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FPSC - COMMISSION CLERK

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

IN RE: Application for certificate to provide wastewater service in Charlotte County, by Environmental Utilities, LLC /

DOCKET NO. 20200226-WS

ENVIRONMENTAL UTILITIES, LLC'S MOTION FOR PARTIAL SUMMARY FINAL ORDER

Environmental Utilities, LLC ("EU") by and through its undersigned attorneys and pursuant to Rule 28-106.204, Florida Administrative Code, hereby files this Motion for Partial Summary Final Order and in support states:

FACTS AND PROCEDURAL HISTORY

1. On October 13, 2020, EU filed its Application for a Wastewater Certificate for certain portions of Charlotte County. On March 8, 2021, EU filed an amendment to its Application to delete from the proposed service area the portion on the mainland, referred to as Cape Haze, leaving only the barrier islands as the proposed service area.

2. The threshold issue in a Certificate proceeding is need for service. Section 367.045(1)(b), Florida Statutes, and 25-30.033(1)(k), Florida Administrative Code. Exhibit "C" to EU's Application sets forth as a basis for need that The Charlotte County Sewer Master Plan has made certain evaluations and concluded that the septic tanks in proposed service area are having significant adverse environmental impacts and recommended that the proposed service area be converted to central wastewater by 2022. The primary protesting party, Palm Island Estates Association, Inc. ("PIE") has asserted as to the issue of need, that EU has not demonstrated that (1) "the current septic systems utilized by the Palm Island Estates development is the proximate cause of pollution" and "the is no evidence of any effluent affecting water systems such that there is no need for service in the particular area." (Pie Objection, Document 02308-2021).

3. Charlotte County adopted a Sewer Master Plan attached hereto as Attachment "A" This Sewer Master Plan is the basis for the County entering into a Bulk Wastewater Agreement with EU for converting septic tanks to central sewer on the islands (This Agreement is attached to the Application as Exhibit "E").[1]

ARGUMENT

4. That motions for summary final order and partial summary final order can be appropriate in PSC administrative proceedings is neither in doubt nor in dispute. As recently as January of this year, in *In re: Application for water and wastewater service in Duval, Baker, and Nassau Counties, by First Coast Regional Utilities, Inc., Docket No. 20190168-WS, Order No. PSC-2021-0054-PCO-WS (January 25, 2021),* the PSC entertained a motion to strike, a motion for summary final order, and a motion for partial summary final order. Each was discussed and decided on the merits, and none was dismissed on procedural grounds. Each can be an appropriate vehicle for resolving issues to which no outstanding facts attach.

5. The *First Coast* case is also highly instructive in its detailed examination of the burden of a fact-laden full case. In *First Coast*, the PSC noted:

> **Standard for Motion for Summary Final Order**
>
> Section 120.57(1)(h), F.S., requires that, in order to grant a motion for summary final order, it must be determined from "pleadings, depositions, answers to interrogatories, and admissions on file, together with affidavits, if any, that no genuine issue as to any material fact exists and that the moving party is entitled as a matter of law to the entry of a final order." This Commission has previously stated that "the standard for granting a summary final order is very high." (footnote omitted)
>
> In general, "a summary judgment should not be granted unless the facts are so crystalized that nothing remains but questions of law," and "must show conclusively the absence of any genuine issue of material fact and the court must

[1] PIE filed an objection to EU's Request for Admissions regarding this document asserting that it was premature since an order establishing procedure had not been issued. Since an OEP is not required before discovery can be initiated the Response is inadequate and thus not a valued objection, thus tantamount to an admission.

> draw every possible inference in favor of the party against whom a summary judgment is sought." *Moore v. Morris (Moore)*, 475 So. 2d 666, 668 (Fla. 1985); see also *City of Clermont, Fla. v. Lake City Util. Servs., Inc.*, 760 So. 2d 1123, 1124 (Fla. 5th DCA 2000), and *Wills v. Sears, Roebuck & Co.*, 351 So. 2d 29 (Fla. 1977). If the record "raises even the slightest doubt" that an issue of material fact may exist, a summary final order is not appropriate. *Albelo v. S. Bell (Albelo)*, 682 So. 2d 1126, 1129 (Fla. 4th DCA 1996). Even if the parties agree as to the facts, "the remedy of summary judgment is not available if different inferences can be reasonably drawn from the uncontroverted facts." *Albelo,* 682 So. 2d at 1129. We have also previously found that "it is premature to decide whether a genuine issue of material fact exists when [a party] has not had the opportunity to complete discovery and file testimony." (footnote omitted). (at p. 4-5)

5. As this Commission acknowledged in the *First Coast* Order, "the purpose of summary final order is to avoid the expense and delay of trial when no dispute exists concerning the material facts." (at p. 5). EU's motion is not dependent upon the resolution of <u>any</u> question of fact - it only requests an acknowledgment that the PSC will accept and follow Charlotte County's Sewer Master Plan in determining the need for central wastewater service on the barrier islands. If the objecting parties have their way, there will be substantial time expense in testimony and evidence as to the underlying facts behind the Sewer Master Plan. The Sewer Master Plan sets forth the substantial environmental evaluation that took place before deciding that certain areas of the County required converting septic tanks to central sewer including EU's proposed service area. The facts substantiating the County's Sewer Master Plan do not need to be litigated. And while typically it may be premature to decide whether genuine issues of material fact exists until after filing testimony and discovery, the nature of the issue of need by acknowledging the Charlotte County Sewer Master Plan as controlling on that issue does not require that delay.

6. Granting EU's motion would not end the case now and would not deprive the protesting parties of their day in court regarding their remaining concerns about the merits of the Application.

7. EU's Motion for a Partial Summary Final Judgment is solely predicated upon facts

"so crystalized that nothing remains but questions of law". EU has not requested the summary disposition of the entire case, but rather a ruling, to the benefit of the parties and the PSC, on the threshold issue in a certificate case.

WHEREFORE, based the argument set forth herein, the PSC should grant this Motion for Partial Summary Order and find that based up the Charlotte County Sewer Master plan that there is a need for central wastewater service in the proposed service area.

Respectfully submitted this 9th day of August, 2021, by:

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CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing has been furnished by E-mail to the following parties this 9th day of August, 2021:

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/s/ Martin S. Friedman
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ATTACHMENT "A"

CHARLOTTE COUNTY SEWER MASTER PLAN

Charlotte County Utilities Department | 2017

JONES EDMUNDS

CHARLOTTE COUNTY FLORIDA 1921

CHARLOTTE COUNTY
SEWER MASTER PLAN

PREPARED FOR:

Charlotte County Utilities Department
25550 Harbor View Road, Suite 1
Port Charlotte, Florida 33980-2503

PREPARED BY:

Jones Edmunds & Associates, Inc.
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Sarasota, Florida 34234

SUBCONSULTANTS:

Raftelis Financial Consultants, Inc.
Giffels-Webster Engineering, Inc.

Certificate of Engineering Authorization #1841

Jones Edmunds Project No.: 03405-022-01

AUTHORIZATION:

The preparation by Jones Edmunds & Associates Inc., 75104 N. Lockwood Ridge Road Sarasota, Florida 34234, of the Fiscal Year (FY) 2016 Sewer Master Plan is authorized by Charlotte County, a political subdivision of the State of Florida, 18500 Murdock Circle, Port Charlotte, Florida 33948-1094, under Purchase Order No. 2016003420.

CERTIFICATIONS & SIGNATURE PAGE

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CHARLOTTE COUNTY GOVERNMENT

Board of County Commissioners
Community Development
Economic Development
Property Appraiser
Public Works
Tourism Development
CCTV
Utilities Department

RESEARCH AND ENVIRONMENTAL INSTITUTIONS

Charlotte Harbor National Estuary Program
Charlotte Soil & Water Conservation District
Florida Atlantic University Harbor Branch Oceanographic Institute
MOTE – Marine Laboratory & Aquarium
Sarasota Operations Coastal Oceans Observation Lab
Water Resources - University of Florida /Institute of Food and Agricultural Sciences Extension
Charlotte Harbor Flatwoods Initiative
Charlotte Harbor Environmental Center

REGULATORY PARTNERS

Florida Department of Environmental Protection
Florida Department of Health
Charlotte County Department of Health
Fish and Wildlife Service Fisheries Program
South Florida Water Management District
Southwest Florida Water Management District

PROFESSIONAL ASSOCIATIONS

Charlotte County Chamber of Commerce
Charlotte County Economic Development Partnership
The Punta Gorda-Port Charlotte-North Port
Association of REALTORS© Inc.

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

LIST OF FIGURES

LIST OF FIGURES (CONTINUED)

LIST OF TABLES

LIST OF TABLES (CONTINUED)

LIST OF ACRONYMS & ABBREVIATIONS

A	
AADF	Annual Average Daily Flow
B	
BCC	Board of County Commissioners
BEBR	Bureau of Economic and Business Research
BOD	Biochemical Oxygen Demand
C	
CAR	Capacity Analysis Report
CBOD	Carbonaceous Biochemical Oxygen Demand (5-day)
CCC	Chlorine Contact Chamber
CCSMP	Charlotte County Sewer Master Plan
CCUD	Charlotte County Utilities Department
CCPNRD	Charlotte County Parks and Natural Resources Division
CHEC	Charlotte Harbor Environmental Center
CHWA	Charlotte Harbor Water Atlas
CIP	Capital Improvement Program
D	
DD	Directional Drill
DMR	Discharge Monitoring Report
DO	Dissolved Oxygen
E	
EOPCC	Engineer's Opinion of Probable Construction Costs
EPA	US Environmental Protection Agency
ERC	Equivalent Residential Connection
ESS	Existing Sewersheds
EWD	Englewood Water District
F	
FAC	Florida Administrative Code
FAC	Florida Association of Counties
FDEP	Florida Department of Environmental Protection
FEMA	Federal Emergency Management Agency
FFWCC	Florida Fish and Wildlife Conservation Commission
FOG	Fats, Oils, and Grease
fps	Feet per Second
FS	Florida Statutes

LIST OF ACRONYMS & ABBREVIATIONS
(CONTINUED)

G	
GDC	General Development Corporation
GDU	General Development Utilities
GIS	Geographical Information System
gpd	Gallons per Day
gph	Gallons per Hour
GST	Ground Storage Tank
H	
HAB	Harmful Algae Bloom
HDPE	High-Density Polyethylene
HMI	Human Machine Interface
HUD	US Department of Housing and Urban Development
I	
I&I	Infiltration and Inflow
IR	Internal Recycle
L	
LF	Linear Feet
LS	Lift Station
M	
MADF	Monthly Average Daily Flow
MBR	Membrane Reactor
MCC	Motor Control Center
MG	Million Gallons
MGD	Million Gallons per Day
mg/L	Milligrams per Liter
MHI	Median Household Income
MHP	Mobile Home Park
MLE	Modified Ludzack-Ettinger
MMADF	Maximum Monthly Average Daily Flow
MSBU	Municipal Service Benefit Unit
MTMADF	Maximum 3-Month Average Daily Flow
N	
N	Nitrogen
NH^4	Ammonia
NELAP	National Environmental Laboratory Accreditation Program
NNC	Numeric Nutrient Criteria
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service

LIST OF ACRONYMS & ABBREVIATIONS
(CONTINUED)

O	
O^2	Oxygen
O.C.	Open Cut
O&M	Operation and Maintenance
ORP	Oxygen Reduction Potential
OSTDS	Onsite Sewage Treatment and Disposal System
OWTS	Onsite Wastewater Treatment Systems
P	
PAR	Public Access Reuse
PER	Preliminary Engineering Report
PLC	Programmable Logic Controller
PSC	Public Service Commission
PVC	Polyvinyl Chloride
R	
RAS	Return-Activated Sludge
RCW	Reclaimed Water
RO	Reverse Osmosis
R&R	Renewal and Replacements
S	
SCADA	Supervisory Control and Data Acquisition
SMP	Sewer Master Plan
SR	State Road
SRF	State Revolving Fund
STEP	Septic Tank Effluent Pumping
STP	Sewage Treatment Plant
SWFRPC	Southwest Florida Regional Planning Council
SWFWMD	Southwest Florida Water Management District
T	
TMADF	Three Month Average Daily Flow
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TPY	Tons per Year
TSS	Total Suspended Solids
U	
µg/L	Micrograms per Liter
UIC	Underground Injection Control
USDA	US Department of Agriculture
UV	Ultraviolet
V	
VFD	Variable-Frequency Drive
W	
WAS	Waste-Activated Sludge
WIFIA	Water Infrastructure Finance and Innovation Act
WRF	Water Reclamation Facility
WWTP	Wastewater Treatment Plant

DEFINITIONS

A	
Activated Sludge	Wastewater treatment process that uses aeration to promote the growth and cultivation of aerobic microorganisms that are used to breakdown, convert and remove/reduce undesirable wastewater constituents.
Air Resources Management System (ARMS) Facilities	ARMS Facilities are point locations of the businesses or facilities in the State of Florida that have requested permitting from FDEP's Division of Air Resource Management. Permits are for major and minor stationary sources of air pollutants that specify emission limits and requirements for construction and operation.
B	
Backflow Prevention	A type of valve that is typically used to prevent liquid from backflowing into a pipe that supplies potable water potentially contaminating the water supply.
Biogas	Byproduct of wastewater treatment that can be used as fuel; similar to natural gas.
Biosolids	Organic byproduct of wastewater treatment; biosolids resemble dark soil and can be used as a nutrient-rich soil amendment.
Biological Oxygen Demand	The amount of dissolved oxygen utilized by aquatic microorganisms.
C	
Capital Cost	Cost of equipment and materials that exclude mark-ups of provided services such as permitting, mobilization, overhead and profit and administrative fees.
Capacity Analysis Report	A report that provides an evaluation and comparison of the current and future flows to a treatment plant (water and/or wastewater) permitted and rated capacities of the different components of the treatment plants to provide timely planning of future improvements or expansions to maintain compliance with the latest rules and regulations.
Cassette	A unit that contains several of the same components.
Centralized Sewer	Sewer conveyance system for transporting sewer from houses, commercial, industrial, and institutional buildings through pipes and pumps to facilities for treatment and disposal.
Certificated Area	An identified geographic area and boundary where an entity has exclusive rights to provide water and wastewater utility services.
Cogeneration	The process in which an internal combustion engine is used to produce heat and electrical power from biogas.
Collection System	A network of pipes used to convey sewage from homes to pump stations under pressure, vacuum, or gravity conditions.
Consumer Confidence Report	Economic indicator that measures the degree of optimism that consumers feel about the overall state of the economy and their personal financial situation.
D	
Dissolved Oxygen	The amount of oxygen gas dissolved in a given volume of water at a particular temperature and pressure, often expressed as a concentration in parts of oxygen per million parts of water.
Directional Drill	Also referred to as directional boring or HDD, a trenchless method of installing underground pipe, conduit, or cable in a shallow arc along a prescribed bore path by using a surface-launched drilling rig, with minimal impact on the surrounding area.

DEFINITIONS (CONTINUED)

E	
Effluent	Flow exiting a specified process or location.
F	
Final Effluent	Treated water that is discharged out of the water reclamation facility.
Flood Irrigation	A method of irrigating in which water is conveyed through small trenches running through crops. Also called surface or furrow irrigation.
Flow	The volume of fluid moving at a continuous rate; commonly measured in millions of gallons per day (MGD) at water reclamation facilities or gallons per minute (gpm) at households.
Force Main	A pressure pipe conveying wastewater from the pump station to the water reclamation facility.
G	
Gravity Collection System	A type of collection system in which flow is conveyed by the energy of gravity. This type of system requires piping to be installed at a gradual incline (slope) to convey fluid to pump stations.
Grinder Pump Low-Pressure System	A grinder pump low-pressure system consists of conventional, drain, waste, and vent piping within the residence connected to the packaged grinder pump basin. The grinder pump basin is typically installed outdoors, below grade, and serves one residence. Grinder pumps discharge a finely ground slurry into small-diameter pressure piping. In a completely pressurized collection system, all the piping downstream from the grinder pump (including laterals and mains) will normally be under low pressure (60 psig or less).
H	
Headworks	Structure that is at the beginning of a water reclamation facility that contains equipment designed to mechanically or hydraulically remove influent solids larger than ½ inch and in some instances smaller than ½ inch.
Hypoxic	In ocean and freshwater environments, the term refers to low or depleted oxygen conditions in a water body. Hypoxic conditions occurs due to an imbalance of oxygen between oxygen consuming and producing biological and chemical processes. It is often associated with the overgrowth of certain species of algae, which can lead to oxygen depletion when they die, sink to the bottom, and decompose.
I	
Impaired Water	A waterbody or waterbody segment that does not meet its applicable water quality standards/use (e.g., drinking, fishing, swimming, shellfish harvesting) as set forth in Chapters 62-302 and 62-4, F.A.C., as determined by the methodology in Part IV of Chapter 62-303 of FS, due in whole or in part to discharges of pollutants from point or nonpoint sources.
Infiltration and Inflow (I&I)	Surface water or groundwater that enters the sewer collection system due to pipe age degredation.
L	
Lateral Line	A privately-owned underground sewer pipe connecting a residence, business, industry, institution, etc. to a publicly-owned sewer pipe.
Load	The mass of solids and organic material conveyed into the water reclamation facility as part of wastewater.
M	
Monthly Peaking Factor	The maximum monthly average daily flow divided by the annual average daily flow over the same 12-month period.
MSBU/MSTU	A geographic area within the County created by ordinance and defined by specific boundaries that provides a funding mechanism to provide capital improvements including sanitary sewer, potable water, roadways, and other services or capital improvements. Some examples of services that

DEFINITIONS (CONTINUED)

	MSBUs/MSTUs may provide are road and drainage maintenance, waterway dredging, stormwater utility, fire protection, or sanitation service.
Monitoring Well	A pit or hole sunk into the earth to reach a water supply for the purposes of water level or water quality data collection. Monitoring wells are often used to assess groundwater contamination or flow patterns.
O	
Operation & Maintenance (O&M) Costs	The collective cost associated with the County to operate and maintain the wastewater system components including labor, repair, power, fuel, parts, cleaning, painting, monitoring. Typically measured on an annual basis.
Open Cut	Also referred to as open trench, an excavation in the ground that is open to the sky at its surface as opposed to a tunnel or bore hole that is trenchless
P	
Percent Capacity	The three-month average daily flow divided by the permitted capacity.
Pollutant	Generally any substance, such as a chemical or waste product, introduced into the environment that adversely affects the usefulness of a resource.
Preliminary Treatment	Initial treatment step which removes larger material, like grit and paper, from wastewater.
Pressure Collection System	Sewer collection technology that transmits sewage from homes to a centralized location under positive pressure conditions. Common technologies include grinder pump and STEP sewer collection systems.
Primary Treatment	Gravity-settling step that removes solid material that floats or sinks.
Process Flow Diagram	A visual representation of the general flow of the water treatment facility operations and processes.
Pump Station	A structure that receives sewage from the collection system and pumps it through a force main toward the water reclamation facility for treatment.
R	
Reclaimed Water	Wastewater that has been treated to acceptable standards for use as irrigation, decorative ponds for aesthetic purposes, and other non-potable uses.
S	
Secondary Treatment	Biological treatment step that removes organic matter.
Septic System	A sewage treatment system installed at the site of a residence/home. Septic systems usually include a septic tank to capture solids and a drain field that allows liquids to be absorbed in the soil.
Sewage	Refers to fluids that are produced at homes and conveyed to septic systems or a centralized sewer collection system.
Sewershed	A delineated area in which sewage is collected and conveyed to a single point or outlet.
STEP Sewer	STEP systems use conventional septic tank systems with automatic pumps and control devices to convey the liquid in the septic tank to a low-pressure collection system. CCUD refers the STEP systems as low-pressure systems. The term "low-pressure" will be used for this type of system in this report.
T	
Tertiary Treatment	Filtering, disinfecting, and dechlorinating the wastewater, making it clean for discharge
TMDL	A TMDL is the maximum amount of a given pollutant that a water body can absorb and still maintain its designated uses (e.g., drinking, fishing, swimming, shellfish harvesting).

DEFINITIONS (CONTINUED)

Train	A collection of different stages of treatment that progress through the water reclamation facility. Typically there are more than one in a water reclamation facility for redundant purposes.
Transmission System	A series of force mains that transmit sewage from the pump station to the water reclamation facilities.
Trunk Lines	Serves as the primary force mains that receive and convey sewage from other force mains to the water reclamation facilities.
V	
Vacuum Sewer Collection System	Sewer collection technology that transmits sewage from homes to a centralized location under vacuum (negative pressure) conditions. Vacuum sewers generally include a valve pit serving 2-3 homes, a collection system, and a pump station with vacuum pumps within the service area.
W	
Water Reclamation Facility	A facility where the wastewater from a collection/transmission system flow through a series of processes that removes contaminants from wastewater. It includes physical, chemical, and biological processes to remove these contaminants and produce environmentally safe treated wastewater (or treated effluent) including reclaimed water.
Wastewater	Refers to the influent fluid entering a water reclamation facility, comprised of residential sewage, industrial and commercial waste fluids, or water that has come into contact with these substances, i.e. groundwater/surface water entering the collection system from I&I.

1. INTRODUCTION

OVERVIEW

Chapter 1 defines the purpose and objectives of Charlotte County's Sewer Master Plan (SMP). Creating an affordable, reliable, and efficient wastewater collection and treatment system is key to sustainable population growth, economic development, and the health of the County's natural resources and landscape.

Charlotte Harbor's rich historical and natural beauty features have been key to attracting businesses and residents to the area. Population surges and steady growth continue to impact our water quality. This SMP is a local and regional collaborative effort to improve and protect the region's water quality in an affordable, sustainable, efficient, and reliable manner.

1.1 PURPOSE

The water quality in Charlotte Harbor, Peace River and Myakka River has a significant impact on our community. A regional effort is underway to improve and protect this crucial natural resource which impacts ecosystems, fisheries, marine and wildlife habitats, beaches, coastal wetlands, our tourism industry, home values and overall quality of life.

As a part of this effort, the Charlotte County Board of County Commissioners developed the Blue Water Strategy to ensure and sustain the quality of natural water resources to protect and provide a safe water supply, a recreational haven and an environmental resource. The Blue Water Strategy consists of four key components: wastewater, reclaimed water, stormwater and drinking water. In accordance with the BCC's Blue Water Strategy, the Charlotte County Utilities Department (Utilities) contracted Jones Edmunds & Associates, Inc. to prepare a Sewer Master Plan to reduce pollution by converting septic to sewer (S2S) for the Utilities' service areas.

As per the Blue Water Strategy, the primary goal of this project is to collaboratively develop an initial 15-year plan to implement an affordable, reliable and efficient wastewater collection and treatment system for a sustainable environment.

1.2 BACKGROUND

The Charlotte Harbor area was originally explored by Ponce de Leon in 1515 and 1521. In 1565, Spanish explorers named the area Carlos Bay after the Native American Calusa Tribe who inhabited Florida's southwest coast at the time. Early settlements on the outer islands failed due to confrontations with the local inhabitants, but Spanish and English settlements slowly developed along the banks of the Peace River.

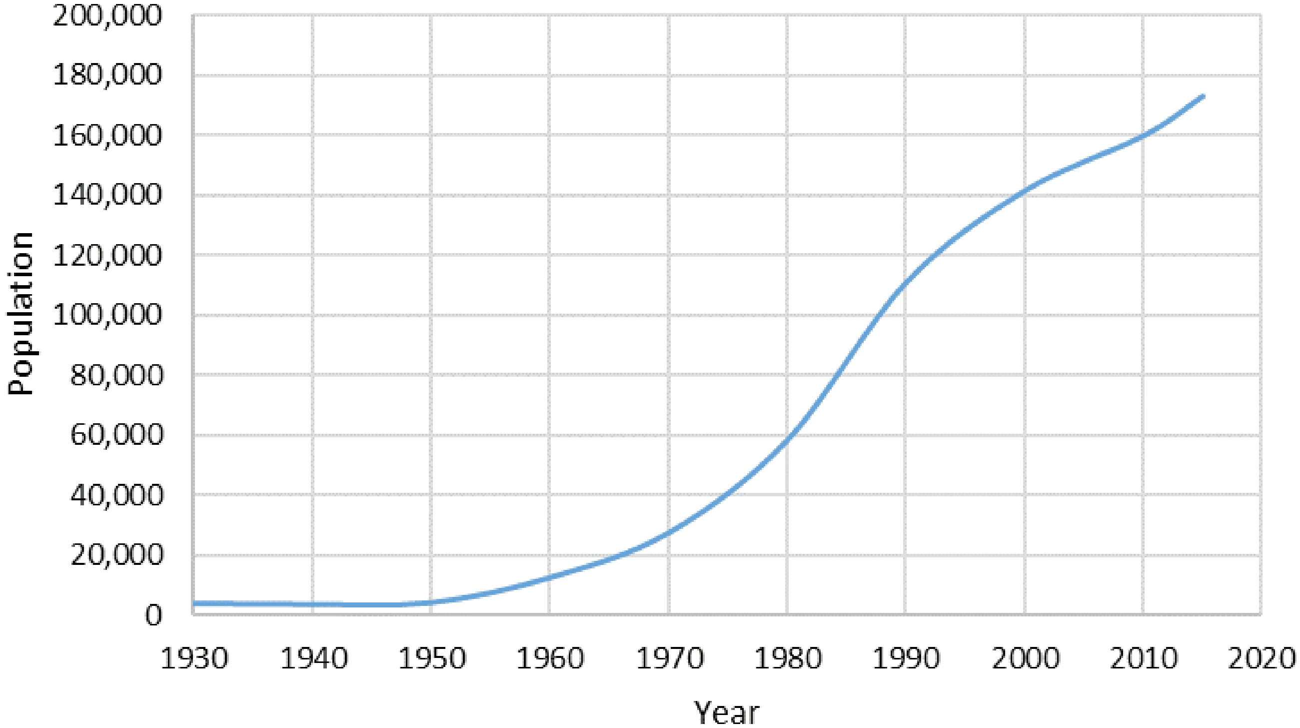
English settlers renamed the bay “Charlotte” in 1775 as a tribute to Queen Charlotte Sophia. In 1819, Florida was ceded to the United States by the Spanish and 26 years later became the 27th state. Col. Isaac Trabue purchased 30 acres on the south shore of Charlotte Harbor and established the Town of Trabue in 1885; today we know it as Punta Gorda.

Real change started to occur in 1886 when the Florida Southern Railroad arrived, connecting the area to the rest of the state. As the century ended, Punta Gorda became an important port for Cuban cattle shipments, and the harbor served as a fishing resource for mullet, Spanish mackerel, and channel bass.

In April 1921, the State approved dividing the original DeSoto County into five counties including Glades, Hardee, Highlands, and Charlotte – which was named by the citizens of Punta Gorda after the bay. Today, Charlotte County covers 694 square miles with approximately 126 square miles of waterways.

Growth took off after the General Development Corporation established the unincorporated community of Port Charlotte in the 1950s, offering affordable homes in Florida’s paradise to the rapidly expanding middle class. Attracted by the beautiful rivers, beaches, estuaries, and resources of Charlotte Harbor, the population grew rapidly and increased from fewer than 5,000 in 1950 to over 170,000 residents today (Figure 1-1).

Figure 1-1 Charlotte County Population by Year



The population increase has impacted water bodies and rivers in Charlotte County. The harbor's historically pristine waters and thriving ecology are being threatened by excess nutrients, bacteria, viruses, dissolved oxygen, and toxic organic compounds; harmful algae blooms (HABs); and decreasing water clarity. The Peace and Myakka Rivers, which flow through Charlotte County and discharge into the Upper Charlotte Harbor, and Charlotte Harbor are now listed as impaired by the US Environmental Protection Agency (EPA) for dissolved oxygen, chlorophyll-a, bacteria in shellfish, and mercury in fish tissue.

Coastal water quality degradation is not limited to Charlotte Harbor. Numerous cities and counties along the Florida coast are experiencing eutrophication and HABs due to nutrient pollution. In 2012, the Florida Department of Environmental Protection (FDEP) adopted specific Numeric Nutrient Criteria (NNC) to protect the State's estuaries and coastal areas from nutrient over-enrichment (Rule 62 302.532, Florida Administrative Code [FAC]). Table 1-1 lists the NNC for Upper Charlotte Harbor and the contributing rivers. Similar coastal areas and estuaries including Tampa Bay, Sarasota Bay, the Florida Keys, and Martin County have already begun implementing sustainable practices to restore their natural water resources and meet NNCs with measureable improvement (Ayers,1998; Lapointe and Herren, 2016).

Table 1-1 Numeric Nutrient Criteria for Charlotte Harbor, Peace River, and Myakka River

Nutrient	Charlotte Harbor Proper	Tidal Peace River	Tidal Myakka River
Total Nitrogen (mg/L)	0.67	1.02	1.08
Total Phosphorus (mg/L)	0.19	0.31	0.50
Chlorophyll-*a* (µg/L)	6.10	11.7	12.6

Note: mg/L = milligrams per liter.
µg/L = micrograms per liter.

The deteriorating water quality in Charlotte County has been largely attributed to nutrient and bacteria loads originating from on-site treatment and disposal systems (OSTDSs), more commonly referred to as septic systems (CHEC, 2003; Tetra Tech, 2013; LaPointe, 2016).

Figure 1-2 displays the number of septic systems installed from 1950 through 2014 within the County's three service areas. The majority of Charlotte County's septic systems were installed in the 1970s and 1980s. Currently, there are approximately 27,000 septic systems within the County's service areas and over 45,000 septic systems County-wide (CCUD, 2010). Septic systems operate through a multi-step process that includes a septic tank and drainfield.

Figure 1-2 *Number of Septic Systems Installed in Charlotte County's Service Area per Year*

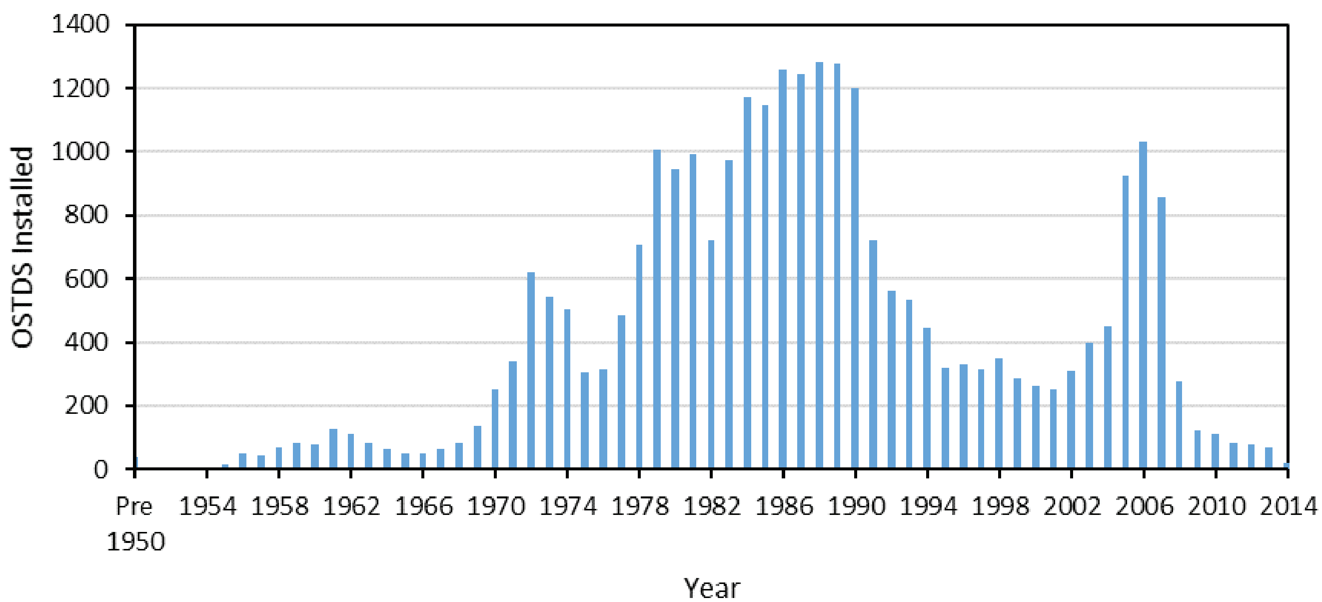


Figure 1-3 depicts how wastewater from the home is collected and conveyed to the septic system through drain pipes.

In the septic tank, solids settle out while the effluent flows through a series of perforated pipes that are embedded in a drainfield generally located in the yard. The effluent percolates into the drainfield and through a deep layer of soil, allowing additional treatment to occur before entering the groundwater.

All septic systems release the nutrients of nitrogen (N) (primarily in the form of ammonia (NH_4^+) and phosphorus to the groundwater from the drainfield. In a properly operating system, nitrifying bacteria in the upper portions of the drainfield / soil convert ammonium (NH_4^+) to nitrate (NO_3^-) in the presence of oxygen (O_2) in porous soils.

As the effluent percolates deeper in the ground, another group of bacteria-denitrifiers convert the NO_3^- to nitrogen gas (N_2 gas), which escapes upward to the atmosphere. The denitrification process occurs under conditions without oxygen present.

FACTORS CONTRIBUTING TO SEPTIC FAILURE

The soil type and separation depth relative to the groundwater table play significant roles in the septic systems' treatment effectiveness. High-porosity soils found in many coastal regions of Florida are saturated due to seasonal high groundwater and are typically unsuitable for providing the necessary treatment time since the effluent travels too quickly through the soil to neutralize bacteria and pollutants in the sewage.

Figure 1-4 shows a Septic System with Non-Ideal Treatment. The high groundwater creates flooded soils, which reduce oxygen transfer and create low oxygen levels leading to incomplete removal of nitrogen. Consequently a limited amount of NH_4^+ will be nitrified to NO_3, and the denitrifying bacteria will not convert the NH_4^+ to nitrogen gas, leaving the NH_4^+ to persist in the groundwater and ultimately impact surrounding surface waters.

In Florida, fill soils are often required for the septic systems to function to meet design parameters and used to increase the separation depth to seasonal high groundwater. To help protect the groundwater, the State changed the septic system requirements in 1983, increasing the requirements from a 6-inch-minimum separation distance between the bottom of the septic tank drainfield and seasonal high water table to a 2-foot-minimum. The EPA recommends a minimum of 5-foot separation to seasonal high groundwater. Additionally, the distance from the septic system to surface waters was increased from a 25- to 50-foot setback to a 50- to 75-foot setback (64E-6.002 Florida Statutes [FS]).

The soil conditions in Charlotte County are classified as A/D indicating high groundwater and drained conditions as discussed in Appendix B. Figure 1-5 displays the groundwater flow patterns throughout Charlotte County. All groundwater in the Mid-County, South-County and east portions of West-County flows into Charlotte Harbor. Therefore, nearly all septic tank effluents ultimately are conveyed to Charlotte Harbor once the groundwater flow reaches the surface water body. In areas of high groundwater, the partially treated sewage exiting septic tanks can comingled with surface water and makes its way to the receiving waters even faster.

A number of researchers have shown correlations between the human population and nitrogen loadings through the use of sewage tracers such as fecal bacteria, nitrogen isotopes, and sucralose concentrations (Lapointe, 2016; Green et al., 2015; Risk et al., 2009; Ursin and Roeder, 2008; and Howarth et al., 2000). Recent studies conducted by the Harbor Branch Oceanographic Institute at Florida Atlantic University (FAU) Marine Ecosystem Health Program have shown that the presence of fecal coliform and concentrations of chlorophyll-a in Charlotte Harbor have increased over the years.

The increased levels of sewage tracers are strongly correlated to the increase in population and septic system installations. The research found ammonia values were well above the macroalgae bloom threshold of 0.014 µg/L, indicating favorable conditions for HABs. Figure 1-6A shows fecal coliform bacteria concentrations are above the surface water quality criteria as established by FDEP in the Florida Statutes to protect the health of swimmers and recreation. Figure 1-6B shows chlorophyll-*a* has consistently increased over time and is well above the NNC value of 6.10 µg/L as shown in Table 1-1.

Note: Chlorophyll-a is used as an indicator of the level of algae growth and biomass within a water body.

Figure 1-3 *Typical Septic System and Drainfield With Ideal Treatment*

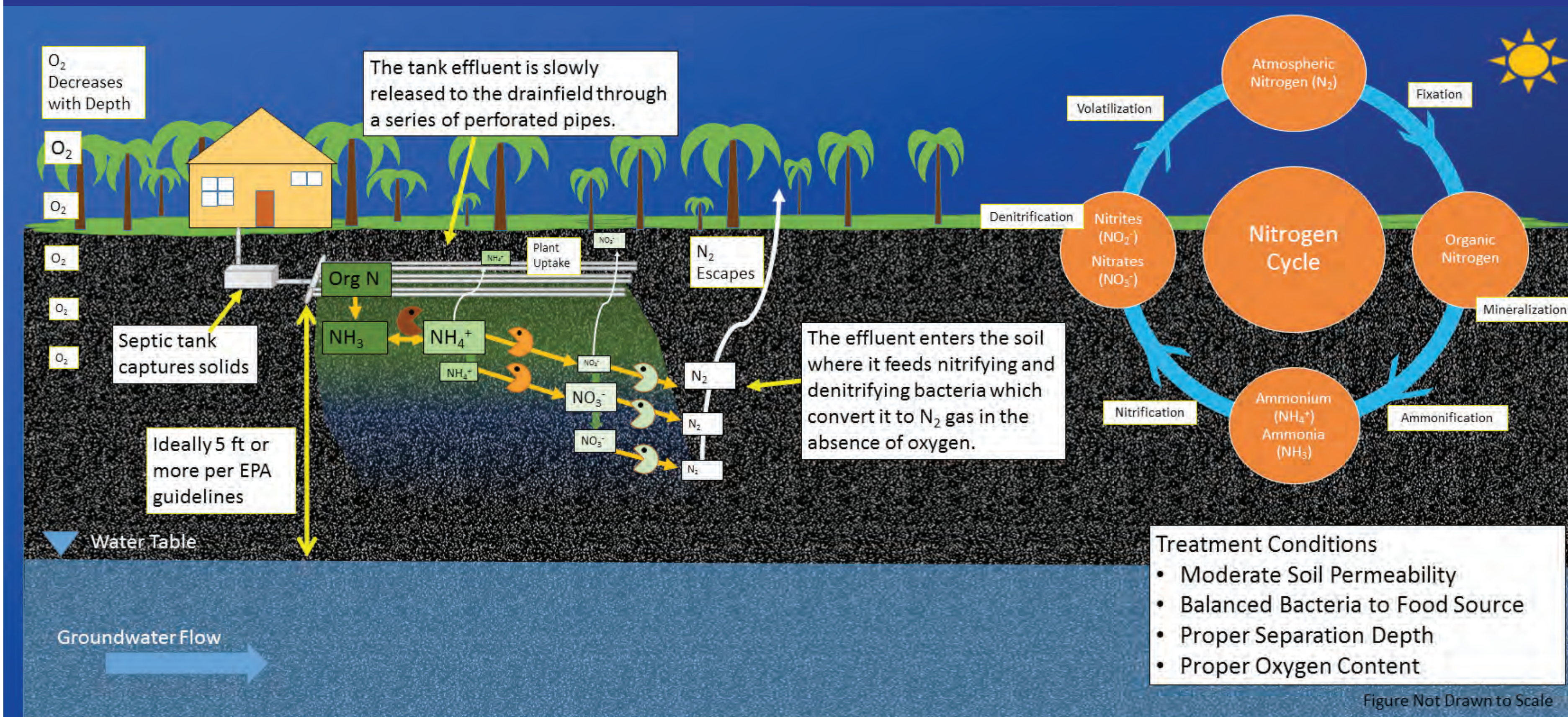


Figure 1-4 *Typical Coastal Septic System and Drainfield with Non-Ideal Treatment*

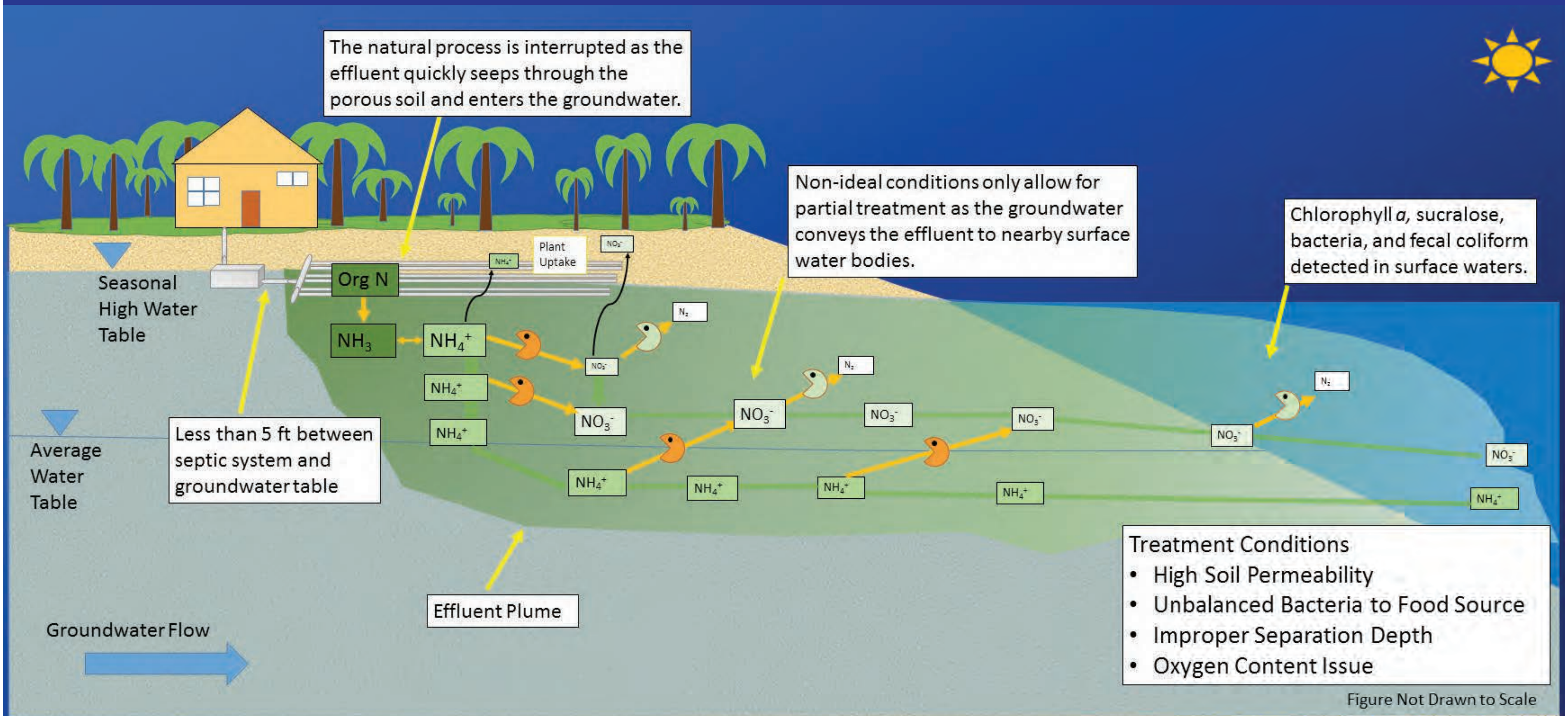


Figure 1-5 *– Groundwater Flow in Charlotte County*

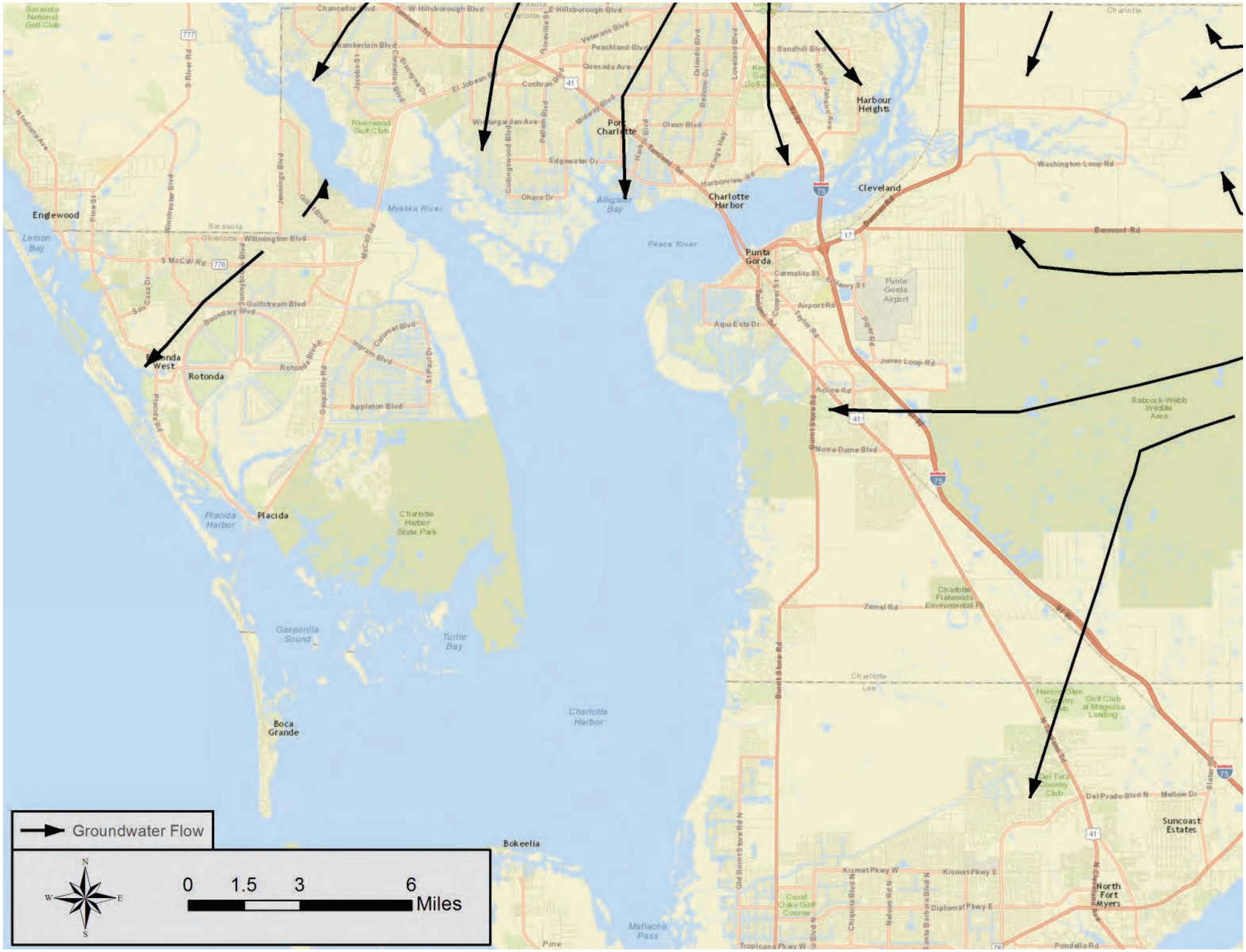
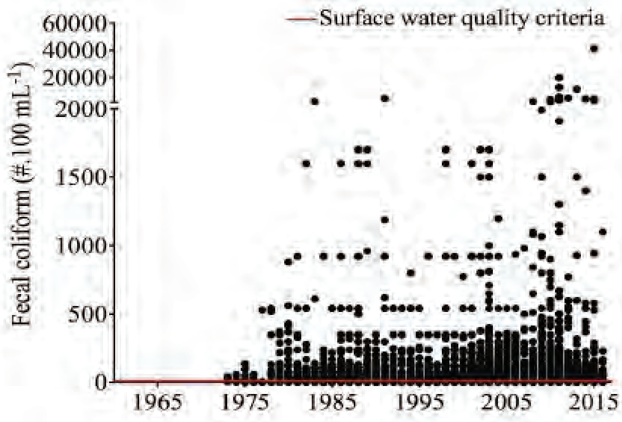
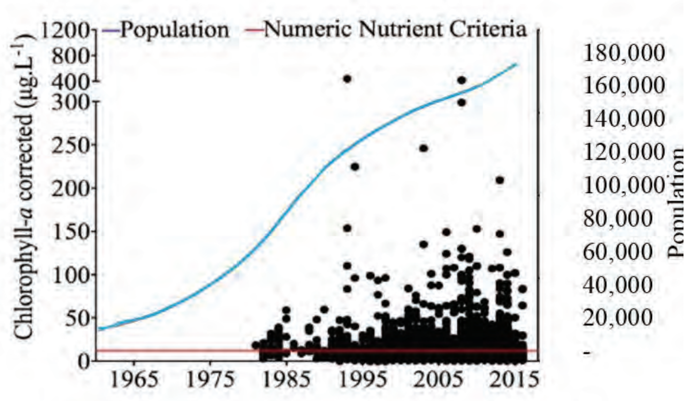


Figure 1-6 A-C *Wastewater Indicator Trends over Time in Charlotte County*

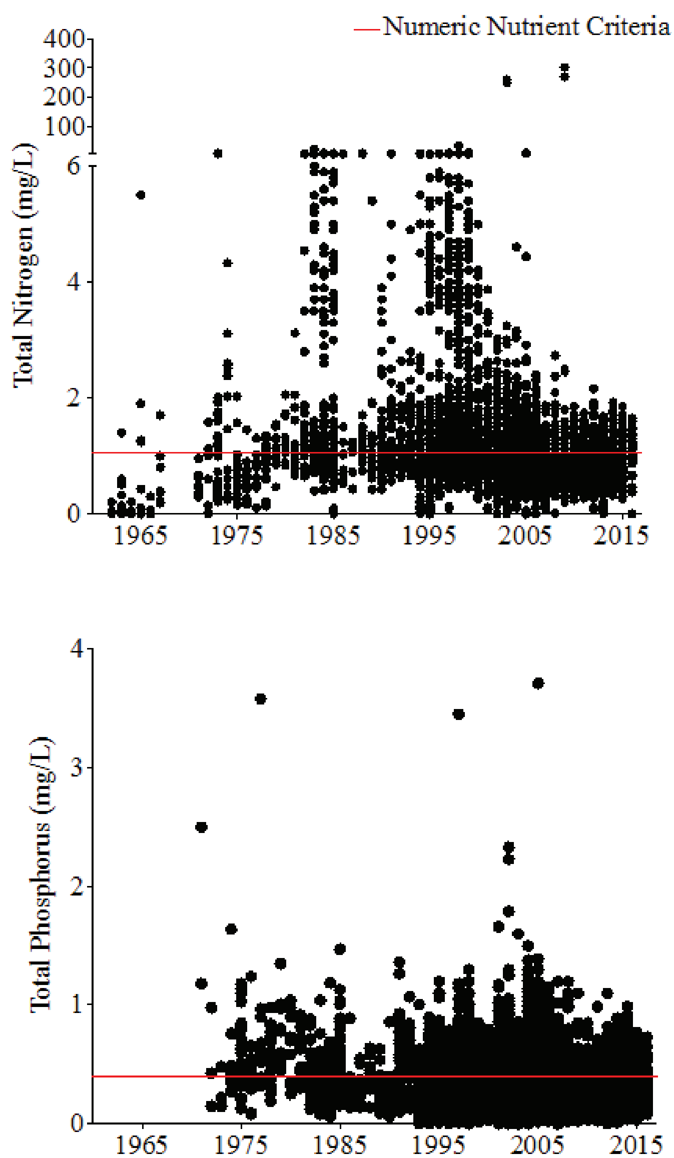


(A)



(B)

Figure 1-6C summarizes Total-Nitrogen and Total Phosphorus levels in Charlotte Harbor canals and estuary, and the increasing trend in these parameters.



(C)

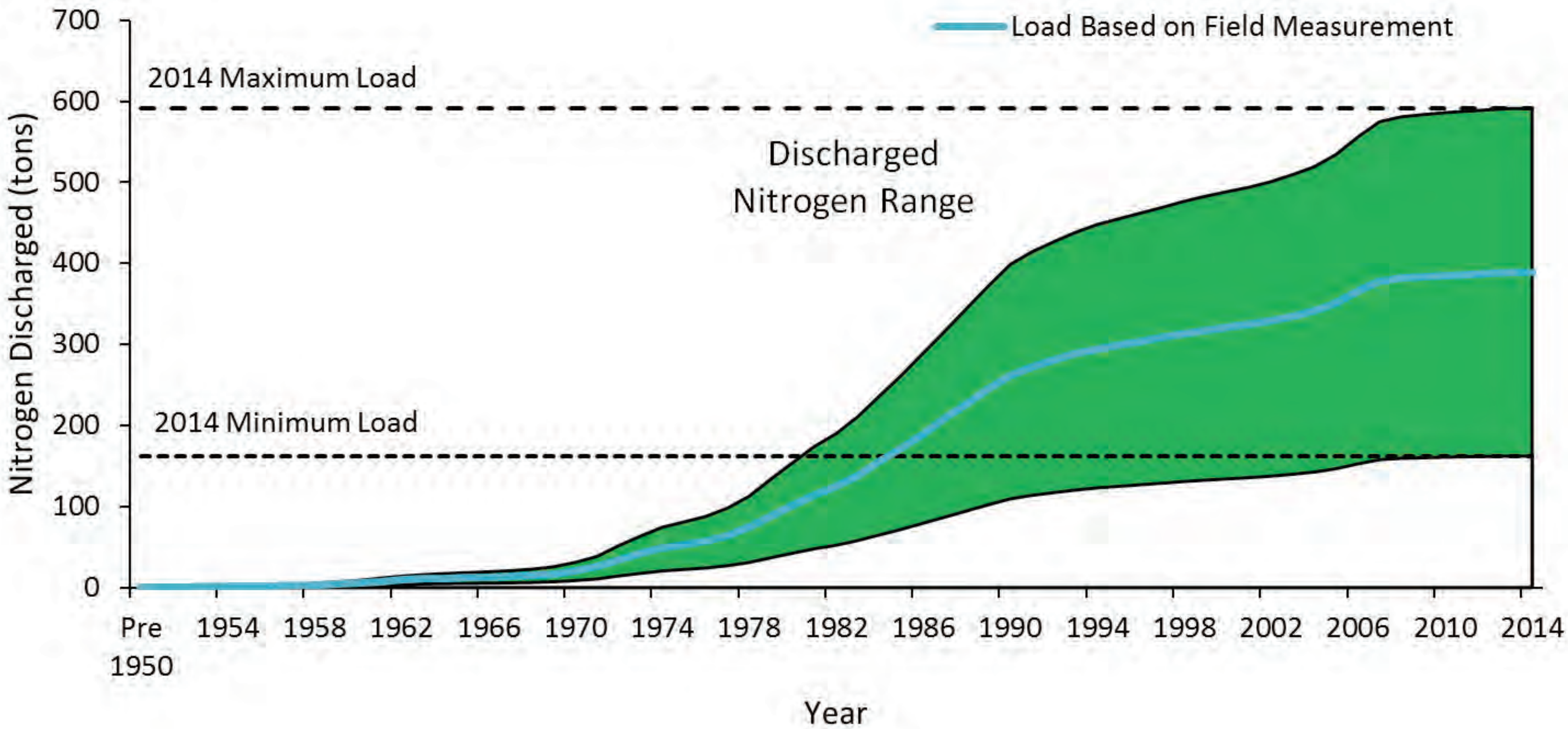
The increasing levels of nitrogen, fecal coliform, and chlorophyll-a reveal that the level of treatment provided by septic systems is not sufficient to protect the water quality of receiving water bodies. The combination of unsuitable soils, seasonally high groundwater tables, and aging septic systems allows minimally treated sewage to percolate through the soil and enter the groundwater where it is conveyed to canals, rivers, creeks, and estuarine shorelines. This results in high levels of nitrogen, phosphorus, fecal microbes, and organic wastewater contaminants being transported to the harbor.

Researchers estimate nitrogen effluent loads originating from septic systems vary between 4.8 to 17.5 pounds per person per year (Ursin and Roeder, 2008; EPA, 2002; and Crites et al.,1998). Based on Census data, an average of 2.5 people per household contributes to each of Charlotte County's 45,000 septic systems. Figure 1-7 displays the range of total nitrogen (TN) loading in Charlotte County based on the number of septic systems within the County's service area. Based on nitrogen loading data and current septic system counts, a range of 161 tons N (approximately 321,500 pounds N) to 580 tons N (approximately 1,172,000 pounds N) were discharged from septic systems in 2014.

Since 2016, the County has conducted field measurements of nitrogen levels released from septic systems. The average total nitrogen effluent concentrations was found to be 70 milligrams per liter (mg/L), corresponding to a nitrogen load of 389 tons (approximately 778,000) N per year discharged to Charlotte Harbor. The excessive amount of nitrogen promotes excess algae growth within the water bodies, which sustains and contributes to the formation of HABs. HABs can lead to aquatic hypoxia, causing red tide events and significant ecological destruction (Gilbert P., 2009; GCOOS, 2013).

Charlotte Harbor (Source: www.charlotteharbortravel.com)

Figure 1-7 *Range of Discharged Nitrogen from Septic Systems in Charlotte County*



Surface water quality in Charlotte Harbor varies between the wet and dry seasons. The rainy season and large tropical storms create increased surface water and groundwater flows into the Harbor. Increased groundwater and stormwater flows contaminated with partially treated septic tank effluent have ammonia-nitrogen and fecal coliforms that flow into the Charlotte Harbor. The increase in nitrogen results in algal blooms as measured by increases in Chlorophyll a. Figures 1-8A, B, C and D show the variability of water quality in Charlotte Harbor during the dry seasons (April 2015 and April 2016) and wet seasons (August and September 2015) for Chlorophyll a, fecal coliform and TN.

Maintaining Charlotte Harbor's estuary water quality is critical to the future of the community. Charlotte Harbor is known as a world-class destination for recreational fishing. The Southwest Florida Regional Planning Council (SWFRPC) estimated the fishing industry has a local economic impact in excess of $1 billion annually (SWFWMD, 2006). The majority of visitors are drawn to the area for the harbor and local beaches and generate an estimated economic impact of $526 million at local restaurants, hotels, and attractions (Research Data Services, 2016). Reducing pollutants entering the water bodies translates into fewer beach closures and improved fishing and recreational opportunities, which improves the quality of life for residents and enhances tourism to the County's shorelines.

The harbor's health not only impacts fishing, retail, and travel industries, but also the real estate market and home values. Modeling studies have been used to estimate the impact of water quality on real estate value. Michael et al. (1996) found a 1-meter improvement in water clarity resulted in average property value increases ranging from $11 to $200 per foot of water frontage along Maine lakes. Considering total water frontage within the study area, this equates to potentially millions of dollars in improved property values. Similar studies have correlated the effect of 1-mg/L changes in suspended solids and dissolved inorganic nitrogen concentrations, noting that the average price of both non-waterfront and waterfront Maryland properties is affected by 1 and 9 percent, respectively (Poor, 2006).

The average non-waterfront and waterfront property values in Charlotte County are $111,000 and $234,000, respectively (TBEP, 2014; Zillow, 2016). A 9-percent decrease in home values due to increases in nitrogen loadings could decrease home values by an average of $26,000 for non-waterfront property and up to $60,000 for waterfront property.

To protect the land and home values, the community must commit to the future – the future of the harbor, rivers, aquifer, beaches, and estuaries, as well as the groundwater under their properties.

Charlotte Harbor is Florida's second largest open water estuary and is home to a large population of snook, tarpon, redfish, and spotted seatrout, as well as numerous species of aquatic organisms, plants, birds, and wildlife. It is the focal point of the County, and restoring the harbor is a common goal to the local, state, and national community. Installing centralized sewer system will benefit the environment by giving the community the ability to transport sewage to WRFs where it can be engineered to achieve a higher level of nutrient removal. Removing the existing septic systems and connecting residential and commercial units to the central sewer systems will alleviate problems with the existing septic systems, protect the public health of the community, improve the water quality of surrounding water bodies, and promote economic growth within the community for current and future generations.

