is very useful for identifying capital improvement projects that will help the system's hydraulic performance.

The model operates primarily based on user input. All the elements of the existing system (i.e. - pipes, valves, junctions, water treatment plants, demands, etc.) must be input into the model. The water treatment plants provide the water sources for the model and the piping network distributes the water throughout the system to meet the demands. Calibration of the model is accomplished using fire hydrant flow and pressure information gathered in the field. The fire flow demands are input into the model and the corresponding pressures are checked to ensure that the model is reasonably predicting what was observed in the field. In the calibration process, elements within the model (i.e. - pipe frictional coefficients) may be adjusted to truth the model against field observations.

The existing model was developed in several steps listed below:

1. The existing pipe network layout of each of the public water supply systems was determined using previously developed GIS mapping.
2. The existing demand distribution was determined in the following manner:
    - The City provided approximately one year of billing information.
    - The existing billing data provided the demands per active water service. To avoid over complicating the model, groups of individual demands within the vicinity of a junction nodes was assigned to that junction.
3. The operating pressures were obtained from City Utility Staff and actual plant data. The following operating pressures were used in the model:

Table 16: Existing System Operating Pressures			
WTP	Operating Pressures		Model Pressure
	Minimum	Maximum	
CR-501	57 psi	62 psi	57 psi
Huey Street	56.4 psi	56.6 psi	56.4 psi
Fairways	56 psi	70 psi	63 psi
CR-214 Re-Pump Station HSP #1	57 psi	57 psi	57 psi
CR-214 Re-Pump Station HSP #2	57 psi	57 psi	
CR-214 Re-Pump Station HSP #3	57 psi	57 psi	

Before proposed improvements could be evaluated for the system, the hydraulic model had to be calibrated to ensure that it accurately reflected the conditions of the system in the field. The follow steps were taken to calibrate the model:

- Data Collection:
  - City staff conducting fire hydrant flow/pressure tests at 14 locations in the City from May 16 to May 18, 2012. Kimley-Horn staff were present during the testing and recorded the pressures and flow readings for each of the tests. Each test used two hydrants (one pressure hydrant, one flow hydrant). Three readings were recorded for each pair of hydrants. First, the flow hydrant was completely closed and a static pressure reading was taken at the pressure hydrant. Second, the flow hydrant was opened partially. A flow reading and the residual pressure measurement were recorded for the partial flow condition. Finally, the flow hydrant was opened fully and the corresponding flow rate and residual pressure was recorded.
- Model Calibration:
  - The fire hydrant flow data were entered into the model and the pipe C values were adjusted to accurately reflect the pressure readings that were observed in the field. Model predictions that were within 15% of the actual collected data were considered acceptable. The data that fell out of that acceptable range were analyzed to determine the cause of the variation and supplemental data collection was performed to truth the model.

Water Demand Projections

The population projections described in the "Population Growth Projections" section served as the basis for projecting future water demands. The future demands were estimated based on one of the methodologies described below. The resulting demand projections are presented in Appendix B.

- **Parcels with existing water usage -** A per capita demand was calculated by using the US Census estimate of 2.37 residents per household and the existing water usage from the City's water billing data. The calculated per capita demand was then multiplied by the 2020, 2025, and 2035 projected populations to determine future demands.
- **Parcels without existing water usage –** First, equivalent residential unit (ERU) determinations were made for each parcel using one of the methodologies described below. Then, the ERU estimate for each parcel was multiplied by the City of Wildwood water level of service standard of 300 gpd/ERU to determine the resulting water demand. .
  - Parcels with a future land use designation in the 2035 Comprehensive Plan - ERU values were assigned to a parcel based on the appropriate residential density or a maximum floor area ratio

(FAR) that corresponds to the future land use shown in the 2035 Comprehensive Plan. For residential land uses with a range density range (i.e. 3-6 units per acre), the maximum density was used for the demand calculations. Demands were calculated from the FAR by assigning an appropriate demand per allowable unit area of development.

- Parcels without a future land use designation in the 2035 Comprehensive Plan - The SWFWMD parcel level population projections were divided by 2.37 residents per ERU then multiplied by the City's 300 gpd/ERU to determine the future demands.
- New large scale developments - The City provided a list of known developments with a buildout timeline. The projected development ERUs were then multiplied by 300 gpd/ERU to determine the development's demands based on the given development schedule provided by the City.

Peaking Factors

The demands calculated above represent average daily flow (ADF) conditions. For the modeling analysis, maximum daily flow (MDF) and peak hour flow (PHF) conditions needed to be approximated. It is common practice to approximate the MDF and PHF conditions by multiplying the ADF demands by a factor. The FDEP estimates these factors as 2.25 for the ADF to MDF conversion and 2.0 for the MDF to PHF conversion. The FDEP factors may be used when little or no information is available for the system being analyzed. The FDEP allows alternative factors to be used provided sufficient historical information is available to accurately determine more appropriate factors. These factors have a significant impact on the modeling results and on the sizing of future components. For the purposes of this analysis and report, a review of the historic MOR data was used to approximate the ADF to MDF factor. Kimley-Horn reviewed MOR data for 2010 thru 2014 (5 years) to compare historic MDF flows to ADF flows. With the exception of two occurrences the ADF to MDF ratio was below 1.5. Kimley-Horn spoke with the City about the two occasions where the factors were greater than 1.5. On one occasion, the unusually high flow was attributed to Coleman Federal Prison emptying and refilling their onsite elevated storage tank two times. The other occurrence was due to a typographic error in the MOR report. Therefore, these two unusually high maximum daily flows were removed from the analysis.

To be conservative, a 20% factor was applied to the 1.5 to yield a final ADF to MDF of 1.8. It was also noted in the review, that the general trend of the ADF to MDF ratio is decreasing slightly. This is expected, as peaking factors tend to decrease as system sizes increase. The FDEP MDF to PHF factor of 2.0 was in the model. The resulting PHF used in the model is 3.6.

System Hydraulic Standards

Before identifying system deficiencies, system hydraulic standards needed to be established. The following hydraulic standards were used to evaluate the hydraulic model for deficiencies:

- Minimum System Pressure with Fire Flow Demand: 20 psi
- Minimum System Pressure with Peak Hour Demand: 35 psi
- Maximum System Pressure: 80 psi
- Typical Network Operating Pressure Range: 45-70 psi
- Fire Flow Demand: 1,000 gpm (minimum)

Methodology

One of the primary objectives of this report is to identify the water treatment plant and distribution system improvements needed to meet future potable water demands. To ensure future distribution system and water treatment improvements are made with the future system in mind, the analysis first establishes the 2035 demands. Then, the hydraulic model was used to identify the distribution and treatment improvements required to meet the 2035 demands. After establishing the required improvement sizes (i.e. water mains and plants), the intermediate demands for the 5-year and 10-year scenarios were modeled. The required

system improvements for each time step were then identified using the hydraulic model while taking into account the future needs.

The approach for modeling the system was to consider as many reasonable system configurations as possible for the 2035 demand scenario and evaluate the required improvements. This evaluation included the plant capacities and distribution line sizes. The minimum system pressures and available fire flows for each scenario were compared to the hydraulic standards presented above to determine adequacy of the system components and sizes. Once the optimal 2035 system configuration was decided, the model was then loaded with the 5-year and 10-years demands to evaluate the intermediate system performance.

In the model analysis, special attention was paid to the net flows coming from each plant in the various scenarios. Since each plant has a fixed existing capacity, the model results were checked against those capacities to ensure the scenario stayed within those limits. Any scenario allowing flow greater than capacity represented a situation where the plant would need to be expanded to accommodate the additional demand. The model was utilized to assess the required plant expansions and/or capacities of new facilities. In addition, the impacts of water main sizes on plant capacities was reviewed to ensure that water mains were sized as efficiently as possible given the treatment plants that were online.

A total of 42 physical scenarios were modeled to evaluate the impact of adding water treatment plants, various proposed system improvements, and physical expansion and growth of the City. The relevant model scenarios are discussed in the following sections. The discussions are organized chronologically for the present; 5-year, 10-year, and 20-year design time frames. A summary is included at the end to summarize the results of the analysis and how it may impact the water distribution system.

Scenarios – Present Year Analysis

Included in this section are the results of scenarios for the present system configuration as well as scenarios that include improvements made in 2015/2016. All scenario results are reported for the MDF demand condition unless otherwise noted. The following scenario analyses are described in detail below:

Scenario 1: Present System

This scenario is the basis for analyzing other scenarios for deficiencies or improvements resulting from modifying the City's system. In this scenario, all existing water treatment plants are connected to the distribution system and are operating at the normal operating pressures. Table 17 below summarizes the results of Scenario 1.

Table 17: Model Results for Scenario 1

	Avg. System Pressure (psi)	Min. System Pressure (psi)	Min. Available Fire Flow (gpm)
Present	63.0	47.7	626

Overall, the system is operating within the minimum system pressure standard established by FDEP. The average system pressure is well above the typical operating pressure of 55 psi. The minimum pressure is also well above the 20 psi minimum. Available fire flow coverage is good overall. However, the minimum fire flow is below the 1,000 gpm hydraulic standard. There are several locations in the present day scenario that have fire flows below the minimum of 1,000 gpm. Primarily, the low available fire flows are located at either the extreme ends of the system branches, the western end of SR 44, Wildwood County Estates neighborhood, the eastern end of CR 468, Okahumpka Service Plaza, or a recently constructed dead-end water main on CR 462 near CR 466A.

Scenario 2: Present System with the Ashley WTP Constructed

This scenario models the present system with the Ashely WTP plant constructed. At the time of the writing of this report, the Ashley WTP project is under construction with anticipated completion in late 2015 or early 2016. In this scenario, all other existing water treatment plants are connected to the distribution system and are operating at the normal operating pressures. Table 18 below summarizes the results of Scenario 2.

Table 18: Model Results for Scenario 2

	Avg. System Pressure (psi)	Min. System Pressure (psi)	Min. Available Fire Flow (gpm)
Present	63.0	47.7	626
Ashley WTP Constructed	63.0	47.7	627
Net Change	**0**	**0**	**1**

The results above indicate that constructing the Ashley WTP does very little for improving system pressures and available fire flows. However, due to the location, the Ashley WTP will be able to improve the available fire flows on the west end of SR 44 so that they are above the 1,000 gpm minimum. The plant will also add a redundant water supply to the I-75 interchange area. The low fire flows will remain in the Wildwood County Estates neighborhood, the eastern end of CR 468, Okahumpka Service Plaza, and the dead-end water main on CR 462.

Scenarios – 5-Year (2020) Analysis

Significant growth in the infill areas and new developments are anticipated throughout the water system within the 5-year planning horizon. The increase in total demands from the present year to the 5-year timeline is 2.21 MGD. The projected north service area and central service area developments are driving the increased water system demands. The increased water demands associated with the growth were input into the model and analyzed. This scenario was analyzed at average day, maximum day, maximum day plus fire flow, and peak hour demand conditions. A total of 12 alternative scenarios were modeled for this scenario.

The system improvements identified in the 5-year (2020) scenario analysis includes constructing a new potable water source and expanding the CR 214 re-pump station. Also identified is construction of various water main extensions associated with known developments and additional 12” water main extensions to accommodate anticipated system expansion throughout the service territory. The following are the specific treatment and water distribution system improvements that need to be constructed in order to meet the anticipated 5-year system hydraulic performance requirements:

- Construct a 16” water main extension from the CR 214 WTP along CR 209 for the O’Dell development.
- Construct 16” water main extension from the O’Dell development to SR 44 for a system loop
- Construct the 12” water main expansions as required by new developments to meet the project expansion and infill growth
- Convert the CR-214 re-pump station to a CR 214 WTP with a 3.0 MGD capacity by the addition of a potable water supply source, treatment system, and additional storage and pumping capacity.

With the above improvements, the resulting system performance is summarized in Table 19 below.

Table 19: Model Results for 5-Year Analysis				
	Avg. System Pressure (psi)	Min. System Pressure (psi)	Avg. Available Fire Flow (gpm)	Min. Available Fire Flow (gpm)
5-year System Results	63.4	48.7	1,954	992

Overall, the system will operate within the minimum system pressure standard established by FDEP. The average system pressure is well above the typical operating pressure of 55 psi. The minimum pressure is also well above the 20 psi minimum. Available fire flow coverage is good overall with much improvement within the present system with coverage above or within 1% of 1,000 gpm.

Scenarios – 10-Year (2025) Analysis

This scenario includes the anticipated additional demands from the existing service area, infill areas, and new developments from the 10-year growth projection. The increase in total demands from the 5-year to 10-year timeline is estimated to be 0.98 MGD. The Monarch Ranch, Southern Oaks DRI, and the Landstone DRI are ultimately driving the increased water system demands between the 5-year and 10-year planning horizons.

The system improvements identified in the 10-year (2025) scenario analysis includes additional water supply, treatment, and pumping capacity expansion of the CR 214 WTP, Coleman WTP, and Ashley WTP. Also identified was additional water main construction associated with known developments along with additional 12" water main extensions for system expansion throughout the service territory. A total of 6 alternative scenarios were modeled for the 10-year scenario to size the remainder of the future water mains and estimate plant capacities. The following are the specific water system treatment and water distribution system improvements that need to be constructed in order to meet the anticipated system hydraulic performance requirements:

- Construct a 12" water main extension for the Monarch Ranch development.
- Construct a 16" Southern Oaks DRI water main extension
- Construct a 16" Landstone DRI water main extension
- Construct a 12" water main expansion as required by new developments to meet the project expansion and infill growth
- Coleman WTP expanded to 4.5 MGD capacity.
- Ashley WTP expanded to 1.0 MGD capacity.
- CR-214 WTP expanded to 4.5 MGD capacity.

With the above improvements, the resulting system performance is summarized in Table 20 below.

Table 20: Model Results for 10-Year Analysis				
	Avg. System Pressure (psi)	Min. System Pressure (psi)	Avg. Available Fire Flow (gpm)	Min. Available Fire Flow (gpm)
10-year System Results	61.6	46.3	2,067	997

Overall, the system will operate within the minimum system pressure standard established by FDEP. The average system pressure is well above the typical operating pressure of 55 psi. The minimum pressure is also well above the 20 psi minimum. Available Fire flow coverage is good overall with minimal changes from the 5-year scenario. Available fire flow coverage is above or within 1% of 1,000 gpm.

Scenarios – 20-Year (2035) Analysis

The bulk of the scenario analysis was performed for the 20-year timeline. The Landstone DRI, Southern Oaks DRI, and the Wildwood Springs DRI in the south service area are the major drivers of the increased water system demands. The resulting water main and WTP capacity requirements were considered in the 5-year and 10-year analysis. Significant demand increases are anticipated in the next 20 years and substantial infrastructure improvements will be needed to support the additional demand. The 2035 system scenario analysis is summarized below:

The system improvements identified in the 20-year (2035) scenario analysis includes increasing the City's potable water supply source and expanding the Coleman WTP and Huey WTP. Also identified are constructing water main extensions associated with known developments in addition to 12" water main extensions for system expansion throughout the service territory. A total of 24 scenarios were modeled for the 20-year scenario to size the future water mains and estimate plant capacities. The following are the water treatment and distribution system improvements that need to be constructed in order to meet the anticipated system hydraulic performance requirement s:

- Construct a 12" water main expansion as required by new developments to meet the project expansion and infill growth.
- Coleman WTP expanded to 11.0 MGD capacity
- Huey St STP expanded to 1.5 MGD capacity

With the above improvements, the resulting system performance is summarized in Table 21 below.

Table 21: Model Results for 20-Year Analysis

Demand	Avg. System Pressure (psi)	Min. System Pressure (psi)	Min. Available Fire Flow (gpm)
2035 MDF	62.6	47.3	991

Overall, the system will operate within the minimum system pressure standard established by FDEP. The average system pressure is well above the typical operating pressure of 55 psi. The minimum pressure is also well above the 20 psi minimum. Available fire flow coverage is good overall with minimal changes from the 10-year scenario. Available fire flow coverage is above or within 1% of 1,000 gpm.

RECOMMENDED WATER SYSTEM CAPITAL IMPROVEMENT PROJECTS

Introduction

This section provides a discussion of the capital improvement projects developed to address current deficiencies and meet future potable water demands. Included in this section is a project list with probable costs of construction for recommended projects at the present year, 5-year, 10-year, and 20-year planning projections. Many of the projects are large enough to be constructed in phases; so, they are included in more than one of the time periods. The proposed capital improvement projects were discussed with City staff and prioritized. See Appendix D for the overall list with budget years and the detailed breakdown of the estimated construction costs for each of the capital improvement projects and a preliminary timeline for project implementation. See Figure 5 for an overall map of the capital projects.

Capital Project Descriptions

Water Distribution (WD) System Improvements

Project No. WD-1:
CR 209 Water main extension and system interconnects – This project consists of a 16" water main extension from the CR 214 WTP south along CR 209 and connecting to the northwest corner of the O'Dell development. See Figure 6 for a map of this improvement. The water main extension will provide redundancy for the north service area water system and is required to meet the projected max day demands and system fire flows. The 5-year projected developments, infill, and expansion will trigger the need for this project. The total length of pipe required to make the connection is approximately 9,200'. The estimated design and construction cost for this project is approximately $1,797,000.

Project No. WD-2:
Monarch Ranch water main and system interconnects – This project consists of a 12" water main extension from the existing SR 44 12" water main to center of the Monarch Ranch development. See Figure 7 for a map of this improvement. The water main extension provides the projected average day, maximum day, peak hour demands, and the required system fire flows for the Monarch Ranch development. The development of the Monarch Ranch will trigger the need for this project. The total length of pipe required to make this connection is approximately 8,660'. The estimated design and construction cost for this project is approximately $1,340,000

Project No. WD-3:
Southern Oaks water main along CR 468 from Turnpike to SR 44 loop – This project consists of a 16" water main extension connecting to the existing SR 44 12" water main east along SR 44 and then south along CR 468 connecting to the existing 8" water main. See Figure 8 for a map of this improvement. The water main extension provides the projected average day, maximum day, peak hour demands, and the required system fire flows for the Southern Oaks DRI and the projected infill and expansion along the water main route. The development of the Southern Oaks DRI will trigger the need for this project. The total length of pipe required to make this connection is approximately 29,100'. The estimated design and construction cost for this project is approximately $5,500,000

Project No. WD-4:
Landstone water main and system interconnect – This project consists of a 16" water main extension from the Coleman WTP and continuing south along CR 501 to the Landstone DRI. See Figure 9 for a map of this improvement. The water main extension provides the projected average day, maximum day, peak hour demands, and the required system fire flows for the Landstone DRI. The development of the Landstone DRI will trigger the need for this project. The total length of pipe required to make this connection is approximately 12,545'. The estimated design and construction cost for this project is approximately $1,660,000

Project No. WD-5:
O'Dell Development CR 462 to SR 44 Loop – This project consist of the following three water main extensions:

1. A 12" water main extension from the existing 10" water main on Industrial Drive north along CR 213 to the northwest corner of the O'Dell development
2. A 12" water main extension from the northwest corner of the O'Dell development east to the existing 10" water on CR 462
3. A 12" water main extension from the intersection of CR 213 and W Clarke St east to the existing 10" water main along US 301.

See Figure 10 for a map of these improvements. These water main extensions provide the projected average day, maximum day, peak hour demands, and the required system fire flows for the O'Dell development in addition to providing the required flows for the projected developments, infill, and expansion in the central and north water service area. The development of the O'Dell development and the projected demands in the north and central water service area trigger the need for this project. The total length of pipe required to make this connection is approximately 23,796'. The estimated design and construction cost for this project is approximately $3,830,000

Project No. WD-6:
Upsize water main along CR 501 – This project consists of a 24" water main extension from the intersection of CR 468 and CR 501 south along CR 501 to the Coleman WTP. See Figure 11 for a map of this improvement. This water main extension provides the projected average day, maximum day, peak hour demands, and the required system fire flows for the projected developments, infill, and expansion north of the Coleman WTP. The overall 20-year projected growth will trigger the need for this project. The total length of pipe required to make this connection is approximately 5,230'. The estimated design and construction cost for this project is approximately $1,090,000

Project No. WD-6a, 6b, W-9, W-12, W-14a, and W-14b:
City of Wildwood – These projects are City of Wildwood utility budget items that were identified by City Staff.

Development based 12" water main extensions – To meet the 20-year projected max day demands with system fire flows in the water service infill and expansion areas, multiple 12" water main extensions are required. These improvements are not based on specific known developments but will be required as new developments enter the system. The 12" water main extensions are required to provide the necessary level of service. The improvements are shown in the project descriptions figures discussed in the previous section and also shown in Appendix E. The total lengths and estimated design and construction costs of 12" water main extensions will be project and development specific.

Water Supply (WS) System Improvements

Project No. WS-1:
CR 214 WTP lower Floridan Well – This project consists of constructing a new potable water supply source at the CR 214 WTP. The City intends to construct a lower Floridan well to serve as a potable water source for the CR 214 WTP to meet the 5-year projected average day, maximum day, peak hour demands, and the required system fire flows for the projected developments, infill, and expansion in the north water service area. The estimated design and construction cost for this project is approximately $667,000

Project No. WS-2:
Coleman WTP lower Floridan Well – The project consists of constructing additional water sources at the Coleman WTP. The City intends to construct an additional lower Floridan well to enable the Coleman WTP to meet the 10-yeat projected average day, maximum day, peak hour demands, and the required system fire flows for the projected developments, infill, and expansion in the north, central, and south water service area. The estimated design and construction cost for this project is approximately $667,000

Project No. WS-3:
Ashley WTP well no. 2 – This project consists of constructing an additional lower Floridan aquifer potable water source at the Ashley WTP. The additional well will enable the Ashley WTP to meet the 10-year projected average day, maximum day, peak hour demands, and the required system fire flows for the projected developments, infill, and expansion along the SR 44 west water service area. The estimated design and construction cost for this project is approximately $527,000

Project No. WS-4:
Permitting: Request increase to the SWFWMD water use permitted withdrawal – This project consists of coordinating with the SWFWMD and submitting a permit application package to increase the permitted withdrawal amount to meet the anticipated 2025 year demands. The estimated cost for this project is approximately $50,000

Water Treatment (WT) System Improvements

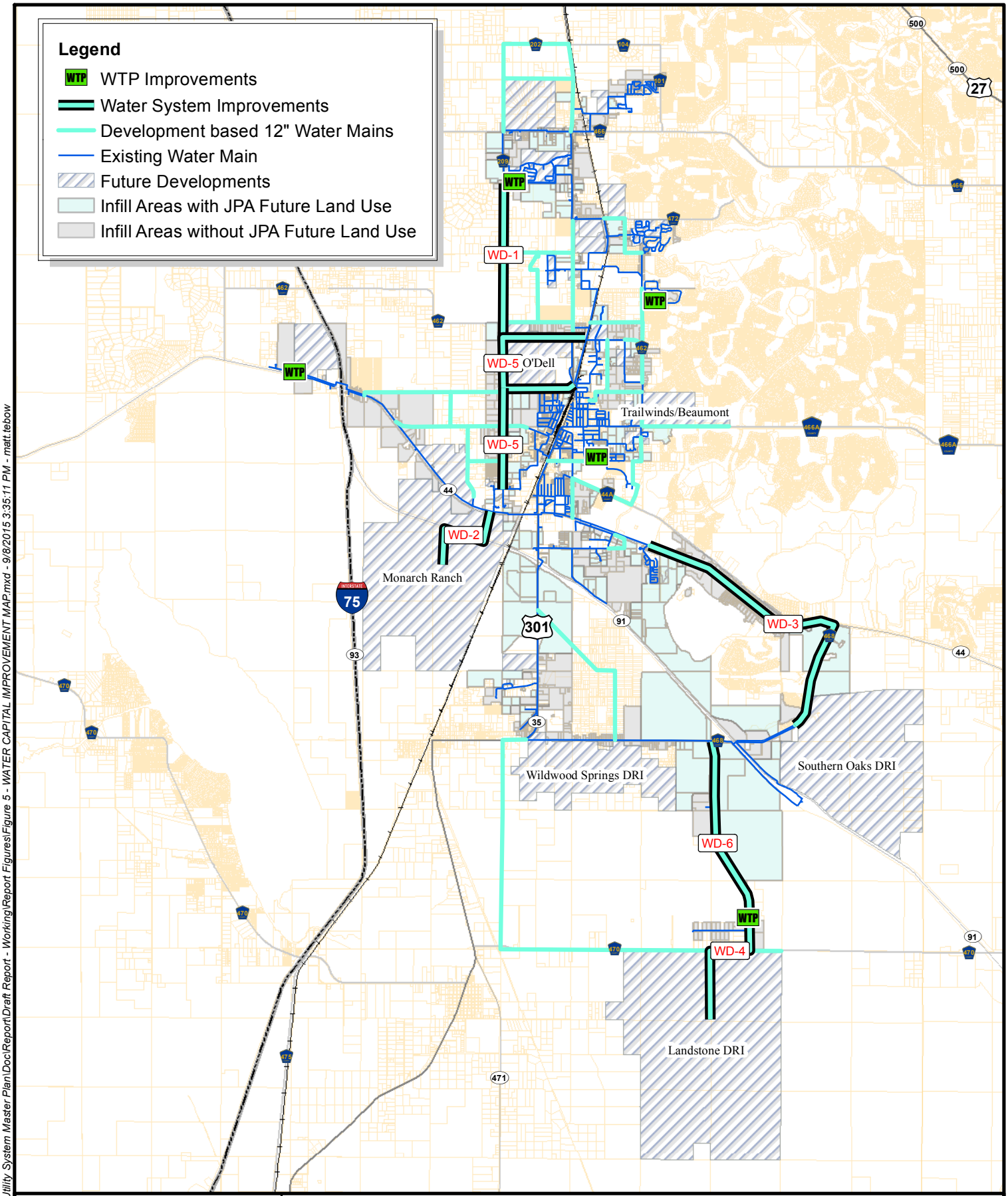
Project No. WT-1:
CR 214 WTP Expansion to 3.0 MGD – The 3.0 MGD MDD expansion will enable the CR 214 WTP to meet the 5-year projected average day, maximum day, peak hour demands, and the required system fire flows for the projected developments, infill, and expansion in the north water service area. The project includes water supply, additional finished water storage capacity, pumping capacity upgrades, and water quality treatment. The estimated design and construction cost for this project is approximately $4,479,000.

Project No. WT-2:
Coleman WTP Expansion to 4.5 MGD – The 4.5 MGD MDD expansion will enable the Coleman WTP to meet the projected average day, maximum day, peak hour demands, and the required system fire flows for the projected developments, infill, and expansion in the north, central, and south water service areas for the 2020 year planning horizon. The project includes water supply, additional finished water storage capacity, pumping upgrades, and water quality treatment for iron. The estimated design and construction cost for this project is approximately $7,075,000.

Project No. WT-3:
Coleman WTP Expansion to 11.0 MGD – The 11.0 MGD MDD expansion will enable the Coleman WTP to meet the projected average day, maximum day, peak hour demands, and the required system fire flows for the projected developments, infill, and expansion in the north, central, and south water service areas for the 2030 year planning horizon. The project includes water supply, additional finished water storage capacity, pumping upgrades, and water quality treatment for iron. The estimated design and construction cost for this project is approximately $17,410,000

Project No. WT-4:
Huey St WTP rehabilitation and expansion to 1,000 gpm – The expansion and rehabilitation will enable the Huey St WTP meet the projected average day, maximum day, peak hour demands, and the required system fire flows for the projected developments, infill, and expansion in the central water service areas anticipated for the 2023 year planning horizon. The project includes a new water supply well and existing WTP improvements. The estimated design and construction cost for this project is approximately $200,000.

Project No. WT-5:
Ashley WTP Expansion to 1.0 MGD – The 1.0 MGD MDD expansion will enable the Ashley WTP to meet the projected average day, maximum day, peak hour demands, and the required system fire flows for the projected developments, infill, and expansion in the central water service areas anticipated for the 2033 year planning horizon. The project includes a new water supply well and associated infrastructure. The estimated design and construction cost for this project is approximately $200,000.



K:\OCA_Civil\142173163 - Utility System Master Plan\Doc\Report\Draft Report - Working\Report Figures\Figure 5 - WATER CAPITAL IMPROVEMENT MAP.mxd - 9/8/2015 3:35:11 PM - matt.tebow

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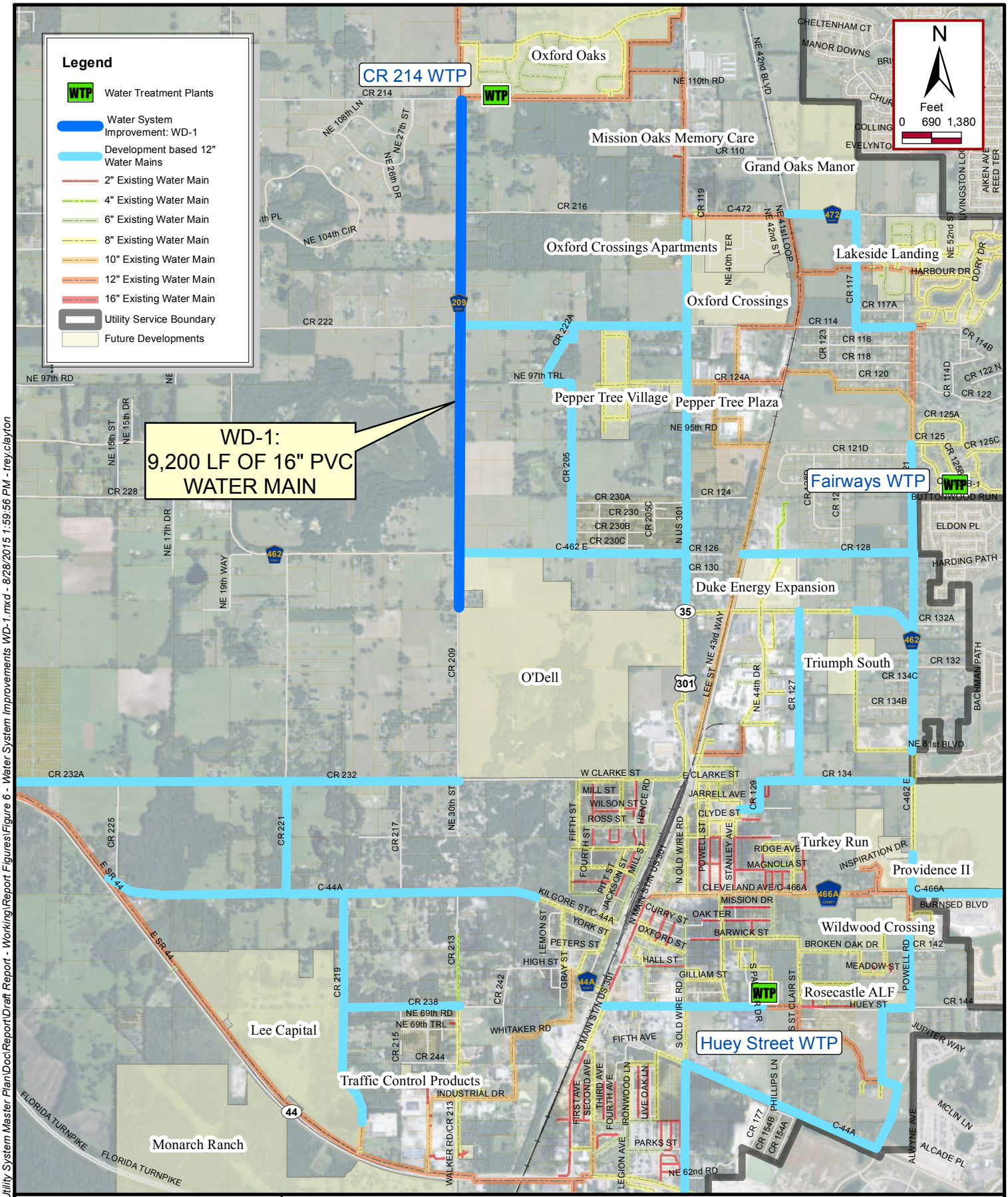
WATER SYSTEM IMPROVEMENTS

UTILITY MASTER PLAN
CITY OF WILDWOOD

Project No: 142173163	Scale: As Noted	AUGUST 2015	Figure 5



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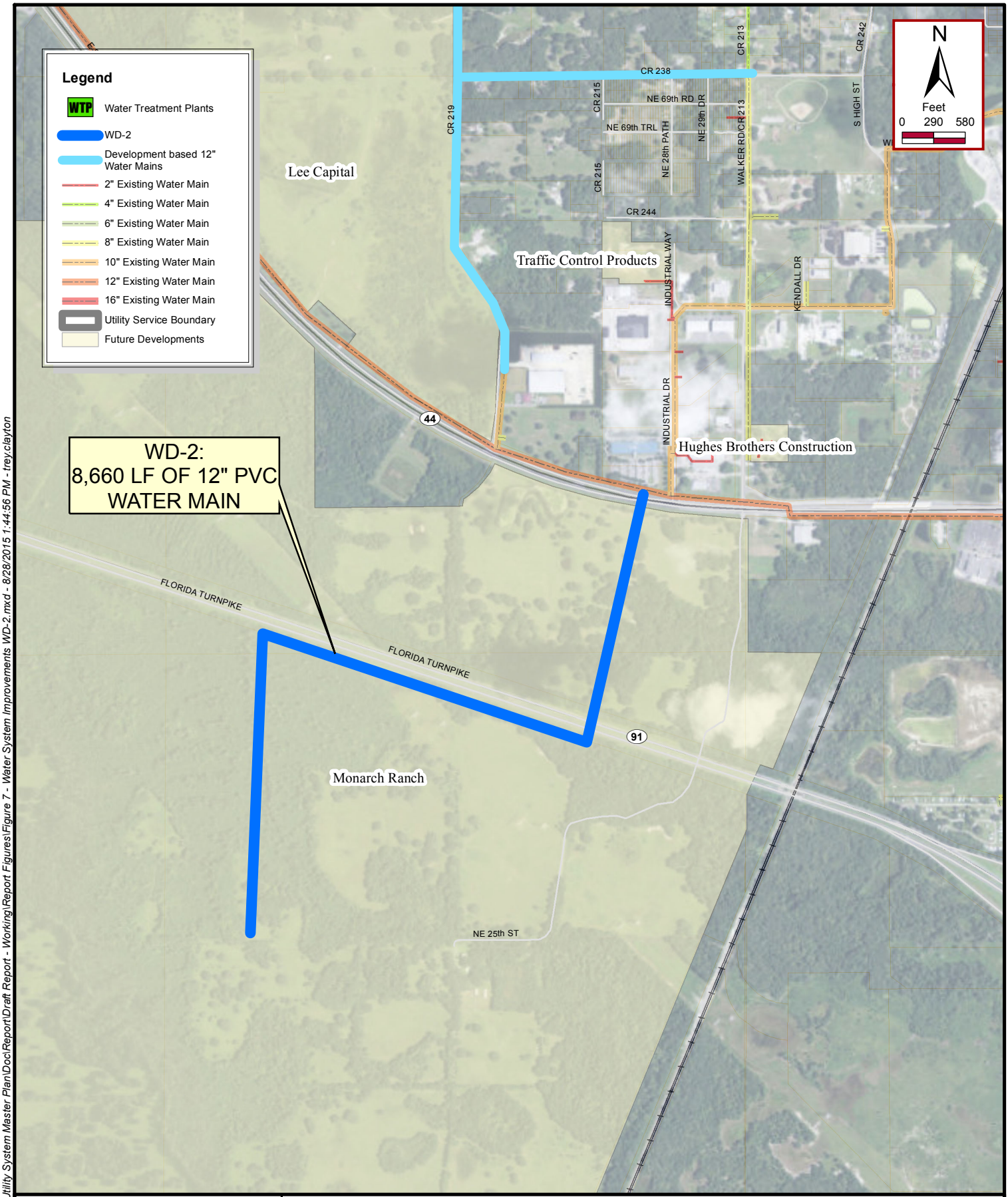
WATER SYSTEM IMPROVEMENTS: WD-1

UTILITY MASTER PLAN
CITY OF WILDWOOD

Project No: 142173163	Scale: As Noted	AUGUST 2015	Figure 6



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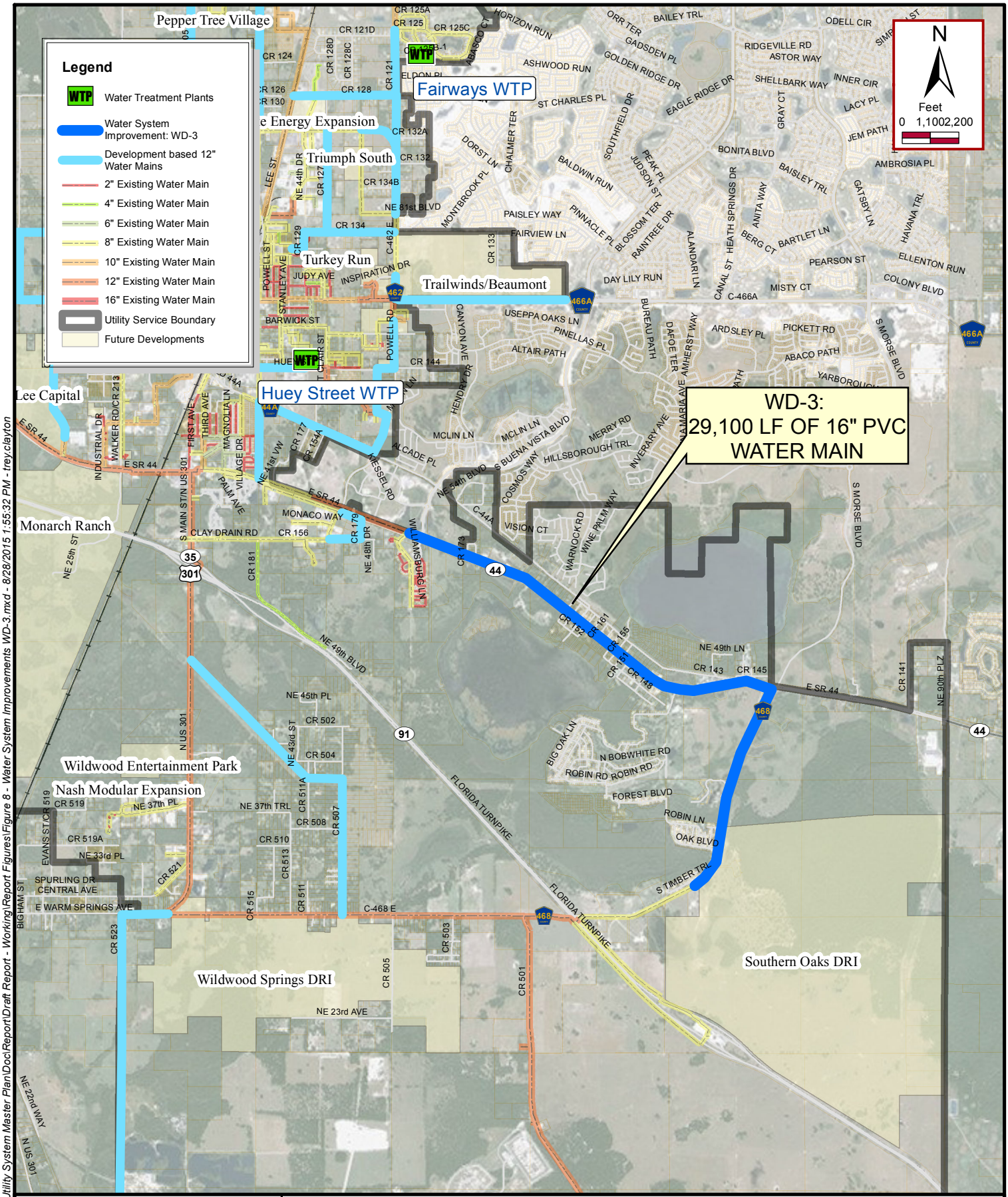
WATER SYSTEM IMPROVEMENTS: WD-2

UTILITY MASTER PLAN
CITY OF WILDWOOD

Project No: 142173163	Scale: As Noted	AUGUST 2015	Figure 7



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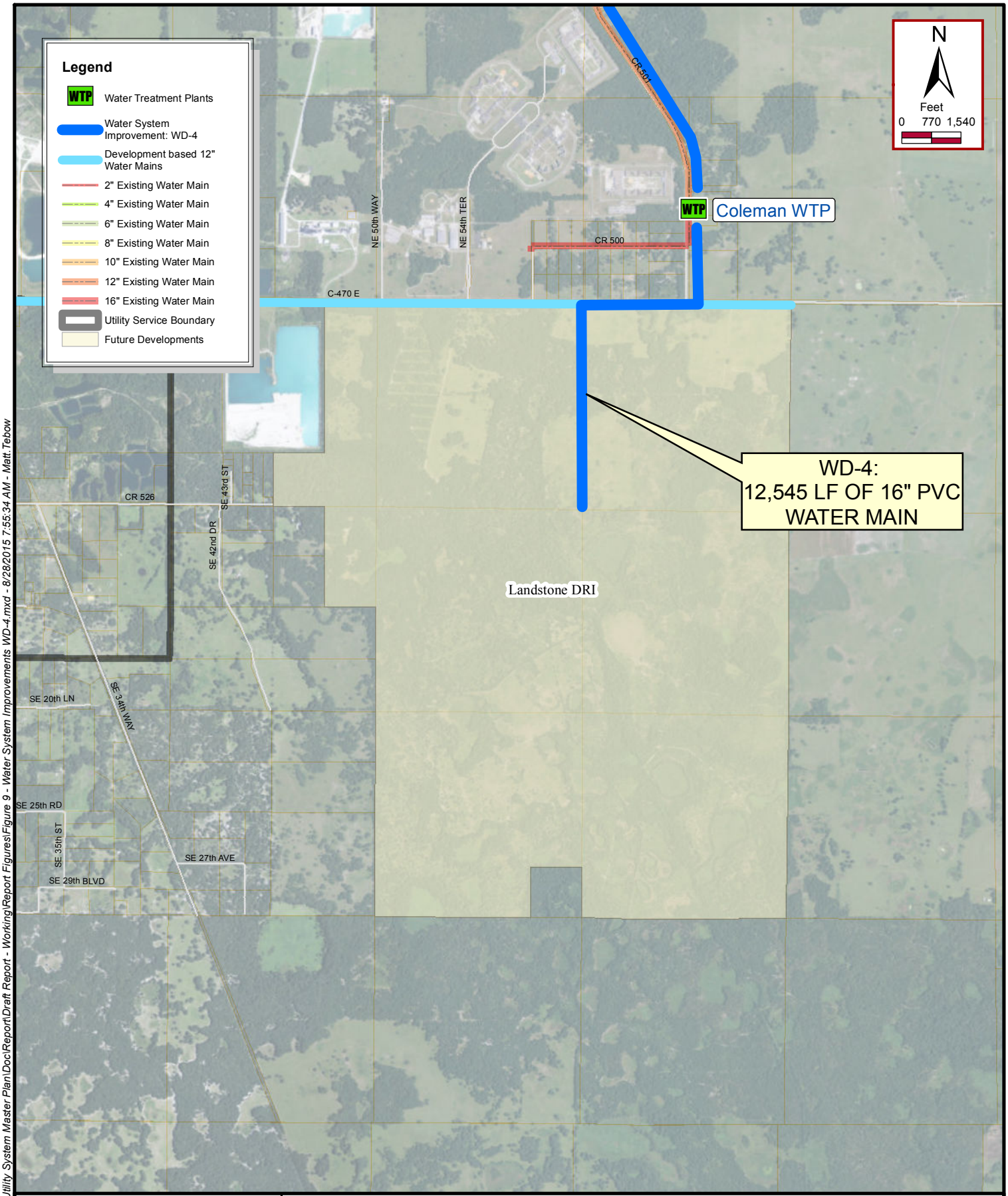
WATER SYSTEM IMPROVEMENTS: WD-3

UTILITY MASTER PLAN
CITY OF WILDWOOD

Project No: 142173163	Scale: As Noted	AUGUST 2015	Figure 8



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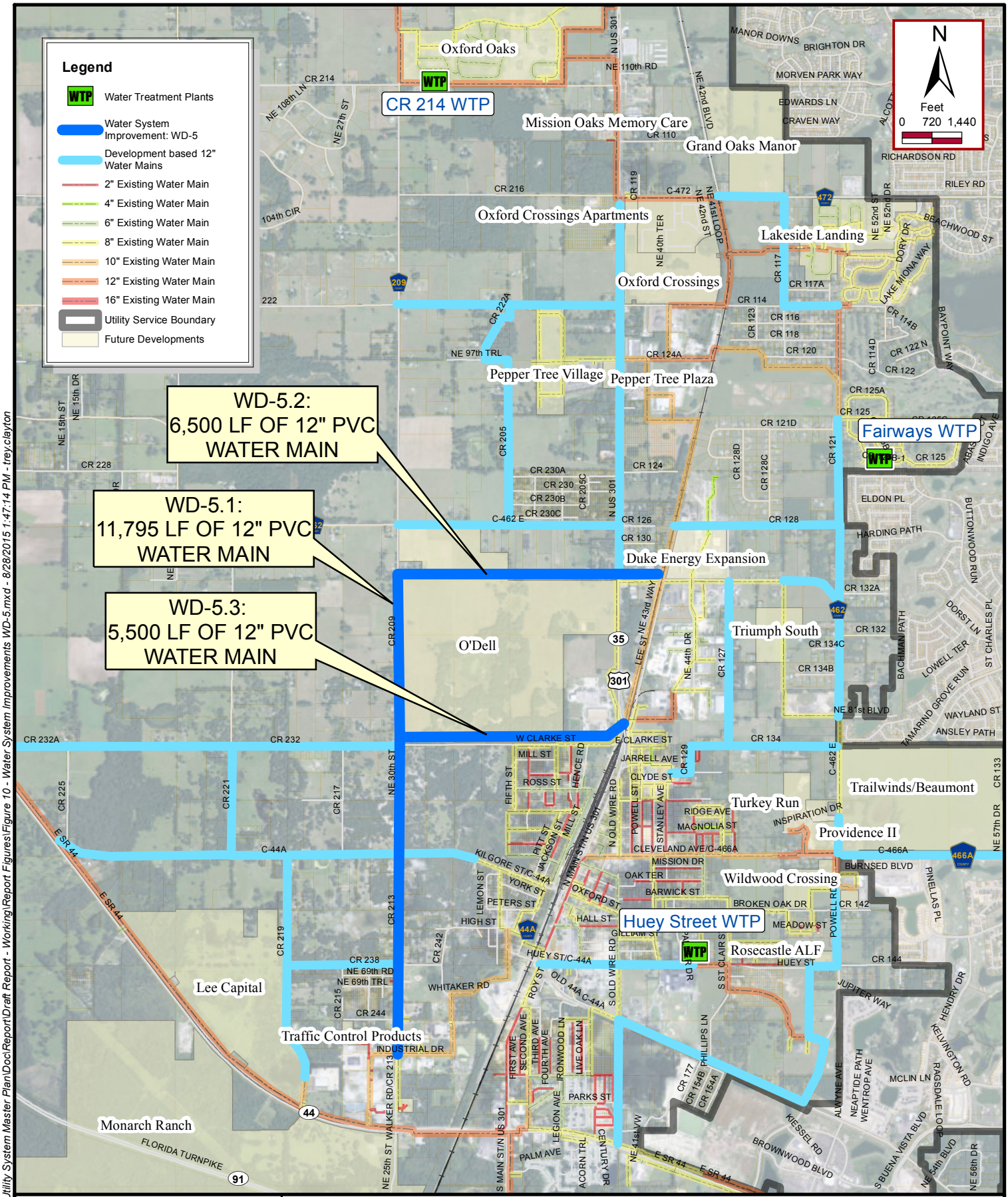
WATER SYSTEM IMPROVEMENTS: WD-4

UTILITY MASTER PLAN
CITY OF WILDWOOD

Project No: 142173163	Scale: As Noted	AUGUST 2015	Figure 9



K:\OCA_Civil\142173163 - Utility System Master Plan\Doc\Report\Draft Report - Working\Report Figures\Figure 10 - Water System Improvements WD-5.mxd - 8/28/2015 1:47:14 PM - trey.clayton

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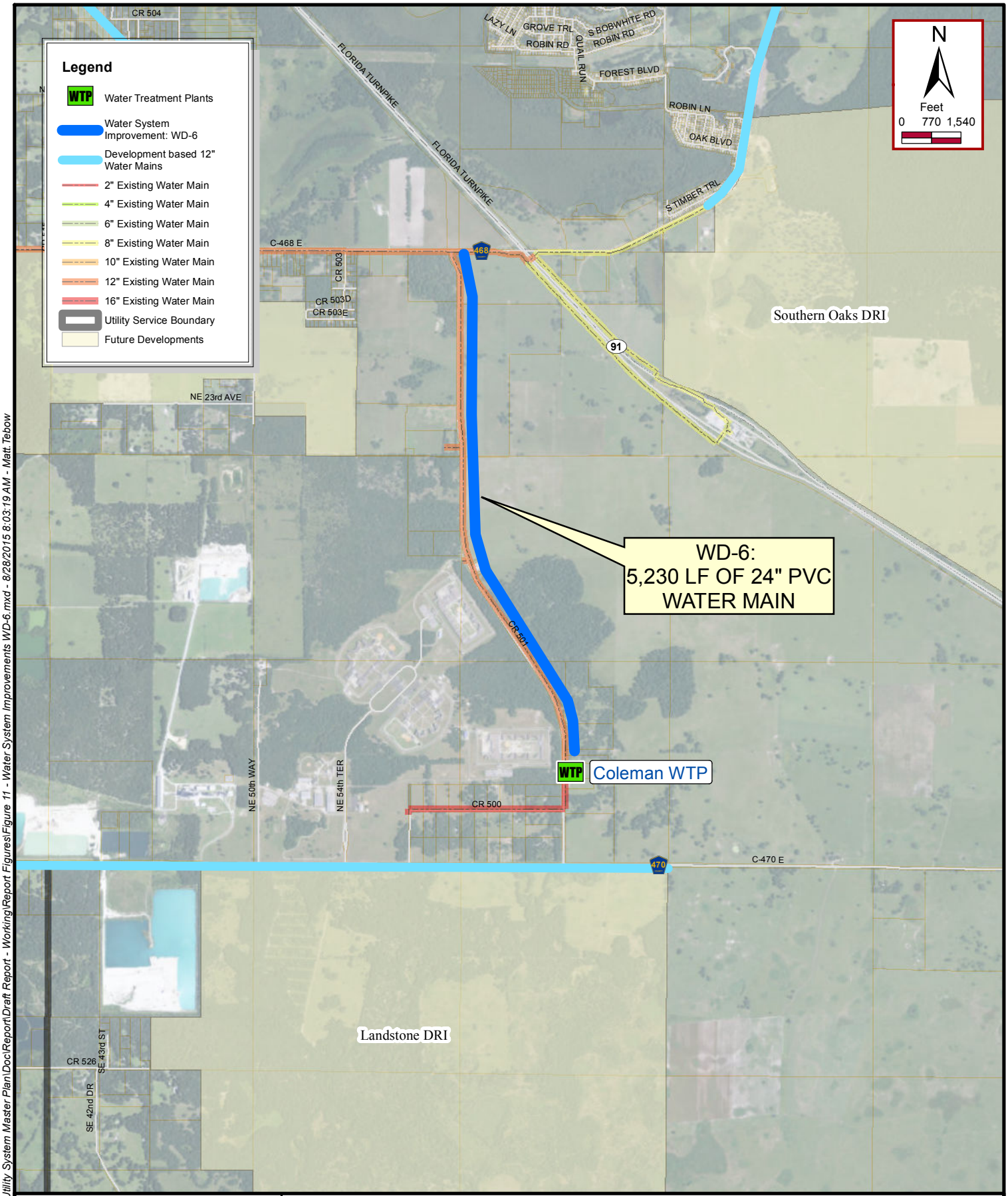
WATER SYSTEM IMPROVEMENTS: WD-5

UTILITY MASTER PLAN
CITY OF WILDWOOD

Project No: 142173163	Scale: As Noted	AUGUST 2015	Figure 10



K:\OCA_Civil\142173163 - Utility System Master Plan\Doc\Report\Draft Report - Working\Report Figures\Figure 11 - Water System Improvements WD-6.mxd - 8/28/2015 8:03:19 AM - Matt.Tebow

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WATER SYSTEM IMPROVEMENTS: WD-6

UTILITY MASTER PLAN
CITY OF WILDWOOD

Project No: 142173163	Scale: As Noted	AUGUST 2015	Figure 11

WASTEWATER SYSTEM

Introduction

This section discusses the existing wastewater collection and treatment system owned and operated by the City of Wildwood. The information includes an evaluation of the collection systems and wastewater treatment systems. Effluent disposal and reclaimed water are described and discussed in the next section.

Existing Wastewater Treatment and Collection System Overview

The City of Wildwood's wastewater collection system consists of the following components (approximately):

- 39 City lift stations and 43 private lift stations with monitoring of 15 private lift stations
- 741 manholes
- 1,926 feet of 6-inch PVC gravity sewer mains
- 187,471 feet of 8-inch PVC gravity sewer mains
- 6,526 feet of 10-inch PVC gravity sewer mains
- 24,028 feet of 4-inch diameter force mains
- 65,997 feet of 6-inch diameter force mains
- 19,556 feet of 10-inch diameter force main
- 10,118 feet of 12-inch diameter force main
- 39,283feet of 14-inch diameter force main
- 5,834 feet of 16-inch diameter force main

The City's WWTF is a Category III, Class C facility that is permitted for 3.55 MGD 3MRADF. The effluent disposal includes slow-rate public access reuse (R-001), Part IV rapid-rate land application (R-002), and a slow-rate public access (R-003) interconnection with the North Sumter Utilities WWTF. According to the 2014 DMR data, the City's WWTF received approximately 1.56 MGD AADF. At this average flow rate, the City has approximately 2.0 MGD AADF of available capacity.

WASTEWATER SYSTEM ANALYSIS AND METHODOLOGY

Introduction

This section provides an overview of City's wastewater collection system, wastewater system modeling and scenario analysis, wastewater treatment facility (WWTF) capacities, and wastewater system infrastructure improvements. The wastewater system analysis described in this section is based upon a strategy of providing wastewater service for future population growth combined with effective operations of the existing wastewater infrastructure within the city's service area.

Hydraulic Model Development

A hydraulic model was created for the City's pressurized sewer system (lift stations and force mains). The model was used to evaluate the performance of the wastewater collection system under current and future wastewater flow conditions. For master planning purposes, a system-wide SewerCAD model was completed by incorporating parcel level wastewater demands into individual sewer sheds to create the model. Kimley-Horn collected field data for the lift stations, force mains, and the gravity system. Lift station drawdown tests were performed at 43 lift stations. Observations were also made of the current condition of each lift station. A system inventory of the City's lift stations is presented in Appendix F. The system-wide model was used to (1) evaluate the available capacity in the existing wastewater collection system under future flow scenarios and (2) evaluate short-term and long-term system improvements.

System Hydraulic Standards

The wastewater system hydraulic standards and operating guidelines were developed from past experience along with information provided by the City. The wastewater system hydraulic standards are described below.

- Minimum force main design velocity: 2 fps
- Maximum force main design velocity: 7 fps
- Maximum gravity pipe capacity: 80% full flow
- Peak Hour Factors:
  - Flows less than 100,000 gpd: 4.0
  - Flows from 100,000 gpd to 250,000 gpd: 3.5
  - Flows from 250,000 gpd to 1,000,000 gpd: 3.0
  - Flows greater than 1,000,000 gpd: 2.5

Methodology

The wastewater system hydraulic model was used to analyze and aid in sizing various elements of the collection system to meet the existing, 5-year, 10-year, and 20-year projected demands. Existing, infill, expansion, and future development flow scenarios were analyzed by steady-state modeling of the pressurized wastewater collection system. Two different methods of steady-state modeling were used: the "pump model" method and the "flow model" method. The analysis also considered future wastewater treatment being provided by a single or two separate wastewater treatment facilities.

Pump Model

The pump model option was used to simulate the pressurized collection system by incorporating the actual pump curves for the pumps at each lift station. The steady-state model simulation was then used with a portion or all of the pumps in a manifold force main running concurrently. Kimley-Horn used the pump model to flag existing and future lift stations that could not pump against the "all pump on" system head. These lift stations received closer scrutiny in the flow model for both existing and future conditions.

Flow Model

The flow model option was used for evaluation of the lift stations and pressurized collection system. The flow model ignores pump curve information and instead adds a flow at each lift station location. Parcel level flow estimates were developed and assigned to specific "sewer sheds" created for each lift station. The lift stations that do not pump directly to the WWTF were added to the flows of the appropriate downstream lift station. Peak flows within each system were determined and then used for force main sizing in accordance with the system hydraulic standards presented above.

Wastewater Demand Projections

The population projections described in the "Population Growth Projections" section served as the basis for projecting future water demands. The future demands were estimated based one of the methodologies described below. The resulting demand projections are presented in Appendix B.

- **Parcels with existing wastewater usage -** Wastewater were based on the water service demand calculations multiplied by the wastewater/water (WW/W) flow ratio of 0.78. This ratio was calculated by dividing the 2014 annual average WWTF flows by the 2014 annual average WTP demands.
- **Parcels without existing wastewater usage -** First, equivalent residential unit (ERU) determinations were made for each parcel using one of the methodologies described below. Then, the ERU estimate for each parcel was multiplied by the City of Wildwood wastewater level of service standard of 250 gpd/ERU to determine the resulting wastewater demand.
  - **Parcels with a future land use designation in the 2035 Comprehensive Plan** - ERU values were assigned to a parcel based on the appropriate residential density or a maximum floor area ratio (FAR) that corresponds to the future land use shown in the 2035 Comprehensive Plan. For residential land uses with a range density range (i.e. 3-6 units per acre), the maximum density was used for the demand calculations. Demands were calculated from the FAR by assigning an appropriate demand per allowable unit area of development.
  - **Parcels without a future land use designation in the 2035 Comprehensive Plan** - The SWFWMD parcel level population projections were divided by 2.37 residents per ERU then multiplied by the City's 250 gpd/ERU to determine the future demands.
  - **New large scale developments -** The City provided a list of known developments with a buildout timeline. The projected development ERUs were then multiplied by 250 gpd/ERU to determine the development's demands based on the given development schedule provided by the City.

Collection System

The entire Wildwood pressurized wastewater collection system was divided into seven sewer sheds: North Area, SR 44 West Area, Trailwinds Area, Peter's Street Area, Main Street North Area, Southern Oaks DRI Area, and the Landstone Area. See Figure 12 for a map of the sewer sheds. A description for each of these areas are also shown in the next sections.

The "flow" and "pump" modeling methods were used to evaluate system performance for each of the flow scenarios against specific hydraulic standards, evaluation criteria, or operating guidelines. If an evaluation criterion was not met, then a proposed system improvement was identified.

North Area

Flows north of CR 462E make up the North Area sewer shed of the collection system. The modeled collection system for the North Area can be seen in Figure 12.

LIFT STATIONS

Currently, all sewer flows north of CR 124A ultimately outfall to one lift station (Charlotte LS) that conveys the flows to the south through a single 6" diameter force main. The Charlotte LS receives a significant portion of its flows through a gravity system that receives flows from a single force main (size varies from 6" to 12") that begins at the CR 209 LS and has several lift stations that manifold into it (including Mission Oaks LS, Lake Side Landings LS, several grinder pumps stations, and two private lift stations). The Charlotte LS flows are ultimately received by the Peter's Street LS.

The CR 209 LS receives sewer flows from all developments north of CR 214 and re-pumps those flows through the force main network to the Charlotte LS.

FORCE MAINS

A 6" diameter, acts as the "backbone" between the North Area and the rest of the City's wastewater collection system. The force main flows to a manhole in the gravity sewer system that ultimately outfalls to the Peter's Street LS. Given the anticipated development north of CR 124A, this force main will not have sufficient capacity to handle the future flows without major modifications to the North Area sewer shed.

GRAVITY SEWER

An 8" diameter gravity sewer line is located just north of the Charlotte LS and receives wastewater flows from the force main coming from the CR 209 LS and several others. This segment of gravity sewer connects the force main outfall to the Charlotte LS. Based on the City's as-built drawings, a significant stretch of this gravity sewer is sloped 0.4%. If this gravity system flows at 100% and 80% full, it has a maximum capacity of approximately 340 gpm and 275 gpm, respectively. Based on the flow rate measured from the CR 209 LS drawdown test, the capacity of this segment of gravity sewer is already being exceeded. It does not have sufficient capacity to handle any additional future flow.

Another gravity sewer segment of interest is located just northeast of the Peter's Street LS and receives wastewater flows from the force main coming from the Charlotte LS. As-built drawings of this area were not available for this analysis. Assuming the system consists of 8" pipes running at 0.4%, this segment has approximately 340 gpm of capacity at 100% full flow. Based on the flow rates measured from Charlotte LS, this segment is within capacity. However, based on the 'do nothing' scenario analysis, when the pumping capacity of Charlotte LS is increased, this section of gravity sewer does not have sufficient capacity to handle any additional flows.

FUTURE DEVELOPMENT AND GROWTH

The North Area has numerous projected developments anticipated. To meet the future demands, the City needs to convert the CR 209 LS to a master lift station and construct a force main from the CR 209 LS to the WWTF. This improvement will provide enough capacity for the existing and proposed developments in this sewer shed, as well as provide a system that can accommodate future developments that are currently considered infill and expansion. In addition, this improvement would reduce the flows that are received by the Charlotte LS and Peter's Street LS, which will return these stations to normal operating conditions.

SR 44 West Area

Flows west of US 301 along SR 44 make up the SR 44 West Area sewer shed of the collection system. The modeled collection system for the SR 44 West Area can be seen in Figure 12.

LIFT STATIONS

All sewer flows in this sewer shed ultimately outfall to one lift station (CR 219 LS) that conveys the flows east through a single 10" diameter force main directly to the WWTF. CR 219 LS receives flows from several lift stations that manifold into it including six private lift stations. The 3 Flags LS can bypass the CR 219 LS and pump directly to the WWTF.

FORCE MAINS

A 10" diameter force main acts as the "backbone" for the SR 44 West Area and flows directly to the WWTF. Excluding the Monarch Ranch Development, this force main has sufficient capacity to handle the future flows. The Monarch Ranch Development will require a force main to be constructed directly to the WWTF.

GRAVITY SEWER

City and privately owned 8" diameter gravity sewers are located west of I-75. Given the anticipated development in the sewer shed, there is sufficient capacity to handle the future flows.

FUTURE DEVELOPMENT AND GROWTH

Multiple developments are planned in this sewer shed along with the associated expansion and infill. The largest planned development in the sewer shed, Monarch Ranch, triggers a new lift station and force main to meet the projected flows. This force main will pump directly to the WWTF. Based on the addition or deletion of future developments, the Project Horizon and Lee Capital developments could also trigger a new lift station to meet the projected flows. Likewise, improvements to the CR 219 LS are triggered during by the 20-year projected expansion and infill growth.

Trailwinds Area

Currently, the flows in the Trailwinds Area sewer shed are distributed between the Main Street North Area sewer shed and the Peter's Street LS Area sewer shed. A force main constructed in 2015/2016 from the proposed development known as "Trailwinds" east along CR 232 and south along CR 209 make up the Trailwinds Area sewer shed collection system. The Trailwinds Area can be seen in Figure 12.

LIFT STATIONS

The existing LS in the Trailwinds sewer shed pumps to a gravity system that outfalls to the Main Street North sewer shed. When constructed, the proposed Trailwinds development LS will convey flows directly to the WWTF. The Charlotte LS and the Providence/Turkey Run LS will be interconnected to the Trailwinds force main. A future re-pump LS will be triggered by projected future developments east of US 301.

FORCE MAINS

A 12" diameter and 16" diameter force main acts as the "backbone" for Trailwinds Area. The force main flows directly to the WWTF. In 2015/2016, the force main will be interconnected to the CR 209 force main which will convey flows from the CR 209 LS. The force main was sized to have sufficient capacity to handle the North Area sewer shed flows from the CR 209 LS, the Trailwinds Area sewer shed flows, and the Charlotte LS flows.

GRAVITY SEWER

Given the anticipated development in the vicinity of St. Vincent Church, there is sufficient capacity to handle the future flows.

FUTURE DEVELOPMENT AND GROWTH

Three large developments, Trailwinds, O'Dell, and Triumph South, will trigger additional wastewater collection system infrastructure improvements in the Trailwinds Area to meet projected flows.

Peter's Street LS Area

Currently, the Peter's Street LS ultimately receives and re-pumps all the flows from the North Area sewer shed, in addition to inflows from a moderately sized gravity collection system, directly to the WWTF. After completion of the 2015/2016 wastewater collection system infrastructure improvement projects (Trailwinds FM, CR 209 FM, and North Area LS improvements), the Peter's Street LS Area will include only the existing gravity system inflows in the vicinity of the Peter's Street LS and the Charlotte LS flows as seen in Figure 12. The Charlotte LS will also be tied into the Trailwinds FM near US 301 which will enable the option for the Charlotte LS flows to bypass the Peter's Street sewer shed area.

LIFT STATIONS

The current inflow rate to Peter's Street LS is very close to the measured pumping rate of the lift station. This indicates that the Peter's Street LS is at capacity. During the drawdown testing, it was also observed that the wastewater level in the Peter's Street LS rose while one of the pumps was running. This indicates that the Peter's Street LS will take in more flow than it is able to pump out during daily peak flow conditions. Currently the existing pumps are able to compensate for this condition by running longer.

FORCE MAINS

The Peter's Street LS force main is 8" diameter and outfalls directly to the WWTF. After completion of the 2015/2016 wastewater collection system infrastructure improvement projects, this force main has sufficient capacity to handle future flow rates from the Peter's Street LS Area sewer shed.

GRAVITY SEWER

Given the anticipated development in the vicinity of the Peter's Street LS, there is sufficient capacity to handle the future flows after completion of the 2015/2016 wastewater collection system infrastructure improvement projects.

FUTURE DEVELOPMENT AND GROWTH

No large developments are anticipated to trigger wastewater collection system infrastructure improvements within the Peters Street LS area. The projected flow increases are from projected growth, system infill, and gravity sewer expansion.

Main Street North Area

Flows east of US 301, north of the turnpike, and south of the Trailwinds force main make up the Main Street North Area sewer shed. The collection system for the Main Street North Area can be seen in Figure 12.

LIFT STATIONS

All flows in this sewer shed ultimately outfall to one lift station (Main Street North) that conveys the flows east through a single 8" diameter force main directly to the WWTF. The Main Street North LS receives combined gravity flows from several lift stations.

FORCE MAINS

An 8" diameter force main acts as the "backbone" for Main Street North Area. This force main flows directly to the WWTF. Given the anticipated development in the sewer shed, the force main has sufficient capacity to handle the projected future flows.

GRAVITY SEWER

A 10" diameter gravity sewer conveys combined flows from multiple LS in the sewer shed. Given the anticipated development in the gravity sewer shed, there is not sufficient capacity to handle the 10-year projected infill and expansion flows.

FUTURE DEVELOPMENT AND GROWTH

No large developments are planned in this sewer shed since this area is mostly build out. The projected flows increases are from existing growth, system infill, and gravity sewer expansion.

Southern Oaks DRI Area

The proposed development known as Southern Oaks DRI, located north of the turnpike and then west along the turnpike make up the Southern Oaks DRI Area sewer shed. The collection system for the Southern Oaks DRI Area can be seen in Figure 12.

LIFT STATIONS

A future LS is triggered by projected development of the Southern Oaks DRI.

FORCE MAINS

A proposed 12" diameter force main will act as the "backbone" for Southern Oaks DRI Area. The force main will convey wastewater directly to the City WWTF. With the anticipated development of the Southern Oaks DRI, including infill and expansion along the Southern Oaks DRI "backbone" force main, there will be sufficient capacity to handle the future flows.

GRAVITY SEWER

The gravity sewer system infrastructure will be based on the anticipated development.

FUTURE DEVELOPMENT AND GROWTH

Development of the Southern Oaks DRI will trigger the wastewater collection system infrastructure improvements in the Southern Oaks DRI Area.

Landstone DRI Area

The proposed development known as the Landstone DRI, located south of the turnpike between US 301 and the Sumter County boundary make up the Landstone DRI Area sewer shed. Included in the Landstone DRI Area sewer shed is the Coleman Correctional Facility sanitary sewer system. The collection system for the Landstone DRI Area can be seen in Figure 12.

LIFT STATIONS

The Coleman Correctional Facility LS consists of an on-site duplex lift station equipped with two 88 horse power (HP) pumps. A future LS will be triggered by the projected developments based on the one WWTF or two WWTF scenarios discussed in the wastewater treatment facility in the next section.

FORCE MAINS

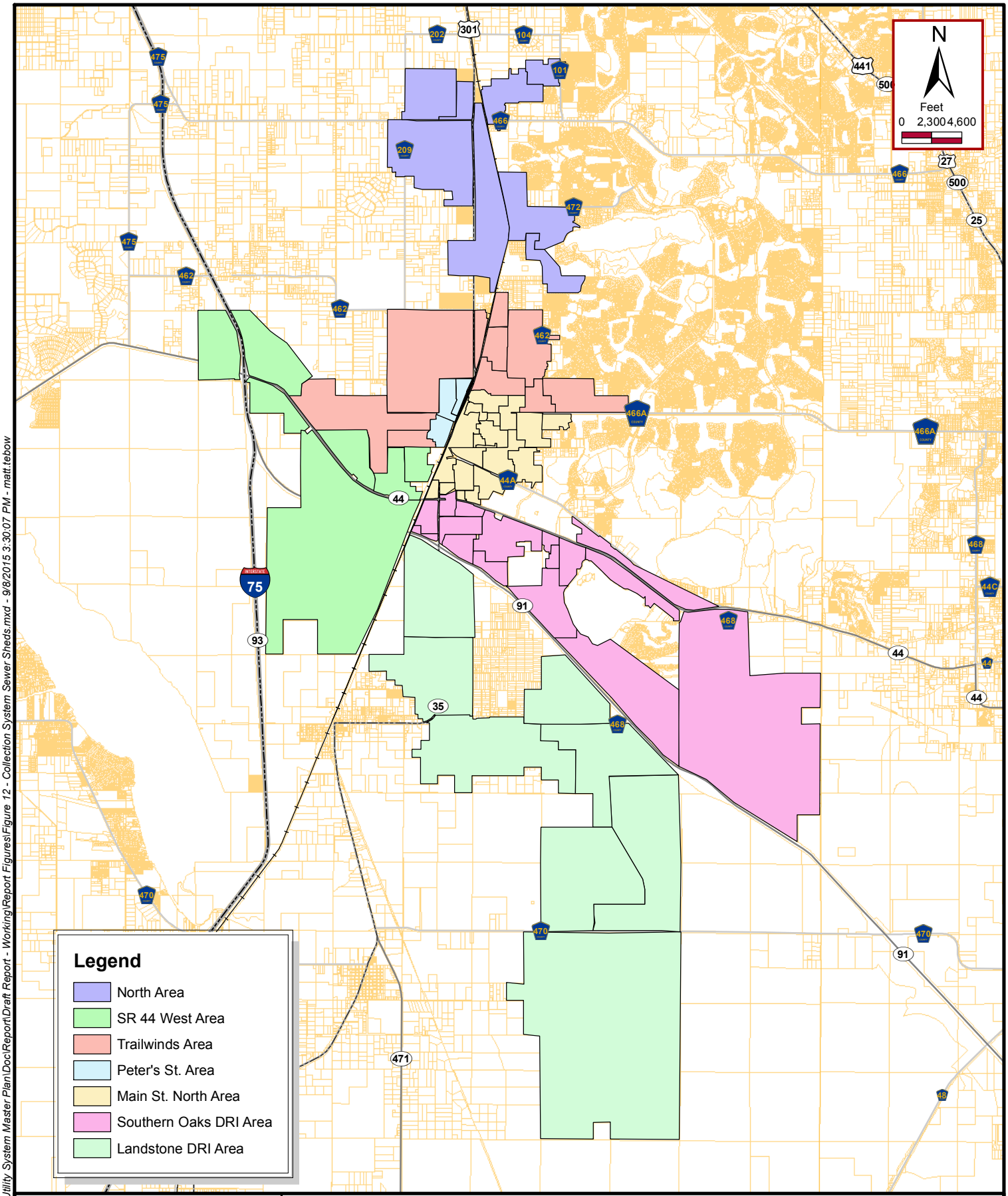
The Coleman Correctional Facility sanitary sewer system consists of approximately 6.8 miles of 14" diameter force main and 1.3 miles of 16" diameter force main which conveys wastewater directly to the City WWTF. This force main acts as the "backbone" for the Landstone DRI Area. The City has experienced 12 force main breaks over the past 10 years along CR 501.

GRAVITY SEWER

The gravity sewer system infrastructure will be based on the anticipated development.

FUTURE DEVELOPMENT AND GROWTH

Development of the Landstone DRI will trigger the wastewater treatment system and collection system infrastructure improvements in the Landstone DRI Area. The development of the Wildwood Springs DRI to the Landstone DRI will affect the one WWTF vs two WWTF scenario discussed in the next section.



K:\OCA_Civil\142173163 - Utility System Master Plan\Doc\Report\Draft Report - Working\Report Figures\Figure 12 - Collection System Sewer Sheds.mxd - 9/8/2015 3:30:07 PM - matt.tebow

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COLLECTION SYSTEM SEWER SHED OVERVIEW MAP

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CITY OF WILDWOOD

Project No: 142173163	Scale: As Noted	AUGUST 2015	Figure 12

Wastewater Treatment Facility Evaluation

The City currently operates its WWTF as permitted and regulated by the Florida Department of Environmental Protection (FDEP) under permit number FLA013497. The permitted capacity of the City's WWTF is 3.55 MGD. The operating permit was renewed on January 18, 2012 and expires on January 17, 2017.

One of the conditions of the WWTF operating permit is that the City must stay in compliance with the Florida Administrative Code (FAC), Section 62-600.405 "Planning for Wastewater Facilities Expansion". This section requires that the City report the three-month average daily flows for the most recent three consecutive months. If the flow exceeds 50 percent of the permitted capacity of the treatment plant or reuse and disposal systems, the City is required to submit a capacity analysis report (CAR) signed and sealed by a professional engineer registered in Florida. Based on when the projected flows will exceed the WWTF capacity in the CAR, the City is required to take different actions. Table 22 below is a summary of the required actions:

Table 22: FDEP WWTF Requirements

Projected WWTF Flow	Action Required
Will not exceed capacity in 10 years	Submit CAR every 5 years
Will exceed capacity in 10 years	Submit CAR annually
Will exceed capacity in 5 years	Start planning and preliminary design to expand WWTF
Will exceed capacity in 4 years	Prepare plans and specifications for the expanded WWTF
Will exceed capacity in 3 years	Submit construction permit for the expanded facility within 30 days of CAR
Will exceed capacity in 6 months	Submit an operation permit for the expanded WWTF

To meet the projected future demands, the City has the option of providing wastewater treatment at a single central facility or at separate regional facilities. Based on the 7.73 MGD 20-year demand projection, to provide treatment at a single WWTF the City will need to expand the existing facility capacity by approximately 5.45 MGD (3.55 MGD existing capacity + 5.45 MGD additional future demand = 9.0 MGD). It is important to note that in order to meet FAC Section 62-600.405 requirements, additional capacity expansions may be required before the end of this 20-year planning horizon.

Under a two regional plant scenario, the wastewater collection system will be partitioned to create two separate systems. Based on the anticipated spatial distribution of future demands, one collection system will serve primarily all areas north of the Florida Turnpike and the other collection system will serve all areas south of the Turnpike. The existing WWTF will serve the "North" system and a new WWTF will be constructed to serve the "South" system. The resulting capacity requirements for each WWTF are 5.0 MGD for the North system and 4.0 MGD for the South system. To accommodate these capacity requirements, the existing WWTF capacity will need to be expanded by 1.45 MGD and a new 4.0 MGD facility will need to be constructed to serve the South system. A review of the analysis for both the one WWTF and two WWTF scenarios are presented in the next section.

Single WWTF Scenario

The following transmission system upgrades were identified for the one WWTF scenario. The total project cost for this scenario is approximately $67,187,048.

- The City WWTF and effluent disposal system capacity needs to be increased by 5.45 MGD at an estimated project cost of $54,500,000.
- Based on the projected flows coming from Landstone Development, the proposed force main carrying flows from the development north on CR 501 to CR 468 needs to be 4.24 miles long and 20" in diameter. The estimated project cost is $3,917,760.
- The proposed force main carrying flows on CR 468 west from CR 501 to US 301 will need to be 20" before the Wildwood Springs Development flows join the system. After this development joins the system, the proposed force main will need to be 24" diameter. The proposed 20" force main will be 1.17 miles long with an estimated project cost of $1,081,080. The proposed 24" force main will be 1.54 miles long with an estimated project cost of $1,748,208. The total estimated project cost of both sections is $2,829,288.
- The proposed force main carrying flows north on US 301 from CR 468 to the WWTF will need to be 30" diameter and approximately 3.75 miles in length. The estimated project cost is $5,940,000.

Two WWTF Scenario

The following transmission system upgrade recommendation modifications were identified for the two WWTF scenario. The total project cost for this scenario is approximately $59,548,256

- The City WWTF and Wildwood WWTF system capacity needs to be increased by 1.45 MGD and 4.0 MGD respectively. The estimated project cost is $54,500,000.
- Based on the projected flows going to Landstone Development, the proposed force main carrying flows to the development from the Coleman Prison needs to be 2.38 miles long and 20" in diameter. The estimated project cost is $2,199,120.
- The existing 14" force main can be utilized to convey wastewater flows to the Landstone WWTF.
- The proposed force main carrying flows north on US 301 from CR 468 to the WWTF will need to be 16" diameter and approximately 2.58 miles in length. The estimated project cost is $1,907,136.
- The proposed force main running south on US 301 will be 8" diameter FM. The estimated project cost is $942,000.

The City will have to expand the available treatment capacity for wastewater to accommodate future growth. How the City approaches expanding the treatment capacity will have both short term and long term financial impacts. Based on the analysis above, the two plant scenario appears to be the most effective approach. The two plant scenario will allow the city to utilize much of the existing infrastructure while expanding into new areas of service. However, the addition or deletion of future developments would influence this recommendation. Additionally, a full life cycle cost analysis including operations, maintenance, and future regulatory requirements should be considered.

RECOMMENDED WASTEWATER SYSTEM CAPITAL IMPROVEMENT PROJECTS

Introduction

This section provides a discussion of capital improvement projects developed by investigating alternatives for addressing current deficiencies and meeting future demands. Included in this chapter is a project list with probable costs of construction for recommended projects. See Appendix D for the detailed breakdown of the estimated construction costs for each of the capital improvement projects and a preliminary timeline for project implementation. Many of the capital improvement projects are large and will require implementation over several years that may overlap the 5-year, 10-year, and 20-year planning time periods. See Figure 13 for a map of the capital improvement projects.

To properly plan for expansion of the City's Wastewater transmission system the following variables were considered:

1. The overall expected growth anticipated over the next 20 years, including new developments and expansion of the existing service territory.
2. The timing of the growth.
3. The spatial orientation of the growth.
4. Given the timing, spatial orientation of the growth, and the existing infrastructure, evaluate the most effective route for future flows.

Capital Project Descriptions

The following capital projects should be considered for improving the sanitary sewer system for the safety and reliability of the sanitary sewer service throughout the City.

Wastewater Collection (WC) System Improvements

Project No. WC-1:
CR 209 force main, CR 209 lift station improvements, and north service area flow reversal to CR 209 LS – This project converts the CR 209 LS to a master lift station and constructs approximately 15,720 feet of 12" force main to interconnect with the Trailwinds FM at the intersection of CR 232 and CR 209. See Figure 14 for a map of this improvement. This force main will divert the wastewater flows north of CR 472 directly to the WWTF. The force main will reduce the flows through the existing 6" force main "backbone" and will immediately reduce pump operating times and increase the long-term capacity and reliability of the wastewater collection system. The lift stations that currently flow to Charlotte LS can be reversed to flow to the CR 209 LS. The pumps in these stations will be replaced. The estimated cost of this improvement, including survey, engineering, and contingency is $2,500,000

Project No. WC-2:
Trailwinds force main – This project consists of a 12" and 16" force main from as the proposed Trailwinds development east along CR 232 and south along CR 209 directly to the City WWTF. The project is currently under construction with anticipated completion in early 2016.

Project No. WC-3:
Trailwinds re-pump station – This LS will enable the Trailwinds force main and Trailwinds Area sewer shed to meet the projected peak wastewater flows. The development of the O'Dell property will trigger this project. The estimated design and construction cost for this project is approximately $803,000.

Project No. WC-4:
Charlotte Lift Station Upgrades – The Charlotte LS pumps will be upgraded and the LS will be rehabilitated to accommodate the changes resulting from the CR 209 FM project. The estimated design and construction cost for this project is approximately $223,000

Project No. WC-5:
Peter's Street Lift Station Upgrades – The Peter's Street LS pumps will be upgraded and the LS will be rehabilitated to accommodate the changes resulting from the CR 209 FM project. The estimated design and construction cost for this project is approximately $223,000

Project No. WC-6:
Monarch Ranch force main and lift station – This projects consists of a 12" diameter force main from the center of the Monarch Ranch development directly to the Wildwood WWTF. See Figure 15 for a map of this improvement. The LS will enable the Monarch Ranch development to meet the projected peak wastewater flows. The development of the Monarch Ranch property will trigger the project. The total length of pipe required to make this connection is approximately 8,660'. The estimated design and construction cost for this project is approximately $1,793,000.

Project No. WC-7:
Southern Oaks DRI force main and lift station – This project consists of a 12" diameter force main from the center of the Southern Oaks development directly to the Wildwood WWTF. See Figure 16 for a map of this improvement. The LS will enable the Southern Oaks development to meet the projected peak wastewater flows. The force main will enable the Southern Oaks development and the projected expansion and infill to meet the projected peak wastewater flows. The development of the Southern Oaks DRI will trigger the project. The total length of pipe required to make this connection is approximately 29,100'. The estimated design and construction cost for this project is approximately $5,922,000.

Project No. WC-8:
Landstone DRI force main and lift station – This project consists of a 20" diameter force main from the existing Coleman Prison LS to the Landstone WWTF. See Figure 17 for a map of this improvement. The force main will enable the Coleman Prison LS and the projected expansion, infill, and southern area developments to meet the projected peak wastewater flows. The development of the Landstone DRI will trigger the project. The total length of pipe required to make this connection is approximately 12,545. The estimated design and construction cost for this project is approximately $3,501,000.00

Project No. WC-9:
Wildwood Springs DRI force main and lift station – This project consists of a 16" diameter force main from the northwest corner of the Wildwood Springs DRI along US 301 to the existing 14" force main along CR 501. See Figure 18 for a map of this improvement. The force main will enable the Wildwood Springs DRI and the projected expansion, infill, and southern area developments to meet the projected peak wastewater flows. The development of the Wildwood Springs DRI will trigger the project. The total length of pipe required to make this connection is approximately 13,600'. The estimated design and construction cost for this project is approximately $4,035,000.

Project No. WC-10:
Wildwood Entertainment Park force main and lift station – This project consist of a 8" diameter force main from just past the northeast corner of the Wildwood Entertainment Park south along US 301 to the Wildwood Springs DRI force main. See Figure 19 for a map of this improvement. The force main will enable the Wildwood Entertainment Park and the projected expansion, infill, and southern area developments to meet the projected peak wastewater flows. The development of the Wildwood Entertainment Park will trigger the project. The total length of pipe required to make this connection is approximately 6,600. The estimated design and construction cost for this project is approximately $942,000.

Project No. WC-11:
Main Street North 10" Gravity Upsize

This project includes upsizing the existing 10" gravity main connected to the Main Street North LS to a 12" gravity main. See Figure 20 for a map of this improvement. This project will enable the Main Street North Area sewer shed to meet the projected peak wastewater flows from the Main Street North Area sewer shed infill and existing growth. The estimated design and construction cost for this project is approximately $520,000.

Project No. WC-12:
CR 219 Lift Station Upgrades – The CR 219 LS pumps will be upgraded and the LS will be rehabilitated to meet project future demands. The lift station upgrades will enable the CR 219 to meet the projected wastewater peak flows from the projected expansion, infill, and SR 44 West Area sewer shed. The estimated design and construction cost for this project is approximately $223,000.

Project No. WC-13:
Infiltration and Inflow (I&I) study – I&I is clean storm and/or groundwater that enters the sanitary sewer system through holes, breaks, joint failures, connection failures, illegal connections (sump pumps, down spouts/gutters, and footing drains), and from cross-connections with storm sewers. Historical WWTF influent flow records indicate significant I&I contributions during rain events. This project is implementation of a program to identify and document locations where the collection system is allowing inflow and infiltration. The approximate cost associated with this study is $250,000.

Project No. WC-14:
Infiltration and Inflow (I&I) repairs – This project is implementation of a program to define corrective measures and repairs to the problem areas identified during the I&I study. The cost associated with these improvements is budgeted for $100,000 per year.

Project No. WW1, WW2, WW5, WW6, WW9, WW10, WW11, WW16a, WW16b, and WW16c:
City of Wildwood – These projects are City of Wildwood utility budget items that were identified by City Staff.

Wastewater Treatment (WW) System Improvements

Project No. WW-1:
WWTF permit renewal – Prepare and submit 10-year WWTF permit renewal application package. The estimated cost for this project is approximately $20,000.

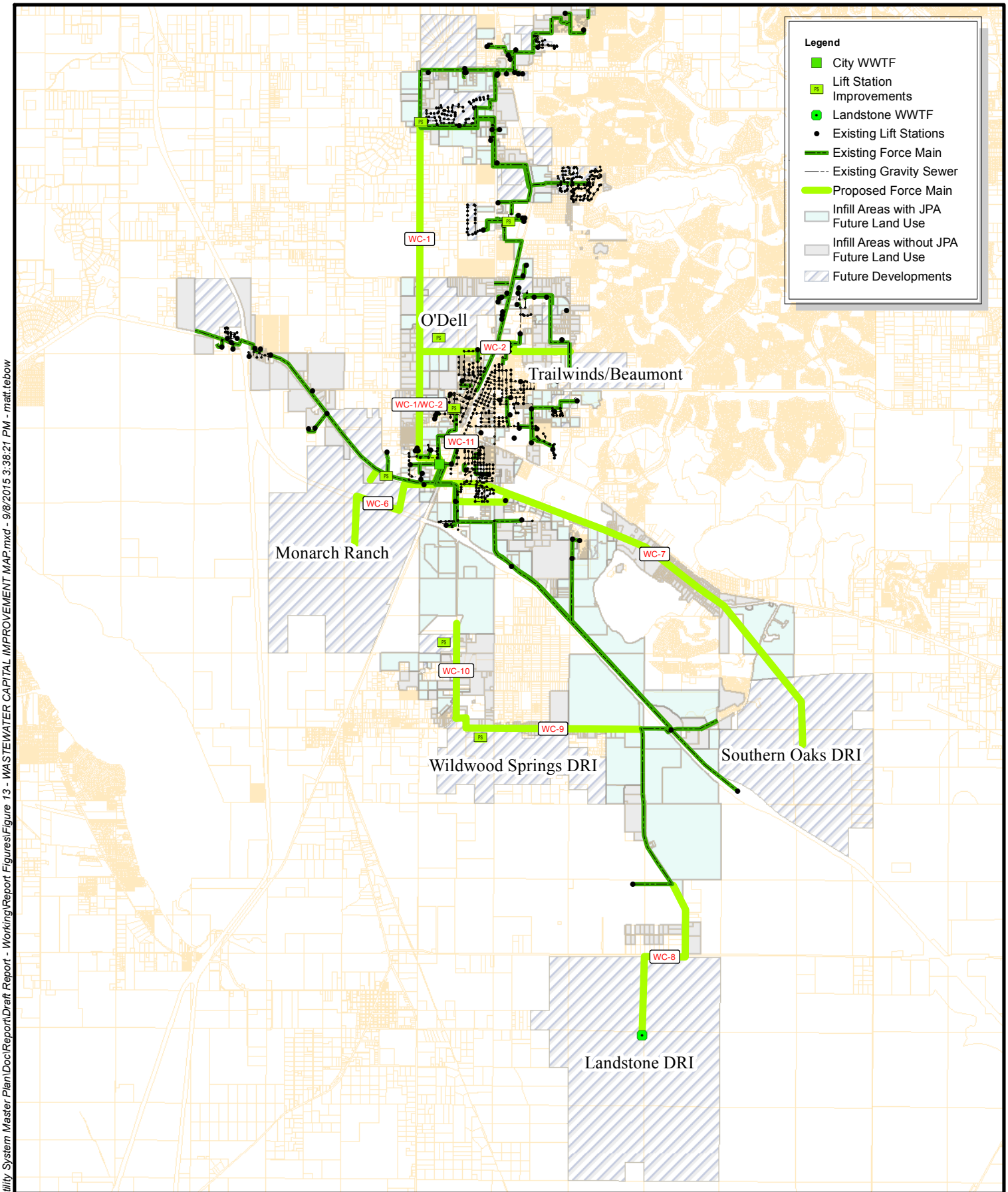
Project No. WW-2:
Existing WWTF process and hydraulic modifications and upgrades – The modifications and upgrades will enable the Wildwood WWTF to meet the permitted capacity of 3.55 MGD. The project includes a clarifier flow splitting structure, RAS flow control modifications, and an actuated valve for the headworks bypass. The estimated design and construction cost for this project is approximately $1,000,000.

Project No. WW-2a:
Tertiary Filter Modifications (Bypass) – The existing filter modification will enable the Wildwood WWTF to meet the permitted capacity of 3.55 MGD. The project includes piping and valve modifications to allow the existing tertiary filter to be bypassed during an effluent reject event. Currently, the filters are overloaded during a reject event and the filters can't be bypassed. The estimated design and construction cost for this project is approximately $100,000.

Project No. WW-3:
Wildwood WWTF Expansion to 5.0 MGD – The 5.0 MGD expansion will enable the wastewater system to meet the projected peak hour wastewater flow requirements for the projected developments, infill, and expansion in the north and central sewer sheds areas. The project includes a new headworks, aeration basins, advanced treatment, disinfection expansion, filtration expansion, reclaimed water transfer system expansion, and a biosolids processing facility expansion. The estimated design and construction cost for this project is approximately $19,909,000.

Project No. WW-4:
New 2.0 MGD Landstone WWTF – The first phase of this project will be a new 2.0 MGD WWTF. The WWTF will meet the 10-year projected peak hour wastewater flow requirements for the Coleman Prison and the projected developments, infill, and expansion in the south sewer sheds areas. The project includes a new headworks, aeration basins, advanced treatment, disinfection, filtration, reclaimed water transfer and disposal system, and a biosolids processing facility. The first phase estimated design and construction cost for this project is approximately $27,460,000.

Project No. WW-5:
Landstone WWTF expansion to 4.0 MGD – The second phase of this project will be an expansion to the Landstone WWTF. The WWTF will then meet the 20-year projected peak hour wastewater flow requirements for Coleman Prison and the projected developments, infill, and expansion in the south sewer sheds areas. The project includes new aeration basins, advanced treatment, disinfection expansion, filtration expansion, reclaimed water transfer and disposal system expansion, and a biosolids processing facility expansion. The second phase estimated design and construction cost for this project is approximately $27,460,000.



K:\OCA_Civil\142173163 - Utility System Master Plan\Doc\Report\Draft Report - Working\Report Figures\Figure 13 - WASTEWATER CAPITAL IMPROVEMENT MAP.mxd - 9/8/2015 3:38:21 PM - matt.tebow

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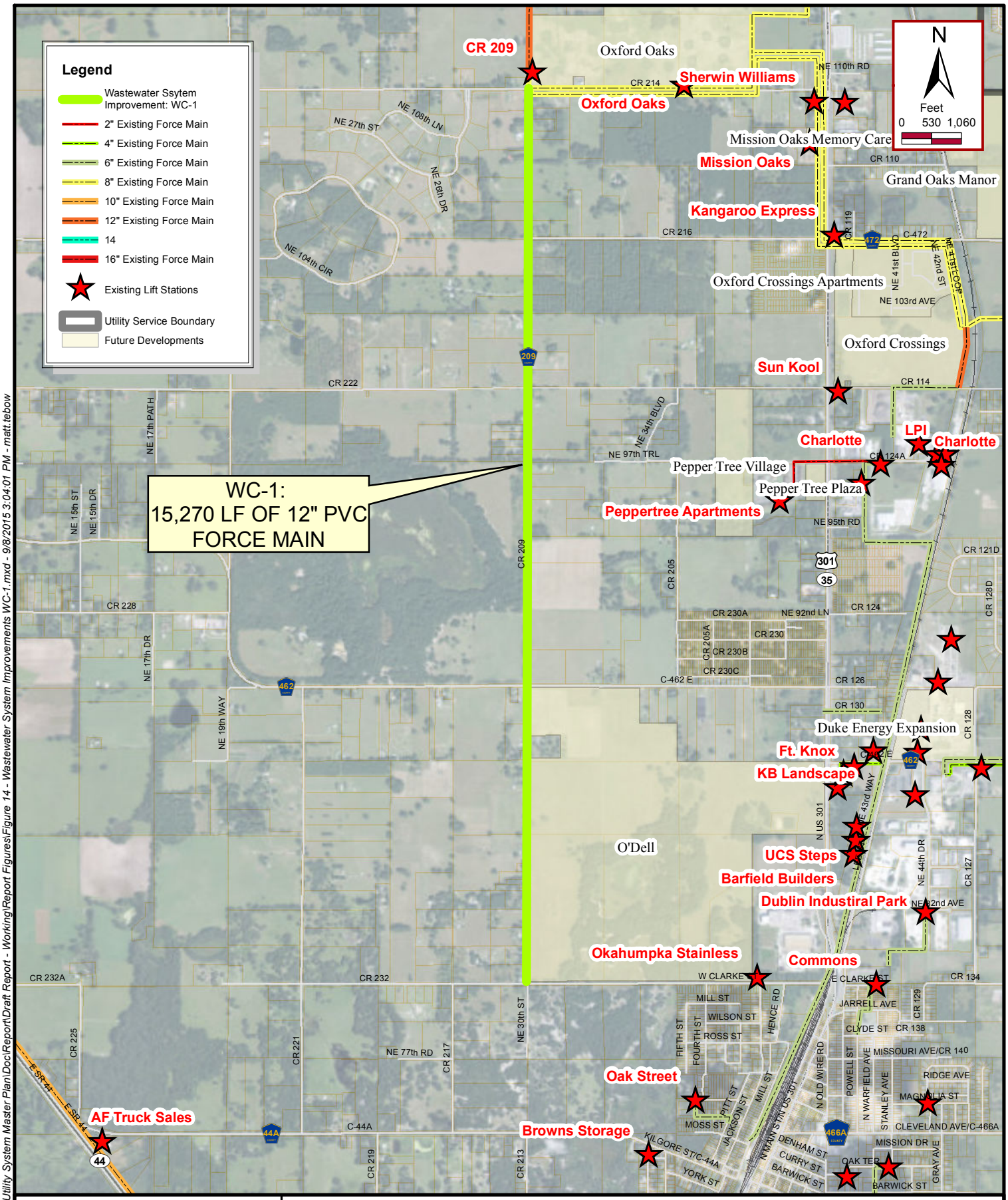
WASTEWATER SYSTEM IMPROVEMENTS

UTILITY MASTER PLAN
CITY OF WILDWOOD

Project No: 142173163	Scale: As Noted	AUGUST 2015	Figure 13



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WASTEWATER SYSTEM IMPROVEMENTS: WC-1

UTILITY MASTER PLAN
CITY OF WILDWOOD

Project No: 142173163	Scale: As Noted	AUGUST 2015	Figure 14

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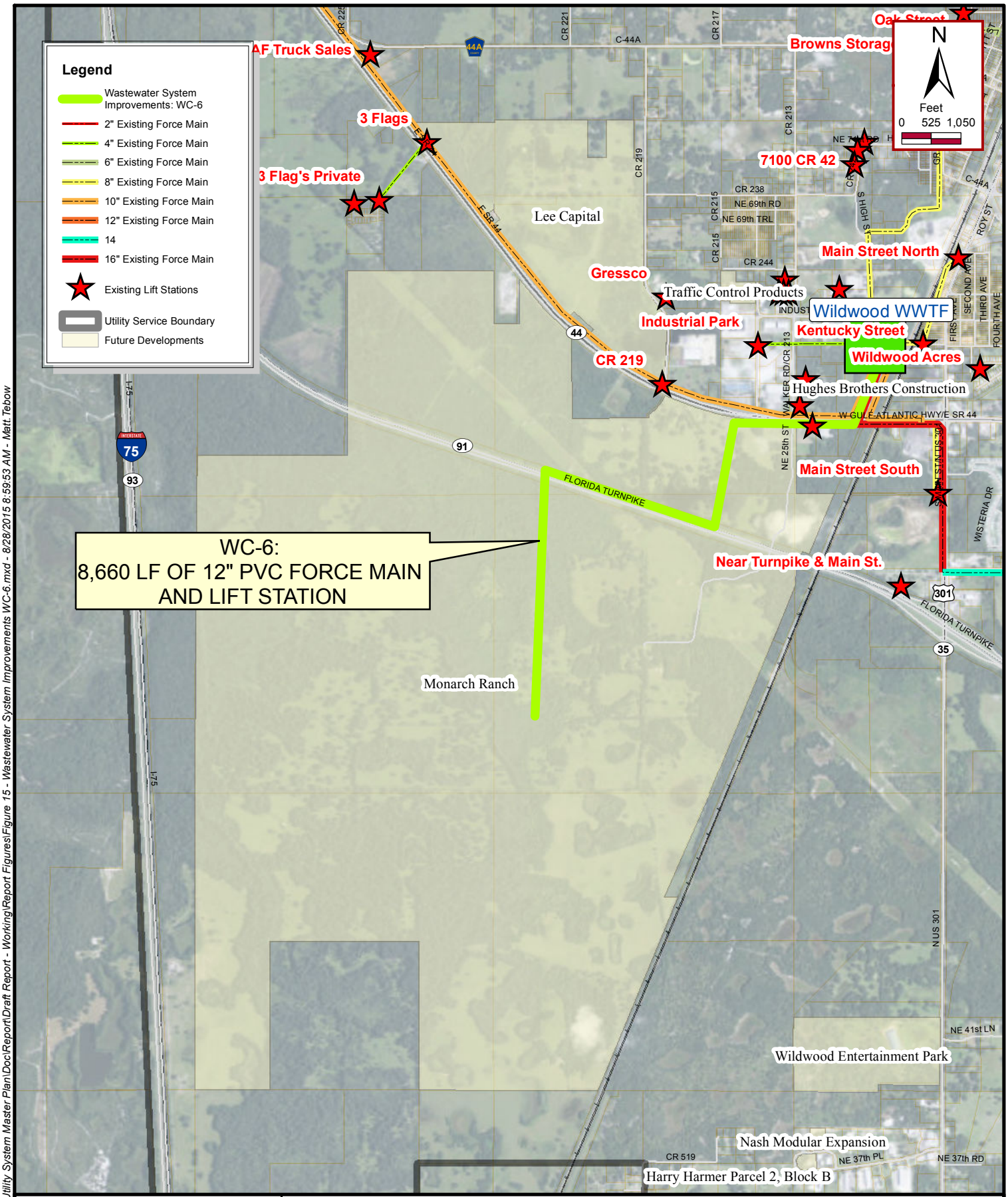