***Figure 1-8** A   Surface Water Quality: April 2015 (2.1" Rain)*

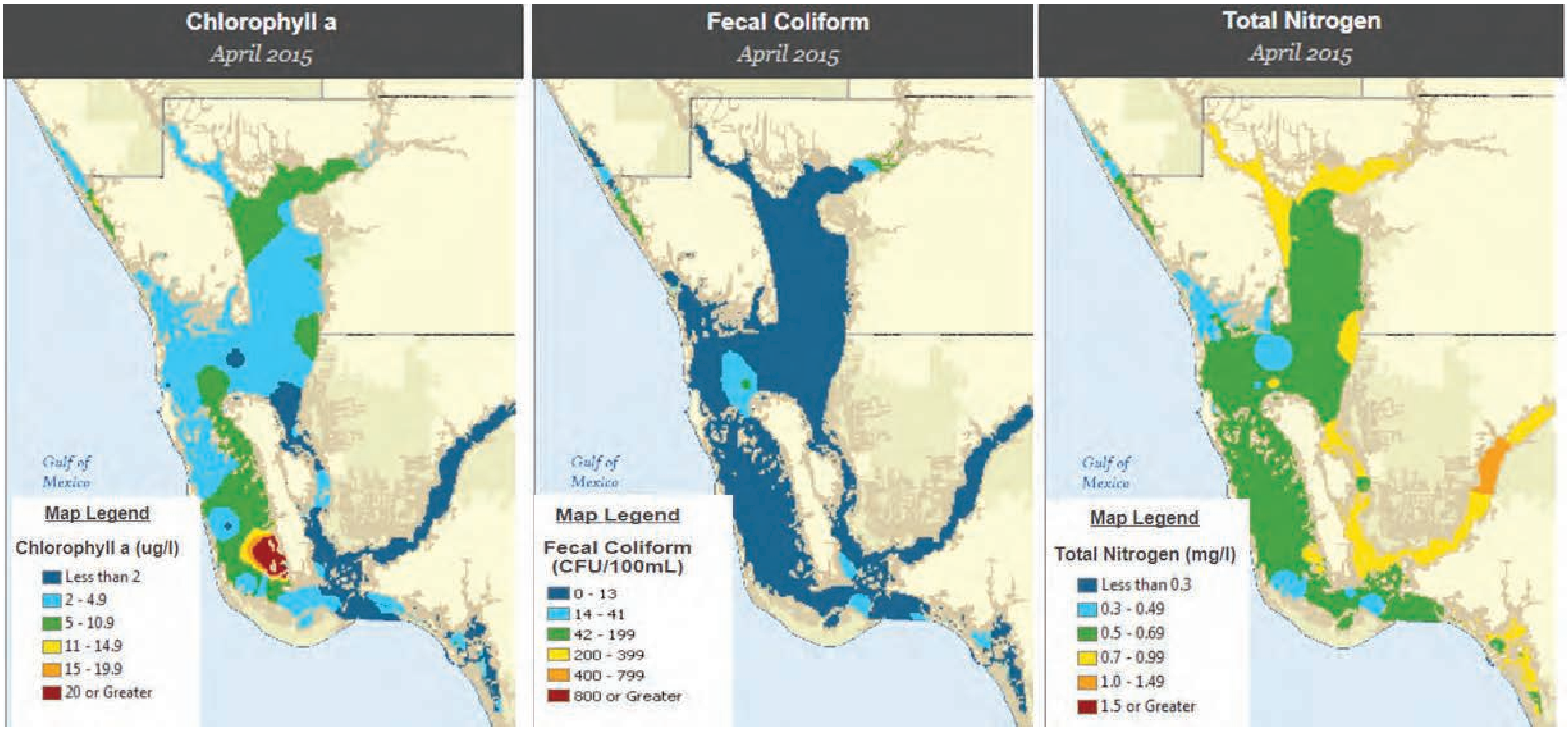


Figure 1-8B *Surface Water Quality: August 2015 (13.6" Rain)*

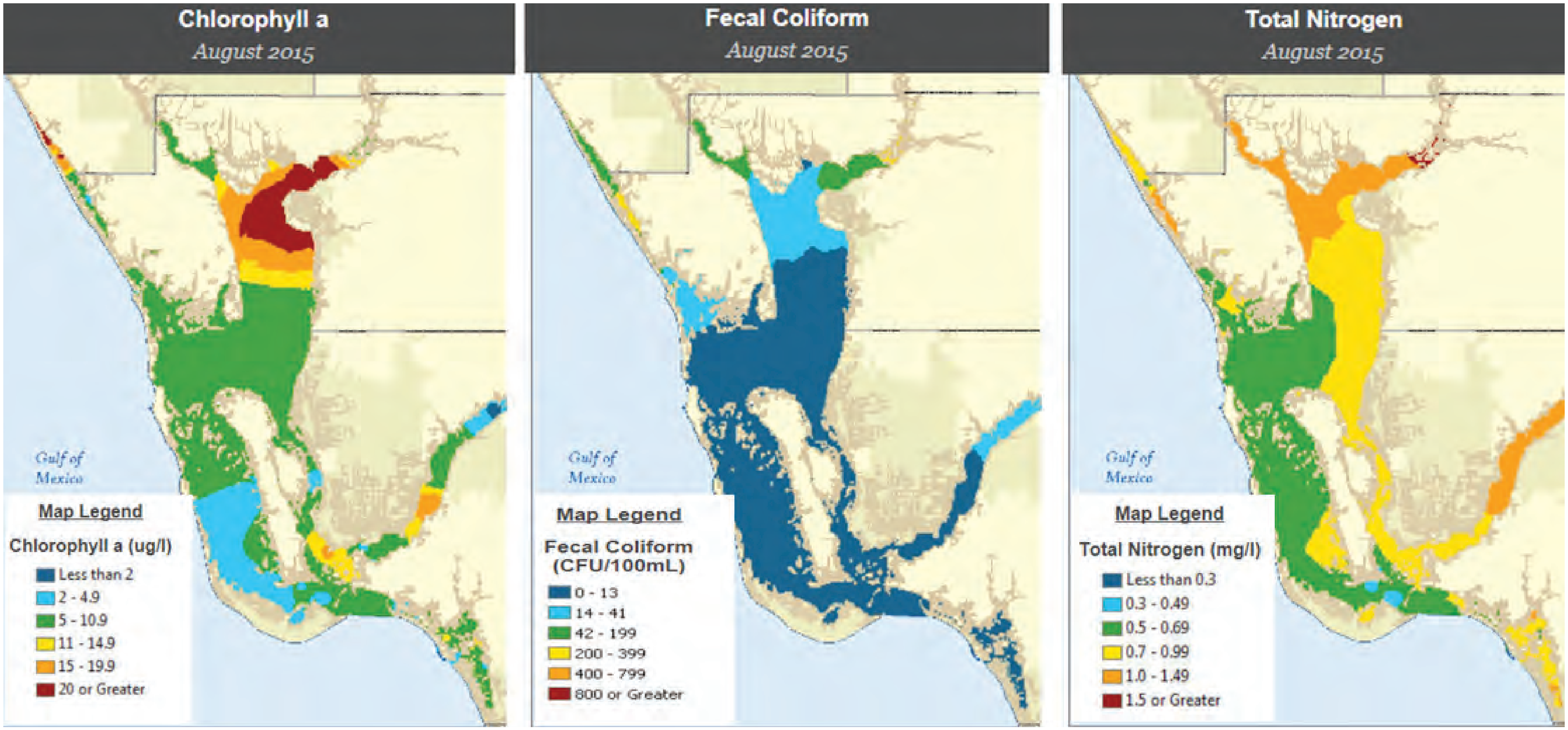


Figure 1-8C   Surface Water Quality: September 2015 (8.2" Rain)

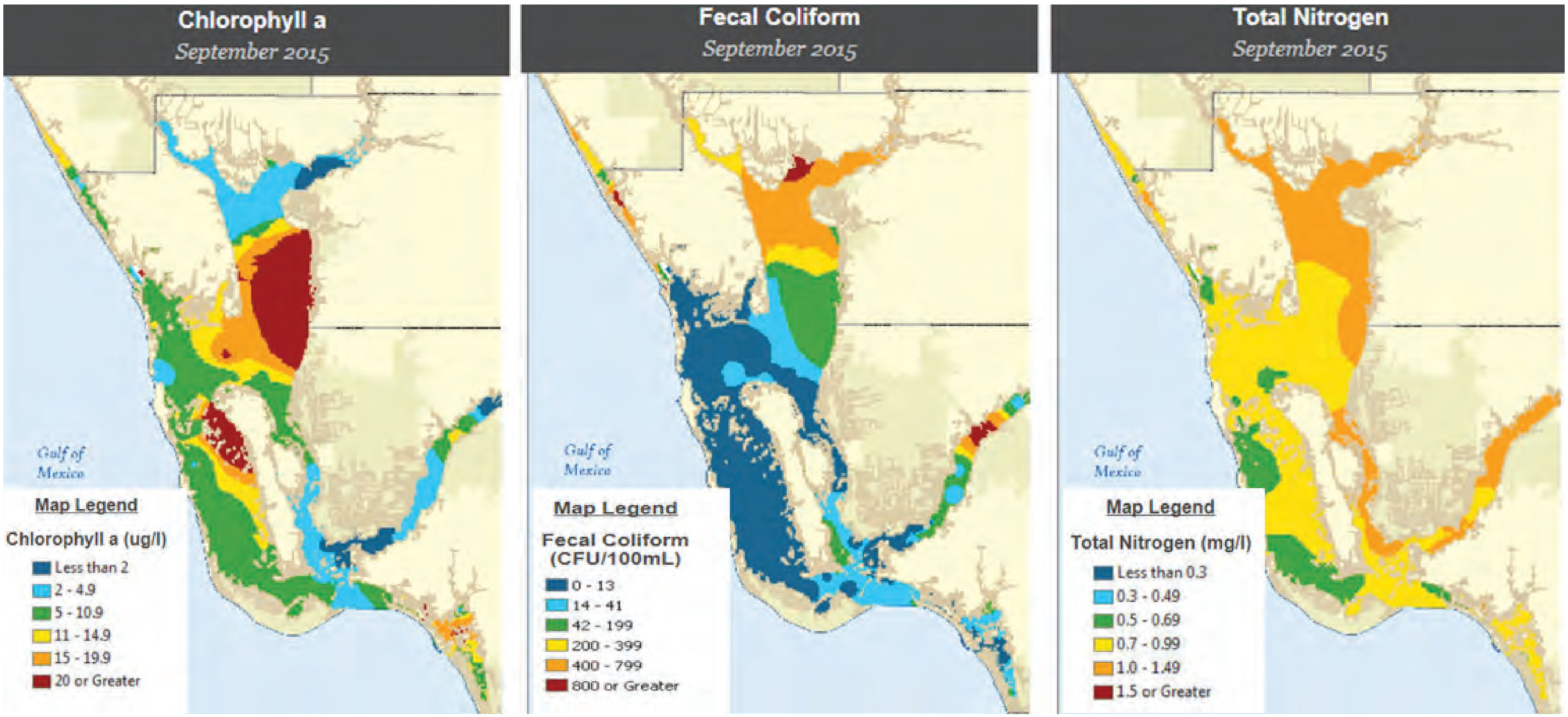
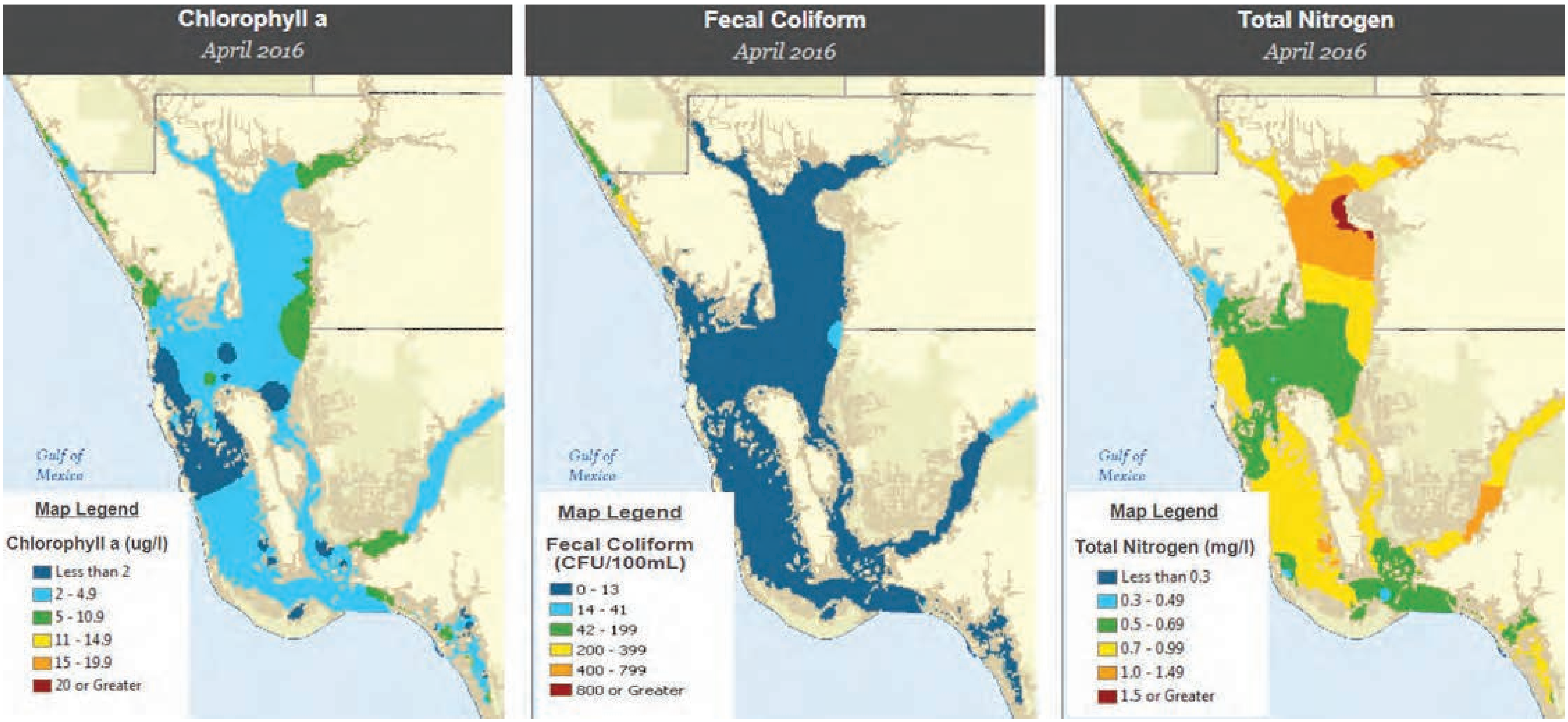


Figure 1-8D   Surface Water Quality: April 2016 (1.4" Rain)



1.3 OBJECTIVES


Port Charlotte, Florida

Developing and implementing the SMP is a joint effort of Charlotte County residents, key stakeholders, BCC, and CCUD. This effort provides an affordable community solution that addresses the common goal of improving and restoring water quality in the Charlotte Harbor Estuary and enhancing the community's quality of life. The following SMP objectives support the BCC's goal:

- Summarize the need to reduce nutrient and bacteria discharges.
- Review and compile historical sewer system, water reclamation facility (WRF), and flows and loads data.
- Summarize the status of private sewer utilities and provide recommendations for acquisition and consolidation.
- Model and estimate system growth due to septic to sewer and infill.
- Develop detailed consumer and wastewater flow estimates through buildout.
- Review existing wastewater collection and transmission systems.
- Review existing WRFs and prepare an infrastructure assessment.
- Develop capital improvement plan (CIP) recommendations based on existing infrastructure needs and guiding principles.
- Perform financial analysis and develop funding programs and options for the County to implement the recommended CIPs.

Sewer Master Plan –
An affordable community solution that addresses the common goal of improving water quality in the Charlotte Harbor, restoring the Charlotte Harbor Estuary, and enhancing the community's quality of life.

1.4 GUIDING PRINCIPLES

The SMP was developed as a collaborative effort to meet the common goal of the local and regional community to incorporate the guiding principles of affordability, sustainability, efficiency, and reliability:

- ***Affordability –*** Each project identified in the Sewer Master Plan focuses on developing affordable solutions for residents and business owners.
- ***Sustainability –*** The Sewer Master Plan incorporates a balanced approach to prioritize septic system replacements to maximize environmental benefits and provide long-term reductions in nutrient loadings in a manner that is affordable to residents and business owners.
- ***Efficiency –*** The Sewer Master Plan considers existing utility infrastructure and implements efficient construction methods to decrease costs on road trenching and repair.
- ***Reliability –*** The Sewer Master Plan considers existing wastewater treatment and conveyance infrastructure and identifies which components will require updating to provide a reliable product to the County's residences and businesses.

Harbor Boulevard, Port Charlotte, Florida

1.5 PARTNERS AND RELATED PLANS

Preparation of the SMP fulfills the wastewater component of the BCC's Blue Water Strategy and is aligned with existing local, regional, and non-profit cooperating partner goals and objectives.

Specifically, the SMP addresses goals and objectives outlined in:

- The Charlotte County Utilities Department Strategic Plan (Revised 2016)
- The County's Smart Charlotte 2050 Comprehensive Plan (Charlotte County BCC, 2010)
- The Priority Actions of the Charlotte Harbor National Estuary Program (CHNEP) Comprehensive Conservation and Management Plan (CCMP) (CHNEP, 2013)
- The Joint Florida Gulf National Estuary Programs Southwest Florida Regional Ecosystem Restoration Plan (SWFRERP, 2013)
- Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act (RESTORE) Council Initial Comprehensive Plan
- Area 1 Preliminary Engineering Report, Charlotte County Utilities (March 2010)
- Charlotte Harbor Environmental Center
- Manchester Waterway Boat Lock Removal Plan Net Ecosystem Benefits by FDEP and US Army Corps of Engineers (USACE) Permit Compliance Report
- The SWFWMD Charlotte Harbor Surface Water Improvement Management (SWIM) Plan

2. PAST & PRESENT - DEVELOPMENT OF A SEWER UTILITY

OVERVIEW

This chapter provides a brief historical perspective of the development of the Charlotte County sewer system, the formation of the Charlotte County Utility Department (CCUD) including initial wastewater asset purchases and subsequent wastewater franchise acquisitions, and a summary of the present-day sewer system.

This chapter also reviews the County's ongoing wastewater projects currently in the planning, design, and construction phases.

2.1 SEWER SYSTEM DEVELOPMENT

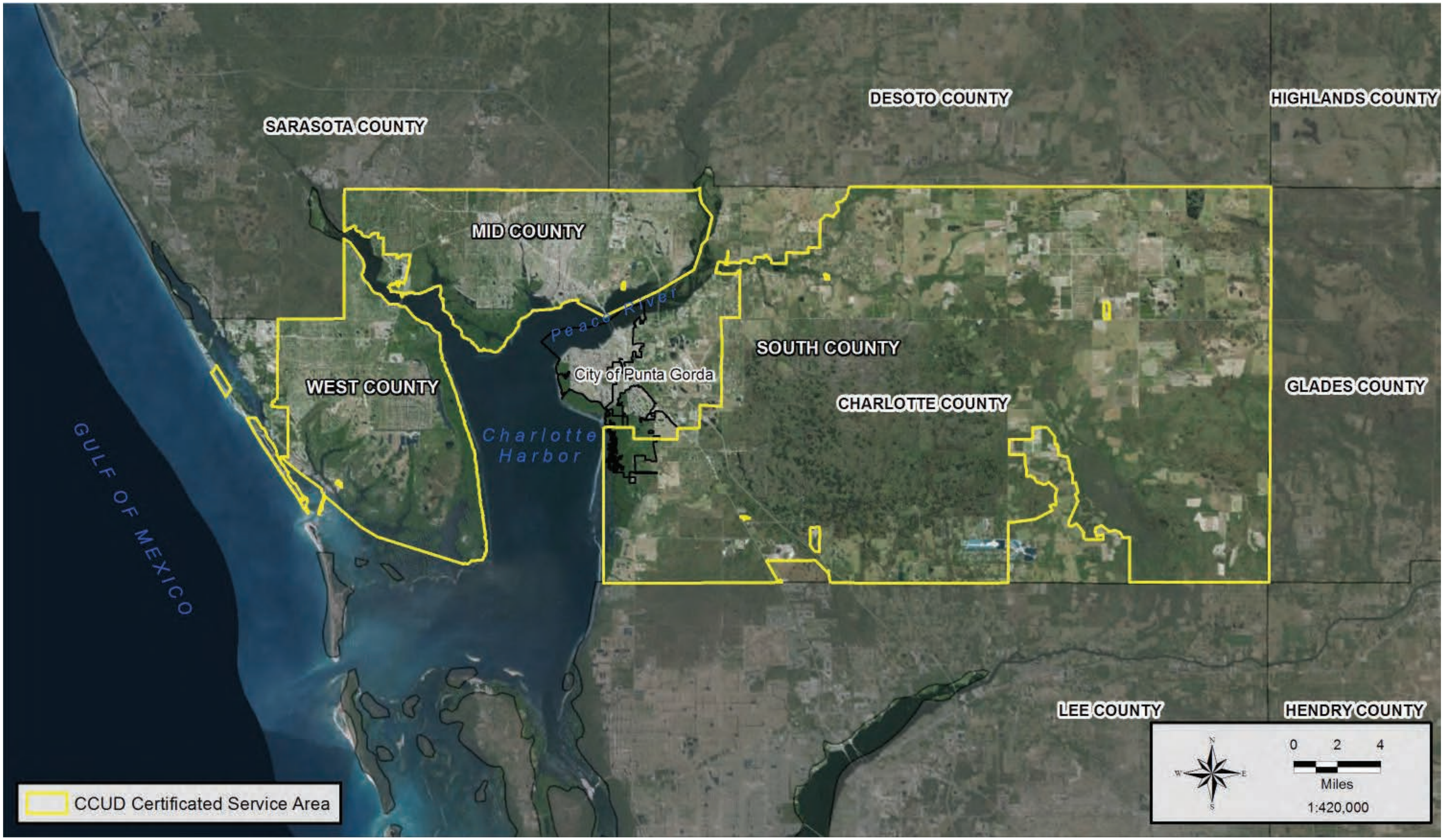
Charlotte County is trisected by the Peace River and the Myakka River into three primary land masses. The central land mass between those two rivers is referred to as "Mid County." The Myakka River separates Mid County from the west coastal peninsula or "West County", and the Peace River forms the barrier between Mid County and the southeast areas known as "South County" (see Figure 2-1).

The vast majority of Charlotte County remained virtually undeveloped for the first half of the 20th Century, consisting mostly of cattle rangelands, timberlands, groves, and a few homesteads. Lands that were subdivided or platted consisted primarily of the Englewood – Grove City area in West County, El Jobean, and Charlotte Harbor areas in Mid County and the City of Punta Gorda in South County. With the exception of small platted areas, which used package treatment units, wastewater treatment was rudimentary on-site septic systems of varying degrees of quality or built before any regulation that only started in the 1970s. Figure 2-1 shows the locations of the three services areas within Charlotte County.

In the mid-1950s, the Mackle brothers of Miami, Florida, began to purchase large tracts of land in the Mid and West County areas. The Mackle brothers, later known as General Development Corporation (GDC), platted the area for residential development communities, generally quarter-acre residential lots with some commercial areas along main corridors such as US Highway 41. Most residential lots were served by on-site septic systems resulting in approximately 20,000 septic systems in the County before 1980. During the decade from 1980 to 1990, septic system growth averaged over 1,200 per annum.

A small portion of the GDC developments included central sewer collection and wastewater treatment systems, which were officially managed by GDC's subsidiary General Development Utilities (GDU). Mid County included two WWTPs, "South Port" with a capacity of 1.0 million gallons per day (MGD) and "East Port" with a permitted capacity of 3.0 MGD, along with associated transmission mains and collection systems. In West County, GDC owned land known as Gulf Cove and South Gulf Cove; only portions of those two areas had central sewer, which was treated at the "West Port" plant, which had an original design capacity of 0.32 MGD.

Figure 2-1 Charlotte County Geographic Area



West County also included a relatively large sewer system built as part of the Rotonda development in the 1970s with a separate sewer certificated area. Parts of the East Englewood area had gravity sewer systems in the former West Charlotte Utilities certificated area, which included treatment plants and collection systems on Manasota Key and Knight Island. The central sewer system was also in portions of South County, specifically in the incorporated City of Punta Gorda and the "Burnt Store" area bordering Lee County.

Many smaller "package treatment plants" and associated collection systems were built throughout the County from the 1960s to 1990s serving smaller subdivisions, apartments, condominiums, mobile home parks, and commercial areas not in the GDU service area. These systems are discussed in more detail in Chapter 4.

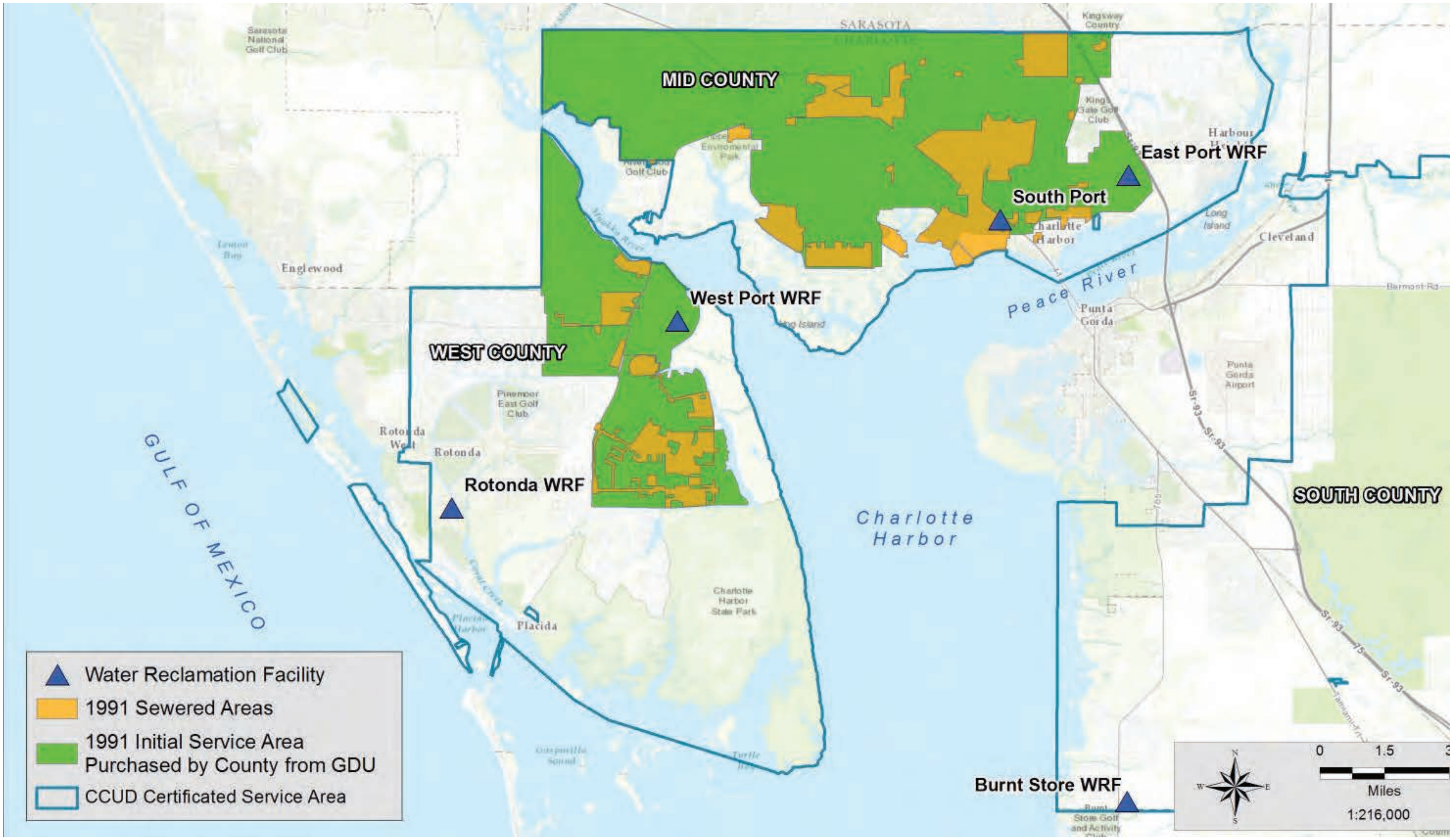
2.2 FORMATION OF CHARLOTTE COUNTY UTILITY DEPARTMENT

In 1991, Charlotte County purchased the GDU assets, forming the initial core of the Charlotte County utility system in Mid County and in the Gulf Cove and South Gulf Cove areas of West County. The purchase included three treatment plants (South Port and East Port in Mid County and West Port in West County) along with associated transmission lines and collection systems consisting of 140 miles of gravity and low-pressure mains, 56 lift stations, and 61 miles of force mains serving approximately 11,000 sewer connections.

Figure 2-2 shows the 1991 sewer service areas purchased from GDU and highlights areas with sanitary sewer collection and treatment, as well as the four Water Reclamation Facilities (WRFs) that are owned and operated by CCUD today – Rotonda, West Port, East Port, and Burnt Store WRFs. The South Port facility was demolished and converted to a master pump station that (currently designated as Pump Station 65) transfers sewage to the East Port WRF.

Gulf Cove, Florida

Figure 2-2 Initial County Purchases from GDU in 1991



Charlotte County continued to expand their certificated service area beyond the 1991 acquisition in the following decades through subsequent purchases of other utility franchises. These purchases are shown in Figure 2-3 and include the following:

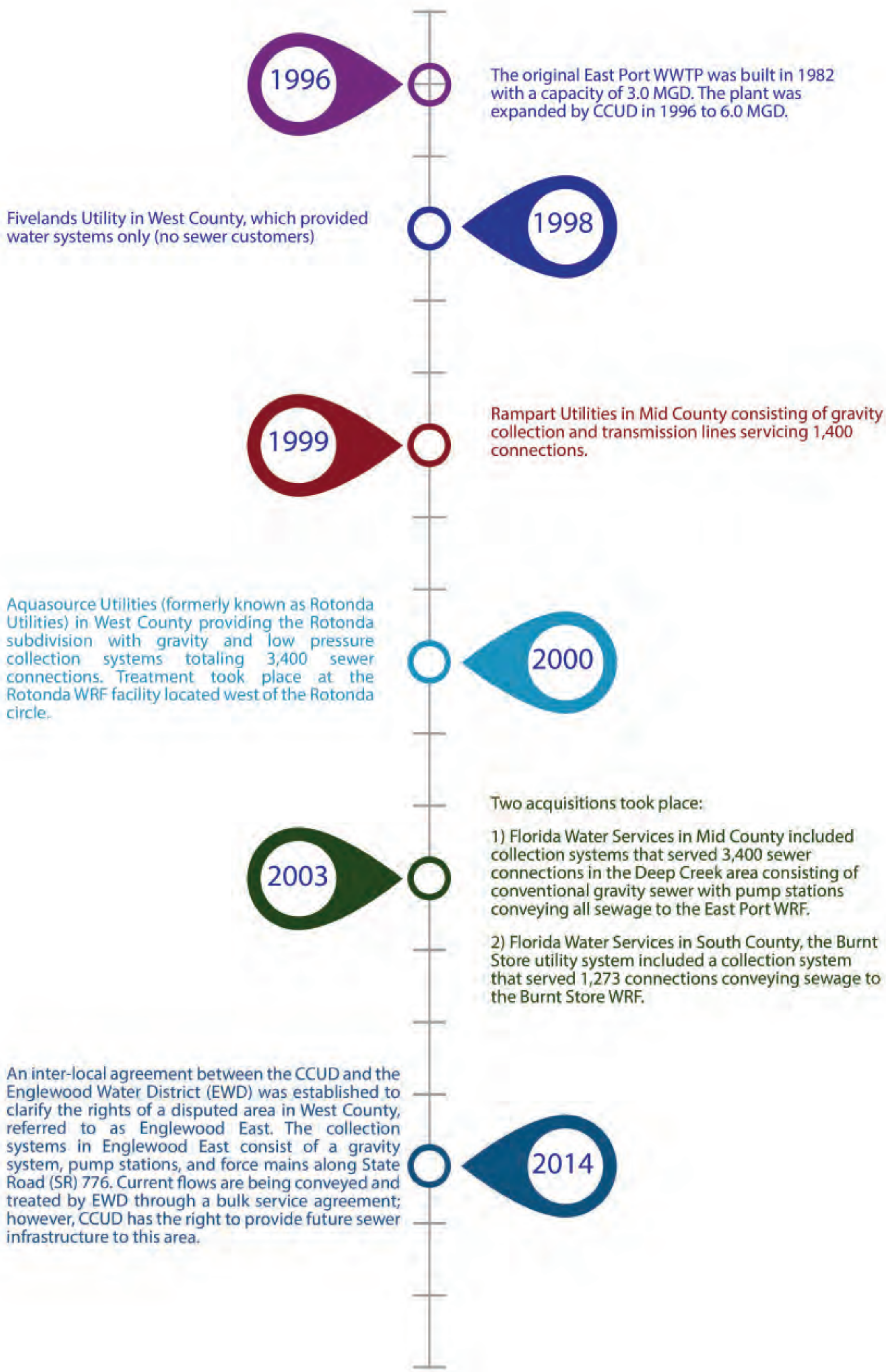
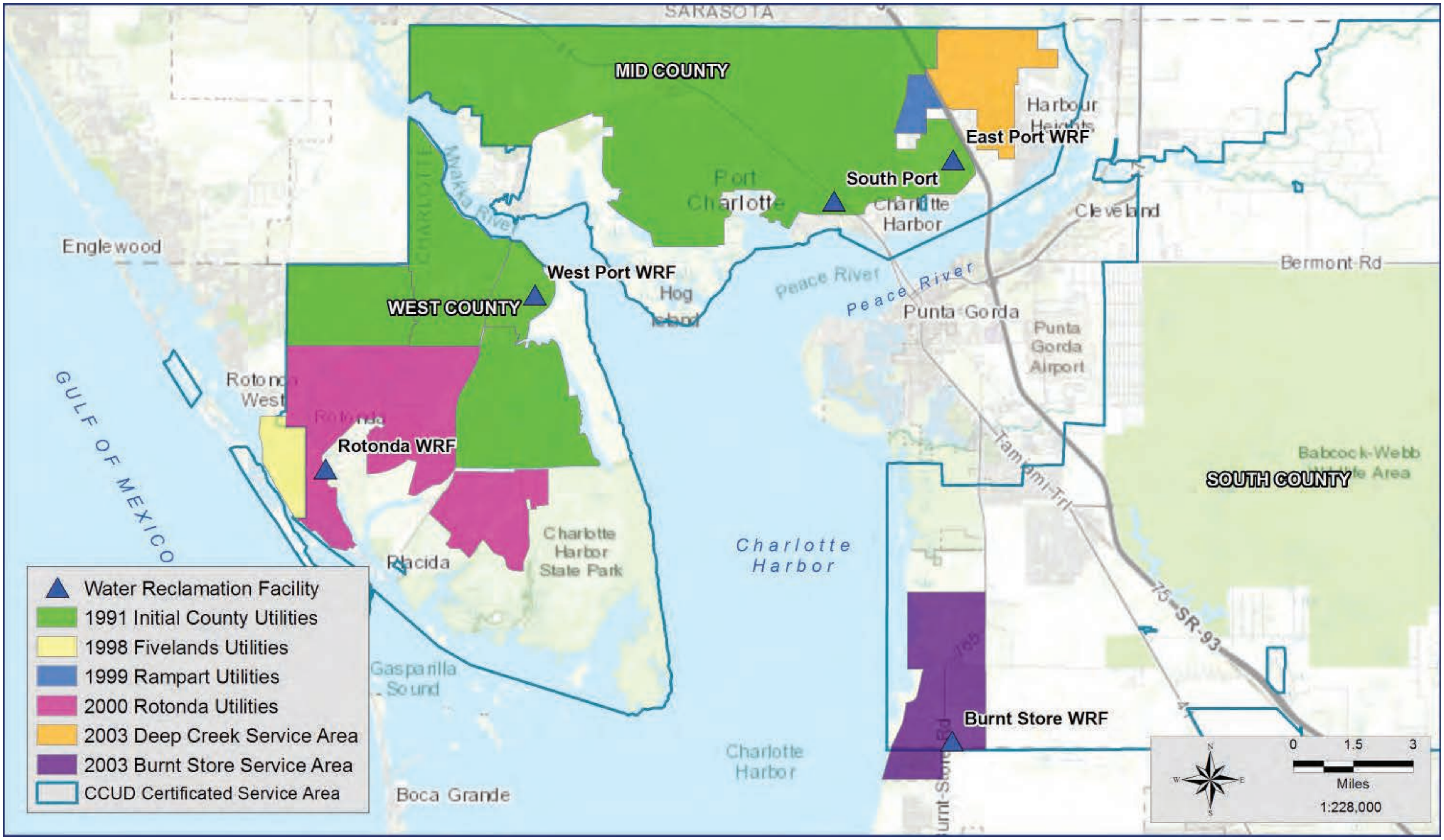


Figure 2-3 Expansion of County Sewer Area




Rotunda Water Reclamation Facility

2.3 PRESENT DAY SEWER SYSTEM

The CCUD service areas currently cover 44.72 square miles and include a network of pipes, lift stations, and WRFs serving nearly 35,000 customers. The primary sewer facilities within the CCUD boundaries consist of the following:

- Four WRFs (East Port, West Port, Rotonda, and Burnt Store).
- 906 miles of sewer mains
- 291 sewer lift stations.
- 7,578 manholes.
- 34,910 sewer customer connections.

The Florida Department of Environmental Protection (FDEP) regulates WRFs through the issuance of Operating and Construction Permits. Table 2-1 provides the permit reference information for each WRF within the CCUD's service areas. The East Port WRF in Mid County receives the majority of sewage collected within the CCUD service area with an annual average daily flow (AADF) of 5.0 MGD (based on 2016 flows). It has a permitted capacity of 6.0 MGD and distributes reclaimed water for unrestricted public access reuse (PAR).

The West County WRFs (Rotonda and West Port) currently receive a total of 1.8 MGD, have a combined permitted capacity of 3.2 MGD, and use a common system to distribute reclaimed water to the public for unrestricted PAR. The Burnt Store WRF in South County receives the least amount of sewage (0.32 MGD) and has a permitted capacity of 0.50 MGD. The effluent flow permit requirements for each WRF have been summarized in Table 2-2.

Each WRF is permitted to dispose of its effluent using two or more methods including underground injection control, spray fields, percolation ponds, or reclaimed. However, limitations exist for the Rotonda WRF as it does not contain its own underground injection control (UIC) but transfers a portion of its effluent to West Port for deep well injection.

Table 2-1   Water Reclamation Facilities Permit Information

Service Area	Water Reclamation Facility	Permitted Capacity (MGD)	AADF[2] (MGD)	FDEP Operating Permit No.
Mid County	East Port WRF	6.0[1]	5.00	FL0040291
West County	West Port WRF	1.2	0.68	FLA014048
West County	Rotonda WRF	2.0	1.09	FLA014098
South County	Burnt Store WRF	0.5	0.32	FLA014083

1. Current WRF permitted treatment capacity = 6.00 MGD. Permit allows expansion to 9 MGD following the addition of required unit treatment processes.
2. Based on December 2016 Discharge Monitoring Report (DMR) data.

Table 2-2   Water Reclamation Facilities Effluent Permitting Capacities

Water Reclamation Facility	Disposal Method and Permit Capacity (AADF)			
	Underground Injection Control (MGD)	Spray Field (MGD)	Percolation Ponds (MGD)	Reclaimed (MGD)
East Port WRF	6.0	2.44	N/A	Report[4]
West Port WRF	4.75[1]	0.162[2]	N/A	Report[4]
Rotonda WRF	4.75[1]	N/A	N/A	Report[4]
Burnt Store WRF	3.44[3]	N/A	0.25	0.50

1. Combined effluent flow from both WRFs must not exceed specified AADF value.
2. Removed from permit April 2016.
3. Based on monthly average flow.
4. CCUD is required to report the quantity as part of the Master Reuse System permit requirements (FDEP, 2014).

2.4 ONGOING PROJECTS AND PROGRAMS

CCUD has a number of ongoing projects related to system operations and maintenance (O&M) needs including pipe lining, pump station repairs, inflow and infiltration (I&I) prevention, and pipe renewal and replacements (R&R). The primary focus of this master plan reports on the conversion from septic to sewer rather than development of condition assessments and R&R programs.

The County has initiated several sewer collection improvement programs to reduce nitrogen loadings to Charlotte Harbor by replacing aging septic tanks with centralized sewer. The initial areas identified for S2S conversion include Pirate Harbor south of Punta Gorda in South County and the areas identified in the Manchester Waterway Boat Lock Removal Plan (MWBLRP) in Mid County. These areas delineated in the MWBLRP include the following projects:

- AB-1: Ackerman/Countryman S2S - The Ackerman Countryman project boundary currently under design encompasses both a section of the boundary delineated as Manchester Basin submitted in the permit and an expanded scope of the area identified on the 2007 CIP as AB-1. This project area is extensive and it is intended to complete this work in several stages similar to East West Springs Lake.

- AB-1: Edgewater Drive S2S – the project has been completed.

- AB-2: East & West Spring Lake S2S - The East and West Spring Lakes project boundary encompasses and expands on the original scope of the area identified on the 2007 CIP as AB-2. The Vacuum Station (Contract A) is in-service with approximately 250 now connected to the central sewer system.

- AB-3: These project areas are being evaluated and ranked as part of the SMP.

- AB-4: These project areas are being evaluated and ranked as part of the SMP.

- CH-1: Charlotte Harbor S2S – the project has been completed.

- CH-1: Northshore S2S – the project has been completed.

- CH-2: This project area is managed by a private utility and is being evaluated and ranked as part of the SMP.

- HH-1: Harbor Heights S2S - These project areas are being evaluated and ranked as part of the SMP.


East Port Water Reclamation Facility

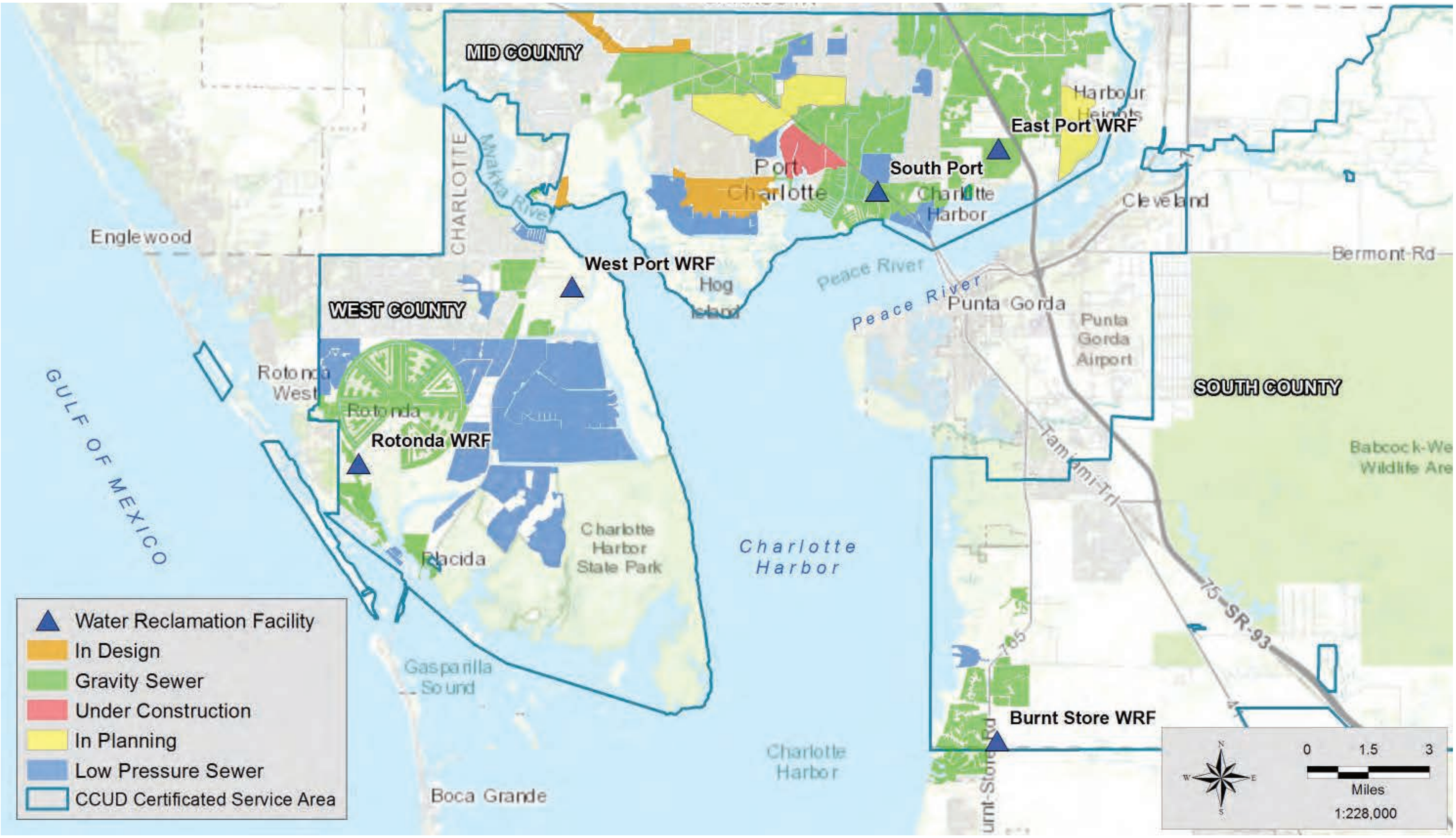
Additional S2S projects include:

- EL Jobean S2S – The preliminary engineering report and environmental report have been completed and submittal to USDA-RUS is now underway for additional funding assistance. The actual design of the project area is scheduled to begin in May 2017.
- U.S. 41 S2S - This project is awaiting completion of the U.S. 41 roadway improvements.
- West Tarpon/Ambrose S2S - This project is substantially complete.
- Line Extension Program S2S - This program allows property owners to request service from CCUD to address on-site wastewater treatment system problems if they are within 500 feet of the existing sewer system for a standard rate. This program is continually assisting homeowners throughout the county with financing payment of the connection costs.

In addition to S2S projects, CCUD is also improving its wastewater infrastructure by replacing and expanding force and collection mains along primary corridors including US Highway 41, Midway Boulevard, Burnt Store Road, Placida Road, Gasparilla, Winchester, and Edgewater Drive.

Figure 2- 4 shows the existing gravity and low-pressure collection systems, current and proposed expansion areas, and treatment facilities. The CCUD's ongoing projects and programs are updated annually and are discussed in additional detail in Chapter 5, Chapter 6, and Appendix E.

Figure 2-4 Current County Sewer Infrastructure and Expansion



3. CONNECTIONS TO PUBLIC AND COMMUNITY UTILITIES

OVERVIEW

This chapter reviews the existing public and community wastewater utilities independent of the County's existing service areas and identifies which utilities could be connected to the CCUD wastewater systems. The intent is to work cooperatively with the utilities and generally provide sewer service through bulk service agreements. The regionalization options for each potential connection are also presented including potential connection routes and cost estimates for each connection.

3.1 IMPACTS OF FUTURE REGULATIONS ON UTILITIES

Wastewater facilities are primarily regulated by the FDEP. Each facility must meet minimum standards for water quality to comply with its operating license. The general trend of future regulations is to require a higher commitment for the proper management of wastewater operations and maintenance; for example, a higher level of treatment such as lower Nitrogen values, odor control, and water quality discharge standards.

To maintain this level of treatment, significant funds must be set aside to maintain and operate wastewater facilities as well as fund the capital improvements required to address new regulations such as a new odor control system. Generally, wastewater treatment plants (WWTPs) have efficiencies of scale; that is, a smaller WWTP has fewer customers to share the operating, renewal, and replacement costs and therefore a higher cost per customer. However, when the customer base expands and a significant plant expansion is required, the larger plant may have a lower cost per customer. Smaller treatment plant owners often face significant expenditures to upgrade their plant to stay in compliance, and the cost per customer to operate and maintain the system becomes excessive. Rather than upgrading, WWTP owners decommission the treatment plant by converting it to a pump station and convey the raw sewage through transmission mains to a larger adjacent facility. This has been the case in Englewood where, as part of the EWD master plan, over 20 smaller treatment plants have been connected to the larger EWD central plant through a network of transmission mains.

3.2 OVERVIEW OF EXISTING UTILITIES

As Charlotte County began to develop in the 1950s, the need for wastewater treatment grew – especially for concentrated developments such as mobile home parks, campgrounds, condominiums, and institutions such as hospitals where large on-site septic systems were impractical. In these locations, community wastewater treatment systems were implemented that used a common collection and central treatment system. Often, as population increases and more community systems are developed within an area, a public system is established. Public systems serve multiple properties with differing ownerships within their certificated areas. In many cases, to increase efficiency and decrease treatment costs, community systems within the boundary of a public system are connected to public systems where the community system is located. Charlotte County has identified 15 community wastewater utility systems and 9 public wastewater utility systems within the CCUD certificated area. These 24 wastewater utility systems are distributed throughout three general geographic areas of the County and are listed in Table 3-1.

Table 3-1 *Wastewater Utility Systems*

Service Area	Public Systems	Community Systems
Mid County	Riverwood Development	Harborview Mobile Home Park (MHP)
West County	Englewood Water District (EWD) Knight Island Utilities Gasparilla Island Water Association, Inc. Utilities Inc. of Sandalhaven	Gasparilla Mobile Home Estates Hideaway Bay Beach Club
South County	City of Punta Gorda Florida Governmental Utility Authority Town and Country Utility Co North Charlotte Waterworks, Inc.	Alligator Creek MHP Bay Palms MHP Correctional Institution Lazy Lagoon MHP Palms and Pines MHP Paradise Park Condos Pelican Harbor MHP River Forest Village Shell Creek Park MHP Sun N Shade Family Campground Tropical Palms MHP Villas Del Sol

3.3 SERVICE AGREEMENT CONSIDERATIONS

The public systems presented in the list below are not being considered to receive sewer service from CCUD. With the exception of Knight Island Utilities, none of the public utilities with established boundaries, existing customer base, published rules and regulations, and infrastructure are being considered for incorporation into the CCUD sewer systems:

- Riverwood Development
- Englewood Water District (EWD)
- Utilities Inc. of Sandalhaven (currently connected to the EWD)
- City of Punta Gorda
- Florida Governmental Utility Authority
- Town and Country Utility Co.
- North Charlotte Waterworks, Inc.
- Gasparilla Island Water Association, Inc.

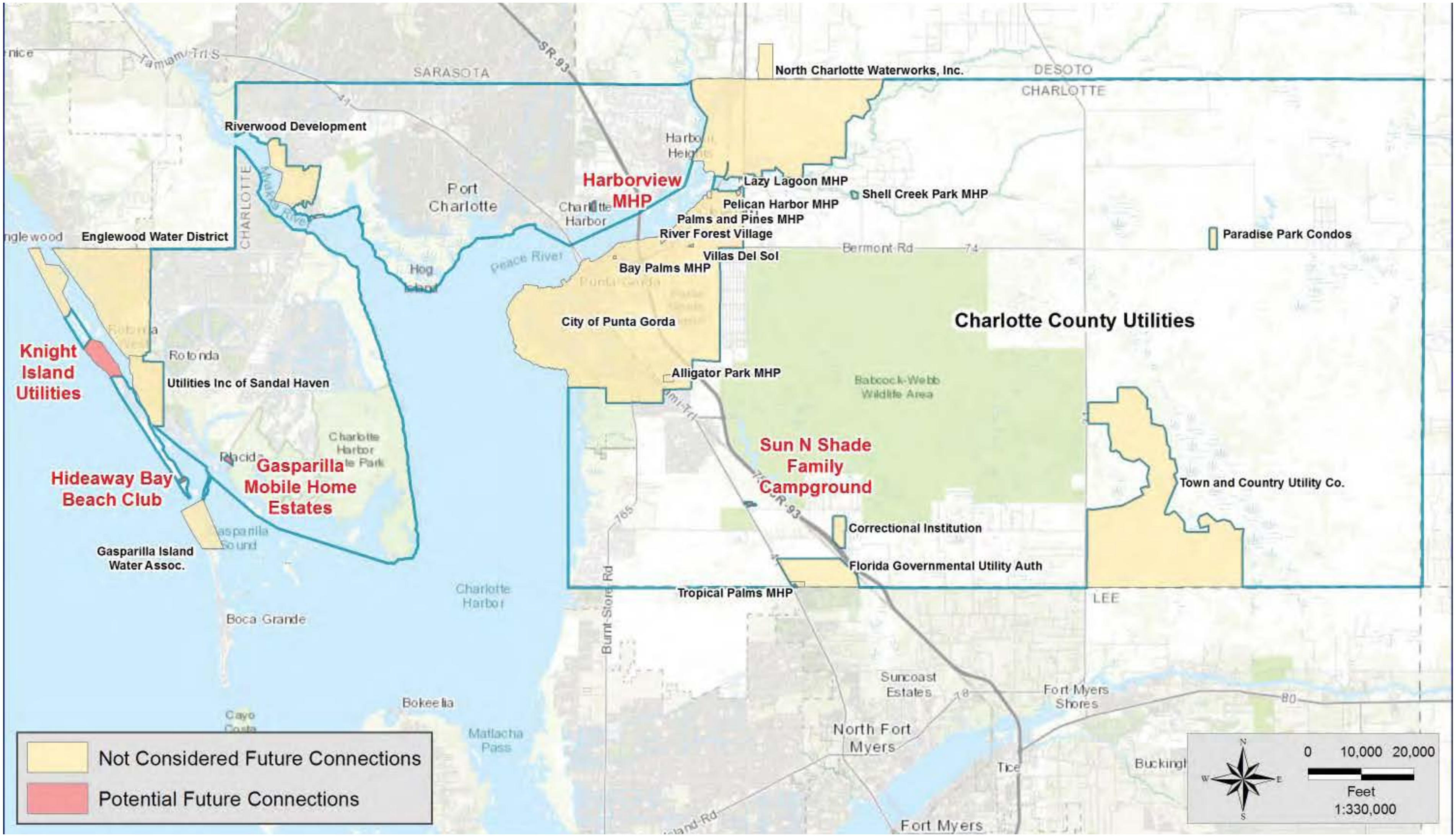
If community systems that lie within the certificated boundaries of the above-listed public systems are decommissioned and consolidated, they will presumably connect to the public system where they are geographically located. For example, seven smaller systems (Alligator Creek MHP, Bay Palms MHP, Lazy Lagoon MHP, Palms and Pines MHP, Pelican Harbor MHP, River Forrest Village, and Villas Del Sol) all lie within the boundaries of the City of Punta Gorda public system. These systems most likely will connect to the City of Punta Gorda infrastructure and are not considered as potential acquisitions by the CCUD.

Four community utilities could be considered for connection to the CCUD system:

- Harborview MHP
- Gasparilla Mobile Home Estates
- Hideaway Bay Beach Club
- Sun N Shade Family Campground

Figure 3-1 shows potential future connections and areas not considered for connection to the CCUD.

Figure 3-1 *Wastewater Utility Systems within Charlotte County*



3.3.1 REGULATORY ISSUES

Table 3-2 summarizes the FDEP permits and the status of the utility systems considered for consolidation. According to the FDEP (South District Office – Fort Myers), these facilities have no active consent orders, administrative orders, or notice of permit violations. All of the WWTP operating permits are active except for Knight Island Utilities WWTP. Knight Island Utilities WWTP is currently in negotiations over a bulk sewer service agreement with CCUD.

Table 3-2 *FDEP Permits and Statuses*

Facility Name	Address	Permitted Capacity (MGD)	FDEP WWTP ID	Expiration
Hideaway Bay Beach Club Condo WWTP	12000 Placida Rd	0.021	FL A014078	08/21/2017
Gasparilla Mobile Home Estates WWTP	2001 Gasparilla Rd (CR 771)	0.025	FL A014089	08/02/2021
Knight Island Utilities WWTP	7092 Placida Rd	0.055	FL A014095	02/23/2016
Harborview Mobile Home Park WWTP	24325 Harborview Rd Lot 1-A	0.024	FL A014116	12/18/2019
Sun N Shade Family Campground STP	14880 Tamiami Trl	0.020	FL A014120	12/03/2020

Note: STP = sewage treatment plant.

3.3.2 FINANCIAL STRENGTH

The Public Service Commission (PSC) was contacted to determine the financial health of facility operations and to document any PSC violations. The PSC has information for 165 water, electric, and wastewater utilities throughout the state. However, the smaller community systems considered for connection to the CCUD are not regulated by the PSC and therefore their financial information is unknown. Only the Utilities Inc. of Sandalhaven (PSC # SU959), which is not being considered for acquisition by CCUD, is regulated by the PSC.

3.4 BULK SERVICE CONNECTION OPTIONS

Each sewer utility identified for bulk service would generally connect to a CCUD gravity or pressure main via a new transmission system. Typically, transmission system mains are sized for the buildout flow and tied into existing CCUD networks that will convey the flow to the appropriate CCUD WRF. Ideally, as the transmission infrastructures are expanded, the sequencing of the facility connection occurs in series with the closest facility connected first. However, frequently the timing of connections can depend more on other issues such as expiring permits, failing WWTPs, and available funds or the cost-benefit of constructing new transmission systems.

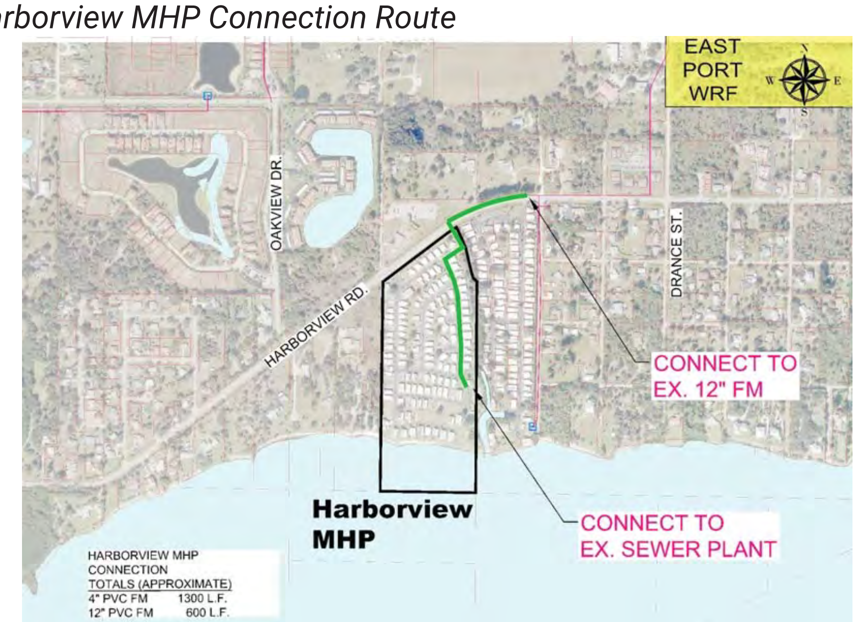
Approximate costs to install the force main infrastructure from the existing treatment plant to an existing CCUD facility using the schematic layouts have been developed. The costs are approximated for the construction of the transmission system and conversion of the WWTP to a pump station only and do not include any collection system improvements, as it was assumed that only the provision of bulk service will be provided by the CCUD.

3.4.1 MID COUNTY

3.4.1.1 HARBORVIEW MOBILE HOME PARK

A 12-inch force main on Harborview Road is just east of the driveway to Harborview MHP. Although the flows from this park only require a 4-inch main, any extension of the existing main on Harborview Road should also be 12 inches to allow other connections farther west. The treatment plant in the MHP could be converted to a pump station, and a 4-inch transmission line could be installed in the park network connecting to the extended 12-inch force main on Harborview Road. Figure 3-2 shows this proposed connection, and Table 3-3 provides the cost estimate for this option.

Figure 3-2 Harborview MHP Connection Route



Harborview Road, Port Charlotte, Florida

Table 3-3 Harborview MHP Connection Cost Estimate

Description	Quantity	Unit	Extension
4-inch PVC O.C.	1,300	$25.00	$ 32,500
12-inch PVC O.C.	600	$80.00	$ 48,000
WWTP– LS Conversion			$ 50,000
Subtotal			$130,500
Professional Services			$ 26,100
Total (Rounded)			$157,000

3.4.2 WEST COUNTY

3.4.2.1 HIDEAWAY BAY BEACH CLUB

Hideaway Bay Beach Club has a small treatment plant on Little Gasparilla Island. Because this is a bridgeless island, any extension of a force main must cross the intra-coastal waterway.

The most likely route would be a direct, subaqueous line connecting the Club to the mainland into the Placida Road force main network near the intersection of Placida Road and the Boca Grande Causeway.

This main could also be used to convey sewage from the south end of Little Gasparilla Island, if a collection system is installed in the future. Figure 3-3 shows this proposed connection, and Table 3-4 provides the cost estimate for this option.

Figure 3-3 Hideaway Bay Beach Club Connection Route

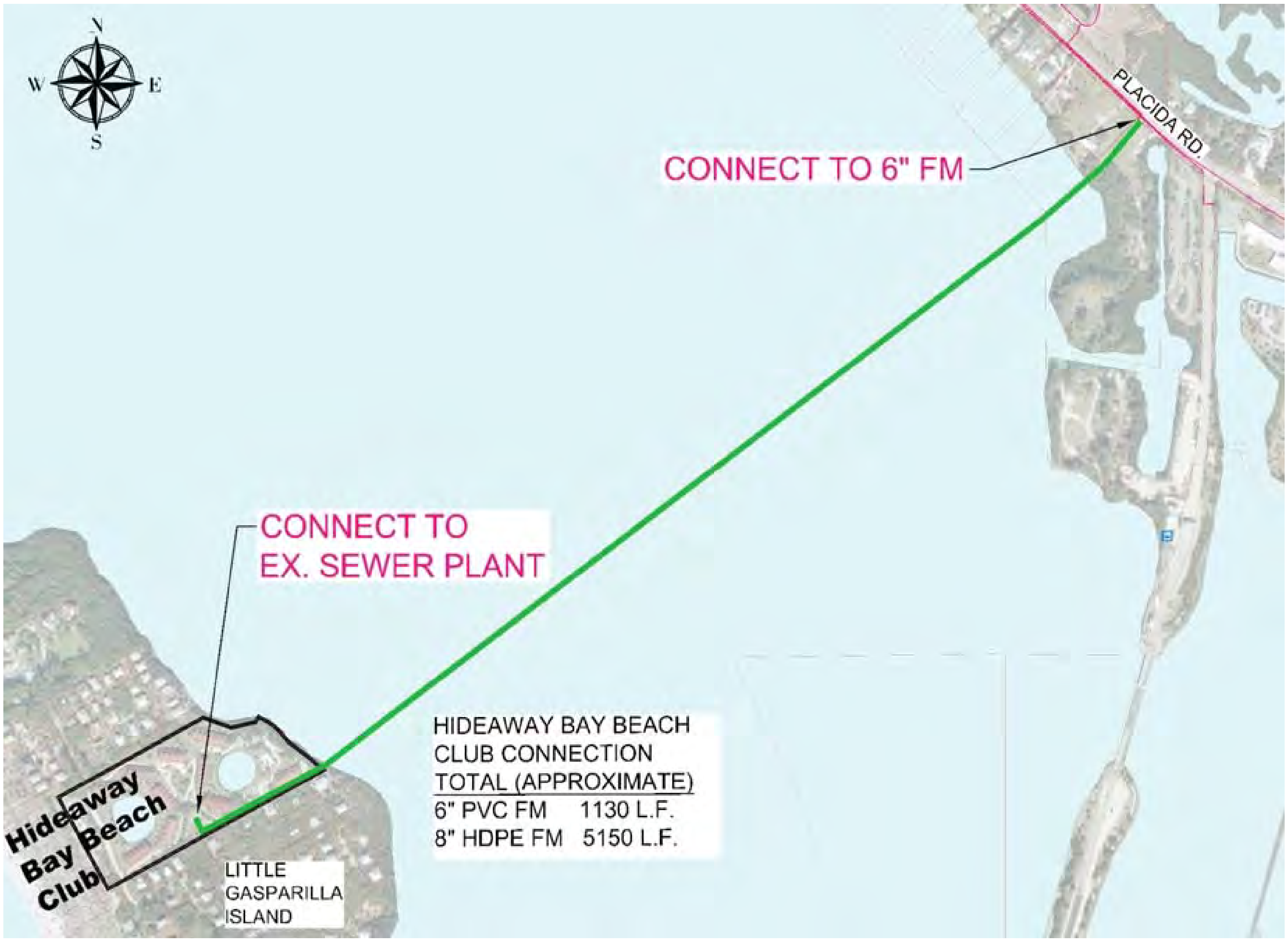


Table 3-4 Hideaway Bay Beach Club Connection Cost Estimate

Description	Quantity	Unit	Extension
6-inch PVC O.C	1130	$ 45.00	$ 50,850
8-inch HDPE DD	5150	$100.00	$515,000
WWTP – LS Conversion			$ 50,000
Subtotal			$615,850
Professional Services			$123,170
Total (Rounded)			$739,000

3.4.2.2 GASPARILLA MOBILE HOME ESTATES

This MHP could be relatively easily connected to the existing force main on Gasparilla Road (SR 771) using a 4-inch line and converting the existing treatment plant to a lift station. Figure 3-4 shows this proposed connection, and Table 3-5 provides the cost estimate for this option.

Figure 3-4 Gasparilla Mobile Home Estates Connection Route

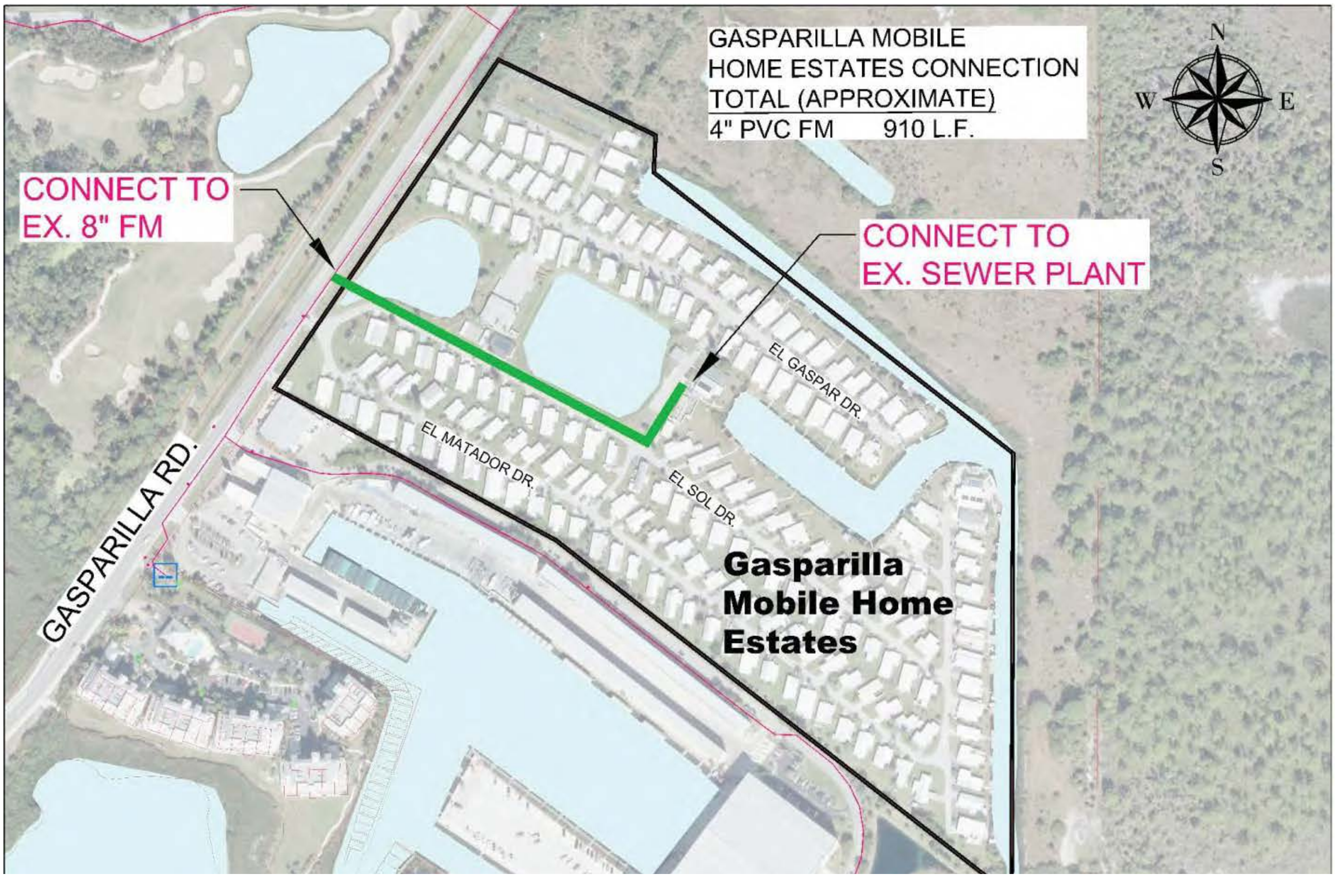


Table 3-5 Gasparilla Mobile Home Estates Connection Cost Estimate

Description	Quantity	Unit	Extension
6-inch PVC O.C	10,350	$ 45.00	$465,750
8-inch PVC O.C.	2,400	$ 60.00	$144,000
8-inch HDPE DD	1,725	$100.00	$172,500
WWTP – LS Conversion			$ 50,000
Subtotal			$832,250
Professional Services			$166,450
Total (Rounded)			$999,000

3.4.2.3 KNIGHT ISLAND UTILITIES

Knight Island Utilities (KIU) operates a WWTP primarily for its resort on this bridgeless island. The unused 6-inch directionally drilled main at the end of Panama Boulevard and the ferry landing could be extended to the existing KIU treatment plant. On the mainland, a new force main network running east to an existing CCUD manhole is currently contemplated. Figure 3-5 shows this proposed connection, and Table 3-6 provides the cost estimate for this option.