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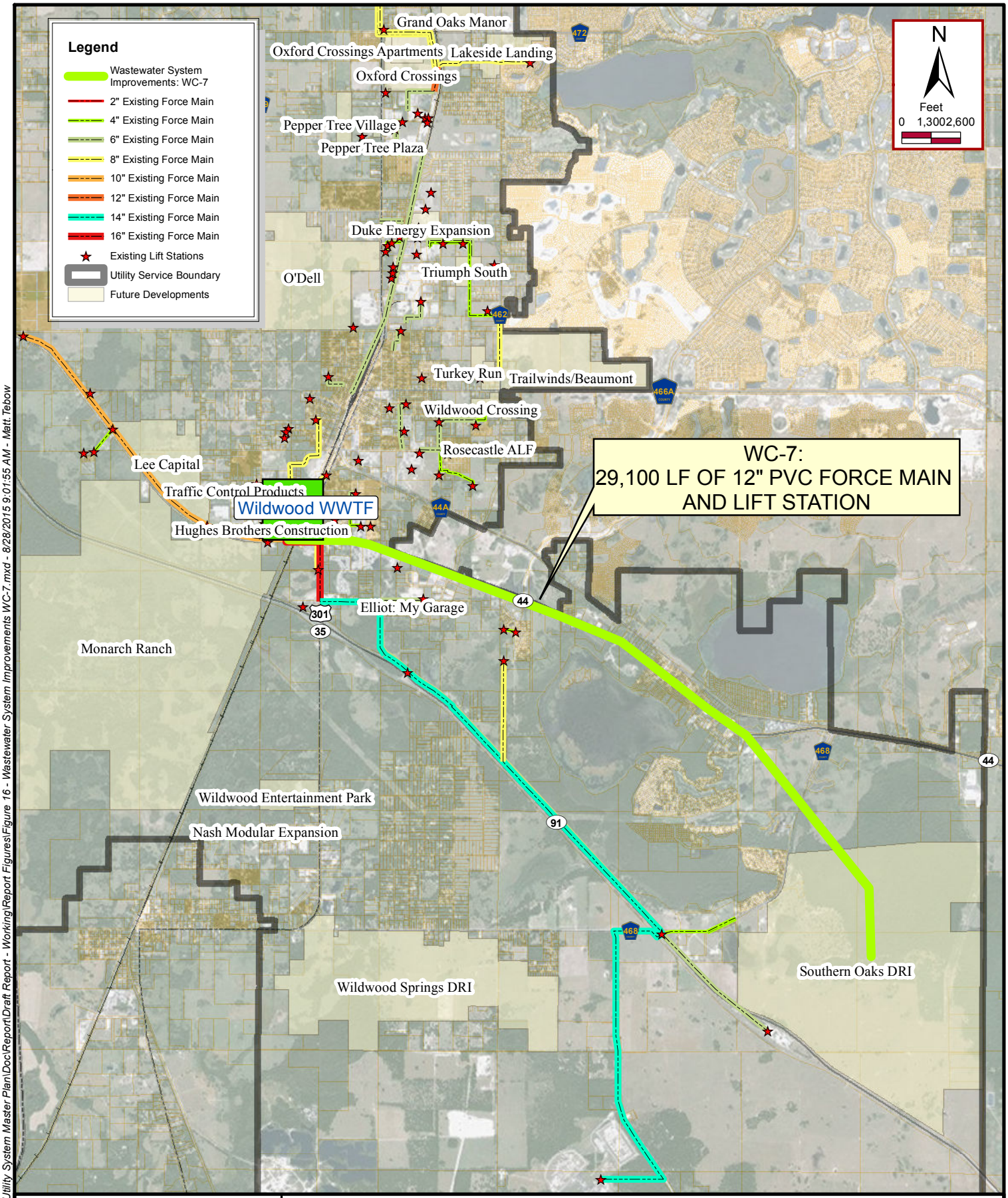
WASTEWATER SYSTEM IMPROVEMENTS: WC-6

UTILITY MASTER PLAN
CITY OF WILDWOOD

Project No: 142173163	Scale: As Noted	AUGUST 2015	Figure 15



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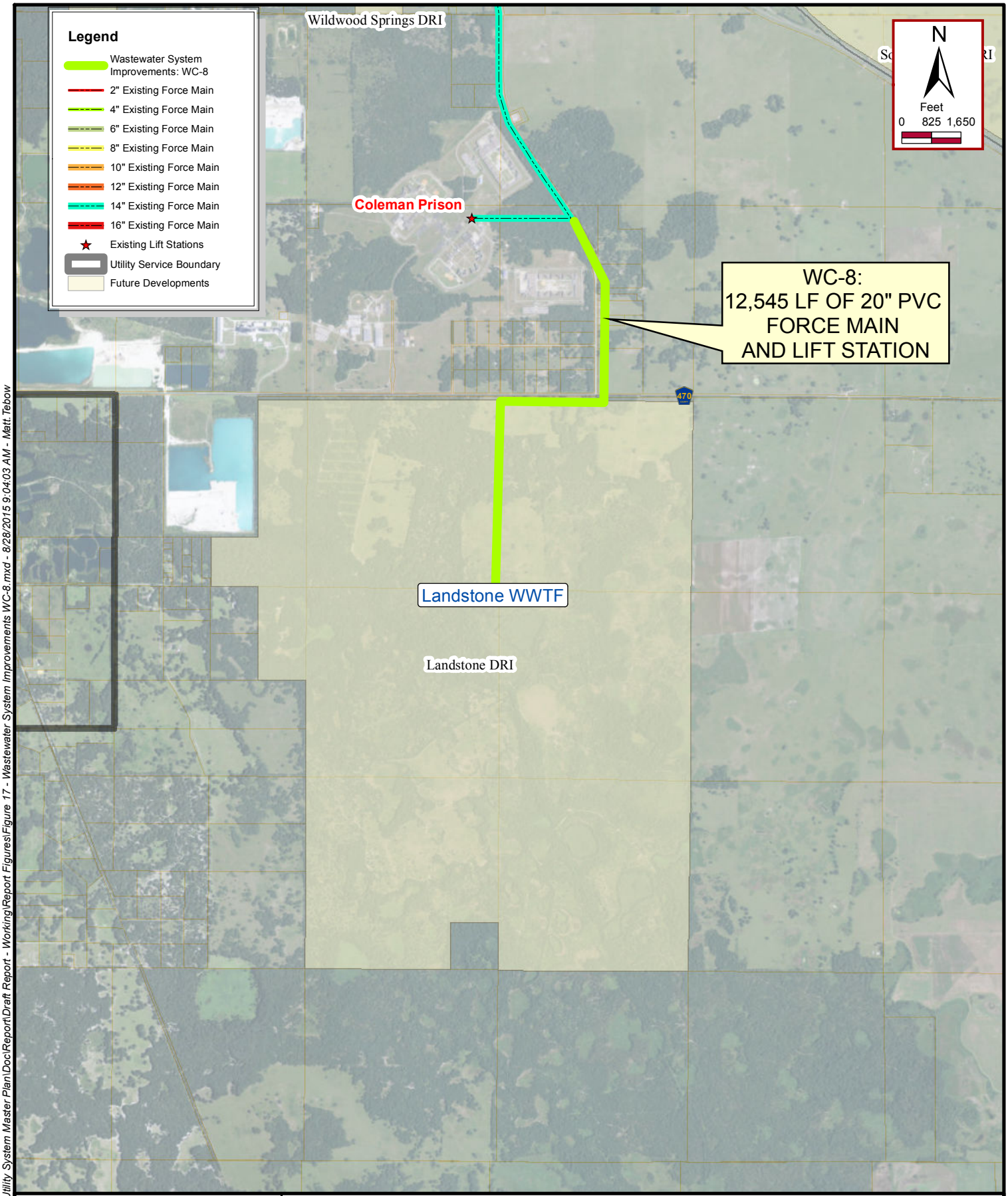
WASTEWATER SYSTEM IMPROVEMENTS: WC-7

UTILITY MASTER PLAN
CITY OF WILDWOOD

Project No: 142173163	Scale: As Noted	AUGUST 2015	Figure 16



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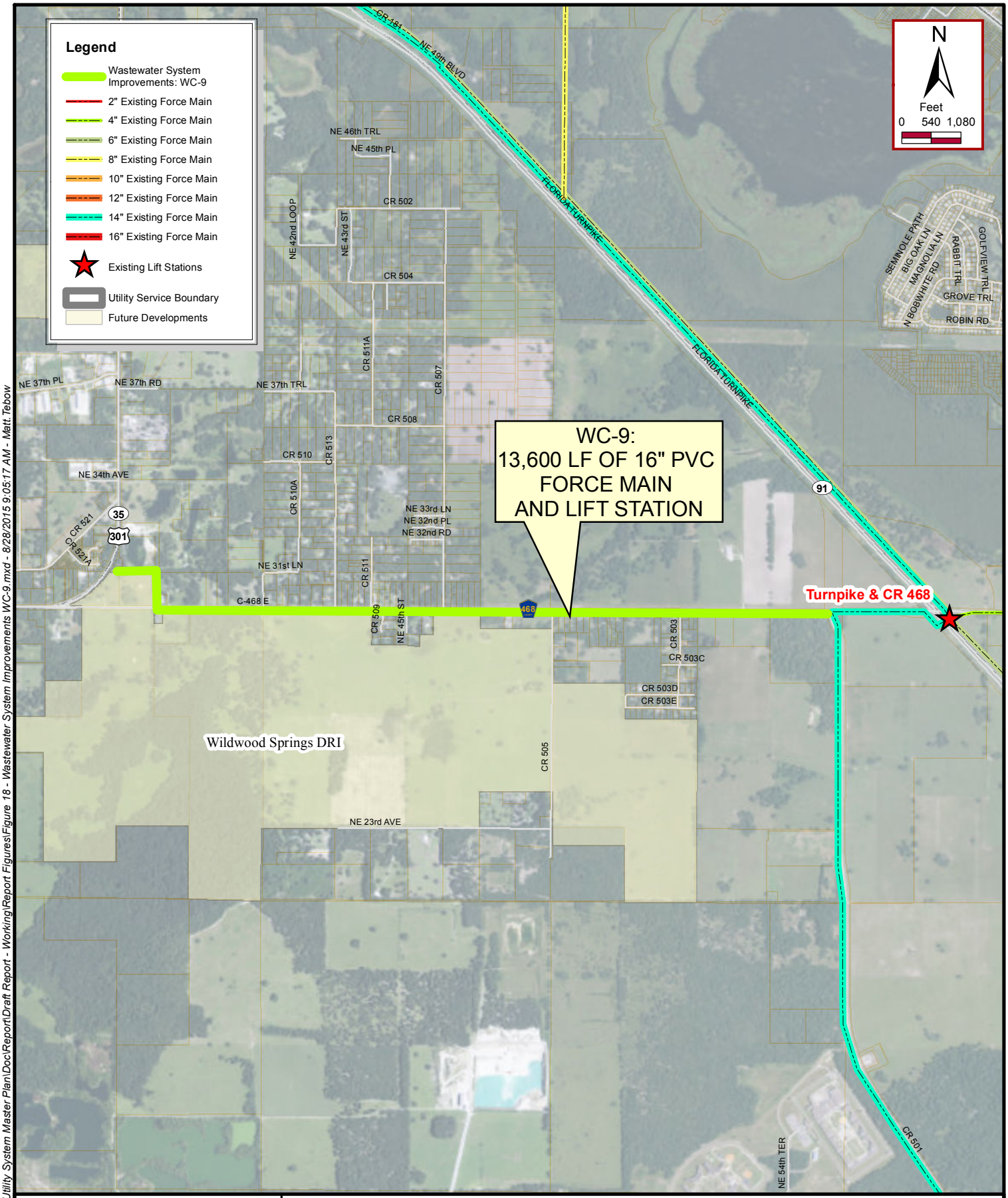
WASTEWATER SYSTEM IMPROVEMENTS: WC-8

UTILITY MASTER PLAN
CITY OF WILDWOOD

Project No: 142173163	Scale: As Noted	AUGUST 2015	Figure 17



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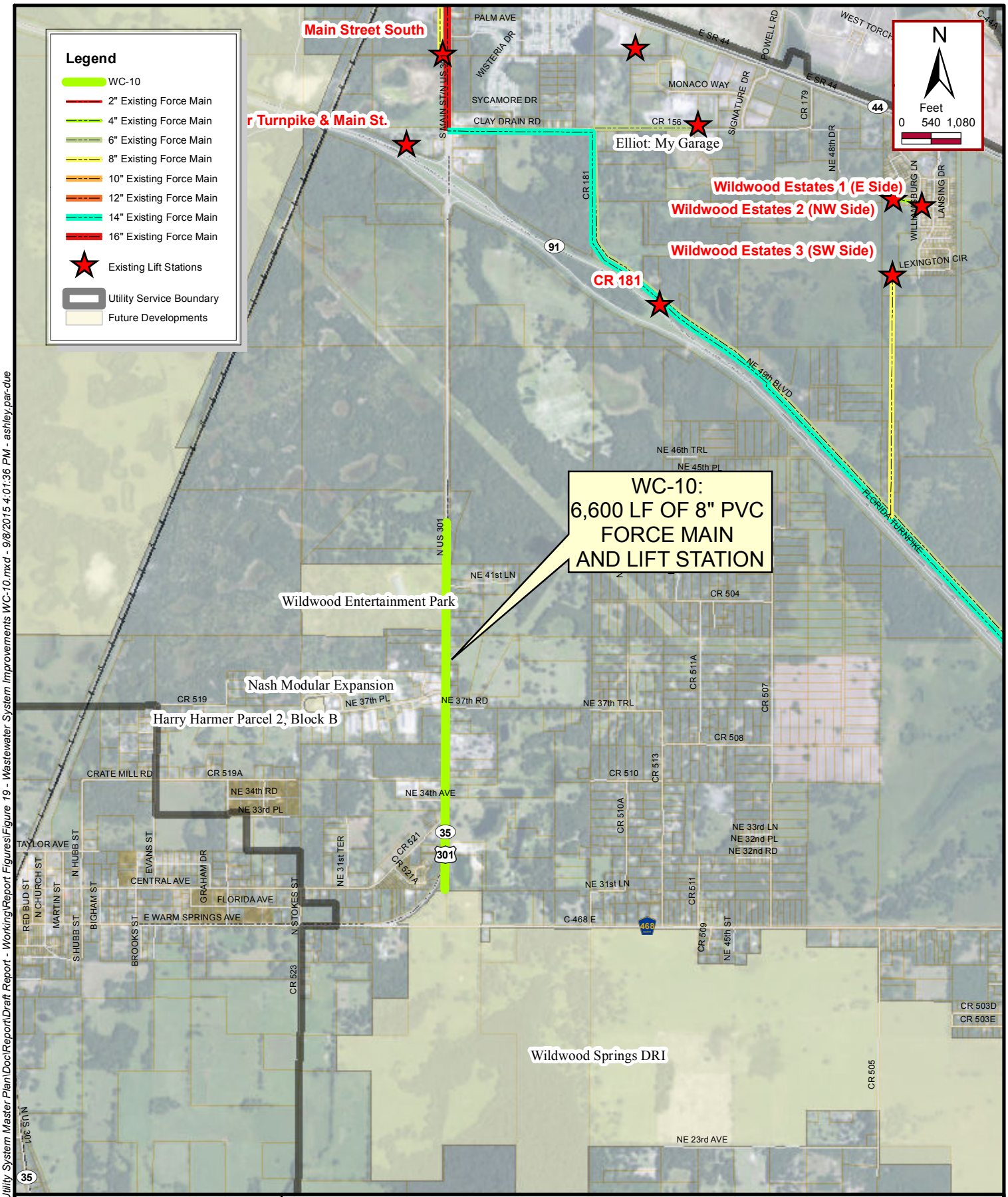
WASTEWATER SYSTEM IMPROVEMENTS: WC-9

UTILITY MASTER PLAN
CITY OF WILDWOOD

Project No: 142173163	Scale: As Noted	AUGUST 2015	Figure 18



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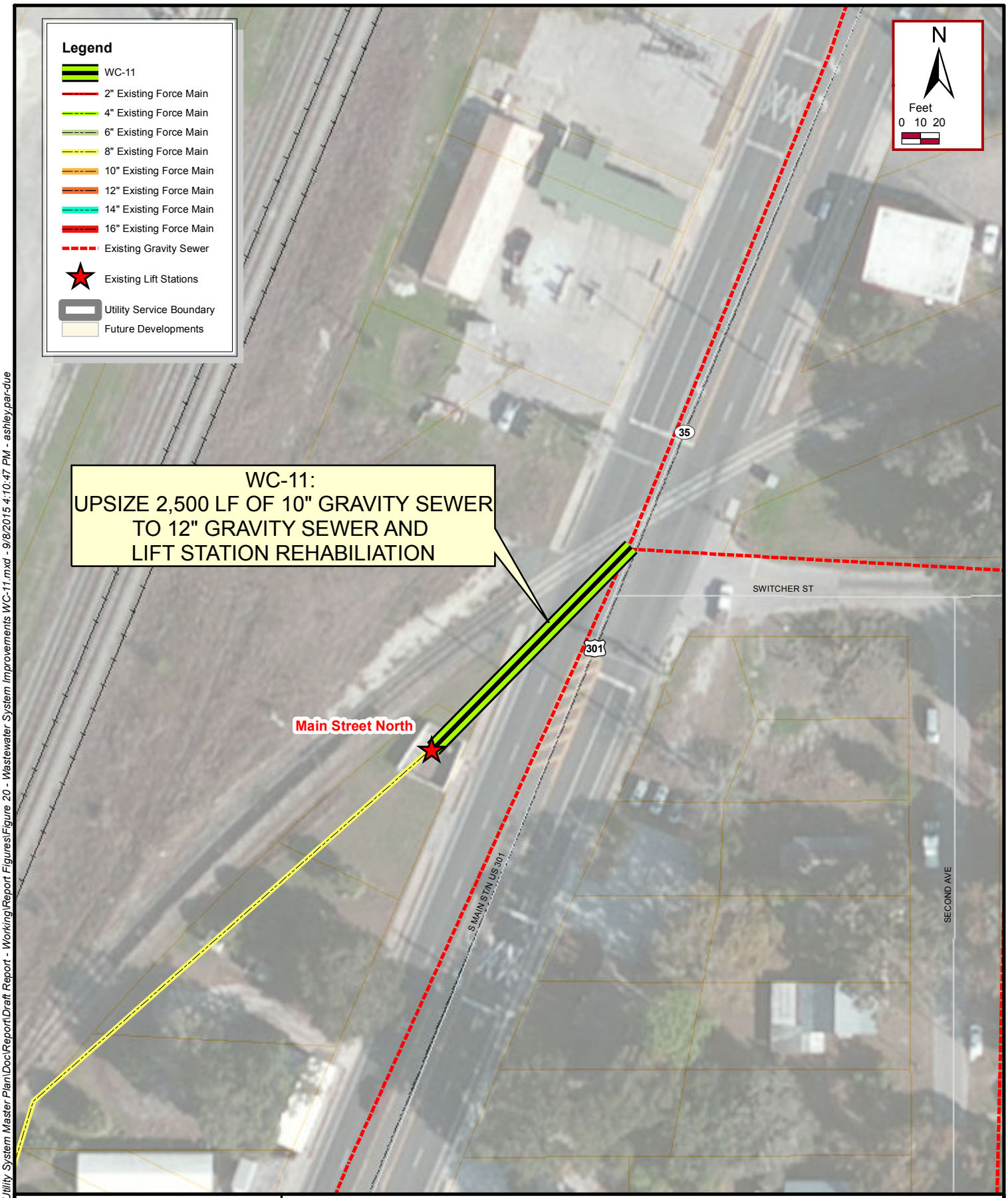
WASTEWATER SYSTEM IMPROVEMENTS: WC-10

UTILITY MASTER PLAN
CITY OF WILDWOOD

Project No: 142173163	Scale: As Noted	AUGUST 2015	Figure 19



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WASTEWATER SYSTEM IMPROVEMENTS: WC-11

UTILITY MASTER PLAN
CITY OF WILDWOOD

Project No: 142173163	Scale: As Noted	AUGUST 2015	Figure 20

RECLAIMED WATER SYSTEM

Introduction

This section discusses the reclaimed water systems owned and operated by the City's WWTF. The WWTF is currently operated under FDEP Permit No. FLA013497. The WWTF provides preliminary, secondary, and tertiary wastewater treatment to produce reclaimed water suitable for slow-rate unrestricted public access land application systems as defined in Rule 62-610.460 FAC. The plant is required to meet Class I Reliability standards in accordance with FAC 62-600 and FAC 62-610.

The combined total capacity of the City's effluent disposal system is 4.55 MGD AADF. Any reclaimed water not reused or not meeting the required effluent standards is disposed through ground water recharge at the RIB site. The City's reclaimed water transmission and distribution system supplies water for commercial users, parks, playgrounds, agricultural irrigation, and landscape irrigation. These users include Miona Lake Golf Course, Martin Luther King Jr. Park, Millennium Park, Wildwood Community Cemetery, Greenwood Cemetery, North Sumter Utilities, and the RIBs.

Existing Reclaimed Water Systems

This section contains a detailed discussion of existing reclaim water systems. See Figure 21 for a map of reclaimed map system.

Reuse and Effluent Disposal

The City's permitted effluent disposal methods has three components:

R-001

This reclaim water system has a 1.3 MGD AADF capacity for slow-rate public access reuse. It serves major and minor users including Miona Lake Golf Course, Wildwood Community Cemetery, Martin Luther King, Jr. Park, and Dublin Industrial Park.

R-003

This reclaim water system has a permitted capacity of 2.0 MGD AADF for slow-rate public access reuse. It consists of an interconnection with the North Sumter Utilities (NSU) WWTF, Permit No. FLA281581, under an agreement with the Villages Water Conservation Authority.

R-002

This effluent disposal system has a permitted capacity of 1.25 MGD AADF for rapid-rate land application. It consists of 11 RIBs with 601,500 SF of total bottom area. The maximum annual average loading rate to the RIBs is limited to 3.33 inches per day.

Reclaim Water Pumping

The reuse pump station at the Wildwood WWTF consists of three 75 hp vertical turbine pumps (VTPs) on variable frequency drives (VFDs) in parallel and one 15 hp VTP. Currently, reclaimed water can be transferred via the 75 hp pumps directly to the Miona Lake Golf Course, the R12 reclaim storage pond, and the RIB site. The cemetery is supplied via the 15 hp VTP.

The R12 pump station consists of one 75 hp with a VFD, one 50 hp VTP, and one 15 hp VTP. Reclaimed water stored in the pond is transferred to the NSU connection via the 50 hp VTP. The 75 hp VTP and 15 hp VTP supplies water to Dublin Industrial

Reclaim Water System Operation

The reclaimed water system functions as follows:

- The reclaimed water from the chlorine contact basins flow by gravity to the WWTF reuse pump station.
- If the chlorine contact basin effluent doesn't meet reclaimed water standards, the reject water will flow by gravity to the lined reject water storage ponds on site. The reject water is pumped back to the WWTF equalization tank or the oxidation ditch splitter box through the plant drain pump station.
- The WWTF reuse pump station transfers reclaimed water to the lined storage pond at R12, directly to Miona Lake Golf Course, or to the RIBs
- The R12 reuse pump station transfers reclaimed water to the North Sumter Utility lined ponds or to Millennium Park.

Reclaim Water System Distribution System

The following table is a summary of the existing distribution system pipe size (diameter) and lengths.

Table 23: Existing Distribution System Pipe Size and Length	
Pipe Size (diameter)	Total Length of Pipe (feet)
6-inch	6812
8-inch	1102
10-inch	5369
12-inch	17,027
16-inch	25,620

Flow Data

The following table summarizes the existing reclaimed water flows for each reuse activity as reported by the most recent Annual Reuse Report dated October 17, 2014:

Table 24: Existing Reuse Flows				
Reuse Type	Reuse Sub-Type	Capacity (MGD)	Flow (MGD)	Area (acre)
Public access areas & landscape irrigation	Golf course irrigation	1.3	0.233	141.3
	Other public access areas	2.0	1.290	1000+
Ground water recharge & indirect potable use	Rapid infiltration basin	1.25	0.014	14
Other	R12 lined pond for NSU	2.65	0.104	2
Total Reuse		**4.55**	**1.631**	**1157.3+**

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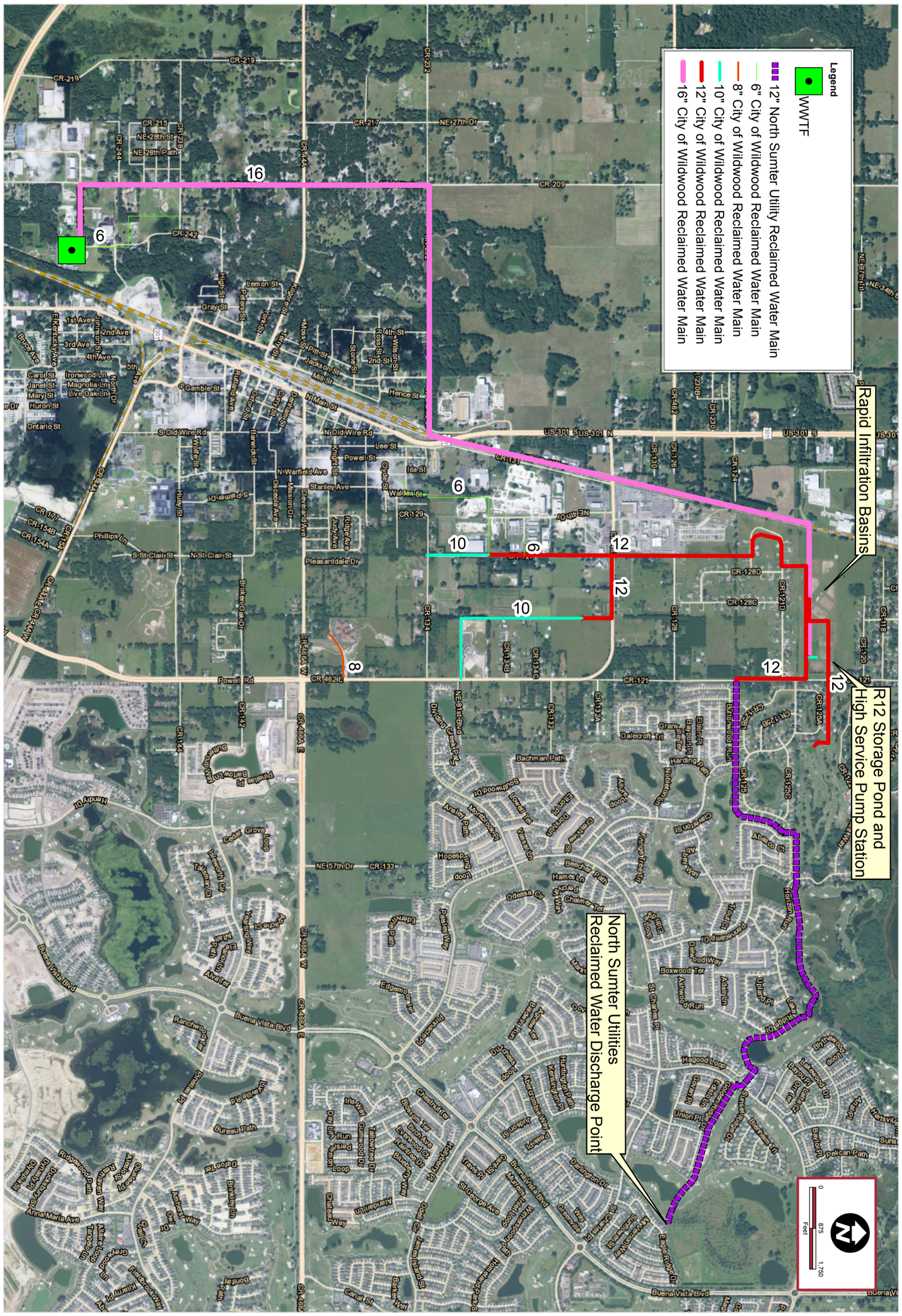

FIGURE 21	PROJECT NO. 142173163	DATE AUGUST 2015	CITY OF WILDWOOD	RECLAIMED WATER SERVICE AREA	SCALE AS NOTED DESIGNED BY KHA DRAWN BY KHA CHECKED BY KHA	RICHARD V. BUSCHE, P.E. FLORIDA P.E. LICENSE NO: 58568 DATE:	Kimley»Horn ©2014 Kimley-Horn and Associates, Inc. 1823 SE Fort King Street, Suite 200, Ocala, Florida 34471 Phone: (352) 438-3000 www.kimley-horn.com CA 00000696	No.	REVISIONS	DATE	BY

RECLAIMED WATER SYSTEM ANALYSIS AND METHODOLOGY

Introduction

This section provides an overview of the methodologies used to develop the reclaimed water system hydraulic model. The model was use to evaluate the existing system for current and future demands.

System Hydraulic Standards

Prior to identifying deficiencies in the existing system, it is necessary to establish system hydraulic standards to determine acceptable hydraulic parameters for the distribution network. The following hydraulic standards were used to evaluate the model for deficiencies:

Minimum system pressure:	20 psi
Maximum system pressure:	90 psi
Design peak flow, R-001:	1.3 MGD (903 gpm)
Design peak flow, R-002:	1.25 MGD (868 gpm)
Design peak flow, R-003:	2.0 MGD (1,389 gpm)
Design maximum velocity:	7 fps

Hydraulic Model Development

The software used for model development was Bentley WaterCAD V8i (SELECTseries 1).

The existing model was developed using the following steps:

- The pipe network layout of the reclaimed water system was determined using previously developed GIS mapping.
  - The reclaimed water flow was determined by the City provided data of approximately three years of effluent discharge and pumping information.
- The operating pressures and flows were obtained from City Utility Staff and actual plant data. The following operating pressures were used in the model:

Table 25: *WWTF* Reuse Pump Station

Pump Number	Pump Type	Horsepower	Capacity (gpm)	Head (ft)
TSP 1	VTP	75	1,480	155
TSP 2	VTP	75	1,480	155
TSP 3	VTP	75	1,480	155
TSP 5	VTP	15	235	150

Table 26: R12 Reuse Pump Station				
Pump Number	Pump Type	Horsepower	Capacity (gpm)	Head (ft)
NSU	VTP	50	1,400	100
Mill-Pk	VTP	75	1,000	215
Mill-Pk (Jockey)	VTP	15	231	150

- Before proposed improvements could be evaluated for the system, the hydraulic model was calibrated to ensure that it accurately reflected the conditions of the system in the field. The following steps were taken to calibrate the model:
  - Data Collection:
    - City staff provided pump information, SCADA data, and conducted numerous sites visits with Kimley-Horn to the WWTF reuse pump station and R12 pump station to record flow and pressure readings.
  - Model Calibration:
    - The flow and pressure data were entered into the model and the pipe C values were adjusted to accurately reflect the pressure readings that were observed in the field.

Methodology

With the model properly calibrated, the proposed system configurations could be modeled. The approach for modeling the system was to add a new control valve array at the R12 reuse pump station site. The model was analyzed using different disposal methods, water surface elevations in the storage pond, system pressures, and flows out of the WWTF.

Scenario Analysis

Scenario 1: Existing Conditions

This scenario is the basis for analyzing other scenarios for deficiencies or improvements resulting from modifying the City's reclaimed water system. Table 27 below summarizes the results of Scenario 1.

Table 27: Reclaimed Water System Existing Conditions		
Model Summary and Results	Worst Case Scenario (highest head conditions)	Best Case Scenario (lowest head conditions)
WWTF reuse pump station wet well WSEL	59.5	64.5
R12 storage pond WSEL	65.0	59
C value	120	150
TSP 1 flow	1,252 gpm	1,543 gpm
TSP 1 head	168 ft	152 ft
TSP 2 flow	1,350 gpm	1,635 gpm
TSP 2 head	164 ft	146 ft
Total flow	2,602 gpm	3,178 gpm
Total flow	3.75 MGD	4.58 MGD

The model results show that the WWTF reuse pump station can provide the effluent disposal and reclaimed water required by WWTF permitted capacity.

Scenario 2: Pump directly to NSU from WWTF Reuse Pump Station

The City requested a scenario model that includes pumping directly from the WWTF to the NSU storage pond. This scenario assumes that a new control valve array is installed at the R12 reuse pump station site. The results from this scenario indicate that the 75 hp VTPs at the WWTF reuse pump station are capable of pumping directly to the NSU storage pond. See Table 28 and 29 for a summary of the model results for this scenario.

Table 28: Reclaimed Water System Pumping Directly to NSU with One Pump

Model Summary and Results	Worst Case Scenario (highest head conditions)	Best Case Scenario (lowest head conditions)
WWTF reuse pump station wet well WSEL	59.5	64.5
NSU storage pond SWEL	89.95	75.0
C value	120	150
TSP 1 flow	1,171 gpm	1,448 gpm
TSP 1 head	172 ft	158 ft

Table 29: Reclaimed Water System Pumping Directly to NSU with Two Pumps

Model Summary and Results	Worst Case Scenario (highest head conditions)	Best Case Scenario (lowest head conditions)
WWTF reuse pump station wet well WSEL	59.5	64.5
NSU storage pond WSEL	89.95	75.0
C value	120	150
TSP 1 flow	704 gpm	919 gpm
TSP 1 head	185 ft	181 ft
TSP 2 flow	767 gpm	986 gpm
TSP 2 head	184 ft	179 ft
Total flow	1,471 gpm	1,905 gpm
Total flow	2.12 MGD	2.74 MGD

The model results show that the 75 hp VTP at the WWTF reuse pump station are capable of pumping directly to the NSU storage pond. Although, a new control valve array is required to accommodate the new pumping regime. The following improvements are also required:

- Piping modifications
- SCADA improvements and modifications
- Control valve assembly
- Survey verification of outfall invert elevation at the NSU storage pond

RECOMMENDED RECLAIMED WATER SYSTEM CAPITAL IMPROVEMENT PROJECTS

Introduction

This section provides a discussion of capital improvement project developed by investigating alternatives for addressing current deficiencies and meeting future demands. Included in this chapter is a project list, with probable costs of construction, for recommended projects.

Capital Project Descriptions

The following capital projects should be considered for improving the reclaimed water system.

Reclaimed Water (RCW) Transmission and Disposal System Improvements

Project No. RCW-1:
Expand Reclaim Storage for NSU – This project expands lined disposal ponds at the reclaimed storage site (R-12). The estimated design and construction cost for this project is approximately $315,000.

Project No. RCW-2:
Effluent Disposal Expansion – This project will expand the RIBs to meet the projected effluent disposal requirements at the reclaimed storage site (R-12). The estimated design and construction cost for this project is approximately $630,000.

Project No. RCW-3:
RCW Transfer Pump Station Updates – This project entails constructing a new control valve array to accommodate the new pumping regime. Additionally, piping modifications and SCADA improvements are required. The estimated design and construction cost for this project is approximately $190,000

CAPITAL IMPROVEMENT PLAN FUNDING RESOURCES

Introduction

This section will discuss the various state and federal funds that may be available to fund some of the capital improvement plan projects through grants and/or loans. Each program has limitations and requirements that should be considered while evaluating projects for funding opportunities. While the City may be capable of applying for many of the programs listed below, some programs are competitive and require complex substantial application information. Specialized grant and funding consultants should be considered as resources for assisting with funding opportunity evaluations and application package preparations.

Water and Wastewater Funding Sources

Community Development Block Grant (CDBG) Grant Funding – The U.S. Department of Housing and Urban Development administers CDBG nationwide. The CDBG program was established to "develop viable communities by providing decent housing and a suitable living environment and by expanding economic opportunities, principally for persons of low- and moderate-income." Community activities that qualify for CDBG funding assistance include:

- Acquisition of property for public purposes
- Construction of reconstruction of streets, water and sewer facilities, neighborhood centers, recreation facilities, and other public works
- Demolition
- Rehabilitation of public and private buildings
- Public services
- Planning activities
- Assistance to non-profit entities for community development activities
- Assistance to private, for profit entities to carry out economic development activities (including assistance to micro-enterprises)

The CDBG program segregates communities into two types: entitled and non-entitled. Entitled communities are larger and have populations greater than 50,000. Non-entitled communities have populations less than 50,000. The City of Wildwood currently falls into non-entitled classification. The non-entitled community benefits are administered locally by the states that participate in the CDBG program. Currently, the City qualifies for a maximum of $600,000 per year of CDBG funding.

Florida Department of Environmental Protection (FDEP) State Revolving Fund (SRF) - SRF programs provide financial savings for projects that benefit the environment, including protection of public health and conservation of local watersheds. Federal and state contributions fund loans for a wide variety of water quality projects, including all types of stormwater, watershed protection or restoration, and estuary management projects, as well as more traditional municipal water and wastewater treatment projects, including water reuse and conservation projects.

The program allows states to provide funding for their highest-priority water quality needs. Funds to establish or capitalize the SRF programs are provided through federal government grants and state matching funds that are equal to 20 percent of federal government grants. SRF monies are loaned to communities at lower than market rate interest rates, and loan repayments are recycled back into the program to fund additional water quality protection projects. The revolving nature of these programs provides for an ongoing funding source that will last far into the future.

U.S. Department of Agriculture (USDA Rural Development – The USDA offers several financial assistance programs for rural communities, including loan and loan/grant programs. Below are some

specific grant programs in which the City may be eligible for participation. Each program has specific requirements for eligibility and level of assistance available. Specific information on each program can be found on the USDA website at http://www.rurdev.usda.gov/Home.html.

- **Direct Loans and Grants** – To develop water and waste disposal systems in rural areas and towns with a population not in excess of 10,000. The funds are available to public bodies, non-profit corporations, and Indian tribes.
- **Guaranteed Loans** – To provide a loan guarantee for the construction or improvement of water and waste disposal projects serving financially needy communities in rural areas. This purpose is achieved through bolstering the existing private credit structure through the guarantee of quality loans which will provide lasting benefits. The water and waste disposal guarantee loans are to serve a population not in excess of 10,000 in rural areas.
- **Emergency Community Water Assistance Grants** – To assist rural communities that have experienced a significant decline in quantity or quality of drinking water due to an emergency, or in which such decline is considered imminent, to obtain or maintain adequate quantities of water that meets the standards set by the Safe Drinking Water Act. This emergency is considered an occurrence of an incident such as, but not limited to, a drought, earthquake, flood, tornado, hurricane, disease outbreak or chemical spill, leakage, or seepage.
- **Pre-development Planning Grants** – Predevelopment planning grants may be available, if needed, to assist in paying costs associated with developing a complete application for a proposed project.
- **Loans for Very Small Projects –** To assist communities with water and wastewater systems. Qualified private non-profit organizations will receive Request for Proposal (RFP) grant funds to establish a lending program for eligible entities. This grant program is to serve a rural area with a population not in excess of 10,000.
- **Opportunities for Lenders** – The Utilities Programs works with private lenders to guarantee loans to borrowers for the construction of water and waste systems in rural areas. Loan guarantees can be issued for up to 90% on any loss of interest and principal on a loan.
- **Revolving Fund Program** – To assist communities with water and wastewater systems. Qualified private non-profit organizations will receive RFP grant funds to establish a lending program for eligible entities. This grant program is to serve a rural area with a population not in excess of 10,000.

FDEP Small Community Wastewater Facilities Grants Program –This is a grant program to assist small communities in the planning, designing, and constructing of wastewater management facilities. An eligible small community must be an incorporated municipality, have a total population and a service area population of 10,000 or less, and have a per capita income (PCI) less than the State of Florida average PCI of $26,503. Projects shall compete separately for Preconstruction planning Grants and Construction and design Grants. Projects must be associated with wastewater collection, transmission, treatment, or disposal facilities. This includes facilities to reuse reclaimed water from wastewater treatment plants. Storm water projects are not eligible. The highest priority is given to projects that address the most serious risks to public health, are necessary to achieve compliance, or assist systems most in need based on an affordability index. A partial match of local funds will be required. Funding of the local match may be obtained through the State Revolving Fund Program.

SWFWMD Cooperative Funding Initiative –The Cooperative Funding Initiative (CFI) covers up to 50 percent of the cost of projects that help create sustainable water resources, enhance conservation efforts, restore natural systems and provide flood protection. All CFI funding decisions are made by volunteer Governing Board members who are well informed on the specific resources and challenges within their areas.

REVENUE SUFFICIENCY ANALYSIS

Introduction

Kimley-Horn utilized a municipal financial advisor (Burton & Associates, Inc.) to conduct a utility revenue sufficiency analysis. The revenue sufficiency analysis consisted of the input of all financial, statistical, capital, and operational data and assumptions into Burton & Associates financial model, preparation of a comparative rate survey, two interactive work sessions with City staff to review the results of the analysis and develop scenarios, participation in public workshops, and preparation of a report documenting the results of the analysis. The analysis was conducted in conjunction with the master plan and used to refine the City's 5 year capital improvement program. Additionally, the revenue sufficiency analysis was used to assist the City with the following elements. A copy of the final report is included in Appendix G.

- Evaluating the impact of key capital improvement projects (in terms of both cost and timing) under various scenarios as appropriate during the master plan process.
- Understanding the future impacts of its current FY 14/15 and proposed FY 15/16 operating and capital improvement budgetary requirements.
- Quantifying the rate impacts of alternative renewal and replacement, operation and maintenance, and system expansion programs.
- Quantifying the amount of renewal and replacement, operation and maintenance, and system expansion funding provided under various rate adjustment options.
- Developing alternative growth forecasts, inclusive of revenue, operating cost, and capital improvement plan requirements.
- Evaluating the impact of alternative borrowing scenarios, including refinancing and/or new borrowings required for future capital improvement requirements.
- Evaluation of the impacts of potential utility acquisition scenarios.
- Establishing financial policies relative to reserves, debt service coverage, and rate adjustments that provide for sustainable services over a multi-year planning period.

APPENDICES

APPENDIX A: Small Area Projection Methodology (SWFWMD)

The Small Area Population Projection Methodology Used by the Southwest Florida Water Management District

Prepared for

Southwest Florida Water Management District
Contract 10CC0000002
Work Order Number 1

Prepared by

GIS Associates, Inc.
806 NW 16th Avenue, Suite A
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October 3, 2013

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INTRODUCTION

The purpose of this document is to describe the methodologies used by the Southwest Florida Water Management District (SWFWMD) to develop small area population projections in support of water supply planning and water use permitting. Accurately projecting future water demand for water utility potable service areas requires more precision than is offered by the county level projections available from the Bureau of Economic and Business Research (BEBR) at the University of Florida, the generally accepted standard throughout the State of Florida. In addition, the Census Population Cohort projected by BEBR does not include important non-permanent populations, such as seasonal residents, tourists or commuters. For these reasons, SWFWMD contracted with GIS Associates, Inc. (GISA), to provide small area population projections for the 16 counties located partly or entirely within SWFWMD. This was achieved by implementing GIS Associates' Small Area Population Projection Model (GISA Projection Model), which makes Census Population Cohort projections at the 2010 Census Tract level, and distributes those projections to individual land parcels to facilitate aggregation by utility or other boundaries. In addition, GISA applied SWFWMD methods for projecting non-permanent population to the Census Population Cohort projections derived from the GISA Projection Model. This document describes these projection methodologies and their use to project future populations. Ultimately, these small area population projections were used as a basis for making future water demand projections for SWFWMD.

SMALL AREA POPULATION PROJECTION MODEL OVERVIEW

The geographic information system (GIS) based small area population projection model used by SWFWMD projected future Census Population Cohort population growth at the parcel level, and normalized those projections to BEBR's latest county level forecasts. Figure 1 on the following page shows a process flow chart of the population projection and distribution methodology. First, a County Build-out Model was developed by GISA from the base parcel data. The purpose of the County Build-out Model is to develop maximum residential development potential at the parcel level. A detailed description of this model is included in the chapter titled County Build-out Models. Current permanent population was estimated and then the maximum population to which a county can grow was modeled by the County Build-out Models. Areas which cannot physically or lawfully sustain residential development (built-out areas, water bodies, public lands, commercial areas, etc.) were excluded from the County Build-out Model. Conversely, the model identified areas where growth is more likely to occur based on proximity to existing infrastructure. This is discussed in detail in chapter titled Growth Drivers Model.

Next, population growth was modeled between the current estimated population and the build-out population. Projections are based on a combination of historic growth trends (using an approach similar to that used by BEBR for its county level projections), and spatial constraints and influences, which restrict or direct growth. This process is described in detail in the chapter titled Population Projection Model. Population growth calculations were limited by

BEBR's 2013 medium projections, which are BEBR's latest population forecasts for the years 2015 through 2040, which were available in five-year increments. The source of this data is the BEBR publication *Projections of Florida Population by County, 2015-2040, with Estimates for 2012.* (Florida Population Studies, Bulletin 165, March 2013). The process for limiting growth is described in the chapter titled Population Projection Model.

The launch year for the version of the model described in this document was 2012, which was calibrated to the 2012 BEBR estimates of county population. Projections were made through the year 2040 in the following increments:

1. April 2, 2012 through April 1, 2015
2. April 2, 2015 through April 1, 2020
3. April 2, 2020 through April 1, 2025
4. April 2, 2025 through April 1, 2030
5. April 2, 2030 through April 1, 2035
6. April 2, 2035 through April 1, 2040

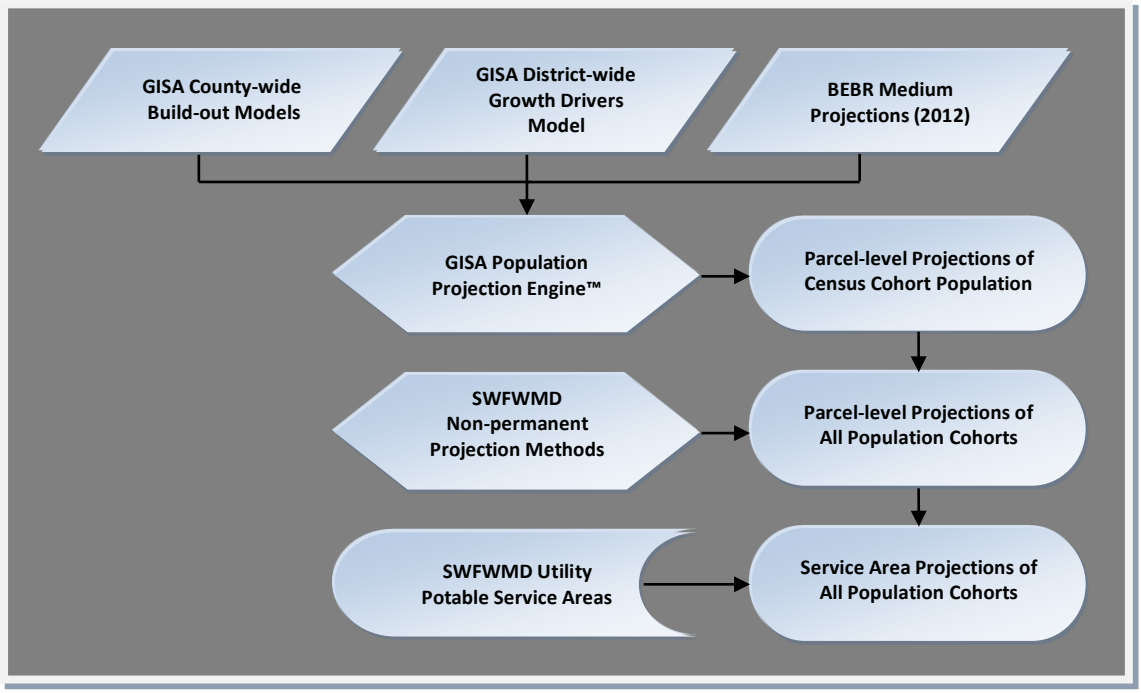

Figure 1. SWFWMD population projection process flowchart

Finally, the parcel level projections are summarized by any set of boundaries desired (utility service areas, municipalities, watersheds, etc.). For SWFWMD planning efforts, parcel projections were summarized by water utility service area boundaries that SWFWMD maintains in a spatial (GIS) database. These summaries were exported to a Microsoft Excel spreadsheet with separate tabs for each county to facilitate the review and distribution of the results.

COUNTY BUILD-OUT MODELS

The County Build-out Models are composed of multiple GIS data elements. Each model is based on each county property appraiser's GIS parcel database, including the associated tax roll information. Other elements incorporated into each build-out model include the 2010 US Census data, SWFWMD wetland data, local government future land use maps, and Development of Regional Impact (DRI) plans for the county of interest.

Parcels

GIS parcel layers and county tax roll databases were obtained from each county property appraiser's office. Parcel geometry was checked for irregular topology, particularly overlaps and fragments. Parcel tables were checked for errors, particularly non-unique parcel identifiers and missing values. Required tax roll table fields include actual year built, Florida Department of Revenue (DOR) land use code, and the total number of existing residential units for each parcel. In cases where values or fields were missing, other relevant information was extrapolated and used as a surrogate. For example, when data identifying the number of housing units per multi-family parcel were absent, multi-family unit totals for each parcel were determined using other data from the county property appraisers.

2010 US Census Data

Some of the essential attribute information to translate parcels to population in the County Build-out Models was derived from data from the 2010 Census. Average population per housing unit by census tract was calculated and then transferred to each county's parcel data. No adjustment for vacant units was required, as the calculation was made using total housing units (not limited to occupied units). This average population per housing unit enabled parcel level estimation of population from parcel based housing unit estimates. In cases where property appraiser data were missing or incomplete, other data were used. For example, because mobile home parks with units not individually platted typically do not contain the number of units within the property appraiser data, the number of residential units for parks larger than five acres was estimated using a hand count from recent imagery.

Water Management District Boundaries

Each parcel in the County Build-out Models was also attributed with water management district boundaries (from SWFWMD), which enabled the county models for any counties split between two or more water management districts to be summarized for the respective district.

Wetlands

Wetlands (including surface water) are an important consideration when modeling a county's build-out. SWFWMD maintains a detailed GIS database of wetlands within its boundaries. This database contains the location and spatial extent of the wetlands, as well as the specific types of wetlands as defined by SWFWMD land cover classifications. Certain wetland types were identified that would be difficult and expensive to convert to residential development. These areas were identified in the SWFWMD wetland database and applied to the appropriate County Build-out Model. The wetland types are listed in Table 1.

Table 1. Wetland land cover codes and descriptions used in the County Build-out Models

Code	Description	Code	Description
5100	Streams and waterways	5600	Slough waters
5200	Lakes	6110	Wetland Hardwood Forests
5250	Marshy Lakes	6120	Mangrove swamp
5300	Reservoirs	6170	Mixed wetland hardwoods
5400	Bays and estuaries	6180	Cabbage palm wetland
6181	Cabbage palm hammock	6410	Freshwater marshes
6200	Wetland Coniferous Forest	6420	Saltwater marshes
6210	Cypress	6430	Wet prairies
6220	Pond pine	6440	Emergent aquatic vegetation
6250	Hydric pine flatwoods	6460	Mixed scrub-shrub wetland
6300	Wetland Forested Mixed	6500	Non-vegetated Wetland

Wetland GIS data (using the above classifications) were overlaid with a county's land parcels. The area of wetlands within parcels were calculated and recorded as the water area for that parcel. If the area covered by water within a parcel exceeded 0.5 acres, it was subtracted from the total area of the parcel feature to determine the relative developable area in that parcel. There were exceptions to this rule. In some cases, parcels with little or no developable area after wetlands were removed were already developed, thus the estimated unit total was not reduced by the wetland acreage. In other cases, inaccurate wetland delineations were overridden, such as when a newly platted residential parcel was shown to be covered by a wetland (Figure 2). In such a case, the parcel was considered developable by the model.

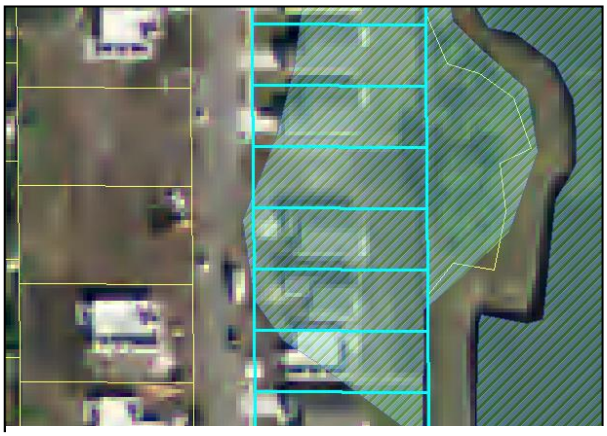

Figure 2. Example of inconsistencies between wetland delineation and residential parcels (outlined here in light blue)

Future Land Use

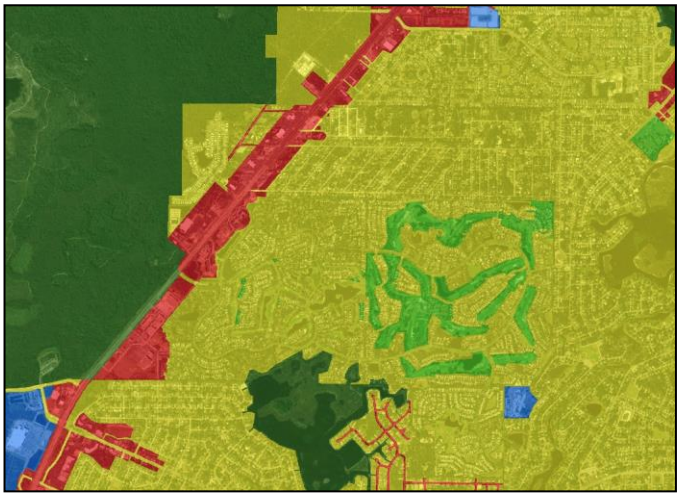

Figure 3. Future land use helps identify future residential areas (here shaded in yellow)

Future land use maps were essential elements of the County Build-out Models. These maps helped guide where and at what density residential development could occur within a county (Figure 3). Future land use maps are a part of the local government comprehensive plans required for all local governments by Chapter 163, Part II, F S. They are typically developed by the local government's planning department, or, in some cases, a regional planning council. The latest available future land use maps were obtained and applied to the build-out model. The planning horizons for these are a minimum of 10 years, and they often extend for 15 to 20 years into the future. Table 2 shows which future land use map classes were assigned residential densities in the County Build-out Models. Future land use map classifications for residential land uses are assigned maximum housing unit densities (per acre) or density ranges. These ranges were intended to guide the type and density of development. However, development does not always occur at densities consistent with future land use maps.

Table 2. Generalized future land use classes allowed by the County Build-out Model to project future residential development

Generalized Future Land Use Classes	Whether Residential Development Is Allowed by the Model
Agricultural	Yes
Low Density Residential	Yes
Medium Density Residential	Yes
High Density Residential	Yes
Mixed Use	Yes
Commercial	No
Recreation / Open Space	No
Conservation / Preservation	No
Industrial	No
Institutional	No
Right of Way	No
Water	No

For this reason, County Build-out Models reflect the current average density for each future land use category in the specific incorporated place instead of the maximum density allowed by the future land use designation. It was assumed that densities of recent development are a better indicator of future densities than the maximum allowable density. For example, if a city's

medium density residential future land use designation allows up to 8 housing units per acre, but the average density of units built is 5.7 housing units per acre, the model assumed future densities at 5.7 housing units per acre for that future land use designation in that city.

As an exception, some future land use categories had insufficient sample size to create average density values. In such cases, countywide average density was applied for that future land use class. Vacant or open parcels less than one acre in size were considered single family residential, with 1 housing unit as the maximum allowable density.

Each land parcel in the County Build-out Models received a future land use designation. In places where parcels overlapped multiple future land use areas, the parcel was assigned the future land use class within which its center fell. Build-out population was modeled only for future land use classes designated to allow residential development (which include agriculture and mixed use).

Build-out Density Calculation

Using GIS overlay techniques, attributes of the census, political boundary, wetlands, and future land use data were attributed to each county's parcel data to develop the County Build-out Models. These models forecast the maximum residential population by parcel at build-out (Figure 4).

Figure 4. Example of Build-out Density Model shaded by housing units per acre

Census tracts where the 2010 population was zero, and therefore the average persons per housing unit was zero, were assigned the county's average persons per housing unit. Also, if there were tracts with 2010 census values for persons per housing unit greater than zero that were based on a small number of homes with greater than five persons per housing unit, the county's average persons per housing unit was typically used.

Developments of Regional Impact

Developments of Regional Impact (DRI) are defined by Section 380.06(1), F.S., as "any development that, because of its character, magnitude or location, would have a substantial effect on the health, safety or welfare of citizens in more than one county." DRI plans are another component of Florida's growth management legislation required by Chapter 380, F.S. The final step in the development of the County Build-out Models was adjusting build-out densities to correspond with approved DRIs, or other large development plans (where

available). The state annually updates population-based thresholds by county to determine when a development must undergo the DRI review process. For residential DRIs, housing unit thresholds range from 250 units (in counties with fewer than 25,000 people) to 3,000 units (in counties with more than 500,000 people). A DRI plan delineates the boundaries of a DRI, the number of housing units within the boundaries, and the projected timing of when these units will be built. Figure 7 shows an example of a DRI with the planned units at build-out. Although DRIs often do not develop as originally planned by the developer, the total number of units planned (regardless of timing) is likely to be a better forecast of the units at build-out than the average historic densities. Therefore, in each of the build-out models, parcels that were within a DRI were attributed with the name of the DRI. The build-out densities for parcels within a particular DRI were adjusted, if necessary, to be consistent with the DRI development plan, and the build-out population for that area was recalculated.

GROWTH DRIVERS MODEL

The Growth Drivers Model is a district-wide, raster (cell-based) GIS model representing development potential. The model is a continuous surface of 10-meter cells containing values of 0-100, with '100' having the highest development potential and '0' having the lowest development potential. It influences the GISA Projection Model by factoring in the attraction of certain spatial features, or growth drivers on development. These drivers were identified from transportation and land use/land cover data. They included the following:

1. Proximity to roads and interchanges prioritized by level of use (with each road type modeled separately, but then combined into a single model)
2. Proximity to existing residential development
3. Proximity to existing commercial development (based on parcels with commercial land use codes deemed attractors to residential growth)
4. Proximity to coastal and inland waters
5. Proximity to active Developments of Regional Impact and Planned Units Developments

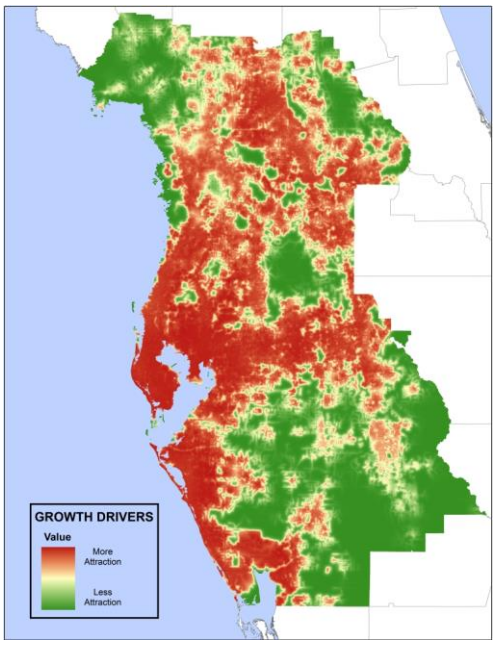

Figure 5. Growth Drivers Model

Figure 5 depicts the Growth Drivers Model for SWFWMD, with high development potential in red, moderate development potential in white and low development potential in green. Data used for generating the Growth Drivers Model and their sources are listed in Table 3 on the following page.

Table 3. GIS datasets used in the Growth Drivers Model

Growth Driver	Data Source
Roads and Limited Access Road Interchanges	Florida Department of Transportation (FDOT) Major Roads: Functional Classification (FUNCLASS), and FDOT Limited Access Road Interchanges
Existing Residential Land Uses	County Property Appraiser Parcel Data
Selected Existing Commercial Land Uses	County Property Appraiser Parcel Data
Coastal and Inland Waters	SWFWMD Land Cover Data, and Florida Geographic Data Library (FGDL) Coastline Data
Active DRIs and PUDs	Multiple sources, including Regional Planning Councils, local governments, and GIS Associates

Each of the drivers listed in Table 3 were used as independent variables in a logistic regression equation. Dependent variables included existing residential units built during or after 1995 as the measure of "presence", and large undeveloped vacant parcels outside of DRIs or PUDs were used to measure "absence". The resulting equation could then be applied back to each of the regional grids resulting in a single regional grid with values 0 through 100, for which a value of 0 represented the lowest relative likelihood of development, and a value of 100 represented the highest relative likelihood of development.

This seamless, "regional" model covers all the counties all or partially within the Southwest Florida Water Management District, plus a one-county buffer to eliminate "edge effects". In this case, the edge effects refer to the presence or absence of growth drivers outside the District that could influence growth within the District. This model was then used by the GISA Projection Model to rank undeveloped parcels based on their development potential, which is explained in the Growth Calculation Methodology section.

SMALL AREA POPULATION PROJECTION MODEL

The GISA Small Area Population Projection Model (GISA Projection Model) integrates the County Build-out Models and the Growth Drivers Model with the GISA Population Projection Engine™, which makes the projection calculations using a combination of those models with the historic growth trends and county level population controls from BEBR.

Historic Growth Trends

The historic growth trends were derived from historic census population estimates for 1990, 2000, and 2010. For 1990 and 2000, census tract population estimates from the Florida House of Representatives Redistricting Data website (http://www.floridaredistricting.org/FredsData.html, 2002) were summarized at the 2010 tract level, and combined with the 2010 tract population estimates. These estimates were used to produce seven tract level projections using five different methods. The minimum and maximum calculations were discarded to moderate the effects of extreme projections (Smith and Rayer 2004). The remaining projections were then averaged.

The five statistical methods for population projection utilized by the model were:

1. Linear
2. Exponential
3. Share-of-Growth
4. Shift-Share
5. Constant Population

The Linear, Exponential, and Constant Population techniques employ a bottom-up approach, extrapolating the historic growth trends or population of each census tract with no consideration for the county's overall growth. The Share-of-Growth and Shift-Share techniques employ a ratio allocation, or top-down approach, allocating a portion of the total projected county growth to each census tract based on that census tract's percentage of county growth over the historical period. Each of the five methods is a good predictor of growth in different situations and growth patterns, so using a combination of all five was the best way to avoid the largest possible errors resulting from the least appropriate techniques for each census tract within the 16-county area (Sipe and Hopkins 1984). This methodology is based on BEBR's population projection methodology and is well suited for small area population projections.

The calculations associated with the five statistical methods are described below.

1. **Linear Projection Method:** The Linear Projection Method assumes that future population change for each census tract will be the same as over the base period (Smith and Rayer, 2013). Two linear growth rate calculations were made, one from 1990 through 2010 (20-year period), and one from 2000 through 2010 (10-year period). In the two Linear methods (LIN), population growth was calculated using the following formulas:

$$LIN_1 = \frac{(TractPop2010 - TractPop1990)}{20} * 5$$

$$LIN_2 = \frac{(TractPop2010 - TractPop2000)}{10} * 5$$

2. **Exponential Projection Method:** The Exponential Projection Method assumes that population will continue to change at the same annual growth rate as over the historic period. In the Exponential method (EXP), population growth was calculated using the following formula:

$$EXP = (TractPop2010 * e^{5r}) - TractPop2010$$

where,

$$r = \frac{\ln \frac{TractPop2010}{TractPop2000}}{10}$$

3. **Share-of-Growth Projection Method:** The Share-of-Growth Projection Method assumes that each census tract's percentage of the county's total growth will be the same as over the base period (Smith and Rayer, 2013). Two Share-of-Growth calculations were made, one from 1990 through 2010 (20-year period), and one from 2000 through 2010 (10-year period). In the two Share-of-Growth calculations (SOG), population growth was calculated using the following formulas (using the five years from 2015–2020 as an example):

$$SOG_1 = \frac{(TractPop2010 - TractPop1990)}{(CountyPop2010 - CountyPop1990)} * (CountyPop2020 - CountyPop2015)$$

$$SOG_2 = \frac{(TractPop2010 - TractPop2000)}{(CountyPop2010 - CountyPop2000)} * (CountyPop2020 - CountyPop2015)$$

4. **Shift-Share Projection Method:** The Shift-Share Projection Method assumes that each census tract's percentage of the county's total annual growth will change by the same annual amount as over the base period (Smith and Rayer, 2013). In the Shift-Share Projection Method (SSH), population growth was calculated with the following formula (using the five years from 2015–2020 as an example):

$$SSH = \left[\begin{array}{l} \frac{(TractPop2010 - TractPop2000)}{(CountyPop2010 - CountyPop2000)} \\ + \\ \left[\frac{(TractPop2010 - TractPop2000)}{(CountyPop2010 - CountyPop2000)} \right] \\ - \\ \left[\frac{(TractPop2000 - TractPop1990)}{(CountyPop2000 - CountyPop1990)} \right] \\ /10*5 \end{array} \right] * (CountyPop2020 - CountyPop2015)$$

The Shift-Share Method is an appropriate method when the historic growth trend at the tract and county levels are consistent (both are positive, or both are negative). If the growth trend at the tract level is negative and the growth trend at the county level is positive (or vice versa), the Shift-Share method is <u>not</u> an appropriate technique according to BEBR (Stanley Smith, Ph.D., personal communication, 2011). For any tracts where the historic growth trend was the opposite of the county's growth trend, the Shift-Share Method was replaced with the Constant Population Method, which a technique that has been newly adopted by BEBR.

5. **Constant Population Method:** The Constant Population Method assumes that future population will remain constant at its 2010 value (Smith and Rayer, 2013). This technique was only used as a substitute for the Shift-Share Method for tracts with a historic growth trend that was inconsistent with the county growth trend over the same period. In the Constant Population (CON), population was held to its 2010 value, so there was no growth calculated.

6. **Average of the Projection Extrapolations:** The minimum and maximum of the six calculations for each census tract were dropped to reduce errors resulting from the least appropriate techniques. The four remaining calculations were averaged to account for the considerable variation in growth rates and patterns over all of the census tracts within the 16-county area (Sipe and Hopkins 1984). All four remaining methods were weighted equally. The average was calculated using the following formula:

$$AVG = \frac{(LIN_1 + LIN_2 + EXP + SOG_1 + SOG_2 + SSH - MIN - MAX)}{4}$$

where,

MIN = method resulting in minimum growth for each tract

and,

MAX = method resulting in maximum growth for each tract

and,

CON was used in place of SSH for tracts with historical growth trends that were inconsistent with the historic county growth trends

Growth Calculation Methodology

After the development of the County Build-out Models and the Growth Drivers Model, the GISA Population Projection Engine™ was used to make the growth calculations. The methodology for calculating growth for each projection increment included the following steps:

1. Applying census tract level average historical growth rate to parcels within a particular tract.
2. Checking growth projections against build-out population, and reducing any projections exceeding build-out to the build-out numbers.
3. After projecting growth for all census tracts within a particular county, summarizing the resulting growth and comparing it against countywide BEBR target growth. This step led to two scenarios:
    a. If the Small Area Population projection model's projections exceeded the BEBR target, projected growth for all tracts was reduced by the percentage that the projections exceeded the BEBR target.
    b. If the Small Area Population projection model's projections were less than the BEBR target (which is more common due to high growth areas building out), the model would continue growing the county using the Growth Drivers Model until

the BEBR target growth for each five-year increment was reached. This process involved developing parcels in undeveloped census tracts with the highest growth driver values.

4. Summarizing growth and checking against build-out.
5. Continuing this process until the county growth target was met. (Note that this BEBR-based target growth was a countywide number. Counties that are partially within another water management district were processed in their entirety and controlled to the BEBR-based target growth. The proportion of the county population within SWFWMD was dictated by the Small Area Population projection model, not by BEBR.)

NON-PERMANENT POPULATION PROJECTIONS

In addition to the Census Population Cohort projections generated by the GISA Projection Model, projections of non-permanent population were also made. Those projections include peak seasonal population, functionalized seasonal population, tourist population and net commuter population. The methods derived by SWFWMD and implemented by GIS Associates for projecting those population types are described in this section.

Peak Seasonal Population Cohort

Seasonal population was estimated using a combination of 2010 census data and emergency room admissions data, both at the Zip Code Tabulation Area (ZCTA) level. Average 2009 - 2011 emergency room admissions data was utilized for a population cohort typical of seasonal residents (between the ages of 55 and 84).

A “Seasonal Resident Ratio” was calculated by ZCTA to estimate the proportion of peak (including seasonal) to permanent population. The ratio was derived using the following steps:

1. Subtract total 2009 - 2011 total third quarter (Q3, or July, August and September) hospital admissions from first quarter (Q1, or January, February and March) admissions.
2. Calculate the average annual difference between Q1 and Q3 by dividing above result by three.
3. Calculate a seasonal population estimate for ZCTA by dividing above difference by the probability of the population in the 45-74 age cohort of being admitted to the emergency room (approximately 2.23%). [Note that the selection of 45-74 age cohort probability (instead of 55-84 age cohort probability) is based on literature indicating that seasonal residents are generally healthier that their year-round counterparts.]
4. Calculate the Seasonal Resident Ratio by adding the seasonal population to the permanent population and dividing that total by the permanent population.

The number of seasonal households was then estimated using the following steps:

1. Multiply the permanent population in households (from the 2010 census) by the Seasonal Resident Ratio.
2. Subtract the permanent population in households from above result.

3. Divide above result by the lesser of SWFWMD's seasonal persons per household (1.95) or the census permanent persons per household for each ZCTA.

The ratio of seasonal to total households was then calculated by dividing seasonal households by the sum of seasonal and permanent households. Seasonal peak population was then calculated using the following steps:

1. Subtract vacant housing units for reasons other than seasonal, recreational, or occasional use from total housing units (from the 2010 census).
2. Multiply above result times the seasonal to total household ratio.
3. Multiply above result times the lesser of SWFWMD's seasonal persons per household (1.95) or the census permanent persons per household for each ZCTA.

Because the Census Population Cohort contains some non-permanent residents who complete the census forms in Florida but reside for part of the year outside of Florida, it was also necessary to calculate the permanent population. Permanent population was calculated using the following steps:

1. Subtract vacant housing units for reasons other than seasonal, recreational, or occasional use from total housing units (from the 2010 census).
2. Multiply above result times one minus the seasonal to total household ratio.
3. Multiply above result times the census permanent persons per household for each ZCTA.

The ratio of total unadjusted peak population to total census population was then calculated by dividing the sum of the seasonal peak population, the permanent population, and the group quarters population (from the 2010 census) by the total census population. This ratio was then applied to the future projections of the Census Population Cohort from the GISA Projection Model to derive parcel level peak population projections.

Functionalized Seasonal Population Cohort

The functional population is the peak seasonal resident population reduced to account for the percentage of the year seasonal residents typically reside elsewhere, and the lack of indoor water use during that time. It was calculated using the following generalized steps:

1. Utilize the following metrics previously derived by SWFWMD:
    a. The appropriate proportion of the year seasonal residents spend in Florida, which varies from beach destination counties (44.2%) to non-beach destination counties (56.7%).
    b. The seasonal resident adjustment based on average per capita water use.
        i. The five-year District-wide average per capita use is 132 gallons per person per day, and 69.3 gallons is estimated indoor use and 62.7 gallons for outdoor use.
        ii. The adjustment factor is calculated using the following equation for "beach destination" counties (Charlotte, Manatee, Pinellas and Sarasota):
        ((0.442 x 132 gpd) + ((1 – 0.442) x 62.7 gpd)) / 132 gpd = 0.707

iii. The adjustment factor is calculated using the following equation for "non-beach destination counties":
((0.567 x 132 gpd) + ((1 – 0.567) x 62.7 gpd)) / 132 gpd = 0.773

2. Calculate "functionalized" seasonal population by multiplying the seasonal peak population by the appropriate seasonal resident adjustment factor for the particular county (0.707 or 0.773).

The ratio of total functional to total census population was then calculated by dividing the sum of the functionalized seasonal population, the permanent population, and the group quarters population (from the 2010 census) by the total census population. This ratio was then applied to the future projections of the Census Population Cohort from the GISA Projection Model to derive parcel level functional population projections.

Tourist Population Cohort

The tourist population projections were based on 17 years (1996-2012) of county level lodging room data from the Florida Department of Business and Professional Regulation (DBPR). The SWFWMD methodology for projecting future tourist rooms by county utilizes two different methods and averages the two results for each county.

The first method projects the increase in rooms by county by extrapolating the linear trend using the least squares method derived from the last 17 years of county total room estimates. This was the method used by the District for the past several years.

A second method projects future rooms based on projections of employment in the Accommodation and Food Services industries (from 2013 data from Woods and Poole). This is also an extrapolation of a linear trend using the least squares method, but rooms by county are projected as a function of a county's employment projections rather than time.

SWFWMD staff tested both methods by projecting values for the years 2007-2012 using room estimates from 1996-2006. Based on the differences between actual room estimates and projected values for 2007-2012, neither method was clearly superior to the other. For that reason, SWFWMD staff opted to use both methods. The results of both methods were averaged, but only after adjusting for the average 2007-2012 error for each projection in each county.

These projections of future rooms were then converted to "functionalized" tourist population by applying various county level average unit occupancy and party size ratios. These ratios were provided by SWFWMD, who also updated the values associated with locations identified as short term rentals for this projection set based on SWFWMD research.

These projections of tourist population were joined to the existing lodging facility locations. No attempt was made to project future locations of lodging facilities, as:

1. The precise locations would be highly speculative.
2. It was assumed that lodging facilities often are built in the general vicinity of existing lodging facilities, or at least in close enough proximity to be within the same utility service area.

Net Commuter Population Cohort

The net commuter population projections were based on net commuter data provided by SWFWMD. A census tract ratio was developed of net commuters to total census population. This ratio was then applied to the future projections of the Census Population Cohort from the GISA Projection Model to derive parcel level projections for net commuter population. That population was then "functionalized" with the following ratios:

1. 8 / 24 (typical working hours per day)
2. 5 / 7 (typical working days per week)

By applying both of these ratios to the net commuter population, the resulting functional net commuter population is 23.8% of the actual net commuter population. This functional number better reflects the water use that is expected for net commuters.

Note that the net commuter population projection summaries by utility service area were often negative, as many utilities serve "bedroom communities" and other areas where more residents work outside the utility service area than the population (residents and non-residents) employed within it. Only positive net commuter populations were included in the SWFWMD service area population totals.

UTILITY SERVICE AREA POPULATION SUMMARIES

The parcel level population projections for all population cohorts discussed above were then summarized by water utility service area boundaries for all utilities in SWFWMD that averaged more than 0.1 million gallons per day (mgd) of total water use. These service areas, maintained by SWFWMD, were overlain with each county's parcel level results, and each parcel within a service area was assigned a unique identifier for that service area. The projected population was then summarized by that identifier and joined to SWFWMD's public service area boundary database to produce tabular and spatial output. Note that these service areas change over time, so it is important to match this projection set only with the service areas included in the GIS deliverables for this project.

Spatial Incongruity of Boundaries

Due to mapping errors, the service area boundaries often bisect parcel boundaries (Figure 6). In the present modeling activity, parcels were deemed to be within a given service area if their center points (or "centroids") fell inside the service area boundaries. The error associated with this spatial incongruity at the parcel level was much smaller than would be the case with census tract level data. This is one of the main reasons for disaggregating census tract level data to the parcel level. The percentage of parcels erroneously attributed or excluded from a service area by this process is insignificant.

Figure 6. Parcel centroids (yellow points) used in summarizing parcels (yellow) to utility service area boundaries (blue)

PROJECTION DELIVERABLES

The final population projections were delivered in multiple formats, including:

1. GIS – Esri's file geodatabase, with feature classes for both parcel level results and utility service area summaries.
2. Tabular – Excel spreadsheet summaries by utility service area

The GIS outputs are useful for quality assuring the results and inputs, for maintaining the projection inputs over time, and for graphically depicting projected patterns of future population growth (Figure 7).

The tabular deliverables were parcel summaries at the utility level. Figure 8 on the next page shows the service area population projection summaries table for Manatee County.

The population summaries for "OUTSIDE SERVICE AREAS" include population considered to be domestic self supply (DSS) or small utilities without a service area boundary in SWFWMD's database. Small utilities are generally defined as those utilities permitted for less than 100,000

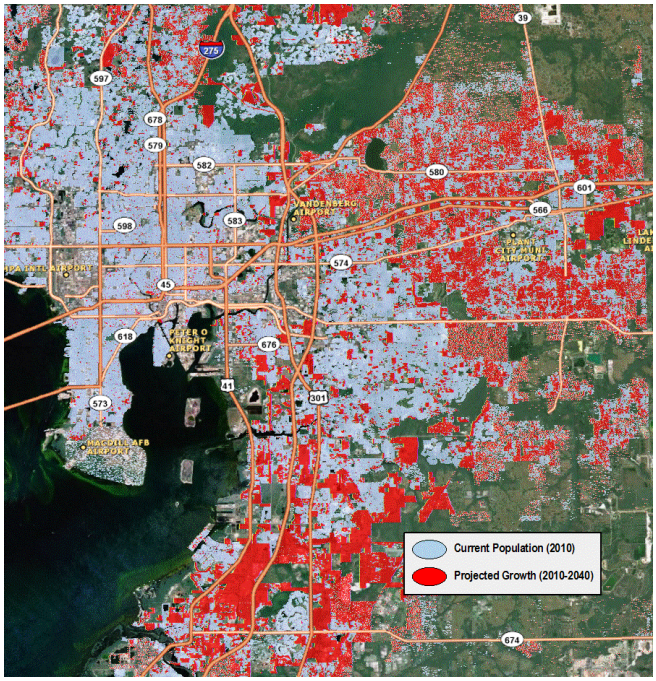

Figure 7. Dot density symbolization of GIS data reflecting parcel level population growth in Hillsborough County. The 2010 population is in gray, and the 2010-2040 growth is in red.

gallons per day (gpd). However, there are some small utilities in that category that are included here because their service area boundary is in SWFWMD's database.

Note that these service area population summaries may include some self-supplied populations (or populations with private wells) that reside within the service areas. In some cases, the population projections utilized for SWFWMD's Regional Water Supply Plan (RWSP) may vary from the raw functional population projections developed with the model due to service area boundary changes after raw model output, DSS identified after raw model output, 2012 population served reported by utility using the required population estimation methodology in Part D of the Water Use Permitting Manual, etc.

BEBR / Census Population Cohort							
Utility Name	POP12	POP15	POP20	POP25	POP30	POP35	POP40
OUTSIDE SERVICE AREAS	9,663	10,161	11,342	12,543	13,791	14,991	16,041
CITY OF BRADENTON PUBLIC WORKS	48,531	48,735	49,144	49,252	49,427	49,629	49,858
CITY OF PALMETTO PUBLIC WORKS	14,056	14,155	14,400	14,695	15,070	15,462	15,888
MANATEE CO PUBLIC WORKS DPT	255,476	269,072	297,537	324,028	347,116	367,206	385,376
TOWN OF LONGBOAT KEY	2,576	2,576	2,577	2,582	2,595	2,613	2,636

Peak Seasonal Population Cohort (Includes BEBR / Census Cohort)							
Utility Name	POP12_P	POP15_P	POP20_P	POP25_P	POP30_P	POP35_P	POP40_P
OUTSIDE SERVICE AREAS	9,872	10,385	11,599	12,834	14,114	15,342	16,407
CITY OF BRADENTON PUBLIC WORKS	51,499	51,715	52,143	52,256	52,440	52,652	52,893
CITY OF PALMETTO PUBLIC WORKS	15,641	15,750	16,023	16,352	16,769	17,204	17,678
MANATEE CO PUBLIC WORKS DPT	285,242	299,891	330,347	358,597	383,276	404,844	424,431
TOWN OF LONGBOAT KEY	5,493	5,493	5,495	5,506	5,534	5,571	5,622

Functionalized Seasonal Population Cohort (Includes BEBR / Census Cohort)							
Utility Name	POP12_F	POP15_F	POP20_F	POP25_F	POP30_F	POP35_F	POP40_F
OUTSIDE SERVICE AREAS	9,798	10,306	11,511	12,736	14,007	15,225	16,283
CITY OF BRADENTON PUBLIC WORKS	50,520	50,732	51,152	51,263	51,443	51,651	51,888
CITY OF PALMETTO PUBLIC WORKS	15,203	15,310	15,575	15,894	16,300	16,723	17,184
MANATEE CO PUBLIC WORKS DPT	278,779	293,158	323,057	350,790	374,983	396,123	415,300
TOWN OF LONGBOAT KEY	5,106	5,106	5,108	5,118	5,144	5,178	5,226

Functionalized Tourist Population Cohort							
Utility Name	POP12_T	POP15_T	POP20_T	POP25_T	POP30_T	POP35_T	POP40_T
OUTSIDE SERVICE AREAS	-	-	-	-	-	-	-
CITY OF BRADENTON PUBLIC WORKS	755	792	861	935	1,012	1,093	1,178
CITY OF PALMETTO PUBLIC WORKS	10	10	11	12	13	14	15
MANATEE CO PUBLIC WORKS DPT	13,876	14,560	15,824	17,155	18,556	20,030	21,583
TOWN OF LONGBOAT KEY	1,270	1,331	1,448	1,572	1,701	1,838	1,982

Functionalized Net Commuter Population Cohort							
Utility Name	POP12_NC	POP15_NC	POP20_NC	POP25_NC	POP30_NC	POP35_NC	POP40_NC
OUTSIDE SERVICE AREAS	(627)	(652)	(709)	(771)	(841)	(913)	(989)
CITY OF BRADENTON PUBLIC WORKS	1,572	1,568	1,561	1,565	1,580	1,601	1,632
CITY OF PALMETTO PUBLIC WORKS	(351)	(358)	(375)	(394)	(416)	(438)	(461)
MANATEE CO PUBLIC WORKS DPT	(6,051)	(6,445)	(7,302)	(8,078)	(8,557)	(8,888)	(9,323)
TOWN OF LONGBOAT KEY	120	120	120	121	121	122	123

Total Functional Population Cohort (Functionalized Seasonal + Tourist + Positive Net Commuter)							
Utility Name	POP12_TF	POP15_TF	POP20_TF	POP25_TF	POP30_TF	POP35_TF	POP40_TF
OUTSIDE SERVICE AREAS	9,798	10,306	11,511	12,736	14,007	15,225	16,283
CITY OF BRADENTON PUBLIC WORKS	52,847	53,092	53,574	53,762	54,035	54,345	54,699
CITY OF PALMETTO PUBLIC WORKS	15,213	15,320	15,587	15,906	16,313	16,737	17,199
MANATEE CO PUBLIC WORKS DPT	292,655	307,718	338,881	367,945	393,539	416,153	436,883
TOWN OF LONGBOAT KEY	6,496	6,558	6,677	6,810	6,966	7,138	7,330

Figure 8. Utility service area population projection summaries table for Manatee County

CONCLUSIONS

Small area population projections have become increasingly important for various regional planning efforts. With ever changing population dynamics and requirements for water supply planning and permitting, it is critical for SWFWMD to be able to accurately forecast population and water demand at a much finer resolution than at the county level, and to be able to update these projections regularly and in an efficient, cost-effective manner. To achieve this, SWFWMD again utilized GIS Associates' Small Area Population Projection Model and GISA's implementation of SWFWMD methods for projecting seasonal, tourist and net commuter populations. The model was updated with current data to project population in an efficient and consistent manner throughout the entire 16-county region. Controlling the projections to BEBR's county level forecasts provided consistency with other projections made by state and local governments, while at the same time providing the spatial precision needed for water supply planning and permitting.

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APPENDIX B: Growth Allocation and Calculation Summary

	AREA	2015				2020				2025				2035			
		Population	ERUs	Water (GPD)	Wastewater (GPD)	Population	ERUs	Water (GPD)	Wastewater (GPD)	Population	ERUs	Water (GPD)	Wastewater (GPD)	Population	ERUs	Water (GPD)	Wastewater (GPD)
EXISTING SERVICE AREA	Existing Served Area based on Billing Data	10,537	4,446	992,629	754,398	11,696	4,935	1,101,787	837,358	11,811	4,984	1,112,686	845,641	12,012	5,068	1,131,542	859,972
	Coleman Prison based on Billing Data	7,499	3,462	1,038,551	789,299	7,499	3,462	1,038,551	789,299	7,499	3,462	1,038,551	789,299	7,499	3,462	1,038,551	789,299
	Subtotal	**18,036**	**7,908**	**2,031,180**	**1,543,697**	**19,195**	**8,397**	**2,140,338**	**1,626,657**	**19,310**	**8,446**	**2,151,237**	**1,634,940**	**19,511**	**8,530**	**2,170,093**	**1,649,270**
INFILL/EXPANSION AREA	Area 1 (City, North)	-	-	-	-	403	400	120,132	100,110	431	476	142,773	118,978	480	682	204,455	170,379
	Area 2 (City, West)	-	-	-	-	277	267	80,189	66,824	431	374	112,150	93,458	703	609	182,800	152,334
	Area 3 (City, East)	-	-	-	-	683	464	139,276	116,063	802	563	168,932	140,777	1,003	789	236,771	197,309
	Area 4 (West SR 44)	-	-	-	-	17	15	4,358	3,632	77	42	12,562	10,469	184	93	27,878	23,231
	Area 5 (East SR 44)	-	-	-	-	495	900	270,109	225,091	563	1,120	336,031	280,026	686	1,727	518,110	431,758
	Area 6 (US 301, South of Turnpike)	-	-	-	-	132	411	123,187	102,656	254	560	168,048	140,040	471	937	280,981	234,151
	Area 7 (CR 501)	-	-	-	-	94	431	129,225	107,688	97	540	162,020	135,017	102	856	256,825	214,021
	Subtotal	**-**	**-**	**-**	**-**	**2,101**	**2,888**	**866,476**	**722,064**	**2,655**	**3,675**	**1,102,517**	**918,765**	**3,629**	**5,693**	**1,707,819**	**1,423,183**
NORTHERN SERVICE DEVELOPMENTS	Parkwood	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lakeside Landings	-	-	-	-	593	250	75,000	62,500	593	250	75,000	62,500	593	250	75,000	62,500
	Oxford Oaks	-	51	15,300	12,750	1,334	563	168,900	140,750	1,334	563	168,900	140,750	1,334	563	168,900	140,750
	Autozone	-	-	-	-	6	2	731	610	6	2	731	610	6	2	731	610
	Goodwill Piedmont	-	-	-	-	21	9	2,655	2,213	21	9	2,655	2,213	21	9	2,655	2,213
	Compass Storage	-	-	-	-	79	33	10,005	8,337	79	33	10,005	8,337	79	33	10,005	8,337
	Miryala Office Complex	-	-	-	-	8	4	1,052	877	8	4	1,052	877	8	4	1,052	877
	Oxford Mower Shop	-	-	-	-	2	1	240	200	2	1	240	200	2	1	240	200
	Baltic Properties	-	-	-	-	1	0	95	79	-	-	95	79	-	-	95	79
	Sumter Retirement Residence	-	-	-	-	261	110	33,034	27,529	261	110	33,034	27,529	261	110	33,034	27,529
	Oxford Crossings	-	-	-	-	-	-	-	-	149	63	18,922	15,769	1,345	568	170,301	141,917
	Oxford Crossings Apartments	-	-	-	-	-	-	-	-	114	48	14,400	12,000	1,024	432	129,600	108,000
	Grank Oaks Manor	-	-	-	-	474	200	60,000	50,000	711	300	90,000	75,000	948	400	120,000	100,000
	Elim Senior Care	-	-	-	-	-	-	-	-	18	20	6,133	5,111	182	184	55,200	46,000
	Mission Oaks Memory Care	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lake Andrews Preserve	-	-	-	-	38	16	4,872	4,060	77	32	9,744	8,120	269	114	34,104	28,420
	Leatherman Property	-	-	-	-	13	5	1,608	1,340	25	11	3,216	2,680	89	38	11,256	9,380
	Subtotal	**-**	**51**	**15,300**	**12,750**	**2,830**	**1,194**	**358,194**	**298,495**	**3,398**	**1,447**	**434,129**	**361,775**	**6,161**	**2,707**	**812,175**	**676,812**
CENTRAL SERVICE DEVELOPMENTS	O'Dell Planned Development	-	-	-	-	296	125	37,515	31,263	296	125	37,515	31,263	296	125	37,515	31,263
	Wildwood Retirement Residence	-	-	-	-	129	55	16,388	13,657	129	55	16,388	13,657	129	55	16,388	13,657
	Rosecastle ALF	-	-	-	-	220	93	27,885	23,238	220	93	27,885	23,238	220	93	27,885	23,238
	Triumph South	-	-	-	-	220	93	27,900	23,250	382	161	48,300	40,250	543	229	68,700	57,250
	Hughes Brothers Construction Office	-	-	-	-	3	1	326	271	3	1	326	271	3	1	326	271
	Pepper Tree Village	-	-	-	-	251	106	31,800	26,500	419	177	53,100	44,250	588	248	74,400	62,000
	Pepper Tree Plaza	-	-	-	-	25	10	3,106	2,589	25	10	3,106	2,589	25	10	3,106	2,589
	Duke Energy Expansion	-	-	-	-	23	10	2,946	2,455	23	10	2,946	2,455	23	10	2,946	2,455
	Providence II	-	-	-	-	138	58	17,514	14,595	138	58	17,514	14,595	138	58	17,514	14,595
	Traffic Control Products	-	-	-	-	4	2	481	401	4	2	481	401	4	2	481	401
	Turkey Run	-	-	-	-	415	175	52,515	43,763	415	175	52,515	43,763	415	175	52,515	43,763
	Trailwinds and Beamount	-	-	-	-	1,069	451	135,300	112,750	2,138	902	270,600	225,500	2,138	902	270,600	225,500
	Elliot: My Garage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Monarch Ranch	-	-	-	-	426	180	53,976	44,980	853	360	107,952	89,960	2,985	1,259	377,832	314,860
	Lee Capital	-	-	-	-	164	69	20,760	17,300	328	138	41,520	34,600	1,148	484	145,320	121,100
	Wildwood Crossings	-	-	-	-	-	-	-	-	58	24	7,349	6,124	522	220	66,138	55,115
	Project Horizon	-	-	-	-	39	16	4,896	4,080	77	33	9,792	8,160	271	114	34,272	28,560
	Subtotal	**-**	**-**	**-**	**-**	**3,423**	**1,444**	**433,308**	**361,090**	**5,509**	**2,324**	**697,288**	**581,074**	**9,448**	**3,986**	**1,195,938**	**996,615**
SOUTHERN SERVICE DEVELOPMENTS	Nash Modular Expansion	-	-	-	-	1	0.3	85	71	1	0.3	85	71	1	0.3	85	71
	Wildwood Entertainment Park	-	-	-	-	1	0.5	137	114	1	0.5	137	114	1	0.5	137	114
	Harry Harmer Parcel 2, Block B	-	-	-	-	3	1	401	334	3	1	401	334	3	1	401	334
	Landstone DRI	-	-	-	-	-	-	-	-	1,588	670	201,033	167,527	14,293	6,031	1,809,295	1,507,746
	Wildwood Springs DRI	-	-	-	-	-	-	-	-	583	246	73,804	61,503	5,247	2,214	664,232	553,527
	Southern Oaks DRI	-	-	-	-	-	-	-	-	800	338	101,316	84,430	7,204	3,039	911,841	759,867
	Subtotal	**-**	**-**	**-**	**-**	**5**	**2**	**623**	**519**	**2,977**	**1,256**	**376,775**	**313,979**	**26,749**	**11,287**	**3,385,991**	**2,821,659**
	Total	**18,036**	**7,959**	**2,046,480**	**1,555,325**	**27,554**	**13,925**	**3,798,939**	**3,165,782**	**33,849**	**17,148**	**4,761,947**	**3,968,289**	**65,498**	**32,203**	**9,272,016**	**7,726,680**

1 Existing serviced area uses 267 gpd/ERU per 2014 data (total of 992,629 gpd divided by 3,715 ERUs)
2 Future Infil and Future Developments use the City of Wildwood Level of Service (300 gpd/ERU)
3 Person per Household (2.37) from U.S. Census (2009-2013)
4 Prison assumes the maximum prison population of 7,499 and 2.17 people/ERU. Calculation: Total of 1,038,551 gpd divided by 300 gpd/ERU equals 3,462 ERUs. Then total prision poulation divided of 7,499 divided by 3,462 ERUs is 2.16
5 Wastewater to Water ratio based on DMR/MOR data (0.76) is used for the existing users.
6 Wastewater to Water ratio based on LOS (250 GPD/300 GPD = 0.83) is used for all infil and future developments
Developments use a percentrage of the full buildout entitlement per the City of Wildwood planning department. See appendix narrative.

APPENDIX C:
Capacity Analysis Criteria and Calculations Summary

CAPACITY ANALYSIS SUMMARY AND CALCULATIONS

Introduction

The capacity analysis evaluates the capacity of source, treatment and storage facilities connected to a water system. This capacity analysis evaluates the existing capacity of the individual City of Wildwood PWS WTP and the consolidated Wildwood PWS. Operating data from 2014 was utilized in the analysis. Specific WTP information was obtained from the 2011 Sanitary Survey and in coordination with City staff. The FAC Chapter 62-555 (Permitting, Construction, Operation, and Maintenance of Public Water Systems) was used in evaluating the capacity of the wells, finished water storage, and pumping capacity.

Capacity Evaluation Criteria

The individual plant capacities were determined by applying strict conformance with FDEP Rule 62-555. The following assumptions were used in the capacity evaluation calculations:

1. For all individual WTP capacity analyses, it was assumed that the standby pump requirement of 62-555.320 (15) (c) was met by an installed standby pump at each WTP.
2. The FDEP peaking factors of 1.8 MDF, 3.6 PHF, and 7.0 Peak Instantaneous were used.
3. The combined system capacity was determined by the sum of the active individual WTP capacities.
4. Hydropneumatic tank WTP (Fairways and Ashely) were determined to have “0” capacity because they were not able to provide maximum day plus fire flow demands or peak hour flow for 4 consecutive hour demands.

Well Capacity

Criteria #1

According to FDEP Rule 62-555.315 (3), the total well capacity for a water system using only ground water shall equal at least the system’s design maximum day water demand (including design fire flow demand if fire protection is being provided).

In the case of a well providing source water for a ground storage tank system, the required fire flow demand is the fire flow replenishment rate (flow required to replenish the required fire storage volume in a 24 hour period).

Criteria #2

In addition, for community systems serving 350 or more persons (or 150 or more service connections), the total well capacity with the largest producing well out of operation shall be equal to the design average daily flow (ADF) and preferably the design maximum daily flow (MDF).

Finished Water Storage Capacity

Criteria #1

According to FDEP Rule 62-555.320 (19), the total useful finished-water storage capacity (excluding any storage capacity for fire protection) connected to a water system shall at least equal 25 percent of the system's maximum-day water demand, excluding any design fire flow demand.

The assumed fire flow rate is 1,000 gpm and the design fire flow duration is 2 hours. Therefore, the fire flow rate multiplied by fire flow duration is 120,000 gallons.

Criteria #2

FDEP Rule 62-555.320 (19) also requires additional finished water storage capacity to meet the design fire flow rate for the design fire flow duration.

Pumping Capacity

Criteria #1 – Without Elevated Storage Tank

FDEP Rule 62-555.320 (a) provides HSP requirements for systems that do not have elevated storage capacity. Since the Huey St PWS has an active elevated storage tank (EST), the requirements 62-555.320 (a) do not apply.

Criteria #2 – With Elevated Storage Tank

According to FDEP Rule 62-555.320 (15) (b), where elevated finished drinking water storage is provided, the total capacity of all high service pumping stations shall be sufficient to meet the maximum day water demand (including design fire flow demand) and to maintain a minimum system pressure of 20 psi.

Criteria #3 – (a) Peak-hour water demand and (b) MDD + FF

(a) In addition, per FDEP Rule 62-555.320 (15) (b), the total capacity of the high-service pumping stations (HSPS), or the capacity of the booster pumping station, combined with the useful elevated finished-water storage capacity shall be sufficient to meet the water system's or the booster station service area's peak hour water demand for at least four consecutive hours

(b) If fire protection is being provided, the total capacity of the high-service pumping stations (HSPS), or the capacity of the booster pumping station, combined with the useful elevated finished-water storage capacity shall be sufficient to meet the water system's or the booster station service area's design fire flow rate plus a background water demand equivalent to the maximum-day demand other than fire flow demand for the design fire flow duration.

For the purpose of this analysis, the potential HSPS capacity related to the above criteria was determined by dividing the total available HSPS and EST flow rate (during the peak hour demand period) by the calculated peak hour factor (3.6) to get the theoretical average day flow (ADF). The ADF then multiplied by the calculated maximum day factor (1.8) to calculate the maximum day capacity.

Calculations

See the next section containing the capacity analysis calculations for the individual WTP and the consolidated PWS.

CITY OF WILDWODD PWS CONSOLIDATED CAPACITY ANALYSIS

Facility Type - Well Pumps, High Service Pump, Ground Storage, Elevated Storage, and Hydropneumatic tanks

SYSTEM PARAMETERS

Fire Flow Rate	1,000	gpm
Fire Flow Duration	2	hrs
Fire Flow Demand	120,000	gallons
Fire Flow Replenishment Rate	83.33	gpm
Average Day Demand (From 2014 MOR Reports)	2,057,210	gpd
Average Day Demand	1,429	gpm
Maximum Day Demand (Calculated)	3,702,978	gpd
Maximum Day Demand (From 2014 MOR Reports)	3,473,000	gpd
Maximum Day Demand	2,572	gpm
Max Day Factor (MDF/ADF)	1.80	
Peak Hour Factor	3.60	
Peak Hour Demand (PHF x ADF)	5,143	gpm
Number of Connections (total system)	4,985	connections
Population Served (total system)	16,436	capita
Is Elevated Storage Available?	yes	"yes" or "no"
Total EST Storage Available to WTP's Service Area	500,000	gallons

NOTE:
Fire-flow demand as defined by 62-555.520(4)(a)3c is fire-flow rate times duration.
Fire replenishment rate is the fire-flow demand divided by 24 hours.

WELL CAPACITY

Criteria #1

According to FDEP Rule 62-555.315 (3), the total well capacity for a water system using only ground water shall equal at least the system's design maximum day water demand (including design fire flow demand if fire protection is being provided).

Criteria #2

In addition, for community systems serving 350 or more persons (or 150 or more service connections), the total well capacity with the largest producing well out of operation shall be equal to the design average daily flow (ADF) and preferably the design maximum daily flow (MDF).

Well Name	Location	Pumping Capacity (gpm)
SE 1	CR-501 WTP	900
SE 2	CR-501 WTP	600
FW 1	Fairways WTP	500
11	Huey WTP	500
AW 1	Ashley WTP	500

Criteria #1

Total Available Well Capacity	3,000	gpm
Fire-flow Demand (EST replenishment rate)	83	gpm
Net Available Total Well Capacity	2,917	gpm
Available Max Day Demand	4,200,000	gpd
Rated Capacity (MDF)	2,917	gpm
Rated Capacity (MDF)	**4,200,000**	**gpd**

Criteria #2

Total Well Capacity	2,500	gpm
Largest Well	900	gpm
Well Capacity w/ Largest Well Out of Service	1,600	gpm
Rated Capacity (ADF or MDF)	1,600	gpm
Rated Capacity Assuming ADF is met with largest well out of service (MDF)	**4,147,200**	**GPD**
Rated Capacity Assuming MDF is met with largest well out of service (MDF)	**2,304,000**	**GPD**

FINISHED WATER STORAGE CAPACITY

Criteria #1 According to FDEP Rule 62-555.320 (19), the total useful finished-water storage capacity (excluding any storage capacity for fire protection) connected to a water system shall at least equal 25 percent of the system's maximum-day water demand, excluding any design fire-flow demand.

Criteria #2 FDEP Rule 62-555.320 (19) also requires additional finished water storage capacity to meet the design fire flow rate for the design fire flow duration.

Storage Tank Name	Location	Type of Storage	Capacity (gallons)
CR 501	CR 501	Ground Storage	500,000
CR 501	CR 501	Ground Storage	1,000,000
Huey Street	HUEY	Elevated Storage	500,000
214 Re-Pump	CR 214	Ground Storage	500,000

Criteria #1

Total Finished Water Storage Available	2,500,000	gallons
Fire Flow Storage Required	120,000	gallons
Useful Finished Water Storage Capacity	2,380,000	gallons
Rated Capacity (Based on 25% of MDF)	**9,520,000**	**gpd**

Criteria #2

Fire-flow Demand (Rate x Duration)	120,000	gallons
Total Storage Capacity	2,500,000	gallons
Net Available Storage Capacity	2,380,000	gallons
Rated Capacity (MDF)	**9,520,000**	**gpd**

PUMPING CAPACITY

Criteria #1

According to FDEP Rule 62-555.320 (15) (a), unless elevated finished drinking water storage is provided, the total capacity of all high-service pumping stations connected to a water system, or the capacity of booster pumping stations, shall be sufficient to meet at least the water system's, or booster station services area's, peak-hour water demand (and if fire protection is being provided, meet at least the water system's, or booster station service area's, design fire-flow rate plus a background water demand equivalent to the maximum-day demand other than fire-flow demand); and maintain a minimum system pressure of 20 pounds per square inch.

Criteria #2

According to FDEP Rule 62-555.320 (15) (b), where elevated finished drinking water storage is provided, the total capacity of all high service pumping stations shall be sufficient to meet the maximum day water demand (including design fire flow demand) and to maintain a minimum system pressure of 20 pounds per square inch.

Criteria #3

In addition, per FDEP Rule 62-555.320 (15) (b), the total capacity of the high-service pumping stations, or the capacity of the booster pumping station, ***combined*** with the useful elevated finished-water storage capacity shall be sufficient to meet the water system's, or the booster station service area's, peak-hour water demand for at least four consecutive hours (and if fire protection is being provided, shall be sufficient to meet the water system's, or the booster station service area's, design fire-flow rate plus a background water demand equivalent to the maximum-day demand other than fire-flow demand for the design fire-flow duration).