Figure 3-5 Knight Island Utilities Connection Route

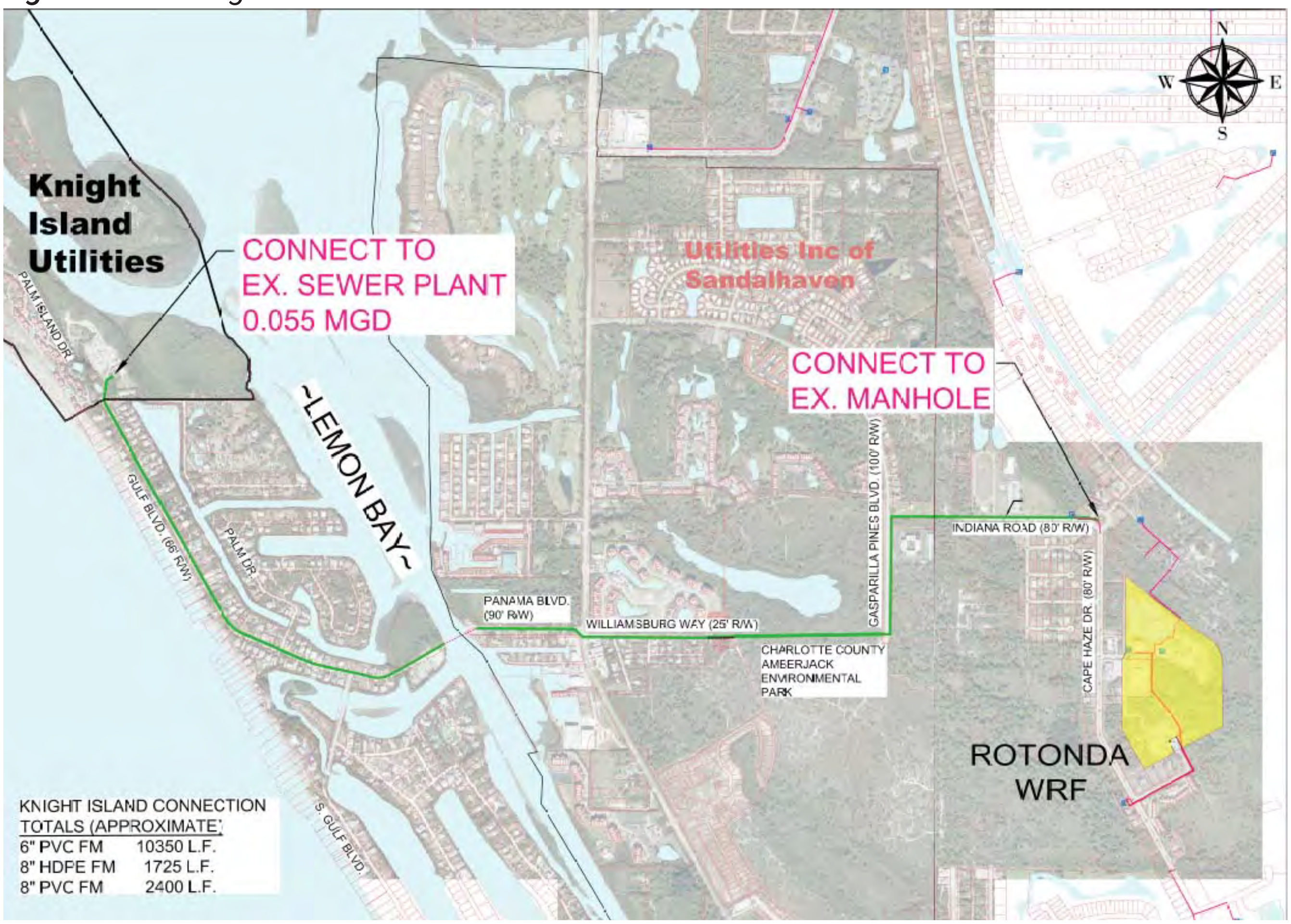


Table 3-6 Knight Island Utilities Connection Cost Estimate

Description	Quantity	Unit	Extension
4-inch PVC O.C.	980	$ 25.00	$ 24,500
8-inch PVC O.C.	6,200	$ 60.00	$ 372,000
12-inch PVC O.C.	28,320	$ 80.00	$2,265,600
8-inch HDPE DD	180	$100.00	$ 18,000
WWTP – LS Conversion			$ 50,000
Subtotal			$2,730,100
Professional Services			$ 546,020
Total (Rounded)			$3,276,120

3.4.3 SOUTH COUNTY

3.4.3.1 SUN N SHADE FAMILY CAMPGROUND

This campground is not located near any existing CCUD transmission lines and would require a significantly long line to connect. One option is to install a transmission main line along Zemel Road, which should be upsized to serve not only this campground but other facilities and lands along the route. Figure 3-6 shows this proposed connection, and Table 3-7 provides the cost estimate for this option. Another option is to extend service south from Tucker Grade and US 41 intersection.

Figure 3-6 Sun N Shade Family Campground Connection Route

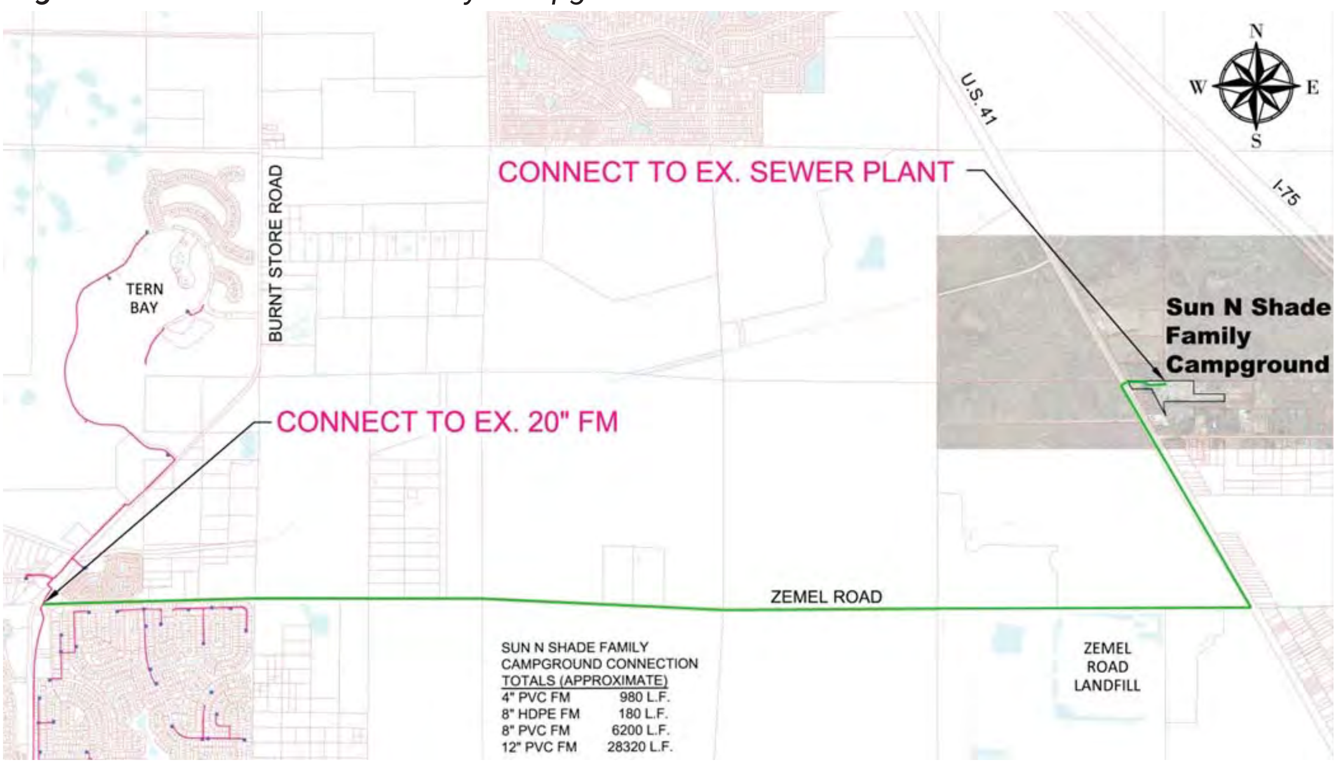


Table 3-7 Sun N Shade Family Campground Connection Cost Estimate

Description	Quantity	Unit	Extension
4-inch PVC O.C.	980	$ 25.00	$ 24,500
8-inch PVC O.C.	6,200	$ 60.00	$ 372,000
12-inch PVC O.C.	28,320	$ 80.00	$2,265,600
8-inch HDPE DD	180	$100.00	$ 18,000
WWTP – LS Conversion			$ 50,000
Subtotal			$2,730,100
Professional Services			$ 546,020
Total (Rounded)			$3,276,120

3.5 PRIORITIZATIONS

The priority and sequencing of connecting utilities to the CCUD sewer systems depend on the desire of the utility owner and the CCUD to connect their systems and the cost associated with connecting the systems. Table 3-8 summarizes the CCUD's feasible consolidation options and ranking. The cost and the permitted capacity were used to rank the cost benefit of each connection based on the cost per gallon to connect. The sequencing for connecting the utilities is discussed in Chapter 7.

Table 3-8 Summary of Connection Options

Utility	Cost to Connect	Capacity (GPD)	Cost/Gal
Gasparilla Mobile Home Estates	$ 87,000	25,000	$ 3.48
Harborview MHP	$ 157,000	24,000	$ 6.54
Knight Island Utilities	$ 999,000	55,000	$ 18.16
Hideaway Bay Beach Club	$ 739,000	21,000	$ 35.19
Sun N Shade Family Campground	$3,276,000	20,000	$163.80

The cost to install some of the transmission systems should not be wholly attributed to the utility being connected because some of the transmission piping is sized to accommodate other future connections adjacent to the transmission line. For example, the Sun N Shade Family Campground 12-inch transmission line along Zemel Road is sized to serve future connections. Consequently, the cost per gallon is skewed higher for that facility. Secondly, the Sun N Shade Family Campground may not have sufficient funds to install the transmission system even though they may wish to connect.

Finally, cost calculations consider the permitted capacity of each WWTP rather than actual flows, which could significantly alter the true cost per gallon. Therefore, the ranking and prioritization of each connection will be determined in detailed preliminary engineering reports, which will consider all possible options for connection and determine the most feasible solution.

4. SEWER IMPROVEMENT AND INFILL

OVERVIEW

This chapter reviews the CCUD sewersheds and presents the methodology used to identify project areas for economical sewer improvements and sustainable infill. Environmental scoring criteria were developed to identify project areas that maximize environmental benefits and provide long-term reductions in nutrient loading to Charlotte Harbor.

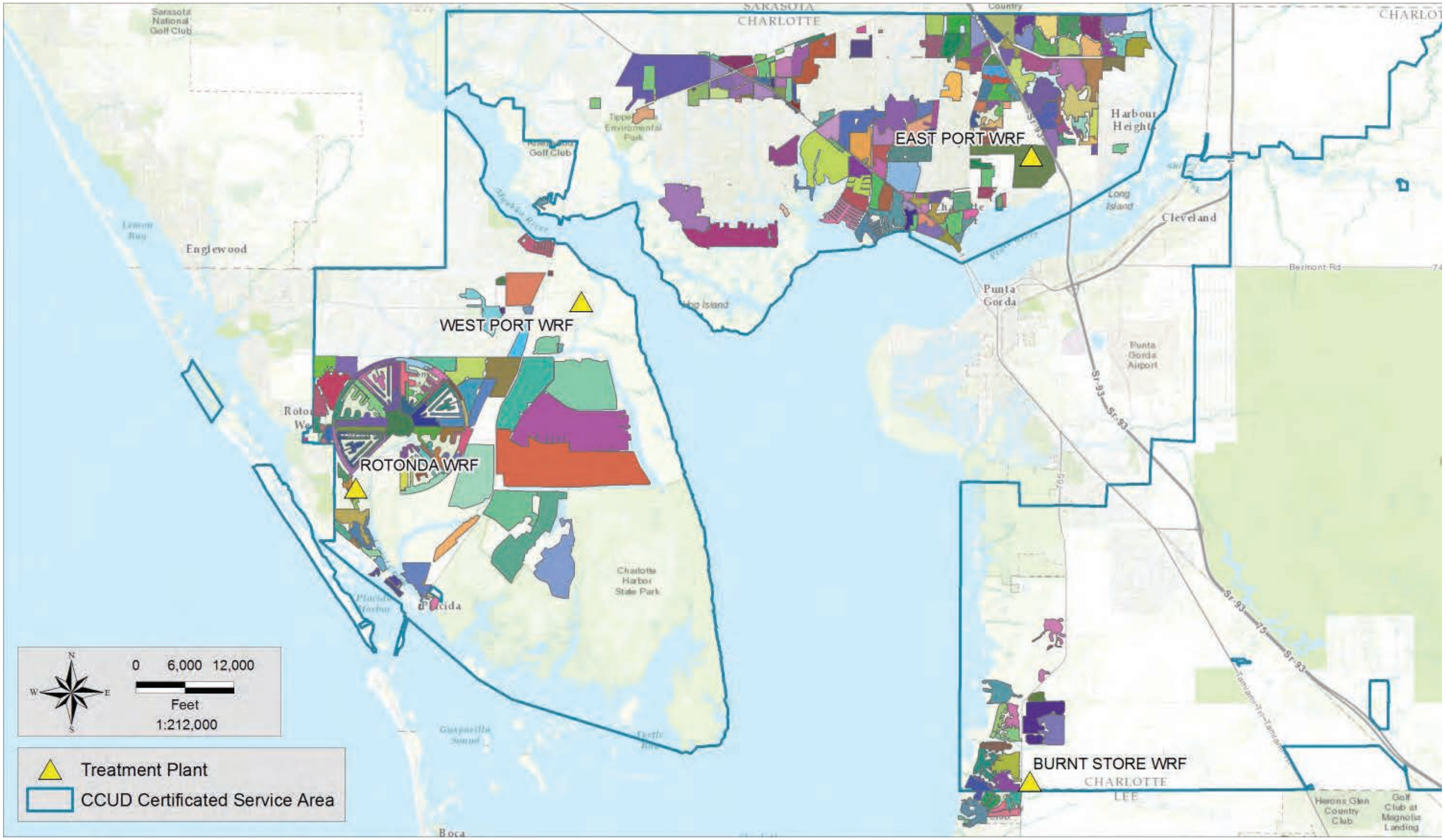
Centralized collection system alternatives (e.g., low pressure, gravity, vacuum) were reviewed to determine the type of collection system implementation for each project area. Cost analyses were conducted to determine affordable improvements and efficient implementation sequencing. Environmental assessments and cost considerations were used to prioritize project areas and to develop 5-year, 10-year, 15-year, and buildout improvement plans for the County's service area.


Port Charlotte, Florida

4.1 EXISTING SEWERSHEDS

Sewersheds refer to the geographic basin in which the wastewater flows are conveyed to each pumping station. CCUD's certificated service areas contains 268 sewersheds as presented in Figure 4-1. Mid County contains 161 sewersheds that serve approximately 16,240 acres or 42 percent of the Mid County buildout area. West County and South County contain 107 sewersheds, serving approximately 57 percent and 7 percent of their respective buildout areas.

Figure 4-1 *Existing Sewersheds*



4.2 PROJECT AREA DEVELOPMENT

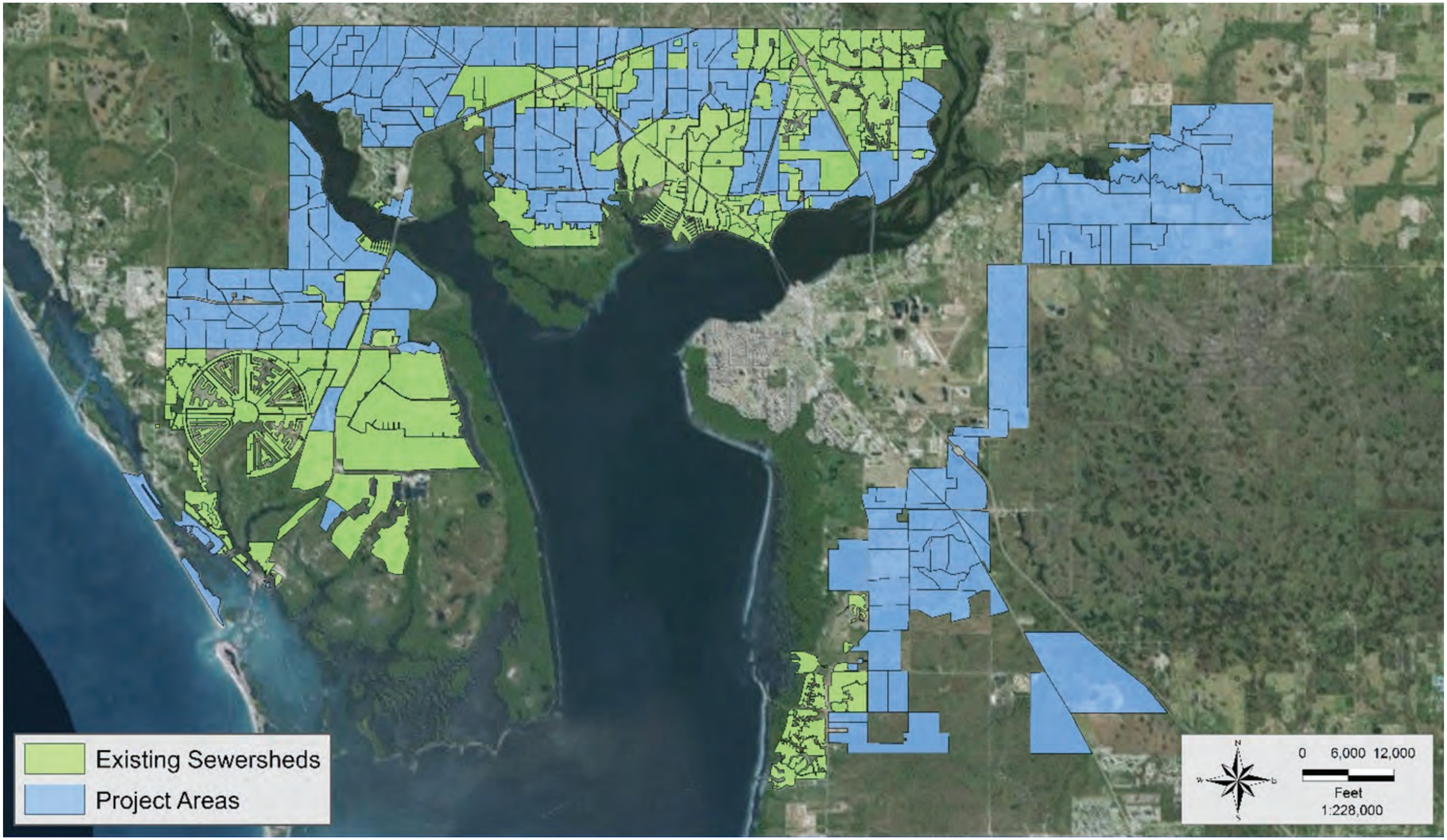
Project areas for future sewersheds were delineated by performing a geospatial analysis by simultaneously considering the following items:

- CCUD certificated service area boundaries.
- Current sewer system infrastructure.
- Topography.
- Dwelling unit density.
- Pump station capacity.
- Information gathered in CCUD workshops.
- Flow projections.
- Geospatial barriers such as major roadways and waterways.

Figure 4-2 shows the existing sewersheds and the project areas in the County service areas. A total of 217 project areas were identified throughout the CCUD certificated service area boundaries.

Bayshore Live Oak Park, Florida

Figure 4-2 Charlotte County Existing Sewersheds and Project Areas for Future Sewersheds



Mid County = 115 project areas
West County = 45 project areas
South County = 57 project areas

4.3 ENVIRONMENTAL ASSESSMENTS

Environmental scoring criteria were developed to prioritize the level of importance of converting septic tanks to sewer for each project area. The environmental scoring criteria included proximity to surface waters, age of septic tanks, and nitrogen loading. Individual impact maps were developed to display the environmental scoring criteria for the project areas. The individual impact maps were used to develop an overall average environmental score for the project areas throughout the County service area.

4.3.1 PROXIMITY TO SURFACE WATERS

Numerous studies have indicated that nutrients from septic tank effluents enter the groundwater if conditions are not sufficient for septic tank effluent treatment. As described in Chapter 1, the groundwater throughout Charlotte County flows directly to Charlotte Harbor or indirectly through contributing streams, canals, and rivers. Therefore, project areas were ranked from 1 to 5 based on the distance from the project area to these surface water bodies. A score of 5 represents project areas within 100 feet of surface water bodies that are hydraulicly connected to the Charlotte Harbor. Scoring criteria 4 through 2 were delineated in increments of 300 feet, with the lowest score of 1 representing > 900 feet to a surface water body. Figure 4-4 outlines the results of this study showing that 94% of the project areas received a score of 5.

El Jobean Boat Ramp, Florida

4.3.2 AGE OF SEPTIC TANKS

The septic tank age provides an estimate of its functionality, likelihood of failure, and design criteria. For instance, septic tanks built before 1983 did not have to meet the current State requirements regarding groundwater separation and surface water setback distances. The age of the septic tanks was estimated using 2015 SWFWMD Geographic Information System (GIS) data, property appraisal data, sewer/potable water laterals, and building permit data. The septic tank age for each project area was calculated as the average septic tank age for lots within the project area. Each project area was assigned a septic tank age impact factor between 1 and 5, based on the scoring criteria.

The basis for the scoring criteria was derived from a number of sources. EPA reports the average drainfield life is 15 years with a typical maximum drainfield life of 20 to 25 years (EPA, 1999; EPA, 2000). In 1983, FDEP and DOH established an agreement to coordinate the regulation of septic systems, approximatively 35 years ago. Additional research suggests the maximum life of a septic tank is 40 years (NewTechBio 2012; InspectApedia.com, 2017a; InspectApedia.com, 2017b). Figure 4-4 displays the average septic tank age for each project area. Results indicate that the majority of the septic tanks in the project area were installed more than 20 years ago.

4.3.3 NITROGEN LOADING

The number of septic tanks within Charlotte County's three sewer service areas was determined using 2015 SWFWMD GIS data and property appraisal data. The number of septic tanks in the Mid County, West County, and South County service areas were estimated to be 15,358, 7,084, and 2,390, respectively.

Nitrogen loading for each project area was calculated using the average people per household, flow projection assumptions, and local nitrogen effluent concentrations. The average local nitrogen loading was determined to be 10 pounds of nitrogen per person per year, corresponding with typical nitrogen effluent estimates (Ursin and Roeder, 2008; EPA, 2002; and Crites et al., 1998). The nitrogen scoring criteria was based on the following:

- 1 = <5 pounds nitrogen per acre per year.
- 2 = 5.1–15 pounds nitrogen per acre per year.
- 3 = 15.1–25 pounds nitrogen per acre per year.
- 4 = 25.1–40 pounds nitrogen per acre per year.
- 5 = 40.1–65 pounds nitrogen per acre per year.

The results from the nitrogen loading assessment is displayed in Figure 4-5. The annual total nitrogen loading for all the project areas in the County service area was estimated to be more than 620,000 pounds N. Table 4-1 lists the number of project areas and their associated averaged impact scores for each service area. This table summarizes the data shown in Figure 4-7.

Table 4-1 Number of Project Areas with Average Impact Scores

Impact Score	Mid County	South County	West County	Total Project Areas
4.0–5.0	40	4	17	61
3.5–3.9	12	14	11	37
3.0–3.4	34	23	12	69
2.5–2.9	10	4	1	15
<2.4	19	12	4	35

Figure 4-3 Current Priority Map - Proximity to Surface Water

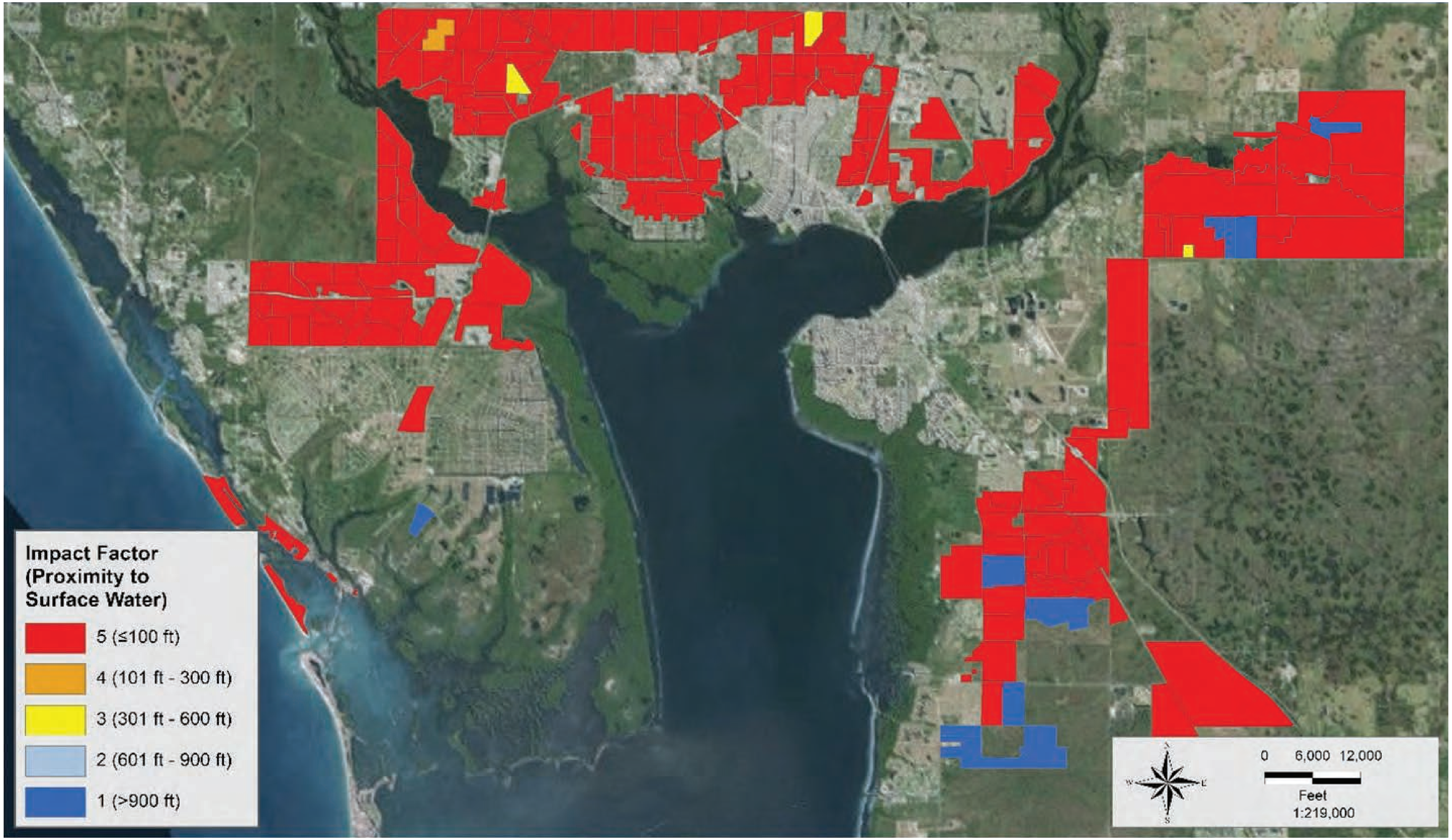


Figure 4-3 is an impact map depicting the project area proximities to surface waters throughout the County service areas. The majority of the project areas within the County service area are within 100 feet of a surface water body and received a score of 5. Fourteen project areas are farther than 100 feet from a surface water body with the majority being located in South County.

Figure 4-4 *Current Priority Map - Estimated Average Age of Septic Tanks*

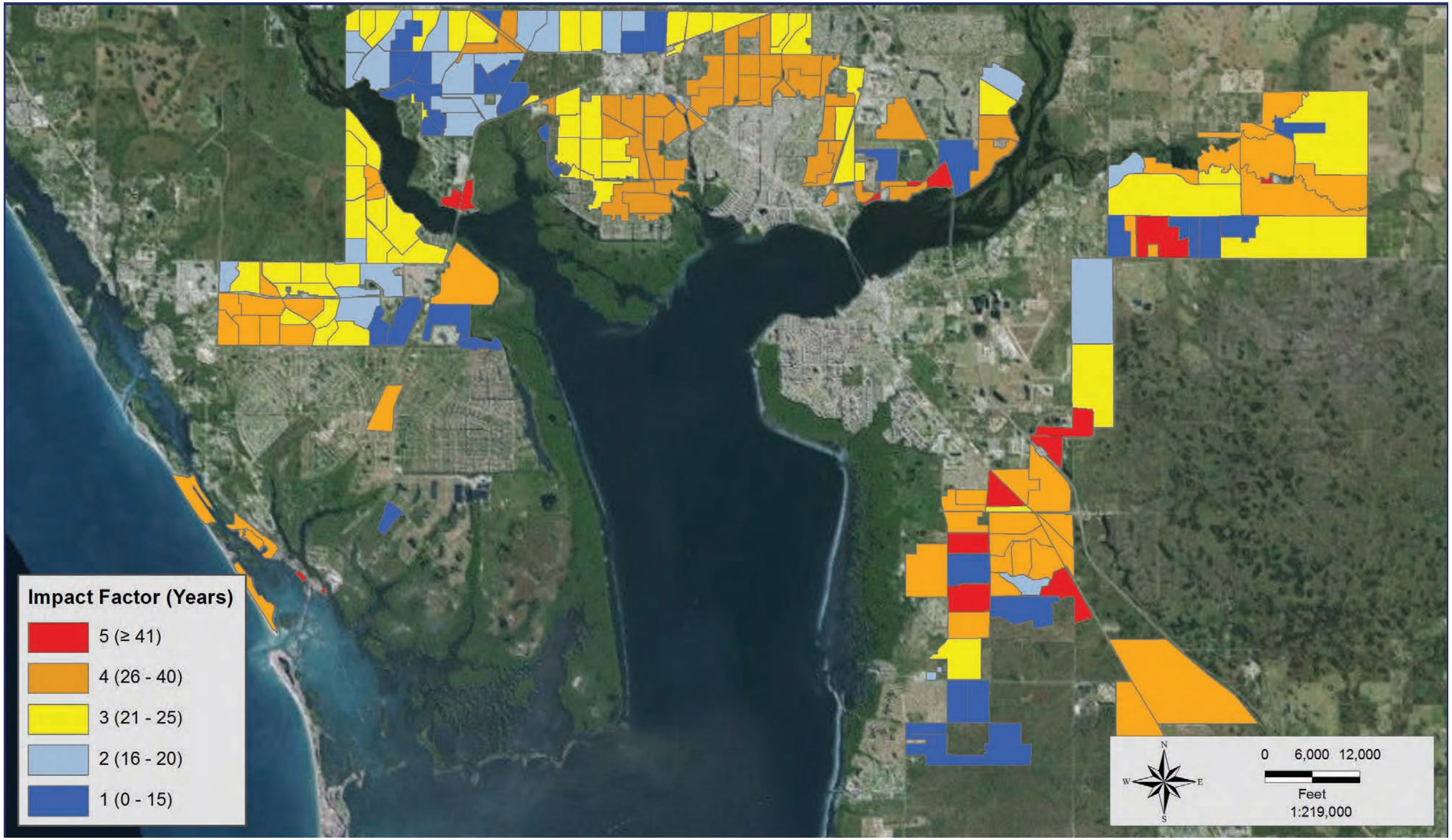


Figure 4-4 shows the nitrogen-removal-impact factor associated with converting each project area within the County from septic systems to sewer. The project areas depicted in red are estimated to contribute between 40 and 65 pounds of nitrogen per acre per year and correspond to the area with the highest dwelling unit density. Eighteen of these project areas are found in the Mid County service area. The analysis indicates that by converting these project areas in Mid County from septic to sewer, nitrogen loadings could be reduced by approximately 156,350 pounds per year, accounting for an overall nitrogen loading reduction of nearly 25 percent in Charlotte County.

Figure 4-5 *Current Priority Map - Nitrogen Loading*

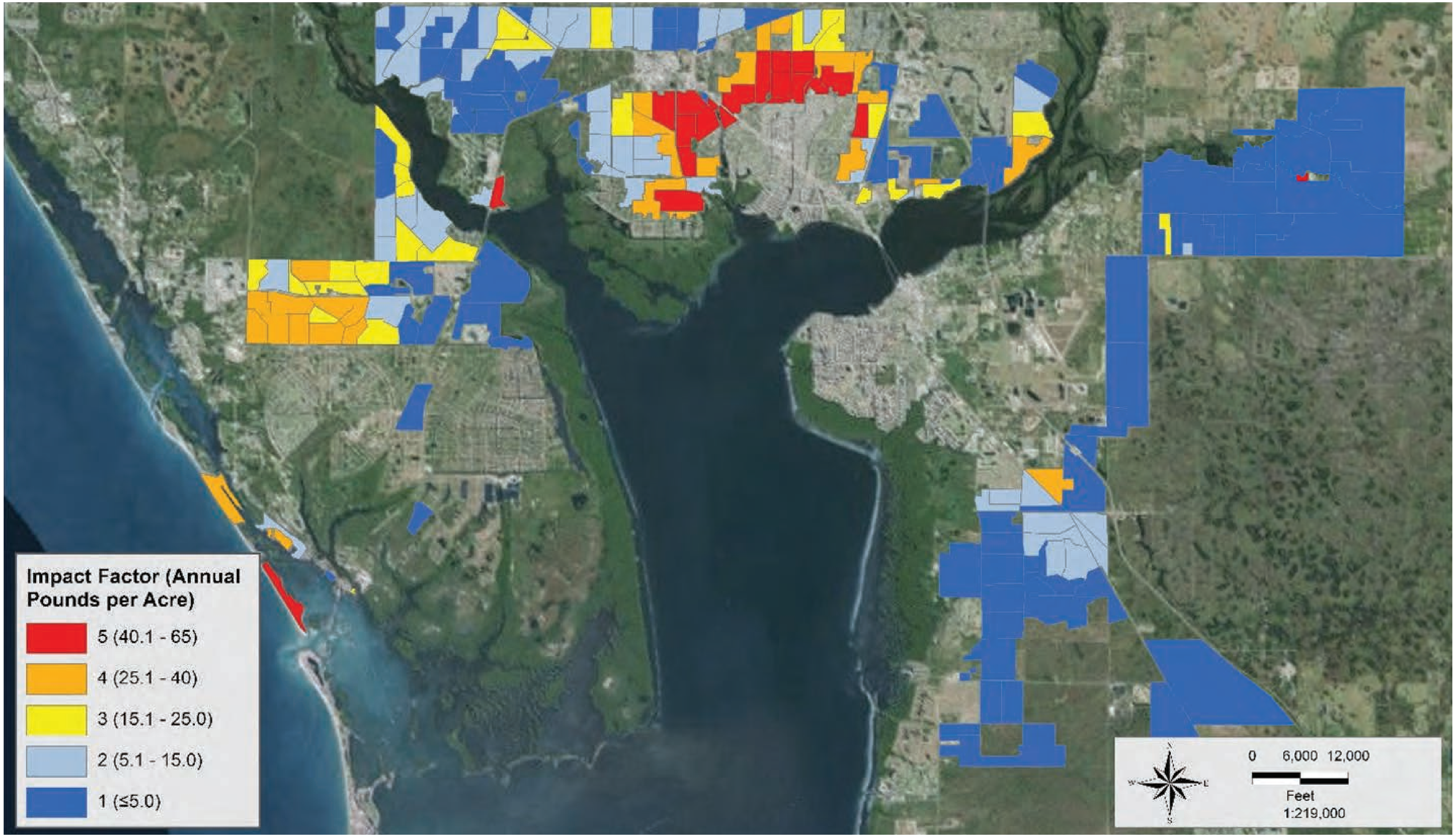


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Figure 4-6 *Current Priority Map - Average Impact Score*

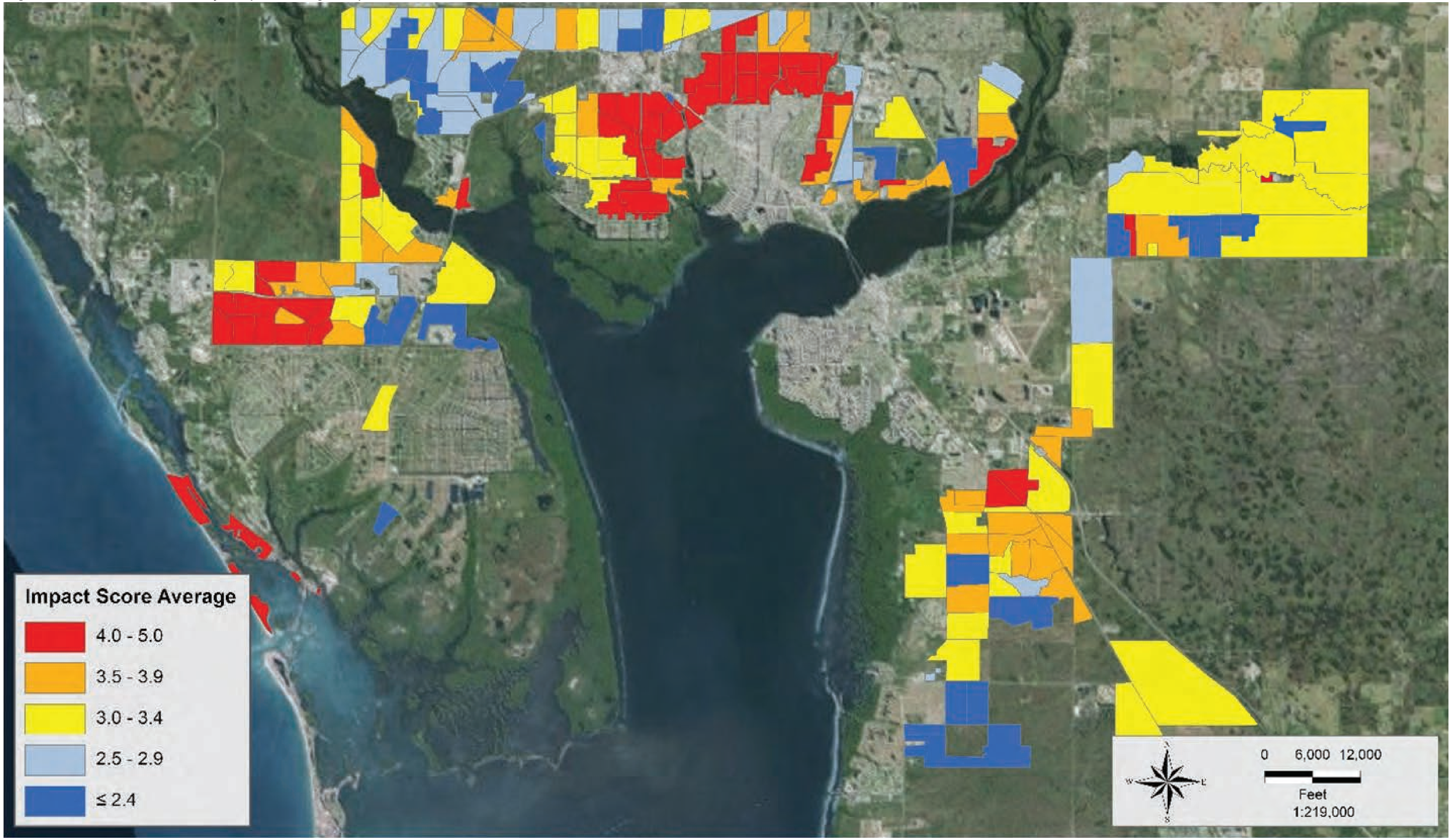


Figure 4-6 displays the average impact score for each project area in Charlotte County. Sixty-one project areas had average impact scores above 4. The majority of the project areas with the worst impact scores were in the middle region of Mid County or in non-sewered coastal areas such as Cape Haze and El Jobean.


Pump Station Tank Installation

4.4 COLLECTION SYSTEM ALTERNATIVES EVALUATION

Sewer collections systems are generally categorized by their principle of transport, which include pressure, vacuum, and gravity. The three most common types of collection systems currently implemented in Charlotte County include low-pressure septic tank effluent pumping (STEP), gravity collection, and vacuum collection systems. An evaluation of these three collection system types was conducted to develop an economical centralized collection system for the CCUD service areas. The following factors were used to evaluate the wastewater collection system alternatives:

- Constructability
- Reliability
- Protection of the Environment
- Ease of Maintenance
- Capital Costs
- Operation and Maintenance (O&M) Costs

Table 4-2 summarizes the costs per equivalent residential connection (ERC) for the three collection system types evaluated. On-lot and collection system costs are total project costs inclusive of construction and professional services. Annual O&M costs include replacement of parts, repairs, labor, and biochemical oxygen demand (BOD) augmentation at the WRFs. The range in Collection System Including On-Lot costs demonstrates that the cost can vary within each type of technology depending on project specific factors such as having the availability of nearby infrastructure or change in topography.

Table 4-2 Cost Comparison Summary Per ERC

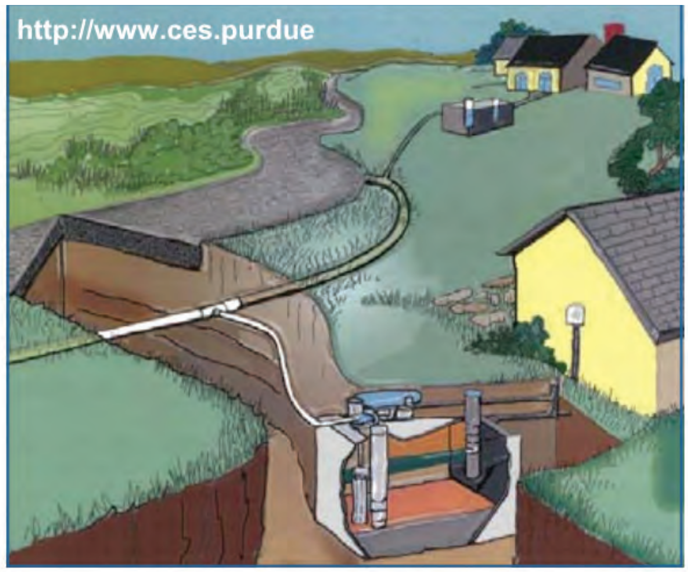
Sewer Collection System Technology	On-Lot	Collection System Including On-Lot	Annual O&M	40-Year Present Worth
Low Pressure/STEP	$7,675	$13,200 – $14,250	$870 – $980	$30,400 – $33,700
Gravity Collection	$2,258	$20,000 – $23,300	$270 – $380	$27,600 – $30,900
Vacuum Collection	$2,258	$13,200 – $15,000	$420 – $540	$21,100 – $25,500

There are a number of additional collection systems technologies that are used in the industry including low-pressure grinder pump and small diameter gravity systems which are discussed in further detail in this Section. However, for purposes of this report the County's most common collection system types were evaluated to determine a feasible County-wide collection system technology. The County is continuously evaluating alternative sewer technologies and considers the most current technologies when designing a collection system for a particular area.

4.4.1 PRESSURE COLLECTION SYSTEM

4.4.1.1 SEPTIC TANK EFFLUENT PUMP (STEP)/LOW-PRESSURE SYSTEM

STEP/low-pressure systems use conventional septic systems with automatic pumps and control devices to convey the liquid in the septic tank to a pressurized collection system. CCUD refers the STEP systems as low-pressure systems.

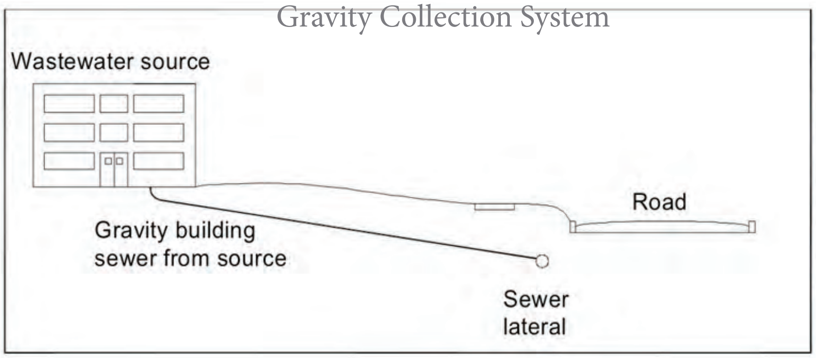


The term "low-pressure" will be used for this type of system in this report. The system is comprised of a tank located at each home on private property and connected to the collection system by a small diameter (typically 2-inch) pressurized pipe.

The collection system piping is typically composed of small diameter pipe pressure mains that can be laid along existing roadways with minimum disruption to streets, sidewalks, lawns, driveways and underground utilities. Surface restoration costs are similarly minimized.

The sewage travels from the house into the septic tank where the solids in the sewage settle out and remain in the tank. Then a pump in the tank conveys the liquid to a pump station where it is transported to the WRFs through transmission force mains. In collection systems that contain significant amount of low-pressure collection systems, BOD augmentation becomes necessary to maintain proper carbon to nitrogen ratios at the WRFs. Since the majority of the carbon-based solids remain in the tank in low-pressure systems the costs for BOD augmentation can be substantial.

Some communities are able to realize cost savings by retrofitting existing septic tanks with effluent pumps. However, the majority of the existing septic tanks in the CCUD service areas are beyond the useful life or cannot be modified for a low-pressure system. A new septic tank with the effluent pump would need to be installed for each home. In addition, each pump installation requires a power connection to the resident's power supply and a dedicated control panel. There is a considerable amount of O&M costs associated with maintaining the effluent pumps. In addition, the cost for BOD augmentation must be considered when installing a low-pressure systems in numerous project areas.



4.4.1.2 GRINDER PUMP LOW-PRESSURE SYSTEM

A grinder pump low-pressure system consists of conventional, drain, waste, and vent piping within the residence connected to the packaged grinder pump basin. The grinder pump basin is typically installed outdoors, below grade, and serves one residence. Grinder pumps discharge a finely ground slurry into small-diameter pressure piping. In a completely pressurized collection system, all the piping downstream from the grinder pump (including laterals and mains) will normally be under low pressure (60 psig or less). The system is comprised of a grinder pump basin located at each home on private property and connected to the collection system by a small (typically 1.25-inch) pressurized pipe. Pipe sizes used in the collection system are typically similar to the small diameter piping used for STEP/low-pressure systems. Small-diameter pipe pressure mains can be laid along existing roadways with minimum disruption to streets, sidewalks, lawns, driveways and underground utilities. Surface restoration costs are similarly minimized. There is a considerable amount of O&M costs associated with maintaining the grinder pumps.

Quesada Pump Station 3

Vacuum Collection System

4.4.2 GRAVITY COLLECTION SYSTEM

Gravity collection systems are a common and traditional method to collect wastewater for public utilities. Sewage exits the home through pipes installed at an angle so the sewage flows by gravity. These service laterals are used to connect each home to the gravity sewer mains. The gravity system then flows to localized pump stations in the area. Manholes are typically required approximately every 400 feet or at each bend. The pump stations pump the sewage into force mains which transport the collected wastewater to other pump stations or to WRFs for treatment. Construction of a gravity system results in a greater disturbance to the developed land (e.g., roadway, sidewalks, and other utilities). In addition, due to the high groundwater table in the CCUD service areas and depth of construction associated with gravity sewer, a significant amount of dewatering would be required. Gravity systems are typically more reliable than other systems since the mechanical and electrical components are only at the pump stations. The maintenance of the service lateral from the property line or up to the right-of-way is the residence's responsibility which can reduce the overall maintenance costs for the utility.

4.4.3 VACUUM COLLECTION SYSTEM

The vacuum sewer system includes a valve pit serving two to four homes, a vacuum collection system, and a vacuum collection station with pumps (vacuum and pressure). In a vacuum system, sewage flows by gravity from the homes/structures into a valve pit. Small-diameter gravity piping (minimum of 4 inches in diameter) would be installed at relatively shallow depths of 4 to 6 feet at a minimum slope. The valve pits have a pneumatic valve that operates by pressure (no electrical power is required). The valve pit pneumatic valve opens automatically when a given quantity of sewage accumulates in the valve pit. The vacuum collection system operates under a negative pressure/vacuum. The sewage is transported by vacuum until it ultimately discharges into a vacuum collection station. The vacuum collection station takes the place of a conventional pump station by collecting, storing, and pumping the sewage via pressure through a force main to the WRF. Disturbance to developed land as a result of construction is less than the disturbance from constructing a gravity collection system.

For the project area sizes proposed in this master plan, the capital costs associated with vacuum collection systems are on par with STEP/low-pressure sewer system. However, the O&M cost associated with vacuum systems is typically much less than STEP/low-pressure sewer systems. Consequently, the 40-year present worth of the vacuum system option is typically less than the STEP-low-pressure system option.

These systems have been proven to be reliable. If a vacuum line breaks, minimal outfall of wastewater occurs. Also, very little I&I occurs in comparison to gravity and low-pressure collection systems. The vacuum system requires more O&M than a gravity collection system since the pneumatic valve pits need to be inspected and maintained. However, it would typically take several lift stations in a gravity collection system to equal one vacuum station.

4.5 SEWER SYSTEM IMPLEMENTATION - COST DEVELOPMENT

4.5.1 COLLECTION SYSTEMS

Overall vacuum collection systems were determined to be the feasible alternative for the majority of the County project areas based on the collection system evaluation, cost comparison, and consultation with CCUD. Detailed capital and O&M costs were determined for each project area and used to develop the CIPs provided in Chapter 7. The costs include mobilization and general conditions (8%), contingency (20%), and professional services (20%)

Vacuum Collection Tank

Table 4-3 Capital Costs for Vacuum Sewer System

Item	Cost
On-lot Connection Cost ($/Connection)	$ 2,258
Off-lot Connection Cost ($/Buildout ERC)	$ 3,436
Collection Piping Construction Unit Cost ($/LF)	$ 58
Vacuum Pump Station Construction Cost (<750 Lots)	$ 837,934
Vacuum Pump Station Construction Cost (>750 Lots)	$ 1,376,594
Vacuum Pump Station Land Cost (<750 Lots)	$ 25,000
Vacuum Pump Station Land Cost (>750 Lots)	$ 40,000

Table 4-3 summarizes the capital costs applied to each project area. The capital cost estimates include costs for planning, survey, design, permitting, and construction.

Table 4-4 presents the annual O&M costs for a vacuum sewer system. The O&M costs for the collection system improvements included labor, power, equipment replacement and maintenance, and additional WRF treatment costs.

Table 4-4 O&M Costs for Vacuum Sewer System

Item	Annual Cost
Labor – Vacuum Pump Station	$ 12,750
Labor – Service Connection/Buildout ERC	$ 17.50
Power – Vacuum Pump Station (Fixed)	$ 1,500
Power – Vacuum Pump Station/ERC (Variable)	$ 32.40
Equipment – Vacuum Pump Station	$ 5,200
Equipment – Service Connections/Buildout ERC	$ 4.00

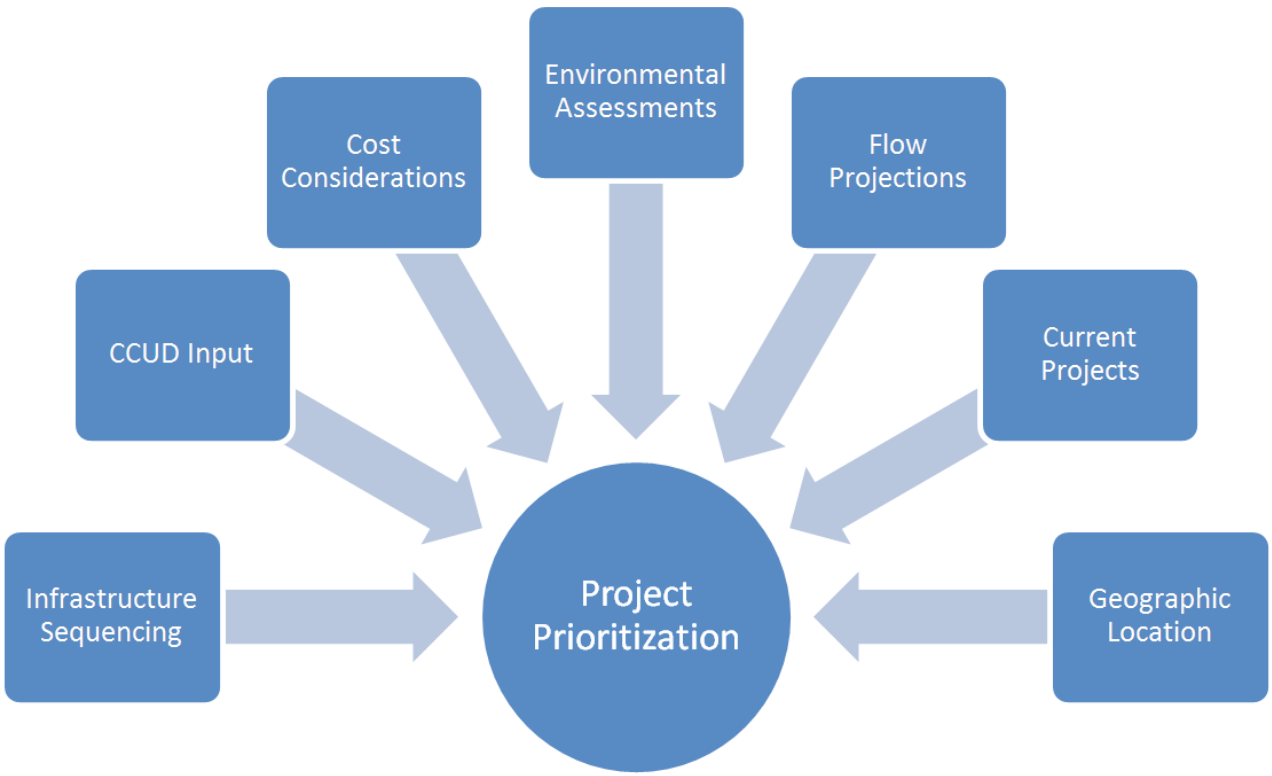

HDPE Pipe Used as Transmission Main

4.5.2 TRANSMISSION MAINS

Capital costs for the transmission mains are provided in Chapter 7. Costs for construction of the transmission mains include unit costs for the transmission main, valves, installation and restoration, contingency (20%), and professional services (20%).

4.6 PROJECT PRIORITIZATION

Once project areas were identified with the completion of environmental and cost assessments, project areas were prioritized to develop a flexible and practical implementation sequence. The optimum economic sequencing was determined considering the following inputs:



4.7 IMPROVEMENT PLANS

The project prioritizations were used to identify and develop consecutive 5-year, 10-year, 15-year, and buildout improvement plans. The project areas have been identified in each improvement plan and discussed in detail in Chapters 5 and 7. The specific infrastructure improvements including collection systems, transmission lines, and pump stations for the project areas under each plan are discussed in detail in Chapter 5.

4.7.1 5-YEAR IMPROVEMENT PLAN

Table 4-5 includes the project area name, corresponding identifier, the occupied lots using septic systems, and the total (including vacant) number of lots in the 5-year improvement plan. The plan includes the conversion of 4,769 septic systems to sewer located in 10 project areas within Mid County and 2 project areas within West County. In addition, two private utilities are expected to connect to the County system during the 5-year plan as were discussed in Chapter 3. Figure 4-7 graphically depicts the 5-year improvement plan by displaying the location of the project areas.

Figure 4-7 *5-Year Improvement Plan*

Table 4-5 5-Year Improvement Plan

Identifier	Name	Occupied Lots	Total Lots
M72A	El Jobean East	297	341
M67	Crestview Circle	64	85
M70	Ellicott Circle	212	266
M61	Seacrest	409	591
M68	Lakeview Corridor	498	611
M81	Yorkshire Ph I	487	660
M62	Hurtig	362	619
M80	Yorkshire Ph II	217	398
M56	Ackerman East	598	866
M55	Ackerman West	649	1067
W4	Cape Haze Ph I	89	118
W3	Cape Haze Ph II	126	306
W5*	L.G.I.	500	767
W2*	Don Pedro	261	429
	Total	4,769	7,124

* Private Utility Note: M= Mid County; S= South County; W=West County.

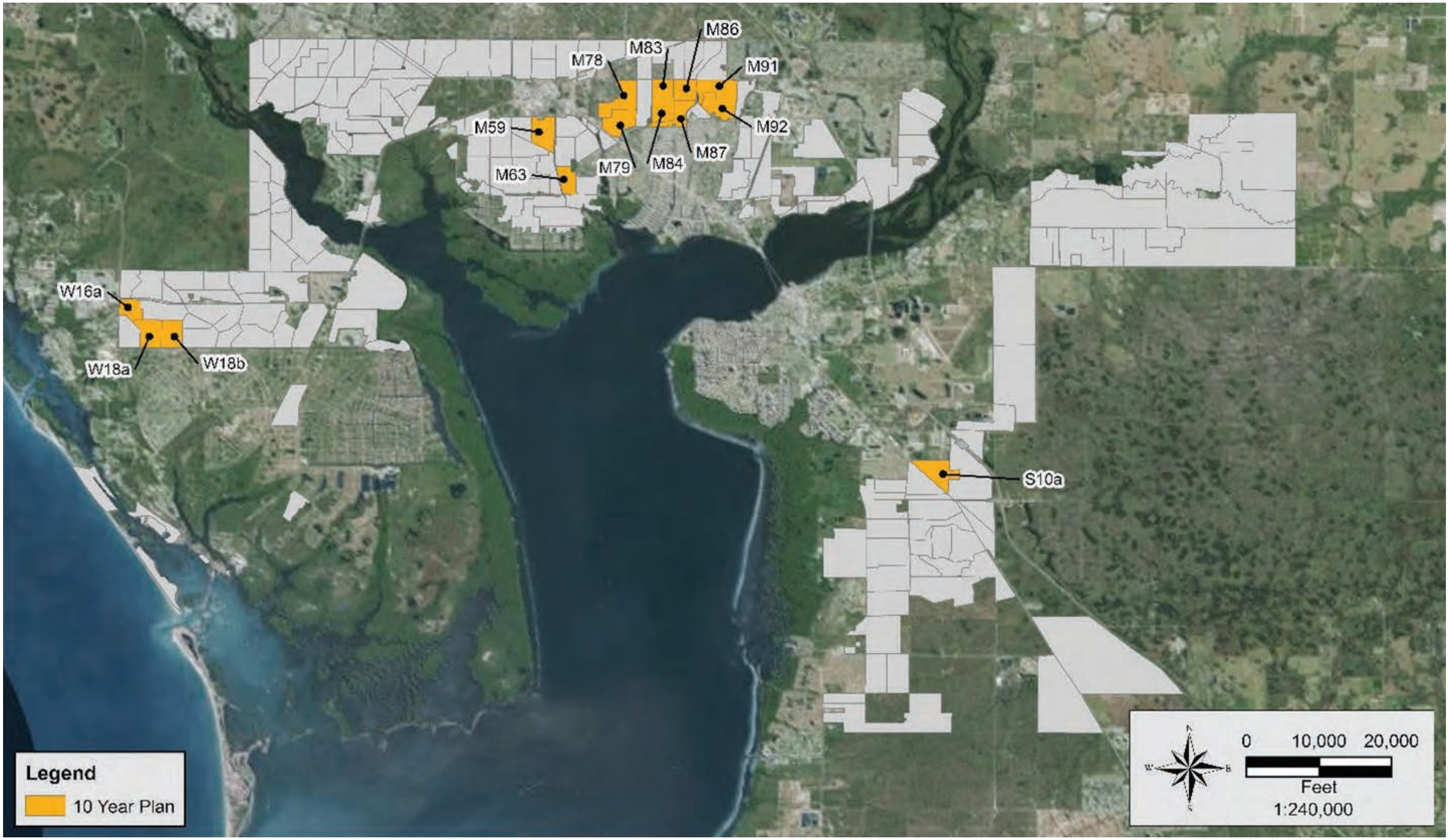
4.7.2 10-YEAR IMPROVEMENT PLAN

The project areas included in the 10-year improvement plan are shown in Figure 4-8 and listed in Table 4-6. The improvement plan includes the connection of 5,476 septic systems throughout 10 project areas located in Mid County, 3 project areas in West County, and 1 project area in South County.

Table 4-6 10-Year Improvement Plan

Identifier	Name	Occupied Lots	Total Lots
M59	Cannolot	533	808
M79	Blaine	500	731
M83	Hayworth	297	434
M78	Nimrod	492	725
M84	Kensington	372	498
M86	Birchcrest Ph I	327	511
M87	Birchcrest Ph II	384	586
M92	Laika	444	739
W18b	Seabrook	328	592
M91	State	402	788
W18a	Ebro	398	623
S10a	Royal Rd	382	588
M63	Beaumont	315	499
W16a	Denmark	302	499
	Total	5,476	8,621

Figure 4-8 10-Year Improvement Plan

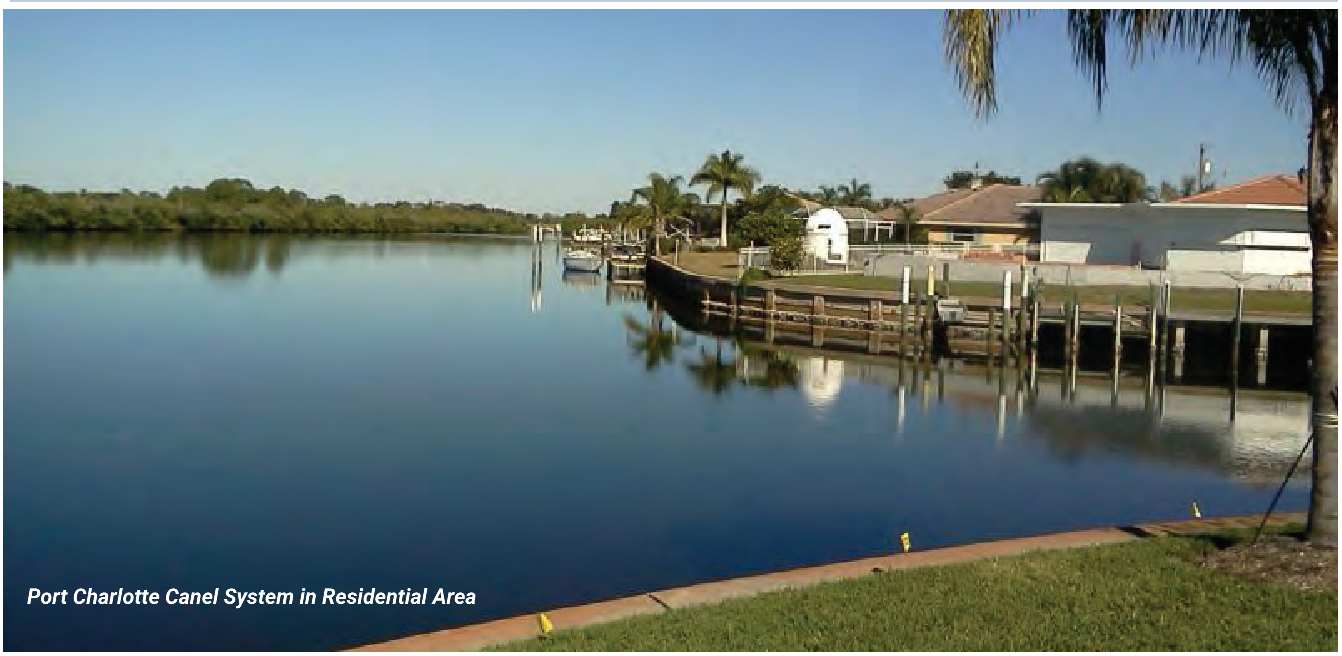


4.7.3 15-YEAR IMPROVEMENT PLAN

Table 4-7 lists the project areas included in the 15-year improvement plan. The total number of septic systems connected during this improvement plan is 5,094 through 16 project areas. The 15-year plan includes 10 project areas in Mid County and 6 project areas in West County as shown in Figure 4-9.

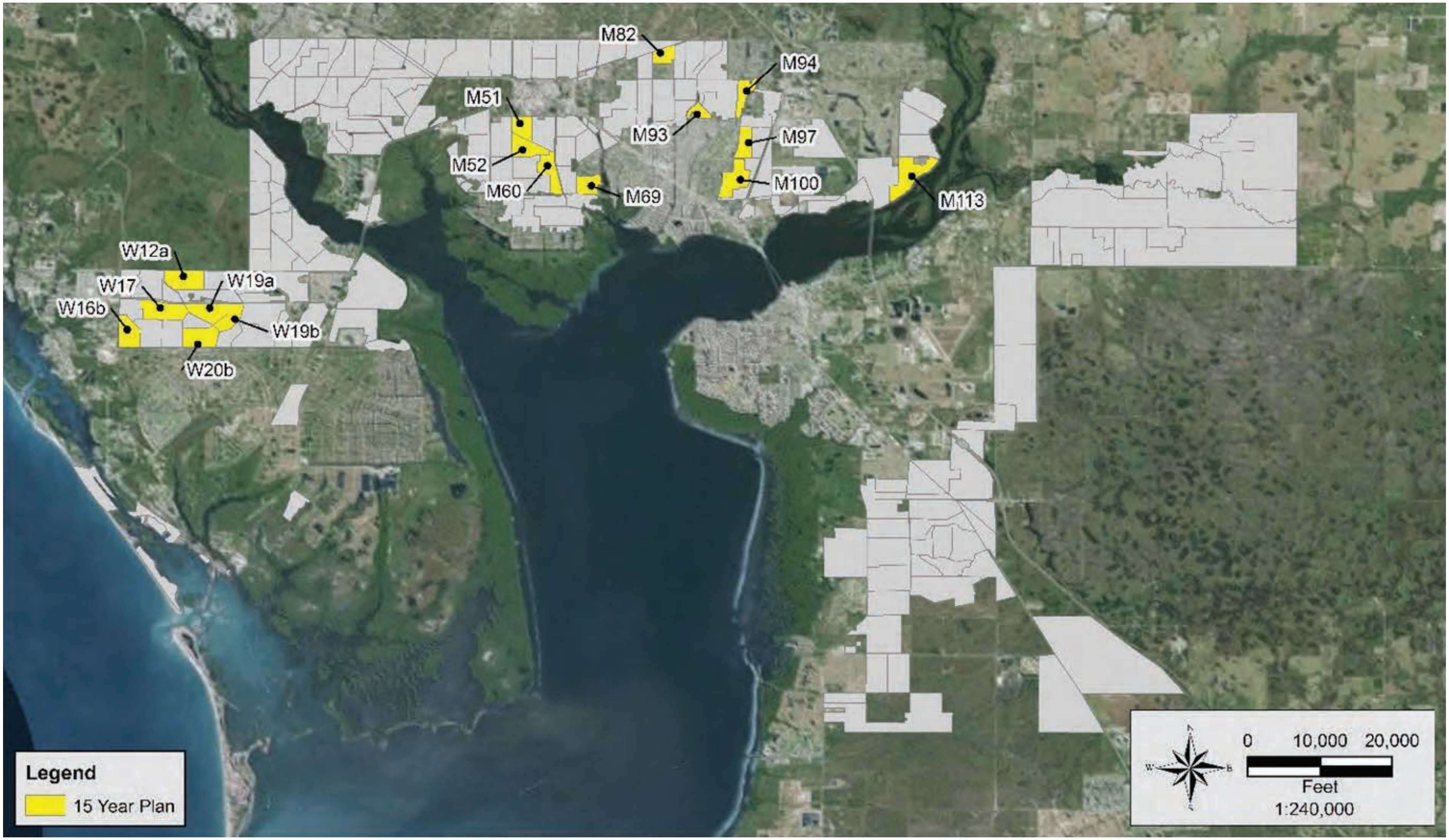
Table 4-7 15-Year Improvement Plan

Identifier	Name	Occupied Lots	Total Lots
M93	Tandy	168	249
M100	Rye	437	760
W17	Gunther	482	903
M69	Seabold	233	455
M94	Ruby	244	441
M113	Dover	572	1038
W19b	Peacock	254	528
W19a	Carnegie	424	849
W16b	Henry	265	637
M97	Villa	284	481
M60	Placid	321	588
W20b	Del Ray	357	713
M51	Windswept	230	384
M52	Auburn	318	578
M82	Danley	157	276
W12a	Thames	348	794
	Total	5,094	9,674



Port Charlotte Canel System in Residential Area

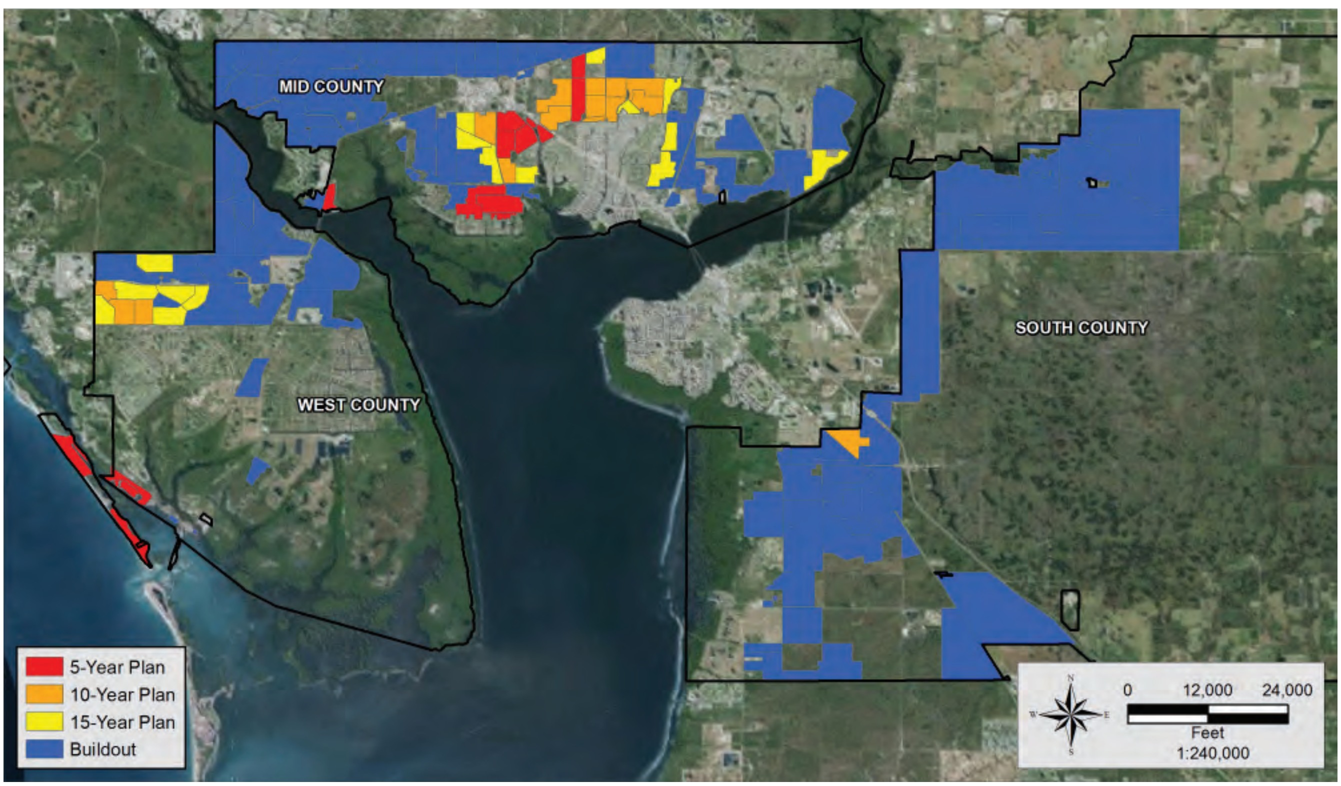
Figure 4-9   *15-Year Improvement Plan*



4.7.4 BUILDOUT IMPROVEMENT PLAN

The buildout improvement plan shown in Figure 4-11 identifies the project areas that remain after completing the 15-year improvement plan.

Figure 4-10 Buildout Improvement and 15 Year Improvement Plan



5. COLLECTION SYSTEM, TRANSMISSION MAINS, AND PUMP STATIONS

OVERVIEW

The CCUD provides wastewater service to over 35,000 customers through a network of collection and transmission systems. This chapter presents an overview of the existing CCUD collection and transmission systems, lists the County's ongoing improvements, and details the infrastructure required to convey wastewater flows under the 5-year, 10-year, 15-year, and buildout improvement plans.

As part of the master planning effort, hydraulic models were developed or updated to determine growth and infrastructure needs throughout the County's collection and transmission system. The models incorporate the County's ongoing improvements and the future project areas identified in Chapter 4.

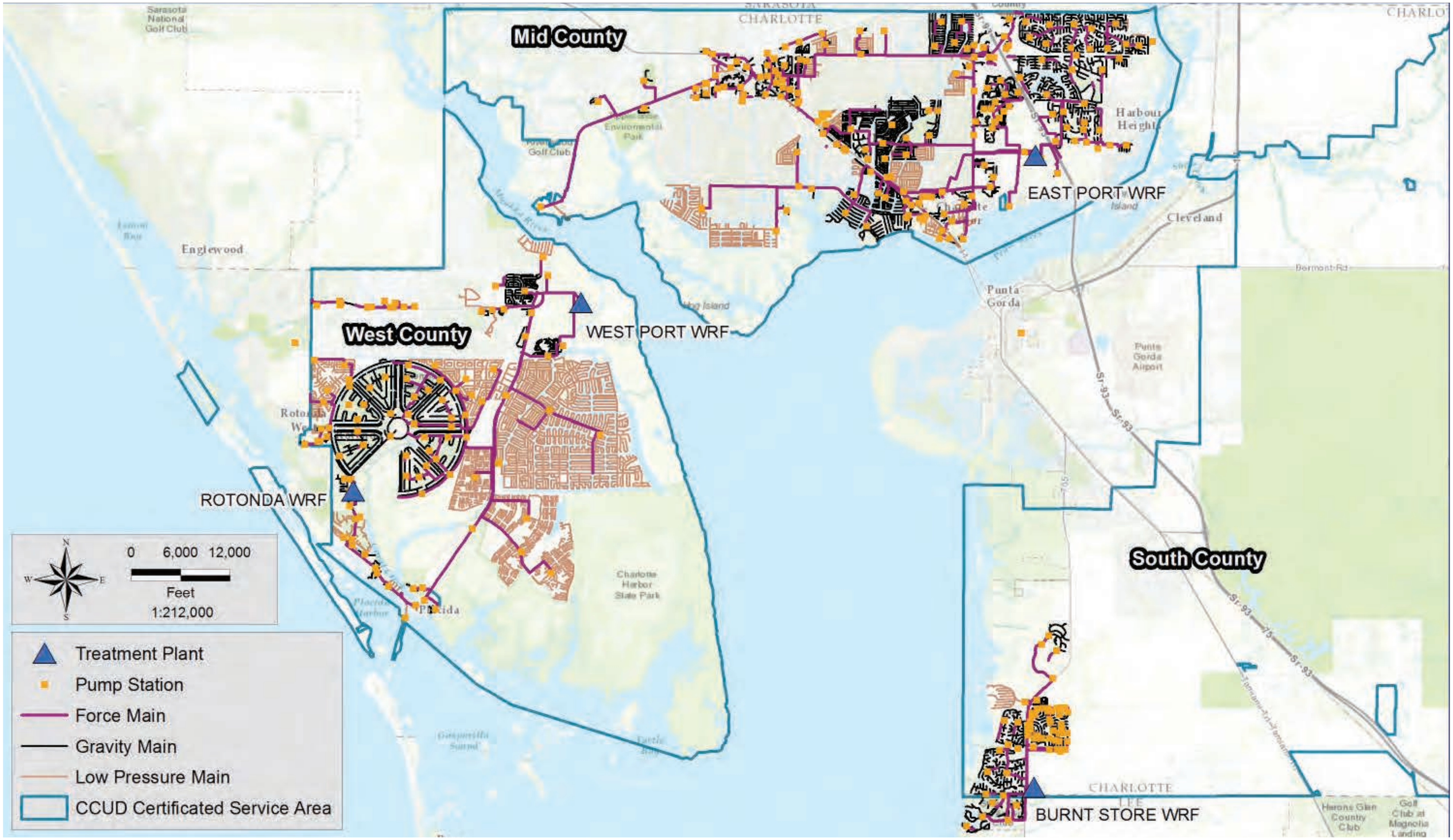
Elkcam Residential Development (johneliasphotography.com)

5.1 EXISTING COLLECTION AND TRANSMISSION SYSTEMS

The Charlotte County wastewater collection systems convey wastewater from homes and businesses through 927 miles of pipe, and over 300 pump stations, to one of four WRFs. The collection systems include gravity mains (over 360 miles), low-pressure mains (over 360 miles), and vacuum mains (32 miles). Pipes range from 1.5 to 48 inches in diameter. Pump stations and force mains (over 175 miles) are used to pump flows to another gravity collection system, to a master pump station, or directly to the WRF. Due to the relatively flat topography in the County, pump stations are required to convey the majority of the wastewater flow.

There are over 300 pump stations (294 in-service County-owned and more than 40 privately owned) in the transmission system network and approximately 8,350 STEP/low pressure systems serve individual addresses. Figure 5-1 presents the current collection, transmission system, pump stations, and the WRFs that serve the County within its certificated service areas.

Figure 5-1 Existing Collection, Transmission, and Treatment Systems Map



Charlotte Harbor Sunset (johneliasphotography,com)

5.2 ONGOING IMPROVEMENTS

CCUD has ongoing improvements that increase pumping capacity and reduce pump head total requirements at pump stations, which are the key factors in improving overall system efficiency and operability. The ongoing improvements in the CCUD wastewater collection and transmission system are presented in Figure 5-2 and include the following projects:

- Loveland Grand Master Pump Station
- Loveland Interceptor
- Deep Creek Force Main
- Midway Force Main and Interceptor
- Spring Lakes Pump Stations
- Wawa Morningstar Force Main Crossing
- Burnt Store Utilities Relocation
- Placida Utility Improvements

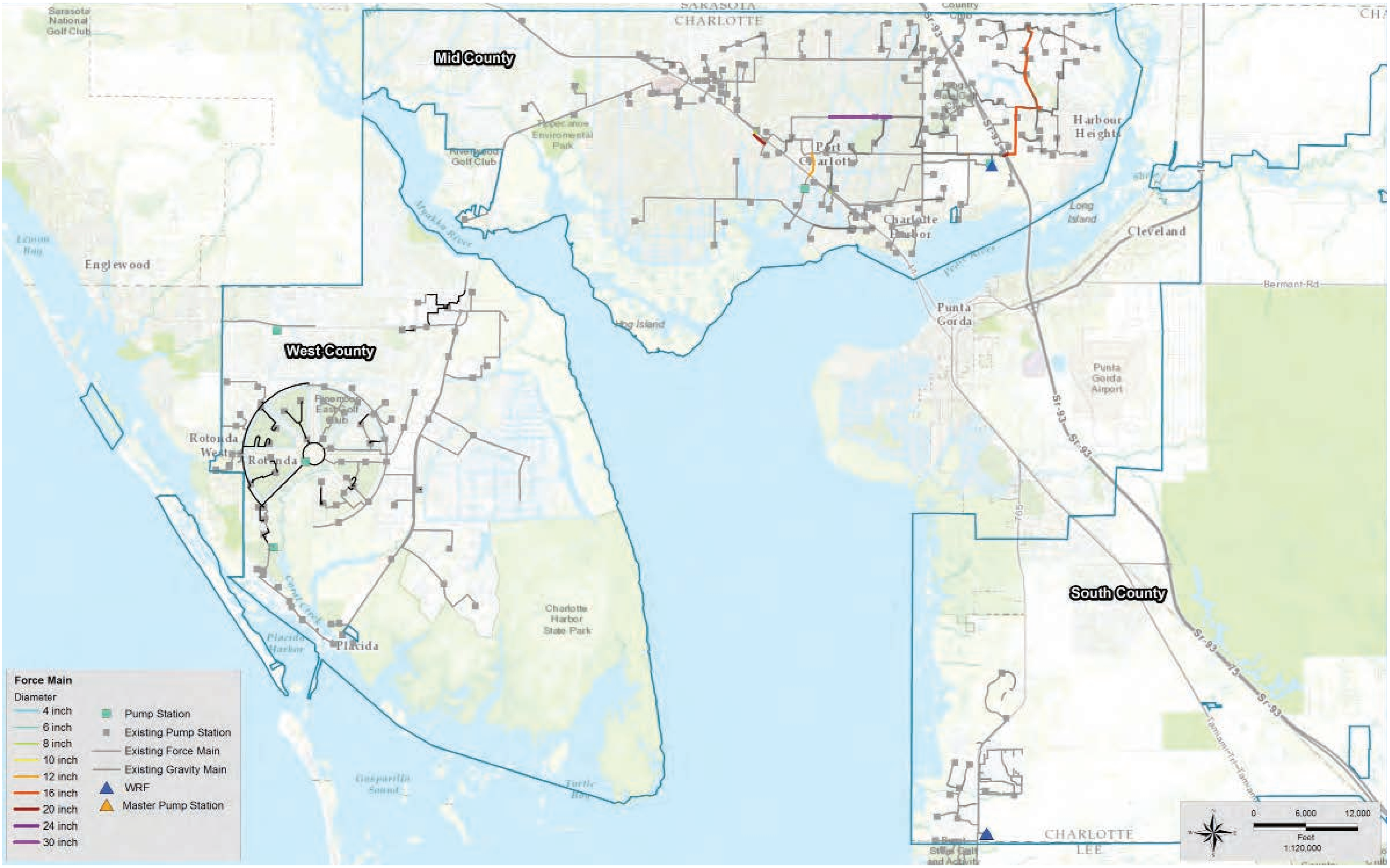
5.3 HYDRAULIC MODELS

Hydraulic wastewater models are typically composed of a detailed model network that includes pump stations, force mains, and gravity mains to simulate flow conveyance throughout the collection and transmission system. These types of models can be used for various purposes depending on the level of correlation to actual network supervisory control and data acquisition (SCADA) data.

CCUD regularly uses hydraulic models of the wastewater transmission systems to identify areas where additional capacity is needed to convey projected long-term flows to the CCUD WRFs. The hydraulic models were updated to include ongoing improvements consisting of projects in the planning, design, and construction phases.

Model simulations were conducted using 2015 wastewater flows to identify areas requiring improvements for the current system and under the assumption that all of the improvements identified in Section 5.2 have been complete. Modeling simulations were also conducted using flow conditions for the 5-year, 10-year, 15-year, and buildout improvement plans to determine additional infrastructure requirements for the wastewater collection and conveyance systems for each planning period.

Figure 5-2 Mid County Ongoing Improvements



5.3.1 CALIBRATION

Models can be calibrated using SCADA data to improve the level of correlation between model predictions and actual system flows. The CCUD models were last calibrated in 2006 and were not re-calibrated as part of this Master Plan. However, the models were validated based on pump station flows and met the desired level of correlation to sufficiently predict WRF flows from each pump station sewage collection area. After completion of the five year plan, CCUD should re-calibrate the wastewater models to account for system improvements and current flows.

5.3.2 HYDRAULIC MODEL UPDATES

As part of the Sewer Master Plan effort, CCUD's existing hydraulic models were updated to reflect ongoing improvement projects in the planning, design, and construction phases. A workshop was held with CCUD staff to review the model updates and to verify the model representation before future system improvements were considered. Pump definition names in the existing models were also updated to include current pump information such as pump make, model, and impeller specifications.

5.3.3 HYDRAULIC MODELING ASSUMPTIONS AND EVALUATION CRITERIA

5.3.3.1 AVERAGE AND MAXIMUM DAILY FLOWS

Modeling simulations used an annual average level of service value of 160 gallons per day (GPD) per residential connection to account for variations in customer water use and to provide adequate transmission capacity throughout the service areas. The actual AADF for most service area was determined to be 135 GPD per residential connection or less based on County data. Peaking factors were determined for each WRF and used for modeling maximum daily extended-period flow simulations that included peak hour flows.

5.3.3.2 EVALUATION CRITERIA

The wastewater hydraulic models were used to evaluate the existing wastewater system performance under the current, 5-year, 10-year, 15-year, and buildout flow scenarios. The evaluation criteria for establishing wastewater collection system performance included system capacity and wastewater velocity:

- System pumping capacity was determined adequate if a stand-by pump was not needed.
- Force main velocities were considered sufficient if the sustained velocities did not exceed the force main operating guideline of 8 feet per second (fps).*
- If the evaluation criteria were not met, system improvements were identified and listed for each flow scenario.

** Ten state standards recommend 6fps for FM design flows, however for extended period modeling purposes, setting the threshold to 8fps will capture the systems that have reached 6fps for extended periods of time.*

5.4 CURRENT SYSTEM IMPROVEMENTS

The modeling analysis showed that the existing transmission system (assuming all improvements in Section 5.2 are completed) requires pumping capacity increases for three pump stations and upsizing a force main to satisfy modeling criteria and adequately meet the County's needs to convey current Mid County, West County, and South County flows. CCUD should incorporate the following improvements to account for current system flows:

- Upsize 200 linear feet (LF) of 4-inch force main to 6-inch force main from LS 123 "KHW" to Kings Highway in Mid County.
- Increase the pumping capacity at LS 403 Islamorada in South County.
- Increase the pumping capacity at LS 815 "Z" located in West County.
- Increase the pumping capacity at LS 805 Windward Preserve located in West County.

5.5 5-YEAR IMPROVEMENT PLAN

The 5-year Improvement Plan includes projects in the Mid County and West County service areas. It includes 12 project areas and the connection of two private utilities.

5.5.1 MID COUNTY 5-YEAR MODEL RESULTS AND IMPROVEMENTS

Modeling results for the Mid County 5-Year Improvement Plan predicted one capacity exceedance within the 5-year sanitary flows and one force main with sustained velocities above 8 fps. Therefore, the following Mid County improvements would need to be completed prior to implementing the projects identified in the 5-Year Improvement Plan:

- Install 4,100 LF of 16-inch force main along Toledo Blade Road to convey additional flows collected on the US 41 corridor from the Sarasota County line to Sherbourne Street and remove the flows through LS 4 Woodbury.
- Upsize 300 LF of 8-inch force main to 12-inch force main crossing Tamiami Trail just north of Conway Boulevard.

Modeling results indicate that the following improvements will be necessary to convey the projected flows for each project area under the 5-year improvement plan:

- Project areas M61, M62, and M68 require the following additional transmission facilities:
  - A pump station at or near the intersection of Mensh Terrace and Forest Hills Lane.
  - 1100 LF of 8-inch force main starting along Mensh Terrace and continuing along Forest Hills Lane to Great Fall Terrace NW.
  - 7,400 LF of 24-inch force main along Lakeview Boulevard, Midway Boulevard, crossing at Spring Lake North, and continuing southeast along US 41.

- Project areas M67 and M70 require the following additional transmission facilities:
  - A pump station at or near corner of N Ellicott Circle and Eifel Terrace.
  - 2,400 LF of 20-inch force main starting from the easternmost corner of Ellicott Circle NW and continuing across Morningstar Waterway, continuing southeast along North Spring Lake Boulevard NW, and ending at West Tarpon Boulevard NW.
- Project areas M80 and M81 require the following additional transmission facilities:
  - A pump station at or near the intersection of Cascade Avenue and Dorchester Street.
  - 3,800 LF of 8-inch force main starting along Dorchester Street and ending at Peachland Boulevard.
- Project areas M55 and M56 require the following additional transmission facilities:
  - A pump station at or near the intersection of Hottelet Circle and Ackerman Avenue.
  - 4,900 LF of 10-inch force main along Ackerman Avenue heading east.
- Project area M72A requires the following additional transmission facilities:
  - A pump station near the intersection of Hollis Avenue and El Jobean Road.

Figure 5-3 on the following page presents an overview of the 5-year Mid County system improvements that are described in this section. Further details on each project can be found in Appendix C.

5.5.2 SOUTH COUNTY 5-YEAR MODEL RESULTS AND IMPROVEMENTS

Modeling results for the South County 5-Year Improvement Plan predicted no improvements are required.

5.5.3 WEST COUNTY 5-YEAR MODEL RESULTS AND IMPROVEMENTS

Modeling results for the West County 5-Year Improvement Plan predicted one force main with sustained velocities above 8 fps. Therefore, the following West County improvements would need to be completed prior to implementing the projects identified in the 5-Year Improvement Plan:

- 1,000 LF of 12-inch force main crossing on Oldsmar Circle in LS 882.

Modeling results indicate that the following improvements will be necessary to convey the projected flows for each West County project area under the 5-year improvement plan:

- Project area W2 requires the following additional transmission facilities:
  - A pump station on South Gulf Boulevard between intersections of South Gulf Boulevard with Bocilla Drive.
  - 12,500 LF of 6-inch force main from the pump station and ending at intersection of Indiana Road and Cape Haze Drive.
- Project areas W4 and W3 require the following additional transmission facilities:
  - A pump station at or near intersection of Green Dolphin Drive and Cape Haze Drive.
  - 1,600 LF of 6-inch force main starting from intersection of Green Dolphin Drive and Cape Haze Drive, continuing to north west on Cape Haze Drive, and ending at intersection of Cape Haze Drive and Placida Road.
- Project area W5 requires the following additional transmission facilities:
  - A pump station at or near intersection of Little Gasparilla Island and Plum Avenue.
  - 6,280 LF of 6-inch force main starting from intersection of Little Gasparilla Island and Plum Avenue, crossing Placida Harbor, and ending near intersection of Placida Road and Boca Grande Causeway.

Figure 5-3 Mid County 5-Year Improvement Plan

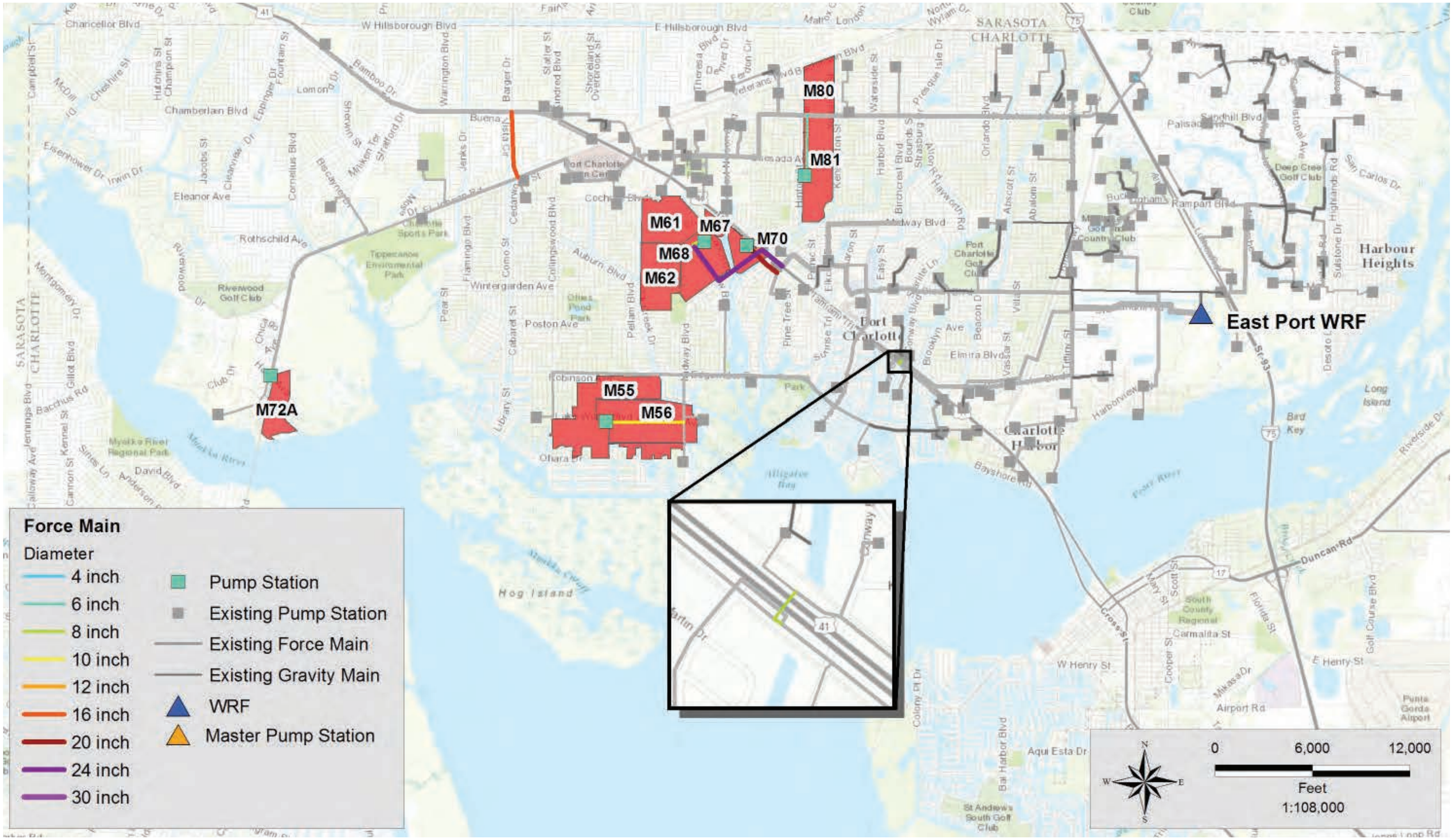


Figure 5-4 *West County 5-Year Improvement Plan*

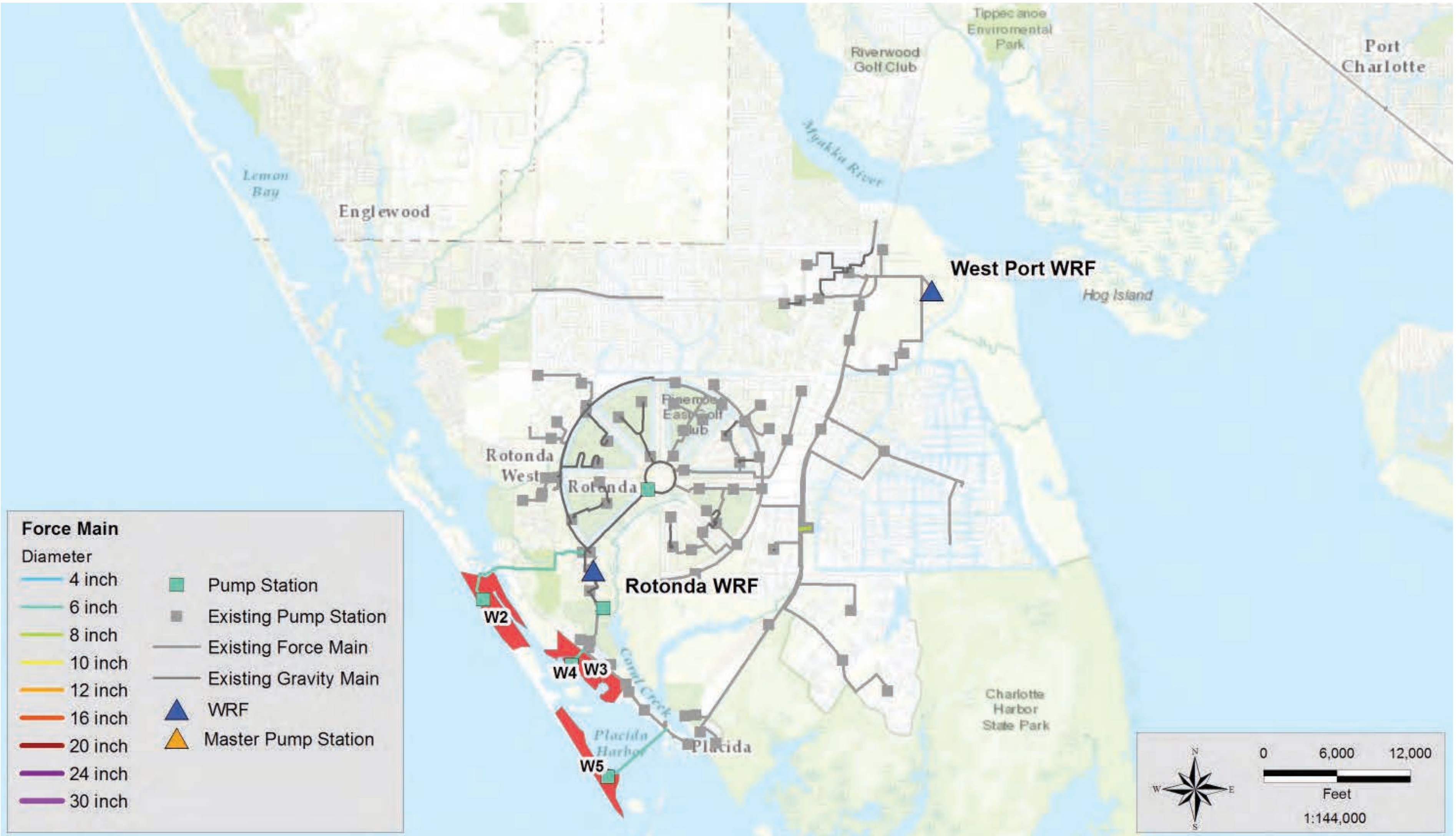


Figure 5-4 presents an overview of the 5-year West County transmission improvements and project areas.

5.6 10-YEAR IMPROVEMENT PLAN

The 10-year Improvement Plan includes projects in the Mid, South, and West County service areas. It includes 14 project areas.

5.6.1 MID COUNTY 10-YEAR IMPROVEMENTS

The modeling analysis showed that the existing transmission system with the improvements included in the 5-year plan adequately meets the County's needs to convey the 10-year flows for Mid County.

To implement the additional project areas included in the 10-Year Improvement Plan for Mid County, the system requires the following:

- Project area M59 requires the following additional or upgraded transmission facilities:
  - A pump station at or near the intersection of Timothy Avenue and Tinker Street.
  - 1,500 LF of 6-inch force main proceeding north along Tinker Street.
  - Upsizing 1,900 LF of 4-inch force main to 8-inch force main starting at Barbara Avenue proceeding north along Tinker Street, continuing west along Cochran Boulevard, turning north on Education Way, and ending at Murdock Circle.

- Project areas M78 and M79 require the following additional transmission facilities:
  - A pump station at or near the intersection of Nina Street and Rutherford Avenue.
  - 5,800 LF of 8-inch force main along Rutherford Avenue heading west, turning south on Song Street, continuing west along Astoria Avenue until Doria Street, continuing south along Doria Street until Navajo Lane, heading southeast along Navajo Lane, turning southwest on Midway Boulevard, and ending at US 41.
  - 1,400 LF of 12-inch force main from US 41 to Ellicott pump station.

- Project areas M83 and M84 require the following additional transmission facilities:
  - A pump station at or near Bassett Avenue between Zinnea Street and Dewhurst Street.
  - 2,800 LF of 6-inch force main proceeding north along Dewhurst to Peachland Boulevard.

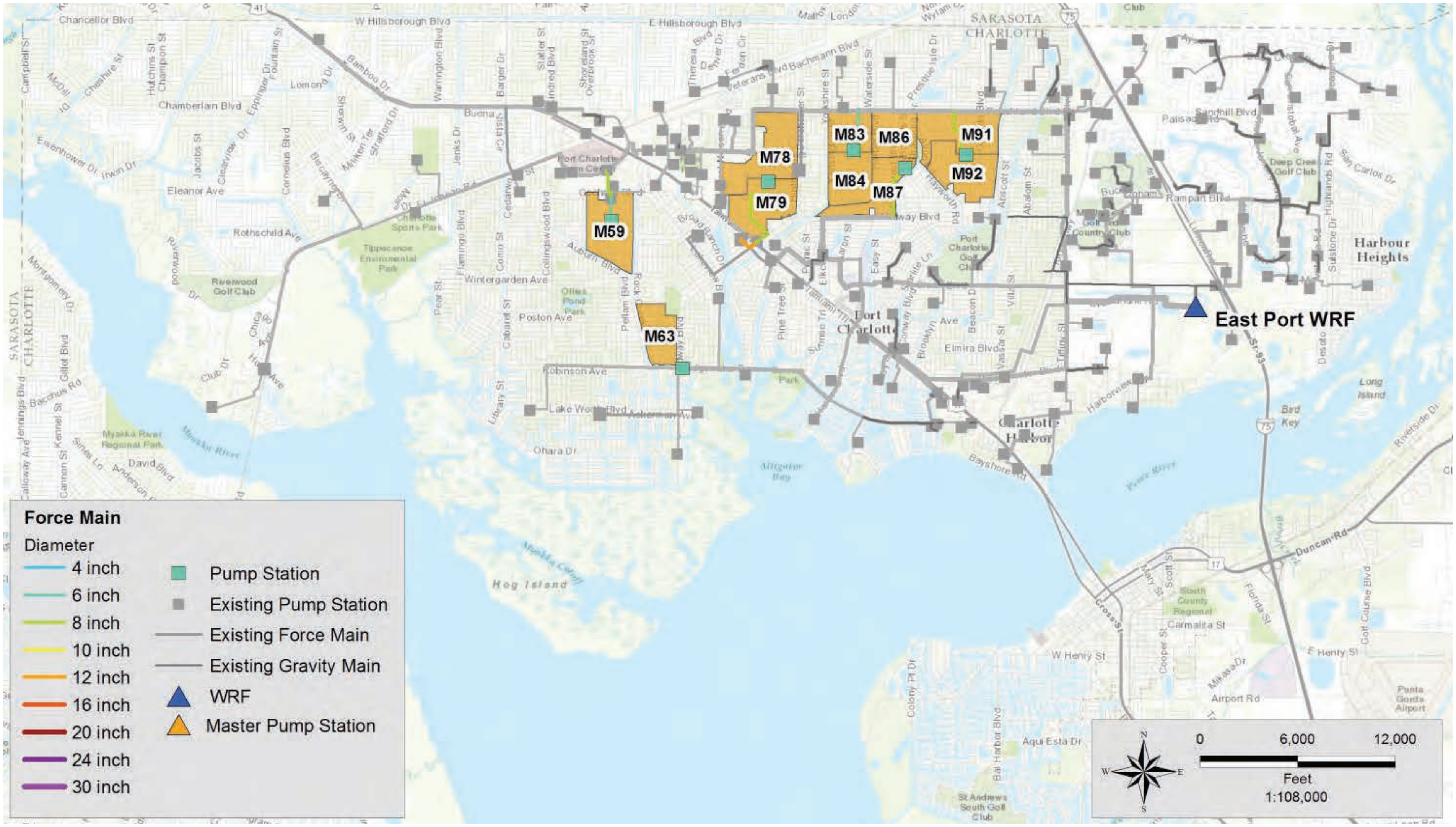
- Project areas M86 and M87 require the following additional transmission facilities:
  - A pump station at or near the intersection of Strasburg Drive and Bounds Street.
  - 3,400 LF of 8-inch force main along Strasburg Drive and Birchcrest Boulevard to Midway Boulevard.

- Project areas M91 and M92 require the following additional transmission facilities:
  - A pump station at or near the intersection of Quesar Boulevard and Richter Street.
  - 3,400 LF of 8-inch force main on Quasar Boulevard, Talbot Street, Hallstead Avenue, and Marlene Street to Peachland Boulevard.

- Project area M63 requires the following additional transmission facilities:
  - A pump station at or near the intersection of Midway Boulevard and Edgewater Drive.

Figure 5-5 presents an overview of the 10-year Mid County transmission improvements and project areas.

Figure 5-5 *Mid County 10-Year Improvement Plan*



5.6.2 SOUTH COUNTY 10-YEAR IMPROVEMENTS

The 10-Year Improvement Plan for the West County system includes the following:

- Project area S10a requires the following additional transmission facilities:
    - A pump station near the intersection of Orchid Drive and Grapefruit Lane.
    - 31,000 LF of 12-inch force main starting from Orchid Drive and Grapefruit Lane to an existing 12-inch force main on Burnt Store Road.

Figure 5-6 presents an overview of the 10-year South County transmission improvements and project areas.

Figure 5-6 *South County 10-Year Improvement Plan*

5.6.3 WEST COUNTY 10-YEAR IMPROVEMENTS

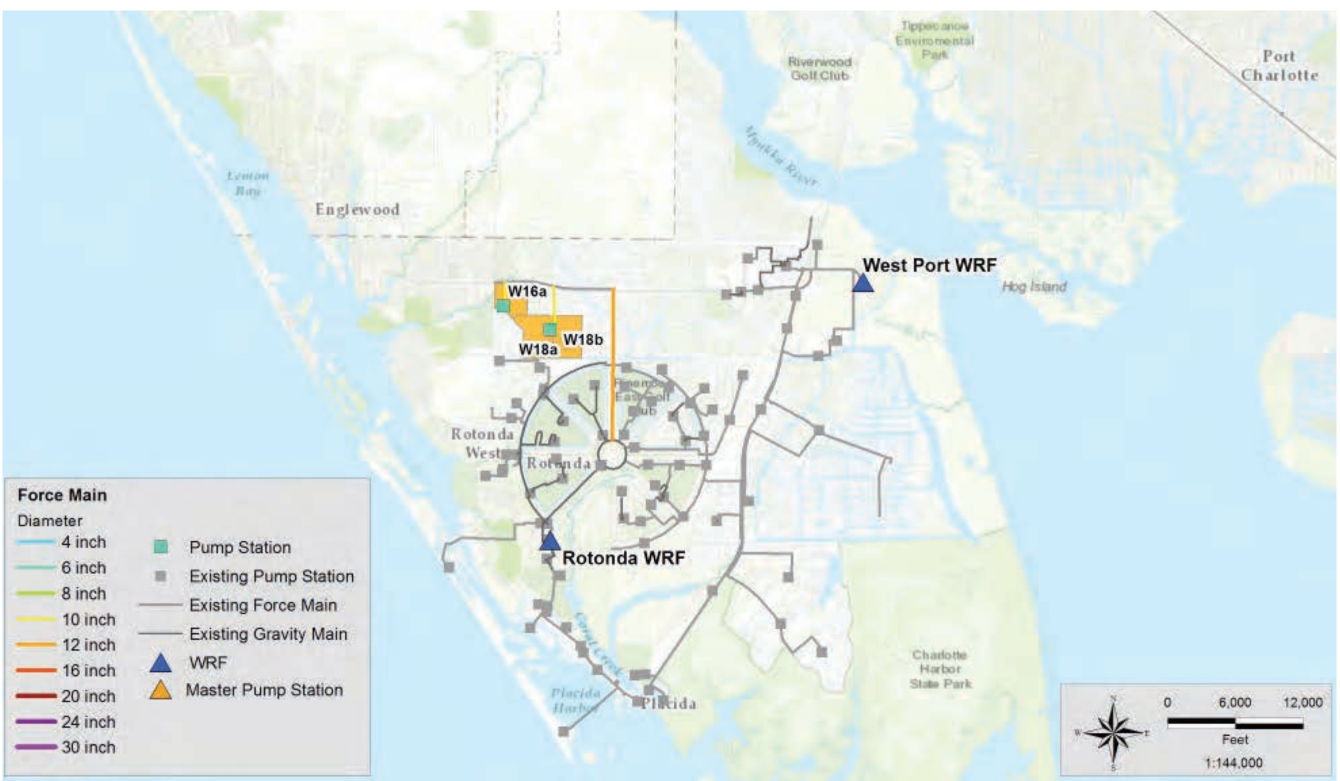
The modeling analysis showed that the existing transmission system with the improvements included in the 5-year plan adequately meets the County's needs to convey the 10-year flows for West County. The 10-Year Improvement Plan for the West County system includes the following:

- Project area W16a requires the following additional transmission facilities:
  - A pump station near or at the intersection of Apple Valley Avenue and Gulfstream Boulevard.
  - 2,300 LF of 10-inch force main starting from the intersection of Apple Valley Avenue and Gulfstream Boulevard, heading to north on Gulfstream Blvd, and ending at intersection of Gulfstream Boulevard and South McCall Road.
  - 13,400 LF of 12-inch force main starting from intersection of Sunnybrook Boulevard and SR776 south continuing along Rotonda Boulevard N to an existing manhole at Parade Circle and Rotonda Boulevard N.

- Project areas W18a and W18b require the following additional transmission facilities:
  - A pump station near or at the intersection of Oceanspray Boulevard and Mamouth Street.
  - 4,300 LF of 10-inch force main starting from intersection of Oceanspray Boulevard and Mamouth Street, heading west on Oceanspray Boulevard, continuing north on Spinnaker Boulevard, and ending at Spinnaker Boulevard and South McCall Road.

Figure 5-7 presents an overview of the 10-year West County transmission improvements and project areas.

Figure 5-7 *West County 10-Year Improvement Plan*



5.7 15-YEAR IMPROVEMENT PLAN

The 15-year Improvement Plan includes projects in the Mid County and West County service areas. It includes 16 project areas.

5.7.1 MID COUNTY 15-YEAR IMPROVEMENTS

The modeling analysis showed that the existing transmission system with the improvements included in the 10-year plan adequately meets the County's needs to convey the 15-year flows for Mid County.

To implement the additional project areas included in the 15-Year Improvement Plan for the Mid County, the system requires the following:

- Project area M93 requires the following additional transmission facilities:
  - A pump station at or near the intersection of Sheehan Boulevard and Truval Terrace.
  - 3,300 LF of 8-inch force main starting at the pump station and heading south along Sheehan Boulevard.

- Project area M100 requires the following additional transmission facilities:
  - A pump station at or near the intersection of Sherwood Road and Grey Avenue.
  - 2,100 LF of 8-inch force main starting at the pump station and heading south along Sherwood Road, east along Paragon Avenue, and south along Vessels Road to Elmira Boulevard.

- Project area M94 requires the following additional transmission facilities:
  - A pump station at or near the intersection of Beacon Drive and Frederick Avenue.
  - 400 LF of 8-inch force main starting at the pump station and heading north along Beacon Drive to Peachland Boulevard.

  - Project area M113 requires the following additional transmission facilities:
    - A pump station at or near the intersection of Sunnybrook Road and Broder Drive.
    - 11,500 LF of 8-inch force main along Sunnybrook Drive, Harbor View Road, and I-75 to the 16-inch force main near the old LS 126 Eastport Master.

  - Project area M69 does not require additional transmission facilities.

  - Project area M97 requires the following additional transmission facilities:
    - A pump station at or near the intersection of Mac Dougall Avenue and Willoughby Street.
    - 2,200 LF of 8-inch force main from Mac Dougall Avenue and Willoughby Street to the intersection of Midway Boulevard and Abalon Street.

  - Project area M60 requires the following additional transmission facilities:
    - A pump station on Placid Avenue between Santilli Street and Hampton Street.
    - 3,800 LF of 8-inch force main from the pump station to the intersection of Edgewater Drive and Dunbar Street.

- Project area M51 requires the following additional transmission facilities:
  - A pump station at or near the intersection of Rickardway Avenue and Lantern Light Street.
  - 1,400 LF of 24-inch force main from Lantern Light Street to Collingswood Boulevard along Cochran Boulevard.
  - 1,500 LF of 6-inch force main from Rickardway Avenue to Cochran Boulevard Avenue along Lantern Light Street.
  - 3,000 LF of 20-inch force main from Collingswood Boulevard to El Jobean Road along Toledo Blade Boulevard.

- Project area M52 requires the following additional transmission facilities:
  - A pump station at or near the intersection of Billiare Avenue and Collingswood Boulevard.
  - 3,600 LF of 8-inch force main from Billiare Avenue to Cochran Boulevard Avenue along Collingswood Boulevard.
  - Project area M82 requires the following additional transmission facilities:
  - A pump station at or near the intersection of Kenilworth Boulevard and Yorkshire Street.
  - 3,800 LF of 4-inch force main from Yorkshire Street to Atwater Street along Kenilworth Boulevard.

Figure 5-8 on the following page presents an overview of the 15-year Mid County transmission improvements and project areas.

Figure 5-8 Mid County 15-Year Improvement Plan

5.7.2 SOUTH COUNTY 15-YEAR IMPROVEMENTS

Modeling results indicate that the improvements necessary to convey the projected flows under the 15-year Improvement Plan is same as the 10-year Improvement Plan.

5.7.3 WEST COUNTY 15-YEAR IMPROVEMENTS

Modeling results indicate that the improvements necessary to convey the projected flows under the 15-year Improvement Plan require upgrades to the existing system as well as improvements for project areas.

Modeling results for the West County 15-Year Improvement Plan predicted that two pump stations and one force main would require capacity upgrades:

- Pump capacity upgrades at pump stations 815 and 801.
- 1,800 LF of 18-inch force main capacity upgrades from 801 to the Rotonda WRF.

The 15-Year Improvement Plan for the West County system includes the following:

- Project area W12a requires the following additional transmission facilities:
    - A pump station near or at the intersection of Sunnybrook Boulevard and Waterford Avenue.
    - 2,400 LF of 10-inch force main starting from the intersection of Sunnybrook Boulevard and Waterford Avenue, continuing south, and ending at the intersection of SR 776 and Sunnybrook Boulevard.

- Project area W17 requires the following additional transmission facilities:
    - A pump station near or at the intersection of Burlington Avenue and Gunther Street.
    - 1,200 LF of 10-inch force main starting from the intersection of Burlington Avenue and Gunther Street, heading east on Burlington Avenue, continuing north on Strawberry Street, and ending at the intersection of Strawberry Street and SR 776.

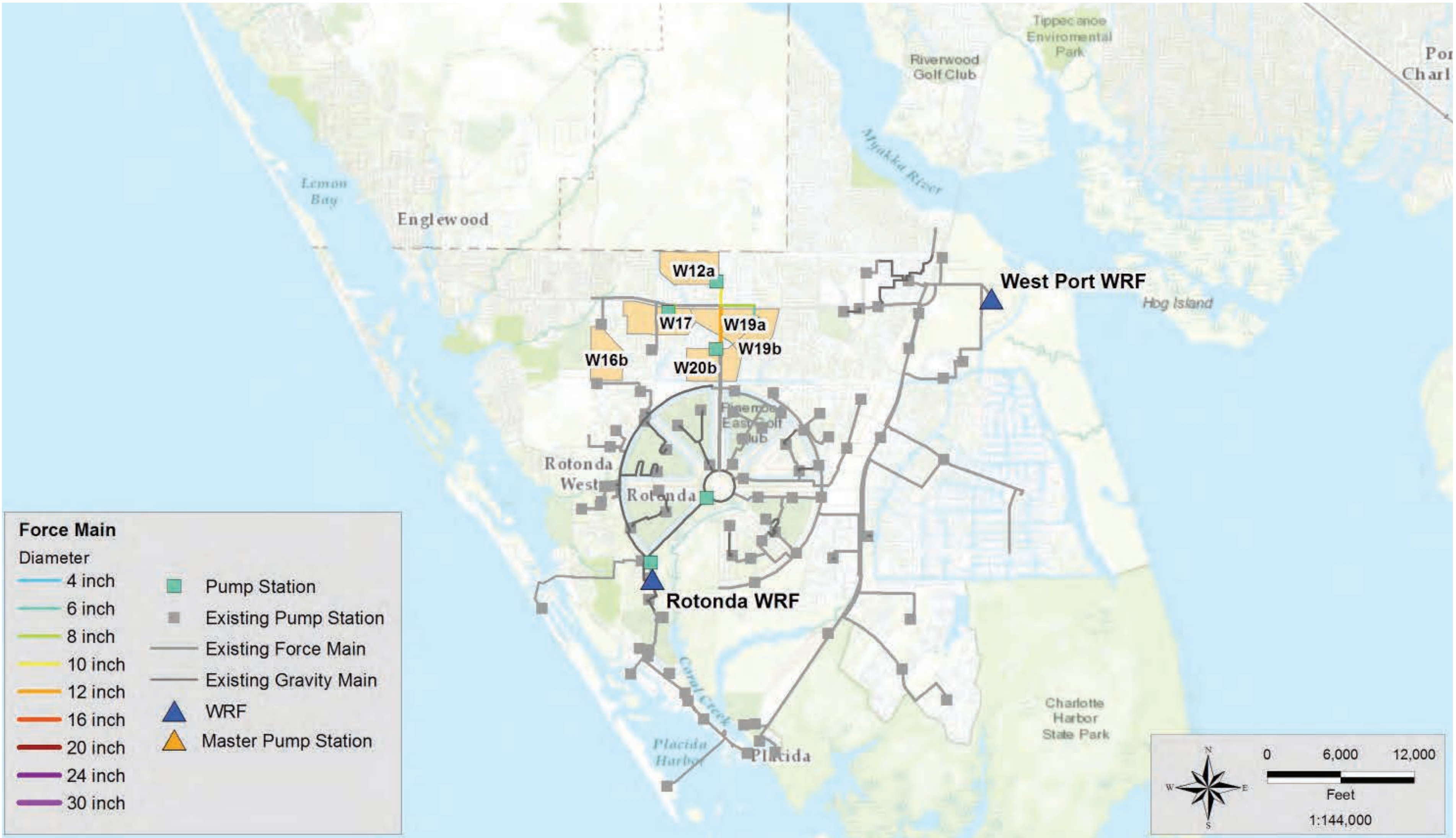
- Project areas W19a and W19b require the following additional transmission facilities:
    - A pump station near or at the intersection of Larkin Street and Oceanspray Boulevard.
    - 1,600 LF of 6-inch force main starting from the intersection of Larkin Street and Oceanspray Boulevard, heading north on Oceanspray Boulevard, and ending at the intersection of Oceanspray Boulevard and SR 776.
    - 2,300 LF of 8-inch force main heading west on SR 776 from Oceanspray Boulevard to Sunnybrook Boulevard.

- Project area W20b requires the following additional transmission facilities:
    - A pump station at the intersection of Oceanspray Boulevard and Carvel Street.
    - 400 LF of 8-inch force main starting from the intersection of Oceanspray Boulevard and Carvel Street, heading east on Oceanspray Boulevard to Sunnybrook Boulevard.

- Project area W16b does not require additional transmission facilities. See Appendix for associated improvements.

Figure 5-9 on the following page presents an overview of the 15-year West County transmission improvements and project areas.

Figure 5-9 West County 15-Year Improvement Plan



5.8 BUILDOUT IMPROVEMENT PLAN

5.8.1 MID COUNTY BUILDOUT CRITICAL SYSTEM IMPROVEMENTS

Modeling results indicate that the following Mid County improvements will be necessary to convey the projected flows for each project area under the Buildout Improvement Plan:

- Two master pump stations – one at the intersection of Cornelius Boulevard and El Jobean Road and one at the intersection of Collingswood Road and Castlerock Lane.
- 9,300 LF of 30-inch gravity main on Cornelius Boulevard.
- 51,500 LF of force main along key corridors including Chamberlain Boulevard, Jacobs Street, El Jobean Road, Kenilworth Boulevard, Cochran Boulevard, and Lake View Boulevard.
- 32 pump stations with 88,700 LF of force main serving individual pump stations.

Figure 5-10 on the following page presents an overview of the Mid County Buildout Improvement Plan and the critical systems required to serve the project areas.

5.8.2 SOUTH COUNTY BUILDOUT CRITICAL SYSTEM IMPROVEMENTS

Modeling results indicate that the following South County improvements will be necessary to convey the projected flows for each project area under the Buildout Improvement Plan:

- Constructing nine master pump stations.
- Constructing 27 pump stations.
- Installing and replacing 212,000 LF pipe along key corridors including Washington Loop Road, Prairie Creek Boulevard, Bronco Road, Bermont Road, Gewant Boulevard, Jones Loop Road, South Jones Loop Road, Grapefruit Lane, Tamiami Trail, Pasadena Drive, Path Avenue, Chinquapin Drive, Tribune Boulevard, Notre Dame Boulevard, and Burnt Store Road.

Figure 5-11 on page 5-21 presents an overview of the South County transmission facilities and project areas for the Buildout Improvement Plan.

In January 2016 an inter-local agreement was established between Charlotte County and Lee County extending the CCUD service area into Lee County. Additional details of this area can be found in the Inter-local Agreement between Charlotte County and Lee County found in Appendix F.

Figure 5-10 Mid County Buildout Improvement Plan

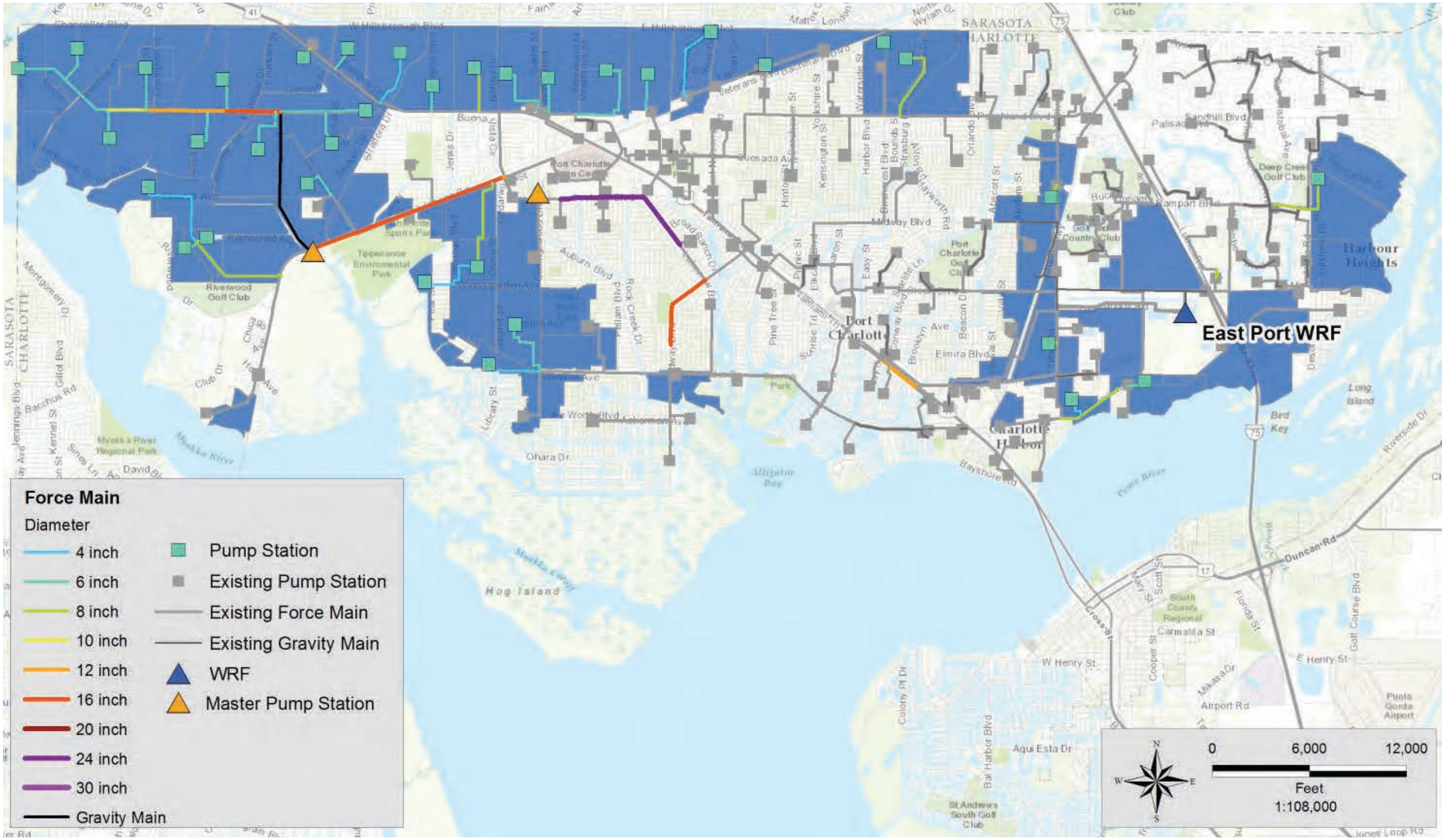
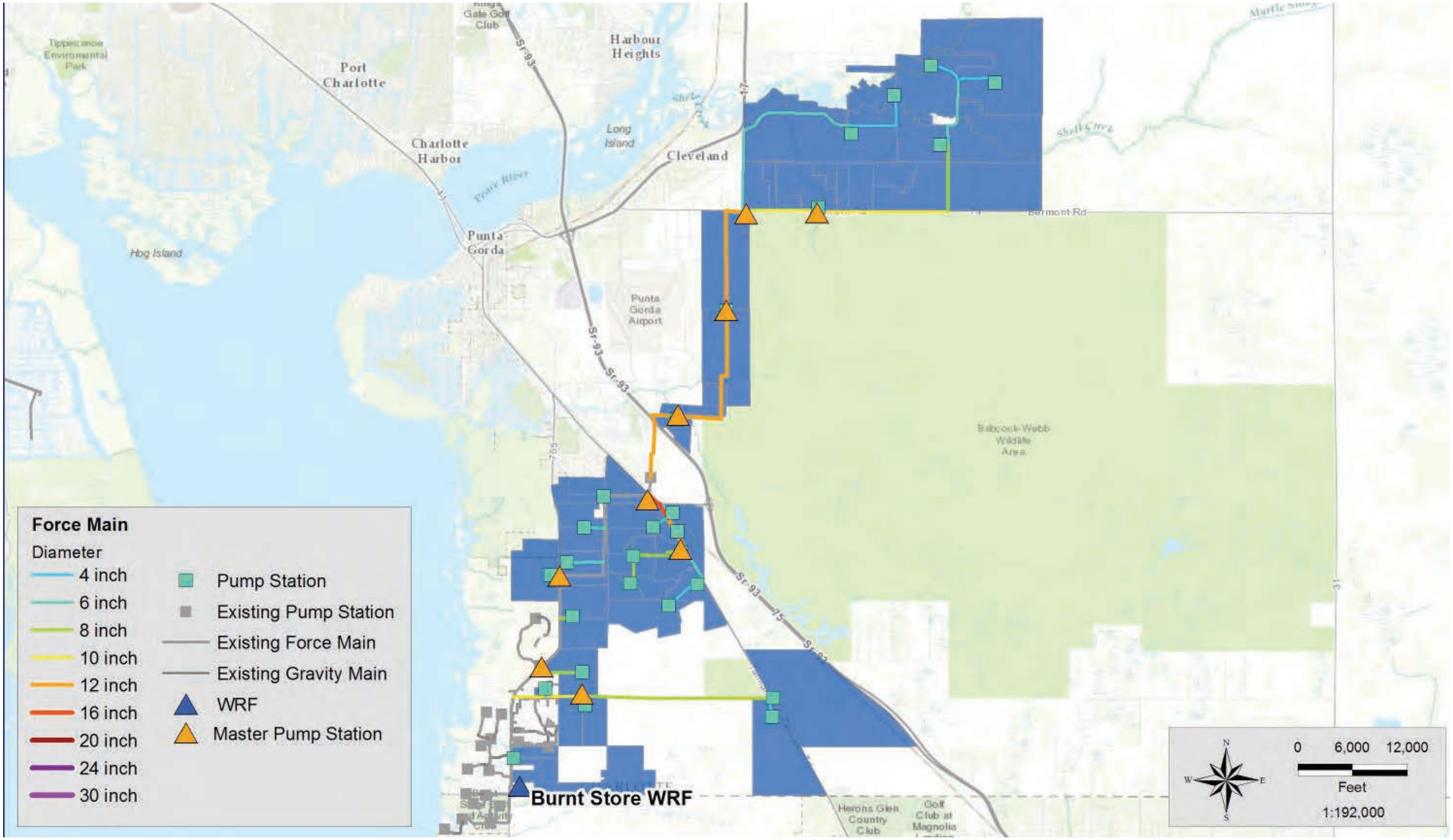


Figure 5-11 South County Buildout Improvement Plan



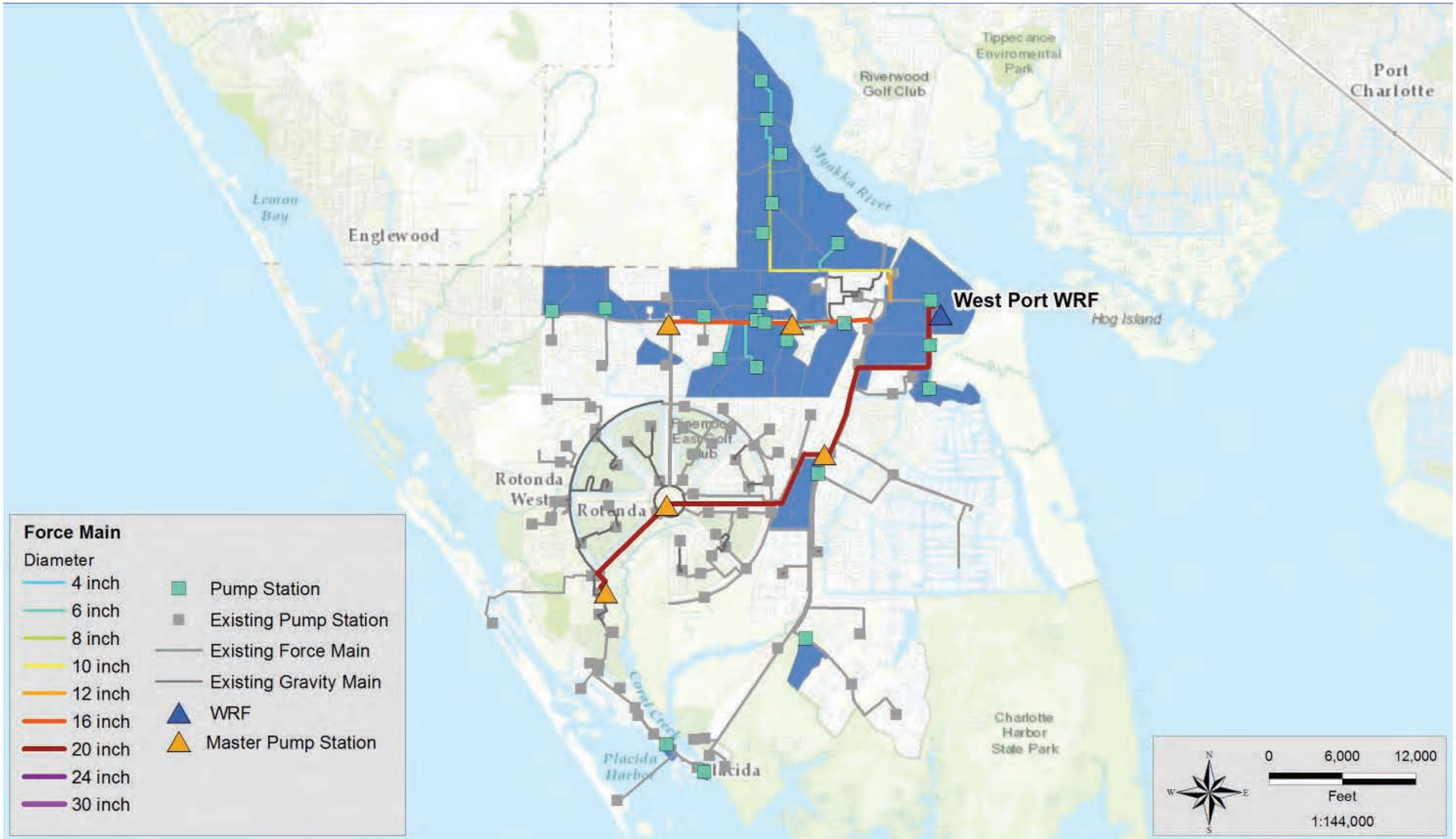
5.8.3 WEST COUNTY BUILDOUT CRITICAL SYSTEM IMPROVEMENTS

Modeling results indicate that the following West County improvements will be necessary to convey the projected flows for each project area under the Buildout Improvement Plan:

- Five master pump stations located:
  - In the vicinity of SR 776 and Sunnybrook Boulevard.
  - In the vicinity of SR 776 and Princeton Street.
  - In the vicinity of SR 771 and Rotonda Boulevard East.
  - At the center of Rotonda Circle with other CCUD facilities.
  - At the Rotonda WRF.
- 24 pump stations to serve project areas.
- 118,000 LF of force main along SR 776, SR 771, Gillot Boulevard, Elvington Road, Cannon Street, David Boulevard, Foresman Boulevard, Norlander Drive, Sea Mist Drive, Princeton Street, Hineline Avenue, and Kenilworth Boulevard.
- 9,400 LF of gravity main along Cornelius Boulevard.

Figure 5-12 on the following page presents an overview of the West County transmission facilities and project areas for the Buildout Improvement Plan.

Figure 5-12 West County Buildout Improvement Plan



6. WATER RECLAMATION FACILITIES

OVERVIEW

The complexity and importance of WRFs are often overlooked; therefore, a brief discussion of their purpose, monitoring requirements, and planning protocols has been included in this chapter.

This chapter also provides an overview of the current WRF processes and operations, reviews the historical flows and treated water (reclaimed water) quality characteristics, lists ongoing improvements, and presents flow projections under low, medium, and high growth conditions.

In addition, the engineer's opinions of probable construction costs (EOPCC) have been prepared for the recommended future improvements for each WRF.