HSP Name	Location	Capacity (gpm)
1	Coleman	1,000
2	Coleman	1,300
3	Coleman	500
FW 1	Fairways	500
11	Huey St	450
CR 214 HSP #1	CR 214	500
CR 214 HSP #2	CR 214	1,100
CR 214 HSP #3	CR 214	1,100
AW 1	Ashley	500

Criteria #1

Total HSP Pumping Capacity	N/A	gpm
HSP Pumping Capacity with Largest Unit Out of Service	N/A	gpm
Fire Flow Rate	N/A	gpm
Max Day Factor	N/A	
Peak Hour Factor	N/A	
Capacity Based on Meeting Peak Hour Demand (MDF)	**N/A**	**gpm**
Capacity Based on Meeting Fire Flow @ Max Day Demand	**N/A**	**gpm**

Criteria #2

Total HSP Pumping Capacity	6,950	gpm
HSP Pumping Capacity with Largest Unit Out of Service	5,650	gpm
Fire Flow Demand (Replenishment Rate)	83	gpm
Net Available Pumping Capacity	5,567	gpm
Potential Rated Capacity (MDF)	**8,016,000**	**gpd**

Criteria #3a

Total HSP Pumping Capacity	6,950	gpm
HSP Pumping Capacity with Largest Unit Out of Service	5,650	gpm
Useful EST Storage Capacity (Total)	500,000	gallons
Useful EST Storage Capacity (gpm for 4 hours)	2,083	gpm
Combined Useful EST and HSP Capacity Available for Peak Hour Flow for 4 Hours	7,733	gpm
Capacity Based on Meeting Peak Hour Flow for 4 Consecutive Hours (MDF)	**5,568,000**	**gpd**

Criteria #3b

Total HSP Pumping Capacity	6,950	gpm
HSP Pumping Capacity with Largest Unit Out of Service	5,650	gpm
Elevated Storage Available to WTP's Service Area	500,000	gallons
Useful EST Storage Capacity Available for Max Day Demand for the Fire Flow Duration	4,167	gpm
Combined Useful EST and HSP Capacity Available for MDF and Fire Flow Rate for Fire Flow Duration	9,817	gpm
Capacity Based on Meeting Fire Flow Rate plus MDF for Fire Flow Duration (MDF)	**14,136,000**	**gpd**

CR-501 (Coleman) WTP CAPACITY ANALYSIS

Facility Type - Well Pumps, High Service Pump, and Ground Storage

SYSTEM PARAMETERS

Fire Flow Rate	1,000	gpm
Fire Flow Duration	2	hrs
Fire Flow Demand	120,000	gallons
Fire Flow Replenishment Rate	83.33	gpm
Average Day Demand (From 2014 MOR Reports)	1,562,279	gpd
Average Day Demand	1,085	gpm
Maximum Day Demand (Calculated)	2,812,103	gpd
Maximum Day Demand (From 2014 MOR Reports)	2,117,000	gpd
Maximum Day Demand	1,953	gpm
Max Day Factor (MDF/ADF)	1.80	
Peak Hour Factor	3.60	
Peak Hour Demand (PHF x ADF)	3,906	gpm
Number of Connections (total system)	Unknown	connections
Population Served (total system)	Unknown	capita
Is Elevated Storage Available?	no	"yes" or "no"
Total EST Storage Available to WTP's Service Area	100,000	gallons

NOTE:
Fire-flow demand as defined by 62-555.520(4)(a)3c is fire-flow rate times duration.
Fire replenishment rate is the fire-flow demand divided by 24 hours.

WELL CAPACITY

Criteria #1

According to FDEP Rule 62-555.315 (3), the total well capacity for a water system using only ground water shall equal at least the system's design maximum day water demand (including design fire flow demand if fire protection is being provided).

Criteria #2

In addition, for community systems serving 350 or more persons (or 150 or more service connections), the total well capacity with the largest producing well out of operation shall be equal to the design average daily flow (ADF) and preferably the design maximum daily flow (MDF).

Well Name	Pumping Capacity (gpm)
SE 1	900
SE 2	600

Criteria #1

Total Available Well Capacity	1,500	gpm
Fire-flow Demand (EST replenishment rate)	83	gpm
Net Available Total Well Capacity	1,417	gpm
Available Max Day Demand	2,040,000	gpd
Rated Capacity (MDF)	1,417	gpm
Rated Capacity (MDF)	**2,040,000**	**gpd**

Criteria #2

Total Well Capacity	1,500	gpm
Largest Well	900	gpm
Well Capacity w/ Largest Well Out of Service	600	gpm
Rated Capacity (ADF or MDF)	600	gpm
Rated Capacity Assuming ADF is met with largest well out of service (MDF)	**1,555,200**	**GPD**
Rated Capacity Assuming MDF is met with largest well out of service (MDF)	**864,000**	**GPD**

FINISHED WATER STORAGE CAPACITY

Criteria #1 According to FDEP Rule 62-555.320 (19), the total useful finished-water storage capacity (excluding any storage capacity for fire protection) connected to a water system shall at least equal 25 percent of the system's maximum-day water demand, excluding any design fire-flow demand.

Criteria #2 FDEP Rule 62-555.320 (19) also requires additional finished water storage capacity to meet the design fire flow rate for the design fire flow duration.

Storage Tank Name	Type of Storage	Capacity (gallons)
1	Ground Storage	500,000
2	Ground Storage	1,000,000

Criteria #1

Total Finished Water Storage Avaliable	1,500,000	gallons
Fire Flow Storage Required	120,000	gallons
Useful Finished Water Storage Capacity	1,380,000	gallons
Rated Capacity (Based on 25% of MDF)	**5,520,000**	**gpd**

Criteria #2

Fire-flow Demand (Rate x Duration)	120,000	gallons
Total Storage Capacity	1,500,000	
Net Available Storage Capacity	1,380,000	Gallons
Rated Capacity (MDF)	**5,520,000**	**gpd**

PUMPING CAPACITY

Criteria #1

According to FDEP Rule 62-555.320 (15) (a), unless elevated finished drinking water storage is provided, the total capacity of all high-service pumping stations connected to a water system, or the capacity of booster pumping stations, shall be sufficient to meet at least the water system's, or booster station services area's, peak-hour water demand (and if fire protection is being provided, meet at least the water system's, or booster station service area's, design fire-flow rate plus a background water demand equivalent to the maximum-day demand other than fire-flow demand); and maintain a minimum system pressure of 20 pounds per square inch.

Criteria #2

According to FDEP Rule 62-555.320 (15) (b), where elevated finished drinking water storage is provided, the total capacity of all high service pumping stations shall be sufficient to meet the maximum day water demand (including design fire flow demand) and to maintain a minimum system pressure of 20 pounds per square inch.

Criteria #3

In addition, per FDEP Rule 62-555.320 (15) (b), the total capacity of the high-service pumping stations, or the capacity of the booster pumping station, ***combined*** with the useful elevated finished-water storage capacity shall be sufficient to meet the water system's, or the booster station service area's, peak-hour water demand for at least four consecutive hours (and if fire protection is being provided, shall be sufficient to meet the water system's, or the booster station service area's, design fire-flow rate plus a background water demand equivalent to the maximum-day demand other than fire-flow demand for the design fire-flow duration).

HSP Name	Location	Capacity (gpm)
1	Coleman	6,000
2	Coleman	6,000
3	Coleman	6,000

Criteria #1

Total HSP Pumping Capacity	18,000	gpm
HSP Pumping Capacity with Largest Unit Out of Service	12,000	gpm
Fire Flow Rate	1,000	gpm
Max Day Factor	1.80	
Peak Hour Factor	3.6	
Capacity Based on Meeting Peak Hour Demand (MDF)	**8,640,000**	**gpd**
Capacity Based on Meeting Fire Flow @ Max Day Demand	**15,840,000**	**gpd**

Criteria #2

Total HSP Pumping Capacity	N/A	gpm
HSP Pumping Capacity with Largest Unit Out of Service	N/A	gpm
Fire Flow Demand (Replenishment Rate)	N/A	gpm
Net Available Pumping Capacity	N/A	gpm
Potentinal Rated Capacity (MDF)	**N/A**	**gpd**

Criteria #3a

Total HSP Pumping Capacity	N/A	gpm
HSP Pumping Capacity with Largest Unit Out of Service	N/A	gpm
Useful EST Storage Capacity (Total)	N/A	gallons
Useful EST Storage Capacity (gpm for 4 hours)	N/A	gpm
Combined Useful EST and HSP Capacity Available for Peak Hour Flow for 4 Hours	N/A	gpm
Capacity Based on Meeting Peak Hour Flow for 4 Consecutive Hours (MDF)	**N/A**	**gpd**

Criteria #3b

Total HSP Pumping Capacity	N/A	gpm
HSP Pumping Capacity with Largest Unit Out of Service	N/A	gpm
Elevated Storage Available to WTP's Service Area	N/A	gallons
Useful EST Storage Capacity Available for Max Day Demand for the Fire Flow Duration	N/A	gpm
ıbined Useful EST and HSP Capacity Available for MDF and Fire Flow Rate for Fire Flow Duration	N/A	gpm
Capacity Based on Meeting Fire Flow Rate plus MDF for Fire Flow Duration (MDF)	**N/A**	**gpd**

Fairways WTP Capacity Analysis

Facility Type - Well and Hydropneumatic Tank

SYSTEM PARAMETERS

Fire Flow Rate	1,000	gpm
Fire Flow Duration	2	hrs
Fire Flow Demand	120,000	gallons
Fire Flow Replenishment Rate	83.33	gpm
Average Day Demand (From 2014 MOR Reports)	125,205	gpd
Average Day Demand	87	gpm
Maximum Day Demand (Calculated)	225,370	gpd
Maximum Day Demand (From 2014 MOR Reports)	676,000	gpd
Maximum Day Demand	157	gpm
Max Day Factor (MDF/ADF)	1.80	
Peak Hour Factor	3.60	
Peak Hour Demand (PHF x ADF)	313	gpm
Peak Instantaneous Factor	7	
Peak Instantaneous Demand (PIF x ADF)	609	gpm
Tank Low Pressure (Well Pump On)	50	psi
Tank High Pressure (Well Pump Off)	65	psi
Number of Connections (total system)	unknown	connections
Population Served (total system)	unknown	capita
Is Elevated Storage Available?	no	"yes" or "no"
Total EST Storage Available to WTP's Service Area	0	gallons

NOTE:
Fire-flow demand as defined by 62-555.520(4)(a)3c is fire-flow rate times duration.
Fire replenishment rate is the fire-flow demand divided by 24 hours.

WELL CAPACITY

Criteria #1 According to FDEP Rule 62-555.315 (3), the total well capacity for a water system using only ground water shall equal at least the system's design maximum day water demand (including design fire flow demand if fire protection is being provided).

Criteria #2 In addition, for community systems serving 350 or more persons (or 150 or more service connections), the total well capacity with the largest producing well out of operation shall be equal to the design average daily flow (ADF) and preferably the design maximum daily flow (MDF).

Well Name	Pumping Capacity (gpm)
FW 1	500

Criteria #1

Total Available Well Capacity	500	gpm
Fire-flow Demand (EST replenishment rate)	83	gpm
Net Available Total Well Capacity	417	gpm
Available Max Day Demand	600,000	gpd
Rated Capacity (MDF)	417	gpm
Rated Capacity (MDF)	**600,000**	**gpd**

Criteria #2

Total Well Capacity	500	gpm
Largest Well	500	gpm
Well Capacity w/ Largest Well Out of Service	0	gpm
Rated Capacity (ADF or MDF)	0	gpm
Rated Capacity Assuming ADF is met with largest well out of service (MDF)	**0**	**GPD**
Rated Capacity Assuming MDF is met with largest well out of service (MDF)	**0**	**GPD**

FINISHED WATER STORAGE CAPACITY

Criteria #1

According to FDEP Rule 62-555.320 (19)(b)2, A demonstration showing that, in conjunction with the capacity of the water system's source, treatment, and finished-water pumping facilities, the water system's total useful finished-water storage capacity (excluding any storage capacity for fire protection) is sufficient to meet the water system's peak-hour water demand for at least four consecutive hours. For small water systems with hydropneumatic tanks that are installed under a construction permit for which the Department receives a complete application on or after August 28, 2003, the supplier of water or construction permit applicant also shall demonstrate that, in conjunction with the capacity of the water system's source, treatment, and finished-water pumping facilities, the water system's total useful finished-water storage capacity (i.e., the water system's total effective hydropneumatic tank volume) is sufficient to meet the water system's peak instantaneous water demand for at least 20 consecutive minutes.

Criteria #2

According to FDEP Rule 62-555.320 (20), hydropneumatic tanks shall be designed and constructed in accordance with Section 7.2 of the 10 States Standards.

Section 7.2 of the 10 States Standards requires the gross volume of a hydropneumatic tank to be 10 times the capacity of the largest pump, rated in gallons per minute. For example, a 250 gpm pump should have a 2,500 gallon pressure tank.

Hydro Tank Name	Type of Storage	Total Volume (gallons)	Useable Volume (gallons)
H1	Hydro Tank	10,000	1,882
			-

Criteria #1

Well Pumping Capacity	500	gpm
Hydropneumatic Tank Useful Storage Volume	1,882	gallons
Useful Hydropneumatic Tank Storage Capacity (gpm for 4 hours)	8	gpm
Total Combined Capacity Available for Peak Hour Flow (4 hours) Excluding Fire Flow	(492)	gpm
Useful Hydropneumatic Tank Storage Capacity (gpm for 20 minutes)	627	gpm
Total Combined Capacity Available for Peak Instantaneous Flow (20 minutes)	1,127	gpm
Capacity Based on Meeting Peak Hour Flow for 4 Consecutive Hours (MDF)	**(354,354)**	**gpd**
Capacity Based on Meeting Peak Instantaneous Demand for 20 Minutes (MDF)	**417,443**	**gpd**

Criteria #2

Total Gross Hydropneumatic Tank Volume	10,000	gallons
Allowable Pumping Rate Based on Hydropneumatic Tank Gross Volume	1,000	gpm
Largest Well Pump	500	gpm
Controlling Pumping Rate	500	gpm
Capacity Based on Hydropneumatic Tank Gross Volume Limitations (MDF)	**720,000**	**gpd**

PUMPING CAPACITY

Criteria #1 According to FDEP Rule 62-555.320 (15) (a), unless elevated finished drinking water storage is provided, the total capacity of all high-service pumping stations connected to a water system, or the capacity of booster pumping stations, shall be sufficient to meet at least the water system's, or booster station services area's, peak-hour water demand (and if fire protection is being provided, meet at least the water system's, or booster station service area's, design fire-flow rate plus a background water demand equivalent to the maximum-day demand other than fire-flow demand); and maintain a minimum system pressure of 20 pounds per square inch.

Criteria #2 According to FDEP Rule 62-555.320 (15) (b), where elevated finished drinking water storage is provided, the total capacity of all high service pumping stations shall be sufficient to meet the maximum day water demand (including design fire flow demand) and to maintain a minimum system pressure of 20 pounds per square inch.

Criteria #3 In addition, per FDEP Rule 62-555.320 (15) (b), the total capacity of the high-service pumping stations, or the capacity of the booster pumping station, ***combined*** with the useful elevated finished-water storage capacity shall be sufficient to meet the water system's, or the booster station service area's, peak-hour water demand for at least four consecutive hours (and if fire protection is being provided, shall be sufficient to meet the water system's, or the booster station service area's, design fire-flow rate plus a background water demand equivalent to the maximum-day demand other than fire-flow demand for the design fire-flow duration).

HSP Name	Pumping Capacity (gpm)	
FW 1		500

Criteria #1	Total HSP Pumping Capacity	500	gpm
	HSP Pumping Capacity with Largest Unit Out of Service	0	gpm
	Fire Flow Rate	1,000	gpm
	Max Day Factor	1.80	
	Peak Hour Factor	3.6	
	Capacity Based on Meeting Peak Hour Demand (MDF)	**0**	**gpm**
	Capacity Based on Meeting Fire Flow @ Max Day Demand	**0**	**gpm**
Criteria #2	Total HSP Pumping Capacity	N/A	gpm
	HSP Pumping Capacity with Largest Unit Out of Service	N/A	gpm
	Fire Flow Demand (Replenishment Rate)	N/A	gpm
	Net Available Pumping Capacity	N/A	gpm
	Potential Rated Capacity (MDF)	**N/A**	**gpd**
Criteria #3a	Total HSP Pumping Capacity	N/A	gpm
	HSP Pumping Capacity with Largest Unit Out of Service	N/A	gpm
	Elevated Storage Available to WTP's Service Area	N/A	gallons
	Useful EST Storage Capacity (gpm for 4 hours)	N/A	gpm
	Combined Useful EST and HSP Capacity Available for Peak Hour Flow for 4 Hours	N/A	gpm
	Capacity Based on Meeting Peak Hour Flow for 4 Consecutive Hours (MDF)	**N/A**	**gpd**
Criteria #3b	Total HSP Pumping Capacity	N/A	gpm
	HSP Pumping Capacity with Largest Unit Out of Service	N/A	gpm
	Elevated Storage Available to WTP's Service Area	N/A	gallons
	Useful EST Storage Capacity Available for Max Day Demand for the Fire Flow Duration	N/A	gpm
	ined Useful EST and HSP Capacity Available for MDF and Fire Flow Rate for Fire Flow Duration	N/A	gpm
	Capacity Based on Meeting Fire Flow Rate plus MDF for Fire Flow Duration (MDF)	**N/A**	**gpd**

Huey WTP Capacity Analysis

Facility Type - High Service Pump w/ Elevated Storage

SYSTEM PARAMETERS

Fire Flow Rate	1,000	gpm
Fire Flow Duration	2	hrs
Fire Flow Demand	120,000	gallons
Fire Flow Replenishment Rate	83.33	gpm
Average Day Demand (From 2014 MOR Reports)	369,726	gpd
Average Day Demand	257	gpm
Maximum Day Demand (Calculated)	665,507	gpd
Maximum Day Demand (From 2014 MOR Reports)	680,000	gpd
Maximum Day Demand	462	gpm
Max Day Factor (MDF/ADF)	1.80	
Peak Hour Factor	3.60	
Peak Hour Demand (PHF x ADF)	924	gpm
Number of Connections (total system)	unknown	connections
Population Served (total system)	unknown	capita
Is Elevated Storage Available?	yes	"yes" or "no"
Total EST Storage Available to WTP's Service Area	500,000	gallons

NOTE:
Fire-flow demand as defined by 62-555.520(4)(a)3c is fire-flow rate times duration.
Fire replenishment rate is the fire-flow demand divided by 24 hours.

WELL CAPACITY

Criteria #1

According to FDEP Rule 62-555.315 (3), the total well capacity for a water system using only ground water shall equal at least the system's design maximum day water demand (including design fire flow demand if fire protection is being provided).

Criteria #2

In addition, for community systems serving 350 or more persons (or 150 or more service connections), the total well capacity with the largest producing well out of operation shall be equal to the design average daily flow (ADF) and preferably the design maximum daily flow (MDF).

Well Name		Pumping Capacity (gpm)
11		500

Criteria #1

Total Available Well Capacity	500	gpm
Fire-flow Demand (EST replenishment rate)	83	gpm
Net Available Total Well Capacity	417	gpm
Available Max Day Demand	600,000	gpd
Rated Capacity (MDF)	417	gpm
Rated Capacity (MDF)	**600,000**	**gpd**

Criteria #2

Total Well Capacity	500	gpm
Largest Well	500	gpm
Well Capacity w/ Largest Well Out of Service	0	gpm
Rated Capacity (ADF or MDF)	-	gpm
Rated Capacity Assuming ADF is met with largest well out of service (MDF)	**-**	**GPD**
Rated Capacity Assuming MDF is met with largest well out of service (MDF)	**-**	**GPD**

FINISHED WATER STORAGE CAPACITY

Criteria #1 According to FDEP Rule 62-555.320 (19), the total useful finished-water storage capacity (excluding any storage capacity for fire protection) connected to a water system shall at least equal 25 percent of the system's maximum-day water demand, excluding any design fire-flow demand.

Criteria #2 FDEP Rule 62-555.320 (19) also requires additional finished water storage capacity to meet the design fire flow rate for the design fire flow duration.

Storage Tank Name	Type of Storage	Capacity (gallons)
1	Elevated Storage	500,000

Criteria #1

Total Finished Water Storage Available	500,000	gallons
Fire Flow Storage Required	120,000	gallons
Useful Finished Water Storage Capacity	380,000	gallons
Rated Capacity (Based on 25% of MDF)	**1,520,000**	**gpd**

Criteria #2

Fire-flow Demand (Rate x Duration)	120,000	gallons
Total Storage Capacity	500,000	gallons
Net Available Storage Capacity	380,000	gallons
Rated Capacity (MDF)	**1,520,000**	**gpd**

PUMPING CAPACITY

Criteria #1

According to FDEP Rule 62-555.320 (15) (a), unless elevated finished drinking water storage is provided, the total capacity of all high-service pumping stations connected to a water system, or the capacity of booster pumping stations, shall be sufficient to meet at least the water system's, or booster station services area's, peak-hour water demand (and if fire protection is being provided, meet at least the water system's, or booster station service area's, design fire-flow rate plus a background water demand equivalent to the maximum-day demand other than fire-flow demand); and maintain a minimum system pressure of 20 pounds per square inch.

Criteria #2

According to FDEP Rule 62-555.320 (15) (b), where elevated finished drinking water storage is provided, the total capacity of all high service pumping stations shall be sufficient to meet the maximum day water demand (including design fire flow demand) and to maintain a minimum system pressure of 20 pounds per square inch.

Criteria #3

In addition, per FDEP Rule 62-555.320 (15) (b), the total capacity of the high-service pumping stations, or the capacity of the booster pumping station, ***combined*** with the useful elevated finished-water storage capacity shall be sufficient to meet the water system's, or the booster station service area's, peak-hour water demand for at least four consecutive hours (and if fire protection is being provided, shall be sufficient to meet the water system's, or the booster station service area's, design fire-flow rate plus a background water demand equivalent to the maximum-day demand other than fire-flow demand for the design fire-flow duration).

HSP Name	Location	Capacity (gpm)
1	Huey St.	500

Criteria #1

Total HSP Pumping Capacity	N/A	gpm
HSP Pumping Capacity with Largest Unit Out of Service	N/A	gpm
Fire Flow Rate	N/A	gpm
Max Day Factor	N/A	
Peak Hour Factor	N/A	
Capacity Based on Meeting Peak Hour Demand (MDF)	**N/A**	**gpm**
Capacity Based on Meeting Fire Flow @ Max Day Demand	**N/A**	**gpm**

Criteria #2

Total HSP Pumping Capacity	500	gpm
HSP Pumping Capacity with Largest Unit Out of Service	-	gpm
Fire Flow Demand (Replenishment Rate)	83	gpm
Net Available Pumping Capacity	(83)	gpm
Potential Rated Capacity (MDF)	**(120,000)**	**gpd**

Criteria #3a

Total HSP Pumping Capacity	500	gpm
HSP Pumping Capacity with Largest Unit Out of Service	-	gpm
Useful EST Storage Capacity (Total)	500,000	gallons
Useful EST Storage Capacity (gpm for 4 hours)	2,083	gpm
Combined Useful EST and HSP Capacity Available for Peak Hour Flow for 4 Hours	2,083	gpm
Capacity Based on Meeting Peak Hour Flow for 4 Consecutive Hours (MDF)	**1,500,000**	**gpd**

Criteria #3b

Total HSP Pumping Capacity	500	gpm
HSP Pumping Capacity with Largest Unit Out of Service	-	gpm
Elevated Storage Available to WTP's Service Area	500,000	gallons
Useful EST Storage Capacity Available for Max Day Demand for the Fire Flow Duration	4,167	gpm
ıbined Useful EST and HSP Capacity Available for MDF and Fire Flow Rate for Fire Flow Duration	4,167	gpm
Capacity Based on Meeting Fire Flow Rate plus MDF for Fire Flow Duration (MDF)	**6,000,000**	**gpd**

Ashley WTP Capacity Analysis

Facility Type - Well and Hydropneumatic Tank

SYSTEM PARAMETERS

Fire Flow Rate	1,000	gpm
Fire Flow Duration	2	hrs
Fire Flow Demand	120,000	gallons
Fire Flow Replenishment Rate	83.33	gpm
Average Day Demand (expected)	350,000	gpd
Average Day Demand	243	gpm
Maximum Day Demand (Calculated)	630,000	gpd
Maximum Day Demand (expected)	650,000	gpd
Maximum Day Demand	438	gpm
Max Day Factor (MDF/ADF)	1.80	
Peak Hour Factor	3.60	
Peak Hour Demand (PHF x ADF)	875	gpm
Peak Instantaneous Factor	7	
Peak Instantaneous Demand (PIF x ADF)	1,701	gpm
Tank Low Pressure (Well Pump On)	50	psi
Tank High Pressure (Well Pump Off)	65	psi
Number of Connections (total system)	unknown	connections
Population Served (total system)	unknown	capita
Is Elevated Storage Available?	no	"yes" or "no"
Total EST Storage Available to WTP's Service Area	0	gallons

NOTE:
Fire-flow demand as defined by 62-555.520(4)(a)3c is fire-flow rate times duration.
Fire replenishment rate is the fire-flow demand divided by 24 hours.

WELL CAPACITY

Criteria #1

According to FDEP Rule 62-555.315 (3), the total well capacity for a water system using only ground water shall equal at least the system's design maximum day water demand (including design fire flow demand if fire protection is being provided).

Criteria #2

In addition, for community systems serving 350 or more persons (or 150 or more service connections), the total well capacity with the largest producing well out of operation shall be equal to the design average daily flow (ADF) and preferably the design maximum daily flow (MDF).

Well Name	Pumping Capacity (gpm)
AW 1	500

Criteria #1

Total Available Well Capacity	500	gpm
Fire-flow Demand	1,000	gpm
Net Available Total Well Capacity	(500)	gpm
Available Max Day Demand	(720,000)	gpd
Rated Capacity (MDF)	(500)	gpm
Rated Capacity (MDF)	**(720,000)**	**gpd**

Criteria #2

Total Well Capacity	500	gpm
Largest Well	500	gpm
Well Capacity w/ Largest Well Out of Service	0	gpm
Rated Capacity (ADF or MDF)	0	gpm
Rated Capacity Assuming ADF is met with largest well out of service (MDF)	**0**	**GPD**
Rated Capacity Assuming MDF is met with largest well out of service (MDF)	**0**	**GPD**

FINISHED WATER STORAGE CAPACITY

Criteria #1

According to FDEP Rule 62-555.320 (19)(b)2, A demonstration showing that, in conjunction with the capacity of the water system's source, treatment, and finished-water pumping facilities, the water system's total useful finished-water storage capacity (excluding any storage capacity for fire protection) is sufficient to meet the water system's peak-hour water demand for at least four consecutive hours. For small water systems with hydropneumatic tanks that are installed under a construction permit for which the Department receives a complete application on or after August 28, 2003, the supplier of water or construction permit applicant also shall demonstrate that, in conjunction with the capacity of the water system's source, treatment, and finished-water pumping facilities, the water system's total useful finished-water storage capacity (i.e., the water system's total effective hydropneumatic tank volume) is sufficient to meet the water system's peak instantaneous water demand for at least 20 consecutive minutes.

Criteria #2

According to FDEP Rule 62-555.320 (20), hydropneumatic tanks shall be designed and constructed in accordance with Section 7.2 of the 10 States Standards.

Section 7.2 of the 10 States Standards requires the gross volume of a hydropneumatic tank to be 10 times the capacity of the largest pump, rated in gallons per minute. For example, a 250 gpm pump should have a 2,500 gallon pressure tank.

Hydro Tank Name	Type of Storage	Total Volume (gallons)	Useable Volume (gallons)
H1	Hydro Tank	10,000	1,882
H2	Hydro Tank	10,000	1,882

Criteria #1

Well Pumping Capacity	500	gpm
Hydropneumatic Tank Useful Storage Volume	3,764	gallons
Useful Hydropneumatic Tank Storage Capacity (gpm for 4 hours)	16	gpm
Total Combined Capacity Available for Peak Hour Flow (4 hours) Excluding Fire Flow	(484)	gpm
Useful Hydropneumatic Tank Storage Capacity (gpm for 20 minutes)	1,255	gpm
Total Combined Capacity Available for Peak Instantaneous Flow (20 minutes)	1,755	gpm
Capacity Based on Meeting Peak Hour Flow for 4 Consecutive Hours (MDF)	**(348,708)**	**gpd**
Capacity Based on Meeting Peak Instantaneous Demand for 20 Minutes (MDF)	**649,742**	**gpd**

Criteria #2

Total Gross Hydropneumatic Tank Volume	20,000	gallons
Allowable Pumping Rate Based on Hydropneumatic Tank Gross Volume	2,000	gpm
Largest Well Pump	500	gpm
Controlling Pumping Rate	500	gpm
Capacity Based on Hydropneumatic Tank Gross Volume Limitations (MDF)	**720,000**	**gpd**

PUMPING CAPACITY

Criteria #1 According to FDEP Rule 62-555.320 (15) (a), unless elevated finished drinking water storage is provided, the total capacity of all high-service pumping stations connected to a water system, or the capacity of booster pumping stations, shall be sufficient to meet at least the water system's, or booster station services area's, peak-hour water demand (and if fire protection is being provided, meet at least the water system's, or booster station service area's, design fire-flow rate plus a background water demand equivalent to the maximum-day demand other than fire-flow demand); and maintain a minimum system pressure of 20 pounds per square inch.

Criteria #2 According to FDEP Rule 62-555.320 (15) (b), where elevated finished drinking water storage is provided, the total capacity of all high service pumping stations shall be sufficient to meet the maximum day water demand (including design fire flow demand) and to maintain a minimum system pressure of 20 pounds per square inch.

Criteria #3 In addition, per FDEP Rule 62-555.320 (15) (b), the total capacity of the high-service pumping stations, or the capacity of the booster pumping station, ***combined*** with the useful elevated finished-water storage capacity shall be sufficient to meet the water system's, or the booster station service area's, peak-hour water demand for at least four consecutive hours (and if fire protection is being provided, shall be sufficient to meet the water system's, or the booster station service area's, design fire-flow rate plus a background water demand equivalent to the maximum-day demand other than fire-flow demand for the design fire-flow duration).

HSP Name		Pumping Capacity (gpm)
AW 1		500

Criteria #1	Total HSP Pumping Capacity	500	gpm
	HSP Pumping Capacity with Largest Unit Out of Service	0	gpm
	Fire Flow Rate	1,000	gpm
	Max Day Factor	1.80	
	Peak Hour Factor	3.6	
	Capacity Based on Meeting Peak Hour Demand (MDF)	**0**	**gpm**
	Capacity Based on Meeting Fire Flow @ Max Day Demand	**0**	**gpm**
Criteria #2	Total HSP Pumping Capacity	N/A	gpm
	HSP Pumping Capacity with Largest Unit Out of Service	N/A	gpm
	Fire Flow Demand (Replenishment Rate)	N/A	gpm
	Net Available Pumping Capacity	N/A	gpm
	Potential Rated Capacity (MDF)	**N/A**	**gpd**
Criteria #3a	Total HSP Pumping Capacity	N/A	gpm
	HSP Pumping Capacity with Largest Unit Out of Service	N/A	gpm
	Elevated Storage Available to WTP's Service Area	N/A	gallons
	Useful EST Storage Capacity (gpm for 4 hours)	N/A	gpm
	Combined Useful EST and HSP Capacity Available for Peak Hour Flow for 4 Hours	N/A	gpm
	Capacity Based on Meeting Peak Hour Flow for 4 Consecutive Hours (MDF)	**N/A**	**gpd**
Criteria #3b	Total HSP Pumping Capacity	N/A	gpm
	HSP Pumping Capacity with Largest Unit Out of Service	N/A	gpm
	Elevated Storage Available to WTP's Service Area	N/A	gallons
	Useful EST Storage Capacity Available for Max Day Demand for the Fire Flow Duration	N/A	gpm
	ined Useful EST and HSP Capacity Available for MDF and Fire Flow Rate for Fire Flow Duration	N/A	gpm
	Capacity Based on Meeting Fire Flow Rate plus MDF for Fire Flow Duration (MDF)	**N/A**	**gpd**

APPENDIX D: Capital Improvement Project Timeline and Detailed Cost Opinions

Project No.	Project	Trigger	Alternative Trigger	Amount	Public/ Private Partnership	Public/ Private Partnership Ratio	Budget Year	Funding Source
WATER DISTIBUTION								
WD-1a	Design, Permitting, Bidding, and Construction Administration: CR 209 Watermain North Extension and System Interconnects	Projected Infil in Expansion Area 1 and Oxford Oaks Development	Low system pressures and fire flow issues	$ 207,000	No		2019	Budget
WD-1b	Construction: CR 209 Watermain North Extension and System Interconnects	Projected Infil in Expansion Area 1 and Oxford Oaks Development	Low system pressures and fire flow issues	$ 1,590,000	No		2020	Loan
WD-2	Monarch Ranch Watermain and system interconnects	Monarch Ranch is projected to be at 25% of the development buildout in 2025		$ 1,340,000	Yes	0/100	2025	Developer
WD-3	Southern Oaks Watermain for CR 468 from Turnpike to SR 44 Loop	Southern Oaks is projected to be at 10% of the development buildout in 2025.	Projected Infil in Expansion Area 5	$ 5,500,000	Yes	40/60	2025	Loan/Developer
WD-4	Landstone Watermain and system interconnects	Landstone is projected to be at 10% of the development buildout in 2025.		$ 1,660,000	Yes	0/100	2025	Developer
WD-5a	Design, Permitting, Bidding, and Construction Administration: O'Dell Development CR-462 to SR 44 Loop	Projected Infil in Expansion Area 2 in addition to O'Dell Property Development		$ 442,000	Yes	90/10	2019	Budget
WD-5b	Construction: O'Dell Development CR-462 to SR 44 Loop	Projected Infil in Expansion Area 2 in addition to O'Dell Property Development		$ 3,390,000	Yes	90/10	2020	Loan/Developer
WD-6	Construction: Upsize Water Main along CR-501	Landstone is projected to be at 10% of the development buildout in 2025.		$ 1,090,000	Yes	90/10	2023	Loan/Developer

Project No.	Project	Trigger	Alternative Trigger	Amount	Public/ Private Partnership	Public/ Private Partnership Ratio	Budget Year	Funding Source
WATER DISTIBUTION								
W6a	CR468 Utility Upgrades US301 to Turnpike	City of Wildwood Wastewater 5-Year CIP		$ 100,000	No	No	2015	Budget
W6b	CR468 Utility Upgrades US301 to Turnpike	City of Wildwood Wastewater 5-Year CIP		$ 250,000	No	No	2016	Budget
W9	CR 462 Utility Upgrades	City of Wildwood Wastewater 5-Year CIP		$ 160,000	No	No	2015	Budget
W12	C466W Waterline Relocations	City of Wildwood Wastewater 5-Year CIP		$ 200,000	No	No	2016	Budget
W14a	Loop/Upgrade Water Mains/ Install Valves	City of Wildwood Wastewater 5-Year CIP		$50,000/year	No	No	2016-2018	Budget
W14b	Loop/Upgrade Water Mains/ Install Valves	City of Wildwood Wastewater 5-Year CIP		$100,000/year	No	No	2019- 2020	Budget

Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WD-1: CR 209 Watermain North Extension and System Interconnects

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	16" PVC Watermain (Level 2)	LF	9,200	$ 150.00	$ 1,380,000
				SUBTOTAL	$ 1,380,000
				ENGINEER DESIGN AND PERMITTING (10%)	$ 138,000
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 69,000
				SUBTOTAL	$ 1,590,000
				CONTINGENCY (20%)	$ 318,000
				GRAND TOTAL	$ 1,797,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WD-2: Monarch Ranch Watermain and system interconnects

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	12" PVC Watermain (Level 2)	LF	8,660	$ 122.00	$ 1,056,520
				SUBTOTAL	$ 1,056,520
				ENGINEER DESIGN AND PERMITTING (8%)	$ 84,522
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 52,826
				SUBTOTAL	$ 1,193,868
				CONTINGENCY (20%)	$ 238,774
				GRAND TOTAL	**$ 1,340,000**

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WD-3: Southern Oaks Watermain for CR 468 from Turnpike to SR 44 Loop

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	16" PVC Watermain (Level 2)	LF	29,100	$ 150.00	$ 4,365,000
				SUBTOTAL	$ 4,365,000
				ENGINEER DESIGN AND PERMITTING (8%)	$ 349,200
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 218,250
				SUBTOTAL	$ 4,932,450
				CONTINGENCY (20%)	$ 986,490
				GRAND TOTAL	**$ 5,500,000**

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WD-4: Landstone Watermain and System Interconnect

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	16" PVC Watermain (Level 1)	LF	12,545	$ 105.00	$ 1,317,225
				SUBTOTAL	$ 1,317,225
				ENGINEER DESIGN AND PERMITTING (8%)	$ 105,378
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 65,861
				SUBTOTAL	$ 1,488,464
				CONTINGENCY (20%)	$ 297,693
				GRAND TOTAL	$ 1,660,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WD-5: O'Dell Development CR-462 to SR 44 Loop

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	12" PVC Watermain (Level 1)	LF	5,500	$ 79.00	$ 434,500
2	12" PVC Watermain (Level 2)	LF	11,795	$ 122.00	$ 1,438,990
3	12" PVC Watermain (Level 3)	LF	6,500	$ 165.00	$ 1,072,500
				SUBTOTAL	$ 2,945,990
				ENGINEER DESIGN AND PERMITTING (10%)	$ 294,599
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 147,300
				SUBTOTAL	$ 3,387,889
				CONTINGENCY (20%)	$ 677,578
				GRAND TOTAL	$ 3,830,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WD-6: Upsize Watermain along CR-501

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	24" PVC Watermain (Level 1)	LF	5,230	$ 165.00	$ 862,950
				SUBTOTAL	$ 862,950
				ENGINEER DESIGN AND PERMITTING (8%)	$ 69,036
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 43,148
				SUBTOTAL	$ 975,134
				CONTINGENCY (20%)	$ 195,027
				GRAND TOTAL	$ 1,090,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Project No.	Project	Trigger	Alternative Trigger	Amount	Public/ Private Partnership	Public/ Private Partnership Ratio	Budget Year	Funding Source
WATER SUPPLY								
WS-1a	Design, Permitting, Bidding, and Construction Administration: CR-214 WTP Lower Floridian Well with Design Complete and Construction Permit by 2017	Projected Infil in Expansion Area 1 and Oxford Oaks Development	Low system pressures and fire flow issues	$ 130,000	No		2016	Budget
WS-1b	Construct CR-214 WTP Lower Floridian Well: Construction Complete and New Well Online by 2019	Projected Infil in Expansion Area 1 and Oxford Oaks Development	Low system pressures and fire flow issues	$ 537,000	No		2017	Budget
WS-2a	Design, Permitting, Bidding, and Construction Administration: Coleman WTP Lower Floridian Well with Design Complete and Construction Permit by 2022	Projected Infil Expansion Area 1, 6, and 7. Landstone, Southern Oaks, and Wildwood Springs		$ 130,000	No		2020	Budget
WS-2b	Construct Coleman WTP Lower Floridian Well: Construction Complete and New Well Online by 2025	Projected Infil Expansion Area 1, 6, and 7. Landstone, Southern Oaks, and Wildwood Springs		$ 537,000	No		2022	Budget
WS-3a	Design, Permitting, Bidding, and Construction Administration: Ashley WTP Well No. 2 with Design Complete and Construction Permit by 2022	Projected Infil in Expansion Area 2		$ 21,750	No		2020	Budget
WS-3b	Construct Ashley WTP Well No. 2: Construction Complete and New Well Online by 2025	Projected Infil in Expansion Area 2		$ 178,350	No		2022	Budget
WS-4	Request SWFWMD Water Use Permitted Withdrawal to be increased	Will exceed permitted capacity in 2028		$ 50,000	No		2025	Budget

Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WS-1: CR-214 WTP LOWER FLORIDIAN WELL

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	Drill Well	LS	1	$ 300,000.00	$ 300,000
2	Well Testing	LS	1	$ 20,000.00	$ 20,000
3	Install Well Head, Pump, and Yard Piping	LS	1	$ 50,000.00	$ 50,000
				SUBTOTAL	$ 370,000
				ENGINEER DESIGN AND PERMITTING (35%)	$ 129,500
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 18,685
				SUBTOTAL	$ 518,185
				CONTINGENCY (20%)	$ 129,546
				GRAND TOTAL	$ 667,000

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WS-2: COLEMAN WTP LOWER FLORIDIAN WELL

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	Drill Well	LS	1	$ 300,000.00	$ 300,000
2	Well Testing	LS	1	$ 20,000.00	$ 20,000
3	Install Well Head, Pump, and Yard Piping	LS	1	$ 50,000.00	$ 50,000
				SUBTOTAL	$ 370,000
				ENGINEER DESIGN AND PERMITTING (35%)	$ 129,500
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 18,685
				SUBTOTAL	$ 518,185
				CONTINGENCY (20%)	$ 103,637
				GRAND TOTAL	$ 667,000

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WS-3: ASHLEY WTP UPPER FLORIDIAN WELL

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	Drill Well	LS	1	$ 60,000.00	$ 60,000
2	Well Testing	LS	1	$ 10,000.00	$ 10,000
3	Install Well Head, Pump, and Yard Piping	LS	1	$ 75,000.00	$ 75,000
				SUBTOTAL	$ 145,000
				ENGINEER DESIGN AND PERMITTING (10%)	$ 14,500
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 7,250
				SUBTOTAL	$ 166,750
				CONTINGENCY (20%)	$ 33,350
				GRAND TOTAL	$ 189,000

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WS-4: INCREASE SWFWMD WATER USE PERMITTED WITHDRAWAL

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	Planning Document and Permitting	LS	1	$ 50,000.00	$ 50,000
				GRAND TOTAL	**$ 50,000**

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Project No.	Project	Trigger	Alternative Trigger	Amount	Public/ Private Partnership	Public/ Private Partnership Ratio	Budget Year	Funding Source
WATER TREATMENT								
WT-1a	Design, Permitting, Bidding, and Construction Administration: CR-214 WTP Expansion to 3.0 MGD MDD to include water supply, elevated storage, HSPS upgrades, and water quality treatment with Design Complete and Construction Permit by 2017	Projected Infil in Expansion Area 1 and Oxford Oaks Development	Low system pressures and fire flow issues	$ 600,000	No		2016	Budget
WT-1b	Construct CR-214 Expansion to 3.0 MGD MDD Construction Complete and New WTP online by 2019	Projected Infil in Expansion Area 1 and Oxford Oaks Development	Low system pressures and fire flow issues	$ 3,878,000	No		2017	Loan TIE fees Connections Fees
WT-2a	Design, Permitting, Bidding, and Construction Administration: Coleman WTP Expansion to 4.5 MGD MDD+FF to include water supply, high service pump, and water quality treatment for iron with Design Complete and Construction Permit by 2022	Projected Infil in Expansion Area 1, 6, and 7		$ 750,000	No		2020	Budget
WT-2b	Construct Coleman WTP Expansion to 4.5 MGD MDD+FF to include water supply, high service pump, and water quality treatment for iron Construction Complete and New WTP online by 2025	Projected Infil in Expansion Area 1, 6, and 7		$ 6,325,000	No		2022	Loan TIE fees Connections Fees
WT-3a	Design, Permitting, Bidding, and Construction Administration: Coleman WTP Expansion to 11.0 MGD MDD+FF including water supply, new Ground Storage Tank, High Service Pump Station, High Service Pump Station Building, and an expanded chlorine storage and feed system with Design Complete and Construction Permit by 2032	Projected Infil in Expansion Area 1, 6, and 7 in addition to Landstone, Southern Oaks, and Wildwood Springs development		$ 1,250,000	No		2030	Loan TIE fees Connections Fees
WT-3b	Construct Coleman WTP Expansion to 11.0 MGD MDD+FF including water supply, new Ground Storage Tank, High Service Pump Station, High Service Pump Station Building, and an expanded chlorine storage and feed system Construction Complete and New WTP online by 2035	Projected Infil in Expansion Area 1, 6, and 7 in addition to Landstone, Southern Oaks, and Wildwood Springs development		$ 16,160,000	No		2032	Loan TIE fees Connections Fees
WT-4	Huey Street WTP Rehabilitation and Expansion to 1,000 gpm	Projected Infil in Expansion Area 3 and 5		$ 200,000	No		2023	Budget
WT-5	Ashley WTP Expansion to include second well for 1.0 MGD MDD	Projected Infil in Expansion Area 2		$ 200,000	No		2033	Budget

Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WT-1: CR-214 WTP EXPANSION

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	**CR-214 Expansion:** Construct CR-214 WTP Expansion to 3.0 MGD MDD to include water supply, elevated storage, HSPS upgrades, and water quality treatment with Design Complete and Construction Permit by 2017	GAL	3,000,000	$ 1.00	$ 3,000,000
				SUBTOTAL	$ 3,000,000
				ENGINEER DESIGN AND PERMITTING (15%)	$ 450,000
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 150,000
				SUBTOTAL	$ 3,600,000
				CONTINGENCY (8%)	$ 277,200
				GRAND TOTAL	$ 4,478,000

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WT-2: COLEMAN WTP EXPANSION TO 4.5 MGD MDD

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	Coleman WTP Expansion to 4.5 MGD MDD Construct ColemanWTP Expansion to 4.5 MGD MDD to include water supply, HSPS upgrades, and water quality treatment	GAL	2,500,000	$ 2.00	$ 5,000,000
				SUBTOTAL	**$ 5,000,000**
				ENGINEER DESIGN AND PERMITTING	**$ 500,000**
				BID AND CONSTRUCTION ADMINISTRATION	**$ 250,000**
				SUBTOTAL	**$ 5,750,000**
				CONTINGENCY (10%)	**$ 575,000**
				GRAND TOTAL	**$ 7,075,000**

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WT-3: COLEMAN WTP EXPANSION to 11.0 MGD MDD

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	Coleman WTP Expansion from 4.5 MGD MDD to 11.0 MGD MDD	GAL	6,500,000	$ 2.00	$ 13,000,000
				SUBTOTAL	$ 13,000,000
				ENGINEER DESIGN AND PERMITTING (6.5%)	$ 839,800
				BID AND CONSTRUCTION ADMINISTRATION (3%)	$ 410,000
				SUBTOTAL	$ 14,249,800
				CONTINGENCY	$ 1,910,000
				GRAND TOTAL	$ 17,410,000

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WT-4: HUEY STREET WTP REHAB AND EXPANSION

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	Huey Expansion	LS	1	$ 150,000.00	$ 150,000
				SUBTOTAL	$ 150,000
				ENGINEER DESIGN AND PERMITTING (11%)	$ 16,500
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 7,500
				SUBTOTAL	$ 174,000
				CONTINGENCY (20%)	$ 34,800
				GRAND TOTAL	$ 200,000

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WT-5: ASHLEY WTP EXPANSTION TO 0.72 MDF

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	Ashley Expansion	LS	1	$ 150,000.00	$ 150,000
				SUBTOTAL	$ 150,000
				ENGINEER DESIGN AND PERMITTING (11%)	$ 16,500
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 7,500
				SUBTOTAL	$ 174,000
				CONTINGENCY (20%)	$ 34,800
				GRAND TOTAL	$ 200,000

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Project No.	Project	Trigger	Alternative Trigger	Amount	Public/ Private Partnership	Public/ Private Partnership Ratio	Budget Year	Funding Source
WASTEWATER COLLECTION								
WC-1	CR 209 Forcemain, CR 209 Lift Stations Improvements, and Northern Service Area Flow reversal to CR 209 Lift Station	The Charlotte and Peter's Street Lift Stations are at their design capacity.		$ 2,500,000	No		2016	Loan
WC-2	Trailwinds Forcemain	Trailwinds property development		$ 2,100,000	Yes	40/60	2016	Loan/Developer
WC-3	Trailwinds Re-Pump Station	O'Dell Property Development		$ 810,000	Yes	90/10	2020	Loan/Developer
WC-4	Charlotte Lift Station Upgrades	Charlotte Street Lift Station Forcemain connection to the Trailwinds Forcemain		$ 223,000	No		2017	Budget
WC-5	Peter's Street Lift Station Rehabilitation	Required Operational Maintenance		$ 223,000	No		2017	Budget
WC-6	Monarch Ranch Forcemain and Lift Station	Monarch Ranch is projected to be at 15% of the development buildout in 2020.		$ 1,793,000	Yes	0/100	2022	Loan/Developer
WC-7	Southern Oaks Forcemain and Lift Station	Southern Oaks is projected to be at 10% of the development buildout in 2025.		$ 5,922,000	Yes	10/90	2022	Loan/Developer
WC-8	Landstone Forcemain and Lift Station	Landstone is projected to be at 10% of the development buildout in 2025.		$ 3,501,000	Yes	0/100	2022	Loan/Developer

Project No.	Project	Trigger	Alternative Trigger	Amount	Public/ Private Partnership	Public/ Private Partnership Ratio	Budget Year	Funding Source
WASTEWATER COLLECTION								
WC-9	Wildwood Springs Forcemain and Lift Station	Wildwood Springs is projected to be at 15% of the development buildout in 2025.	Wildwood Springs developed prior to new Landstone WWTF (South).	$ 4,035,000	Yes	20/80	2022	Loan/Developer
WC-10	Wildwood Entertainment Park Forcemain	Wildwood Entertainment Park development	Landstone Forcemain and WWTF (South) constructed prior to Wildwood Entertainment Park development	$ 942,000	Yes	20/80	2017	Loan/Developer
WC-11	Main Street North Lift Station Rehabilitation and Main Street North 10" Gravity Upsize	Projected Infil in Expansion Area 3	Projected flows from Turkey Run/Providence and St. Vincent Sewer Basins are not diverted to Trailwinds FM.	$ 520,000	No		2022	Budget
WC-12	CR 219 Lift Station Improvements	Projected Infil in Expansion Area 4 in addition to Project Horizon and Lee Capital		$ 223,000	No		2022	Budget
WC-13	Infiltration and Inflow Study	Required Operational Maintenance		$ 250,000	No		2016	Budget
WC-14	Infiltration and Inflow Repairs	Required Operational Maintenance		$100,000/year	No		2017/2018/2019	Budget
WW1	Trailer Mounted Sewer Jetter Machine	City of Wildwood Wastewater 5-Year CIP		$ 45,000	No		2015	Budget