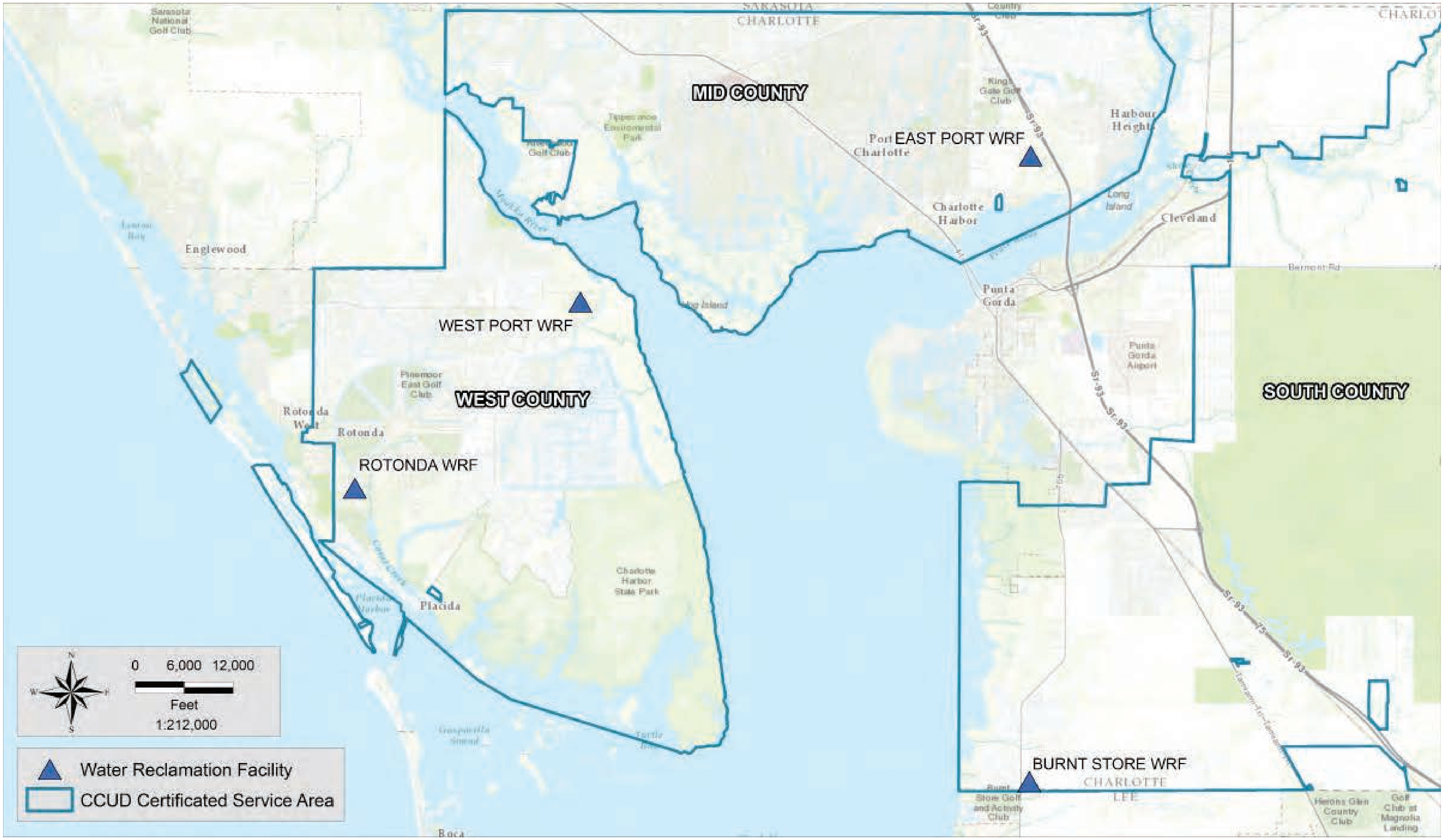
6.1 WRF TREATMENT, MONITORING, AND PLANNING OVERVIEW

WRFs are designed to treat the wastewater collected throughout the community and return the treated water to the environment. The treatment methods implemented at WRFs include a number of physical and biological processes designed to provide optimal conditions for nutrient removal. The level and method of treatment depends on local conditions, disposal methods, and regulations set forth to protect the health and safety of the public and our natural resources. The FDEP is the state agency that issues WRF permits and requires utilities to record and submit DMRs of flows and water quality characteristics to maintain compliance with the regulations.

The CCUD owns and operates four WRFs throughout Charlotte County. The East Port WRF serves Mid County, West Port and Rotonda WRFs serve West County, and the Burnt Store WRF serves South County. Each WRF is unique in its design and treatment approach; as such, each facility needs to be evaluated independently. The WRFs are designed and permitted to treat a specific volume of wastewater expressed on an AADF basis. In addition, each WRF has to meet effluent water quality requirements for constituents such as nitrogen, total suspended solids (TSS), carbonaceous biological oxygen demand (CBOD), and fecal coliform before safely discharging the water to Charlotte Harbor or using the water for irrigation.

As local population grows and infrastructure ages, the flows to the WRFs increase and eventually require the WRFs to be expanded. The timing for expansions and infrastructure improvements can be estimated using historical patterns and flow projections. As part of the master planning effort, population-based flow projections were developed to identify future improvements for each WRF and delineate the project areas identified in the 5-year, 10-year, 15-year, and buildout improvement plans.

Charlotte County Water Reclamation Facilities



The SWFWMD developed spatially located population projections by combining the Bureau of Economic and Business Research (BEBR) growth data with Property Appraiser GIS parcel data. Jones Edmunds combined SWFWMD's data with census data, DMR data, County planning data, and commercial water use data to determine the 5-year, 10-year, 15-year, and buildout projections for each WRF. The flow projections were modeled under medium growth conditions, and low and high growth factors were used to determine the early and late start dates for each WRF improvement.

The timing of WRF expansions presented in this Chapter are based on flow projections and FDEP Rule 62-600.405, Planning for Wastewater Facilities Expansion. This rule specifies when an owner of a WRF is required to prepare and implement a capacity analysis report (CAR) or an update to one, preliminary design, final design, and an FDEP permit application for construction of the expansion based on the historical flows recorded in DMRs.

Initiation of construction of an expansion depends on the complexity of the expansion, growth rate of the WRF service area, the availability of funding, and other operational factors. For this reason, CCUD staff and outside consultants routinely conduct facility assessments to identify improvements to optimize the operation and aesthetics of the WRFs.

The most recent assessments were completed in February 2016 and identified the physical conditions, capacity, performance, and reliability for each WRF. For planning purposes presented in this SMP, it was assumed that construction is initiated 3 years prior to exceeding the permitted plant capacity.

The criteria established in Rule 62-600.405 include:

- A CAR shall be submitted to the FDEP when the three-month average daily flow (TMADF) of the most recent three consecutive months exceeds 50% of the permitted capacity of the WRF or reclaimed water and disposal systems.
- If the permitted capacity will not be equaled or exceeded in at least 10 years, then a CAR shall be submitted every 5 years.
- If the permitted capacity will be equaled or exceeded in 10 years, then a CAR shall be submitted annually.
- If the latest CAR concludes that the permitted capacity will be equaled or exceeded:
    - In the next 5 years: Planning and preliminary design of a WRF expansion needs to be prepared.
    - In the next 4 years: Final design documents (drawings and specifications) need to be prepared.
    - In the next 3 years: An FDEP permit application for expansion needs to be prepared.

East Port Water Reclamation Facility

6.2 EAST PORT WATER RECLAMATION FACILITY – MID COUNTY

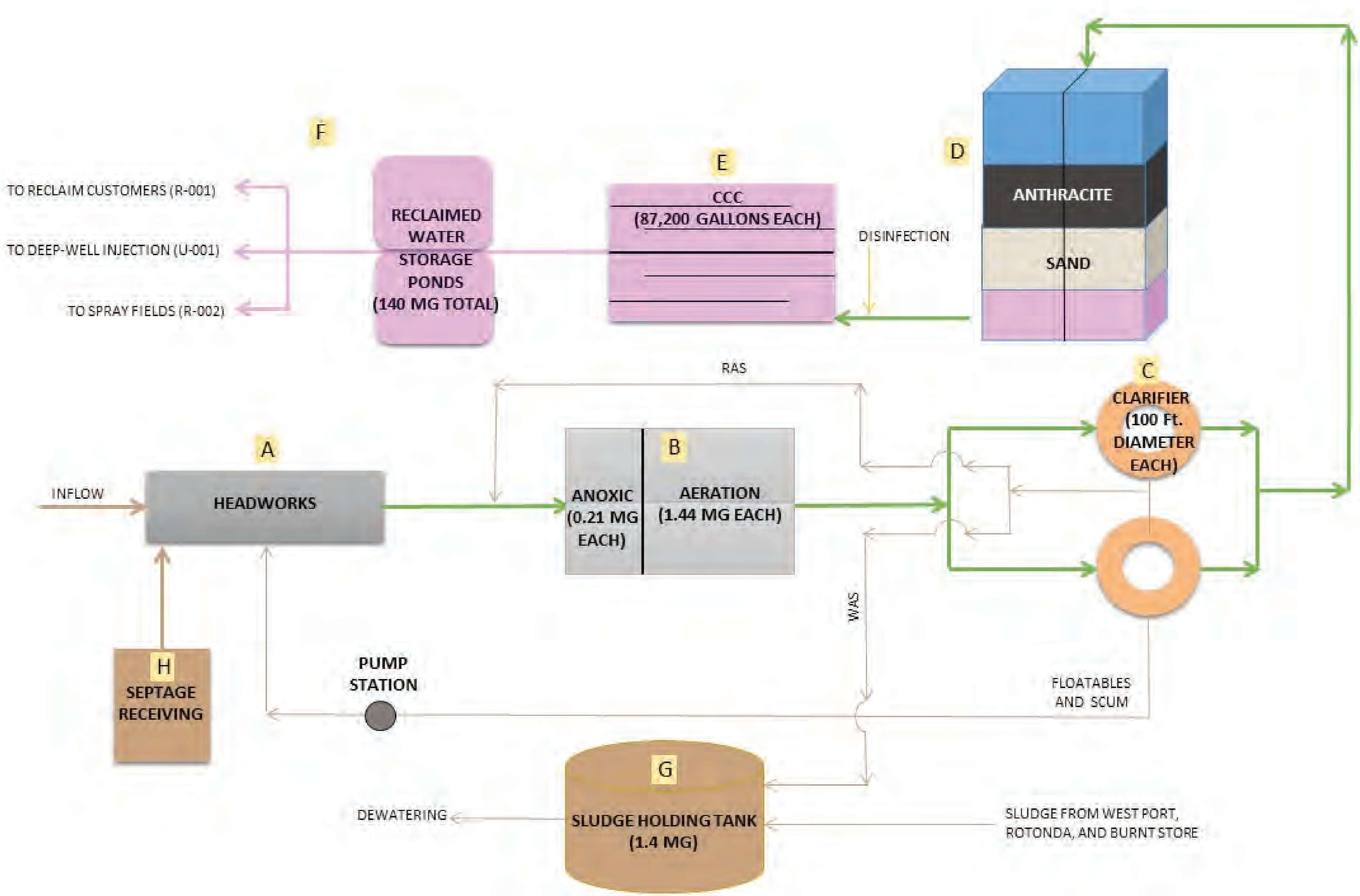
6.2.1 OVERVIEW OF EAST PORT WRF

The East Port WRF is located at 3100 Loveland Boulevard, Port Charlotte. The WRF began operations in 1996 under FDEP Permit No. FL0040291 and has a current permit operating capacity of 6.0-MGD on an AADF basis. The East Port WRF uses an activated sludge process to treat domestic wastewater collected from the Mid County service area. Figure 6-1 shows the East Port WRF process flow diagram. This location also houses the National Environmental Laboratory Accreditation Program (NELAP)-certified East Port Laboratory. The WRF site includes 51 acres of conservation easement, with the remaining area consisting primarily of woodlands. Emergency power is provided by a diesel emergency generator in an on-site building with an automatic transfer switch to maintain operation of critical facilities.

The following describes the East Port WRF process in more detail:

A) Headworks: Raw wastewater enters the WRF headworks structure where screening and grit removal take place. After screening, wastewater flows into one of the two vortex-type grit removal units for grit separation. Compacted screening and separated grit are dewatered and discharged to dumpsters for disposal. Internal plant flows from the on-site pump station are introduced and include biosolids dewatering system filtrate, tank and unit process drains, septage hauling, pump station flows, and supernatant from the aerobic digesters.

Figure 6-1 *East Port Water Reclamation Facility Process Flowchart (A-H)*



B) Biological Treatment Using Modified Ludzack Ettinger (MLE) Process: Wastewater from the headworks splits between two treatment trains. Each train includes an anoxic basin and oxidation ditch (aeration basin) for organics and nutrient removal. Mixers keep solids suspended and homogenous in the anoxic zones. Mechanical surface agitators keep the oxidation ditches aerated. Internal recycle (IR) pumps send flow from the oxidation ditch (aeration basin) to the anoxic basins for nitrogen removal.

C) Secondary Treatment: Flow from the biological treatment process splits between two clarifiers. These provide a passive environment for solids separation. The clarifiers are skimmed to remove floatables and scum before the clarifier effluent flows over a circumferential weir. Sludge pumps send settled solids from the secondary clarifiers to two locations: the front of the anoxic basins as return activated sludge (RAS) to replenish the microbial community and the digesters as waste activated sludge (WAS).

D) Tertiary Treatment - Filtration: Clarified water splits between two multi-media traveling bridge filters, containing sand and anthracite, to remove remaining suspended solids. A metal canopy over the filters inhibits algae growth, and a UV filter component provides protection from sun exposure.

E) Tertiary Treatment - Disinfection: Filtered water splits between two chlorine contact chambers (CCCs) where liquid sodium hypochlorite is dosed for disinfection. CCC No. 1 is designated for reclaimed water production that meets high-level disinfection requirements. CCC No. 2 is designated for disposal to restricted access sites (e.g., Class I deep injection wells or spray fields) using unfiltered effluent from the secondary clarifiers that meet basic-level disinfection requirements. A UV-inhibiting net over the chamber reduces algae growth.

F) Effluent Reclaimed Storage and Disposal Facilities: The WRF has two lined storage ponds. One pond is used to store reject and the other pond is used to store reclaimed water prior to distribution to the reclaimed system.

G) Aerobic Digestion: WAS is pumped from the clarifiers to the aerobic digester where blowers provide aeration to aerobically digest the sludge prior to belt press dewatering. Dewatered sludge is hauled to the Charlotte County Class I landfill for disposal. The East Port WRF digester is permitted to accept waste sludge from the West Port, Rotonda, and Burnt Store WRFs.

H) Septage Receiving Stations: The WRF has two stations: one for conventional septage and one for fats, oils, and grease (FOG) from private septage tank haulers. The septage receiving station materials are screened and directly pumped to the WRF headworks. The station containing FOG is screened, collected, and stored in two holding tanks. The FOG is then supplied to an on-site biogas production company and used for energy production.

The East Port WRF is permitted to distribute reclaimed-quality water to unrestricted-public-access reuse sites. During the wet season, excess reclaimed water can be injected into a deep well injection system, and applied to a slow-rate restricted access land application system.

Table 6-1 summarizes the major uses of reclaimed water for East Port WRF. Water not meeting reclaimed water standards is pumped to a separate reject pond. From there reject water can be sent to the slow-rate restricted access reclaimed water spray fields or the two Class I injection wells. The WRF is classified as a Type I, Category III, Class B domestic wastewater treatment facility under FAC 62-699 and is required to meet Class III Reliability standards in accordance with FAC 62-600 and FAC 62-610.

Table 6-1 Partial List of Major Reclaimed Water Users Near East Port WRF

Major User	Area (acres)	Capacity (MGD)
Kingsway Country Club	100	0.388
Maple Leaf Golf Course	100	0.388
Port Charlotte Country Club	158	0.613
Mary-Lu Mobile Home Park	8	0.031
Suncoast Lakes	35	0.136
Charlotte County Sports Park	115	0.446
Riverwood Acres	1200	1.2

6.2.2 EAST PORT WRF HISTORICAL FLOW AND CHARACTERISTICS SUMMARY

Table 6-2 summarizes historical flows for the East Port WRF from 2011 to 2016 including the AADF, the maximum monthly average daily flow (MMADF), and the maximum 3-month average daily flow (MTMADF). The AADF values ranged from 3.9 to 5.0 MGD from 2011 to 2016. The MMADF of 11.3 MGD experienced at the East Port WRF occurred in September 2016.

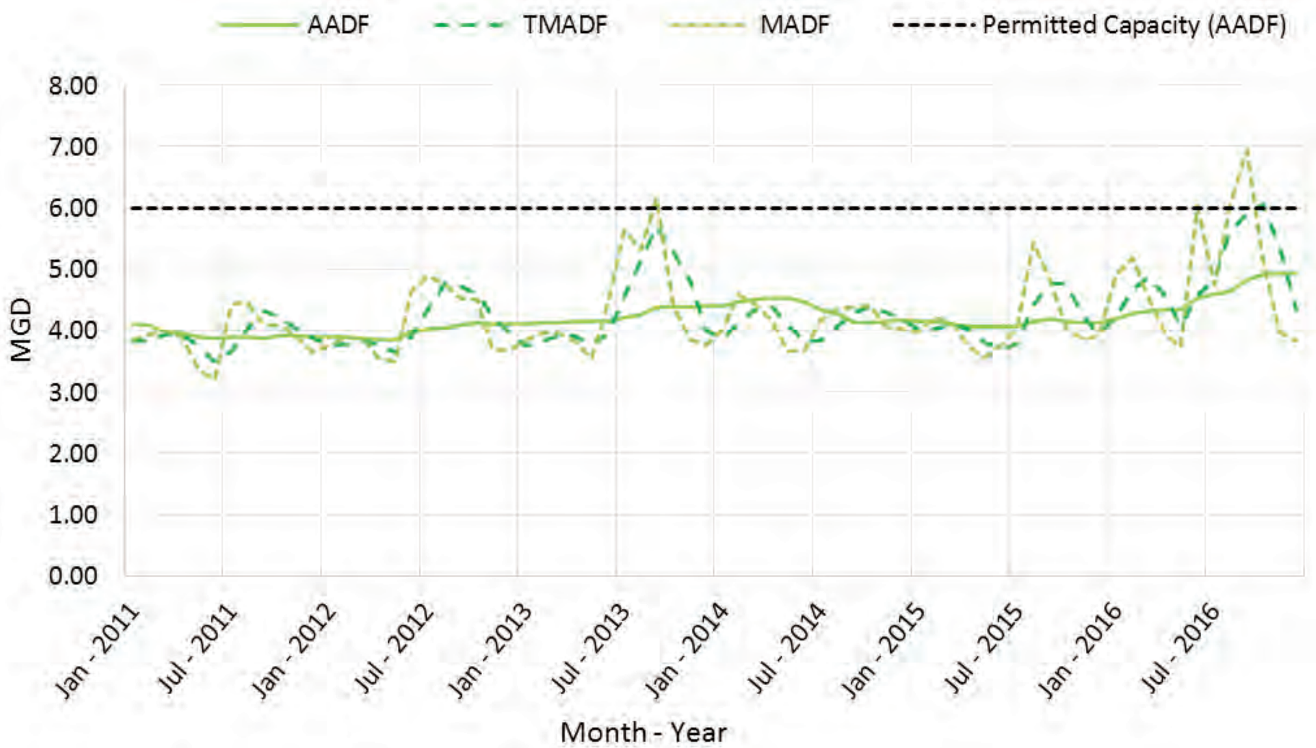
Table 6-2 Historical Influent Flow Summary for East Port WRF

Year	AADF (MGD)	MMADF (MGD)	MTMADF (MGD)	Percent Capacity (MTMADF:Permit)	Monthly Peaking Factor (MMADF/AADF)
2011	3.90	8.48	4.33	72%	2.2
2012	4.11	8.67	4.77	79%	2.1
2013	4.39	10.67	5.70	95%	2.4
2014	4.16	6.72	4.39	73%	1.6
2015	4.13	7.34	4.77	79%	1.8
2016	5.03	11.3	6.06	100%	2.3

Figure 6-2 presents the monthly average daily flow (MADF), TMADF, and AADF for January 2011 through December 2016. Influent MADFs varied between 3.2 and 7.0 MGD from 2011 to 2016. TMADFs varied between 3.5 MGD and as high as 6.1 MGD in October 2016.

The MTMADF varied from 4.3 to 6.1 MGD from 2011 through 2016 operating at percent capacities ranging from 72 to 100%. As of 2016, the WRF is operating at approximately 84% of the permitted capacity on an AADF basis. The increase in flows in 2016 is related to extreme wet weather conditions as described in this chapter.

Figure 6-2 *Historical Wastewater Influent Flows for East Port (2011 - 2016)*



The MTMADF varied from 4.3 to 6.1 MGD from 2011 through 2016 operating at percent capacities ranging from 72 to 100%. As of 2016, the WRF is operating at approximately 84% of the permitted capacity on an AADF basis. The increase in flows in 2016 is related to extreme wet weather conditions as described in this chapter.

A Preliminary Engineering Report (PER) was completed in May 2007 to plan for the WRF's treatment capacity expansion to meet projected growth and development needs. In June 2010, CCUD updated the WRF PER and developed a plan for implementing improvements to expand the plant capacity to 9 MGD over several years as Stages 1 through 5 as described in Section 6.2.3.

The original East Port WRF unit treatment processes and capacities were evaluated using a BioWin® biological treatment model and a plant hydraulic profile. This evaluation was used to size new structures and equipment required for expansion. This staged approach allows the County to build capacity as needed and account for economic fluctuations.

Table 6-3 summarizes the historical influent 5-day CBOD and TSS loadings from 2011 to 2016. Influent wastewater samples are taken 5 days per week for the East Port WRF. The yearly average CBODs values ranged from 120 to 190 milligrams per liter (mg/L) (2 to 3 tons per day) from 2011 to 2016 and are within the typical range of average strength municipal wastewater of 120 to 380 mg/L. The yearly average TSS concentrations were within the typical range varying between 133 mg/L and 225 mg/L or approximately 3 to 4 tons per day.

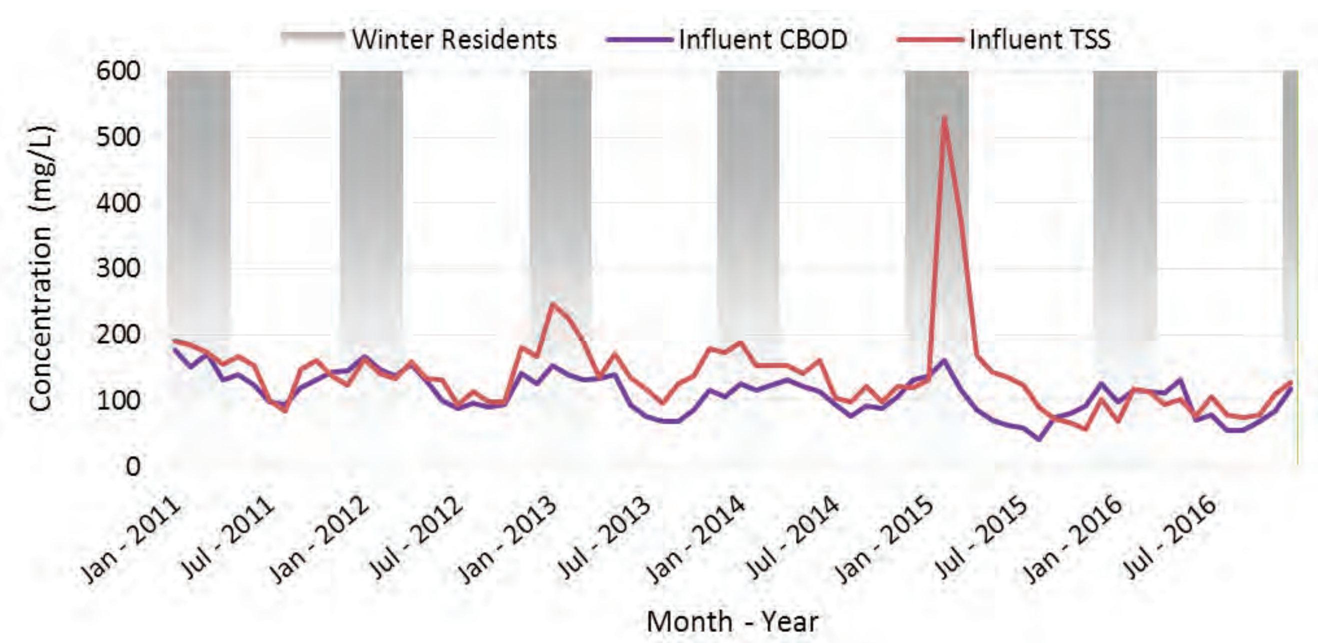
Table 6-3 Historical Influent Loadings Summary for East Port WRF

Year	AADF (MGD)	CBOD[1] (mg/L)	CBOD (lbs/day)	TSS[2] (mg/L)	TSS (lbs/day)
2011	3.90	190	6,190	205	6,740
2012	4.11	170	5,880	190	6,440
2013	4.39	150	5,580	225	8,240
2014	4.16	155	5,330	190	6,540
2015	4.11	120	4,120	185	6,400
2016	4.93	125	5,230	135	5,470

Note: 1. Typical average strength municipal wastewater CBOD range is between 120 – 380 mg/L.
2. Typical average strength municipal wastewater TSS range is between 120 – 370 mg/L.

Figure 6-3 displays the average monthly influent CBOD and TSS concentrations for the East Port WRF. Vertical bars are included during December through April to represent winter resident occupancy. Influent CBOD and TSS average monthly concentrations are relatively stable with the exception of a spike in TSS concentrations in February 2016, which the County indicated was due to an operational maintenance event.

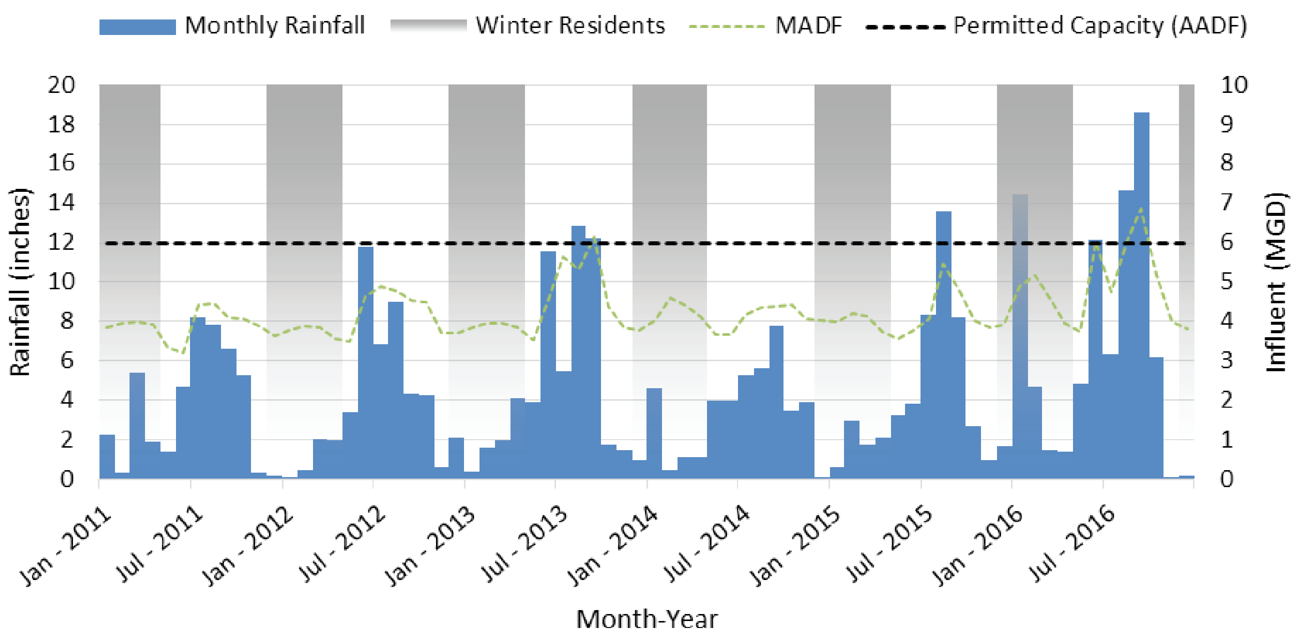
Figure 6-3 Historical CBOD and TSS Concentrations for East Port WRF



The effects of I&I events can be estimated using Figure 6-4, which displays the total monthly rainfall at the East Port WRF and MADF from January 2011 to December 2016. Total rainfall per year varied from 41 inches in 2014 to 85 inches in 2016. MADF experiences significant increases during wetter months (June through September) for the East Port WRF. In contrast, the concentrations of CBOD and TSS decrease during the wetter months indicating wastewater is diluted when rain events increase.

Figure 6-4 also indicates the months (December through April) during which the County's winter residents are contributing to the wastewater flows. Since 2005, the CCUD has implemented a robust sewer lining program to reduce I&I.

Figure 6-4 Historical Rainfall and Influent Wastewater Flows for East Port WRF



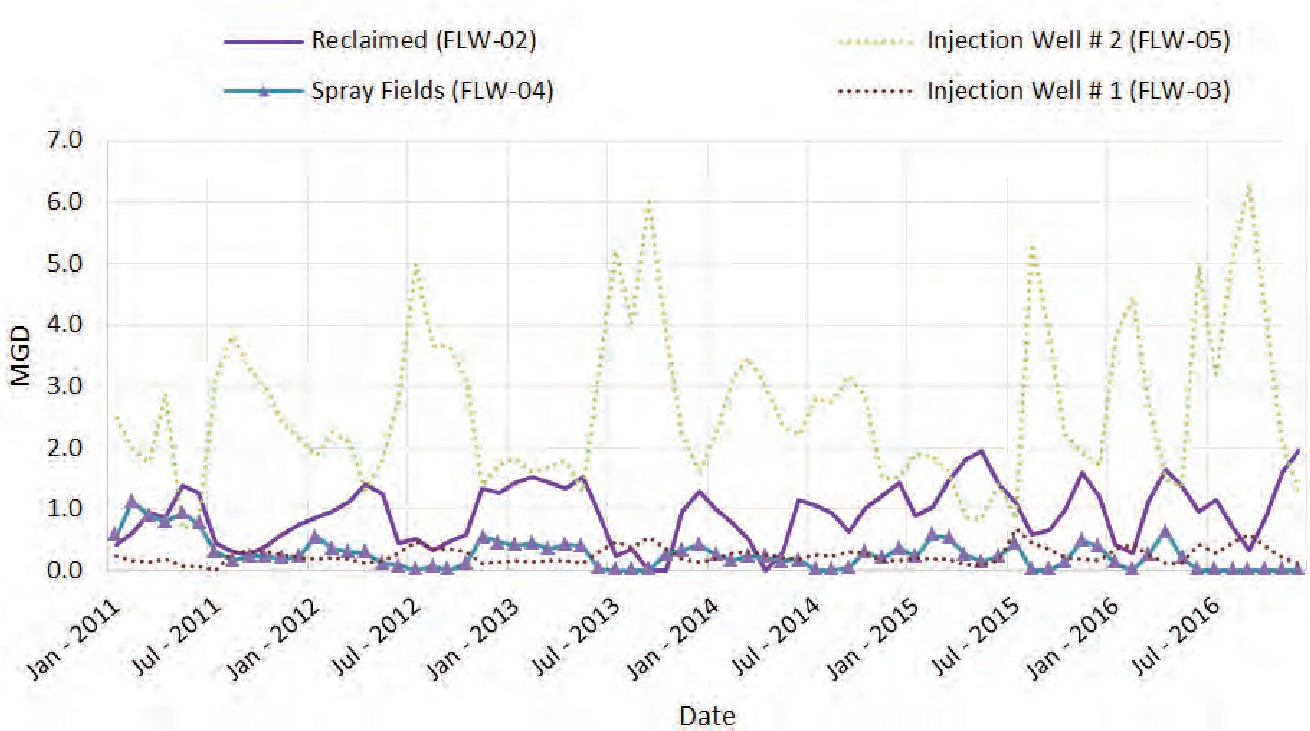
As of 2016, the County had lined 33 manholes and a total of 76,094 LF of sewer pipe. The pipe lining efforts have reduced peak flows to the WRF and hydraulic capacity requirements for the East Port WRF.

The East Port WRF is permitted to dispose of its treated effluent using Class I deep injection wells, restricted access spray fields, and unrestricted public access reclaimed water. The underground injection well and spray field flows permitted for the East Port WRF are 6.0 MGD and 2.44 MGD AADF, respectively.

In 2012, the County received a Master Reuse Permit from the FDEP that combines the reclaimed water service areas from East Port, West Port, and Rotonda WRFs forming the Charlotte County Master Reuse System. This system allows CCUD to move reclaimed water within the combined service areas of the three WRFs and provide reclaimed water to the major users such as golf courses, recreation areas, sports fields, median areas, and large residential tracts. Figure 6-5 displays the monthly average effluent flows from the East Port WRF from 2011 through 2016.

The monthly effluent peaks correspond with the rainfall events shown in Figure 6-4. Monthly effluent flows for the injection wells and spray field effluents peaked at 6.3 and 1.12 MGD, respectively. The maximum AADFs for the spray field and reclaimed effluent from 2011 to 2016 were below the permit capacities at approximately 0.54 and 3.44 MGD, respectively.

Figure 6-5 Historical Wastewater Monthly Average Effluent Flows for East Port WRF (2011 - 2016)




East Port Aerobic Digester

6.2.3 ONGOING EAST PORT WRF IMPROVEMENTS

6.2.3.1 EAST PORT STAGE 1 AND 2 IMPROVEMENTS

CCUD completed a CAR, O&M Performance Report, and FDEP Permit modification in 2012 and the design of the East Port Stage 1 and 2 improvements in 2013. The construction of Stages 1 and 2 was completed at the end of 2015, and the new components are now in service. The Stages 1 and 2 improvements included:

Headworks:
- Replaced the original screen with a new 11.5-MGD mechanical bar screen.
- Installed a duplicate grit removal unit and washer.
- Installed new grit pumps.
- Installed a new septage receiving station.

Biological Treatment:
- Removed grit from the anoxic and aerobic treatment basins.
- Installed new gates for anoxic zone.
- Installed variable frequency drives (VFDs) and D.O. control system for the aerators in the oxidation ditch.
- Installed new IR pumps.
- Installed new RAS pumps.
- Installed new WAS pumps.

Tertiary Treatment:
- Provided a major overhaul of both sand filters.
- Replaced two 2,500-gallon sodium hypochlorite storage tanks with one 5,000-gallon tank.

Sludge Handling:
- Constructed a new aerobic digester.
- Installed new blowers for the new digester.
- Installed new truck off-loading pump station.
- Installed new dewatering feed pumps.

New Internal Recycle Pump Station at Oxidation Ditch

East Port WRF Aerial Following Stage 1 & 2 Improvements

East Port Electrical Building's Motor Control Center (MCC)

Electrical:

- Upgraded the plant electrical distribution.
- Installed a new automatic transfer switch.
- Installed new MCC components for the plant.
- Constructed additional MCC facility.

6.2.3.2 EAST PORT STAGE 5 IMPROVEMENTS

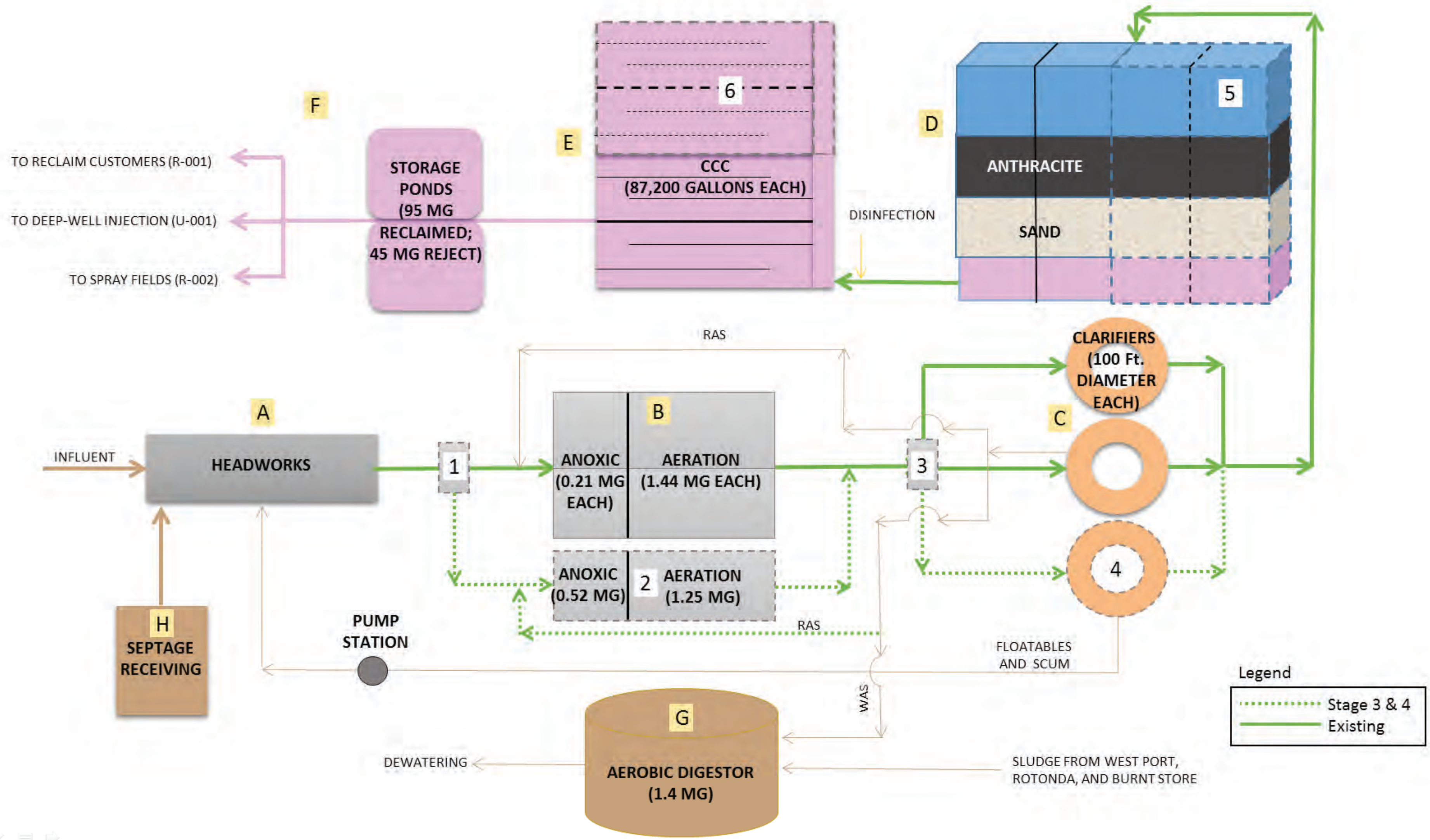
CCUD prioritized Stage 5 ahead of Stages 3 and 4 to enhance reclaimed water storage and transmission capacity. Stage 5 design was completed in 2016, the County awarded a construction contract in spring 2017 with construction completion by the end of 2018. The Stage 5 improvements include:

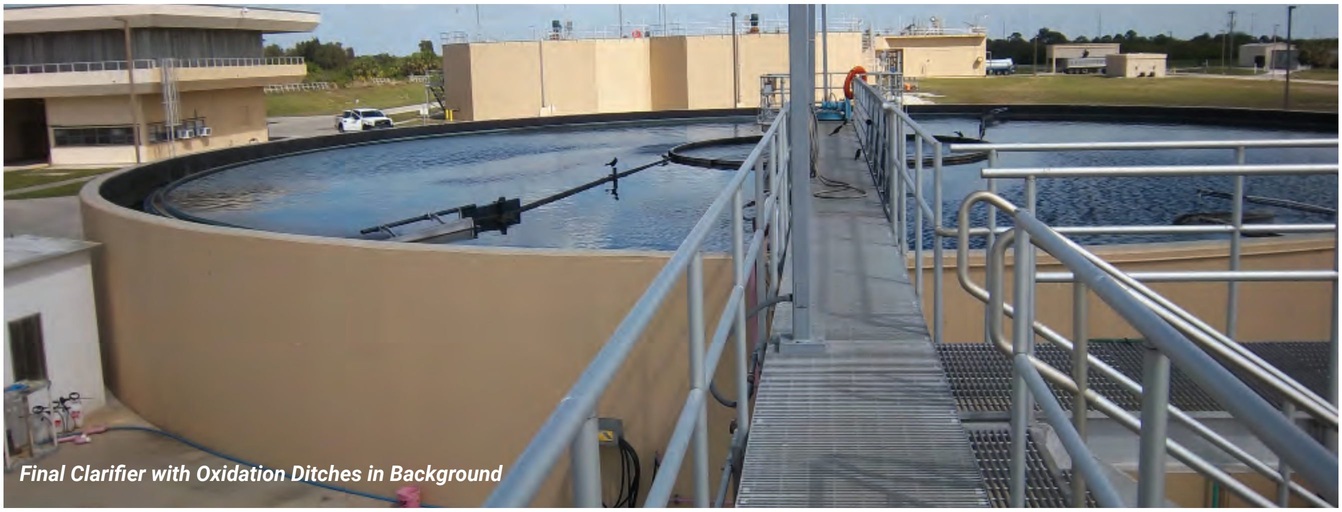
- Convert the 95- million gallon (MG) reject storage pond to a reclaimed water storage pond.
- Construct a new 9 MGD high-service pump station to distribute reclaimed water from the 95-MG pond.
- Add stand-by emergency generator.
- Modify the yard piping to accommodate the new pump station and pond connections.

6.2.3.3 EAST PORT STAGE 3 AND 4 IMPROVEMENTS

Stages 3 and 4 improvements were designed in 2014 and include bid-ready specifications and drawings. When these final two stages are complete, the East Port WRF will have a treatment capacity of 9.0 MGD AADF. Figure 6-6 is the East Port WRF process flow diagram with Stages 3 and 4 upgrades.

Figure 6-6 East Port WRF Process Flow Diagram at 9.0 MGD AADF




Final Clarifier with Oxidation Ditches in Background

1) Headworks: Add an influent flow-splitter box to equalize flow distribution between existing Oxidation Ditch Nos. 1 and 2 and proposed Oxidation Ditch No. 3.

2) Biological Treatment: Add Oxidation Ditch No. 3 using the MLE process for biological treatment and construct it adjacent to the existing ditches. The proposed oxidation ditch will have two treatment zones – a 0.52-MG anoxic basin and a 1.25-MG aeration basin.

- The anoxic basin is designed to reduce the nitrate-N concentrations below 5.0 mg/L during MMAD influent load conditions using RAS from the clarifiers and IR from the back end of the aeration basin.
- The aeration basin provides an aerobic environment, created by two mechanical aerators, for biodegradation of organic matter and conversion of ammonia to nitrate via nitrification.

3) Secondary Treatment: Clarification - Flow Splitter Box: Modify existing clarifier flow-splitter box to split flow between the Secondary Clarifiers No. 1, No. 2, and the proposed Secondary Clarifier No. 3.

4) Secondary Treatment: Clarification - Clarifier No. 3: Add Clarifier No. 3 – 100-foot-diameter – for solids separation after the oxidation ditches. The new clarifier will include RAS/WAS and scum pumping stations. New scum pumping stations will be added to Clarifiers No. 1 and No. 2 to replace the existing scum pumping stations.

5) Tertiary Treatment: Filtration: Add Filters Nos. 3 and 4 – two new automatic backwashable (ABW) traveling-bridge filters with a surface of 1,120 square feet each and a combined surface area of 4,480 square feet. Turbidity analyzers will be installed in the filter effluent channel to monitor the turbidity of the filter effluent.

6) Tertiary Treatment: Disinfecti***on:*** Add CCCs Nos. 3 and 4 adjacent to the existing basin to provide high-level disinfection for all filtered effluent and basic-level disinfection for all unfiltered bypass effluent. CCCs Nos. 3 and 4 will have similar dimensions, volume, and flow configuration as the existing CCCs. A new chemical metering pumping station will be installed to feed liquid sodium hypochlorite to the new CCCs. A continuous total residual chlorine (TRC) analyzer and recorder will be provided to obtain samples and analyze the combined effluent from the existing and new CCCs.

Two additional improvements not shown on Figure 6-6 are a new chemical building and additional transfer pumps. The new chemical building will include a 6,500-gallon HDPE double-walled chemical storage tank in a covered containment area sized for the new and existing tanks. Four additional transfer pumps will be added to the existing Pond Transfer Pump Station. This pump station will transfer effluent from the CCCs to the existing South Storage Pond, which is undergoing conversion in Stage 5 to a reclaimed storage pond.

For the Stages 3 and 4 Improvements summarized above, Table 6-4 provides the EOPCC inflated to 2017 dollars. A more detailed EOPCC was prepared during the final design of the Stage 3 and 4 Improvements in 2014.

Table 6-4 Stages 3 and 4 Improvements Engineer's Opinion of Probable Construction Costs

Description – East Port Stage 3 and 4 (9 MGD)	Total Cost (2017 Dollars)
Demolition	$ 500,000
Yard Piping	$ 1,200,000
1) Oxidation Ditch Flow Splitter	$ 450,000
2) Oxidation Ditch No. 3	$ 2,800,000
3) Clarifiers No. 1 and No. 2 Rehabilitation	$ 200,000
Modify Existing Clarifier Splitter Box	$ 250,000
4) Clarifier No. 3	$ 1,400,000
RAS/WAS PS No. 2 and WAS PS No. 1	$ 600,000
Scum Pump Station No. 1 and 2	$ 750,000
5) ABW Filters No. 3 and No. 4	$ 1,630,000
6) CCCs No. 1 and No. 2 Modifications	$ 130,000
CCCs No. 3 and No. 4	$ 800,000
Chemical Feed System and Building	$ 1,000,000
Emergency Generator	$ 900,000
Pond Transfer Pump Station	$ 300,000
Electrical	$ 2,000,000
Instrumentation and Controls	$ 500,000
Other - Miscellaneous	$ 600,000
Subtotal	$ 16,000,000
Site Work (5%)	$ 800,000
Mobilization and Demobilization (5%)	$ 800,000
General Conditions (3%)	$ 480,000
Overhead and Profit (10%)	$ 1,600,000
Sales Tax	$ 1,000,000
Contingency (20%)	$ 3,200,000
Fiscal, Legal, Administrative and Engineering (10%)	$ 1,600,000
Total	$ 25,500,000
EOPCC (Rounded)	$ 26,000,000

6.2.4 EAST PORT WRF FLOW PROJECTIONS

Figure 6-7 shows the historical and projected flows in relation to the current 6.0-MGD-AADF and the proposed 9.0-MGD-AADF expansion. The flows projections for the East Port WRF include infill growth from existing sewersheds, projected growth due to project area conversions, and growth from the integration of a private wastewater system in the East Port service area. The flow projections indicate that the current permitted capacity will be exceeded in 2026 under medium growth conditions and in 2023 under high growth conditions.

As mentioned previously, Stage 1 and 2 improvements have been completed, Stage 5 is in the construction phase and the construction of Stages 3 and 4 is currently scheduled for commencement in 2019, which will increase the WRF's AADF capacity to 9.0 MGD. The funds for completing Stage 3 and 4 have previously been allocated. However, if the projects identified in this SMP are implemented according to the proposed schedule, the East Port WRF may require an additional expansion (up to 12 MGD) in the future.

Under medium growth conditions, the permitted capacity of the Stage 3 and 4 rerate is not exceeded until after 2040. Under high growth conditions, it is estimated that the East Port WRF flows will reach the future 9 MGD permitted capacity by 2037. Based on FDEP guidelines, the preliminary and final expansion design plans should be prepared in 2032 and 2033, respectively. The construction start year is estimated to be in 2034 under high growth conditions. High growth conditions are not expected in this region; therefore, the rerated capacity of 9.0 MGD AADF should be sufficient for the 15-year CIP plan. The CCUD should continue to monitor flows and update projections after the 10-year improvement plan is complete to determine the timing of future buildout improvements.

6.2.5 FUTURE EAST PORT WRF IMPROVEMENTS

6.2.5.1 15-YEAR IMPROVEMENT PLAN

Flow projections for the East Port WRF indicate expansion improvements are required within the 15-Year CIP period under the current permitted capacity. CCUD has already completed the FDEP permit, capacity analysis report, and operation and maintenance performance report in 2012 and completed the design of the East Port Stage 3 and 4 Improvements in 2013, which will allow the plant permitted capacity to be 9 MGD following construction of the improvements. The existing permit is undergoing renewal in 2017 where these data and improvements will be proposed for incorporation into the permit renewal. The Stage 3 and 4 improvements were discussed and presented in Section 3.2.3.

Figure 6-7 East Port WRF Historical and Projected AADFs

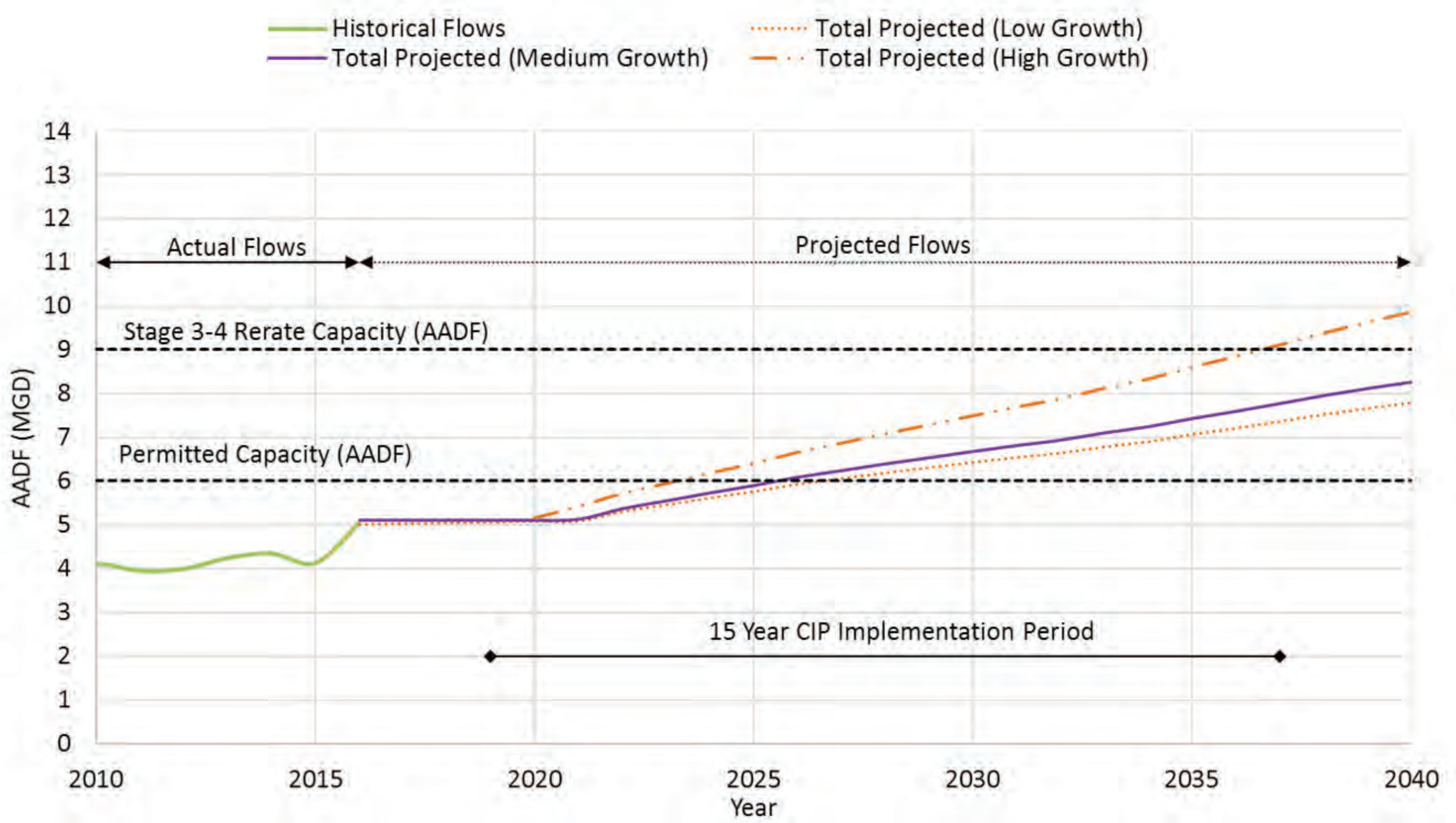


Figure 6-8 *Proposed Site Plan for East Port WRF Buildout Plan*

The buildout improvement plan for the East Port WRF includes rerating the permitted capacity from 9.0 MGD AADF to 12 MGD AADF. The service population demographics could have a significant impact on the future flow projections. The County will continue to monitor flows and adjust projections accordingly to predict future conditions. The buildout improvements for the East Port WRF under the current conditions include:

1) Headworks: The existing 120 feet diameter aerobic digester tank will be retrofitted to serve as an equalization tank. Includes headworks, pumps, and mixing improvements.

2) Oxidation Ditch No.4: The existing MLE process for biological treatment will be expanded by adding oxidation ditch No. 4 adjacent to the existing ditches. The proposed oxidation ditch will have two treatment zones – a 0.52-MG anoxic basin and a 1.25-MG aeration basin.

3) Aerobic Digester Basin No.4: A fourth aerobic digester would be added to the existing aerobic digesters to treat WAS, scum, and sludge from other WRFs. The existing belt filter press will be used for dewatering the digested sludge.

4) Clarifier No.4: A 100 feet diameter clarifier for solids separation after the oxidation ditches. The new clarifier will include RAS/WAS and scum pumping stations.

5) ABW Filter No. 5 and No. 6: Two new ABW traveling-bridge filters with a surface of 1,120 square feet each and a surface area of 2,240 square feet. Turbidity analyzers will be installed in the filter effluent channel to monitor the turbidity of the filter effluent.

6) Chlorine Contact Chamber No. 5 and No. 6: CCCs No. 5 and No. 6 will be located adjacent to the existing basin to provide high-level disinfection for all filtered effluent and basic-level disinfection for all unfiltered bypass effluent. CCCs No. 5 and No. 6 will have similar dimensions, volume, and flow configuration as the existing CCCs.

7) High Service Pump Station Upgrades: The existing pump station will be modified to convey 18 MGD reclaimed water from the 95-MG south storage pond to the CCUD master reuse system.

8) MCC Building Upgrades: Upgrade MCC building to house the programmable logic controllers (PLCs), SCADA, human machine interfaces (HMIs), electrical components, and instrumentation.

Table 6-5 East Port WRF Buildout - Engineer's Opinion of Probable Construction Costs

Description - East Port WRF Build Out (12 MGD)		Total Cost (2017 Dollars)
1) Headworks Improvements, Equalization Tank, Pumps, Mixing	$	8,000,000
2) Oxidation Ditch No. 4	$	2,800,000
3) Aerobic Digester Basin No. 4	$	1,000,000
4) Clarifier No. 4	$	1,400,000
5) ABW Filters No. 5 and No. 6	$	1,630,000
6) CCCs No. 5 and No. 6	$	800,000
7) High Service (Reclaimed) Pump Station Additions for 18 MGD	$	6,000,000
8) MCC Building, Electrical, and Instrumentation Upgrades	$	4,000,000
Subtotal	**$**	**25,600,000**
Site Work (5%)	$	1,280,000
Yard Piping (8%)	$	2,050,000
Mobilization and Demobilization (5%)	$	1,280,000
General Conditions (3%)	$	770,000
Overhead and Profit (10%)	$	2,560,000
Sales Tax	$	1,540,000
Contingency (30%)	$	7,700,000
Fiscal, Legal, Administrative and Engineering (12%)	$	5,100,000
Total	**$**	**47,900,000**
EOPCC (Rounded)	**$**	**48,000,000**

West Port Water Reclamation Facility

6.3 WEST PORT WATER RECLAMATION FACILITY

6.3.1 OVERVIEW OF WEST PORT WRF

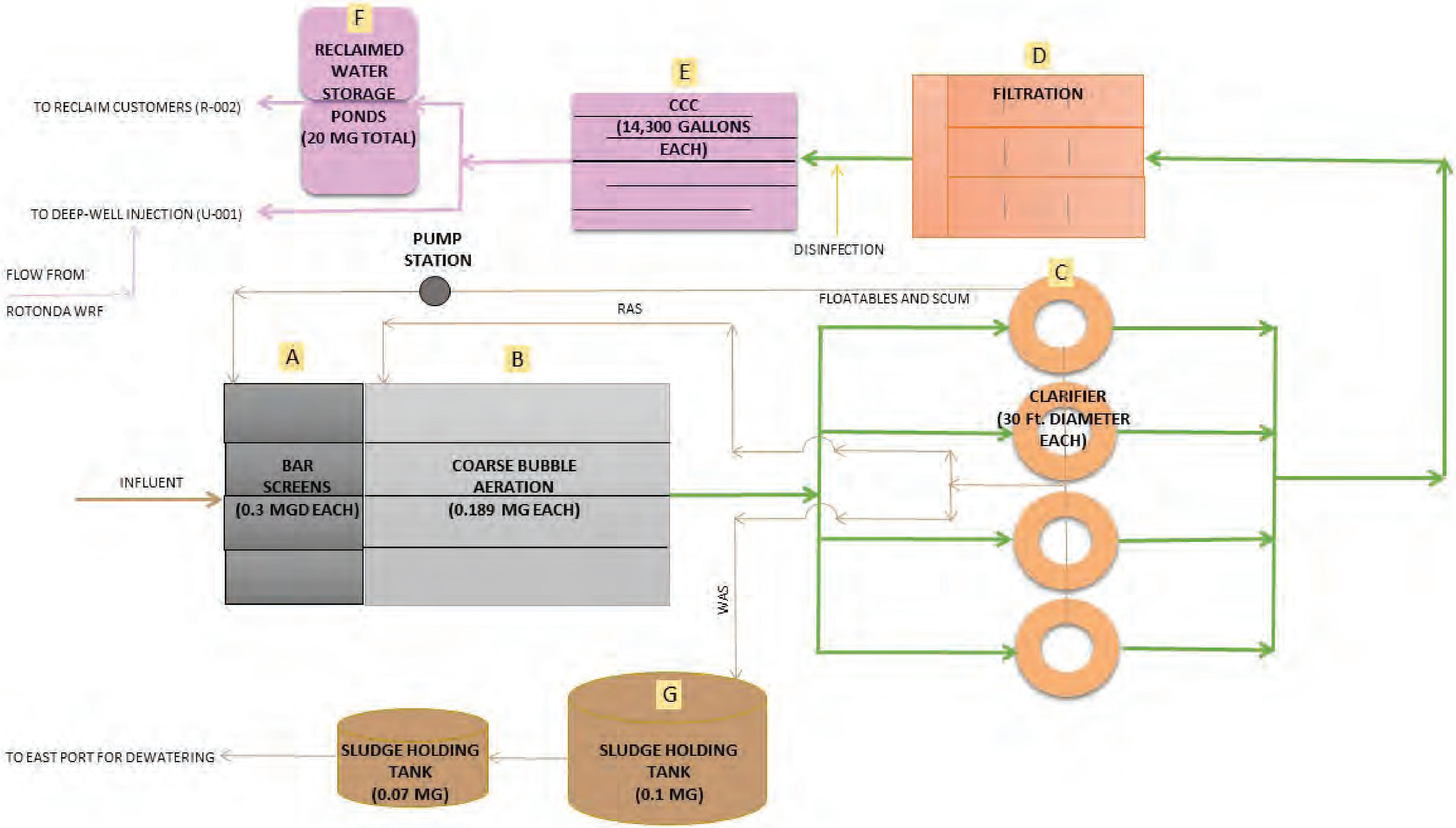
The West Port WRF is in the Gulf Cover area of West Charlotte County at 15005 Cattle Dock Point Road, Port Charlotte. This WRF was purchased by Charlotte County in 1996 and operates under FDEP Permit No. FLA014048. It has a current permitted capacity of 1.20 MGD AADF. West Port WRF uses an activated sludge process to treat domestic wastewater collected from part of the West County service area.

The West Port WRF is permitted to distribute reclaimed-quality water to unrestricted-public-access reuse sites and inject into a deep well injection system. The former 0.162-MGD slow-rate restricted-access spray field permitted discharge was removed in the October 2015 permit renewal. Two diesel-powered emergency generators with automatic transfer switches provide standby power to the WRF. Figure 6-9 shows the West Port WRF process flow diagram.

A) Screening: Raw wastewater from the West County service area collection/transmission system is screened to remove large inorganic material by four rotary influent screens. A manual bar screen is also available for bypass purposes. Screenings are collected in a dumpster and hauled to the landfill for disposal. Internal plant flows from the on-site pump station are introduced at the bar screens.

B) Biological Treatment for Organics Removal: Screened wastewater is split equally into four aeration basins where aeration and microorganisms are used to treat biodegradable material. Blowers aerate the wastewater through fine-bubble diffusers in each aeration basin.

Figure 6-9 West Port Water Reclamation Facility



C) Secondary Treatment: Flow from the biological treatment process is split between four secondary clarifiers for solids separation. The clarifiers are skimmed to remove floatables and scum before the effluent flows over a circumferential weir. Telescoping valves adjust sludge withdrawal from the bottom of each clarifier and convey it to the sludge return chamber. The sludge exits the return chamber where it is conveyed to the front of the aeration basins as RAS to replenish the microbial community or to the sludge holding/aerobic digestion tanks as WAS.

D) Tertiary Treatment – Filtration: Clarified water enters three automatic cleaning, disc-type cloth media filters for tertiary filtration to remove the remaining solids. The filters are housed in individual steel tanks.

E) Tertiary Treatment – Disinfection: The filtered water enters the CCCs where liquid Sodium hypochlorite is dosed for disinfection. Only one chamber is currently in use.

F) Effluent Reclaimed and Disposal Facilities: Reclaimed-quality water is pumped to two lined storage ponds for storage and distribution to the reclaimed system.

G) Aerobic Digestion: WAS is pumped from the clarifiers to the sludge holding/aerobic digestion tanks where blowers provide aeration through coarse-bubble diffusers. The sludge is gravity thickened and decanted before being hauled to the East Port WRF for aerobic digestion and dewatering.

Table 6-6 shows the current major users of reclaimed water within the West Port WRF. Excess reclaimed water and water not meeting reclaimed standards are pumped to the Class I injection wells by three equally sized pumps. The West Port WRF and Rotonda WRF reclaimed water systems are interconnected, allowing Rotonda WRF to dispose of excess reclaimed water.

Table 6-6 ***Partial*** *West Port WRF - Major Users of Reclaimed Water*

Major User	Area (acres)	Capacity (MGD)
Coral Creek Golf Course	124	0.308
Long Marsh North and South Golf Club	120	0.460
The Palms Golf Course	120	0.423

6.3.2 WEST PORT WRF HISTORICAL FLOW AND CHARACTERISTICS SUMMARY

Table 6-7 summarizes the historical flows from 2011 to 2016 for the West Port WRF. The West Port WRF operated at a capacity between 46 and 64 percent of the MTMADF and 43 to 56% of the AADF with the MMADF peaking factors varying from 1.5 to 2.9. The MMADF from 2011 through 2016 occurred in August 2016 at 1.99 MGD.

Table 6-7 *Historical Influent Flow Summary for West Port WRF*

Year	AADF (MGD)	MMADF (MGD)	MTMADF (MGD)	Percent Capacity (MTMADF/Permit)	Monthly Peaking Factor (MMADF/AADF)
2011	0.52	0.78	0.59	49%	1.5
2012	0.51	0.91	0.55	46%	1.8
2013	0.57	1.29	0.64	53%	2.8
2014	0.64	1.00	0.71	59%	1.6
2015	0.60	1.07	0.71	59%	1.8
2016	0.68	1.99	0.77	64%	2.9

Figure 6-10 presents the MADF, TMADF, and AADF reported to FDEP for the West Port WRF. MADFs vary from 0.38 MGD in June 2011 to 0.84 MGD in February 2016. TMADFs vary from 0.44 to 0.77 MGD. The AADFs were approximately 50% of the WRF Permit Capacity with AADF values ranging from 0.51 MGD to 0.68 MGD.

Figure 6-10 *Historical Wastewater Influent Flows for West Port WRF (2011 - 2016)*

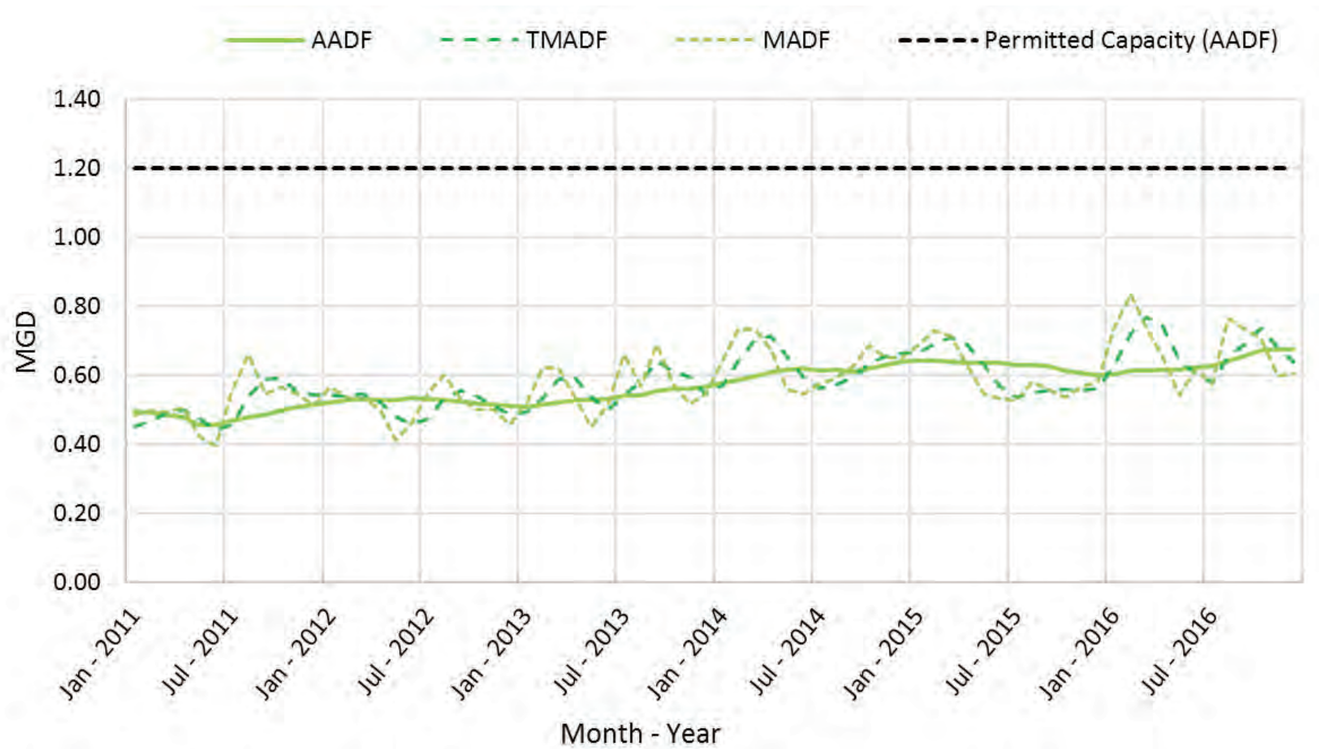


Table 6-8 summarizes the historical influent flow characteristics and loadings from 2011 through 2016 for the West Port WRF. Weekly influent water samples are taken for the West Port WRF. The yearly average CBOD values varied from 80 to 160 mg/L (360 to 660 pounds per day [lb/day]) between 2011 and 2016. The concentrations decreased lower than the typical municipal wastewater range of 120 to 380 mg/L between 2013 and 2016. The yearly average TSS concentrations varied between 70 and 290 mg/L from 2011 to 2016, equating to approximately 300 to 1,500 pounds per day.

Table 6-8 Historical Influent Flow Characteristics Summary for West Port WRF

Year	AADF (MGD)	CBOD[1] (mg/L)	CBOD (lbs/day)	TSS[2] (mg/L)	TSS (lbs/day)
2011	0.52	120	520	150	640
2012	0.51	160	660	210	900
2013	0.57	80	360	70	310
2014	0.64	90	480	100	520
2015	0.60	110	530	290	1,460
2016	0.68	115	640	240	1,360

Note: 1. Typical municipal wastewater CBOD range is between 120 – 380 mg/L.
2. Typical municipal wastewater TSS range is between 120 – 370 mg/L.

Figure 6-11 displays the average monthly influent CBOD and TSS concentrations for the West Port WRF and the typical months that winter residents are contributing to loads. The CBOD and TSS concentrations fluctuate due to load variations from seasonal population and the West Port WRF collection system characteristics.

Figure 6-11 Historical CBOD and TSS Concentrations for West Port WRF

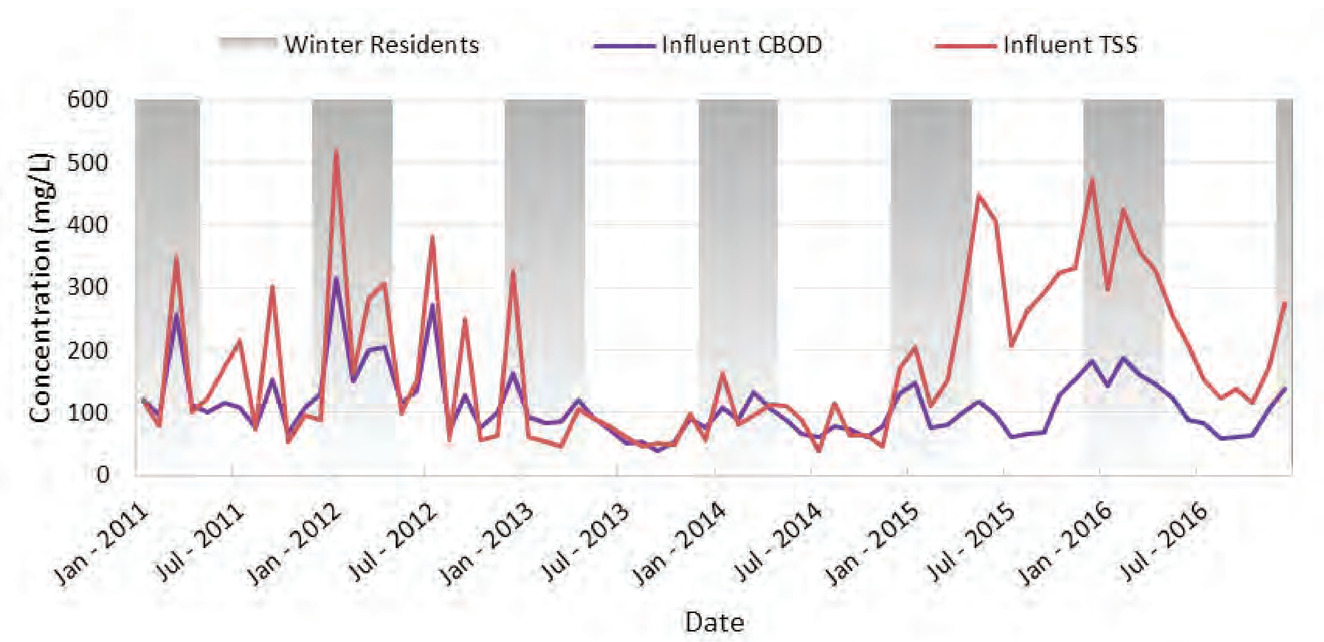
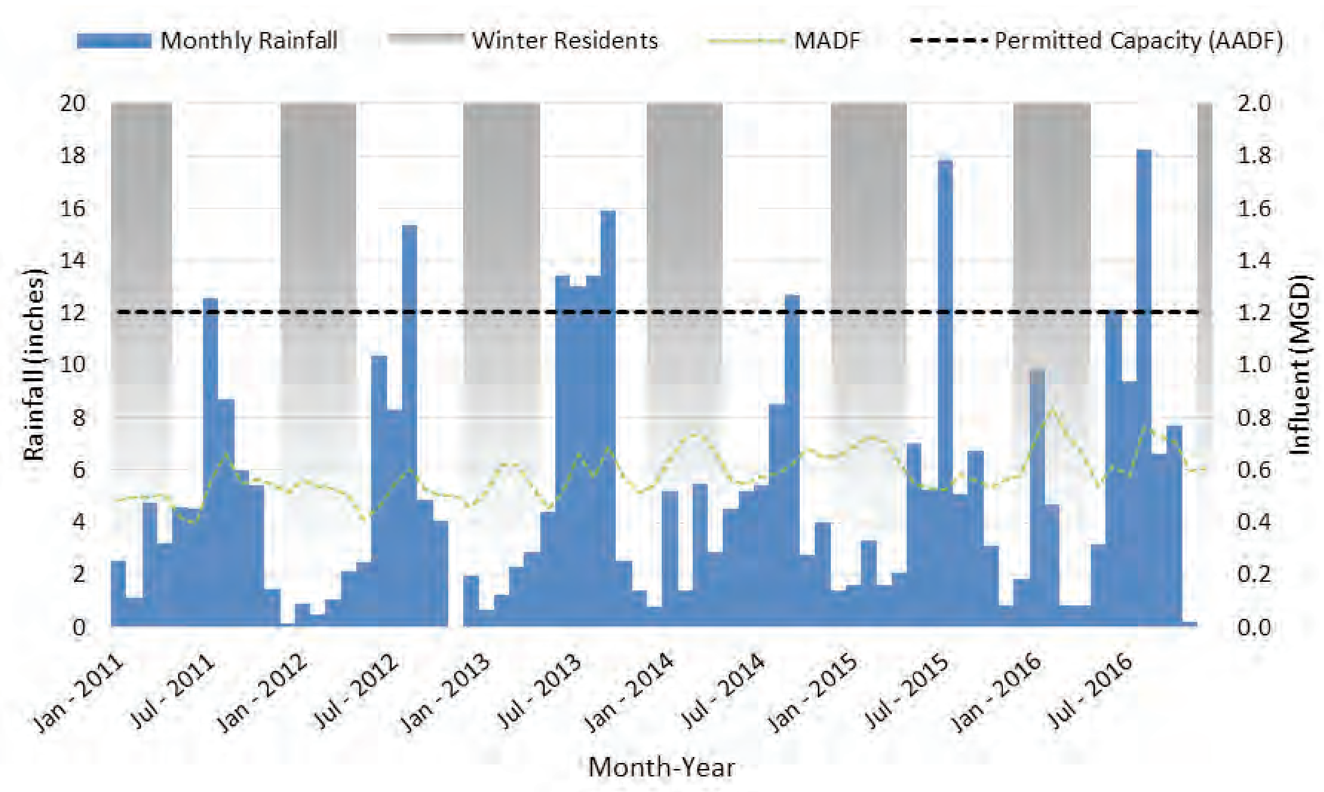


Figure 6-12 displays the total monthly rainfall and MADF from January 2011 to December 2016 for the West Port WRF. The total rainfall per year varied from 52 inches in 2012 to 74 inches in 2016. The increases in MADF appear to be correlated with the increased population of the area during December through April. Additional flow peaks occur during the summer months of 2011 through 2014, which is likely due to I&I.

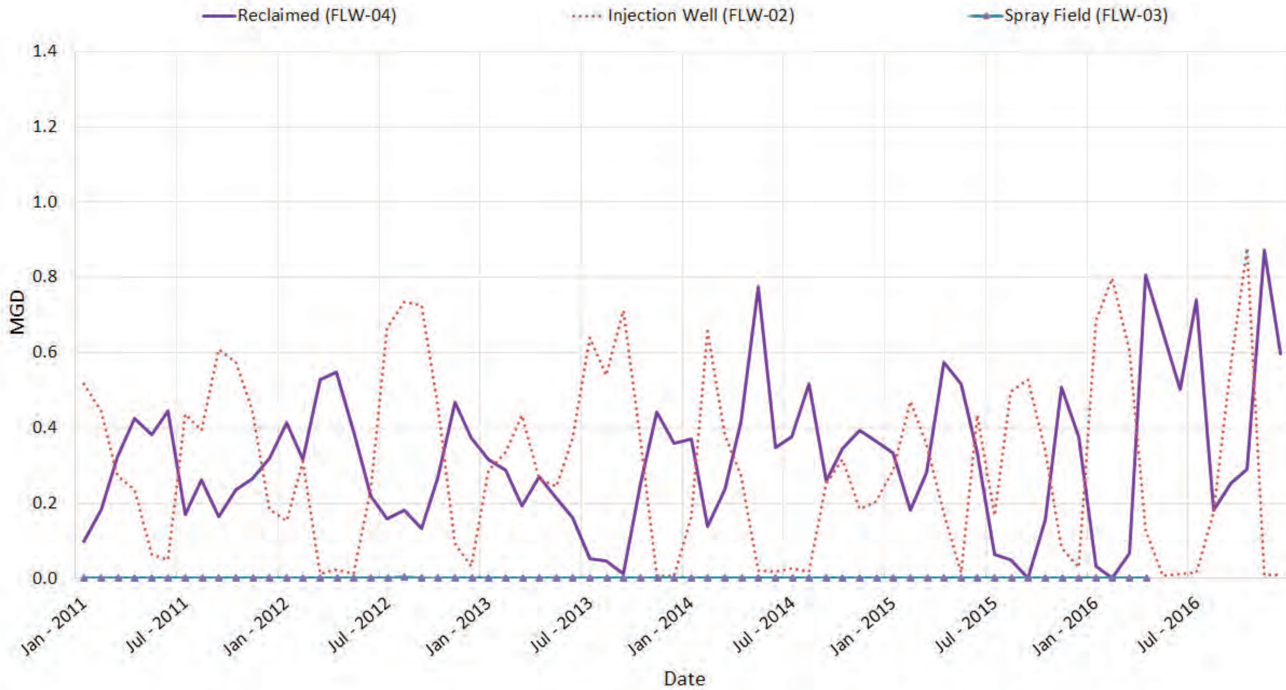
Figure 6-12 *Historical Rainfall and Influent Wastewater Flows for West Port WRF*



The West Port WRF has historically been permitted to dispose of its treated effluent using a deep injection well, spray fields, and reclaimed water use. The deep injection well was permitted for an instantaneous maximum of 4.75 MGD. The spray field and reclaimed effluent flows had permitted capacities of 0.162 and 1.244 MGD AADF, respectively. In February 2014, the County revised the West Port WRF permit to dispose of 4.75 MGD AADF into underground injection, 0.162 MGD AADF to spray fields and use the Charlotte County Master Reuse System. In April 2016, the County removed the spray field disposal option from its permit as it was not using this disposal method. The monthly average effluent flows from the West Port WRF from 2011 through 2016 are displayed in Figure 6-13.

Monthly effluent flows for the deep injection well and reclaimed effluents peaked at 0.88 and 0.87 MGD, respectively. The effluent disposal methods are relatively equal with 55 percent of effluent flows disposed of via deep well injection and 45 percent used for reclaimed water. The monthly effluent flows alternate throughout the year, with more reclaimed water use occurring during December through April when winter residents are present. The maximum AADF for the reclaimed effluent from 2011 to 2016 was approximately 0.42 MGD.

Figure 6-13 Historical Wastewater Effluent Flows for West Port WRF (2011 - 2016)




West Port Water Reclamation Facility

6.3.3 ONGOING WEST PORT WRF IMPROVEMENTS

A number of O&M projects have been identified for the West Port WRF. The recently completed and scheduled improvements include:

Completed:

- Replaced the corroded support beam above the influent splitter box and coarse bar screen.
- Adjusted aeration blowers to allow simultaneous operation.
- Repaired and repainted two clarifiers with rust and structural problems.
- Painted the cloth filter platforms.
- Provided new cloth media for two of the filters.
- Started using the sludge-to-tanker pumps to transfer sludge between holding tanks.

Scheduled for 2017 and 2018:

- Determine the source of flow spikes and TSS/CBOD variation to the WRF.
- Repair and paint the other two clarifiers with rust and structural problems.
- Provide new cloth media for the remaining filter.
- Install the new chlorine chemical feed pumps.
- Prepare the second pair of CCCs for service during periods of high flow.

Operational staff currently monitor pH levels for operational control. When the pH moves out of the normal range, staff has limited options for correcting the situation. The WRF has no equalization tank or grit removal, causing inconsistent treatment during varying inflows and an accumulation of sand in the aeration basins. Issues being experienced with rotary screens, and clarifiers are acting as a weak link in the treatment operation. The size of the digesters limits the capacity of the WRF and its ability to process nutrients. The following improvements could be implemented to increase operational efficiency:

- Provide an equalization tank to handle the varying influent.
- Update the clarifiers from those built in 2004.
- Upgrade the digester to handle future flows and loads.

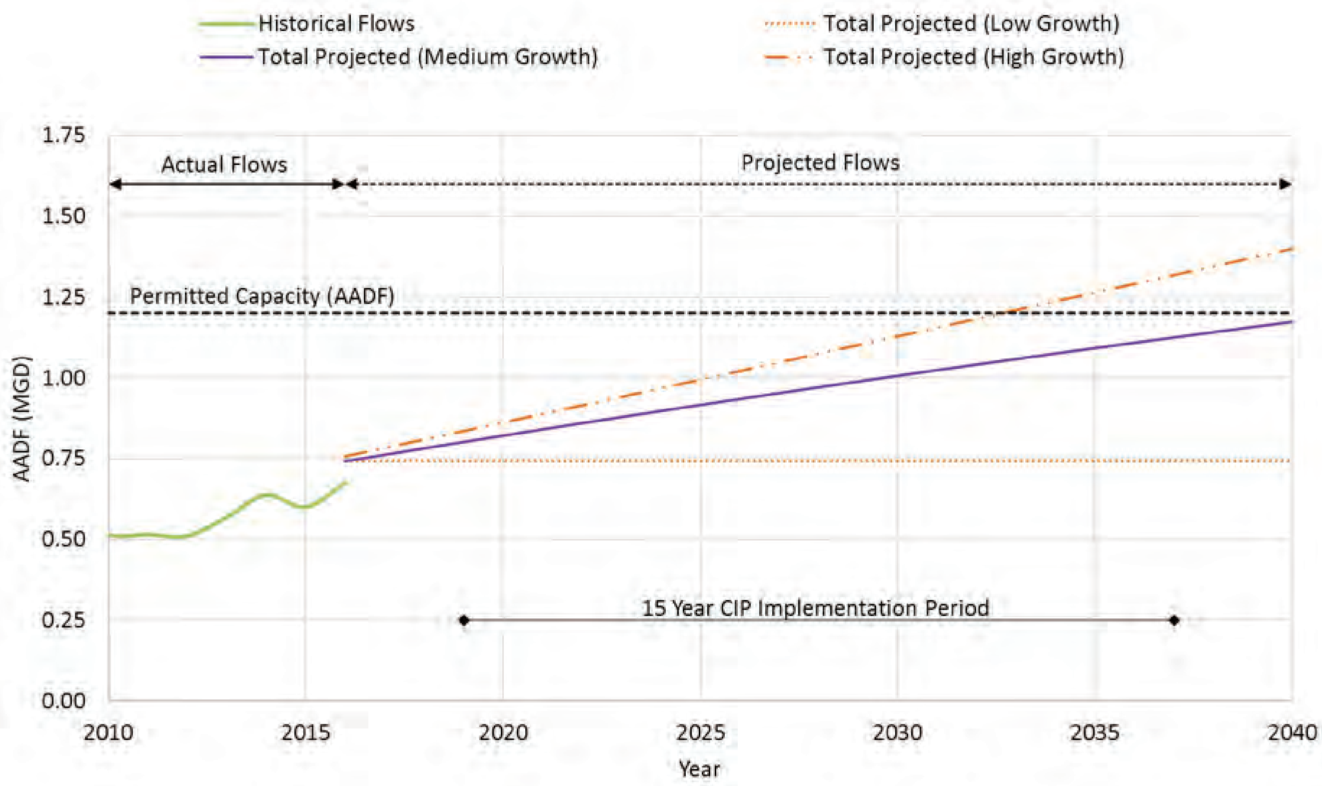
6.3.4 WEST PORT WRF FLOW PROJECTIONS

Figure 6-14 shows the historical and projected AADFs for the West Port WRF. The flow projections for the West Port WRF include infill growth from existing sewersheds. The flow projections indicate that the permitted capacity will not be exceeded until after 2040 under medium growth conditions. The FDEP guidelines indicate that planning and preliminary design should be prepared in 2036, the final design should be prepared in 2037, and the construction should begin by 2038.

At the time of planning for the expansion of the West Port WRF in 2036, the Rotonda WRF will have exceeded its useful life and improvements to Rotonda WRF will be an inefficient use of funds. This SMP includes a conversion of the Rotonda WRF to a master pump station to send wastewater flows from the Rotonda WRF service area to the West Port WRF. Therefore, the West Port WRF expansion will be sized to accommodate these flows in 2040.

West Port Water Reclamation Facility

Figure 6-14 *West Port WRF Historical and Projected AADFs*



The low growth scenario assumes flows from project areas are routed to the Rotonda WRF and infill growth from the existing West Port WRF sewershed is negligible. Under high growth conditions, it is estimated that the West Port WRF flows will reach the permitted capacity by 2033.

The preliminary and final expansion design plans would be prepared in 2028 and 2029, respectively. The construction start year is estimated to be in 2030 under high growth conditions. However, high growth conditions in this region are not expected; therefore, the timing of future improvements were based upon medium growth conditions.


West Port Reclaimed Water Storage Pond

6.3.5 FUTURE WEST PORT WRF IMPROVEMENTS

6.3.5.1 15-YEAR IMPROVEMENT PLAN

Under medium growth conditions, no expansion improvements are required at the West Port WRF in the 15-Year CIP period.

6.3.5.2 BUILDOUT IMPROVEMENTS PLAN

The buildout improvement plan for the West Port WRF contains two phases to accommodate flows from the West Port and Rotonda WRFs. Phase 1 will expand the West Port WRF to 5.0 MGD AADF, and Phase 2 will expand the WRF to 10 MGD AADF. The proposed buildout improvement plan for the new WRF has been shown in Figure 6-15. Phase 1 includes the following major components as well as all required weirs, gates, piping and valves, paving, drainage, site grading, stormwater storage, concrete slabs on grade for equipment, electrical, instrumentation, controls, and appurtenances:

Phase 1 Improvements

1) Headworks

- Two in-channel mechanical fine screens with screening dewatering and disposal.
- One in-channel manual bar screen.
- One vortex grit removal unit with grit cleaning/dewatering and disposal.
- Flow splitter box.

The headworks will be an elevated cast-in-place concrete structure. The headworks structure will be sized to accommodate the Phase 2 expansion with space for additional screening and grit removal.

2) Biological Treatment Units
At this level of planning, it is assumed that the biological treatment will be a MLE process similar to the East Port WRF to provide nitrogen removal. Final determination on the type of biological treatment process will be made during the planning phase of this expansion:
- Two concrete anoxic basins with mixers.
- Two concrete carrousel oxidation ditches with mechanical aerators.

3) Secondary Treatment: Clarification (solids separation)
- Concrete flow splitter box.
- Two concrete circular clarifier tanks with energy dissipation inlet, effluent weirs and launder, bottom rake arms and scrapers and sludge collection, and scum skimmer arm and disposal.
- Sludge pump station at each clarifier with two RAS pumps and two WAS pumps.

4) Tertiary Treatment: Filtration
- Four disk filtration units (cloth or woven media).

5) Tertiary Treatment: Disinfection
- Concrete flow splitter box.
- Two baffled concrete CCCs.
- Liquid sodium hypochlorite storage and feed system with two dual containment polyethylene storage tanks and two feed pump skids.

6) Effluent Reclaimed Storage and Disposal Facilities
- Three new vertical turbine pumps.

7) Sludge Handling
- Retrofit the existing aeration tanks to use as aerobic digesters.
- One dewatering and truck loading facility (belt filter press or screw press) with polymer feed.

8) Auxiliary Power
- One emergency diesel generator with an automatic transfer switch and fuel storage tank.

9) MCC Building
- One MCC building to house the PLCs, SCADA, HMIs, electrical components, and instrumentation.

Figure 6-15 *Proposed Site Plan for West Port WRF Buildout Plan*

Some of the infrastructure (i.e. concrete structures) in Phase 1 will be designed to accommodate the Phase 2 expansion such as the headworks, clarifier flow splitter box, and CCC flow splitter box, and MCC building. Therefore, minimal equipment will need to be added to this infrastructure to accommodate the Phase 2 expansion.

After Rotonda WRF service area wastewater flow is transferred to the proposed West Port WRF expansion, the expanded West Port WRF will provide reclaimed water to the Rotonda service area. Table 6-9 and Table 6-10 provide the EOPCC for Phase 1 and Phase 2, respectively.

Table 6-9 West Port WRF Phase 1 - Engineer's Opinion of Probable Construction Cost

Description		Total Cost (2017 Dollars)
1) Headworks	$	2,500,000
2) Biological Treatment Units	$	5,600,000
3) Secondary Treatment: Clarification	$	3,600,000
4) Tertiary Treatment: Filtration	$	1,600,000
5) Tertiary Treatment: Disinfection	$	1,800,000
6) Reclaimed Water HSPS and Wetwell	$	3,500,000
7) Sludge Handling - Additional Aerobic Digesters and Sludge Thickening	$	2,000,000
8) Auxiliary Power	$	750,000
9) MCC Building, Electrical, and Instrumentation	$	4,000,000
Subtotal	**$**	**25,350,000**
Demolition	$	1,000,000
Site Work (5%)	$	1,300,000
Yard Piping (8%)	$	2,000,000
Mobilization and Demobilization (5%)	$	1,300,000
General Conditions (3%)	$	800,000
Overhead and Profit (10%)	$	2,500,000
Sales Tax	$	1,500,000
Contingency (30%)	$	7,600,000
Fiscal, Legal, Administrative and Engineering (12%)	$	3,000,000
Total	**$**	**46,350,000**
EOPC (Rounded)	**$**	**47,000,000**


Deep Well Injection System at Westport WRF

Table 6-10 West Port WRF Phase 2 - Engineer's Opinion of Probable Construction Cost

Description - West Port Phase II, Expansion (10 MGD)		Total Cost (2017 Dollars)
1) Headworks	$	1,000,000
2) Biological Treatment Units	$	5,600,000
3) Secondary Treatment: Clarification	$	3,600,000
4) Tertiary Treatment: Filtration	$	1,600,000
5) Tertiary Treatment: Disinfection	$	1,800,000
6) Effluent Reclaimed Storage and Disposal Facilities	$	700,000
7) Sludge Handling	$	2,000,000
8) Auxiliary Power	$	750,000
9) MCC Building, Electrical, and Instrumentation	$	2,000,000
Subtotal	**$**	**19,100,000**
Site Work (5%)	$	1,000,000
Yard Piping (8%)	$	1,500,000
Mobilization and Demobilization (5%)	$	960,000
General Conditions (3%)	$	570,000
Overhead and Profit (10%)	$	1,900,000
Sales Tax	$	1,100,000
Contingency (30%)	$	5,700,000
Fiscal, Legal, Administrative and Engineering (12%)	$	2,300,000
Total	$	**34,100,000**
EOPPC (Rounded)	$	**35,000,000**


Westport Water Reclamation Facility


Rotonda Water Reclamation Facility

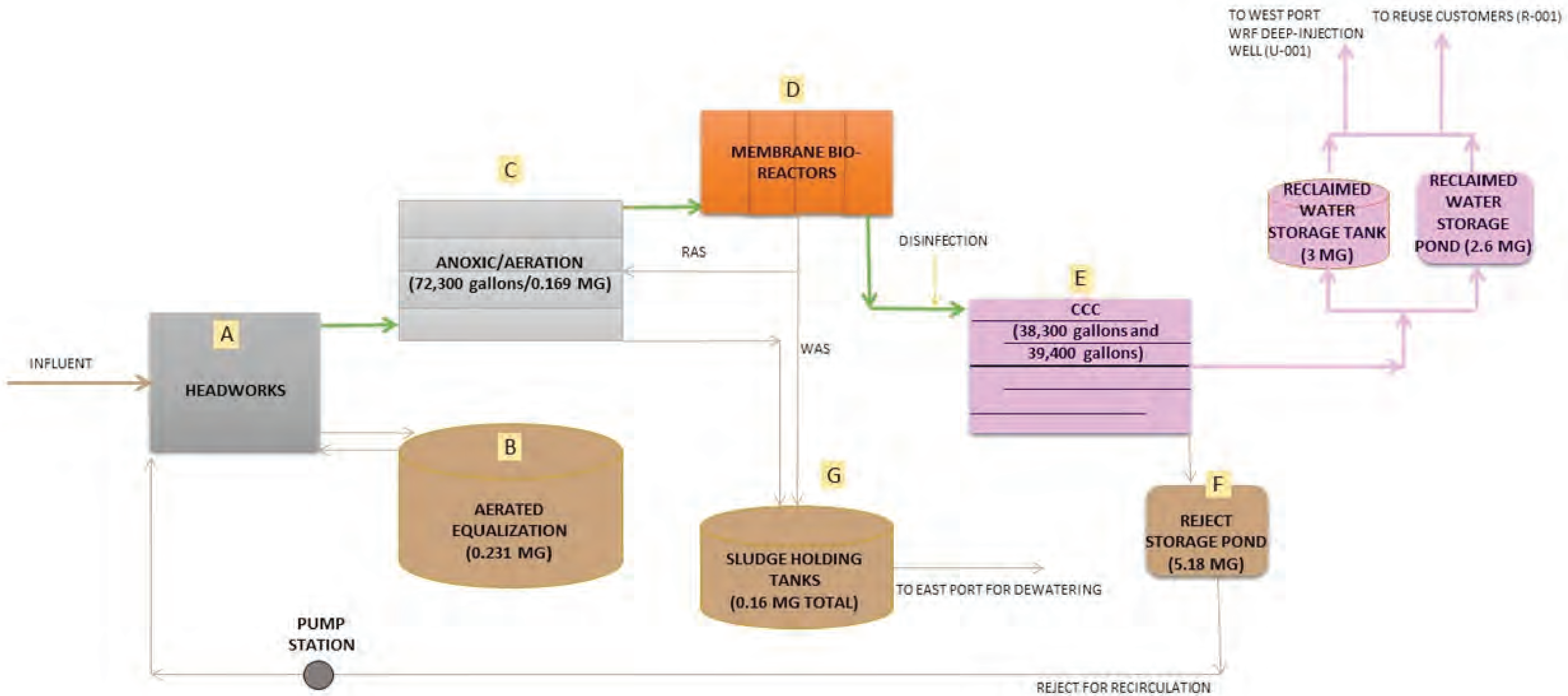
6.4 ROTONDA WATER RECLAMATION FACILITY

6.4.1 OVERVIEW OF ROTONDA WRF

The Rotonda WRF is at 3740 Kendall Road, Rotonda West. This facility was purchased by Charlotte County in 2000 and operates under FDEP Permit No. FLA014098 with a permitted capacity of 2.0 MGD AADF. The Rotonda WRF is permitted to distribute reclaimed-quality water to unrestricted-public-access reuse sites and to use the West Port WRF deep well injection system. Figure 6-16 shows the Rotonda WRF process flow diagram.


Rotonda Water Reclamation Facility Activated Sludge Treatment Train

Figure 6-16 Rotonda Water Reclamation Facility




Rotonda Water Reclamation Facility Headworks Structure

A) Headworks: Raw wastewater from the West County service area enters the Rotonda WRF headworks for screening and grit removal. Two rotary drum fine screens remove larger inorganic material, and two grit cyclones remove fine inorganics such as sand. Solids removed by these two processes are collected and hauled to the landfill for disposal. Flows for the on-site pump station are introduced here.

B) Equalization: During peak flows, excess wastewater flows over a weir at the headworks and is diverted to an equalization tank. Pumps at the equalization tank return the wastewater to the system as influent flows return to average conditions. The equalization tank is equipped with two forced-air pumps to maintain the biological medium and prevent hypoxic conditions.

C) Biological Treatment for Organics and Nutrient Removal: Wastewater from the pretreatment structure enters two activated sludge treatment trains that consist of an aeration zone, an anoxic zone, and a swing zone that can be an aeration or anoxic zone. This configuration allows the biodegradation of organics and removal of excess nitrogen. Blowers and fine-bubble diffusers are used to provide sufficient oxygen to the wastewater in the aeration zone.

D) Tertiary Treatment – Filtration: From the biological treatment process, the wastewater flows to the four membrane bioreactor (MBR) filtration trains. Hollow-tube membranes housed in individual cassettes provide a high level of filtration and take the place of clarifiers and gravity filters used at the other treatment plants. The cassettes are periodically submerged in cleaning tanks where liquid sodium hypochlorite is added. Sludge produced in the treatment process is pumped to two locations: to the aeration basins as RAS to replenish the microbial community and to the two sludge holding/aerobic digestion tanks as WAS.

E) Tertiary Treatment – Disinfection: The filtered water enters the CCC splitter box that directs the flow into one of two CCCs. Additional liquid sodium hypochlorite is introduced for reclaimed water disinfection requirements. The sodium hypochlorite is controlled by flow meters on the MBR effluent piping.

F) Effluent Reclaimed and Disposal Facilities: Reclaimed water enters the on-site ground storage tank (GST) and a reclaimed water storage pond. An on-site pump station provides flow to the reclaimed water transmission system that is interconnected with the West Port WRF to increase reclaimed distribution in West Charlotte County.

G) Aerobic Digestion: WAS pumped to the sludge holding/aerobic digesters is gravity thickened and hauled to the East Port WRF for aerobic digestion and dewatering. Decanted supernatant recirculates to the headworks. The sludge holding/aerobic digestion tanks use surface mechanical agitators for aeration.

The site consists of 24 acres in the southwest portion of the Rotonda Circle. Two diesel-powered emergency generators in an on-site building have automatic transfer switches for providing emergency power to the WRF.

Rotonda CCC with UV Shade Cloth

Table 6-11 shows the current major users of reclaimed water from the Rotonda WRF. During wet weather, excess reclaimed water can be disposed of in the West Port WRF deep injection well. If effluent does not meet the unrestricted public-access reclaimed water quality requirements, the flow can be diverted to an on-site lined reclaimed water storage pond or recirculated to the WRF headworks if permit requirements are not met.

Table 6-11 **Partial** *Rotonda WRF - Major Users of Reclaimed Water*

Major User	Area (acres)	Capacity (MGD)
Palm Golf Course	120	0.423
Cape Haze Country Club and Windward Patio Homes	86	0.333
Preserve at Windward	1.25	0.005

Rotonda Reclaimed Water Storage Pond

6.4.2 ROTONDA WRF HISTORICAL FLOW AND CHARACTERISTICS SUMMARY

Table 6-12 summarizes the historical flows for the Rotonda WRF from January 2011 to December 2016. The WRF is permitted for 2 MGD AADF and operates at approximately 46-percent capacity (AADF basis). The percent capacity on a MTMADF basis varied between 51 and 69% from 2011 to 2016. The maximum MADF occurred in September 2013, reaching approximately 2.4 MGD. Monthly peaking factors vary between 1.7 and 3.5.

Table 6-12 Historical Influent Flow Summary for Rotonda WRF

Year	AADF[1] (MGD)	MMADF (MGD)	MTMADF (MGD)	Percent Capacity (MTMADF/Permit)	Monthly Peaking Factor (MMADF/AADF)
2011	0.91	1.62	1.05	53%	1.8
2012	0.85	1.65	1.01	51%	1.9
2013	0.92	2.39	1.19	59%	2.6
2014	0.85	1.48	1.02	51%	1.7
2015	0.89	1.84	1.12	56%	2.1
2016	1.09	3.77	1.38	69%	3.5

Figure 6-17 presents the MADF, TMADF, and AADF for the Rotonda WRF from January 2011 to December 2016. The maximum TMADF observed from 2011 to 2016 was approximately 1.4 MGD. Figure 6-17 depicts relatively stable AADFs from 2011 to 2016, indicating limited increases in flows within the service area.

Figure 6-17 Historical Wastewater Influent Flows for Rotonda WRF (2011 - 2016)

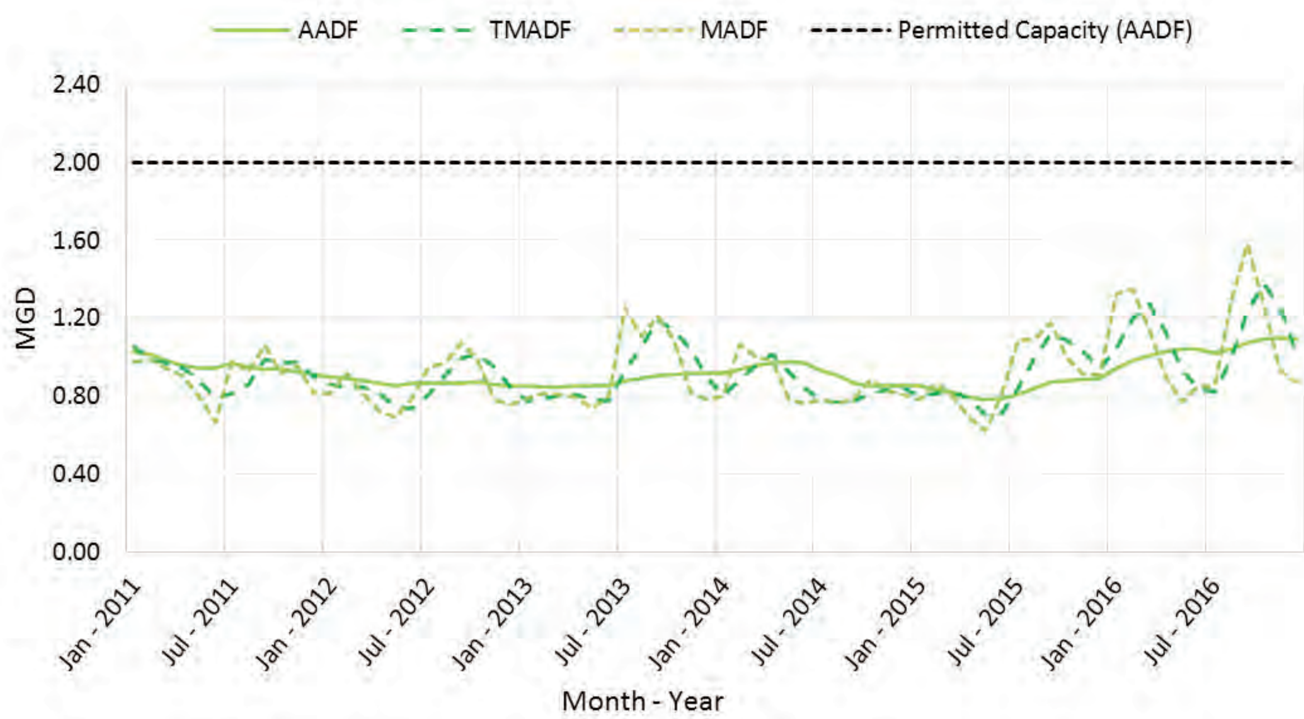


Table 6-13 summarizes the historical influent flow characteristics and loadings from 2011 to 2016 for the Rotonda WRF. Weekly influent water samples are taken for the Rotonda WRF. The yearly average CBOD values varied from 80 to 130 mg/L between 2011 and 2016. The yearly average TSS concentrations varied between 100 and 150 mg/L.

Table 6-13 *Historical Influent Flow Characteristics Summary for Rotonda WRF*

Year	AADF (MGD)	CBOD (mg/L)	CBOD (lbs/day)	TSS (mg/L)	TSS (lbs/day)
2011	0.91	120	900	130	960
2012	0.85	130	920	150	1,060
2013	0.92	120	880	140	1,080
2014	0.85	100	690	100	690
2015	0.89	80	570	110	820
2016	1.09	100	880	120	1,110

Note: Typical municipal wastewater CBOD range is between 120 – 380 mg/L.
Typical municipal wastewater TSS range is between 120 – 370 mg/L.

Figure 6-18 displays the average monthly influent CBOD and TSS concentrations for Rotonda WRF. CBOD and TSS concentrations generally correspond with occupancy of seasonal winter residents with the exception of an event that occurred in August 2011, which caused in increase in CBOD and TSS concentrations.

Figure 6-18 *Historical Influent CBOD and TSS Concentrations for Rotonda WRF*

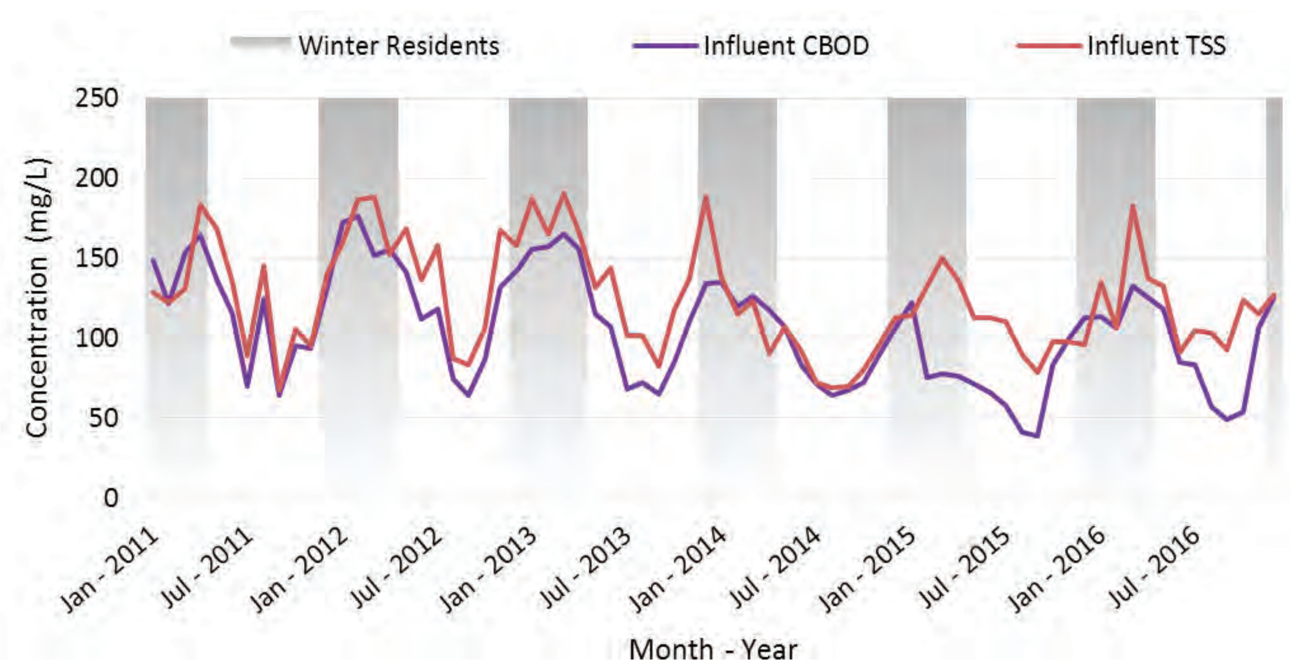
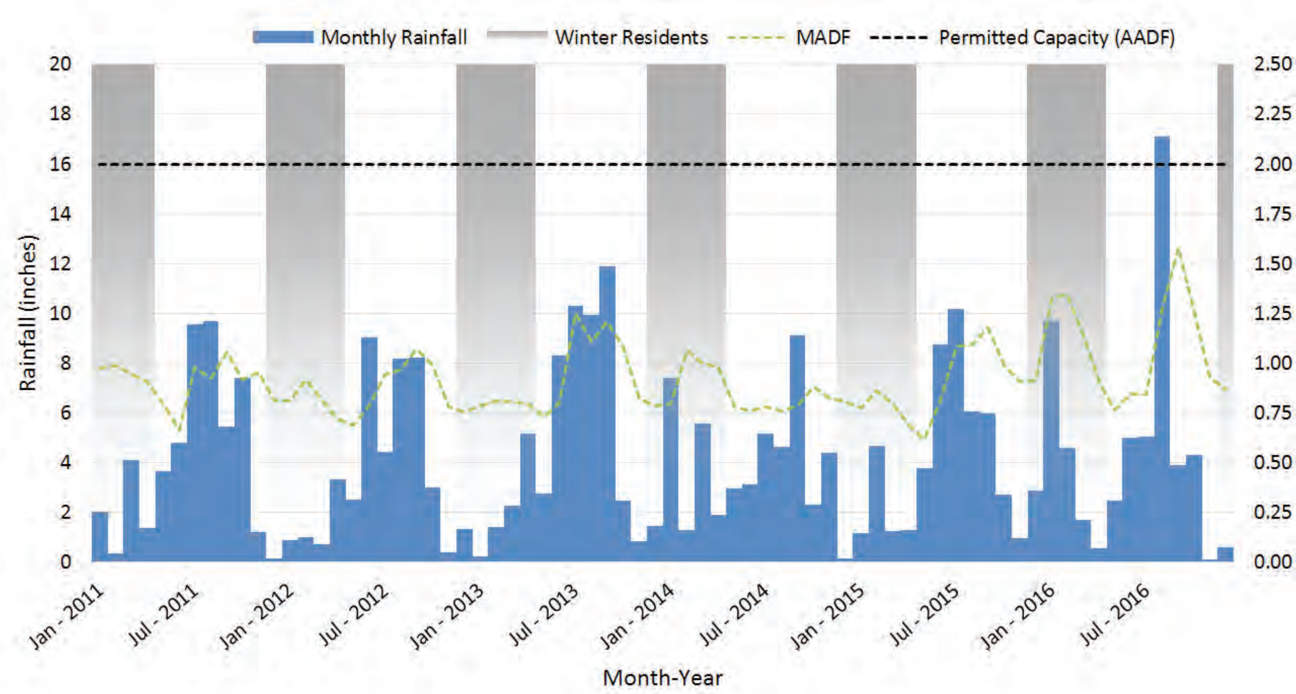


Figure 6-19 depicts the historical rainfall and MADFs from January 2011 to December 2016. The total yearly rainfall experienced at the Rotonda WRF varied between 43 and 57 inches from 2011 to 2016. December and January are typically the driest months, and June through September are often the wettest months. Total monthly rainfall and MADFs peaked in August 2016 and September 2016, respectively.

Figure 6-19 *Historical Rainfall and Influent Wastewater Flows for Rotonda WRF*

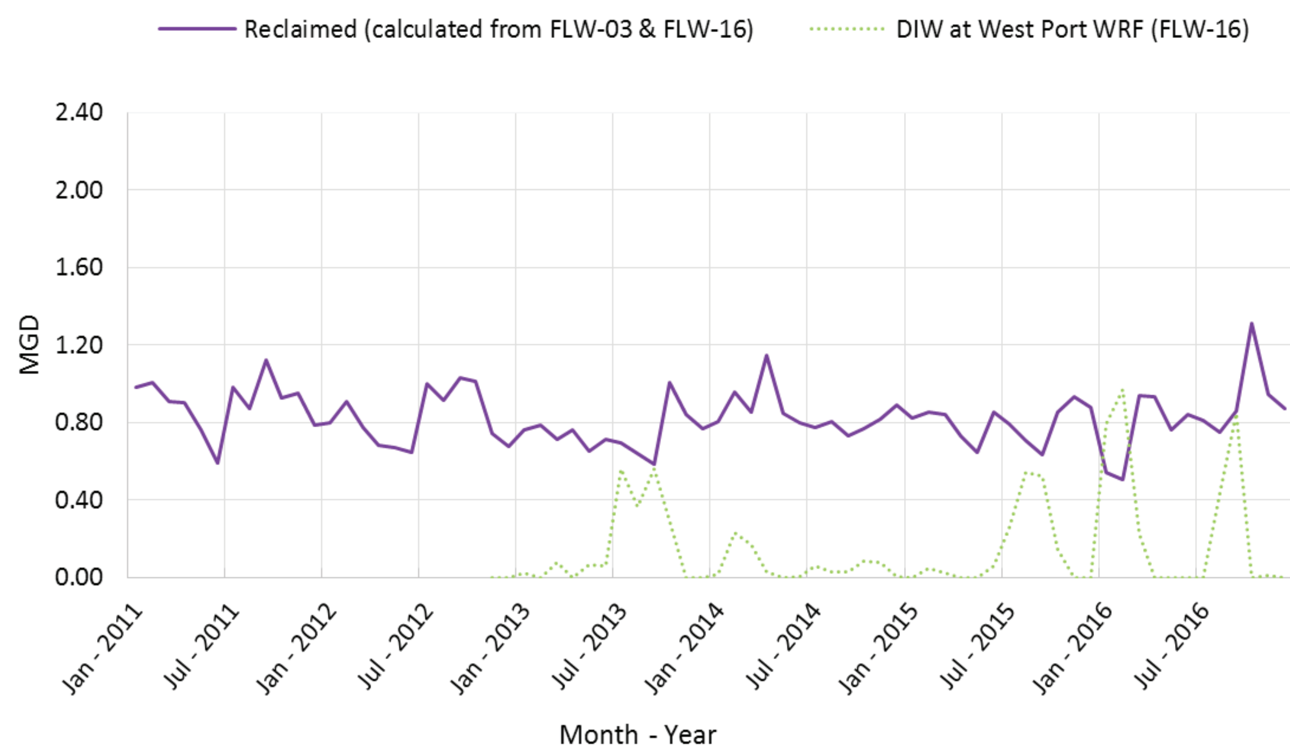


The Rotonda WRF is permitted to dispose of its treated effluent using the County's Master Reuse System or by conveying the effluent to the West Port WRF and using its deep injection well. The flow rate is limited by West Port WRF's permit capacity and the infrastructure connecting the WRFs. Rotonda WRF operators must coordinate with the West Port WRF operators frequently to dispose of effluent flows.


Rotonda Reclaimed Water Storage Pond

Figure 6-20 on the following page displays the monthly average effluent flows from the Rotonda WRF from 2011 through 2016. Effluent flows from Rotonda WRF to West Port WRF have historically been conveyed between the two WRFs but were not recorded before 2013. Average monthly reclaimed use varies between 0.6 and 1.7 MGD. Deep injection well flows peaked in February 2016 at 1 MGD.

Figure 6-20 *Historical Wastewater Effluent Flows for Rotonda WRF (2011-2016)*



6.4.3 ONGOING ROTONDA WRF IMPROVEMENTS

Several O&M projects have recently been completed at the Rotonda WRF. These include:

- Performed touch-up painting of the facilities.
- Monitored general headworks and addressed maintenance concerns.
- Added a wash-water spray to the screening compactors to improve their operation and lengthen the life of the lower bearing units.
- Modified the compactors to improve their effectiveness.
- Upsized the transmission mains exiting the WRF.
- Upgraded the Wonderware software.

The Rotonda WRF experiences high I&I levels that impact plant operations during the rainy season because of limited disposal capacity. Addressing the I&I and increasing disposal should be a high priority. The current rotary drum screens remove particles well but require frequent adjustments to maintain operations. The equalization tank acts effectively as the grit chamber, and grit is hosed into the grit pumps every couple of years for removal.

The blowers in the activated sludge treatment trains are oversized; operators often operate at the minimum allowable level to achieve a low sludge yield rather than dealing with the foam and mess created at high flows. The WRF is hydraulically limited at the MBR process. Reclaimed water storage and disposal are limited during high flows caused by tropical storms and hurricanes. Increasing storage capacity would provide the WRF with flexibility during storms but potential buildout is limited due to the wetland area near the facility.

The following improvements could be implemented to increase operational efficiency:

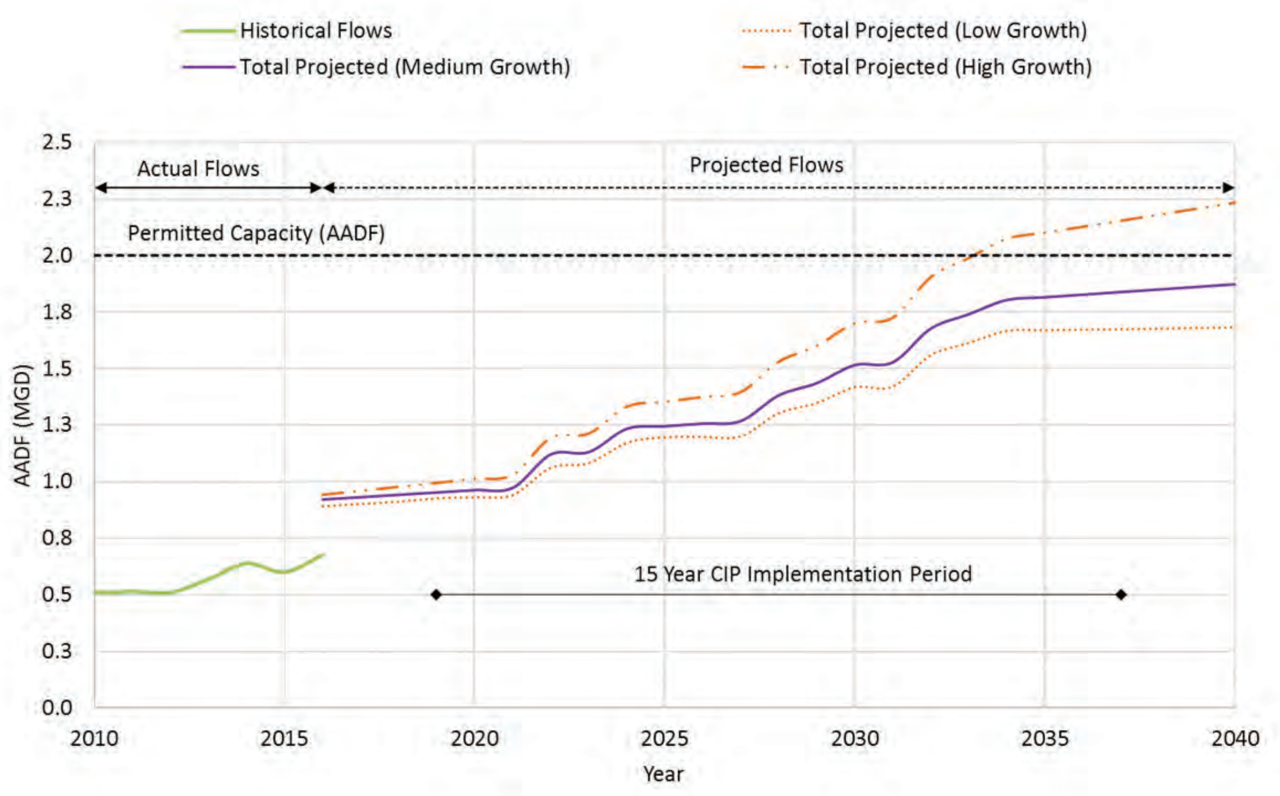
- Update the aeration basin blowers to an accurate, lower size.
- Upgrade the reclaimed transmission pipe to the Cape Haze Golf Course.
- Provide additional reclaimed water storage or disposal – increase transmission capacity to West Port WRF or install an aquifer storage and recovery well in the West County region.
- Install dissolved oxygen (DO) or oxygen reduction potential (ORP) probes to control the blowers in the aeration basins.
- Replace the rotary fine screens.
- Update or replace the compactors.

6.4.4 ROTONDA WRF FLOW PROJECTIONS

Figure 6-21 shows the historical and projected flows for the Rotonda WRF. The flows projections for the Rotonda WRF include infill growth from existing sewersheds, projected growth due to project area conversions, and growth from the integration of several private wastewater systems in the Rotonda service area. The flow projections indicate that the permitted capacity will not be exceeded until after 2040 under medium growth conditions.

Based on FDEP rules, planning the expansion for the Rotonda WRF should begin around 2040. It is expected that by this time, expansion of the Rotonda WRF would be limited due to costly equipment improvements and limited land in the area. Therefore, the Rotonda WRF should be converted to a master pump station and the wastewater flows from the Rotonda WRF service area be sent to the West Port WRF.

Figure 6-21 *Rotonda WRF Historical and Projected AADFs*



High and low growth conditions are also depicted on Figure 6-21. Low growth conditions indicate flows plateau at approximately 1.7 MGD. High growth conditions indicate the permitted capacity could be exceeded in 2033. Based on FDEP rules and high growth conditions, planning an expansion of the Rotonda WRF would need to begin in 2028 with construction starting in 2030. Alternatively, if the County continues to address the significant I&I within the Rotonda service area, the projected flows of the Rotonda WRF would decrease and prolong the need for expansion.

6.4.5 FUTURE ROTONDA WRF IMPROVEMENTS

6.4.5.1 15-YEAR IMPROVEMENT PLAN

Under medium growth conditions, no expansion improvements are required at the West Port WRF in the 15-Year CIP period.

6.4.5.2 BUILDOUT IMPROVEMENTS

As previously mentioned, the Rotonda WRF major equipment will have reached or exceeded its useful life by 2040 and rehabilitation or replacement of the equipment will not be cost effective. Therefore, the Rotonda WRF will be converted to a 5.0 MGD master pump station and the wastewater flows from its service area will be sent to the proposed West Port WRF for treatment as detailed in Section 6.3.4 and 6.3.5.

The master pump station will be operated based on the downstream pressure. Submersible pumps with variable frequency drives will convey flow to the proposed West Port WRF using a new force main. The Rotonda buildout improvements include the following major components:

1) Wet Well

- One concrete wet well.

2) Submersible Pumps

- Four non-clog submersible pumps with VFDs.

3) Associated Piping, Isolation Valves, and Check Valves

- Miscellaneous piping and valves required for converting the existing WRF to a master pump station.

4) Electromagnetic Flow Meter

- One electromagnetic flow meter to monitor flows conveyed to the proposed West Port WRF.

5) Force Main

- 45,000 LF of 20-inch force main connecting the proposed Rotonda master pump station to the proposed West Port WRF.

6) Master Pump Stations

- Modeling analysis indicates three master pump stations would be necessary to convey flow from the Rotonda service area to the proposed West Port WRF. The pump stations should be located at the Rotonda WRF, Rotonda Circle where other CCUD facilities are located, and near the intersection of SR 771 and Rotonda Boulevard East as specified in Chapter 5.

7) Auxiliary Power

- Emergency diesel generator with an automatic transfer switch and fuel storage tank.

8) MCC Buildings

- One MCC building to house the VFDs and other electrical, instrumentation, and controls for integration into the CCUD SCADA system.

Figure 6-22 on the following page displays the proposed modifications for the Rotonda WRF. The Rotonda WRF existing GST, storage pond, and reclaimed water pump station will be converted to a booster station to maintain pressures in the reclaimed water system. The existing administration building will be used for the proposed master pump station and reclaimed water booster station.

Figure 6-22 *Proposed Site Plan for the Rotonda WRF Buildout Improvements*

Table 6-14 provides the EOPCC for the Rotonda WRF buildout improvement.

Table 6-14 Rotonda WRF Buildout - Engineer's Opinion of Probable Construction Cost

Description - Build Out Convert Rotonda WRF to a Master Pump Station (5 MGD)	Total Cost (2017 Dollars)
1) Wet Well	$ 310,000
2) Submersible Non-Clog Pumps, Piping, Valves and Crane	$ 500,000
3) Odor Control Biofilter	$ 250,000
4) Electromagnetic Flow Meter	$ 25,000
5) Auxiliary Power - Replace Existing Generator	$ 250,000
6) Retrofit Existing MCC Building, Electrical, and Instrumentation	$ 500,000
Subtotal Master Pump Station at Rotonda	**$ 1,800,000**
Site Work (5%)	$ 90,000
Yard Piping (8%)	$ 140,000
Mobilization and Demobilization (5%)	$ 90,000
General Conditions (3%)	$ 50,000
Overhead and Profit (10%)	$ 180,000
Sales Tax	$ 110,000
Contingency (30%)	$ 170,000
Planning, Design, Permitting, Bidding and Construction (15%)	$ 390,000
Master Pump Station Total	**$ 3,000,000**
EOPC (Rounded)	**$ 3,000,000**
Build Out - Force Main from Rotonda Master Pump Station to West Port WRF	
1) 20 inch Force Main (45,000 LF), Valves and Restoration	$11,100,000
Force Main Subtotal	**$11,100,000**
Mobilization and Demobilization (5%)	$ 560,000
General Conditions (3%)	$ 330,000
Overhead and Profit (10%)	$1,100,000
Sales Tax	$ 700,000
Contingency (30%)	$3,300,000
Fiscal, Legal, Administrative and Engineering (12%)	$1,300,000
Force Main Total	**$18,400,000**
EOPC (Rounded)	**$19,000,000**
Total Rotonda - Master Pump Station and Force Main to West Port WRF	**$22,000,000**

Burnt Store Water Reclamation Facility

6.5 BURNT STORE WATER RECLAMATION FACILITY

6.5.1 OVERVIEW OF BURNT STORE WRF

The Burnt Store WRF is at 17430 Burnt Store Road, Punta Gorda, and was purchased by Charlotte County in 2003. This WRF operates under FDEP Permit No. FLA014083 with a capacity of 0.50 MGD AADF. The Burnt Store WRF is permitted to distribute reclaimed-quality water to unrestricted-public-access reuse sites, inject it into a deep well injection system, and apply it to a slow-rate restricted-access land application system or percolation pond.

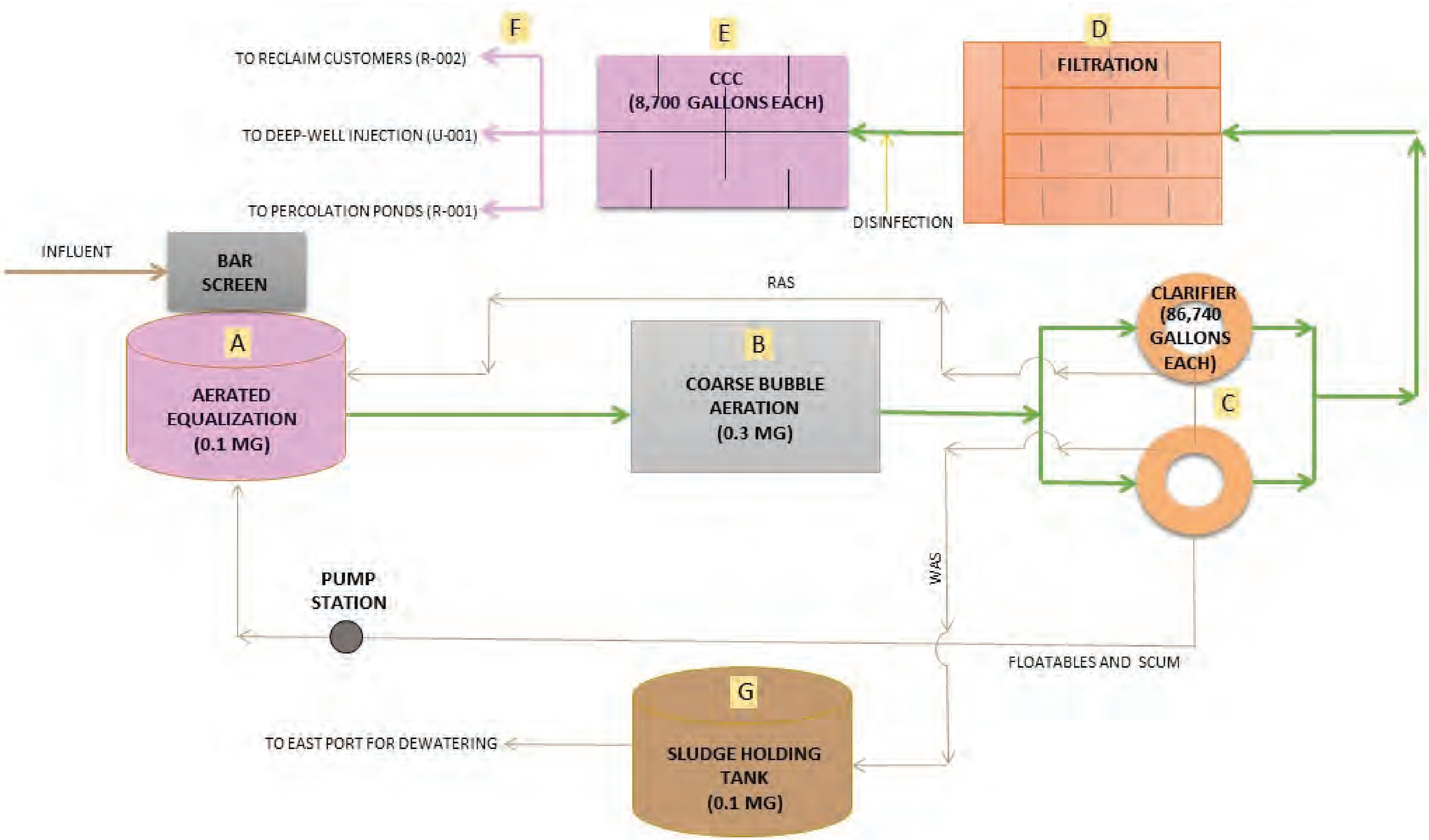
Figure 6-23 on the following page shows the Burnt Store WRF process flow diagram. This location also houses the Burnt Store Reverse Osmosis (RO) WTP. Emergency power is provided by a diesel emergency generator stored outdoors with an automatic transfer switch.

A) Inert Solids Removal and Equalization Tank: Raw wastewater from the South County service area collection/transmission system enters the WRF manual bar screen and flows into the equalization tank. Blowers and course-bubble diffusers aerate the wastewater and suspend solids. Internal plant flows from the on-site pump station are introduced at the equalization tank.

B) Biological Treatment for Organics and Nutrient Removal: Transfer pumps convey flow from the equalization tank to the activated sludge treatment process where blowers continue to aerate the flow. The wastewater enters the outer ring of a package-type treatment basin equipped with coarse-bubble diffusers. The air flowrate of the diffusers are adjusted to achieve nitrogen removal.

C) Secondary Treatment for Solids Separation: The two steel circular secondary clarifiers are within the center of each unit for gravity solids separation. The clarifiers are skimmed to remove floatables and scum before clarifier effluent flows over a circumferential weir to the tertiary filters. Sludge pumps convey settled solids to the activated sludge tank (RAS) or the sludge holding tank (WAS).

Figure 6-23 *Burnt Store Water Reclamation Facility*



Burnt Store Effluent

D) Tertiary Treatment – Filtration: Clarified water enters four disk filters, each having 5-micron cloth. The disk filter unit is installed in a steel filter tank that allows water to flow from outside the disk filters into a manifold system of the filter unit.

E) Tertiary Treatment – Disinfection: The filtered water is sent to two CCCs where liquid sodium hypochlorite is introduced for disinfection. A mixing pump is provided at the chemical feed point, and the chambers are baffled and sized to meet disinfection requirements.

F) Effluent Reclaimed and Disposal Facilities: Reclaimed water is conveyed through the unrestricted public-access reclaimed-water system via a high-service pump station. Two Class I deep injection wells and two percolation ponds are available for disposal of excess reclaimed or treated water that does not meet reclaimed water standards. The deep injection wells are also used for disposal of concentrate from the Burnt Store WTP RO facilities. Flows from the WTP and WRF are combined in a wet well at the injection well pumping station. Two equally sized vertical turbine pumps are used to inject water into the well.

G) Aerobic Digestion: Sludge is hauled to the East Port WRF and combined with the sludge from other Charlotte County WRFs for digestion and dewatering. One blower is dedicated to the sludge holding/aerobic digestion tank.

Burnt Store WRF Blowers

6.5.2 BURNT STORE WRF HISTORICAL FLOW AND CHARACTERISTICS SUMMARY

Table 6-15 summarizes the historical flows based on the December DMRs for the Burnt Store WRF for from 2011 to 2016. The Burnt Store WRF operated at a capacity between 64 and 86 percent based on MTMADF. The highest peaking factor in the past 5 years was 2.8 corresponding with a MMADF occurring in January 2016.

Table 6-15 *Historical Influent Flow Summary for Burnt Store WRF*

Year	AADF (MGD)	MMADF (MGD)	MTMADF (MGD)	Percent Capacity (MTMADF/Permit)	Monthly Peaking Factor (MMADF/AADF)
2011	0.28	0.56	0.32	64%	2.0
2012	0.31	0.61	0.34	69%	2.2
2013	0.32	0.82	0.37	73%	2.5
2014	0.31	0.51	0.36	73%	1.6
2015	0.33	0.75	0.36	72%	2.3
2016	0.32	0.89	0.43	86%	2.8

Figure 6-24 presents the MADF, TMADF, and AADF reported to FDEP for the Burnt Store WRF. MADF values vary from 0.18 MGD to 0.46 MGD. Influent flows are typically the lowest in May and June and are consistently higher from January through March. The maximum TMADF observed between 2011 and 2016 was 0.43 MGD. AADFs are fairly constant at approximately 0.32 MGD.