Project No.	Project	Trigger	Alternative Trigger	Amount	Public/ Private Partnership	Public/ Private Partnership Ratio	Budget Year	Funding Source
WASTEWATER COLLECTION								
WW-2	Headworks Bypass Valve	City of Wildwood Wastewater 5-Year CIP		$ 50,000	No		2016	Budget
WW5	Replace CR 501 Force Main	City of Wildwood Wastewater 5-Year CIP		$ 750,000	No		2017	Budget
WW6	460v - 3-Phase Lift Station Generator Set. (5)	City of Wildwood Wastewater 5-Year CIP		$50,000/year	No		2016-2020	Budget
WW9	C466W Utility Sewer Relocations	City of Wildwood Wastewater 5-Year CIP		$ 200,000	No		2016	Budget
WW10	Truck Mounted Vac-Con	City of Wildwood Wastewater 5-Year CIP		$ 300,000	No		2016	Budget
WW11	SCADA at Coleman Lift Station	City of Wildwood Wastewater 5-Year CIP		$ 15,000	No		2016	Budget
WW16a	Miscellaneous System Enhancements including main and lateral lining and replacements	City of Wildwood Wastewater 5-Year CIP		$100,000/year	No		2016/2017	Budget
WW16b	Miscellaneous System Enhancements including main and lateral lining and replacements	City of Wildwood Wastewater 5-Year CIP		$200,000/year	No		2018/2025	Budget

Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST FOR WC-1: CR 209 FM, LS, FLOW REVERSAL					
ITEM #	**DESCRIPTION**	**UNIT**	**QUANTITY**	**UNIT PRICE**	**AMOUNT**
1	12" PVC Forcemain (Level 1)	LF	15,720	$ 91.00	$ 1,430,520
2	CR 209 Lift Station Improvements	LS	1	$ 100,000.00	$ 100,000
3	Existing Forcemain Improvements for Flow Reversal	LS	1	$ 100,000.00	$ 100,000
				SUBTOTAL	$ 1,630,520
				ENGINEER DESIGN AND PERMITTING (8%)	$ 130,442
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 81,526
				SUBTOTAL	$ 1,842,488
				CONTINGENCY (20%)	$ 368,498
				GRAND TOTAL	$ 2,500,000

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST FOR WC-2: TRAILWINDS FM					
ITEM #	**DESCRIPTION**	**UNIT**	**QUANTITY**	**UNIT PRICE**	**AMOUNT**
1	12" PVC Forcemain (Level 2)	LF	10,000	$ 122.00	$ 1,220,000
				SUBTOTAL	$ 1,220,000
				ENGINEER DESIGN AND PERMITTING (15%)	$ 190,000
				BID AND CONSTRUCTION ADMINISTRATION (8%)	$ 99,091
				SUBTOTAL	$ 1,509,091
				CONTINGENCY (20%)	$ 301,818
				GRAND TOTAL	$ 2,100,000

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WC-3: TRAILWINDS RE-PUMP STATION

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
2	Re-Pump Lift Station (3.6 MGD PHF)	MGD	3.6	$ 150,000.00	$ 540,000
				SUBTOTAL	$ 540,000
				ENGINEER DESIGN AND PERMITTING (8%)	$ 46,440
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 27,000
				SUBTOTAL	$ 613,440
				CONTINGENCY (20%)	$ 122,688
				GRAND TOTAL	$ 810,000

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WC-4: CHARLOTTE STREET LS UPGRADES

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	Lift Station Improvements	LS	1	$ 150,000.00	$ 150,000
				SUBTOTAL	$ 150,000
				ENGINEER DESIGN AND PERMITTING (8%)	$ 12,000
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 7,500
				SUBTOTAL	$ 169,500
				CONTINGENCY (20%)	$ 33,900
				GRAND TOTAL	$ 223,000

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WC-5: PETER STREET LS UPGRADES

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	Lift Station Improvements	LS	1	$ 150,000.00	$ 150,000
				SUBTOTAL	$ 150,000
				ENGINEER DESIGN AND PERMITTING (8%)	$ 12,000
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 7,500
				SUBTOTAL	$ 169,500
				CONTINGENCY (20%)	$ 33,900
				GRAND TOTAL	$ 223,000

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST FOR WC-6: MONARCH RANCH FM AND LS					
ITEM #	**DESCRIPTION**	**UNIT**	**QUANTITY**	**UNIT PRICE**	**AMOUNT**
1	12" PVC Forcemain (Level 2)	LF	8,660	$ 122.00	$ 1,056,520
2	Lift Station (1.0 MGD PHF)	MGD	1.0	$ 150,000.00	$ 150,000
				SUBTOTAL	$ 1,206,520
				ENGINEER DESIGN AND PERMITTING (8%)	$ 96,522
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 60,326
				SUBTOTAL	$ 1,363,368
				CONTINGENCY (20%)	$ 272,674
				GRAND TOTAL	$ 1,793,000

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WC-7: SOUTHERN OAKS FM AND LS

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	12" PVC Forcemain (Level 2)	LF	29,100	$ 122.00	$ 3,550,200
2	Lift Station (2.9 MGD PHF)	MGD	2.9	$ 150,000.00	$ 435,000
				SUBTOTAL	$ 3,985,200
				ENGINEER DESIGN AND PERMITTING (8%)	$ 318,417
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 199,260
				SUBTOTAL	$ 4,502,877
				CONTINGENCY (20%)	$ 900,575
				GRAND TOTAL	$ 5,922,000

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST FOR WC-8: LANDSTONE FM AND LS					
ITEM #	**DESCRIPTION**	**UNIT**	**QUANTITY**	**UNIT PRICE**	**AMOUNT**
1	20" PVC Forcemain (Level 1)	LF	12,545	$ 134.00	$ 1,681,030
2	Lift Station (4.5 MGD PHF)	MGD	4.5	$ 150,000.00	$ 675,000
				SUBTOTAL	$ 2,356,030
				ENGINEER DESIGN AND PERMITTING (8%)	$ 188,247
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 117,802
				SUBTOTAL	$ 2,662,078
				CONTINGENCY (20%)	$ 532,416
				GRAND TOTAL	$ 3,501,000

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST FOR WC-9: WILDWOOD SPRINGS FM AND LS					
ITEM #	**DESCRIPTION**	**UNIT**	**QUANTITY**	**UNIT PRICE**	**AMOUNT**
1	16" PVC Forcemain (Level 2)	LF	13,600	$ 150.00	$ 2,040,000
2	Lift Station (1.5 MGD PHF)	MGD	4.5	$ 150,000.00	$ 675,000
				SUBTOTAL	$ 2,715,000
				ENGINEER DESIGN AND PERMITTING (8%)	$ 217,200
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 135,750
				SUBTOTAL	$ 3,067,950
				CONTINGENCY (20%)	$ 613,590
				GRAND TOTAL	$ 4,035,000

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Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST FOR WC-10: WILDWOOD ENTERTAINMENT PARK FORCEMAIN					
ITEM #	**DESCRIPTION**	**UNIT**	**QUANTITY**	**UNIT PRICE**	**AMOUNT**
1	8" PVC Forcemain (Level 2)	LF	6,600	$ 96.00	$ 633,600
				SUBTOTAL	$ 633,600
				ENGINEER DESIGN AND PERMITTING (8%)	$ 50,688
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 31,680
				SUBTOTAL	$ 715,968
				CONTINGENCY (20%)	$ 143,194
				GRAND TOTAL	$ 942,000

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WC-11: MAIN STREET NORTH LS AND GRAVITY UPSIZE

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	Lift Station Improvements	LS	1	$ 100,000.00	$ 100,000
2	Gravity Sewer Upsize	LF	2,500	$ 100.00	$ 250,000
				SUBTOTAL	$ 350,000
				ENGINEER DESIGN AND PERMITTING (8%)	$ 27,650
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 17,500
				SUBTOTAL	$ 395,150
				CONTINGENCY (20%)	$ 79,030
				GRAND TOTAL	$ 520,000

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WC-12: CR 219 LS IMPROVEMENTS

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	Lift Station Improvements	LS	1	$ 150,000.00	$ 150,000
				SUBTOTAL	$ 150,000
				ENGINEER DESIGN AND PERMITTING (8%)	$ 12,000
				BID AND CONSTRUCTION ADMINISTRATION (5%)	$ 7,500
				SUBTOTAL	$ 169,500
				CONTINGENCY (20%)	$ 33,900
				GRAND TOTAL	$ 222,900

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST FOR WC-13: INFILTRATION AND INFLOW STUDY					
ITEM #	**DESCRIPTION**	**UNIT**	**QUANTITY**	**UNIT PRICE**	**AMOUNT**
1	I&I Study	LS	1	$ 250,000.00	$ 250,000
				GRAND TOTAL	**$ 250,000**

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST FOR WC-14: INFILTRATION AND INFLOW REPAIRS					
ITEM #	**DESCRIPTION**	**UNIT**	**QUANTITY**	**UNIT PRICE**	**AMOUNT**
1	I&I Repairs	LS	1	$ 100,000.00	$ 100,000
				GRAND TOTAL	**$ 100,000**

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Project No.	Project	Trigger	Alternative Trigger	Amount	Public/ Private Partnership	Public/ Private Partnership Ratio	Budget Year	Funding Source
WASTEWATER TREATMENT								
WW-1	WWTF Permit Renewal, Capacity Analysis, and update to the WWTF Master Planning document	Permit Expiration Date: January 17, 2017		$ 20,000	No		2016	Budget
WW-2	Existing WWTF Process and Hydraulic Modifications and Upgrades to achieve permitted capacity	Greater than 2.0 MGD average flows		$ 1,000,000	No		2017	Budget
WW-2a	Tertiary Filter Modifications (Bypass)	No existing bypass		$ 100,000	No		2017	Budget
WW-3a	Design, Permitting, Bidding, and Construction Administration: Existing WWTF (North) Expansion from 3.55 MGD to 5.0 MGD with Design Complete and Construction Permit by 2019	Exceeding permitted capacity within 5 years: Projected to exceed permit in 2022 per Planning document	Landstone Forcemain and WWTF developed earlier than planned	$ 1,885,000	No		2017	Loan TIE fees Connections Fees
WW-3b	Construct Existing WWTF (North) Expansion from 3.55 MGD to 5.0 MGD: Expanded WWTF Online by 2022	Exceeding permitted capacity within 3 years: Projected to exceed permit in 2022 per Planning document		$ 18,024,000	No		2019	Loan TIE fees Connections Fees
WW-4a	Design, Permitting, Bidding, and Construction Administration: New 2.0 MGD Landstone WWTF (South) with Design Complete and Construction Permit by 2022	Design, Permitting, Bidding, and Construction Administration: Planning and Design timeline begin 5 years prior to the Landstone Development projected 10% buildout in 2025		$ 2,600,000	No		2020	Loan TIE fees Connections Fees
WW-4b	Construct New 2.0 MGD Landstone WWTF (South): New WWTF Online by 2025	Construction timeline begin 3 years prior to the Landstone Development projected 10% buildout in 2025		$ 24,860,000	No		2022	Loan TIE fees Connections Fees
WW-5a	Design, Permitting, Bidding, and Construction Administration: 2.0 MGD expansion for Landstone WWTF (South) with Design Complete and Construction Permit by 2032	Design, Permitting, Bidding, and Construction Administration: Planning and Design timeline begin 5 years prior to the Landstone Development projected 10% buildout in 2025		$ 2,600,000	No		2030	Loan TIE fees Connections Fees
WW-5b	Construct 2.0 MGD expansion for Landstone WWTF (South): New WWTF Online by 2035	Construction timeline begin 3 years prior to the Landstone Development projected 10% buildout in 2025		$ 24,860,000	No		2032	Loan TIE fees Connections Fees

Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WW-1: WWTF PERMIT RENEWAL

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	Permit Renewal	LS	1	$ 20,000.00	$ 20,000
				GRAND TOTAL	**$ 20,000**

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WW-2: PROCESS AND HYDRAULIC MODIFICATIONS REQUIRED FOR 3.55 MGD

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	Flow meter assembly on Clarifier No. 3 and No. 4 Return Activated Sludge (RAS) Pump Station (PS), Flow meter assembly on Clarifier No. 1 and No. 2 RAS PS, Clarifier No. 3 and No. 4 RAS PS modifications, Clarifier No. 1 and No. 2 RAS PS modifications, Headworks actuated valve for bypass	LS	1	$ 1,000,000.00	$ 1,000,000
				GRAND TOTAL	**$ 1,000,000**

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST FOR WW-2A: TERTIARY FILTER MODIFICATIONS					
ITEM #	**DESCRIPTION**	**UNIT**	**QUANTITY**	**UNIT PRICE**	**AMOUNT**
1	Tertiary Filter Modifications	LS	1	$ 100,000.00	$ 100,000
				GRAND TOTAL	**$ 100,000**

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WW-3: EXISTING WWTF (NORTH) EXPANSION TO 5.0 MGD

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	WWTP Expansion from 3.55 MGD to 5.0 MGD	gallons	1,450,000	$ 10.00	$ 14,500,000
				SUBTOTAL	$ 14,500,000
				ENGINEER DESIGN AND PERMITTING	$ 1,160,000
				BID AND CONSTRUCTION ADMINISTRATION	$ 725,000
				SUBTOTAL	$ 16,385,000
				CONTINGENCY (10%)	$ 1,638,500
				GRAND TOTAL	**$ 19,909,000**

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST FOR WW-4: NEW 4.0 MGD LANDSTONE WWTF					
ITEM #	**DESCRIPTION**	**UNIT**	**QUANTITY**	**UNIT PRICE**	**AMOUNT**
1	New Landstone WWTF (2.0 MGD ADF)	gallons	2,000,000	$ 10.00	$ 20,000,000
				SUBTOTAL	$ 20,000,000
				ENGINEER DESIGN AND PERMITTING	$ 1,600,000
				BID AND CONSTRUCTION ADMINISTRATION	$ 1,000,000
				SUBTOTAL	$ 22,600,000
				CONTINGENCY (10%)	$ 2,260,000
				GRAND TOTAL	$ 27,460,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
WW-5: NEW 4.0 MGD LANDSTONE WWTF

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	Expand Landstone WWTF to 4.0 MGD ADF	gallons	2,000,000	$ 10.00	$ 20,000,000
				SUBTOTAL	$ 20,000,000
				ENGINEER DESIGN AND PERMITTING	$ 1,600,000
				BID AND CONSTRUCTION ADMINISTRATION	$ 1,000,000
				SUBTOTAL	$ 22,600,000
				CONTINGENCY (10%)	$ 2,260,000
				GRAND TOTAL	$ 27,460,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Project No.	Project	Trigger	Alternative Trigger	Amount	Public/ Private Partnership	Public/ Private Partnership Ratio	Budget Year	Funding Source
RECLAIMED WATER TRANSMISSION AND DISPOSAL								
RCW-1	Expand Reclaim Storage for NSU	Exceeding permitted capacity within 3 years: Projected to exceed permit in 2022 per Planning document		$ 315,000	No		2022	Budget
RCW-2	Effluent Disposal Expansion	Included in WWTF Expansions		included in WWTF Expansion	No			
RCW-3	RCW Transfer Pump Station Upgrades	Pumping to North Sumter Utilities		$ 190,000	No			

Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST FOR RCW-1: EXPAND RECLAIM STORAGE FOR NSU					
ITEM #	**DESCRIPTION**	**UNIT**	**QUANTITY**	**UNIT PRICE**	**AMOUNT**
1	Convert RIB to lined Pond	LS	1	$ 250,000.00	$ 250,000
				SUBTOTAL	$ 250,000
				ENGINEER DESIGN AND PERMITTING	$ 20,000
				BID AND CONSTRUCTION ADMINISTRATION	$ 12,500
				SUBTOTAL	$ 282,500
				CONTINGENCY (20%)	$ 56,500
				GRAND TOTAL	$ 315,000

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Prepared by:
Kimley»Horn

ENGINEER'S OPINION OF PROBABLE COST
FOR
RCW-3: RCW Transfer Pump Station Upgrades

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	Construct control valve array, piping modifications, and SCADA improvements	LS	1	$ 150,000.00	$ 150,000
				SUBTOTAL	$ 150,000
				ENGINEER DESIGN AND PERMITTING	$ 12,000
				BID AND CONSTRUCTION ADMINISTRATION	$ 7,500
				SUBTOTAL	$ 169,500
				CONTINGENCY (20%)	$ 33,900
				GRAND TOTAL	**$ 190,000**

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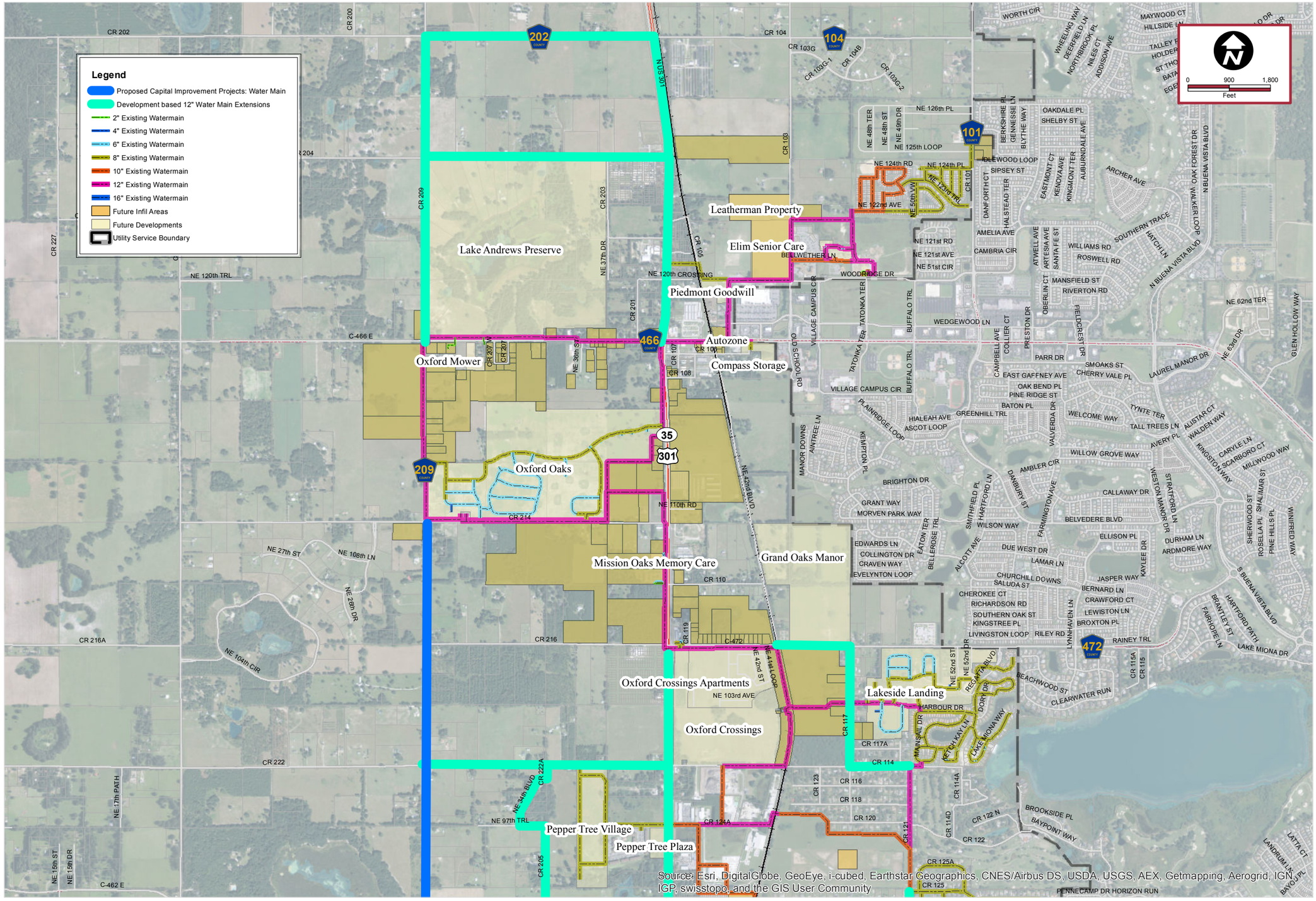
APPENDIX E: Development Based Water Service Area Maps



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No.	REVISIONS	DATE	BY

Kimley»Horn
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1823 SE Fort King Street, Ocala, Florida 34471
Phone: (352) 438-3000
www.kimley-horn.com CA 00000696

FLORIDA P.E. LICENSE NO:

DATE:

SCALE	DESIGNED BY	DRAWN BY	CHECKED BY
AS NOTED	KHA	KHA	KHA

WATER SERVICE AREA

CITY OF WILDWOOD

DATE
August 2015

PROJECT NO.
142173163

AREA
1

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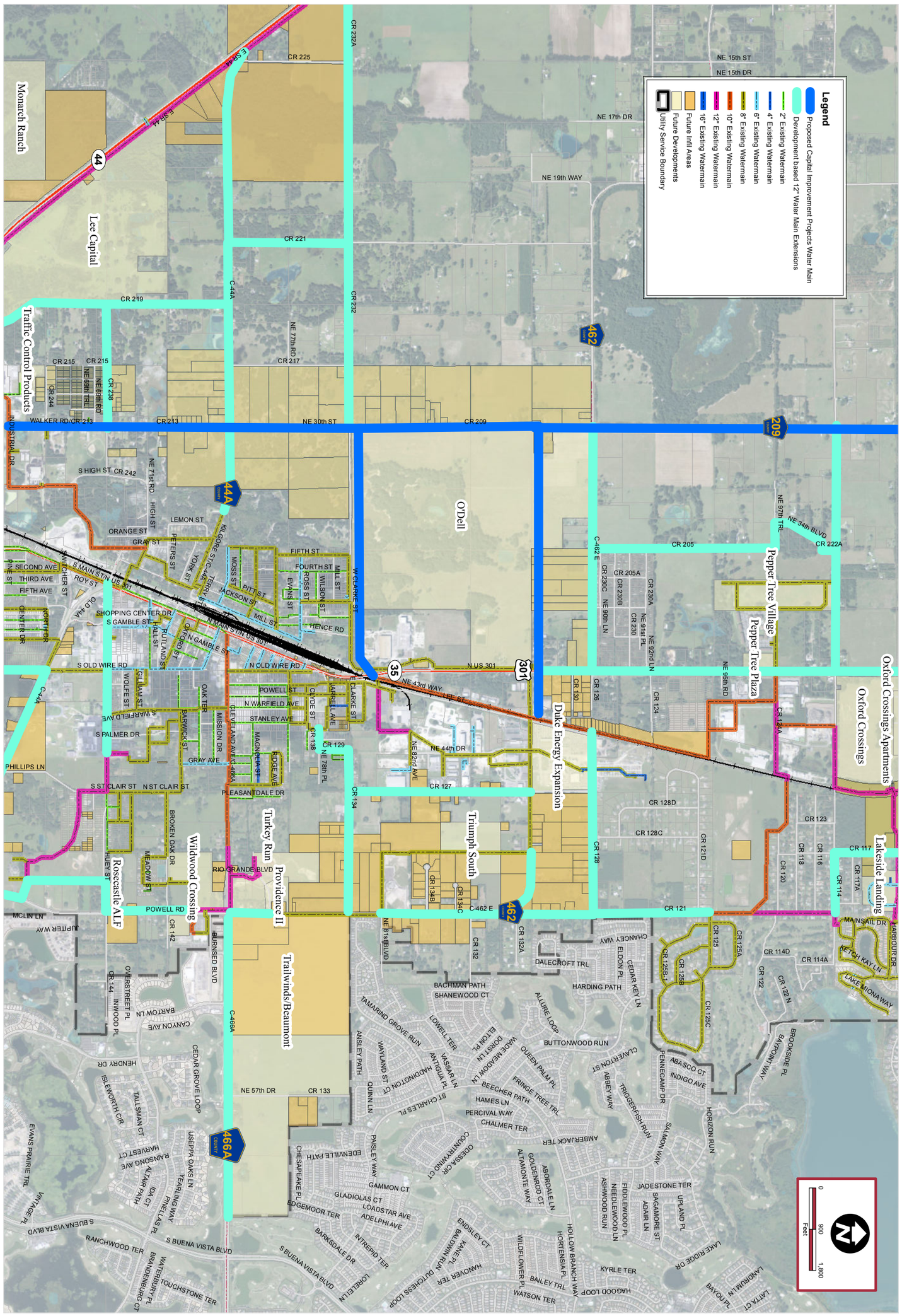

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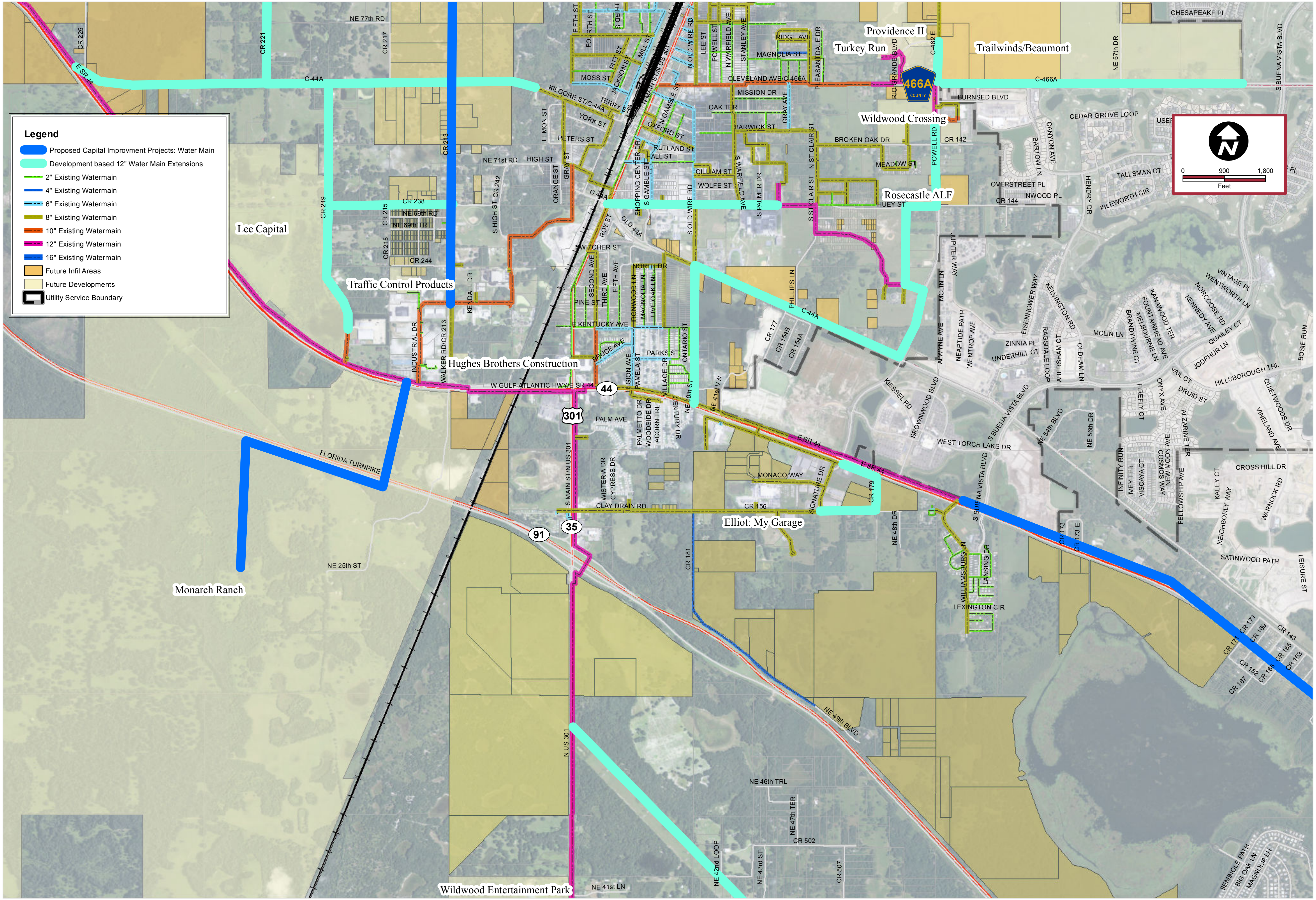

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DATE:

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DRAWN BY KHA
CHECKED BY KHA

WATER SERVICE AREA

CITY OF WILDWOOD

DATE
AUGUST 2015

PROJECT NO.
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AREA
3

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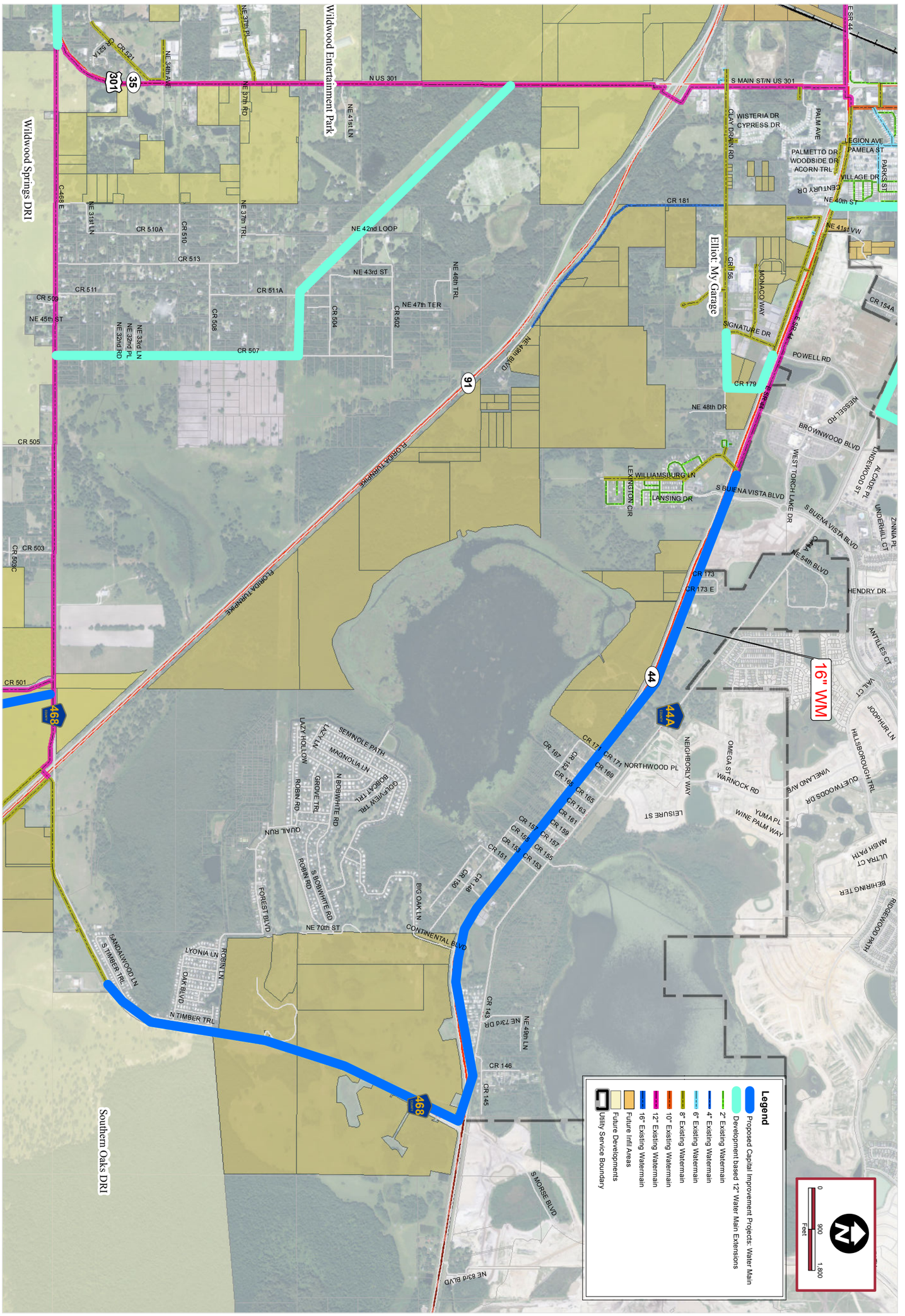

4 AREA	PROJECT NO. 142173163	DATE AUGUST 2015	CITY OF WILDWOOD	WATER SERVICE AREA	SCALE AS NOTED DESIGNED BY KHA DRAWN BY KHA CHECKED BY KHA	FLORIDA P.E. LICENSE NO: DATE:	Kimley»Horn ©2014 Kimley-Horn and Associates, Inc. 1823 SE Fort King Street, Suite 200, Ocala, Florida 34471 Phone: (352) 438-3000 www.kimley-horn.com CA 00000696	No. REVISIONS DATE BY

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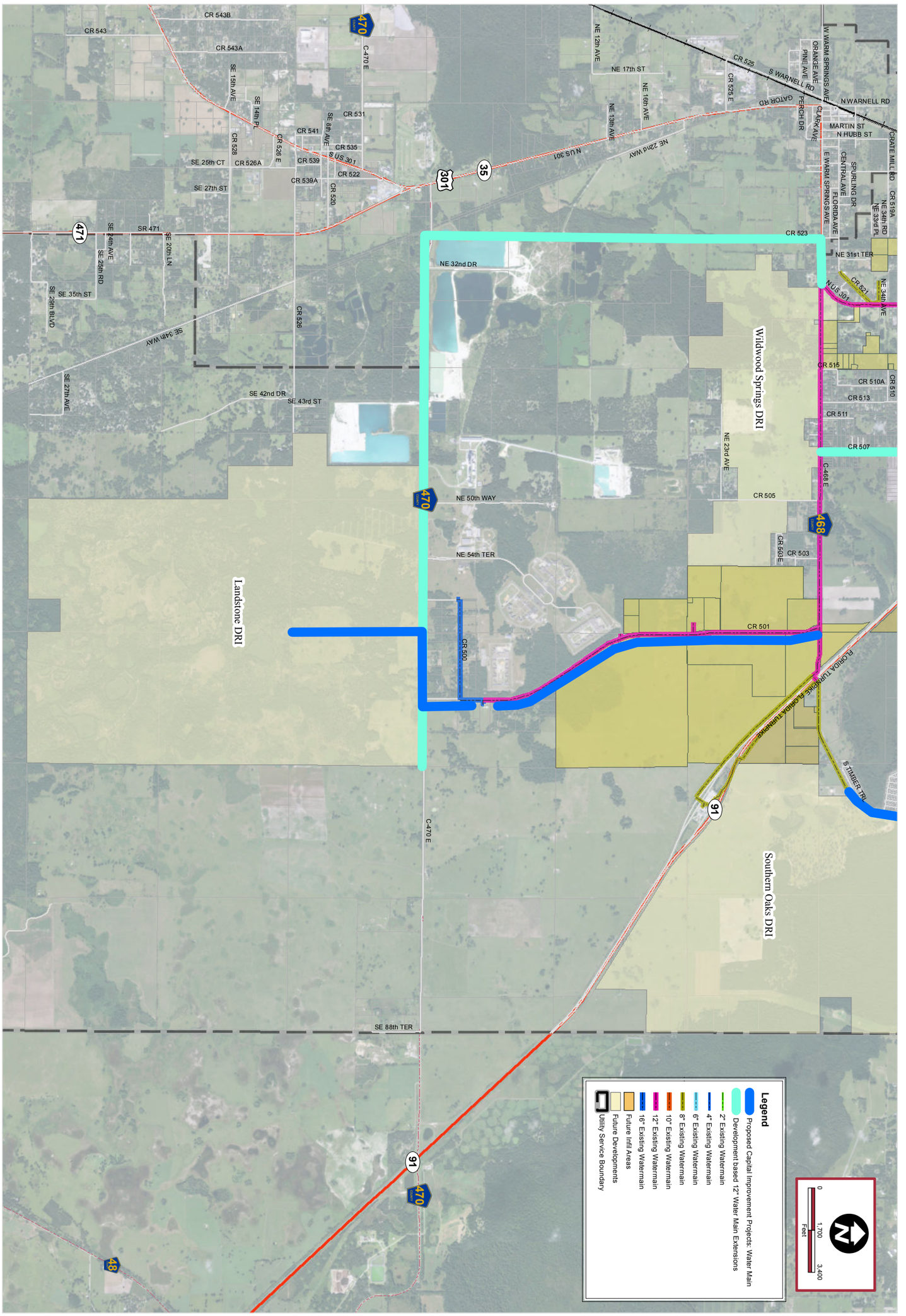

5 AREA	PROJECT NO. 142173163	DATE AUGUST 2015	CITY OF WILDWOOD	WATER SERVICE AREA	SCALE AS NOTED DESIGNED BY KHA DRAWN BY KHA CHECKED BY KHA	FLORIDA P.E. LICENSE NO: DATE:	Kimley»Horn ©2014 Kimley-Horn and Associates, Inc. 1823 SE Fort King Street, Suite 200, Ocala, Florida 34471 Phone: (352) 438-3000 www.kimley-horn.com CA 00000696	No.	REVISIONS / DATE / BY

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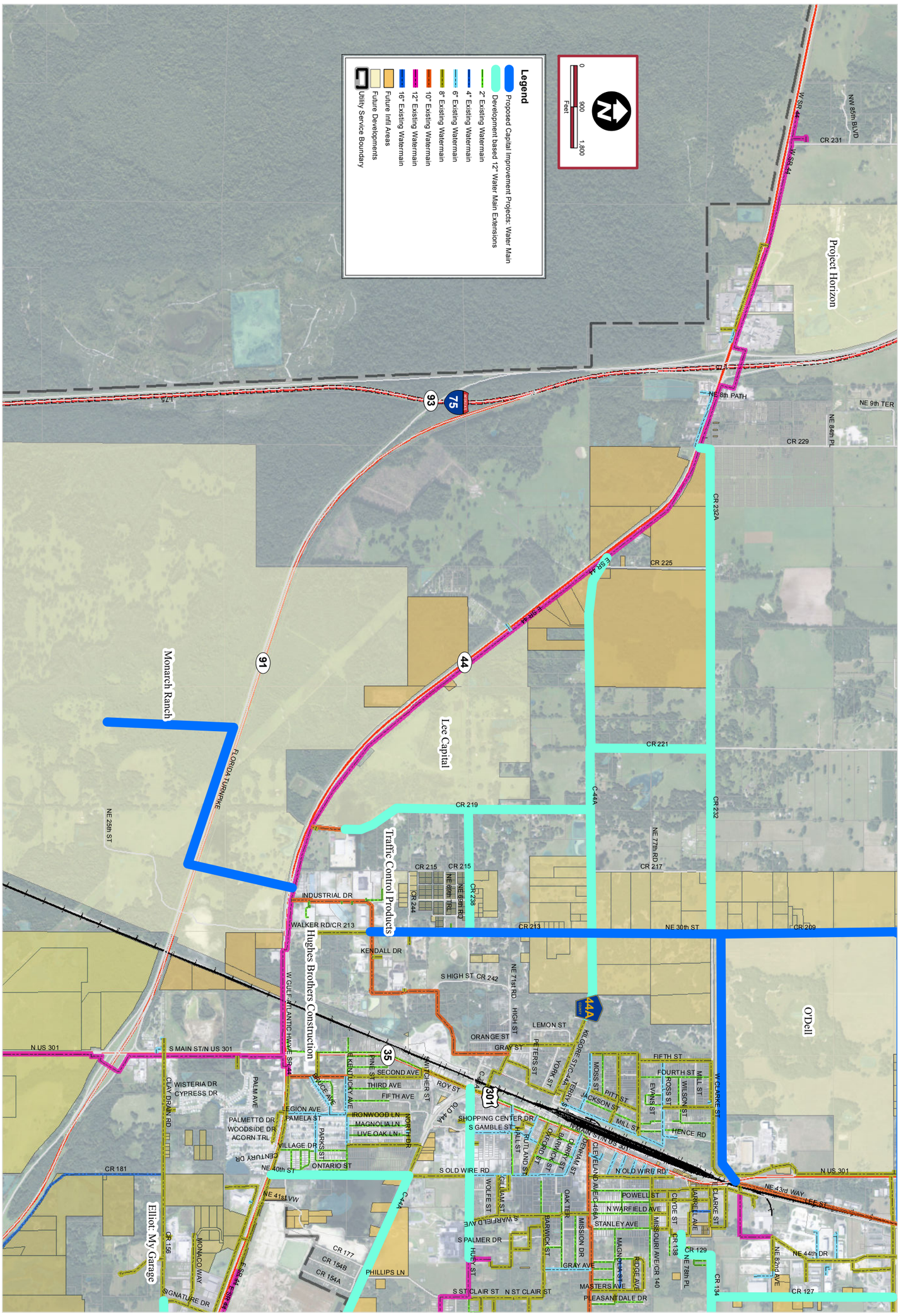


6	AREA	PROJECT NO. 142173163	DATE AUGUST 2015	CITY OF WILDWOOD	WATER SERVICE AREA	SCALE AS NOTED DESIGNED BY KHA DRAWN BY KHA CHECKED BY KHA	FLORIDA P.E. LICENSE NO: DATE:	Kimley»Horn ©2014 Kimley-Horn and Associates, Inc. 1823 SE Fort King Street, Suite 200, Ocala, Florida 34471 Phone: (352) 438-3000 www.kimley-horn.com CA 00000696	No. REVISIONS DATE BY