Figure 6-24 *Historical Wastewater Influent Flows for Burnt Store WRF (2011 - 2016)*

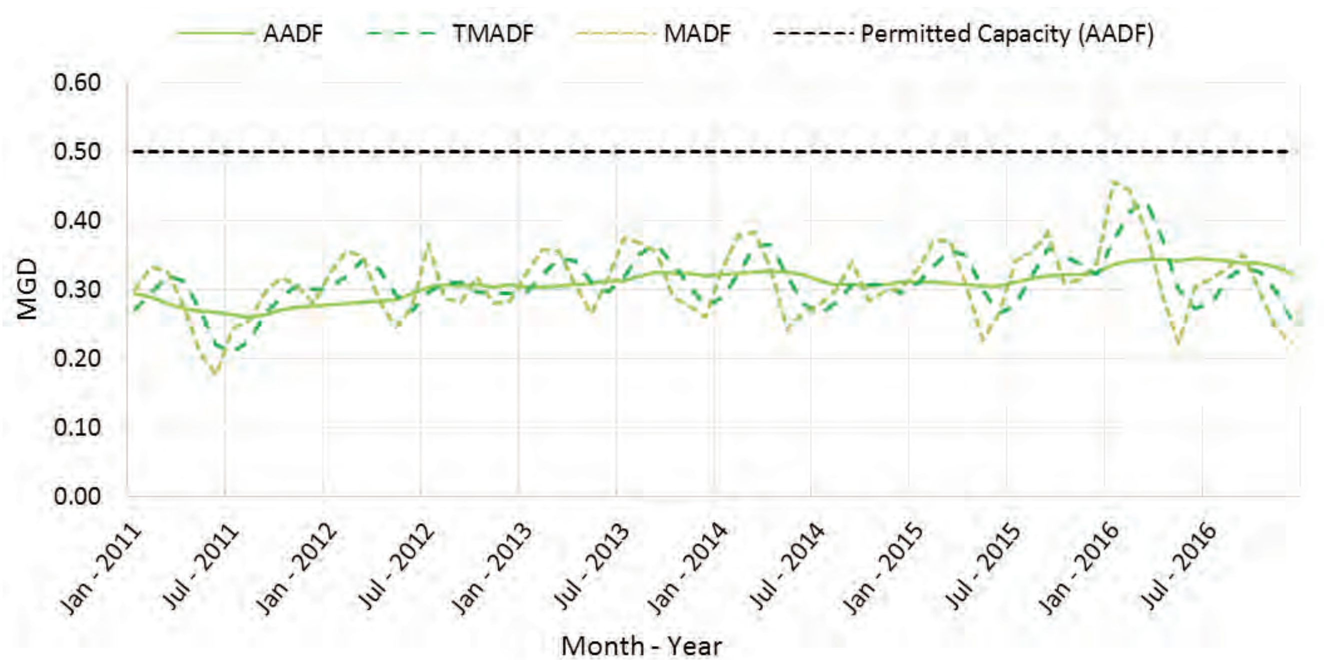


Table 6-16 summarizes the historical influent flow characteristics and loadings of the Burnt Store WRF from 2011 to 2016. Weekly influent water samples are taken for the Burnt Store WRF. Average yearly CBOD concentrations varied between 95 to 160 mg/L from 2011 to 2016. Average yearly TSS concentrations varied between 150 and 230 mg/L.

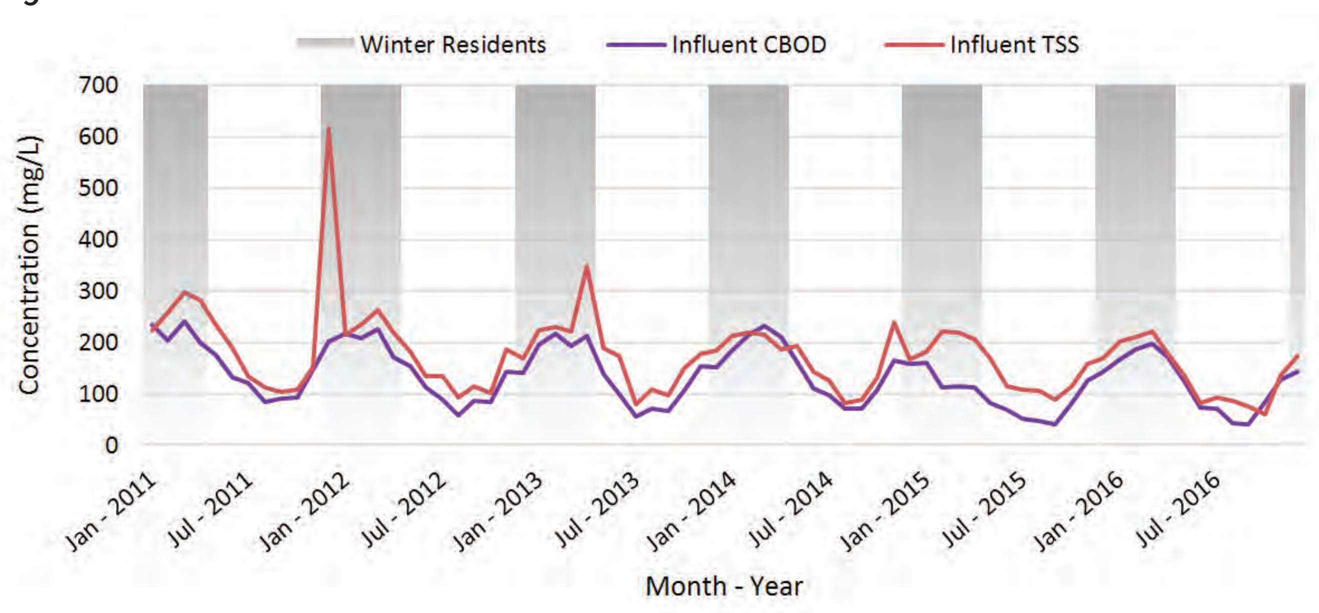
Table 6-16 *Historical Influent Flow Characteristics Summary for Burnt Store WRF*

Year	AADF (MGD)	CBOD (mg/L)	CBOD (lbs/day)	TSS (mg/L)	TSS (lbs/day)
2011	0.28	160	370	230	530
2012	0.31	145	375	180	455
2013	0.32	140	370	180	480
2014	0.31	145	380	165	430
2015	0.33	95	260	155	420
2016	0.32	130	340	150	400

Note: Typical municipal wastewater CBOD range is between 120 – 380 mg/L.
Typical municipal wastewater TSS range is between 120 – 370 mg/L.

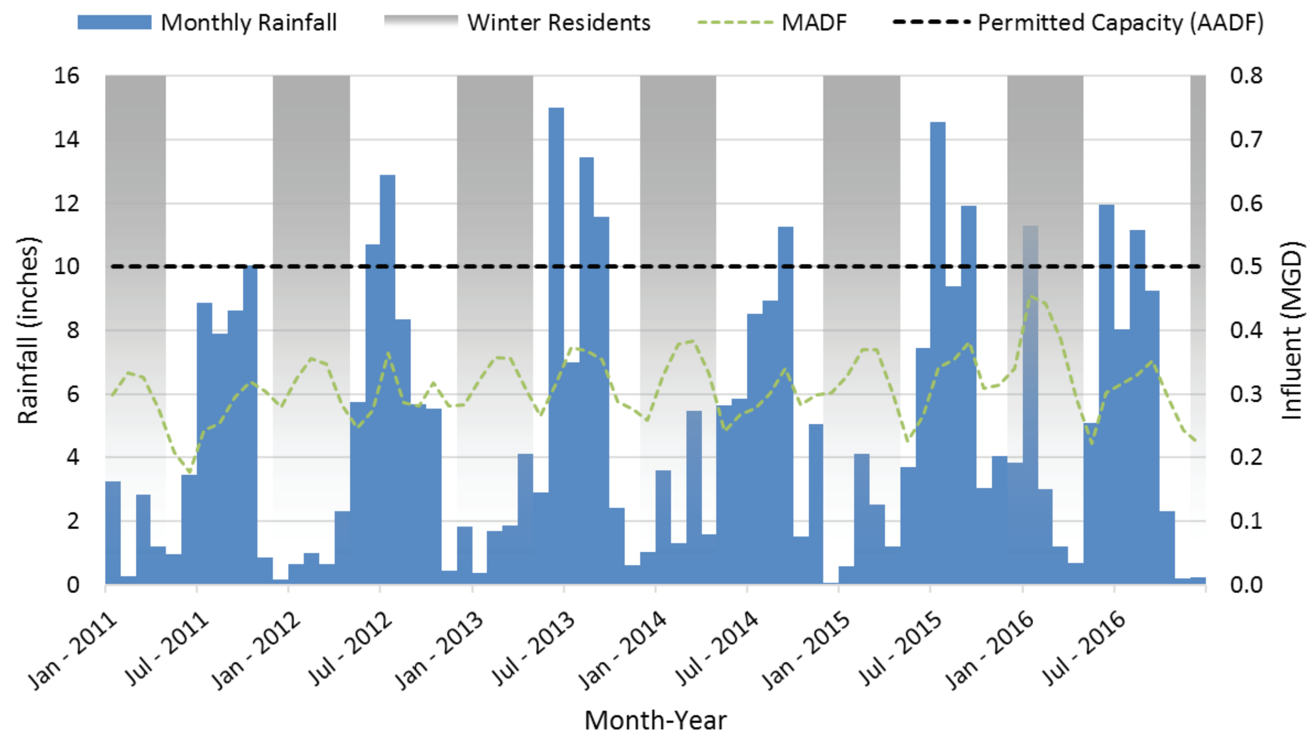
Figure 6-25 displays the monthly influent CBOD and TSS concentrations from 2011 to 2016. CBOD and TSS concentrations increase with months that winter residents are present and decrease in the summer months. TSS concentrations spiked in December 2011 and April 2013.

Figure 6-25 *Historical Influent CBOD and TSS Concentrations for Burnt Store WRF*



The monthly flow patterns depicted on Figure 6-26 indicate I&I to be significant within the service area during the wet months. The peaks during the drier winter months continue to grow larger, indicating flows are significantly affected by increases in winter resident occupancy. Total yearly rainfall varied from 48 inches to 66 inches. The driest year occurred in 2011 and the wettest year was 2015.

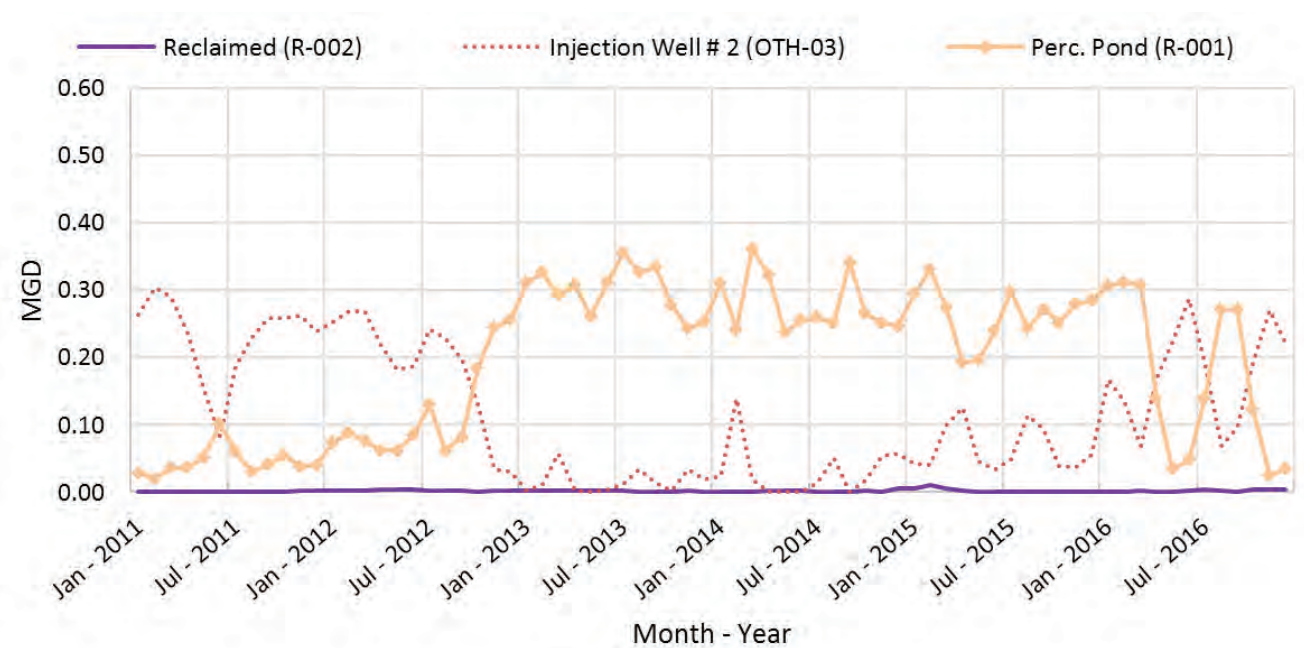
Figure 6-26 *Historical Rainfall and Influent Wastewater Flows for Burnt Store WRF*



The Burnt Store WRF is permitted to dispose of its treated effluent using deep injection wells, percolation ponds, or reclaimed water use. The deep injection wells are permitted for a combined monthly average capacity of 3.44 MGD. The percolation ponds and reclaimed effluent flows are permitted at 0.25 and 0.05 MGD AADF, respectively.

Figure 6-27 displays the monthly average effluent flows from the Burnt Store WRF from 2011 through 2016. In recent years, the Burnt Store WRF has disposed of the majority of its effluent using the percolation ponds and its injection well.

Figure 6-27 *Historical Wastewater Effluent Flows for Burnt Store WRF (2011-2016)*



6.5.3 ONGOING BURNT STORE WRF IMPROVEMENTS

The Burnt Store WRF recently installed two cloth disks in the filter and upgraded the Wonderware software. The ongoing improvement projects include:

- Remove grit from the bottom of the equalization tank.
- Remove rust on the tanks to preserve their integrity.

Influent bar screen solids accumulation and grit settling in the equalization tank are common maintenance issues. Another challenge is handling excess effluent during the rainy season when flows can reach 1,100 gpm. Burnt Store WRF typically disposes of excess effluent into the injection wells; however, the 6-inch line between the CCC and injection wet well limits the discharge to a flow of 400 gpm. The remainder of the reclaimed water is sent to the percolation ponds, causing regulatory challenges. If the pipe size was increased, more effluent could be sent down the well. The nearby golf course and new neighborhoods being developed will help with reclaimed water disposal because the Burnt Store WRF will have more potential reclaimed water customers.

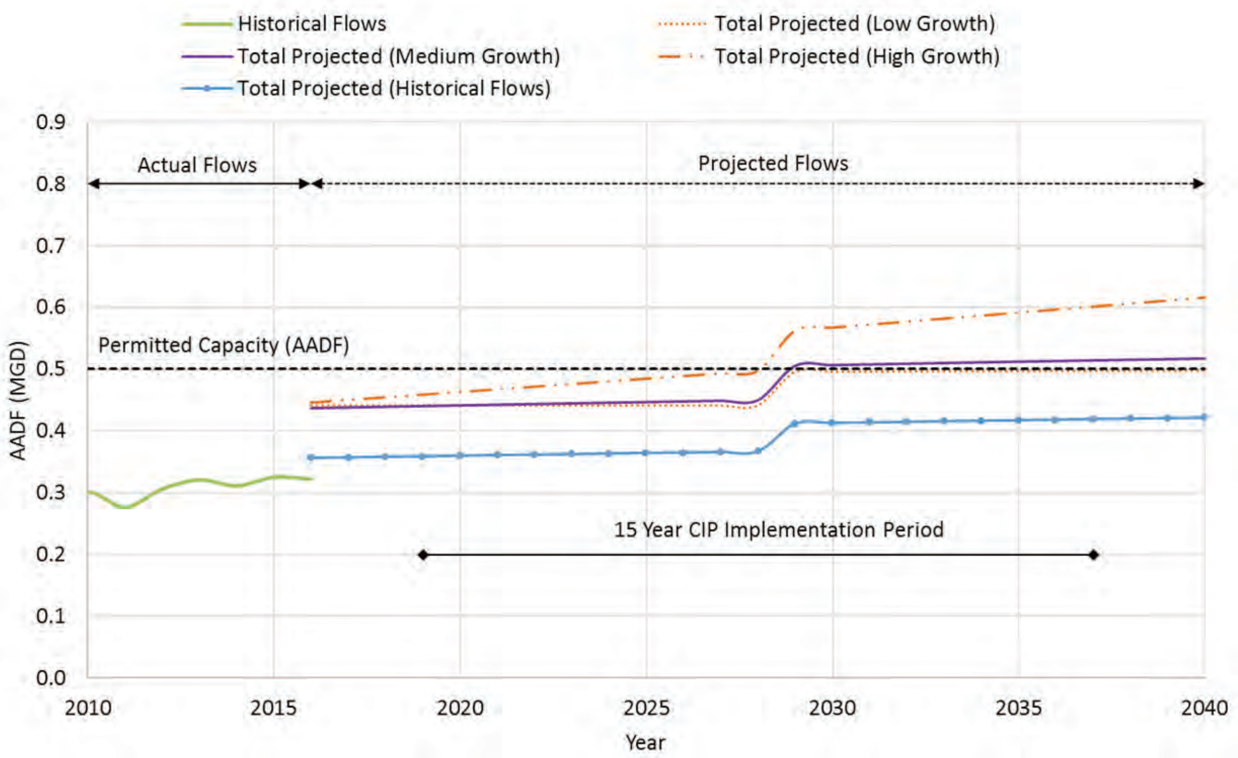
Burnt Store WRF Rust and Wear on Tanks

6.5.4 BURNT STORE WRF FLOW PROJECTIONS

Figure 6-28 shows the historical and projected flows of the Burnt Store WRF. Flows projections include infill growth of existing sewersheds and projected growth due to project area conversions in the Burnt Store WRF service area. Under the BEBR model medium growth conditions, it was estimated that the permitted capacity would be exceeded in 2029.

Based on FDEP rules, planning an expansion of the Burnt Store WRF should begin in 2024 with construction starting in 2026 under medium growth conditions and would begin a year sooner under high growth conditions. However, comparing the localized historical flow conditions of the area shows actual flows in the area more nearly equal to 110 gpd rather than the 135 gpd assumed in the analysis as discussed in Chapter 4. When applying localized flow conditions to the medium growth projections, the permitted capacity is sufficient past 2040.

Figure 6-28 *Burnt Store WRF Historical and Projected AADFs*



There is a significant amount of undeveloped land within South County service area as discussed in Appendix B – Environmental Considerations. The Burnt Store WRF projections do not account for large developments of real estate within the displayed year range.

Flow projections and the timing of WRF expansions would need to be adjusted if large commercial development occurs along Interstate 75 (i.e., Tucker's Grade) or within the CCUD service area in Lee County.

6.5.5 FUTURE BURNT STORE WRF IMPROVEMENTS

6.5.5.1 15-YEAR IMPROVEMENT PLAN

Applying localized flow and medium growth conditions and assuming no major real estate development, no expansion improvements are required at the Burnt Store WRF in the 15-Year CIP period.

6.5.5.2 BUILDOUT IMPROVEMENTS

CCUD investigated the cost for upgrading the current Burnt Store WRF to 0.75 MGD. The WRF upgrade would require the addition of an equalization pump, a process blower, a RAS pump, a filter disk, a new chlorine contact tank, screening improvements, grit collection process improvements, and associated yard piping modifications. The cost of construction for these improvements was not found to be economical; therefore, a new WRF has been proposed under the buildout plan.

The ultimate buildout capacity for the new Burnt Store WRF is 5.0 MGD AADF. The components of the existing WRF will have reached their useful life and will be decommissioned and demolished. Two locations have been identified for the new Burnt Store WRF. The County could purchase 40 acres of land near the existing Burnt Store WRF or could relocate the WRF to the County's Municipal Solid Waste Management and Leachate Treatment Facility on Zemel Road. This document provides cost estimates assuming the County proceeds with the land acquisition option.

Figure 6-29 on the following page shows the proposed plant layout and includes the following major components as well as all required weirs, gates, piping and valves, paving, drainage, site grading, stormwater storage, concrete slabs on grade for equipment, electrical, instrumentation, controls, and appurtenances. Table 6-17 on page 6-60 provides the EOPCC for the new Burnt Store WRF.

1) Headworks (elevated concrete structure)
- Two in-channel mechanical fine screens with screening dewatering and disposal.
- One in-channel manual bar screen.
- Vortex grit removal with grit cleaning/dewatering and disposal.
- Flow splitter box.

2) Biological Treatment Units (MLE)
At this level of planning, it is assumed that the biological treatment will be a MLE process similar to the East Port WRF. Final determination on the type of biological treatment process will be made during the planning phase of this expansion.
- Two concrete anoxic basins with mixers.
- Two carrousel oxidation ditches with mechanical aerators.

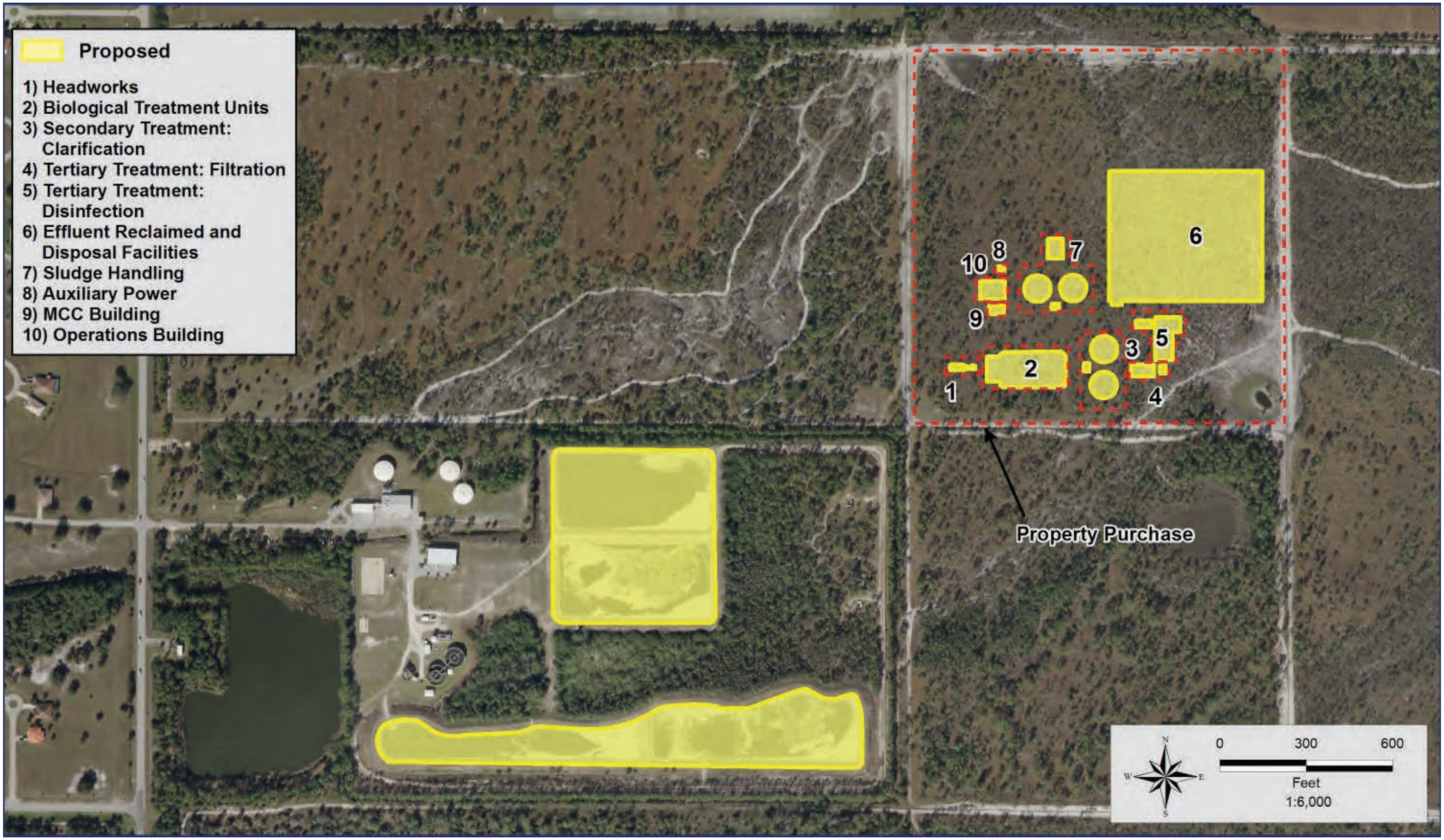
3) Secondary Treatment: Clarification (solids separation)
- Concrete splitter box.
- Two concrete circular clarifier tanks with energy dissipation inlet, effluent weirs and launder, bottom rake arms and scrapers and sludge collection, and scum skimmer arm and disposal.
- Sludge pump station at each clarifier with two RAS pumps and two WAS pumps.

4) Tertiary Treatment: Filtration
- Four disk filters (cloth or woven media).

5) Tertiary Treatment: Disinfection
- Concrete flow splitter.
- Two baffled concrete CCCs.
- Liquid sodium hypochlorite storage and feed system with two dual containment polyethylene storage tanks and two feed pump skids.

6) Effluent Disposal Facilities
- Two new vertical turbine transfer pumps.
- One lined reclaimed water storage pond.
- One lined reject water storage pond.
- Three vertical reclaimed water pumps.
- This expansion includes removing any common berm walls and lining the existing percolation ponds to repurpose them as reclaimed water and/or reject water storage ponds.

Figure 6-29 ***Proposed** Burnt Store WRF Location and Site Plan*




Burnt Store Bar Screen

7) Sludge Handling

- Retrofit the existing aeration tanks to use as aerobic digesters.
- One dewatering and truck loading facility (belt filter press or screw press) with polymer feed.

8) Operations Building

- One building that includes reception area, offices, breakroom, bathrooms and showers, conference room, testing laboratory, and control room.

9) Land Acquisition

- 40-acre land purchase.

10) Auxiliary Power

- One emergency diesel generator with an automatic transfer switch and fuel storage tank.

11) MCC Building

- One MCC building to house the PLCs, SCADA, HMIs, electrical components, and instrumentation.

Burnt Store Water Reclamation Facility

Table 6-17 Burnt Store WRF Buildout - Engineer's Opinion of Probable Construction Cost

Description - Burnt Store WRF Build Out (5 MGD)		Total Cost (2017 Dollars)
1) Headworks	$	2,500,000
2) Biological Treatment Units	$	5,600,000
3) Secondary Treatment: Clarification, Flow Splitter, and RAS/WAS Pumps	$	3,600,000
4) Tertiary Treatment: Filtration	$	1,600,000
5) Tertiary Treatment: Disinfection	$	1,800,000
6) Reclaimed Storage and Disposal Facilities	$	6,817,000
7) Sludge Handling - Aerobic Digesters and Sludge Thickening	$	2,000,000
8)Operations Building	$	1,000,000
9)Land Acquisition (40 acres)	$	240,000
10) Auxiliary Power	$	750,000
11) MCC Building, Electrical, and Instrumentation	$	5,000,000
Subtotal	**$**	**30,900,000**
Demolition	$	500,000
Site Work (5%)	$	1,500,000
Yard Piping (8%)	$	2,500,000
Mobilization and Demobilization (5%)	$	1,500,000
General Conditions (3%)	$	930,000
Overhead and Profit (10%)	$	3,100,000
Sales Tax	$	1,900,000
Contingency (30%)	$	9,300,000
Fiscal, Legal, Administrative and Engineering (12%)	$	3,700,000
Total	**$**	**55,800,000**
Total (Rounded)	**$**	**56,000,000**

6.6 FLOW PROJECTIONS SUMMARY

Flow projections indicate that no additional expansions will be required under the 15-year improvement plan after the Stage 3 and 4 improvements for the Eastport WRF are completed. Table 6-18 summarizes the year the existing permitted capacity is projected to be exceeded and includes a timeline for preparing preliminary design, final design, and FDEP permit applications for each WRF, considering the guidelines provided in Section 6.1. The capacity exceedance year was determined from flow projections under medium growth conditions and assumes project areas and flows are implemented according to the 15-year plan as outlined in this chapter. The County should continue to monitor the actual growth rate and flows presented in the annual CARs and adjust the milestone years accordingly

Table 6-18 *Planning Summary for Charlotte County's WRFs*

WRF	Prepare Planning and Preliminary Design	Prepare Final Design Documents	Prepare FDEP Permit Application	Capacity Exceedance Year (Medium Growth)
Eastport	2040	2041	2042	2045
Westport[1]	2028	2029	2030	2033
Rotonda	2040	2041	2042	2045
Burnt Store	Post 2045	Post 2045	Post 2045	Post 2045
Eastport	2040	2041	2042	2045
Westport[1]	2028	2029	2030	2033

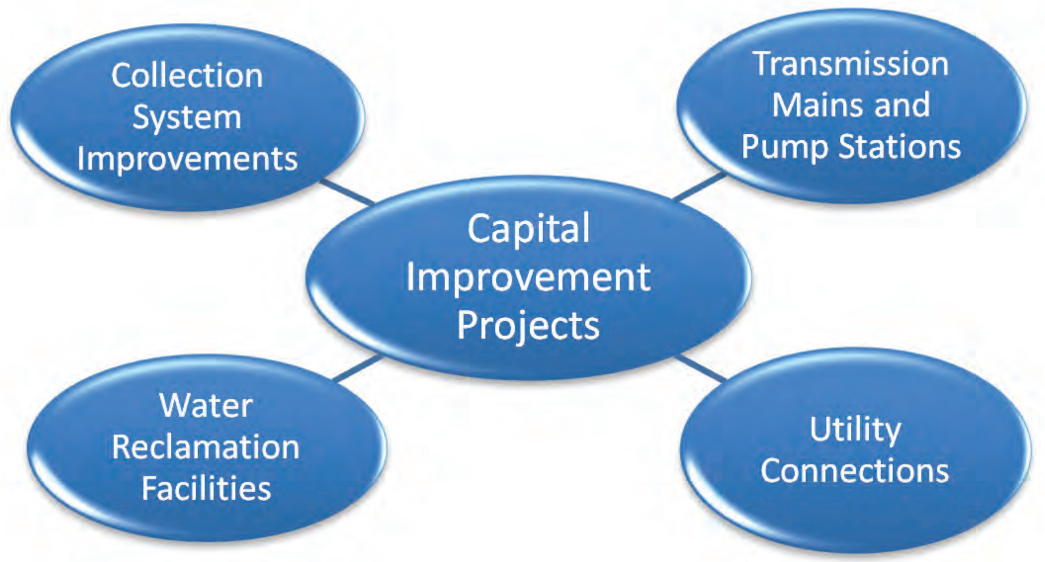
[1] Assumes all flows from new project areas are routed to the Rotonda WRF.

7. CAPITAL IMPROVEMENT PROJECTS

OVERVIEW

This chapter summarizes the CCUD County-wide wastewater CIPs identified and discussed in Chapters 3 through 6. The EOPCCs were estimated in 2017 for each project and presented herein. Costs such as state revolving fund (SRF) origination fees, capitalized interest, and inflation are not included in this chapter but are considered in Chapter 8. The CIPs do not include wastewater improvements relating to rehabilitation or replacement, as the County has a separate, on-going wastewater infrastructure rehabilitation and replacement program. The anticipated schedule and optimum sequencing for implementing CIPs are presented in terms of 5-year, 10-year, and 15-year funding and expenditure plans.

7.1 CAPITAL IMPROVEMENT PROJECT COMPONENTS



7.1.1 COLLECTION SYSTEM IMPROVEMENTS

The collection system improvements include the projects related to the conversion of septic to sewer (S2S) as identified in the 5-year, 10-year, and 15-year improvement plans. Development and prioritization of the improvement plans were discussed in Chapter 4. The collection system CIPs presented in Sections 7.2 through 7.4 include the connection year and cost for a vacuum collection system unless denoted otherwise in the CIP sheets provided in Appendix C. The costs were determined on a per-connection basis using unit cost for a vacuum collection system. Each cost included:

- On-Lot Connections
- Off-Lot Connections
- Collection Piping
- Pump Stations
- Restoration
- Mobilization and General Conditions (8%)
- Contingency (20%)
- Professional Services (20%)

7.1.2 TRANSMISSION MAINS

Transmission main improvements refer to the piping that (1) connect project areas identified in the improvement plans to the County's existing wastewater infrastructure and (2) accommodate
additional flow due to growth. The location, implementation cost, and implementation year for each transmission main CIP are presented in Sections 7.2 through 7.5.

The schedule, size, and route of the recommended transmission mains were based on modeling results and the vicinity to the existing wastewater system as discussed in Chapter 5. Detailed figures for each transmission main CIP are included in Appendix C. The costs of these transmission mains included unit costs for:

- Transmission Main Installation
- Valves and Fittings
- Restoration
- Contingency (20%)
- Professional services (20%)

The costs associated with transmission main CIPs under the 15-year plan are presented in this
Chapter but are not included in the funding plan provided in Chapter 8 since the financing for these improvements is accounted for in a separate fund.

7.1.3 WATER RECLAMATION FACILITIES

The CIPs for the WRFs were discussed in detail in Chapter 6. The total costs per year and implementation year for the WRFs CIPs have been included in this Chapter for scheduling purposes. The costs associated with WRFs CIPs under the 15-year plan do not contribute to the total yearly CIPs since the financing for these improvements is accounted for in a separate fund.

7.1.4 UTILITY CONNECTIONS

Regionalization options refer to the potential public and community utilities that may consider connecting to the CCUD's wastewater system through bulk service agreements. The utility connection costs presented in this chapter include the costs associated with connecting the transmission systems and converting the WWTPs to pump stations. Hideaway Bay Beach Club and Don Pedro utilities were the only utilities considered in the 5-year Improvement Plan.

The funding for the transmission mains and cost to connect the Hideaway Bay Beach Club collection system as identified in Chapter 3 are not included in the CCUD 5-year improvement plan. In addition, the collection system and transmission system improvement costs for Don Pedro Utility are also excluded from the CCUD's 5-year funding plan. Additional details regarding these costs can be found in Chapter 3.

7.2 IMPROVEMENT PLANS

The following tables include funding and expenditure plans for the 5, 10, and 15 year improvement periods. The funding plans provide the required amounts needed to fund the project areas outlined in each 5-year plan before planning and construction for the project can commence.

Alternatively, the expenditure plans provide recommendations on how the funds will be spent during planning and construction of each project area. Project areas are estimated to be completed in a three year period, with planning and design being conducted the first year and construction occurring in years 2 and 3. Smaller CIPs, such as pump station upgrades, are expected to be completed in two years but larger projects may require additional time and their schedules should be adjusted during the project preliminary design phase.

Annual and total project costs are presented in the funding and expenditure CIP tables provided in this Chapter and do not include inflation, administrative fees, or capitalized interest. Additional funding and expenditure details are provided in the CIP sheets provided in Appendix C.

7.2 FIVE YEAR IMPROVEMENT PLAN

Table 7-1 5-Year Capital Improvements Projects Funding Plan ($ in Thousands)

CIP Type	Identifier	Predecessor CIP	Description	Project Area Served	Year 1	Year 2	Year 3	Year 4	Year 5
Collection System	M72A	None	El Jobean East		$9,181				
Transmission Facility	M-FM-1	None	LS 123 "KHW" to Kings Highway	Mid County 5-year CIPs		$27			
Transmission Facility	M-FM-2	None	Toledo Blade Road	Mid County 5-year CIPs		$966			
Transmission Facility	M-FM-3	None	Tamiami Trail	Mid County 5-year CIPs		$58			
Transmission Facility	M-FM-4	None	Mensh Terrace	M61, M62, M68		$174			
Transmission Facility	M-FM-5	None	Lakeview Blvd to US 41	M61, M62, M68		$2,327			
Transmission Facility	M-FM-6	None	Ellicott Circle to W. Tarpon Blvd NW	M67, M70		$661			
Transmission Facility	S-LS-403	None	LS 403 Islamorada Upgrade	South County 5-year CIPs		$250			
Transmission Facility	W-FM-9	None	Oldsmar Circle	West County 5-year CIPs		$198			
Transmission Facility	W-LS-805	None	LS 805 Windward Preserve Upgrade	West County 5-year CIPs		$250			
Transmission Facility	W-LS-815	None	LS 815 "Z" Upgrade	West County 5-year CIPs		$250			
Collection System	M61	M68, M-FM-4, M-FM-5	Seacrest			$7,299			
Collection System	M67	M70, M-FM-6	Crestview Circle			$1,040			
Collection System	M68	M-FM-4, M-FM-5	Lakeview Corridor			$9,921			
Collection System	M70	M-FM-6	Ellicott Circle			$3,524			
Water Reclaim. Facility	M-EP-WRF	None	Eastport Stage 3 and 4				$19,000[a]		
Utility Connection	W-UTLCON-HBBC	None	HBBC - L.G.I. to Placida Rd				$870		
Transmission Facility	M-FM-7	None	Quesada Ave to Peachland Blvd	M81, M80			$601		
Transmission Facility	W-FM-12	W-UTLCON-HBBC	Little Gasparilla Island and Placida Rd	W5			$870[b]		
Collection System	M81	M-FM-7	Yorkshire Ph I				$10,305		
Collection System	W5	W-UTLCON-HBBC, W-FM-12	L.G.I.				$10,400		
Transmission Facility	M-FM-8	None	Ackerman Ave	M55, M56				$871	
Collection System	M56	M-FM-8	Ackerman East					$12,873	
Collection System	M62	M68, M-FM-4, M-FM-5	Hurtig					$7,362	
Collection System	M80	M81, M-FM-7	Yorkshire Ph II					$4,579	
Utility Connection	W-UTLCON-DP	None	Don Pedro						$8,032
Transmission Facility	W-FM-10	W-UTLCON-DP	Indiana Rd and Cape Haze Dr	W2					$1,732[b]
Transmission Facility	W-FM-11	None	Green Dolphin and Placida Rd	W4					$221
Collection System	M55	M56, M-FM-8	Ackerman West						$13,459
Collection System	W2	W-UTLCON-DP, W-FM-10	Don Pedro						$6,300[b]
Collection System	W3	W4, W-FM-11	Cape Haze Ph II						$3,210
Collection System	W4	W-FM-11	Cape Haze Ph I						$2,086
				Yearly S2S Funds	**$9,181**	**$21,784**	**$10,305**	**$24,815**	**$18,754**
				Additional CCUD Funds	**$-**	**$5,162**	**$601**	**$871**	**$221**
				Funds from Other Sources	**$-**	**$-**	**$11,270**	**$-**	**$8,032**
				Total Capital Funding	**$9,181**	**$26,946**	**$22,175**	**$25,685**	**$27,008**

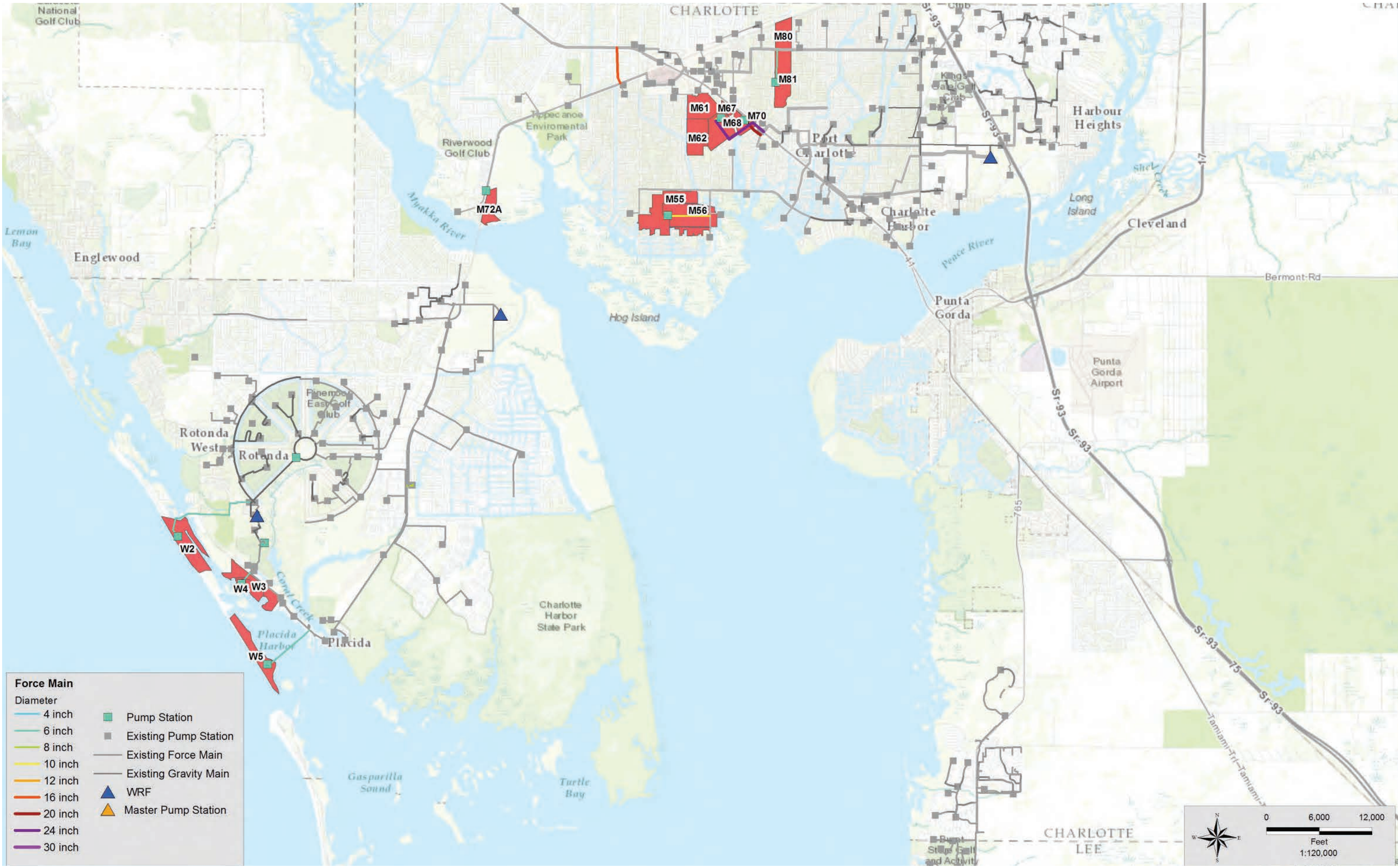
[a] The funds have already been allocated in a previous CIP and therefore do not contribute to the Total Capital Funding Value; [b] the funding is included in the utility connection cost.

Table 7-2 *5-Year Capital Improvement Projects Expenditure Plan ($ in Thousands)*

CIP Type	Identifier	Predecessor CIP	Description	Project Area Served	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Total Project Cost
Collection System	M72A	None	El Jobean East		$1,132	$4,208	$3,841					**$9,181**
Transmission Facility	M-FM-1	None	LS 123 "KHW" to Kings Highway	Mid County 5-year CIPs		$7	$11	$10				**$27**
Transmission Facility	M-FM-2	None	Toledo Blade Road	Mid County 5-year CIPs		$236	$380	$350				**$966**
Transmission Facility	M-FM-3	None	Tamiami Trail	Mid County 5-year CIPs		$14	$23	$21				**$58**
Transmission Facility	M-FM-4	None	Mensh Terrace	M61, M62, M68		$43	$69	$63				**$174**
Transmission Facility	M-FM-5	None	Lakeview Blvd to US 41	M61, M62, M68		$569	$915	$844				**$2,327**
Transmission Facility	M-FM-6	None	Ellicott C to W. Tarpon Blvd NW	M67, M70		$162	$260	$240				**$661**
Transmission Facility	S-LS-403	None	LS 403 Islamorada Upgrade	South County 5-year CIPs		$25	$225					**$250**
Transmission Facility	W-FM-9	None	Oldsmar Circle	West County 5-year CIPs		$48	$78	$72				**$198**
Transmission Facility	W-LS-805	None	LS 805 Windward P. Upgrade	West County 5-year CIPs		$25	$225					**$250**
Transmission Facility	W-LS-815	None	LS 815 "Z" Upgrade	West County 5-year CIPs		$25	$225					**$250**
Collection System	M61	M68, M-FM-4, M-FM-5	Seacrest			$730	$3,285	$3,285				**$7,299**
Collection System	M67	M70, M-FM-6	Crestview Circle			$104	$468	$468				**$1,040**
Collection System	M68	M-FM-4, M-FM-5	Lakeview Corridor			$1,040	$4,440	$4,440				**$9,921**
Collection System	M70	M-FM-6	Ellicott Circle			$382	$1,571	$1,571				**$3,524**
Water Reclaim. Facility	M-EP-WRF	None	Eastport Stage 3 and 4				$19,000[a]					**$19,000[a]**
Utility Connection	W-UTLCON-HBBC	None	HBBC - L.G.I. to Placida Rd				$218	$339	$313			**$870**
Transmission Facility	M-FM-7	None	Quesada Ave to Peachland Blvd	M81, M80			$147	$236	$218			**$601**
Transmission Facility	W-FM-12	W-UTLCON-HBBC	L.G.I and Placida Rd	W5			$218[b]	$339[b]	$313[b]			**$870[b]**
Collection System	M81	M-FM-7	Yorkshire Ph I				$1,078	$4,613	$4,613			**$10,305**
Collection System	W5	W-UTLCON-HBBC, W-FM-12	L.G.I.				$1,088	$4,656	$4,656			**$10,400**
Transmission Facility	M-FM-8	None	Ackerman Ave	M55, M56				$213	$342	$316		**$871**
Collection System	M56	M-FM-8	Ackerman East					$1,335	$5,769	$5,769		**$12,873**
Collection System	M62	M68, M-FM-4, M-FM-5	Hurtig					$736	$3,313	$3,313		**$7,362**
Collection System	M80	M81, M-FM-7	Yorkshire Ph II					$458	$2,061	$2,061		**$4,579**
Utility Connection	W-UTLCON-DP	None	Don Pedro						$1,083	$3,501	$3,448	**$8,032**
Transmission Facility	W-FM-10	W-UTLCON-DP	Indiana Rd and Cape Haze Dr	W2					$423[b]	$681[b]	$628[b]	**$1,732[b]**
Transmission Facility	W-FM-11	None	Green Dolphin and Placida Rd	W4					$54	$87	$80	**$221**
Collection System	M55	M56, M-FM-8	Ackerman West						$1,346	$6,057	$6,057	**$13,459**
Collection System	W2	W-UTLCON-DP, W-FM-10	Don Pedro						$660[b]	$2,820[b]	$2,820[b]	**$6,300[b]**
Collection System	W3	W4, W-FM-11	Cape Haze Ph II						$351	$1,429	$1,429	**$3,210**
Collection System	W4	W-FM-11	Cape Haze Ph I						$239	$924	$924	**$2,086**
				Yearly S2S Expenditures	**$1,132**	**$6,465**	**$14,683**	**$16,906**	**$17,691**	**$19,552**	**$8,410**	**$84,839**
				Additional CCUD Expenditures	**$-**	**$1,154**	**$2,556**	**$2,048**	**$614**	**$402**	**$80**	**$6,855**
				Other Expenditures Sources	**$-**	**$-**	**$1,306**	**$4,995**	**$6,053**	**$3,501**	**$3,448**	**$19,171**
				Total Capital Expenditures	**$1,132**	**$7,618**	**$18,545**	**$23,950**	**$24,358**	**$23,455**	**$11,938**	**$110,864**

[a] The funds have already been allocated in a previous CIP and therefore do not contribute to the Total Capital Expenditure Value; [b] the funding is included in the utility connection cost.

Figure 7-1 5-Year Improvement Plan Project Areas and Transmission Mains



7.3 TEN YEAR IMPROVEMENT PLAN

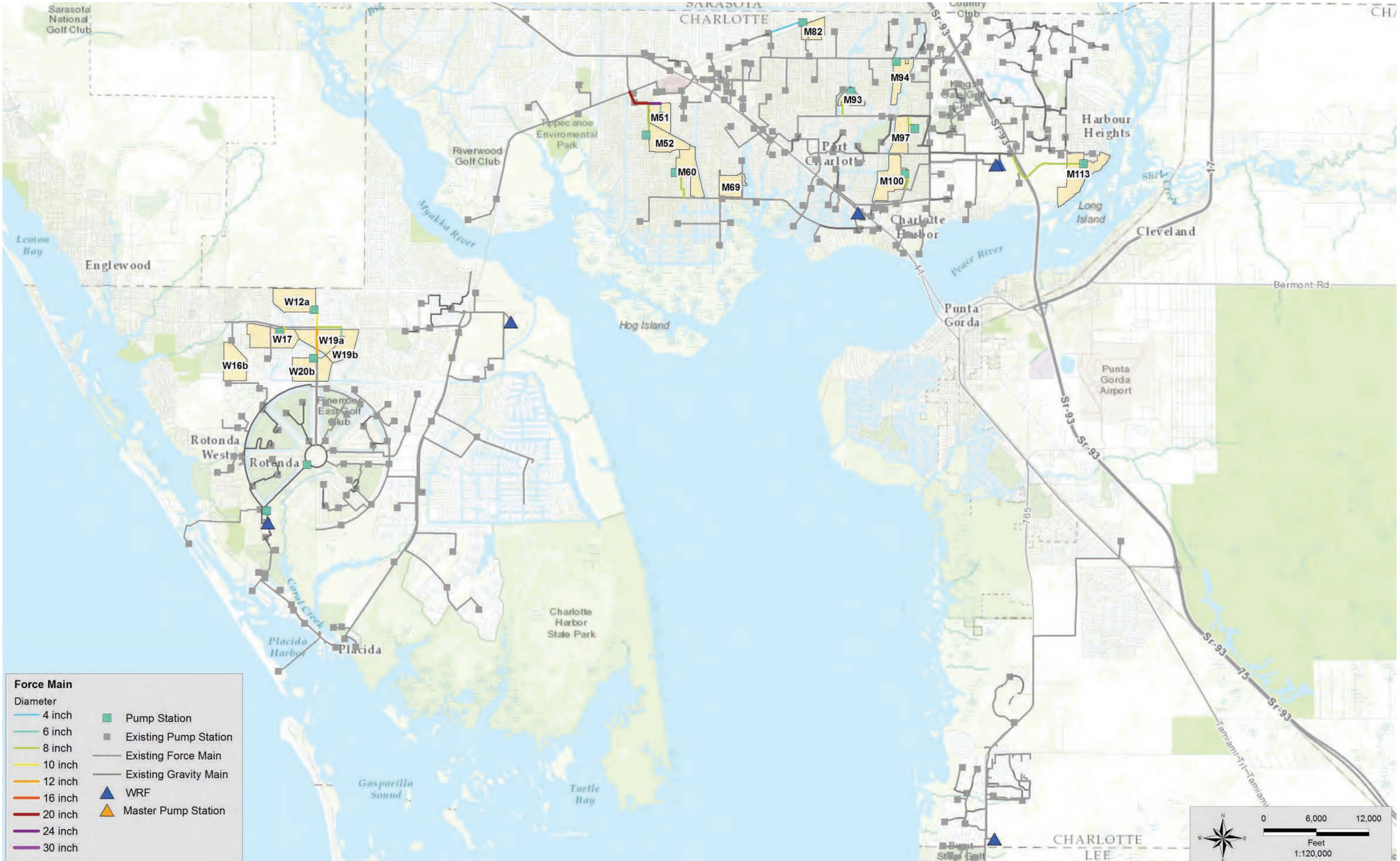
Table 7-3 10-Year Capital Improvement Projects Funding Plan ($ in Thousands)

CIP Type	Identifier	Predecessor CIP	Description	Project Area Served	Year 6	Year 7	Year 8	Year 9	Year 10
Transmission Facility	M-FM-13	None	Tinker Street	M59	$207				
Transmission Facility	M-FM-14	None	Barbara Avenue to Murdock Circle	M59	$302				
Transmission Facility	M-FM-15	None	Rutherford Ave to US 41	M78, M79	$918				
Transmission Facility	M-FM-16	None	US 41 to Ellicott LS	M78, M79	$275				
Collection System	M59	M-FM-13, M-FM-14	Cannolot		$11,670				
Collection System	M79	M-FM-15, M-FM-16	Blaine		$11,058				
Transmission Facility	M-FM-17	None	Dewhurst to Peachland Blvd	M83, M84		$387			
Collection System	M78	M79, M-FM-15, M-FM-16	Nimrod			$9,517			
Collection System	M83	M-FM-17	Hayworth			$5,290			
Collection System	M84	M83, M-FM-17	Kensington			$8,362			
Transmission Facility	M-FM-18	None	Strasburg Dr to Midway Blvd	M86, M87			$539		
Transmission Facility	M-FM-19	None	Quasar Blvd to Marlene Street	M91, M92			$539		
Collection System	M86	M87, M-FM-18	Birchcrest Ph I				$6,241		
Collection System	M87	M-FM-18	Birchcrest Ph II				$9,157		
Collection System	M92	M-FM-19	Laika				$11,180		
Transmission Facility	W-FM-23	None	Oceanspray Blvd to S McCall Rd	W18a, W18b				$762	
Collection System	M91	M92, M-FM-19	State					$9,342	
Collection System	W18a	W-FM-23	Ebro					$9,835	
Collection System	W18b	W18a, W-FM-23	Seabrook					$6,756	
Transmission Facility	W-FM-21	None	Apple Valley Ave to S McCall Rd	W16a, W16b					$409
Transmission Facility	W-FM-22	None	SR776 to Parade Circle	W16a, W16b					$2,644
Transmission Facility	S-FM-20	None	Grapefruit Lane	S10a					$6,113
Collection System	M63	None	Beaumont						$8,059
Collection System	S10a	S-FM-20	Royal Rd						$9,582
Collection System	W16a	W-FM-21, W-FM-22	Denmark						$7,620
				Yearly S2S Funds	**$22,728**	**$23,168**	**$26,577**	**$25,932**	**$25,262**
				Additional CCUD Funds	**$1,703**	**$387**	**$1,077**	**$762**	**$9,166**
				Total Capital Funding	**$24,431**	**$23,555**	**$27,655**	**$26,694**	**$34,428**

Table 7-4 10-Year Capital Improvement Projects Expenditure Plan ($ in Thousands)

CIP Type	Identifier	Predecessor CIP	Description	Project Area Served	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Total Project Cost
Transmission Facility	M-FM-13	None	Tinker Street	M59	$51	$81	$75					**$207**
Transmission Facility	M-FM-14	None	Barbara Avenue to Murdock Circle	M59	$74	$119	$110					**$302**
Transmission Facility	M-FM-15	None	Rutherford Ave to US 41	M78, M79	$225	$361	$333					**$918**
Transmission Facility	M-FM-16	None	US 41 to Ellicott LS	M78, M79	$67	$108	$100					**$275**
Collection System	M59	M-FM-13, M-FM-14	Cannolot		$1,215	$5,227	$5,227					**$11,670**
Collection System	M79	M-FM-15, M-FM-16	Blaine		$1,154	$4,952	$4,952					**$11,058**
Transmission Facility	M-FM-17	None	Dewhurst to Peachland Blvd	M83, M84		$95	$152	$140				**$387**
Collection System	M78	M79, M-FM-15, M-FM-16	Nimrod			$952	$4,282	$4,282				**$9,517**
Collection System	M83	M-FM-17	Hayworth			$529	$2,380	$2,380				**$5,290**
Collection System	M84	M83, M-FM-17	Kensington			$884	$3,739	$3,739				**$8,362**
Transmission Facility	M-FM-18	None	Strasburg Dr to Midway Blvd	M86, M87			$132	$212	$195			**$539**
Transmission Facility	M-FM-19	None	Quasar Blvd to Marlene Street	M91, M92			$132	$212	$195			**$539**
Collection System	M86	M87, M-FM-18	Birchcrest Ph I				$624	$2,808	$2,808			**$6,241**
Collection System	M87	M-FM-18	Birchcrest Ph II				$964	$4,097	$4,097			**$9,157**
Collection System	M92	M-FM-19	Laika				$1,166	$5,007	$5,007			**$11,180**
Transmission Facility	W-FM-23	None	Oceanspray Blvd to S McCall Rd	W18a, W18b				$186	$299	$276		**$762**
Collection System	M91	M92, M-FM-19	State					$934	$4,204	$4,204		**$9,342**
Collection System	W18a	W-FM-23	Ebro					$1,031	$4,402	$4,402		**$9,835**
Collection System	W18b	W18a, W-FM-23	Seabrook					$676	$3,040	$3,040		**$6,756**
Transmission Facility	W-FM-21	None	Apple Valley Ave to S McCall Rd	W16a, W16b					$100	$161	$148	**$409**
Transmission Facility	W-FM-22	None	SR776 to Parade Circle	W16a, W16b					$646	$1,039	$958	**$2,644**
Transmission Facility	S-FM-20	None	Grapefruit Lane	S10a					$1,494	$2,403	$2,216	**$6,113**
Collection System	M63	None	Beaumont						$854	$3,603	$3,603	**$8,059**
Collection System	S10a	S-FM-20	Royal Rd						$1,006	$4,288	$4,288	**$9,582**
Collection System	W16a	W-FM-21, W-FM-22	Denmark						$810	$3,405	$3,405	**$7,620**
				Yearly S2S Expenditures	**$2,369**	**$12,544**	**$23,335**	**$24,955**	**$26,227**	**$22,941**	**$11,296**	**$123,667**
				Additional CCUD Expenditures	**$416**	**$764**	**$1,033**	**$750**	**$2,931**	**$3,879**	**$3,323**	**$13,096**
				Total Capital Expenditures	**$2,785**	**$13,308**	**$24,368**	**$25,705**	**$29,158**	**$26,820**	**$14,618**	**$136,762**

Figure 7-2 10-Year Improvement Plan Project Areas and Transmission Mains



7.4 FIFTEEN YEAR IMPROVEMENT PLAN

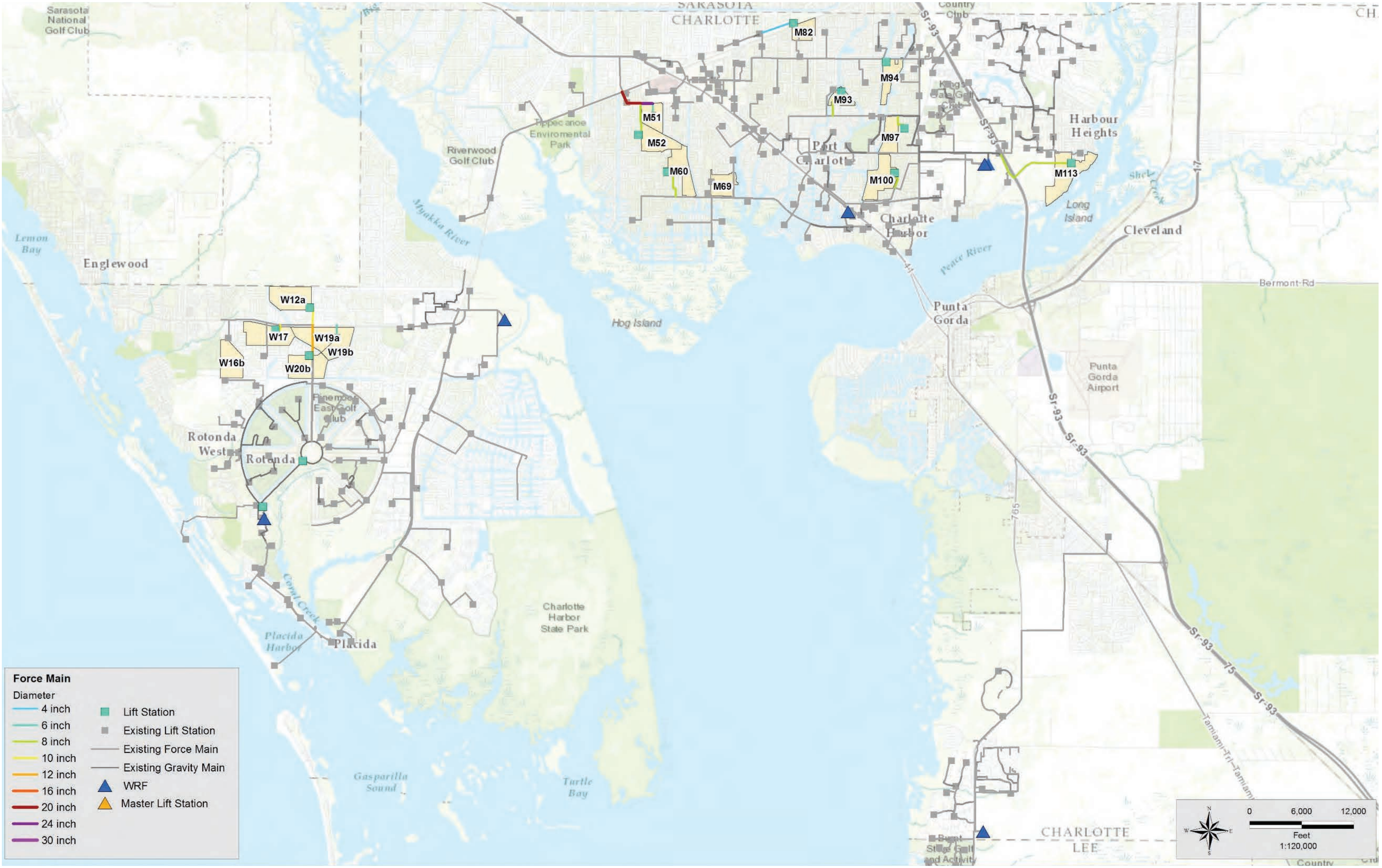
Table 7-5 15-Year Capital Improvement Projects Funding Plan ($ in Thousands)

CIP Type	Identifier	Predecessor CIP	Description	Project Area Served	Year 11	Year 12	Year 13	Year 14	Year 15
Transmission Facility	M-FM-24	None	Sheehan Blvd	M93	$523				
Transmission Facility	M-FM-25	None	Sherwood Rd to Elmira Blvd	M100	$333				
Transmission Facility	W-FM-35	None	LS 801 to Rotonda WRF	West County 15-year CIPs	$456				
Transmission Facility	W-FM-37	None	Burlington Ave to Strawberry St	W17	$213				
Transmission Facility	W-LS-801	None	LS 801 Upgrade	West County 15-year CIPs	$250				
Transmission Facility	W-LS-815	None	LS 815 Upgrade	West County 15-year CIPs	$250				
Collection System	M100	M-FM-25	Rye		$11,408				
Collection System	M93	M-FM-24	Tandy		$4,237				
Collection System	W17	W-FM-37	Gunther		$12,342				
Transmission Facility	M-FM-26	None	Beacon Dr to Peachland Blvd	M94		$62			
Transmission Facility	M-FM-27	None	Broder Dr to Eastport Master	M113		$1,817			
Collection System	M113	M-FM-27	Dover			$14,506			
Collection System	M69	M63	Seabold			$5,570			
Collection System	M94	M-FM-26	Ruby			$6,460			
Transmission Facility	W-FM-38	None	Larki St to SR776	W19a, W19b			$221		
Transmission Facility	W-FM-39	None	Oceanspray to Sunnybrook Blvd	W19a, W19b			$364		
Collection System	W16b	W16a, W-FM-21, W-FM-22	Henry				$7,468		
Collection System	W19a	W-FM-38, W-FM-39	Carnegie				$11,181		
Collection System	W19b	W19a, W-FM-38, W-FM-39	Peacock				$5,870		
Transmission Facility	M-FM-28	None	Willoughby St to Abalon St	M97				$349	
Transmission Facility	M-FM-29	None	Edgewater Dr	M60				$601	
Transmission Facility	W-FM-40	None	Carvel St. to Sunnybrook Blvd	W20b				$62	
Collection System	M60	M-FM-29	Placid					$9,377	
Collection System	M97	M-FM-28	Villa					$8,033	
Collection System	W20b	W-FM-40	Del Ray					$10,523	
Transmission Facility	M-FM-30	None	Cochran Blvd	M51					$439
Transmission Facility	M-FM-31	None	Lantern Light St	M51					$207
Transmission Facility	M-FM-32	None	Toledo Blade Blvd	M51					$822
Transmission Facility	M-FM-33	None	Collingswood Blvd	M52					$570
Transmission Facility	W-FM-36	None	Waterford Ave to SR776	W12a					$427
Transmission Facility	M-FM-34	None	Kenilworth Blvd	M82					$452
Collection System	M51	M-FM-30, M-FM-31, M-FM-32	Windswept						$6,132
Collection System	M52	M-FM-33	Auburn						$9,616
Collection System	M82	M-FM-34	Danley						$5,136
Collection System	W12a	W-FM-36	Thames						$11,112
				Yearly S2S Funds	**$27,987**	**$26,535**	**$24,519**	**$27,933**	**$31,996**
				Additional CCUD Funds	**$2,026**	**$1,879**	**$585**	**$1,011**	**$2,916**
				Total Capital Funding	**$30,013**	**$28,415**	**$25,104**	**$28,944**	**$34,913**

Table 7-6 15-Year Capital Improvement Projects Expenditure Plan ($ in Thousands)

CIP Type	Identifier	Predecessor CIP	Description	Project Area Served	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Total Project Cost
Transmission Facility	M-FM-24	None	Sheehan Blvd	M93	$128	$206	$190					**$523**
Transmission Facility	M-FM-25	None	Sherwood Rd to Elmira Blvd	M100	$81	$131	$121					**$333**
Transmission Facility	W-FM-35	None	LS 801 to Rotonda WRF	West County 15-year CIPs	$112	$179	$165					**$456**
Transmission Facility	W-FM-37	None	Burlington Ave to Strawberry St	W17	$52	$84	$77					**$213**
Transmission Facility	W-LS-801	None	LS 801 Upgrade	West County 15-year CIPs	$25	$225						**$250**
Transmission Facility	W-LS-815	None	LS 815 Upgrade	West County 15-year CIPs	$25	$225						**$250**
Collection System	M100	M-FM-25	Rye		$1,189	$5,110	$5,110					**$11,408**
Collection System	M93	M-FM-24	Tandy		$454	$1,892	$1,892					**$4,237**
Collection System	W17	W-FM-37	Gunther		$1,282	$5,530	$5,530					**$12,342**
Transmission Facility	M-FM-26	None	Beacon Dr to Peachland Blvd	M94		$15	$24	$22				**$62**
Transmission Facility	M-FM-27	None	Broder Dr to Eastport Master	M113		$444	$714	$659				**$1,817**
Collection System	M113	M-FM-27	Dover			$1,499	$6,504	$6,504				**$14,506**
Collection System	M69	M63	Seabold			$557	$2,506	$2,506				**$5,570**
Collection System	M94	M-FM-26	Ruby			$676	$2,892	$2,892				**$6,460**
Transmission Facility	W-FM-38	None	Larki St to SR776	W19a, W19b			$54	$87	$80			**$221**
Transmission Facility	W-FM-39	None	Oceanspray to Sunnybrook Blvd	W19a, W19b			$89	$143	$132			**$364**
Collection System	W16b	W16a, W-FM-21, W-FM-22	Henry				$747	$3,361	$3,361			**$7,468**
Collection System	W19a	W-FM-38, W-FM-39	Carnegie				$1,166	$5,008	$5,008			**$11,181**
Collection System	W19b	W19a, W-FM-38, W-FM-39	Peacock				$587	$2,642	$2,642			**$5,870**
Transmission Facility	M-FM-28	None	Willoughby St to Abalon St	M97				$85	$137	$126		**$349**
Transmission Facility	M-FM-29	None	Edgewater Dr	M60				$147	$236	$218		**$601**
Transmission Facility	W-FM-40	None	Carvel St. to Sunnybrook Blvd	W20b				$15	$24	$22		**$62**
Collection System	M60	M-FM-29	Placid					$986	$4,196	$4,196		**$9,377**
Collection System	M97	M-FM-28	Villa					$851	$3,591	$3,591		**$8,033**
Collection System	W20b	W-FM-40	Del Ray					$1,100	$4,711	$4,711		**$10,523**
Transmission Facility	M-FM-30	None	Cochran Blvd	M51					$107	$172	$159	**$439**
Transmission Facility	M-FM-31	None	Lantern Light St	M51					$51	$81	$75	**$207**
Transmission Facility	M-FM-32	None	Toledo Blade Blvd	M51					$201	$323	$298	**$822**
Transmission Facility	M-FM-33	None	Collingswood Blvd	M52					$139	$224	$207	**$570**
Transmission Facility	W-FM-36	None	Waterford Ave to SR776	W12a					$104	$168	$155	**$427**
Transmission Facility	M-FM-34	None	Kenilworth Blvd	M82					$111	$178	$164	**$452**
Collection System	M51	M-FM-30, M-FM-31, M-FM-32	Windswept						$643	$2,744	$2,744	**$6,132**
Collection System	M52	M-FM-33	Auburn						$1,010	$4,303	$4,303	**$9,616**
Collection System	M82	M-FM-34	Danley						$544	$2,296	$2,296	**$5,136**
Collection System	W12a	W-FM-36	Thames						$1,159	$4,976	$4,976	**$11,112**
				Yearly S2S Expenditures	**$2,925**	**$15,263**	**$26,933**	**25,849**	**$26,863**	**$26,818**	**$14,320**	**$138,971**
				Additional CCUD Expenditures	**$423**	**$1,509**	**$1,435**	**$1,159**	**$1,323**	**$1,513**	**$1,057**	**$8,418**
				Total Capital Expenditures	**$3,348**	**$16,772**	**$28,368**	**$27,007**	**28,186**	**$28,331**	**$15,377**	**$147,389**

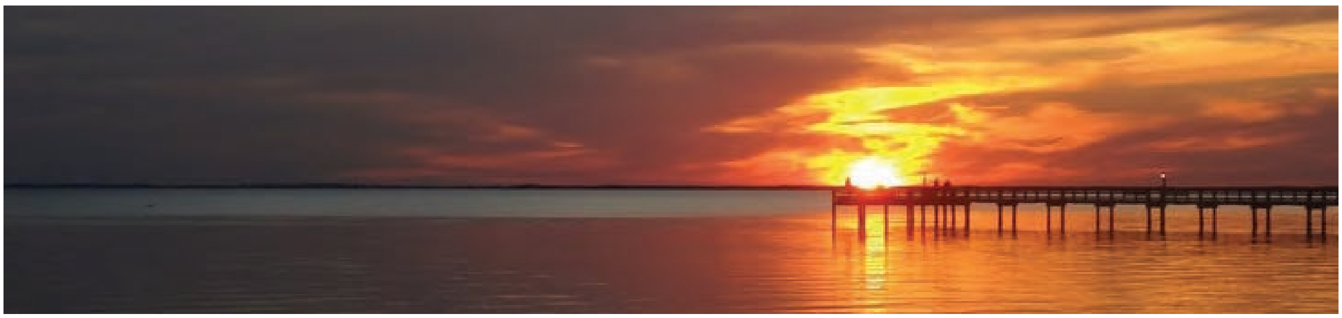
Figure 7-3 *15-Year Improvement Plan Project Areas and Transmission Mains*



8. FINANCING AND FUNDING OPTIONS

OVERVIEW

One objective of the CCSMP is to develop an affordable and realistic funding strategy that apportions just, equitable, and affordable costs to property owners while not having an adverse effect on existing CCUD ratepayers. This chapter develops a funding plan and roadmap based on the County's service area characteristics. The constraints of this goal include uncertainty of outside funding sources, construction cost schedules, and public acceptance.