APPENDIX F:
Lift Station System Inventory

CITY ID#	STATION	Photos	Logger Data	Test Log	DESTINATION	PUMP	TYPE	HP	IMP SIZE	Pump Model #	Curve #	Drawdown Date	FORCE MAIN DIAMETER (IN)	FLOW GPM (w avg Inflow)	TDH	VOLTAGE/ PHASE	SINGLE/ DUPLEX/ TRIPLEX	WETWELL DIAMETER (FEET)	WET WELL TOTAL DEPTH	WET WELL TOTAL GALLONS	PUMP #1 INSTALL YEAR	PUMP #2 INSTALL YEAR	ON SITE GEN SET YES/NO	STATION W/ VFD	GENERATOR CONNECTION	PUMP/BYPASS PIPING SYSTEM
1	TURNPIKE & CR 468	x	x	x	Plant	1	ABS	40	624.5	CP 3201.180	63-452-00-5350	1/21/2015		1174.42	93.27	460/3	DUPLEX	10	14	8,221	2012	2003	No		Yes	Yes
1	TURNPIKE & CR 468	x	x	x	Plant	2	FLYGT	47	452	CP 3201.180	63-452-00-5350	1/21/2015		1130.46	97.89											
2	3 FLAGS	x	x	x	CR 219	1	FLYGT	15	481	NP 3153.185	63-464-00-4550	1/27/2015		632.82	51.89	230/3	DUPLEX	10	13	7,633	2005	2002	No		Yes	Yes
2	3 FLAGS	x	x	x	CR 219	2	FLYGT	15	481	C-3140		1/27/2015		X	X											
2	3 FLAGS PRIVATE	x		x		1		2				1/28/2015		0.00	18.24	230/1	DUPLEX	4	7.5				No		No	
2	3 FLAGS PRIVATE	x		x		2		2				1/28/2015		0.00	18.24											
3	COMMONS	x	x	x	Osceola	1	FLYGT	5	432	CP 3102.181	63-432-00-3703	1/23/2015		334.64	19.85	230/3	DUPLEX	6	12	2,537	1996	1996	No		Yes	Yes
3	COMMONS	x	x	x	Osceola	2	FLYGT	5	432	CP 3102.181	63-432-00-3703	1/23/2015		322.88	19.85											
4	OAK ST.	x	x	x	Peters Street	1	FLYGT	3	434	CP3085.183		1/23/2015		260.91	23.86	230/3	DUPLEX	6	12.5	2,642	1998	1998	No		Yes	Yes
4	OAK ST.	x	x	x	Peters Street	2	FLYGT	3	434	CP3085.183		1/23/2015		234.63	23.86											
5	MAIN ST NORTH	x	x	x	Plant	1	FLYGT	20	454 X 4in.	CP 3152.181	63-454-00-5360	1/26/2015		647.12	67.18	230/3	DUPLEX	10	23	13,505	1997	1998	No		Yes	Yes
5	MAIN ST NORTH	x	x	x	Plant	2	FLYGT	20	454 X 4in.	CP 3152.181	63-454-00-5360	1/26/2015		465.56	52.16											
6	PETERS ST.	x	x	x	Plant	1	FLYGT	10	483	CP 3127.181	63-483-00-3702	1/26/2015		211.89	50.25	230/3	DUPLEX	8	15	5,637	1996	1999	No		Yes	Yes
6	PETERS ST.	x	x	x	Plant	2	FLYGT	10	483	NP 3127.185	63-488-00-3702	1/26/2015		247.93	52.56											
7	CHARLOTTE	x	x	x	Peters Street	1	FLYGT	10	435	CP 3127.181	63-484-00-3702	1/30/2015		190.60	60.32	230/3	DUPLEX	8	14	5,261	2005	1987	No		Yes	Yes
7	CHARLOTTE	x	x	x	Peters Street	2	FLYGT	10	435	CP 3127.181	63-484-00-3702	1/30/2015		201.70	58.01											
8	WILDWOOD ESTATES (SW SIDE MAIN)	x		x	Into CFCC Force Main	1	FLYGT	20	454	CP 3152.181	63-454-00-5360	1/29/2015		367.77	30.00	230/3	DUPLEX	6	19.5	4,122	1999	1999	No	VFD	Yes	Yes
8	WILDWOOD ESTATES (SW SIDE MAIN)	x		x	Into CFCC Force Main	2	FLYGT	20	454	CP 3152.181	63-454-00-5360	1/29/2015		339.42	32.00											
9	MAIN ST. SOUTH	x	x	x	Plant	1	FLYGT	10	485	CP 3127.181	63-485-00-2202	1/21/2015		136.24	36.22	230/3	DUPLEX	8	16	6,013	1995	1995	No		Yes	Yes
9	MAIN ST. SOUTH	x	x	x	Plant	2	FLYGT	10	485	CP 3127.181	63-485-00-2202	1/21/2015		256.77	36.22											
10	KENTUCKY ST.	x		x	Plant	1	FLYGT	7.5	485	CP 3127.1881	63-485-00-2202	1/28/2015		267.10	10.61	230/3	DUPLEX	6	12	2,537	1990	1990	No		Yes	Yes
10	KENTUCKY ST.	x		x	Plant	2	FLYGT	7.5	485	CP 3127.1881	63-485-00-2202	1/28/2015		162.07	10.61											
11	COLEMAN PRISON FCC	x	x	x	Plant	1	ABS	88	A-48/C40	3300-181		1/21/2015		1446.84	117.95	460/3	DUPLEX	12	16				Yes		Yes	
11	COLEMAN PRISON FCC	x	x	x	Plant	2	ABS	88	A-48/C40	3300-181		1/21/2015		1803.58	129.50											
12	INDUSTRIAL PARK	x	x	x	Plant	1	FLYGT	5	435	NT 3127.185	63-469-00-2202	1/27/2015		88.02	65.86	230/3	DUPLEX	6	10	2,114	1978	1978	No		Yes	Yes
12	INDUSTRIAL PARK	x	x	x	Plant	2	FLYGT	5	435	CP 3102.181	NT 3127.185	1/27/2015		44.92	65.86											
13	WILDWOOD ESTATES (NW SIDE WOODS)	x		x	Wildwood Estates Main	1	FLYGT	5	435	CP 3102.181	63-435-00-3703	1/29/2015		57.87	7.11	230/3	DUPLEX	4	10	939	1999	1999	No	VFD	Yes	Yes
13	WILDWOOD ESTATES (NW SIDE WOODS)	x		x	Wildwood Estates Main	2	FLYGT	5	435	CP 3102.181	63-435-00-3703	1/29/2015		108.24	7.11											
14	SHONEY'S (CR 229)	x	x	x	3 Flags	1	FLYGT	10	432	CP 3127.181	63-432-00-3704	1/29/2015		451.12	38.30	230/3	DUPLEX	8	20	7,516	2000	1999	No		Yes	Yes
14	SHONEY'S (CR 229)	x	x	x	3 Flags	2	FLYGT	10	432	CP 3127.181	63-432-00-3704	1/29/2015		353.88	38.30											
15	TRUCK STOP (TA)	x	x	x	Shoney's	1	ABS	4	CB 32	CP 3102.181	63-435-00-3703	1/27/2015		297.72	19.14	230/3	DUPLEX	8	16	6,013	1994	1987	No		Yes	Yes
15	TRUCK STOP (TA)	x	x	x	Shoney's	2	ABS	4	CB 32	CP 3102.181	63-435-00-3703	1/27/2015		428.70	19.14											
16	WILDWOOD ESTATES (EASTSIDE CORNER)	x		x	Wildwood Estates Main #8	1	FLYGT	3	436	C3085.183		1/29/2015		88.18	13.01	230/3	DUPLEX	4	12	1,127	1999	1999	No		Yes	Yes
16	WILDWOOD ESTATES (EASTSIDE CORNER)	x		x	Wildwood Estates Main #8	2	FLYGT	3	465	C3085.183		1/29/2015		80.47	13.01											
17	OSCEOLA	x	x	x	Main Street North	1	FLYGT	10	483	CP 3127.181	63-483-00-3702	1/26/2015		357.61	56.30	230/3	DUPLEX	8	17	6,389	1990	1987	No		Yes	Yes
17	OSCEOLA	x	x	x	Main Street North	2	FLYGT	10	483	CP 3127.181	63-483-00-3702	1/26/2015		355.28	53.99											
18	ST. CLAIR NORTH	x	x	x	Main Street North	1	FLYGT	5	437	CP/CS-3102		1/28/2015		200.38	34.50	230/3	DUPLEX	6	16	3,382	1991	1991	No		Yes	Yes
18	ST. CLAIR NORTH	x	x	x	Main Street North	2	FLYGT	5	437	CP/CS-3102		1/28/2015		281.07	34.50											
19	CENTER ST.	x		x	Kentucky Street	1	FLYGT	3	463 (N)	NP 3085.183	63-466-00-3806	1/29/2015		47.44	112.41	230/3	DUPLEX	6	13	2,748	2003	2004	No	VFD	Yes	No
19	CENTER ST.	x		x	Kentucky Street	2	FLYGT	3	463 (N)	NP 3085.183	63-466-00-3806	1/29/2015		56.40	112.41											
20	KINGS PARK COURT (KPC)	x		x	Industrial Park	1	FLYGT	3	434	CP3085.183		1/28/2015		54.38	30.40	230/3	DUPLEX	6	10.5	2,220	1997	2000	No		Yes	Yes
20	KINGS PARK COURT (KPC)	x		x	Industrial Park	2	FLYGT	3	434	CP3085.183		1/28/2015		63.15	30.40											
21	PARK ST. EAST	x		x	Kentucky Street	1	HYDROMATIC	3	4.19	S 3HR-C300		1/29/2015		128.54	38.65	230/3	DUPLEX	4	15	1,409	1995	1987	No		Yes	No
21	PARK ST. EAST	x		x	Kentucky Street	2	HYDROMATIC	3	4.19	S 3HR-C300		1/29/2015		103.59	40.96											
22	WAGNER PARK/BUSNESS PARK 44	x		x	Main Street South	1	FLYGT	5	436	CP3102.181	63-434-00-3703	1/29/2015		317.90	27.44	230/3	DUPLEX	7	21	6,042	2002	2002	No		Yes	Yes
22	WAGNER PARK/BUSNESS PARK 44	x		x	Main Street South	2	FLYGT	5	436	CP3102.181	63-434-00-3703	1/29/2015		243.61	25.13											
23	MILLINEUM PARK	x	x	x	Huey Street Gravity	1	FLYGT	5	435	CP 3102.181	63-435-00-3703	1/26/2015		104.81	49.25	230/3	DUPLEX	7	21	6,042	2002	2002	No		Yes	Yes
23	MILLINEUM PARK	x	x	x	Huey Street Gravity	2	FLYGT	5	435	CP 3102.181	63-435-00-3703	1/26/2015		93.00	49.25											
24	MAGNOLIA	x	x	x	Osceola	1	FLYGT	3	434	CP 3085.183		1/28/2015		201.79	13.11	230/3	DUPLEX	4	12	1,127	2001	1999	No		Yes	Yes
24	MAGNOLIA	x	x	x	Osceola	2	FLYGT	3	438	CP 3085.183		1/28/2015		159.82	13.11											
25	DUBLIN INDUSTRAIL PARK	x	x	x	Commons	1	FLYGT	5	433	CP3102.181	63-433-00-3703	1/22/2015		226.03	17.76	230/3	DUPLEX	6	17.5	3,699	2004	2004	No	VFD	Yes	Yes
25	DUBLIN INDUSTRAIL PARK	x	x	x	Commons	2	FLYGT	5	433	CP3102.181	63-433-00-3703	1/22/2015		245.70	17.76											
26	WOODLANE MEADOWS	x		x	St Clair North	1	FLYGT	5	465	CP 3102.181	63-435-00-3703	1/28/2015		267.23	29.79	230/3	DUPLEX	6	11	2,325	1994	1998	No	VFD	Yes	Yes
26	WOODLANE MEADOWS	x		x	St Clair North	2	FLYGT	5	465	CP 3102.181	63-435-00-3703	1/28/2015		316.12	27.48											
27	CR 219	x	x	x	Plant	1	FLYGT	20	622-13	CP 3152.181	63-454-00-5360	1/27/2015		710.42	65.94	230/3	DUPLEX	10	13	7,633	1992	N/A	No		Yes	Yes
27	CR 219	x	x	x	Plant	2	FLYGT	20	454	CP 3152.181	63-454-00-5360	1/27/2015		849.28	38.22											
28	PARK STREET WEST	x		x	Kentucky Street	1	FLYGT	3	N 462	NP 3085.183	63-465-00-5306	1/28/2015		123.21	23.15	230/3	DUPLEX	4	8.5	799	1999	2009	No		Yes	No
28	PARK STREET WEST	x		x	Kentucky Street	2	HYDROMATIC	3	4.19	S 3HR-C300		1/28/2015		140.81	23.15											
29	WILDWOOD ACRES	x		x	Kentucky Street	1	FLYGT	3	N 463	3085-182-2042		1/29/2015		115.78	14.52	230/3	DUPLEX	5	8.5	1,248	2007	2008	No	VFD	Yes	No
29	WILDWOOD ACRES	x		x	Kentucky Street	2	FLYGT	3	N 462	3085-182-9531		1/29/2015		17.65	16.83											
30	McDONALDS	x	x	x		1	ABS	2.5	CB 11	AF-18-4		1/27/2015		121.72	18.15											
30	McDONALDS	x	x	x		2	ABS	2.5	CB 11	AF-18-4		1/27/2015		45.94	8.91											
31	ST CLAIR SOUTH	x	x	x	St Clair North	1	ABS	2	136	PIR-E25W		1/26/2015		28.79	44.26	230/3	DUPLEX	4	9.5	893	2006	2006	No		No	No
31	ST CLAIR SOUTH	x	x	x	St Clair North	2	ABS	2	136	PIR-E25W		1/26/2015		33.79	48.88											
32	CR 181	x		x	Off Line	1										230/3	DUPLEX	10	14	8,221	N/A	N/A	No		Yes	Yes
32	CR 181	x		x	Off Line	2																				
33	PROVIDENCE	x	x	x		1	FLYGT	20	462	NP 3153.185	63-462-00-6050	1/23/2015		526.61	80.08											
33	PROVIDENCE	x	x	x		2	FLYGT	20	462	NP 3153.185	63-462-00-6050	1/23/2015		472.04	80.08											
34	STEEPLECHASE	x	x	x	CR 209	1	FLYGT	6.5	GRINDER	NP 3102.185	63-256-00-5206	1/30/2015		191.12	60.10	230/3	DUPLEX	8	20	7,516	2009	2009	No		Yes	Yes
34	STEEPLECHASE	x	x	x	CR 209	2	FLYGT	6.5	GRINDER	NP 3102.185	63-256-00-5206	1/30/2015		198.57	60.10											
35	LAKE MIONOA VILLAS/LAKESIDE LANDING	x	x	x	Charlotte	1	FLYGT	10	485	CP 3127.181	63-485-00-2202	1/22/2015		138.61	55.55											
35	LAKE MIONOA VILLAS/LAKESIDE LANDING	x	x	x	Charlotte	2	FLYGT	10	485	CP 3127.181	63-485-00-2202	1/22/2015		134.29	55.55											
36	CR 209 STATION	x	x	x	Charlotte	1	FLYGT	47	452	CP 3201.180	63-452-00-5350	1/22/2015		638.80	110.90	460/3	TRIPLEX	12	25.5	21,561	2007	2007	Yes		N/A	Yes
36	CR 209 STATION	x	x	x	Charlotte	2	FLYGT	47	452	CP 3201.180	63-452-00-5350	1/22/2015		613.30	134.00											
36	CR 209 STATION	x	x	x	Charlotte	???	FLYGT	47	452	CP 3201.180	63-452-00-5350	1/22/2015														
37	PARKWOOD CR 101	x	x	x	CR 209		FLYGT	30	454	N 3171.181	63-454-00-3050	1/22/2015		339.03	125.13	460/3	DUPLEX	10	22	12,918	2008	2008	No		Yes	Yes
37	PARKWOOD CR 101	x	x	x	CR 209		FLYGT	30	454	N 3171.181	63-454-00-3050	1/22/2015		339.21	107.80											
38	OXFORD OAKS	x	x	x		1	FLYGT	10	488	NP 3127.185	63-488-00-3702	1/30/2015		261.27	42.62	230/3	DUPLEX	8	17.5				No			
38	OXFORD OAKS	x	x	x		2	FLYGT	10	488	NP 3127.185	63-488-00-3702	1/30/2015		405.60	49.55											
66	PEPPERTREE	x	x	x	Charlotte	1	FLYGT	6.5	GRINDER	NP 3102.185	63-257-00-6206	1/30/2015		236.84	43.93		DUPLEX	6	16.5				No			
66	PEPPERTREE	x	x	x	Charlotte	2	FLYGT	6.5	GRINDER	NP 3102.185	63-257-00-6206	1/30/2015		195.07	32.38											
200	LAKE MIONA GOLF COURSE	x		x																			No			
200	LAKE MIONA GOLF COURSE	x		x																						
200	LAKE MIONA GOLF COURSE	x		x																						
300	GEORGE NAHAS CHEVROLET	x	x	x	Main Street South	1	FLYGT	3	436	3085		1/30/2015		136.42	21.41		DUPLEX	8	20.5				No			
300	GEORGE NAHAS CHEVROLET	x	x	x		2	FLYGT	3	436	3085		1/30/2015		70.02	30.65											
400	Near Turnpike & Main St.		x	x		1		2				1/26/2015		78.44	34.50		DUPLEX	5	9.5				No			
400	Near Turnpike & Main St.	x		x	Plaza	2		2				1/26/2015		37.42	16.02											
500	South End of Turnpike	x		x	Plaza	1	FLYGT	5		FP 3102		1/21/2015		190.60	60.32		DUPLEX	4	8				No			
600	W Clark St. & First St.					2	FLYGT	5		FP 3102		1/21/2015		201.70	58.01											
700	Sumter County Annex	x	x	x		1	FLYGT	6		MP 3102		1/26/2015		90.55	29.16		DUPLEX	6	19				Yes			
700	Sumter County Annex					2	FLYGT	6		MP 3102		1/26/2015		67.08	29.16											
900	Oxford Assembly of God	x		x		1		15				1/28/2015		247.20	49.57		DUPLEX	5	11.5				Yes			
900	Oxford Assembly of God					2		15				1/28/2015		124.29	x											
1000	St. Vincent Church	x	x	x		1		7.5				1/23/2015		89.75	100.20		DUPLEX	4	8.5				No			
1100	MISSION OAKS					1	FLYGT	17	158	NP 3153.181	63-276-00-0078	N/A														
1100	MISSION OAKS					2	FLYGT	17	158	NP 3153.181	63-276-00-0078	N/A														

APPENDIX G:
Revenue Sufficiency

WILDWOOD
FLORIDA

City of Wildwood, FL

Utility Revenue Sufficiency Analysis

In Support of Master Plan Prepared by:

Kimley»Horn

Final Report

September 1, 2015

Prepared by:

BURTON & ASSOCIATES

UTILITY RATES ▪ ASSESSMENTS ▪ FINANCIAL PLANNING

WILDWOOD

FLORIDA

BURTON & ASSOCIATES

September 1, 2015

Mr. Jason McHugh
Assistant City Manager
100 N. Main Street
Wildwood, FL 34785

Re: FY 2015 Utility Revenue Sufficiency Analysis

Dear Mr. McHugh:

Burton & Associates is pleased to present this Final Report of the FY 2015 Utility Revenue Sufficiency Analysis that we have performed for the City's Utility (Water and Sewer) Enterprise Fund.

We appreciate the fine assistance provided by you and all of the members of City staff who participated in the analysis. We respectfully request that you distribute this Final Report to the appropriate individuals at the City for their records.

If you or others at the City have any questions, please do not hesitate to call me at (813) 443-5138. We sincerely appreciate the opportunity to be of service to you and the City.

Very Truly Yours,

Andrew J. Burnham
Senior Vice President

Enclosure

TABLE OF CONTENTS

SECTION 1. INTRODUCTION

Burton & Associates has conducted a Revenue Sufficiency Analysis (RSA) for the City's Water and Sewer Utility System (Utility) as part of the master plan being developed for the Utility by the City's consulting engineer, Kimley-Horn. This report describes in detail the source data, assumptions, procedures, and results of the RSA.

1.1 BACKGROUND

The City of Wildwood presently has a population of about 7,000 residents, and is currently expected to grow to around 50,000 residents by 2035. In order to better project the timing of this growth, the corresponding infrastructure requirements to support it, as well as the appropriate level of system renewal and replacement, the City retained Kimley-Horn to perform a comprehensive utility master plan. As part of the master plan, the City requested the performance of a revenue sufficiency analysis to measure the adequacy of the revenue provided by its current rates (adjusted for assumed growth) to meet the projected expenditure requirements of the Utility over a multi-year projection period.

As such, Kimley-Horn engaged Burton & Associates to populate and customize its proprietary financial modeling system to assist the City in:

1) Evaluating the impact of key capital improvement projects (in terms of both cost and timing) under various scenarios as part of developing the master plan.
2) Understanding the future impacts of its current FY 14/15 and projected FY 15/16 operating and capital improvement budgetary requirements.
3) Quantifying the rate impacts of alternative renewal and replacement, operation and maintenance, and system expansion programs.
4) Quantifying the amount of renewal and replacement, operation and maintenance, and system expansion funding for various rate plans.
5) Developing alternative growth forecasts, inclusive of revenue, operating cost, and capital improvement requirements.
6) Evaluating the impact of alternative borrowing scenarios, including refinancing and/or new borrowings required for future capital improvement requirements.

7) Establishing financial policies relative to reserves, debt service coverage, and rate adjustments that provide for sustainable services over a multi-year period.

1.2 OBJECTIVES

The objectives of the RSA were as follows:

Revenue Sufficiency Analysis – To ensure that the Utility has sufficient annual revenues to meet its financial requirements, and to identify a plan of future rate increases that would provide adequate revenue to fund the Utility's operating, capital, debt service (including coverage), and reserve requirements over a multi-year projection period.

Residential Rate Survey – To compare the current monthly water and sewer bill for the Utility's "typical" single-family residential user to the costs of other utility systems in the surrounding geographic area.

SECTION 2. ANALYSIS & RESULTS

The primary objective of the study was to conduct a Revenue Sufficiency Analysis (RSA) that would evaluate the sufficiency of the revenue provided by the Utility's current water and sewer rates to meet its projected expenditure requirements, and subsequently identify the level of any required water and sewer rate adjustments over a ten-year projection period (FY 2016 - FY 2025)[1]. The following sub-sections present the source data, assumptions, results, as well as the conclusions and recommendations of the RSA.

2.1 DESCRIPTION

The RSA was performed using both historical and projected information. The detailed historical financial information used to establish the beginning FY 2015 balances for each of the various funds was obtained from City staff. It is important to note that funds reserved or encumbered for specific capital projects were included in the beginning fund balances available for capital projects in FY 2015 and the associated capital project costs were included in the FY 2015 capital expenditure requirements.

The revenue utilized in the RSA consists of rate revenue, interest earnings, connection and extension fees, grants, developer contributions, and other minor revenue from miscellaneous service charges. Water and sewer rate revenue projections were based on FY 2014 actual revenues, adjusted for assumed growth and rate increases. With the exception of interest earnings, connection fees, and Transmission Infrastructure Extension (TIE) fees, all non-rate revenue amounts reflect the FY 2015 Budget. Annual interest earnings were calculated based upon projected fund balances and assumed

[1] While the RSA begins with FY 2015 data, the majority of this information serves as the base data upon which projected FY 2016 beginning fund balances were determined. As such, for purposes of this RSA, FY 2015 is not considered part of the projection period.

interest rates[2]. Water and sewer connection fee and TIE fee revenues were calculated based upon the respective fee and assumed growth in each year of the projection period.

The projected operating expenditure requirements of the Utility, with the exception of transfers, were based upon the FY 2015 Budget and include all O&M expenses, debt service requirements, and minor capital outlay requirements. Future cost projections were adjusted by the assumed cost escalation factors for individual expense categories and annual execution/spending assumptions. Anticipated transfers to the General Fund were assumed to be equal to $500,000 in FY 2016 and were increased annually by 5% for the remainder of the projection period. Beginning in FY 2016, transfers to the Renewal & Replacement (R&R) Fund were assumed to be equal to 5% of the total prior year operating revenue for each year of the projection period.

The annual capital expenditure requirements reflect the ten-year capital improvement program (CIP) developed by Kimley-Horn as part of the master plan. The CIP is presented in project-level detail by year in Appendix A of this report.

2.2 ASSUMPTIONS

The following presents the key assumptions and financial policies utilized in the RSA:

2.2.1 Cost Escalation

Annual cost escalation factors for the various types of O&M expenses were discussed with City staff and applied in each year of the projection period beginning in FY 2016. The specific escalation factors assumed for each category of expense are presented in Appendix A of this report and reflect recent historical trends, current industry observations, and City Management expectations.

[2] The estimated interest earnings rate on invested funds is 0.25% in FY 2016; increasing to 0.50% in FY 2017, 0.75% in FY 2018, 1.00% in FY 2019, and 1.50% in FY 2020 through the remainder of the projection period.

2.2.2 Growth

New connection and demand/sales growth projections were based upon a review of multiple years of historical billing data, the projected growth in five-year increments identified in the master plan (excluding infill areas per direction from City staff), and discussions with City staff regarding the timing or distribution of future growth within each five-year period . Beginning in FY 2016, it is assumed that the Utility will add 400 equivalent residential units (ERUs) to the water system and sewer systems, increasing annually through FY 2020, when growth is expected to reach 700 additional ERUs. Starting in FY 2021, growth is assumed to "level off" to 475 new ERUs annually for the remainder of the projection period. This assumed growth schedule represents average annual growth rates of approximately 6% per year for the water and sewer systems over the ten-year projection period, and is used in determining annual revenue from connection and TIE fees, as well as determining the change in billed use associated with system growth.

2.2.3 Capital Projects Funding

The CIP was provided by Kimley-Horn in current day dollars. Therefore, beginning in FY 2016, a compounded annual cost inflation factor of 3.00% (based upon the five-year average increase in the Engineering News Record Construction Cost Index) was applied to each dollar of projected capital spending to account for inflation in the future cost of construction. The total CIP is approximately $106.5 million from FY 2016 through FY 2025 in current dollars. A detailed list of all the specific projects and costs by year are presented in Appendix A of this report. It is important to note that, for the purpose of dedicating a minimum level of revenues for capital funding, annual contributions to the R&R Fund equal to 5% of total prior year operating revenues were assumed in each year of the projection period. These R&R funds were then used for funding various annual capital improvement requirements. Moreover, Kimley-Horn also identified the portion of certain expansion-related projects that are presently expected to be funded all or in part from developer contributions. For these projects, the RSA includes the full cost of each project and includes the estimated developer contributions as a funding source for the projects.

2.2.4 Borrowing Assumptions

To the extent new debt is required during any year of the projection period, it is assumed it would carry the following terms:

Long-Term Debt:

- Term: 20 Years
- Interest Rate: 4.00% in FY 2016, and increasing by 0.25% each year thereafter until FY 2020 when the cost of borrowing is assumed to be 5.00% in each remaining year of the projection period
- Cost of Issuance: 1.50% of Par
- Debt Service Reserve: Equal to 1 year of annual debt service expense

While this RSA was being performed, the City applied to receive a SRF loan in the amount of $2,575,000 in FY 2016. Per discussions with City staff, the annual debt payments of approximately $110,000 will begin in FY 2017 and extend until FY 2036. The SRF funds will be used to pay for wastewater collections improvements (specifically Project WC-1 as identified on the CIP included on Schedule 3 of Appendix A).

2.2.5 Debt Service and Coverage

The Utility must maintain net revenue (gross revenue minus operating expenses) that is at least 1.15 times greater than the annual debt service requirement (i.e. the annual principal and interest payments) on its outstanding senior-lien debt.

This coverage requirement is a minimum requirement. To the extent the Utility is unable to meet this requirement it could be found in technical default, resulting in the Utility having its credit rating downgraded, which would affect the interest rate and terms of future financing initiatives. As a policy decision, utilities often measure revenue sufficiency and set rates based upon a higher coverage level so as to ensure compliance with these covenants in the event future projections of revenue and expenses do not occur as predicted. This RSA targeted debt service coverage of at least 1.50 times net

revenue. Debt service coverage of 1.5-2.0 times net revenue is considered "strong" coverage for utilities per guidance published by the municipal utility rating agencies.

2.2.6 Minimum Working Capital Reserve

The working capital reserve is the primary fund for utility systems (akin to one's personal checking account), and fluctuates based upon monthly cash flow. Utilities typically establish a minimum reserve in order to provide the ability to withstand cash-flow fluctuations. There can be a significant length of time between when a system provides a service and when a customer may pay for that service. In addition to timing, the volume of cash flow for water and sewer utilities can be substantially affected by weather and seasonal demand patterns.

Absent a detailed multi-year historical study of monthly cash flows and an analysis of the aging of accounts receivable, there are various industry guidelines and practices available to determine an appropriate target reserve. Per a recent analysis conducted by the Rates and Charges Committee of the American Water Works Association (AWWA), a prudent level of minimum unrestricted reserves is an amount equal to at least 2 months of O&M expenses (excluding capital and revenue volatility considerations). This is consistent with our industry experience, in which water and sewer utilities generally target total minimum reserves in the range of 3-6 months of O&M expenses.

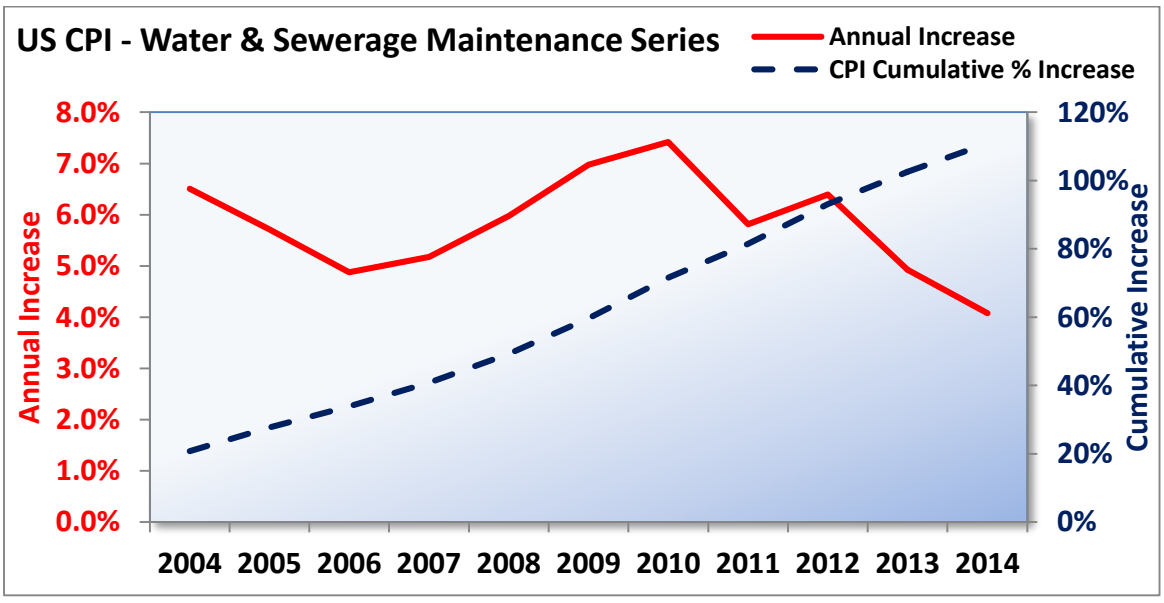
However, based upon discussions with City Management relative to the Utility's exposure to potential variability in future growth and the magnitude of the infrastructure costs to support that growth, we recommend establishing a working capital reserve target equal to 9 months of O&M expenses. At the end of FY 2014, the Utility's existing working capital reserve was equal to approximately $920,000, or just over 3 months of O&M expenses. The financial management plan presented in this report reflects annual contributions to this reserve to build it to the recommended target level by FY 2019.

2.3 RESULTS

Upon completing the RSA using the data and assumptions detailed in Section 2.1 and Section 2.2, it was determined that the Utility's current rates are not expected to generate sufficient revenue to meet its projected cost requirements. Based upon the Utility's current rates, it is projected that the Utility would exhaust its fund balances by FY 2017 and be in technical default on its debt by FY 2022.

In order to meets its revenue requirements, the RSA identified a plan of 15% rate increases in FY 2016 and FY 2017 followed by annual rate indexing adjustments of 2.50% starting in FY 2018 extending through the remainder of the projection period. The City's past practice had been to adjust its utility rates annually based upon the observed change in the overall United States Consumer Price Index covering nearly 200 different goods and services. This resulted in average annual rate indexing adjustments of about 2% per year.

However, the U.S. Consumer Price Index (CPI) Water & Sewerage Maintenance Series, which specifically measures the average national change in the cost of water and wastewater service to households, has risen at an average annual rate of nearly 6% annually over the past 10 year period (see graph below). Moreover, many of our clients in the state are experiencing rate increase requirements in the range of 3 to 8% per year.



As such, the plan of water and sewer rate adjustments presented herein effectively allows the Utility to "catch up" with national and local trends in FY 2016 and FY 2017, and return to modest rate indexing adjustments in the future to "keep up" with projected increases in costs (based upon the assumed growth presented herein).

2.4 CONCLUSIONS & RECOMMENDATIONS

Based upon the analysis presented herein and the results presented in the prior subsection, we have reached the following conclusions and recommendations:

- Water and sewer rate adjustments of 15% in FY 2016 and FY 2017 are needed to satisfy the Utility's operating and maintenance expense requirements, to fund the expansion and renewal and replacement of its infrastructure, and to meet identified reserve and debt service coverage policies during that time period.

- Beginning in FY 2018, a plan of 2.50% annual water and sewer rate indexing adjustments is sufficient to fund the Utility's financial requirements and policy objectives for the remainder of the ten-year projection period (through FY 2025).

- Beginning in FY 2019, long-term borrowing is projected to fund large capital improvement expenditures, including the expansion of water and wastewater treatment facilities in FY 2019 and FY 2022, and the design and construction of the Landstone wastewater treatment facility in FY 2020 through FY 2022.

- Lastly, it is recommended that the City continue to update this analysis on an annual basis to evaluate the adequacy of its revenues and plan of water and sewer rate adjustments. Doing so will allow for the incorporation of updated revenue and expense information, as well as changes in economic conditions, water consumption, regulatory requirements, and other factors, so that any necessary adjustments can be made to the financial management plan presented herein.

SECTION 3. RESIDENTIAL RATE SURVEY

As part of the RSA, we also performed a comparative survey of the single-family residential water and sewer rates of other communities providing utility service in the City's surrounding geographic area. The survey presents the combined water and sewer monthly bill calculations for each community assuming the rates in effect for FY 2015 for "low volume", "typical", and "high volume" single-family residential customers.

The results of the survey indicate that the Utility's current water and sewer monthly bill is among the lowest in the area for each type of single-family residential user in FY 2015.

Each of the surveys included in Appendix B of this report include color-coded arrows identifying the City's FY 2016 and FY 2017 bill based upon the rate adjustments recommended herein as compared to the current FY 2015 bills of other communities. As can be seen, the Utility's costs in FY 2016 and FY 2017 compare very favorably against the current cost of the other local utility providers. Moreover, it is very likely that the majority of municipalities surveyed will implement rate adjustments effective at the beginning of FY 2016 and FY 2017 as is recommended for the City. Therefore, it is reasonable to expect that the City will continue to compare very favorably in cost to other communities as they implement their own rate adjustments (presumably comparable to national trends).

APPENDIX A – SUPPORTING FINANCIAL SCHEDULES

Schedule 1 contains the assumptions of the RSA, including projected growth in ERUs

Schedule 2 identifies the end of FY 2014 fund balances that serve as the FY 2015 beginning balances of the analysis

Schedule 3 provides a listing of the ten-year capital improvement program that was utilized in the RSA

Schedule 4 presents a detailed list of all projected cash inflows from FY 2015 – FY 2025

Schedule 5 presents a detailed list of all projected cash outflows from FY 2015 – FY 2025

Schedule 6 presents the list of specific annual cost escalation factors, in line-item detail

Schedule 7 contains the FAMS-XL © Control Panel that presents a summary of the financial management plan, including annual rate increases, debt service coverage ratios, annual O&M execution rates, customer impacts, and fund balances

Schedule 8 presents the projected annual net income, debt service coverage, and cash flow results

Schedule 9 shows the projected funding sources for the capital improvement program

Schedule 10 contains the calculation of projected annual long-term borrowing

Schedule 11 presents a fund-level cash flow reconciliation, providing the beginning balance in each year, the amount utilized for project funding or payment of debt service, interest calculations, and the end of year fund balance

Schedule 1 – Assumptions

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Annual Revenue Growth - Water:											
Number of Billed Accounts	6,581	6,981	7,481	8,081	8,731	9,431	9,906	10,381	10,856	11,331	11,806
Growth	N/A	400	500	600	650	700	475	475	475	475	475
Percent Change in Billed Accounts	N/A	6.08%	7.16%	8.02%	8.04%	8.02%	5.04%	4.80%	4.58%	4.38%	4.19%
Percent Change in Billed Use	N/A	6.08%	7.16%	8.02%	8.04%	8.02%	5.04%	4.80%	4.58%	4.38%	4.19%
Projected Growth in Capital Contribution Charge Paying Accounts	N/A	300	400	500	600	650	700	475	475	475	475
Annual Revenue Growth - Sewer:											
Number of Billed Accounts	5,767	6,167	6,667	7,267	7,917	8,617	9,092	9,567	10,042	10,517	10,992
Growth	N/A	400	500	600	650	700	475	475	475	475	475
Percent Change in Billed Accounts	N/A	6.94%	8.11%	9.00%	8.94%	8.84%	5.51%	5.22%	4.96%	4.73%	4.52%
Percent Change in Billed Use	N/A	6.94%	8.11%	9.00%	8.94%	8.84%	5.51%	5.22%	4.96%	4.73%	4.52%
Projected Growth in Capital Contribution Charge Paying Accounts	N/A	300	400	500	600	650	700	475	475	475	475
Price Elasticity Coefficient:											
Applied to Usage Charge Rate Revenue	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Capital Contribution Charges:											
Connection Fees											
Water	$ 1,222	$ 1,247	$ 1,272	$ 1,297	$ 1,323	$ 1,350	$ 1,377	$ 1,404	$ 1,432	$ 1,461	$ 1,490
Sewer	$ 2,382	$ 2,429	$ 2,478	$ 2,528	$ 2,578	$ 2,630	$ 2,683	$ 2,736	$ 2,791	$ 2,847	$ 2,904
Tie Fees											
Water (per Account)	$ 647	$ 660	$ 673	$ 687	$ 700	$ 714	$ 729	$ 743	$ 758	$ 773	$ 789
Sewer (per Account)	$ 709	$ 723	$ 738	$ 752	$ 768	$ 783	$ 799	$ 815	$ 831	$ 847	$ 864
Average Annual Interest Earnings Rate:											
On Fund Balances	0.25%	0.25%	0.50%	0.75%	1.00%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%
Operating Budget Execution Percentage:											
Personal Services	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Operating Expenses	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Capital Spending	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Operating Cost Escalation Factors: [(1)]											
Weighted Average Annual Cost Escalation	N/A	1.63%	4.56%	5.07%	5.55%	5.84%	5.91%	5.20%	5.18%	5.17%	5.16%
Capital Outlay Cost Escalation Factors: [(1)]											
Weighted Average Annual Cost Escalation	N/A	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
CIP Budget Annual Cost Inflation:											
Compounded Annual Cost Escalation	0.00%	3.00%	6.10%	9.30%	12.60%	15.90%	19.40%	23.00%	26.70%	30.50%	34.40%
Operating Fund Reserve Target:											
Number of Months of Annual Operating Expense	3.00	3.00	5.00	7.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00

(1) See Schedule 6 for list of specific annual cost escalation factors, in line-item detail.

Schedule 2 – Beginning Balances

GROUPING OF FUNDS IN MODEL		Revenue Fund	Capital Projects Fund	R&R Fund	Water Connection	Sewer Connection	Water TIE Fees	Sewer TIE Fees	Restricted Reserves
CURRENT UNRESTRICTED ASSETS									
Cash and Cash Equivalents	$	1,272,745	-	-	301,265	1,006,075	53,872	416,720	-
A/R - Net of Uncollectibles		453,865	-	-	4,660	10,750	104,115	18,374	-
Due From Other Govts/Funds		10,708	-	-	-	-	-	-	-
Compensated Absences		70,863	-	-	-	-	-	-	-
Prepaid Expenses		1,132	-	-	-	-	-	-	-
FY 2013 Refi and Construction Acct		-	-	1,550,578	-	-	-	-	-
Debt Service Sinking - FY 2013 Refi		71,895	-	-	-	-	-	-	-
SRF Debt Service Reserve		-	-	-	-	-	-	-	261,053
SRF Debt Service Sinking Fund		213,667	-	-	-	-	-	-	-
Water Deposits		197,273	-	-	-	-	-	-	-
TOTAL ASSETS	$	**2,292,148**	**-**	**1,550,578**	**305,925**	**1,016,825**	**157,987**	**435,095**	**261,053**
Less: Accounts Payable		(3,114)							
Less: Accrued Expenses		(133,065)							
Less: Customer Deposits		(233,069)							
Less: Due to Other Govts/Funds		(174,942)	-	-	-	-	-	-	-
Less: SRF Loan - Current Portion		(728,254)	-	-	-	-	-	-	-
Less: Other Loans/Leases - Current Portion		(101,596)	-	-	-	-	-	-	-
CALCULATED FUND BALANCE (ASSETS - LIABILITIES)	$	**918,108**	**-**	**1,550,578**	**305,925**	**1,016,825**	**157,987**	**435,095**	**261,053**
Plus/(Less):		-	-	-	-	-	-	-	-
NET UNRESTRICTED FUND BALANCE	$	**918,108**	**-**	**1,550,578**	**305,925**	**1,016,825**	**157,987**	**435,095**	**261,053**

FUND TITLE		Balance as of 157,987	Funds Encumbered or Reserved for Projects not in the CIP	Beginning Balance Available for Projects in the CIP
Water Connection Fees	$	305,925	-	305,925
Sewer Connection Fees	$	1,016,825	-	1,016,825
Water TIE Fees	$	157,987	-	157,987
Sewer TIE Fees	$	435,095	-	435,095
Capital Projects Fund	$	-	-	-
R&R Fund	$	1,550,578	-	1,550,578
Revenue Fund	$	918,108	-	918,108
Restricted Reserves	$	261,053	-	261,053
Total Consolidated Fund Balance	**$**	**4,645,570**	**-**	**4,645,570**

PROJECT DESCRIPTION	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Capital Projects - Water	$ 50,000	-	-	-	-	-	-	-	-	-	-
Water Distribution											
WD1a - Design, Permitting, Bidding, and Const Admin: CR 209 Water Main N Ext and System Interc	-	-	-	-	207,000	-	-	-	-	-	-
WD1b - Construction: US 301 Watermain North Ext and Sys Interconn	-	-	-	-	-	1,590,000	-	-	-	-	-
WD2 - Monarch Ranch Watermain and Sys Interconn	-	-	-	-	-	-	-	-	-	-	1,340,000
WD3 - Southern Oaks Watermain for CR 468 from Turnpike to SR 44 Loop	-	-	-	-	-	-	-	-	-	-	5,500,000
WD4 - Landstone Watermain and Sys Interconn	-	-	-	-	-	-	-	-	-	-	1,660,000
WD5a - O'Dell Development CR-462 to SR 44 Loop	-	-	-	-	442,000	-	-	-	-	-	-
WD5b - O'Dell Development CR-462 to SR 44 Loop	-	-	-	-	-	3,390,000	-	-	-	-	-
WD6 - Upsize Watermain along CR-501	-	-	-	-	-	-	-	-	-	-	1,090,000
W6a - CR468 Utility Upgrades US301 to Turnpike	100,000	-	-	-	-	-	-	-	-	-	-
W6b - CR468 Utility Upgrades US301 to Turnpike	-	250,000	-	-	-	-	-	-	-	-	-
W9 - CR 462 Utility Upgrades	160,000	-	-	-	-	-	-	-	-	-	-
W12 - C466W Waterline Relocations	-	200,000	-	-	-	-	-	-	-	-	-
W14a - Loop/Upgrade Water Mains/ Install Valves	-	50,000	50,000	50,000	-	-	-	-	-	-	-
W14b - Loop/Upgrade Water Mains/ Install Valves	-	-	-	-	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Water Supply	-	-	-	-	-	-	-	-	-	-	-
WS1a - Design, Permitting, Bidding, and Const Admin: CR-214 WTP Lower Floridian Well	-	-	-	-	-	130,000	-	-	-	-	-
WS1b - Construct CR-214 WTP Lower Floridian Well	-	-	-	-	-	537,000	-	-	-	-	-
WS2a - Design, Permitting, Bidding, and Const Admin: Coleman WTP Lower Floridian Well	-	-	-	-	-	-	-	-	-	-	130,000
WS2b - Construct Coleman WTP Lower Floridian Well	-	-	-	-	-	-	-	-	-	-	537,000
WS3a - Design, Permitting, Bidding, and Const Admin: Ashley WTP Well No. 2	-	-	-	-	-	61,000	-	-	-	-	-
WS3b - Construct Ashley WTP Well No. 2	-	-	-	-	-	-	-	466,000	-	-	-
WS4 - Request SWFWMD Water Use Permitted Withdrawal to be increased	-	-	-	-	-	-	-	-	-	-	50,000
Water Treatment	-	-	-	-	-	-	-	-	-	-	-
WT1a - Design, Permitting, Bidding, and Const Admin: CR-214 WTP Exp to 3.0 MGD	-	600,000	-	-	-	-	-	-	-	-	-
WT1b - Construct CR-214 Exp to 3.0 MGD MDD	-	-	2,908,500	969,500	-	-	-	-	-	-	-
WT2a - Design, Permitting, Bidding, and Const Admin: Coleman WTP Exp to 4.5 MGD	-	-	-	-	-	750,000	-	-	-	-	-
WT2b - Construct Coleman WTP Exp to 4.5 MGD MDD+FF	-	-	-	-	-	-	-	6,325,000	-	-	-
WT3a - Design, Permitting, Bidding, and Const Admin: Coleman WTP Exp to 11.0 MGD MDD+FF	-	-	-	-	-	-	-	-	-	-	-
WT3b - Construct Coleman WTP Exp to 11.0 MGD MDD+FF	-	-	-	-	-	-	-	-	-	-	-
WT4 - Huey Street WTP Rehabilitation and Exp to 1,000 gpm	-	-	-	-	-	-	-	-	200,000	-	-
WT5 - Ashley WTP Exp to include second well for 1.0 MGD MDD	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
Wastewater Collection	-	-	-	-	-	-	-	-	-	-	-
WC1 - CR 209 Forcemain, CR 209 Lift Stations Impr and N Svc Area Flow reversal to CR 209 LS	-	2,500,000	-	-	-	-	-	-	-	-	-
WC2 - Trailwinds Forcemain	-	2,100,000	-	-	-	-	-	-	-	-	-
WC3 - Trailwinds Re-Pump Station	-	-	-	-	-	810,000	-	-	-	-	-
WC4 - Charlotte Street Lift Station Upgrades	-	-	223,000	-	-	-	-	-	-	-	-
WC5 - Peter Street Lift Station Rehabilitation	-	-	223,000	-	-	-	-	-	-	-	-
WC6 - Monarch Ranch Forcemain and Lift Station	-	-	-	-	-	-	-	1,793,000	-	-	-
WC7 - Southern Oaks Forcemain and Lift Station	-	-	-	-	-	-	-	5,922,000	-	-	-
WC8 - Landstone Forcemain and Lift Station	-	-	-	-	-	-	-	3,501,000	-	-	-
WC9 - Wildwood Springs Forcemain and Lift Station	-	-	-	-	-	-	-	4,035,000	-	-	-
WC10 - Wildwood Entertainment Park Forcemain	-	-	-	942,000	-	-	-	-	-	-	-
WC11 - Main Street North Lift Station Rehabilitation and Main Street North 10" Gravity Upsize	-	-	-	-	-	-	-	520,000	-	-	-
WC12 - CR 219 Lift Station Improvements	-	-	-	-	-	-	-	223,000	-	-	-

PROJECT DESCRIPTION	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
WC13 - Infiltration and Inflow Study	-	250,000	-	-	-	-	-	-	-	-	-
WC14 - Infiltration and Inflow Repairs	-	-	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Project Adjustment	-	-	-	-	-	-	-	-	-	-	-
WW1 - Trailer Mounted Sewer Jetter Machine	45,000	-	-	-	-	-	-	-	-	-	-
WW2 - Headworks Bypass Valve	-	50,000	-	-	-	-	-	-	-	-	-
WW5 - Replace CR 501 Force Main	-	-	-	750,000	-	-	-	-	-	-	-
WW6 - 460v - 3-Phase Lift Station Generator Set. (5)	-	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
WW9 - C466W Utility Sewer Relocations	-	200,000	-	-	-	-	-	-	-	-	-
WW10 - Truck Mounted Vac-Con	-	300,000	-	-	-	-	-	-	-	-	-
WW11 - SCADA at Coleman Lift Station	-	15,000	-	-	-	-	-	-	-	-	-
WW16a - Miscellaneous Sys Enhancements inc main and lateral lining and replacements	-	100,000	100,000	-	-	-	-	-	-	-	-
WW16b - Miscellaneous Sys Enhancements inc main and lateral lining and replacements	-	-	-	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
WW16c - Miscellaneous Sys Enhancements inc main and lateral lining and replacements	-	-	-	-	-	-	-	-	-	-	-
Wastewater Treatment	-	-	-	-	-	-	-	-	-	-	-
WW1 - WWTF Permit Renewal, cap Analysis, and update to the WWTF Master Planning doc	-	20,000	-	-	-	-	-	-	-	-	-
WW2 - Existing WWTF Process and Hydraulic Modss and Upgrades to achieve permitted cap	-	500,000	500,000	-	-	-	-	-	-	-	-
WW2a - Tertiary Filter Modifications (Bypass)	-	-	100,000	-	-	-	-	-	-	-	-
WW3a - Design, Permitting, Bidding, and Const Admin: Existing WWTF N Exp	-	-	942,500	942,500	-	-	-	-	-	-	-
WW3b - Construct Existing WWTF N Exp from 3.55 MGD to 5.0 MGD	-	-	-	-	18,024,000	-	-	-	-	-	-
WW4a - Design, Permitting, Bidding, and Const Admin: New 2.0 MGD Landstone WWTF S	-	-	-	-	-	2,600,000	-	-	-	-	-
WW4b - Construct New 2.0 MGD Landstone WWTF S	-	-	-	-	-	-	-	24,860,000	-	-	-
WW5a - Design, Permitting, Bidding, and Const Admin: 2.0 MGD Exp for Landstone WWTF S	-	-	-	-	-	-	-	-	-	-	-
WW5b - Construct 2.0 MGD Exp for Landstone WWTF S	-	-	-	-	-	-	-	-	-	-	-
Reclaimed Water Transmission and Disposal	-	-	-	-	-	-	-	-	-	-	-
RCW1 - Expand Reclaim Storage for NSU	-	-	-	-	-	-	-	315,000	-	-	-
RCW2 - Effluent Disposal Exp	-	-	-	-	-	-	-	-	-	-	-
RCW3 - RCW Transfer Pump Station Upgrades	-	-	-	-	-	-	-	-	-	-	-
Total CIP Budget (in FY 2015 dollars)	**$ 355,000**	**7,185,000**	**5,197,000**	**4,004,000**	**19,123,000**	**10,318,000**	**450,000**	**48,410,000**	**650,000**	**450,000**	**10,757,000**
Compounded Annual Cost Escalation	0.0%	3.0%	6.1%	9.3%	12.6%	15.9%	19.4%	23.0%	26.7%	30.5%	34.4%
Annual Capital Spending Execution Percentage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Final CIP Funding Level	**$ 355,000**	**7,400,550**	**5,514,017**	**4,376,372**	**21,532,498**	**11,958,562**	**537,300**	**59,544,300**	**823,550**	**587,250**	**14,457,408**

Schedule 4 – Projection of Cash Inflows

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Rate Revenue Growth Assumptions											
Growth in Water Accounts	N/A	6.08%	7.16%	8.02%	8.04%	8.02%	5.04%	4.80%	4.58%	4.38%	4.19%
Growth in Water Usage	N/A	6.08%	7.16%	8.02%	8.04%	8.02%	5.04%	4.80%	4.58%	4.38%	4.19%
Growth in Sewer Accounts	N/A	6.94%	8.11%	9.00%	8.94%	8.84%	5.51%	5.22%	4.96%	4.73%	4.52%
Growth in Sewer Usage	N/A	6.94%	8.11%	9.00%	8.94%	8.84%	5.51%	5.22%	4.96%	4.73%	4.52%
Assumed Rate Revenue Adjustments											
Assumed Water Rate Adjustment	**N/A**	**15.00%**	**15.00%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**
Assumed Sewer Rate Adjustment	**N/A**	**15.00%**	**15.00%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**
Water Rate Revenue [1]											
Base Facility Charges	$ 466,936	569,614	701,972	777,229	860,739	952,991	1,026,014	1,102,092	1,181,332	1,263,846	1,349,748
Usage Charges	1,212,935	1,479,656	1,823,477	2,018,968	2,235,897	2,475,536	2,665,223	2,862,847	3,068,686	3,283,028	3,506,169
Total Water Rate Revenue	**$1,679,871**	**2,049,270**	**2,525,450**	**2,796,197**	**3,096,636**	**3,428,527**	**3,691,236**	**3,964,938**	**4,250,018**	**4,546,874**	**4,855,917**
Sewer Rate Revenue [1]											
Base Facility Charges	$ 824,872	1,014,397	1,261,134	1,408,993	1,573,393	1,755,318	1,898,377	2,047,492	2,202,877	2,364,750	2,533,341
Usage Charges	2,011,548	2,473,725	3,075,423	3,435,994	3,836,904	4,280,548	4,629,415	4,993,050	5,371,973	5,766,722	6,177,851
Total Sewer Rate Revenue	**$2,836,421**	**3,488,122**	**4,336,556**	**4,844,987**	**5,410,297**	**6,035,866**	**6,527,792**	**7,040,542**	**7,574,850**	**8,131,472**	**8,711,192**
Total Rate Revenue	**$4,516,291**	**5,537,391**	**6,862,006**	**7,641,184**	**8,506,933**	**9,464,393**	**10,219,028**	**11,005,480**	**11,824,868**	**12,678,347**	**13,567,109**
Other Operating Revenue [2]											
Water											
Water - Meter Installations	$ 60,000	63,647	68,205	73,676	79,602	85,984	90,314	94,645	98,975	103,306	107,637
Water - Other (On/Off Fees)	34,000	34,000	34,000	34,000	34,000	34,000	34,000	34,000	34,000	34,000	34,000
Water Income - Other	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Sewer											
Sewer Other Misc	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Land Lease - Turtle Mount (Tower)	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000
TSS/COD Wastewater Fees	720,000	720,000	720,000	720,000	720,000	720,000	720,000	720,000	720,000	720,000	720,000
Refuse											
Reuse Water Operations	65,543	75,374	86,680	88,847	91,068	93,345	95,679	98,071	100,522	103,035	105,611
Total Other Operating Revenue	**$ 916,543**	**930,021**	**945,885**	**953,523**	**961,670**	**970,329**	**976,993**	**983,715**	**990,498**	**997,341**	**1,004,248**
Non Operating Revenue [2]											
Word Family, Llc - Water/Wastewater Main	540,000	1,008,000	-	-	-	-	-	-	-	-	-
Total Non Operating Revenue	**$ 540,000**	**1,008,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Schedule 4 – Projection of Cash Inflows

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Interest Earnings Revenue	**$ 7,940**	**7,792**	**10,879**	**19,365**	**38,841**	**68,472**	**94,202**	**118,085**	**131,094**	**160,444**	**189,917**
Transfers In											
Transfer to R&R	-	271,642	323,371	390,395	429,735	473,430	521,736	559,801	599,460	640,768	683,784
Developer Contributions	-	-	-	823,685	49,769	486,780	-	17,037,714	-	-	8,467,200
SRF Loan Proceeds		2,575,000	-	-	-	-	-	-	-	-	-
Total Transfers In	**$ -**	**2,846,642**	**323,371**	**1,214,079**	**479,505**	**960,210**	**521,736**	**17,597,515**	**599,460**	**640,768**	**9,150,984**
Capital Project Funding Sources [3]											
Water System - Connection Fees	$ 366,714	498,650	635,859	778,287	860,007	944,693	653,861	666,940	680,278	693,883	707,761
Water - TIE Fees	194,118	263,957	336,588	411,982	455,240	500,068	346,118	353,041	360,101	367,303	374,650
Sewer Tap/Connection Fees	714,642	971,755	1,239,144	1,516,704	1,675,958	1,840,991	1,274,226	1,299,714	1,325,707	1,352,220	1,379,266
Sewer TIE Fees	212,730	289,266	368,860	451,483	498,888	548,014	379,303	386,890	394,628	402,520	410,571
Total Capital Project Funding Sources	**$1,488,204**	**2,023,628**	**2,580,452**	**3,158,455**	**3,490,093**	**3,833,765**	**2,653,508**	**2,706,586**	**2,760,715**	**2,815,926**	**2,872,247**
TOTAL CASH INFLOWS	**$7,468,978**	**12,353,474**	**10,722,593**	**12,986,606**	**13,477,040**	**15,297,168**	**14,465,467**	**32,411,382**	**16,306,635**	**17,292,826**	**26,784,505**

(1) Estimated rate revenues in FY 2015 were based on the FY 2014 estimated results, adjusted for assumed growth and an approved 2.1% rate increase. Future rate revenue projections are based upon FY 2015 estimated results, adjusted annually to reflect assumed rate increases and customer growth.

(2) Unless otherwise specified, FY 2015 non-rate revenues are per the FY 2015 Budget.

(3) Connection Fee and TIE Fee revenues were calculated based upon the current water impact fees and the projected growth in impact fee paying accounts (see Schedule 1 for annual growth

Schedule 5 – Projection of Cash Outflows

	FY 2015 [1]	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Personal Services											
Salaries	$1,117,550	1,166,590	1,231,207	1,312,234	1,410,785	1,523,954	1,646,003	1,753,294	1,865,461	1,982,758	2,105,445
On Call	10,000	10,439	11,017	11,742	12,624	13,637	14,729	15,689	16,692	17,742	18,840
Overtime	23,100	24,114	25,449	27,124	29,161	31,500	34,023	36,241	38,559	40,984	43,520
Holiday Premium	8,000	8,351	8,814	9,394	10,099	10,909	11,783	12,551	13,354	14,194	15,072
FICA Expense	88,460	92,342	97,457	103,870	111,671	120,629	130,290	138,782	147,661	156,946	166,657
Retirement	80,546	84,080	88,738	94,578	101,681	109,837	118,634	126,366	134,451	142,905	151,747
Life & Health Insurance	156,500	172,757	191,828	214,044	239,751	268,573	300,825	332,467	367,035	404,795	446,034
Unemployment Compensation	6,500	6,785	7,161	7,632	8,206	8,864	9,574	10,198	10,850	11,532	12,246
Workers Compensation Insurance	38,275	40,720	43,586	46,891	50,647	54,709	59,091	62,943	66,969	71,180	75,585
Sub-Total: Personal Services	**$1,528,931**	**1,606,178**	**1,705,257**	**1,827,509**	**1,974,624**	**2,142,613**	**2,324,951**	**2,488,530**	**2,661,033**	**2,843,036**	**3,035,146**
Personal Services Execution Percentage	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Operating Expenses											
Professional Services	$ 265,828	271,145	276,567	282,099	287,741	293,496	299,366	305,353	311,460	317,689	324,043
2013 Refinance Loan Closing	-	-	-	-	-	-	-	-	-	-	-
Accounting & Auditing Fees	22,500	22,950	23,409	23,877	24,355	24,842	25,339	25,845	26,362	26,890	27,427
Other Contractual Service	82,060	83,701	85,375	87,083	88,824	90,601	92,413	94,261	96,146	98,069	100,031
Travel And Per Diem	3,300	3,366	3,433	3,502	3,572	3,643	3,716	3,791	3,866	3,944	4,023
Telephone Expense	17,800	18,156	18,519	18,890	19,267	19,653	20,046	20,447	20,856	21,273	21,698
Postage/Transportation	19,700	20,094	20,496	20,906	21,324	21,750	22,185	22,629	23,082	23,543	24,014
Utilities	310,000	322,400	335,296	348,708	362,656	377,162	392,249	407,939	424,256	441,227	458,876
Rental & Leasing	22,200	22,644	23,097	23,559	24,030	24,511	25,001	25,501	26,011	26,531	27,062
General Insurance	154,100	158,723	163,485	168,389	173,441	178,644	184,003	189,524	195,209	201,066	207,098
Repair & Maintenance	544,250	482,525	497,001	511,911	527,268	543,086	559,379	576,160	593,445	611,248	629,586
Misc Expense & Other Current	15,000	15,300	15,606	15,918	16,236	16,561	16,892	17,230	17,575	17,926	18,285
Boot Allowance	900	918	936	955	974	994	1,014	1,034	1,054	1,076	1,097
Office Supplies	12,000	12,240	12,485	12,734	12,989	13,249	13,514	13,784	14,060	14,341	14,628
Operating Supplies	301,700	313,768	326,319	339,371	352,946	367,064	381,747	397,017	412,897	429,413	446,590
Subscriptions/Dues/Training	5,800	5,916	6,034	6,155	6,278	6,404	6,532	6,662	6,796	6,932	7,070
Training	5,000	5,100	5,202	5,306	5,412	5,520	5,631	5,743	5,858	5,975	6,095
Sub-Total: Professional Services	**$1,782,138**	**1,758,946**	**1,813,261**	**1,869,363**	**1,927,315**	**1,987,180**	**2,049,026**	**2,112,920**	**2,178,934**	**2,247,142**	**2,317,621**
Operating Expenses Execution Percentage	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Total: Personnel Services and O&M Funding Leve	**$3,311,069**	**3,365,124**	**3,518,517**	**3,696,872**	**3,901,938**	**4,129,793**	**4,373,976**	**4,601,450**	**4,839,967**	**5,090,178**	**5,352,768**
Minor Capital Outlay											
Capital Improvement - Other	$ 75,000	-	-	-	-	-	-	-	-	-	-
Capital Improvement - Machinery	258,895	254,530	259,621	264,813	270,109	275,511	281,022	286,642	292,375	298,222	304,187
Total: Minor Capital Outlay	**$ 333,895**	**$ 254,530**	**$ 259,621**	**$ 264,813**	**$ 270,109**	**$ 275,511**	**$ 281,022**	**$ 286,642**	**$ 292,375**	**$ 298,222**	**$ 304,187**

	FY 2015 [1]	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Debt Service Expenses											
Existing Senior Debt Service	$ 553,561	553,246	552,796	554,202	553,448	553,559	553,509	276,315	-	-	-
Existing Subordinate Debt Service	379,915	379,915	489,915	489,915	489,915	489,915	489,915	489,915	489,915	489,915	489,915
New Debt Service	-	-	-	-	699,384	1,325,142	1,427,104	3,190,947	4,257,810	4,257,810	4,257,810
Total: Debt Service Expenses	**$ 933,476**	**933,161**	**1,042,711**	**1,044,117**	**1,742,747**	**2,368,615**	**2,470,528**	**3,957,177**	**4,747,725**	**4,747,725**	**4,747,725**
Transfers Out											
Transfer To General Fund	$ 350,000	500,000	525,000	551,250	578,813	607,753	638,141	670,048	703,550	738,728	775,664
Transfer To R&R	-	271,642	323,371	390,395	429,735	473,430	521,736	559,801	599,460	640,768	683,784
Total: Transfers Out	**$ 350,000**	**771,642**	**848,371**	**941,645**	**1,008,548**	**1,081,183**	**1,159,877**	**1,229,849**	**1,303,010**	**1,379,496**	**1,459,449**
TOTAL CASH OUTFLOWS	**$4,928,440**	**5,324,456**	**5,669,220**	**5,947,447**	**6,923,343**	**7,855,103**	**8,285,403**	**10,075,118**	**11,183,077**	**11,515,622**	**11,864,128**

(1) FY 2015 expenditures based upon the FY 2015 Budget.

Schedule 6 – Cost Escalation Factors

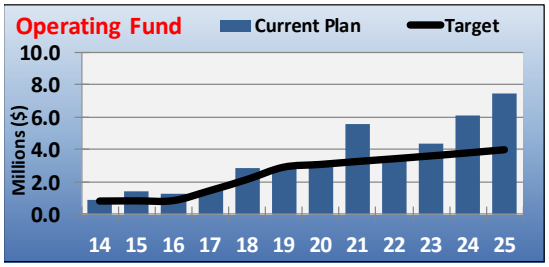
Annual Cost Escalation Factors:	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Personal Services										
Salaries	4.39%	5.54%	6.58%	7.51%	8.02%	8.01%	6.52%	6.40%	6.29%	6.19%
On Call	4.39%	5.54%	6.58%	7.51%	8.02%	8.01%	6.52%	6.40%	6.29%	6.19%
Overtime	4.39%	5.54%	6.58%	7.51%	8.02%	8.01%	6.52%	6.40%	6.29%	6.19%
Holiday Premium	4.39%	5.54%	6.58%	7.51%	8.02%	8.01%	6.52%	6.40%	6.29%	6.19%
FICA Expense	4.39%	5.54%	6.58%	7.51%	8.02%	8.01%	6.52%	6.40%	6.29%	6.19%
Retirement	4.39%	5.54%	6.58%	7.51%	8.02%	8.01%	6.52%	6.40%	6.29%	6.19%
Life & Health Insurance	10.39%	11.04%	11.58%	12.01%	12.02%	12.01%	10.52%	10.40%	10.29%	10.19%
Unemployment Compensation	4.39%	5.54%	6.58%	7.51%	8.02%	8.01%	6.52%	6.40%	6.29%	6.19%
Workers Compensation Insurance	6.39%	7.04%	7.58%	8.01%	8.02%	8.01%	6.52%	6.40%	6.29%	6.19%
Operating Expenses										
Professional Services	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
2013 Refinance Loan Closing	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Accounting & Auditing Fees	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Other Contractual Service	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Travel And Per Diem	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Telephone Expense	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Postage/Transportation	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Utilities	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
Rental & Leasing	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
General Insurance	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Repair & Maintenance	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Misc Expense & Other Current	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Landfill Fees	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Boot Allowance	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Office Supplies	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Operating Supplies	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
Subscriptions/Dues/Training	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Training	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Capital Outlay										
Capital Improvement - Other	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Capital Improvement - Machinery	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Additional Personal Services from Growth	4.65%	5.94%	7.11%	8.11%	8.66%	8.41%	6.83%	6.69%	6.56%	6.45%
Additional O&M Expense from Growth	4.24%	4.29%	4.32%	4.32%	4.32%	4.20%	4.19%	4.18%	4.18%	4.17%

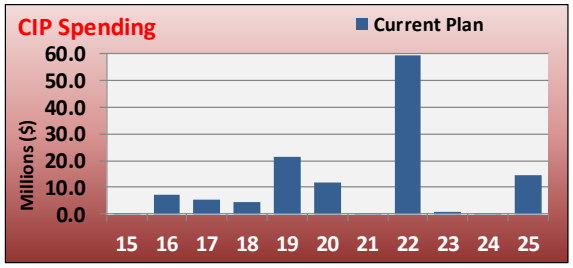
(1) FY 2015 cost requirements are per the FY 2015 Budget.

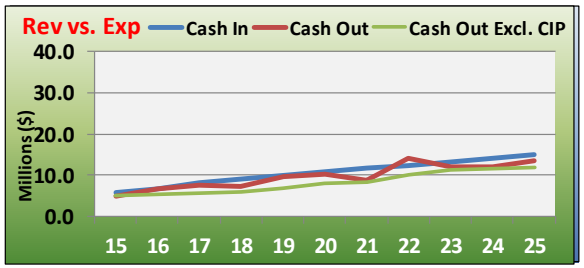
FINANCIAL ANALYSIS AND MANAGEMENT SYSTEM (FAMS) SUMMARY

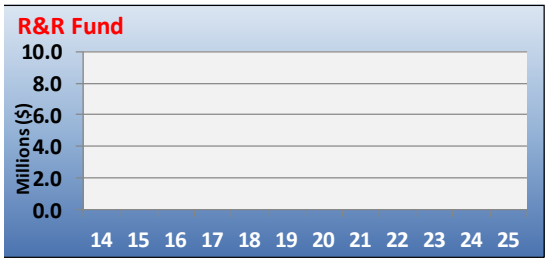
SAVE CALC ROLL

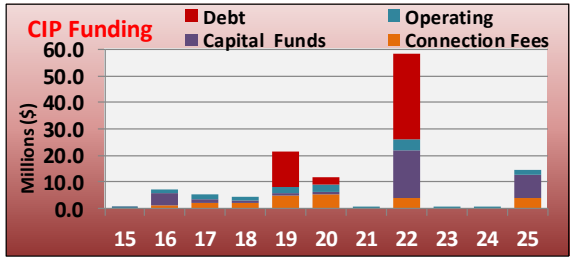
	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Cumulative Change	
Water Rate Increases	0.00%	15.00%	15.00%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	42.69%	60.90%
Sewer Rate Increases	0.00%	15.00%	15.00%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	*OMV FY16* ▶	100.0%
Rate Covenant	3.85	5.62	7.78	8.87	4.47	3.39	3.49	2.16	1.90	2.05	2.21		
SRF Coverage	3.93	6.51	7.48	8.74	8.50	8.60	9.47	7.18	6.55	7.86	9.21		
CIP $ Redistribution ▶	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	*Landstone*	FY 2022
CIP Execution % ▶	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	*Growth %*	100%
Operating Reserve Mo ▶	3	3	5	7	9	9	9	9	9	9	9		
Average Bill (5,000 gals.)	$37.84	43.54	50.11	51.37	52.67	54.00	55.33	56.69	58.12	59.56	61.02	*Elasticity*	0.0%

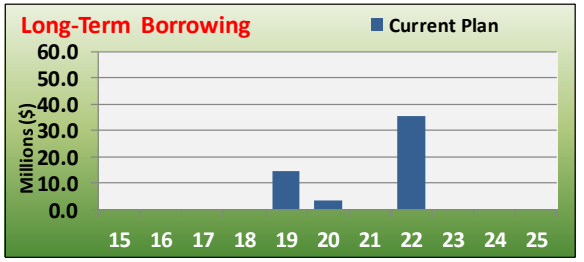












			FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
1	**Rate Revenue Subject to Growth & Rate Adjustments**												
2	Fixed and Usage Charge Rate Revenue		$ 4,581,834	4,581,834	5,612,765	6,948,686	7,730,031	8,598,001	9,557,738	10,314,707	11,103,551	11,925,390	12,781,382
3	Additional Rate Revenue From Partial PY Rate Increase		-	-	-	-	-	-	-	-	-	-	-
4	Additional Revenue From Growth		-	298,832	429,570	592,807	658,263	726,621	505,391	518,026	530,976	544,251	557,857
5	Weather Normalization And Other Adjustments		-	-	-	-	-	-	-	-	-	-	-
6	Subtotal: Base Revenue With Growth		$ 4,581,834	4,880,665	6,042,336	7,541,493	8,388,294	9,324,622	10,063,129	10,832,732	11,634,527	12,469,641	13,339,239
7	Weighted Average Rate Increase		0.00%	15.00%	15.00%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
8	Additional Rate Revenue From Rate Increase		-	732,100	906,350	188,537	209,707	233,116	251,578	270,818	290,863	311,741	333,481
9	Price Elasticity Adjustment		-	-	-	-	-	-	-	-	-	-	-
10	**Total Rate Revenue**		**$ 4,581,834**	**5,612,765**	**6,948,686**	**7,730,031**	**8,598,001**	**9,557,738**	**10,314,707**	**11,103,551**	**11,925,390**	**12,781,382**	**13,672,720**
11	**Plus: Other Operating Revenue**												
12	Other Operating Revenue		$ 851,000	854,647	859,205	864,676	870,602	876,984	881,314	885,645	889,975	894,306	898,637
13	**Equals: Total Operating Revenue**		**$ 5,432,834**	**6,467,412**	**7,807,891**	**8,594,706**	**9,468,603**	**10,434,721**	**11,196,021**	**11,989,196**	**12,815,366**	**13,675,688**	**14,571,357**
14	**Less: Operating Expenses**												
15	Personal Services		$(1,528,931)	(1,606,178)	(1,705,257)	(1,827,509)	(1,974,624)	(2,142,613)	(2,324,951)	(2,488,530)	(2,661,033)	(2,843,036)	(3,035,146)
16	Variable O&M Expenses		-	-	-	-	-	-	-	-	-	-	-
17	Fixed O&M Expenses		(1,782,138)	(1,758,946)	(1,813,261)	(1,869,363)	(1,927,315)	(1,987,180)	(2,049,026)	(2,112,920)	(2,178,934)	(2,247,142)	(2,317,621)
18	**Equals: Net Operating Income**		**$ 2,121,765**	**3,102,288**	**4,289,374**	**4,897,834**	**5,566,664**	**6,304,928**	**6,822,045**	**7,387,745**	**7,975,398**	**8,585,510**	**9,218,589**
19	**Plus: Non-Operating Income/(Expense)**												
20	Non-Operating Revenue		$ -	-	-	-	-	-	-	-	-	-	-
21	Interest Earned On Fund Balances		7,940	7,792	10,879	19,365	38,841	68,472	94,202	118,085	131,094	160,444	189,917
22	Water Connection/TIE Fees		366,714	498,650	635,859	778,287	860,007	944,693	653,861	666,940	680,278	693,883	707,761
23	Sewer Connection/TIE Fees		714,642	971,755	1,239,144	1,516,704	1,675,958	1,840,991	1,274,226	1,299,714	1,325,707	1,352,220	1,379,266
24	Capital Projects Fund		540,000	3,583,000	-	-	-	-	-	-	-	-	-
25	Transfers In		-	-	-	-	-	-	-	-	-	-	-
26	**Equals: Net Income**		**$ 3,751,061**	**8,163,485**	**6,175,257**	**7,212,190**	**8,141,469**	**9,159,083**	**8,844,334**	**9,472,485**	**10,112,478**	**10,792,057**	**11,495,533**
27	**Less: Revenues Excluded From Coverage Test**												
28	Connection/TIE Fees		$(1,275,474)	(1,734,362)	(2,211,592)	(2,706,973)	(2,991,204)	(3,285,751)	(2,274,205)	(2,319,695)	(2,366,087)	(2,413,406)	(2,461,676)
29	Other Capital Funding Sources		(752,730)	(4,143,907)	(692,231)	(1,665,562)	(978,393)	(1,508,224)	(901,039)	(17,984,406)	(994,088)	(1,043,288)	(9,561,555)
30	Transfers In		-	-	-	-	-	-	-	-	-	-	-
31	**Equals: Net Income Available For Debt Service**		**$ 1,722,857**	**2,285,216**	**3,271,434**	**2,839,655**	**4,171,872**	**4,365,108**	**5,669,089**	**(10,831,616)**	**6,752,303**	**7,335,363**	**(527,699)**
32	**Senior-Lien Debt Service Coverage Test**												
33	Existing Debt Service		$ 553,561	553,246	552,796	554,202	553,448	553,559	553,509	276,315	-	-	-
34	New Debt Service		-	-	-	-	-	-	-	-	-	-	-
35	Cumulative New Debt Service		-	-	-	-	699,384	1,325,142	1,427,104	3,190,947	4,257,810	4,257,810	4,257,810
36	**Total Senior-Lien Debt Service**		**$ 553,561**	**553,246**	**552,796**	**554,202**	**1,252,832**	**1,878,700**	**1,980,613**	**3,467,262**	**4,257,810**	**4,257,810**	**4,257,810**
37	**Calculated Debt Service Coverage (Test I)**	1.15 Req.	**3.85**	**5.62**	**7.78**	**8.87**	**4.47**	**3.39**	**3.49**	**2.16**	**1.90**	**2.05**	**2.21**
38	**Calculated Debt Service Coverage (Test II)**	1.25 Req.	**6.15**	**8.76**	**11.78**	**13.76**	**6.86**	**5.14**	**4.64**	**2.83**	**2.46**	**2.62**	**2.79**

Schedule 8 – Pro Forma

		FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
39	**Subordinate Debt Service**											
40	Total Subordinate Debt Service	$ 379,915	379,915	489,915	489,915	489,915	489,915	489,915	489,915	489,915	489,915	489,915
41	**Calculated Subordinate Debt Coverage**	**3.93**	**6.51**	**7.48**	**8.74**	**8.50**	**8.60**	**9.47**	**7.18**	**6.55**	**7.86**	**9.21**
42	**Cash Flow Test**											
43	Net Income Available For Debt Service	$ 2,129,705	3,110,081	4,300,253	4,917,199	5,605,505	6,373,400	6,916,247	7,505,831	8,106,492	8,745,954	9,408,506
44	Transfers In	-	-	-	-	-	-	-	-	-	-	-
45	Transfers Out	(350,000)	(771,642)	(848,371)	(941,645)	(1,008,548)	(1,081,183)	(1,159,877)	(1,229,849)	(1,303,010)	(1,379,496)	(1,459,449)
46	Total Debt Service	(553,561)	(553,246)	(552,796)	(554,202)	(1,252,832)	(1,878,700)	(1,980,613)	(3,467,262)	(4,257,810)	(4,257,810)	(4,257,810)
47	Total SRF Debt Service	(379,915)	(379,915)	(489,915)	(489,915)	(489,915)	(489,915)	(489,915)	(489,915)	(489,915)	(489,915)	(489,915)
48	Total Short-Term Debt Service	-	-	-	-	-	-	-	-	-	-	-
48	Payment of Debt Service With Water Connection/TIE Fees	-	-	-	-	-	-	-	-	-	-	-
49	Payment of Debt Service With Sewer Connection/TIE Fees	-	-	-	-	-	-	-	-	-	-	-
50	Capital Outlay	(333,895)	(254,530)	(259,621)	(264,813)	(270,109)	(275,511)	(281,022)	(286,642)	(292,375)	(298,222)	(304,187)
51	**Net Cash Flow**	**$ 512,334**	**1,150,748**	**2,149,551**	**2,666,624**	**2,584,101**	**2,648,090**	**3,004,820**	**2,032,163**	**1,763,382**	**2,320,510**	**2,897,145**
52	**Unrestricted Working Capital Reserve Fund Test**											
53	Balance At Beginning Of Fiscal Year	$ 918,108	1,385,441	1,264,140	1,478,849	2,888,523	2,926,454	3,097,345	5,564,865	3,451,088	4,390,920	6,124,180
54	Cash Flow Surplus/(Deficit)	512,334	1,150,748	2,149,551	2,666,624	2,584,101	2,648,090	3,004,820	2,032,163	1,763,382	2,320,510	2,897,145
55	Cash Flow Deficit Paid with Unrestricted Reserve Fund Balance	-	-	-	-	-	-	-	-	-	-	-
56	Projects Designated to be Paid with Cash	(45,000)	(1,272,050)	(661,003)	(1,256,950)	(739,782)	(2,234,552)	(537,300)	(2,428,020)	(823,550)	(587,250)	(1,568,448)
57	Projects Paid with Unrestricted Reserve Fund Balance	-	-	(1,273,839)	-	(1,806,388)	(242,647)	-	(1,717,920)	-	-	-
58	**Balance At End Of Fiscal Year**	**$ 1,385,441**	**1,264,140**	**1,478,849**	**2,888,523**	**2,926,454**	**3,097,345**	**5,564,865**	**3,451,088**	**4,390,920**	**6,124,180**	**7,452,878**
59	Minimum Working Capital Reserve Target	827,767	841,281	1,466,049	2,156,509	2,926,454	3,097,345	3,280,482	3,451,088	3,629,976	3,817,634	4,014,576
60	**Excess Working Capital Above Target**	**$ 557,674**	**422,859**	**12,800**	**732,015**	**-**	**-**	**2,284,383**	**-**	**760,944**	**2,306,547**	**3,438,302**

CIP Funding Sources:	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Water Connection Fees	$ 130,000	746,750	932,507	779,029	447,923	1,358,840	-	1,328,858	-	-	2,107,624
Sewer Connection Fees	-	309,000	1,236,596	1,236,074	4,393,162	1,854,577	-	2,583,601	-	-	-
Capital Projects Fund	-	4,123,000	-	-	-	-	-	-	-	-	-
R&R Fund	115,000	620,518	1,410,072	939,583	754,001	960,210	-	18,119,251	-	-	8,923,987
Revenue Fund	-	-	1,273,839	-	1,806,388	242,647	-	1,717,920	-	-	-
SRF Proceeds	-	-	-	-	-	-	-	-	-	-	-
Debt Proceeds	-	-	-	-	13,346,449	3,050,378	-	31,916,997	-	-	-
Projects Designated To Be Paid With Cash	45,000	1,272,050	661,003	1,256,950	739,782	2,234,552	537,300	2,428,020	823,550	587,250	1,568,448
Total CIP Funding Sources	**$ 355,000**	**7,400,550**	**5,514,017**	**4,376,372**	**21,532,498**	**11,958,562**	**537,300**	**59,544,300**	**823,550**	**587,250**	**14,457,408**
Total CIP Input	355,000	7,400,550	5,514,017	4,376,372	21,532,498	11,958,562	537,300	59,544,300	823,550	587,250	14,457,408
Variance	$ -	-	-	-	-	-	-	-	-	-	-

Schedule 10 – Projection of Long-Term Borrowing

			FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Term (Years)			20	20	20	20	20	20	20	20	20	20	20
Interest Rate			3.75%	4.00%	4.25%	4.50%	4.75%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Sources of Funds													
Par Amount			$ -	-	-	-	14,723,874	3,371,487	-	35,276,856	-	-	-
Uses of Funds													
Proceeds			$ -	-	-	-	13,346,449	3,050,378	-	31,916,997	-	-	-
Cost of Issuance	1.50%	of Par	-	-	-	-	220,858	50,572	-	529,153	-	-	-
Underwriter's Discount	$0.00	per $1,000	-	-	-	-	-	-	-	-	-	-	-
Bond Insurance	-	times total Debt Service	-	-	-	-	-	-	-	-	-	-	-
Capitalized Interest	0	Years Interest	-	-	-	-	-	-	-	-	-	-	-
Debt Service Surety	0.00%	of Debt Service	-	-	-	-	-	-	-	-	-	-	-
Debt Service Reserve	1	Years of Debt Service	-	-	-	-	1,156,567	270,537	-	2,830,706	-	-	-
Other Costs			-	-	-	-	-	-	-	-	-	-	-
Total Uses			$ -	-	-	-	14,723,874	3,371,487	-	35,276,856	-	-	-
1 Year Interest			$ -	-	-	-	699,384	168,574	-	1,763,843	-	-	-
Annual Debt Service			**$ -**	**-**	**-**	**-**	**1,156,567**	**270,537**	**-**	**2,830,706**	**-**	**-**	**-**
Total Debt Service			$ -	-	-	-	23,131,344	5,410,737	-	56,614,124	-	-	-
Cumulative New Annual Debt Service [1]			**$ -**	**-**	**-**	**-**	**699,384**	**1,325,142**	**1,427,104**	**3,190,947**	**4,257,810**	**4,257,810**	**4,257,810**

(1) Cumulative new annual debt service assumes interest-only payments in first year of debt issuance.

Schedule 11 – Funding Summary by Fund

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
WATER CONNECTION FEES											
BALANCE AT BEGINNING OF FISCAL YEAR	$ 305,925	543,700	296,648	742	3	414,147	3,106	661,918	4,964	690,419	1,399,863
ADDITIONAL ANNUAL REVENUES	366,714	498,650	635,859	778,287	860,007	944,693	653,861	666,940	680,278	693,883	707,761
LESS: PAYMENT OF DEBT SERVICE	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL	$ 672,639	1,042,349	932,507	779,029	860,010	1,358,840	656,967	1,328,858	685,243	1,384,302	2,107,624
LESS: RESTRICTED FUNDS	-	-	-	-	-	-	-	-	-	-	-
TOTAL AMOUNT AVAILABLE FOR PROJECTS	$ 672,639	1,042,349	932,507	779,029	860,010	1,358,840	656,967	1,328,858	685,243	1,384,302	2,107,624
AMOUNT PAID FOR PROJECTS	(130,000)	(746,750)	(932,507)	(779,029)	(447,923)	(1,358,840)	-	(1,328,858)	-	-	(2,107,624)
SUBTOTAL	$ 542,639	295,599	-	-	412,087	-	656,967	-	685,243	1,384,302	-
ADD BACK: RESTRICTED FUNDS	-	-	-	-	-	-	-	-	-	-	-
PLUS: INTEREST EARNINGS	1,061	1,049	742	3	2,060	3,106	4,951	4,964	5,177	15,560	10,499
LESS: INTEREST ALLOCATED TO CASH FLOW	-	-	-	-	-	-	-	-	-	-	-
BALANCE AT END OF FISCAL YEAR	$ 543,700	296,648	742	3	414,147	3,106	661,918	4,964	690,419	1,399,863	10,499
SEWER CONNECTION FEES											
BALANCE AT BEGINNING OF FISCAL YEAR	$1,016,825	1,734,902	2,402,823	2,417,392	2,717,205	13,586	102	1,283,886	9,629	1,345,424	2,727,966
ADDITIONAL ANNUAL REVENUES	714,642	971,755	1,239,144	1,516,704	1,675,958	1,840,991	1,274,226	1,299,714	1,325,707	1,352,220	1,379,266
LESS: PAYMENT OF DEBT SERVICE	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL	$1,731,467	2,706,657	3,641,967	3,934,096	4,393,162	1,854,577	1,274,328	2,583,601	1,335,336	2,697,643	4,107,232
LESS: RESTRICTED FUNDS	-	-	-	-	-	-	-	-	-	-	-
TOTAL AMOUNT AVAILABLE FOR PROJECTS	$1,731,467	2,706,657	3,641,967	3,934,096	4,393,162	1,854,577	1,274,328	2,583,601	1,335,336	2,697,643	4,107,232
AMOUNT PAID FOR PROJECTS	-	(309,000)	(1,236,596)	(1,236,074)	(4,393,162)	(1,854,577)	-	(2,583,601)	-	-	-
SUBTOTAL	$1,731,467	2,397,657	2,405,371	2,698,022	-	-	1,274,328	-	1,335,336	2,697,643	4,107,232
ADD BACK: RESTRICTED FUNDS	-	-	-	-	-	-	-	-	-	-	-
PLUS: INTEREST EARNINGS	3,435	5,166	12,020	19,183	13,586	102	9,558	9,629	10,087	30,323	51,264
LESS: INTEREST ALLOCATED TO CASH FLOW	-	-	-	-	-	-	-	-	-	-	-
BALANCE AT END OF FISCAL YEAR	$1,734,902	2,402,823	2,417,392	2,717,205	13,586	102	1,283,886	9,629	1,345,424	2,727,966	4,158,496
WATER TIE FEES											
BALANCE AT BEGINNING OF FISCAL YEAR	$ 157,987	287,662	488,213	828,084	1,247,821	1,672,799	12,546	361,448	722,558	1,096,199	1,482,700
ADDITIONAL ANNUAL REVENUES	194,118	263,957	336,588	411,982	455,240	500,068	346,118	353,041	360,101	367,303	374,650
LESS: PAYMENT OF DEBT SERVICE	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL	$ 352,105	551,619	824,801	1,240,066	1,703,061	2,172,867	358,664	714,489	1,082,660	1,463,502	1,857,349
LESS: RESTRICTED FUNDS	-	-	-	-	-	-	-	-	-	-	-
TOTAL AMOUNT AVAILABLE FOR PROJECTS	$ 352,105	551,619	824,801	1,240,066	1,703,061	2,172,867	358,664	714,489	1,082,660	1,463,502	1,857,349
AMOUNT PAID FOR PROJECTS	(65,000)	(64,375)	-	-	(44,792)	(2,172,867)	-	-	-	-	(1,857,349)
SUBTOTAL	$ 287,105	487,244	824,801	1,240,066	1,658,269	-	358,664	714,489	1,082,660	1,463,502	-
ADD BACK: RESTRICTED FUNDS	-	-	-	-	-	-	-	-	-	-	-
PLUS: INTEREST EARNINGS	556	969	3,283	7,756	14,530	12,546	2,784	8,070	13,539	19,198	11,120
LESS: INTEREST ALLOCATED TO CASH FLOW	-	-	-	-	-	-	-	-	-	-	-
BALANCE AT END OF FISCAL YEAR	$ 287,662	488,213	828,084	1,247,821	1,672,799	12,546	361,448	722,558	1,096,199	1,482,700	11,120

Schedule 11 – Funding Summary by Fund

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
SEWER TIE FEES											
BALANCE AT BEGINNING OF FISCAL YEAR	$ 435,095	649,178	675,240	1,048,399	1,344,083	1,858,906	2,353,790	2,771,245	1,742,080	2,165,798	2,603,824
ADDITIONAL ANNUAL REVENUES	212,730	289,266	368,860	451,483	498,888	548,014	379,303	386,890	394,628	402,520	410,571
LESS: PAYMENT OF DEBT SERVICE	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL	$ 647,825	938,444	1,044,101	1,499,882	1,842,971	2,406,921	2,733,093	3,158,135	2,136,708	2,568,319	3,014,395
LESS: RESTRICTED FUNDS	-	-	-	-	-	-	-	-	-	-	-
TOTAL AMOUNT AVAILABLE FOR PROJECTS	$ 647,825	938,444	1,044,101	1,499,882	1,842,971	2,406,921	2,733,093	3,158,135	2,136,708	2,568,319	3,014,395
AMOUNT PAID FOR PROJECTS	-	(264,857)	-	(164,737)	-	(84,491)	-	(1,449,653)	-	-	-
SUBTOTAL	$ 647,825	673,587	1,044,101	1,335,145	1,842,971	2,322,430	2,733,093	1,708,482	2,136,708	2,568,319	3,014,395
ADD BACK: RESTRICTED FUNDS	-	-	-	-	-	-	-	-	-	-	-
PLUS: INTEREST EARNINGS	1,354	1,653	4,298	8,938	15,935	31,360	38,152	33,598	29,091	35,506	42,137
LESS: INTEREST ALLOCATED TO CASH FLOW	-	-	-	-	-	-	-	-	-	-	-
BALANCE AT END OF FISCAL YEAR	$ 649,178	675,240	1,048,399	1,344,083	1,858,906	2,353,790	2,771,245	1,742,080	2,165,798	2,603,824	3,056,532
CAPITAL PROJECTS FUND											
BALANCE AT BEGINNING OF FISCAL YEAR	$ -	540,000	-	-	-	-	-	-	-	-	-
ADDITIONAL ANNUAL REVENUES	540,000	3,583,000	-	-	-	-	-	-	-	-	-
LESS: PAYMENT OF DEBT SERVICE	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL	$ 540,000	4,123,000	-	-	-	-	-	-	-	-	-
LESS: RESTRICTED FUNDS	-	-	-	-	-	-	-	-	-	-	-
TOTAL AMOUNT AVAILABLE FOR PROJECTS	$ 540,000	4,123,000	-	-	-	-	-	-	-	-	-
AMOUNT PAID FOR PROJECTS	-	(4,123,000)	-	-	-	-	-	-	-	-	-
SUBTOTAL	$ 540,000	-	-	-	-	-	-	-	-	-	-
ADD BACK: RESTRICTED FUNDS	-	-	-	-	-	-	-	-	-	-	-
PLUS: INTEREST EARNINGS	675	675	-	-	-	-	-	-	-	-	-
LESS: INTEREST ALLOCATED TO CASH FLOW	(675)	(675)	-	-	-	-	-	-	-	-	-
BALANCE AT END OF FISCAL YEAR	$ 540,000	-	-	-	-	-	-	-	-	-	-
R&R FUND											
BALANCE AT BEGINNING OF FISCAL YEAR	$1,550,578	1,435,578	1,086,702	-	274,497	-	-	521,736	-	599,460	1,240,228
ADDITIONAL ANNUAL REVENUES	-	271,642	323,371	1,214,079	479,505	960,210	521,736	17,597,515	599,460	640,768	9,150,984
LESS: PAYMENT OF DEBT SERVICE	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL	$1,550,578	1,707,220	1,410,072	1,214,079	754,001	960,210	521,736	18,119,251	599,460	1,240,228	10,391,212
LESS: RESTRICTED FUNDS	-	-	-	-	-	-	-	-	-	-	-
TOTAL AMOUNT AVAILABLE FOR PROJECTS	$1,550,578	1,707,220	1,410,072	1,214,079	754,001	960,210	521,736	18,119,251	599,460	1,240,228	10,391,212
AMOUNT PAID FOR PROJECTS	(115,000)	(620,518)	(1,410,072)	(939,583)	(754,001)	(960,210)	-	(18,119,251)	-	-	(8,923,987)
SUBTOTAL	$1,435,578	1,086,702	-	274,497	-	-	521,736	-	599,460	1,240,228	1,467,226
ADD BACK: RESTRICTED FUNDS	-	-	-	-	-	-	-	-	-	-	-
PLUS: INTEREST EARNINGS	3,733	3,153	2,717	1,029	1,372	-	3,913	3,913	4,496	13,798	20,306
LESS: INTEREST ALLOCATED TO CASH FLOW	(3,733)	(3,153)	(2,717)	(1,029)	(1,372)	-	(3,913)	(3,913)	(4,496)	(13,798)	(20,306)
BALANCE AT END OF FISCAL YEAR	$1,435,578	1,086,702	-	274,497	-	-	521,736	-	599,460	1,240,228	1,467,226

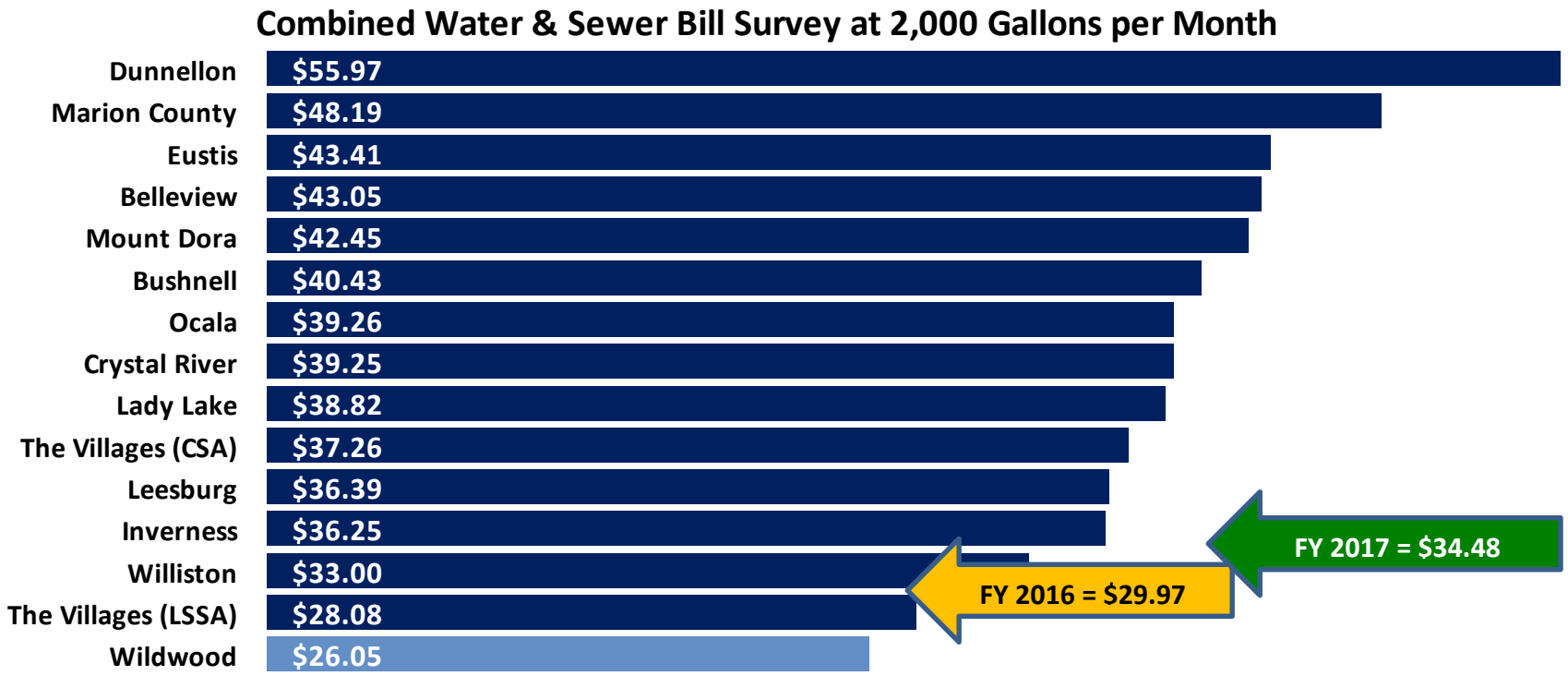
	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
REVENUE FUND											
BALANCE AT BEGINNING OF FISCAL YEAR	$ 918,108	1,385,441	1,264,140	1,478,849	2,888,523	2,926,454	3,097,345	5,564,865	3,451,088	4,390,920	6,124,180
ADDITIONAL ANNUAL REVENUES	512,334	1,150,748	2,149,551	2,666,624	2,584,101	2,648,090	3,004,820	2,032,163	1,763,382	2,320,510	2,897,145
LESS: CASH-FUNDED CAPITAL PROJECTS	(45,000)	(1,272,050)	(661,003)	(1,256,950)	(739,782)	(2,234,552)	(537,300)	(2,428,020)	(823,550)	(587,250)	(1,568,448)
LESS: PAYMENT OF DEBT SERVICE	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL	$1,385,441	1,264,140	2,752,688	2,888,523	4,732,842	3,339,992	5,564,865	5,169,008	4,390,920	6,124,180	7,452,878
LESS: RESTRICTED FUNDS	(827,767)	(841,281)	(1,466,049)	(2,156,509)	(2,926,454)	(3,097,345)	(3,280,482)	(3,451,088)	(3,629,976)	(3,817,634)	(4,014,576)
TOTAL AMOUNT AVAILABLE FOR PROJECTS	$ 557,674	422,859	1,286,639	732,015	1,806,388	242,647	2,284,383	1,717,920	760,944	2,306,547	3,438,302
AMOUNT PAID FOR PROJECTS	-	-	(1,273,839)	-	(1,806,388)	(242,647)	-	(1,717,920)	-	-	-
SUBTOTAL	$ 557,674	422,859	12,800	732,015	-	-	2,284,383	-	760,944	2,306,547	3,438,302
ADD BACK: RESTRICTED FUNDS	827,767	841,281	1,466,049	2,156,509	2,926,454	3,097,345	3,280,482	3,451,088	3,629,976	3,817,634	4,014,576
PLUS: INTEREST EARNINGS	2,879	3,312	6,857	16,378	29,075	45,178	64,967	67,620	58,815	78,863	101,828
LESS: INTEREST ALLOCATED TO CASH FLOW	(2,879)	(3,312)	(6,857)	(16,378)	(29,075)	(45,178)	(64,967)	(67,620)	(58,815)	(78,863)	(101,828)
BALANCE AT END OF FISCAL YEAR	$1,385,441	1,264,140	1,478,849	2,888,523	2,926,454	3,097,345	5,564,865	3,451,088	4,390,920	6,124,180	7,452,878
RESTRICTED RESERVES											
BALANCE AT BEGINNING OF FISCAL YEAR	$ 261,053	261,053	261,053	261,053	261,053	1,417,620	1,688,157	1,688,157	4,518,863	4,518,863	4,518,863
ADDITIONAL FUNDS:	-	-	-	-	-	-	-	-	-	-	-
DEBT SERVICE RESERVE ON NEW DEBT	-	-	-	-	1,156,567	270,537	-	2,830,706	-	-	-
OTHER ADDITIONAL FUNDS	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL	$ 261,053	261,053	261,053	261,053	1,417,620	1,688,157	1,688,157	4,518,863	4,518,863	4,518,863	4,518,863
PLUS: INTEREST EARNINGS	653	653	1,305	1,958	8,393	23,293	25,322	46,553	67,783	67,783	67,783
LESS: INTEREST ALLOCATED TO CASH FLOW	(653)	(653)	(1,305)	(1,958)	(8,393)	(23,293)	(25,322)	(46,553)	(67,783)	(67,783)	(67,783)
BALANCE AT END OF FISCAL YEAR	$ 261,053	261,053	261,053	261,053	1,417,620	1,688,157	1,688,157	4,518,863	4,518,863	4,518,863	4,518,863

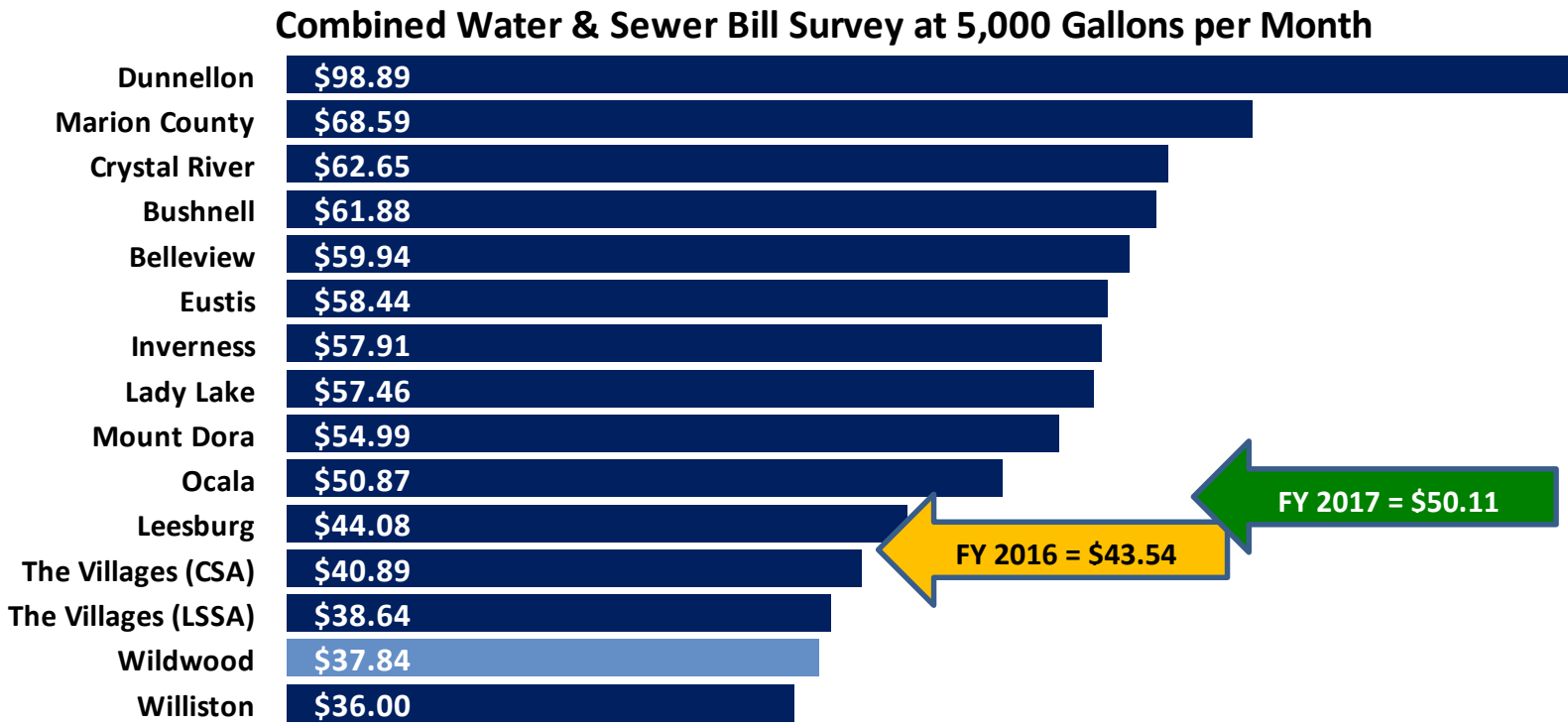
APPENDIX B – FY 2015 WATER & SEWER MONTHLY BILL SURVEYS

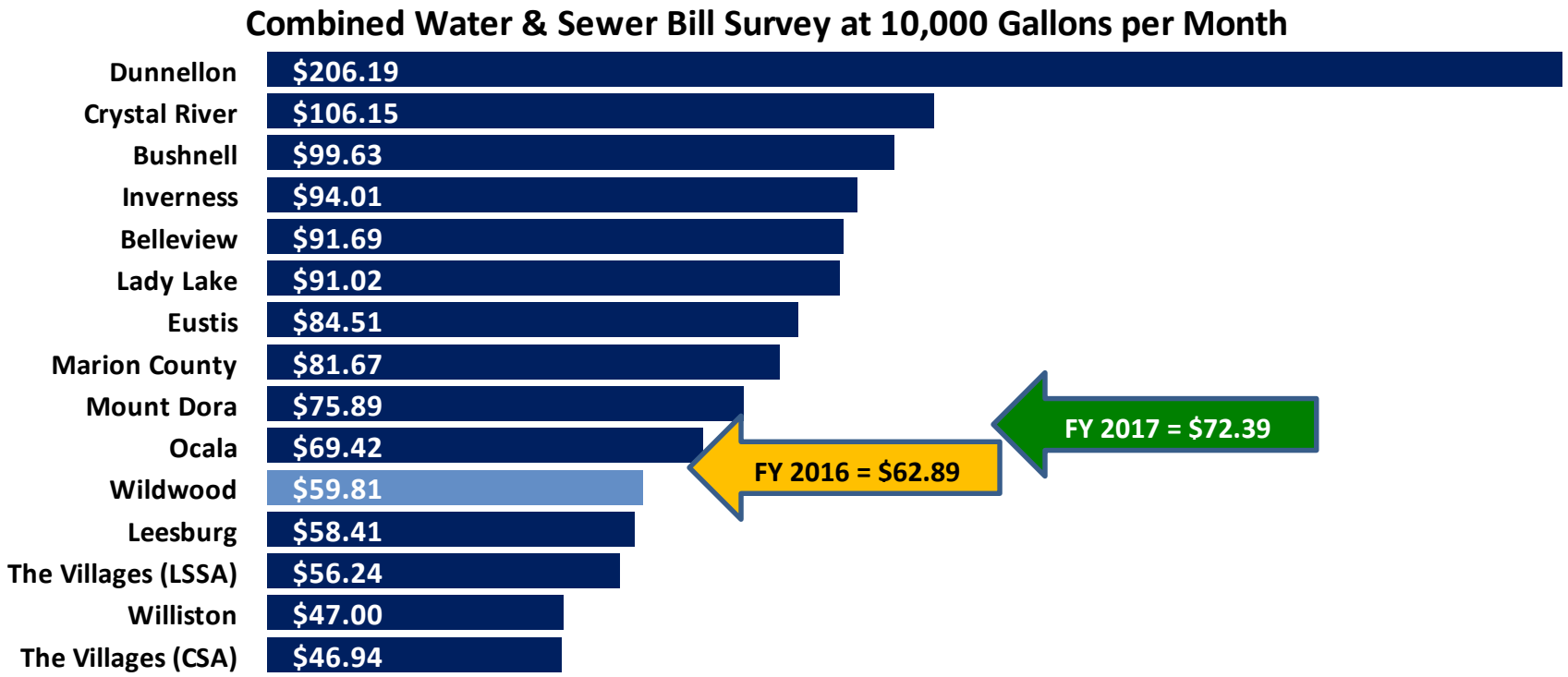
Schedule 1 presents the monthly combined water and sewer bill survey for "low volume" single-family residential customers in the City's surrounding geographic area, assuming consumption of 2,000 gallons per month

Schedule 2 presents the monthly combined water and sewer bill survey for "typical" single-family residential customers in the City's surrounding geographic area, assuming consumption of 5,000 gallons per month

Schedule 3 presents the monthly combined water and sewer bill survey for "high volume" single-family residential customers in the City's surrounding geographic area, assuming consumption of 10,000 gallons per month


Combined Water & Sewer Bill Survey at 2,000 Gallons per Month
Dunnellon $55.97
Marion County $48.19
Eustis $43.41
Belleview $43.05
Mount Dora $42.45
Bushnell $40.43
Ocala $39.26
Crystal River $39.25
Lady Lake $38.82
The Villages (CSA) $37.26
Leesburg $36.39
Inverness $36.25
Williston $33.00
The Villages (LSSA) $28.08
Wildwood $26.05
FY 2017 = $34.48
FY 2016 = $29.97


Combined Water & Sewer Bill Survey at 5,000 Gallons per Month
Dunnellon $98.89
Marion County $68.59
Crystal River $62.65
Bushnell $61.88
Belleview $59.94
Eustis $58.44
Inverness $57.91
Lady Lake $57.46
Mount Dora $54.99
Ocala $50.87
Leesburg $44.08
The Villages (CSA) $40.89
The Villages (LSSA) $38.64
Wildwood $37.84
Williston $36.00
FY 2017 = $50.11
FY 2016 = $43.54


Combined Water & Sewer Bill Survey at 10,000 Gallons per Month
Dunnellon
$206.19
Crystal River
$106.15
Bushnell
$99.63
Inverness
$94.01
Belleview
$91.69
Lady Lake
$91.02
Eustis
$84.51
Marion County
$81.67
Mount Dora
$75.89
Ocala
$69.42
Wildwood
$59.81
Leesburg
$58.41
The Villages (LSSA)
$56.24
Williston
$47.00
The Villages (CSA)
$46.94
FY 2017 = $72.39
FY 2016 = $62.89