8.1 AFFORDABILITY

The water industry has made various attempts to define the concept of affordability. The industry literature generally links water and sewer bills to median household income (MHI) statistics. Although this is an imperfect method, it does provide a framework from which to begin judging the cost of providing water and sewer service. When discussing affordability, other factors to be considered are income, property value, local cost of living, and economic conditions.

The industry literature on affordability typically views water and sewer bills as a percentage of local MHI statistics. This methodology standardizes affordability comparisons across regions and gauges a utility's "all-in" costs to ratepayers. The all-in utility payments described herein include monthly water and sewer service bills, property assessments, and other methods used to collect utility revenues.

For water and sewer services, the benchmark for affordability has historically been set at 4.5 percent of MHI (Stratus Consulting, 2013). Under this methodology, CCUD would begin with an MHI of $54,500 – Charlotte County, entire County (City-Data.com, 2017). In dollars, the 4.5 percent yields $204 in monthly payments ($2,448 annually) to CCUD.

Due to the relatively higher treatment and disposal costs of wastewater compared to the acquisition and treatment of potable water, 2.5 percent of the total 4.5 percent affordability allowance has been allocated to the sewer portion of CCUD costs. Focusing on the monthly sewer utility bills and potential sewer assessments for those portions of the CCUD service area currently using septic tanks, the affordability estimate indicates monthly payments of approximately $113.

Historical CCUD water usage statistics indicate that the average monthly water usage is 4,000 gallons. However, the average monthly water usage for those water customers with CCUD sewer service is approximately 3,300 gallons. Therefore, the monthly utility bill of $86 ($36 water and $50 sewer) for 3,300 gallons of service is the first piece of the cost equation.

The monthly sewer utility bill of $50 accounts for almost half of the 2.5-percent affordability allowance. This leaves $63 per month to be recovered by sewer assessments and other sources. However, with no significant rate adjustments or water system assessments on the horizon, the total water and sewer affordability of $204 per month can also be used as a top-end affordability-level indicator.

This indicator points to $118 per month of property assessments or connection fee installment payments that CCUD can add on top of the existing monthly utility bills before reaching stress levels of standardized measures of affordability. This does not necessarily indicate that the program is “unaffordable” since these metrics were developed for the entire U.S. and other states have much greater tax burdens that limit affordability of user fees. Other factors should be considered in this affordability discussion:

- **Property Value:** Central sewer adds value to not only developed properties but also to undeveloped properties. In certain situations, septic tank development within neighborhoods can be limited based on proximity to potable drinking water wells on adjacent lots. These limitations inhibit the ability to construct on these lots and can essentially render them undevelopable, severely reducing the properties’ values. Central sewer eliminates these limitations, and property values across the neighborhood are increased.

- **Septic Tank Maintenance:** Another consideration is the cost avoidance from owning and operating a septic tank along with alleviating risks associated with a septic tank failure. Septic tanks have a limited lifespan and can be costly to repair or replace (well above 10 percent of annual gross income), especially when put in terms of those living below the MHI level established above.

- **Environmental Implications:** One other primary factor to consider is the future environmental implications from the current level of septic tanks and the expected septic tanks from future development. With a growing population and an already strained natural waterway system, the County will only be able to manage growth and future wastewater treatment by making central sewer available to the majority of the service area

8.2 SEWER SYSTEM COSTS

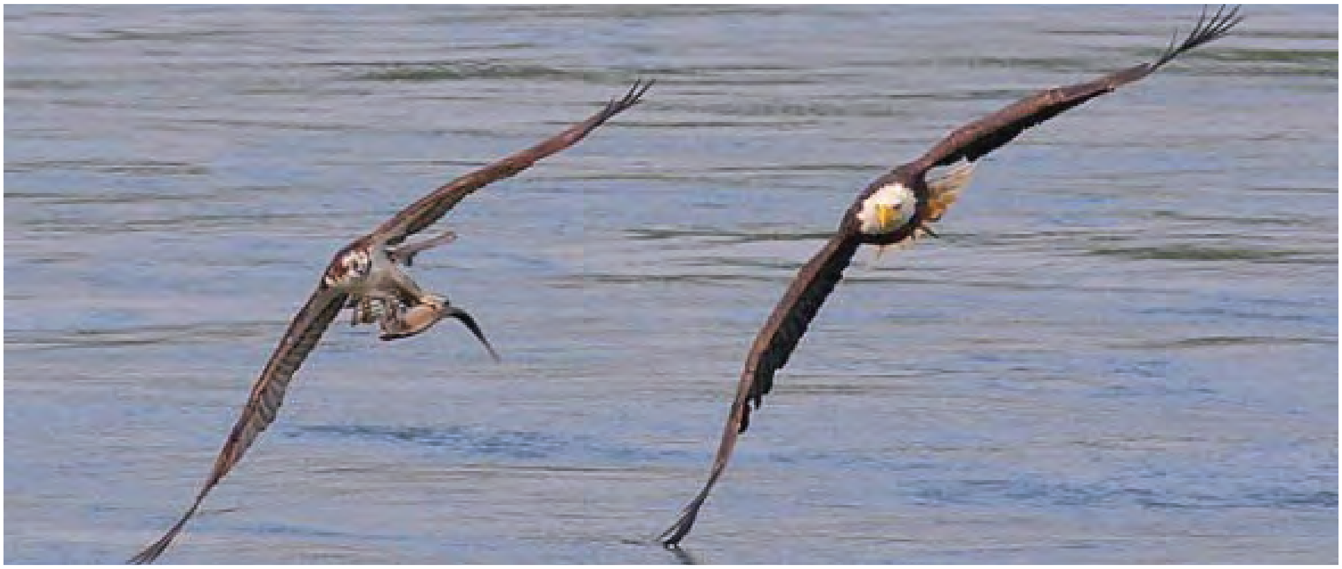
The following section summarizes the current value costs of constructing sewer systems under the County’s 5-Year, 10-Year, and 15-Year improvement plans. The cost assumptions, development, and individual project area estimates are presented in Chapters 4 and 7.

The cost to develop the sewer collection system for the County’s 15-Year Improvement Plan at current costs is $347,476,237 (including onsite costs) for 14,578 existing developed lots and 24,223 total lots at buildout. Table 8-1 shows the cost and connection breakdown for the 5-Year, 10-Year, and 15-Year Improvement Plans.

Table 8-1 5-Year, 10-Year, and 15-Year Improvement Plan Connections and Project Costs

Improvement Plan	Initial Connections	Buildout Connections	Project Costs
5-Year	4,008	5,928	$84,838,522
10-Year	5,476	8,621	$123,666,668
15-Year	5,094	9,674	$138,971,047
Totals	14,578	24,223	$347,476,237

Note: The connections and costs of private utilities are excluded from the 5-Year plan.

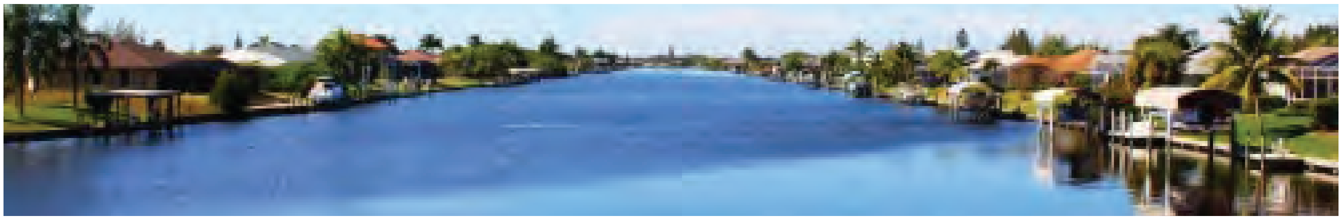


8.3 FUNDING ELEMENTS

Funding for central sewers includes two distinct elements: 1) the funding of infrastructure improvements by the County/CCUD and associated planning, design, and project management and 2) the methods by which any borrowed funds for such infrastructure are repaid by property owners, end users, and/or other future revenue streams. The CCUD is constantly exploring funding opportunities as these sources become available. The funding sources for the former include loans, bonds, grants, etc., and the latter includes the assessments, loan installments, rates, and taxes that support the repayment of debt obligations. This section discusses several funding sources starting with the infrastructure funding and followed by the future revenue streams to support debt repayment.

8.3.1 STATE APPROPRIATION

The State Legislature and the Governor's Office have had significant interest in the impact of septic tanks on the state's sensitive water bodies such as springs and coastal areas like Charlotte Harbor and the Indian River Lagoon. FDEP recognizes the financial magnitude of the septic-to-sewer need in Florida and the support that will be required to address this issue throughout the state. A Bill has been filed (HB551/SB874) that directs FDEP to develop specified on-site sewage treatment and disposal system remediation plans under certain conditions. This Bill could have impact on available funding for the Charlotte County septic-to-sewer program. With proactive lobbying efforts, Charlotte County could seek legislative appropriations to lessen the local burden of funding central sewers. Currently, a local Bill (HB3117) has been filed in the House of Representatives requesting $2 million for the El Jobean Septic-to-Sewer Project. This Bill has been approved by the Agriculture & Natural Resources Appropriations Subcommittee.



8.3.2 GRANTS

One such grant the County is currently pursuing is funding from the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act (RESTORE Act; Subtitle F of Public Law 112-141). Under the Federal Water Pollution Control Act, civil penalties in connection with the Deepwater Horizon oil spill were deposited into the Gulf Coast Restoration Trust Fund. A portion of the fund was made available for programs, projects, and activities that restore and protect the environment and economy of the Gulf Coast region.

These funds are managed by the Gulf Coast Ecosystem Restoration Council which includes members from six Federal agencies or departments and the five Gulf Coast States. The Council directs these funds to projects and programs for the restoration of the Gulf Coast region, pursuant to a comprehensive plan developed by the Council. The Federal and state entities that administer grants under the Act are primarily responsible for overseeing compliance with the terms of their award agreements, including administrative requirements common to Federal grant programs. In addition, the Treasury Inspector General is authorized to conduct, supervise, and coordinate audits and investigations of projects, programs, and activities funded under the Act. Grant recipients under the RESTORE Act need to comply with the Federal Office of Management and Budget guidance (US Department of the Treasury, 2016; Fl-counties.com, 2017; Fl-counties.com, 2016).

8.3.3 LOW-INTEREST LOANS

FDEP administers the Clean Water State Revolving Fund (SRF) loan program for financing public sewer utility infrastructure projects. The SRF financing rate for clean water projects is determined using a formula that includes the Bond Buyer 20-Bond GO Index average market rate[3]. In early 2017, this rate for many communities was less than 0.5 percent, depending on census tract and other SRF affordability indices. This current level of interest is almost cost free. To the extent that the County is able to take advantage of this program, the interest costs will be significantly minimized. One drawback is that SRF loan repayment terms are typically limited to 20 years or less. The principal and interest payments cannot be tailored around the issuer's existing debt service structure in an effort to levelize overall debt payments. SRF loan agreements also require that rates be sufficient to provide for at least 1.15 annual debt service coverage. Another drawback is that SRF loans require a loan service fee to be paid by the local government or entity eligible to receive the loan. The loan service fee is two percent of the total loan amount less the portion of the loan for capitalized interest.

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[3] FDEP. 2017. State Revolving Fund, What is the State Revolving Fund (SRF)?
Accessed at: www.dep.state.fl.us/water/wff/.

The clean water SRF Financing Rate Formula is: FR = MR – 4 + (4/(1+(100/AI)3)) – 1/Log(P)

Where: FR = Financing Rate.
MR = Market Rate.
AI = Affordability Index.
P = Population served or to be served by the sponsor.

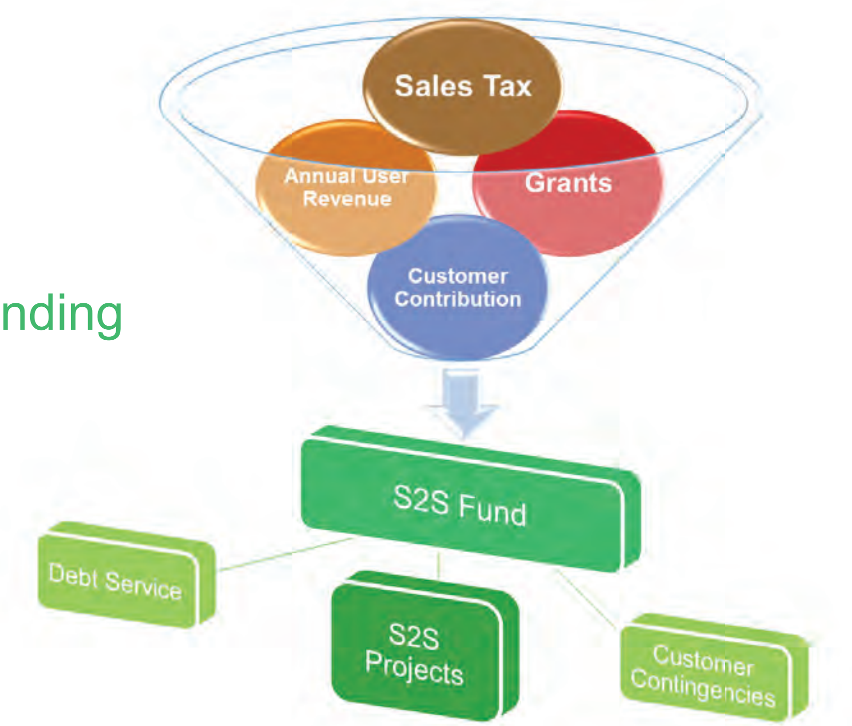
EPA has recently developed the Water Infrastructure Finance and Innovation Act (WIFIA) program to provide a subsidized loan program for water- and sewer-related infrastructure projects. Based on early information provided by EPA, the subsidized interest rates are based on a similar maturing treasury bond. Based on recent treasury rates, a 30-year WIFIA interest rate could be near 3.0 percent. Since the WIFIA legislation limits funding to 49 percent of the project, the remaining 51 percent would need to derive from other loans or sources.

One benefit of WIFIA is that the repayment structure can be tailored to suit the specific project needs and other obligations, unlike SRF loans that typically have fixed 20-year debt service terms. The County should monitor the WIFIA program as EPA unveils it to pursue advantageous funding opportunities. However, the SRF loan program appears to suit the County's SMP since the interest rate is much lower than other loan options and the program is firmly established for Florida utilities. A recent $25 million annual segment cap was established for SRF loans, which is expected to exceed the County's annual borrowing requirements for the sewer master plan.

8.3.4 BONDS

The traditional method for utilities to finance infrastructure programs is to issue revenue bonds. Public utilities typically issue tax-exempt revenue bonds that provide tax savings for investors and thus attract lower interest rates than conventional bonds that are subject to income taxes from the investor. The term revenue bond is used since the primary pledge of repayment is a revenue stream associated with the infrastructure improvements. The interest rate on revenue bonds is currently in the 4.0- to 4.5-percent range, depending on the issuer's credit rating, bond maturity structure, economic conditions, and other factors. Since this interest rate is substantially higher than SRF loans, the advantage to revenue bonds is the repayment structure can be tailored to meet the utilities' short- and long-term needs and existing debt repayment structure. A drawback of revenues bonds are the issuance costs associated with the bonds. Management, legal, financial, consulting, and engineering fees, along with other issuance costs inherent in this type of debt, generally increase the issuer's costs. Unlike SRF loans, which are two percent of the total loan amount, issuance costs on revenue bonds can vary depending on the costs mentioned above.

S2S Project Funding



8.3.5 SALES TAX

Pursuant to Section 212.055, FS, the governing authority in each Florida county may levy a discretionary sales surtax of 0.5 or 1 percent to fund infrastructure projects, contingent on a successful referendum. Proceeds from the discretionary sales tax may be used toward capital outlays associated with construction, reconstruction, or improvement of public facilities that have a life expectancy of 5 years or more; any related land acquisition, land improvement, design and engineering costs; and all other professional and related costs required to bring the public facilities into service (Florida Legislature, 2016).

Charlotte County has imposed a 1-percent discretionary sales tax since 1995 with the current tax effective starting January 1, 2015, and expiring December 31, 2020 (Office of Economic and Demographic Research, 2016). A voter referendum would be required to extend the discretionary sales tax to account for projects identified past 2020. Through discussions with County staff, an allocation of 0.25 percent of the potential future discretionary sales tax could be used toward the septic tank and central sewer program. The level of revenue associated with this allocation is approximately $5,000,000 per year and would defray the costs of central sewers to property owners. Discretionary sales tax revenue has been used toward utility infrastructure in Sarasota, Hillsborough, and Monroe Counties, and a new tax was passed in Brevard County in 2016 for this purpose.

8.3.6 ENVIRONMENTAL ASSESSMENT

As discussed in Chapter 4, the sewer improvement program provides an environmental benefit as well as a general benefit to property owners. Revenue from an environmental assessment could be used for central sewer implementation.

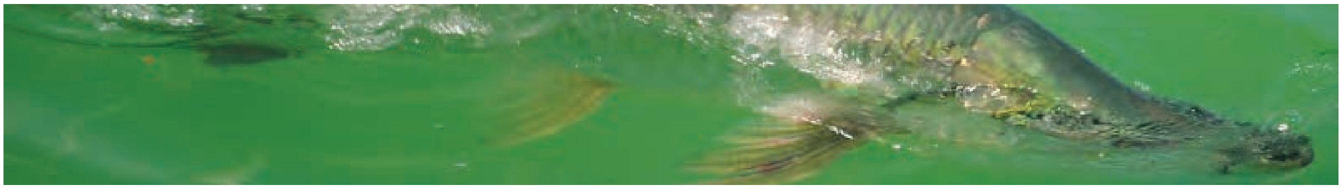
Although it is not practical to construct and connect every septic tank in the County to central sewer, each septic tank – or even vacant lots with no sewer availability – should help fund the central sewer improvement program. Two apparent drawbacks from this approach are:

1) The legality and enforcement of such a fee or assessment.

2) The practical amount of revenue such a program would generate for the central sewer program.

The most similar type of fee to the one described here is a stormwater fee or assessment. A stormwater fee or assessment is similar in that it benefits properties in ways that are not directly measured compared to a service such as metered water service. Stormwater funding has an explicit state statutory authorization pursuant to Section 403.0893, FS, but no such provision is provided for an environmental assessment or fee.

Although some overlap of water quality improvements initiated from a central sewer program and stormwater program can be debated, there is no known literature of a fee system that combines both. If a County-wide stormwater program is pursued, perhaps opportunities may arise to link septic tank management and central sewer planning with the stormwater program. Such a program requires an inter-disciplinary study of the specific merits that is beyond the scope of this study.



8.3.7 MSBU AND UTILITY EXTENSION

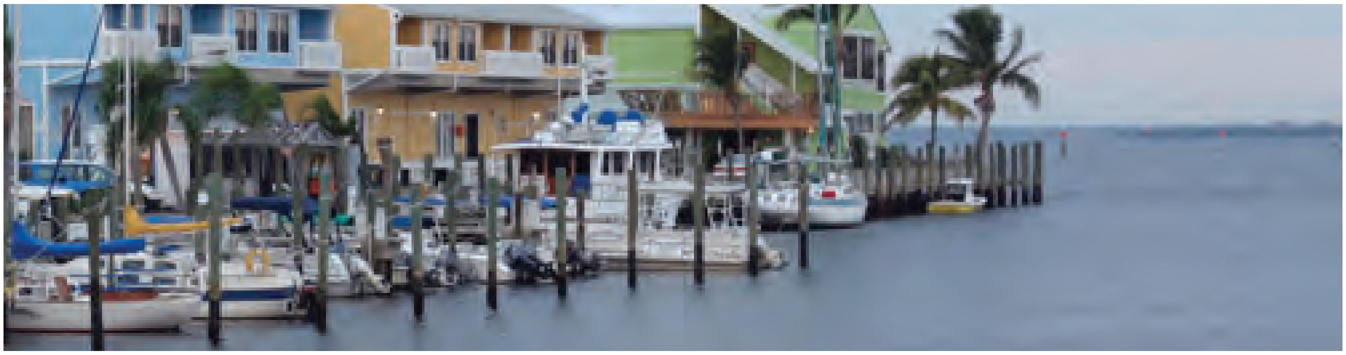
CCUD recovers the cost of extending sewer lines in two ways – the Municipal Service Benefit Units (MSBU)/assessment approach and the extension/lien approach. The following provides an overview of each approach.

Because of the localized nature of the costs and benefits of central sewer installation, local governing bodies often impose special assessments on the property and typically collect such assessments through the annual tax bill administered through the tax collector’s office. The procedure for imposing special assessments in Florida are set forth in Chapter 197, FS. In addition to public hearing, notification, and other procedural matters, special assessments imposed on a property must meet a two-pronged test: 1) the property must receive a special benefit from the improvement, and 2) the costs of such improvements must be fairly and reasonably apportioned among benefitting properties. Counties typically will establish MSBUs if special assessments apply to only portions of the county area. Charlotte County has developed MSBUs for a variety of municipal services such as streets/drainage as well as certain sewer areas.

In FY 2016, CCUD initiated a new line extension program designed to serve new customers with water and sewer services throughout the service area. Line extensions constructed by CCUD are available to properties within 500 feet of an existing utility main. Longer extensions may be considered if the requesting person is willing to pay the cost of the additional length of the water or sewer main. Developed properties are required to connect to the sewer system within 180 days of notice of availability, pursuant to Section 3-8-41, Charlotte County Code. Properties are required to pay connection and extension fees pursuant to adopted fee schedules. For a typical residential property, these costs are $11,200. To defray this significant expense, CCUD provides financing opportunities that are administered by CCUD that involves mailing a separate monthly bill to the property owner. The property owner is required to execute a connection fee installment agreement and lien on the property to qualify for financing with repayment terms that are available for up to 20 years.

The MSBU/assessment approach is the traditional method of recovering costs. The advantages to this approach are that it meets Florida Statutes as well as it involves an established collection procedure through the local tax collector. Since taxes have the highest priority of payment relative to liens and other claims, the collection rate is significantly high. Offsetting these benefits are the administrative costs of administering the program, developing assessment resolutions, public hearings, and related procedure matters. Statutory early pay discounts of up to 4 percent to property owners are available and need to be built into the assessment calculation so that revenues adequately fund the extension program.

The extension/lien program does not require the same level of administrative burden compared to the MSBU/assessment approach. However, the administrative and collection burden under the extension shifts to CCUD. The collection enforcement of a separate monthly bill to the property owner is not as certain as the tax bill. CCUD may be able to enforce payment through a combination of a lien and cutoff of the water service. However, the ability to disconnect service for non-payment of financed connection fee is a legal question beyond the scope of this study.



8.4 IMPROVEMENT PLAN FINANCIAL FORECAST AND FUNDING STRATEGIES

An interactive financial model was developed to evaluate the financial viability of various sewer expansion segments. The financial model provides for input assumptions and projections in terms of level of self-sufficiency under various scenarios. After reviewing a variety of funding strategies, an initial 5-year plan has been developed based on achievable funding levels that balances property owner affordability with funding sources that match well with the infrastructure costs.

The sewer expansion plan was viewed from the County's perspective and from the property owner's viewpoint. The major cost to the homeowner is the adopted line extension fee of $11,200 (customer contribution), which is proposed to be indexed by 2.32-percent annually. This fee includes the costs for the necessary on-site work to connect from the property to the CCUD sewer system and is used to fund the WRF and transmission system improvements necessary for growth and septic to sewer conversion. This fee may be paid up front or the fee may be assessed for up to 30 years, which equates to $528/year or $44/month assuming a 2.25-percent interest rate (compared to the assumed 2.00% interest rate on the proposed SRF loans). The cost to vacant lots would defer to such time that development occurs.

8.4.1 FIVE-YEAR IMPROVEMENT PLAN

The initial 5-year forecast for the sewer improvement plan includes 4,008 existing developed units out of 5,928 total lots. The annual project costs range from $17 million to $19 million per year for a 5-year total cost of $89 million, or an average cost per lot of $15,013. These estimated project costs include the components listed in Section 7.1.1. A number of funding strategies were reviewed for the initial 5-year expansion plan. The goal of the strategy is to assign just, equitable, and affordable costs to property owners and find an achievable level of outside funding while having no adverse effect on existing CCUD ratepayers. The sources of outside funding proposed in the plan include: SRF low-interest loans, sales tax (use 0.25% of the 1% tax), and grants (such as RESTORE). The proposed plan assumes that the entire amount of project costs during the initial 5-year forecast is funded through SRF loan proceeds.

As mentioned above, the SRF loan program would be advantageous to CCUD because of the low interest rates (2.00%) currently offered and the program being firmly established in Florida for utilities infrastructure improvements. The other sources of outside funding (taxes and grants) are proposed to help buy down project cost borrowing and help fund the debt service associated with the proposed SRF loans. Table 8-2 provides the assumptions used for the SRF loan issuances and adjusts for inflation. Table 8-3 summarizes the annual project expenses and project revenues for the initial 5-year improvement plan based on 2017 source funding.

Table 8-2 5-Year SRF Loan Issuances

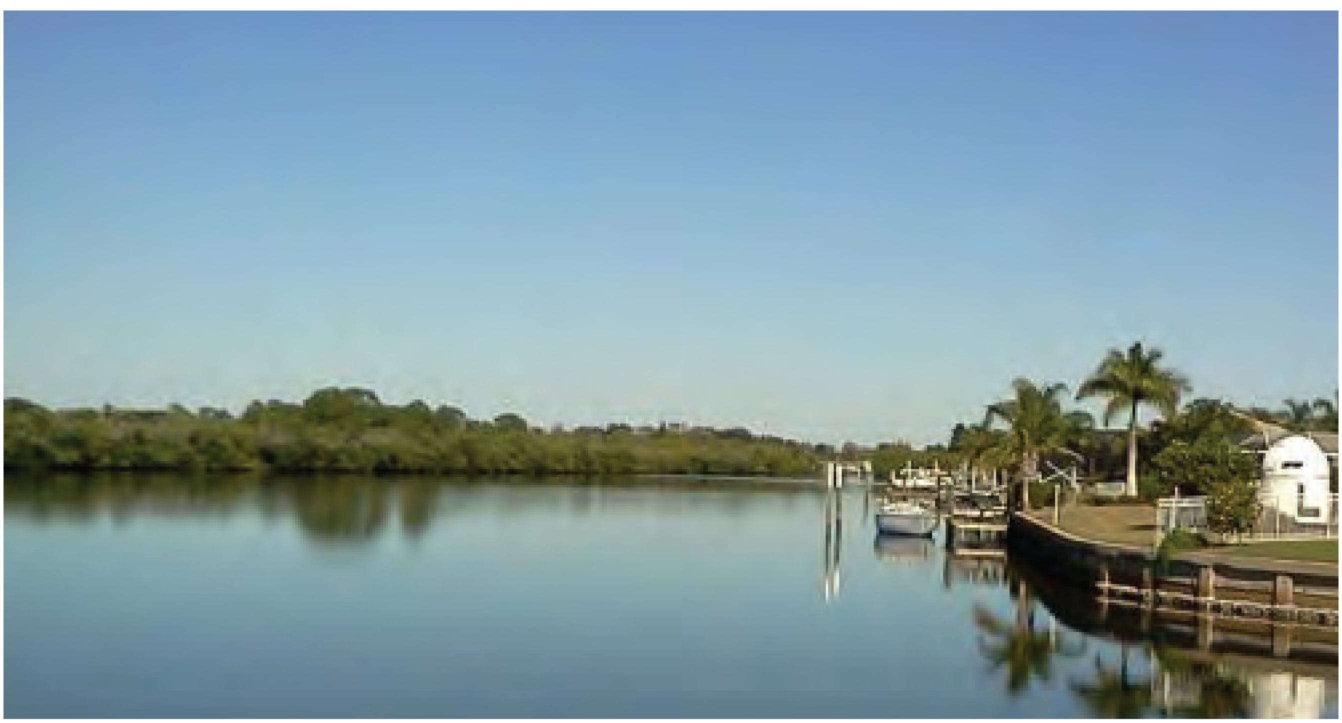
	Year 1	Year 2	Year 3	Year 4	Year 5
Construction & Design	$17,000,000	$17,400,000	$17,800,000	$18,200,000	$18,600,000
Loan Costs	$2,040,000	$2,088,000	$2,136,000	$2,184,000	$2,232,000
Capitalized Interest	$680,000	$696,000	$712,000	$728,000	$744,000
Grants	($850,000)	($1,720,000)	($1,760,000)	($1,800,000)	($2,770,000)
Total Loan Amount	$18,870,000	$18,464,000	$18,888,000	$19,312,000	$18,806,000
Term	20	20	20	20	20
Interest Rate	2.00%	2.00%	2.00%	2.00%	2.00%

Note: Loan costs include financing and administrative costs and a construction contingency. Construction & Design costs reflect 2.32% annual inflation factor. Grants assumed at 10% of average annual project costs and are used to buy down project cost borrowing.

Table 8-3 5-Year Funding Summary

	Total	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Total Project Expenses:							
SRF Design Loan Debt Service	$1.60	$0.00	$0.10	$0.21	$0.32	$0.43	$0.54
SRF Construction Loan Debt Service	$6.22	$0.00	$0.00	$0.00	$1.05	$2.06	$3.11
Septic Maintenance Expense	$1.30	$0.10	$0.20	$0.25	$0.25	$0.25	$0.25
Hardship	$0.11	$0.00	$0.01	$0.01	$0.02	$0.03	$0.04
Total Expenses	$9.23	$0.10	$0.31	$0.47	$1.64	$2.77	$3.94
Total Project Revenue:							
Seed Money	$6.00	$0.00	$1.50	$1.50	$1.50	$1.50	$0.00
Customer Contribution	$5.64	$0.00	$0.36	$0.74	$1.12	$1.51	$1.91
New User Revenue	$2.12	$0.00	$0.00	$0.00	$0.36	$0.71	$1.05
Sales Tax	$5.00	$0.00	$0.00	$0.00	$0.00	$0.00	$5.00
Total Revenue	$18.76	$0.00	$1.86	$2.24	$2.98	$3.72	$7.96

Note: All amounts are expressed in million dollars; Grants not shown since they are applied directly to construction costs.



Appendix A

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Appendix B

Environmental Considerations

ENVIRONMENTAL CONSIDERATIONS

1.1 LAND USE

1.1.1 LAND COVER

Figure 1 shows the CCUD sewer service area is comprised of a diversity of land uses ranging from residential to tidal flats. Seventeen land uses were identified and are summarized in Table 1. The dominant land use in the service area is Residential (32%) followed by Open Land (14%), Forested Wetlands (12%), and Forested Uplands (10%). Forested wetlands is a dominate land use because large acreages of this land cover are found within Charlotte Harbor State Park Preserve.

Figure 1 Charlotte County Land Cover

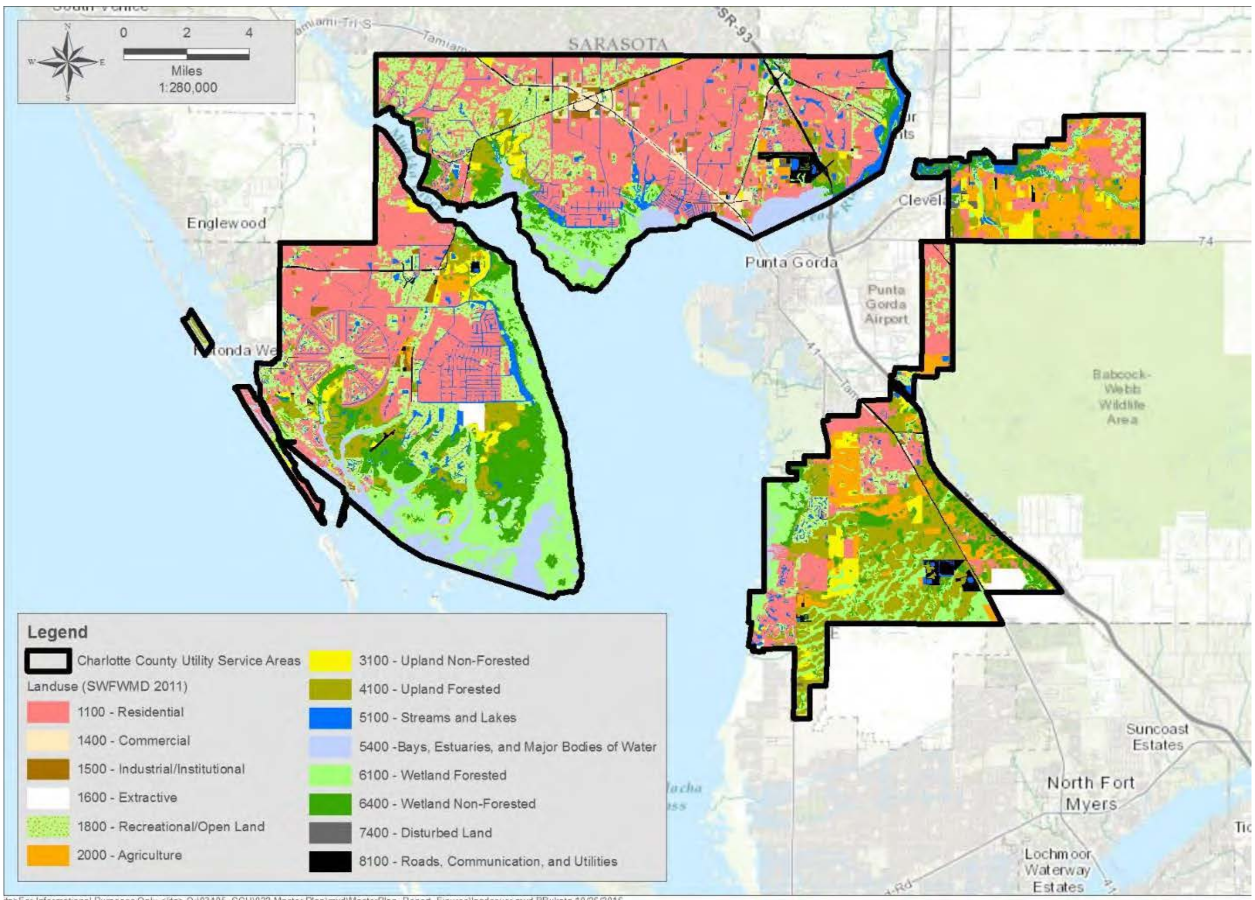

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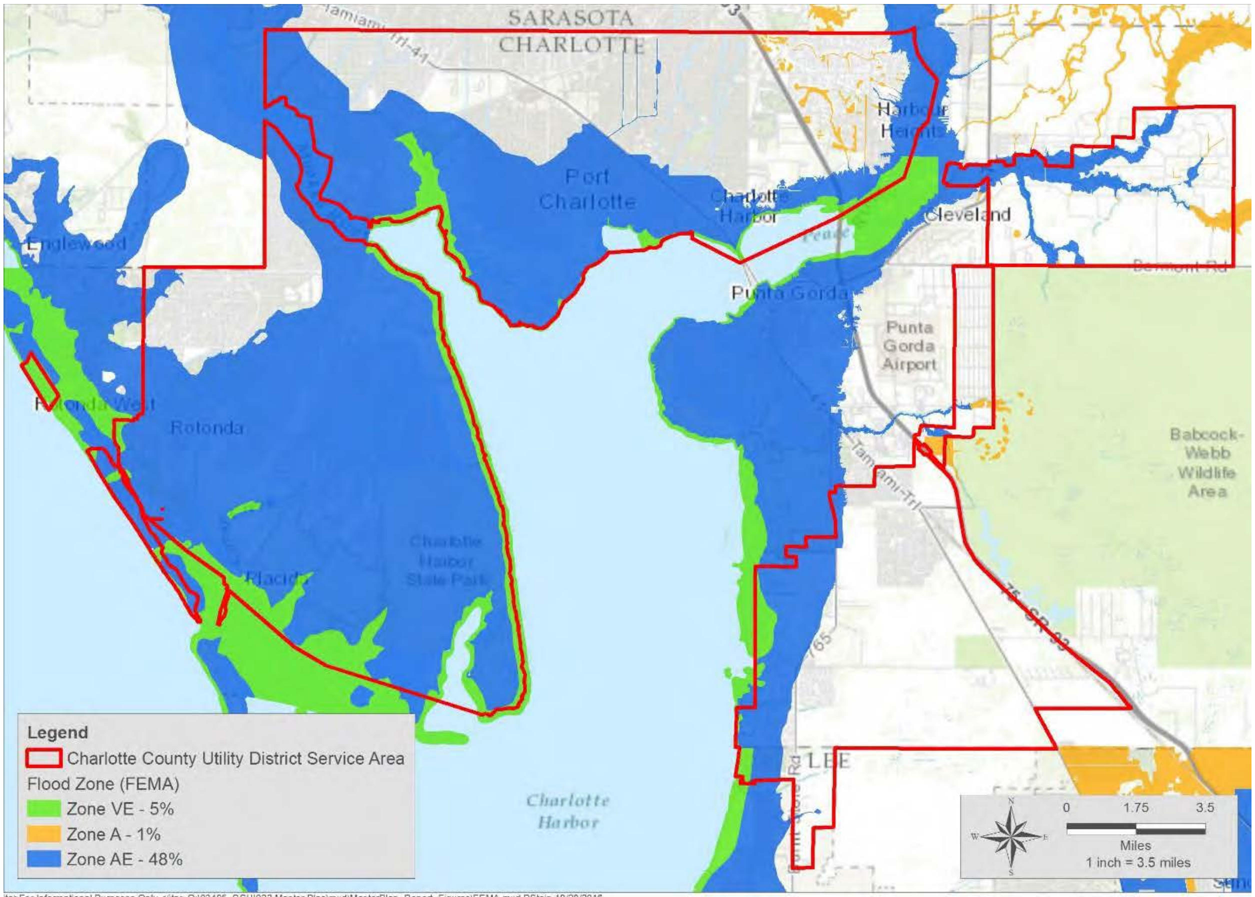
Table 1 Land Uses Within the Service Area (SWFWMD, 2011)

Land Use		Acreage	Percentage (%)
Residential		49,849	32%
Commercial		2,161	1%
Industrial		479	0.3%
Extractive		860	1%
Institutional		883	1%
Recreational		2,446	2%
Open Land		21,325	14%
Agriculture		5,555	4%
Open Land		5,208	3%
Forested Upland		16,472	10%
Streams, Lakes, and Reservoirs		7,572	5%
Bays and Estuaries		9,431	6%
Forested Wetland		19,152	12%
Non-Forested Wetlands		12,809	8%
Tidal Flats		574	0.4%
Disturbed Land		236	0.1%
Transportation, Utilities, and Communications		2876	2%
	TOTAL=	157,888	100%

1.1.2 Floodplains

Flood hazard areas are identified on the Flood Insurance Rate Map as Special Flood Hazard Areas (SFHAs). SFHAs are defined as the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual-chance flood is also referred to as the base flood or 100-year flood. Figure 2 shows that approximately 54-percent of the service area is within Flood Zones A, AE, or VE. Zone A defines areas inundated by 1-percent annual chance flooding, for which no base flood elevations (BFEs) have been determined. Zone AE defines an area inundated by 1-percent annual chance flooding, for which BFEs have been determined. Zone VE defines an area inundated by 1-percent annual chance flooding with velocity hazard (wave action) and for which BFEs have been determined.

Figure 2 Charlotte County Flood Zones (FEMA, 2016)



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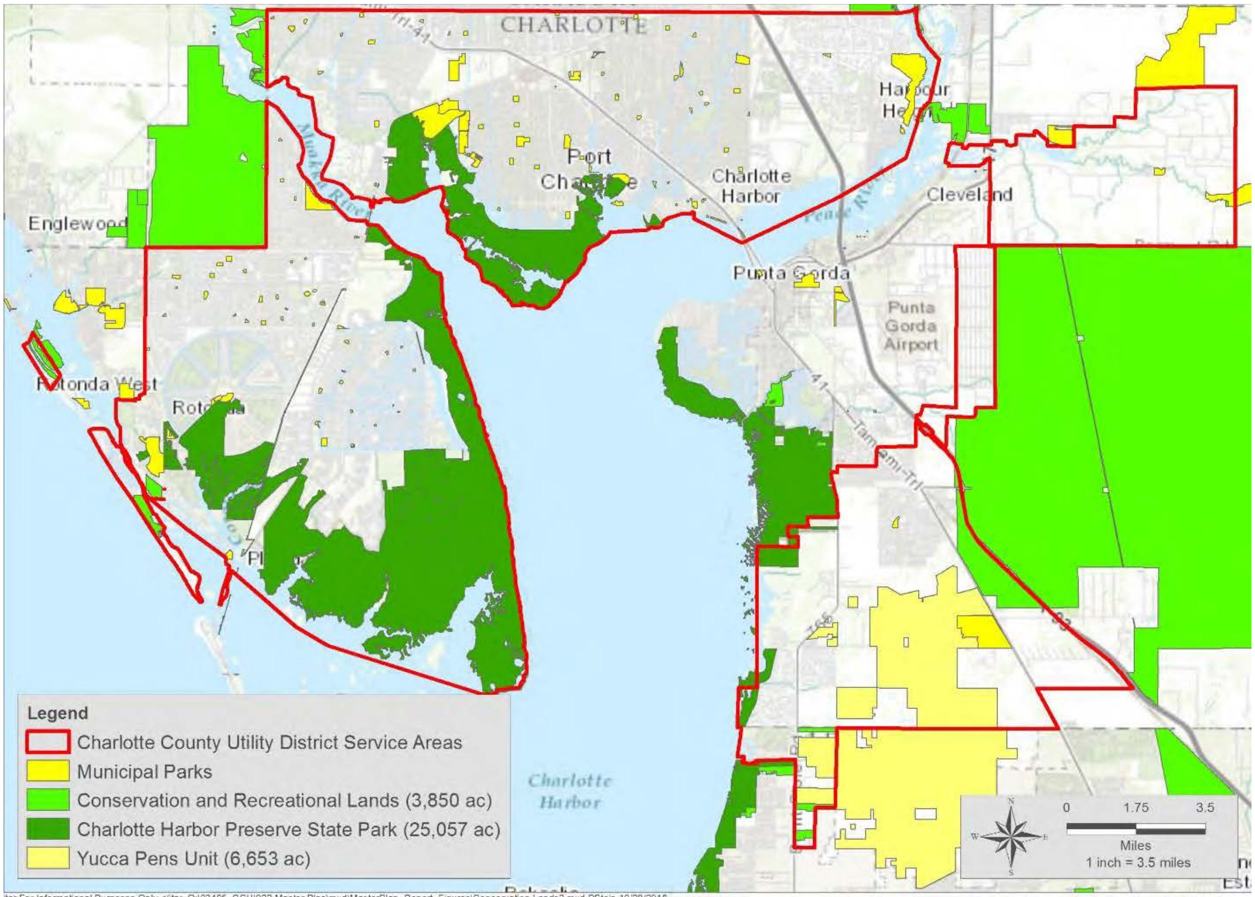
1.1.3 Conservation Lands

The CCUD sewer service area contains several large conservation areas, municipal parks, and the Charlotte Harbor Preserve State Park. The Charlotte Harbor Preserve State Park comprises over 25,000 acres within the service area. The Yucca Pens Unit is over 6,600 acres in the south region of the service area, and numerous small municipal parks are located throughout the service area (Figure 3).

Figure 3 **Conservation Lands Within Charlotte County**



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1.1.4 Air Quality

Charlotte County has been designated an air quality attainment area by the USEPA. The major dischargers of air emissions that could potentially affect the area include Preferred Materials' Placida ready mix plant (EP ID# 10470), Punta Gorda fly ash terminal (EP ID# 16494), Zemel Road solid waste management facility (EP ID# 19277), Punta Gorda plant No. 2 (EP ID# 10448), and DBA Coastal Bridge Company's Asphalt Babe (EP ID# 10471). Transportation-generated pollutants such as carbon monoxide, particulate matter, and hydrocarbons also contribute to local air pollution. Air quality such as ozone and particulate matter is monitored by neighboring Sarasota, Lee, and Highland Counties. There are currently 66 additional Air Resources Management System (ARMS) facilities that have requested stationary sources of air pollutant permits from FDEP's Division of Air Resource Management. Fourteen ARMS facilities are located in West County, 18 in Mid County, and 34 located outside the CCSMP service areas (FDEP, 2017). Given the small number of industries in the Charlotte Harbor area, any decrease in the County's air quality standards will likely be generated by automobiles. In the future, methods to attenuate increased emission levels resulting from an increase in traffic may need to be implemented.

1.2 ENVIRONMENTAL INVENTORY

1.2.1 PHYSIOGRAPHY

1.2.1.1 Soils

A diversity of soil series occur within the CCUD sewer service area. One of the most important soil characteristics is the soil infiltration rate. Infiltration rates determine the amount of runoff from rainfall events because certain soils allow rainwater to infiltrate easier than others. A common way that Civil and Environmental Engineers classify a soil's infiltration capabilities is by assigning the soil a grade of either "A", "B", "C", or "D".

- Group A soils mainly consist of deep, well drained to excessively drained sands or gravelling sands. This soil type experiences low runoff potential and a high rate of water transmission and infiltration (USDA, 2007).

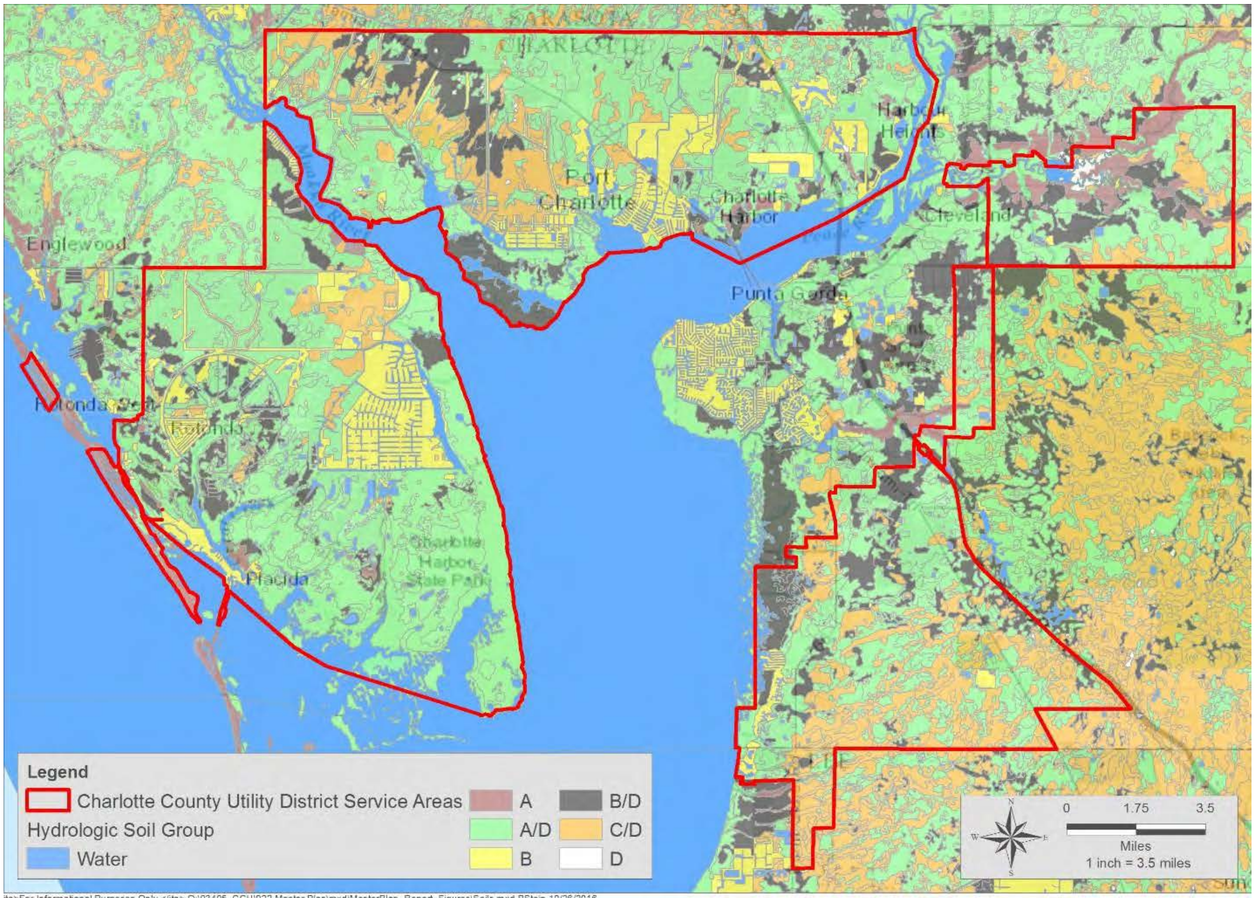
- Group B soils mainly consist of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. The soil experiences a moderate rate of water transmission and infiltration.

- Group C soils have a slow infiltration rate, consist of soils that impede downward movement, and have moderately fine or fine texture.

- Group D soils chiefly consist of clay that have a high shrink-swell potential, soils with a high water table, soils that have a clay layer near the surface, or soils that are shallow over nearly impervious material. These attributes cause the soil to have very slow infiltration rates and increase the runoff potential of the soil which can contribute to local flooding.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes. Figure 4 shows that the service area is dominated by Hydrologic Soil Group A/D indicating that the water is typically within 24 inches of the soil surface and are in a drained state.

Figure 4 Hydrologic Soil Groups Within Charlotte County



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1.2.1.2 Geology

In descending order, the following geologic units are typically found within the upper 1500 feet of sedimentary rock beneath Charlotte County: undifferentiated sands, the Caloosahatchee Marl, the Tamiami Formation, the Hawthorn Group (includes the Tampa Member of the Arcadia Formation); the Suwanne Limestone; the Ocala Limestone, and the Avon Park Formation (Sutcliffe, 1975; Arthur et al., 2008).

The thickness and depth of each unit varies markedly throughout the County. The undifferentiated sands are generally less than 25 feet thick and overlie the shell, sand, marl, and limestone of the Caloosahatchee Marl. The thickness of the Caloosahatchee Marl ranges from 0 to 50 feet (Sutcliffe, 1985). The formation unconformably overlies the Tamiami Formation, which consists of clay, marl sand, and thin beds of limestone. The thickness ranges from 0 to 150 feet. All units, except the limestone are unconsolidated and slightly phosphatic (Sutcliffe, 1975). The Hawthorn Group disconformably underlies the Tamiami Formation. The upper part of the formation consists principally of beds of sandy, phosphatic limestone; dolomite; and sandy, chalky to granular phosphatic marl and clay (Wolansky, 1983). The lower part is usually a more dolomitized and crystalline limestone with less clayey sand and sandy clay than the upper part. The Tampa Member of the Arcadia Formation makes up the base of the Hawthorn Group. A sand and clay unit that occurs about 50 to 100 feet below the top of the Tampa Member represents the base of the lower Hawthorn-upper Tampa aquifer, and a sandy limestone of the Tampa Member represents the top of the Floridan Aquifer System (FAS) (Arthur et al., 2008).

The units below the Hawthorn Group consist chiefly of limestone and dolomite, with the sequence becoming more dolomitic with depth. The Suwannee Limestone consists of tan to creamy white limestone, sandy limestone, and sand. The Ocala Limestone is a tan chalky limestone that darkens and is dolomitized near the base. The Avon Park Formation consists of tan to dark-brown dolomite and hard limestone.

1.2.1.3 Hydrostratigraphy

Charlotte County is relatively flat and is drained by two major rivers, the Maykka and Peace River, and many small streams and canals. The hydrogeologic framework consists of the surficial aquifer, intermediate aquifers and confining beds, Floridan aquifer, and lower confining bed (or base of the Floridan aquifer). The surficial and intermediate aquifers are the major sources of public water supplies because water in the Floridan aquifer, the principal aquifer in most of the State, yields relatively poor-quality water (Wolansky, 1983).

The surficial aquifer consists primarily of permeable units of the surficial deposits and the Caloosahatchee Marl. Permeable units near the top of the Tamiami Formation may also be hydraulically connected to the surficial aquifer. The surficial aquifer is generally unconfined; however, local confined lenses occur. The surficial aquifer extends 20 to 50 feet below surface and regionally thickens to the east and south. The transmissivity of the surficial aquifer is generally higher in the west portion of the County where the aquifer contains highly permeable shell beds. The base of the surficial aquifer generally consists of clayey sand and sandy clay in the upper part of the Tamiami Formation in the south or similar lithologies in the lower part of the Caloosahatchee Marl in the north (Wolansky, 1983).

The depth to the water table of the surficial aquifer is generally about 5 to 10 feet. In areas of high altitude (greater than 40 feet) and well-defined drainage channels, such as in east Charlotte County, the water table may be more than 15 feet below land surface; in areas of low topographic relief and near the coast, the water table may be less than 1 foot below land surface. Fluctuations in the water table in the surficial aquifer are generally seasonal and vary by approximately 5 feet. The lowest water table occurs during the spring and the annual high is typically in September or October (Wolansky, 1983).

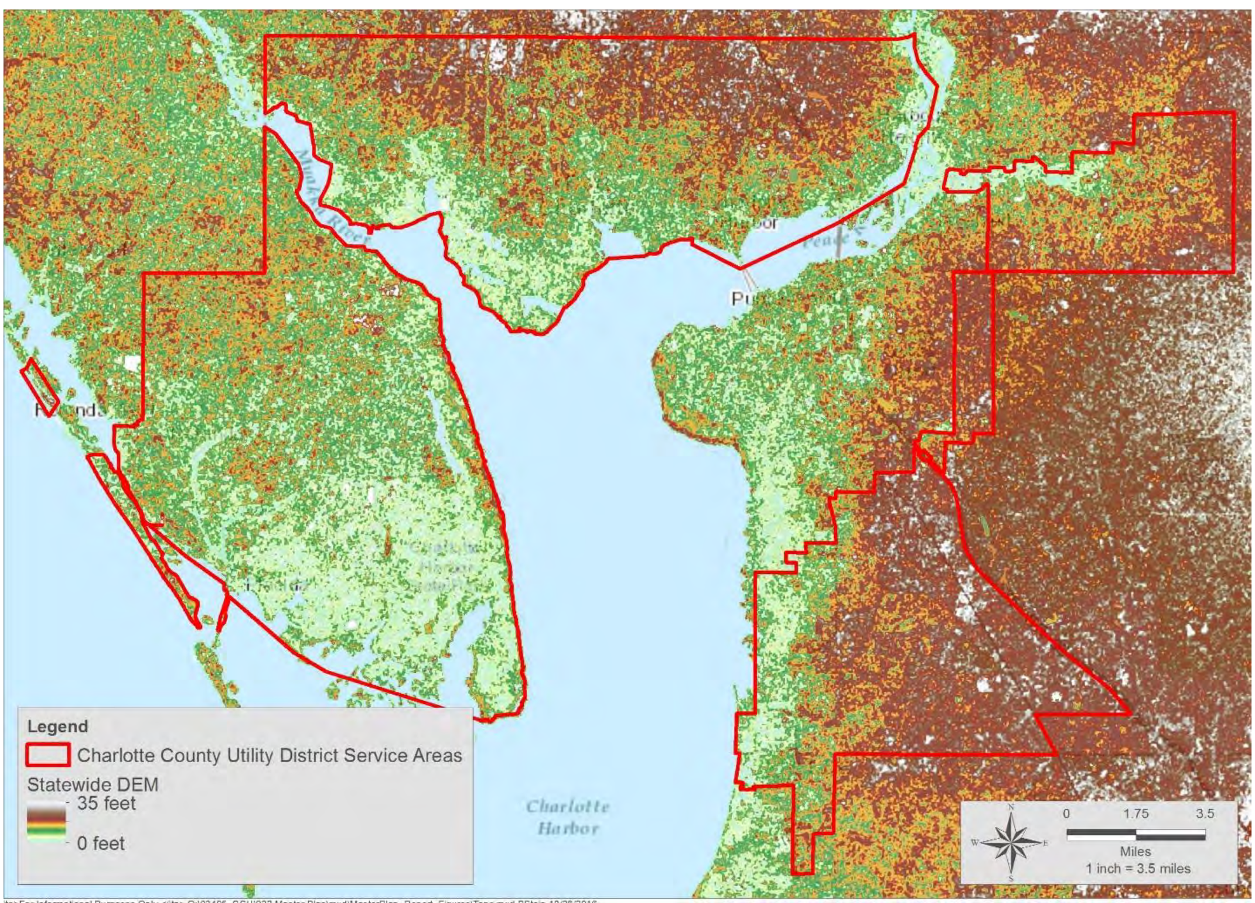
In the central and west portions of Charlotte County, the intermediate aquifer system has three recognized aquifers defined as the upper, middle, and lower permeable zones. These zones are referred to as PZ1, PZ2, and PZ3, and are separated by varying thicknesses of low-permeability confining units (SWFWMD, 1987). Intermediate confining beds consisting of sandy clay, clay, and marl are found at the base of the surficial aquifer in the upper part of the Tamiami Formation; between the upper and lower parts of the Hawthorn Formation, and generally 50 to 100 feet below the top of the Tampa Limestone (Wilson, 1977). The intermediate confining beds retard vertical movement of groundwater between the surficial and the Floridan aquifers. The thickness of the intermediate aquifers and confining beds generally increases from north to south. The potentiometric head of the intermediate aquifers generally range from about 30 feet above land surface along the coast to about 20 feet below land surface in the highest areas of the County (Sutcliffe, 1975).

Groundwater conditions vary widely within the County. Suttcliffe (1975) divided the County into four hydrologic areas (A-D). The West County service area is in the peninsular part of the County and falls within hydrologic area A. In this area, the only source of fresh water is the shallow water-table aquifer. The aquifer is 25 to 50 feet thick and is subject to saltwater intrusion during high storm events. The Mid County service area is in Area B, which lies between the Myakka and Peace Rivers. The water-table aquifer in this area ranges from 20 to 60 feet thick and consists of mainly fine to medium sand with locally interbedded gravel and shell. The hydraulic conductivity of this area may be greater than Area A due to the local presence of gravel and shell units. The water table ranges from 0 to 25 feet above mean sea level with elevations increasing to the north. Canals cut inland have allowed salt-water intrusion of the surficial aquifer. Controls have been installed in the canals to prevent intrusion south of US Highway 41. The three intermediate aquifers present below Area B are under artesian conditions. Water quality in the intermediate aquifers generally does not meet drinking water standards, but in some areas is suitable for irrigation. Water quality is poorer in the lower intermediate aquifer and a strong upward gradient occurs between aquifers. Therefore, wells penetrating the lower and middle aquifers have allowed salt-water intrusion into the overlying aquifer. The South County service area is in hydrologic Area C. The surficial aquifer in this area consists of sand and discontinuous shell beds. Wells tapping lower aquifers have also allowed for salt-water intrusion in this area. In the east portions of Area C, the water quality in the upper intermediate aquifer is suitable for domestic use and irrigation; however, the west portion generally does not meet drinking water standards. The water quality is poorer in the lower aquifers, but has been historically used for flood irrigation. Rainfall generally flushes the salts from the soil, preventing an accumulation that would not be tolerated by crops.

1.2.1.4 Topography

The topography of the service area varies from 35 feet North American Vertical Datum of 1988 (NAVD88) down to sea level (Figure 5). Elevations above 30 feet are restricted to the north and east regions of the service area. A large portion of the west service area has elevations below 10 feet NAVD88.

Figure 5 Charlotte County Topography



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1.2.2 Climate and Precipitation

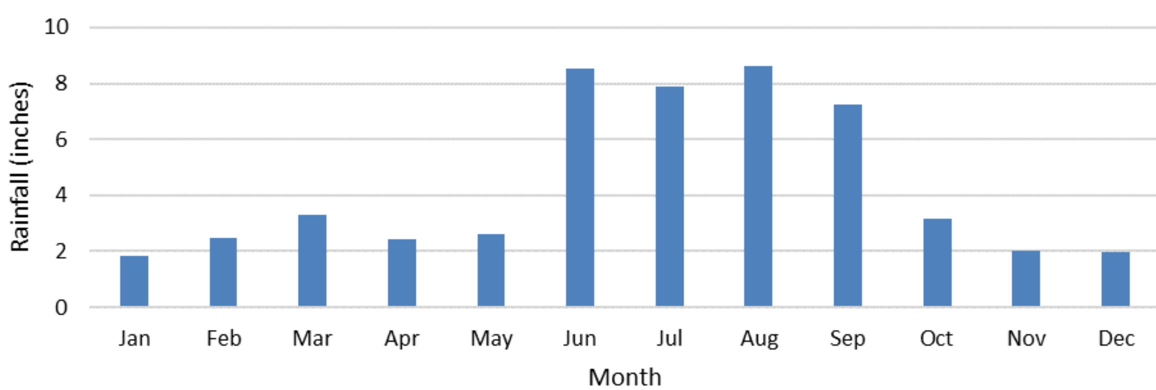
1.2.2.1 Temperature

Charlotte County has a warm subtropical climate with high relative humidity, short mild winters, and long warm summers. The prevailing gulf breezes usually subdue extreme temperatures in the summer and winter. Temperatures display little day-to-day variation in this general area during the summer months, June through September. Daily maximums during this period average near 92°F with daily minimums averages of 73°F. Daily maximum temperatures during December, January, and February average close to 75°F. Daily minimum temperatures in winter range from between 52° and 54°F. An occasional cold wave of the more severe type brings minimum temperatures down to the middle and high 20s. The average low and high temperatures in Charlotte County are 63°F and 84°F, respectively (NOAA, 2016).

1.2.2.2 Rainfall Patterns

The summer shower season occasionally begins in late May and typically lasts through September. Most of the summer rains fall during local afternoon or evening showers. Showers occasionally are locally heavy and sometimes produce 3 or more inches of rain in an hour or two. Rainfall in the fall, winter, and spring seasons is much less frequent than in summer. Average monthly precipitation varies from 1.7 to 8.5 inches. Tropical storms and hurricanes also affect this area at irregular intervals. These storms usually occur during the summer and fall months and cause widespread heavy rainfall and flooding. Figure 6 shows the average monthly rainfalls for Charlotte County.

Figure 6 Average Monthly Rainfall in Charlotte County

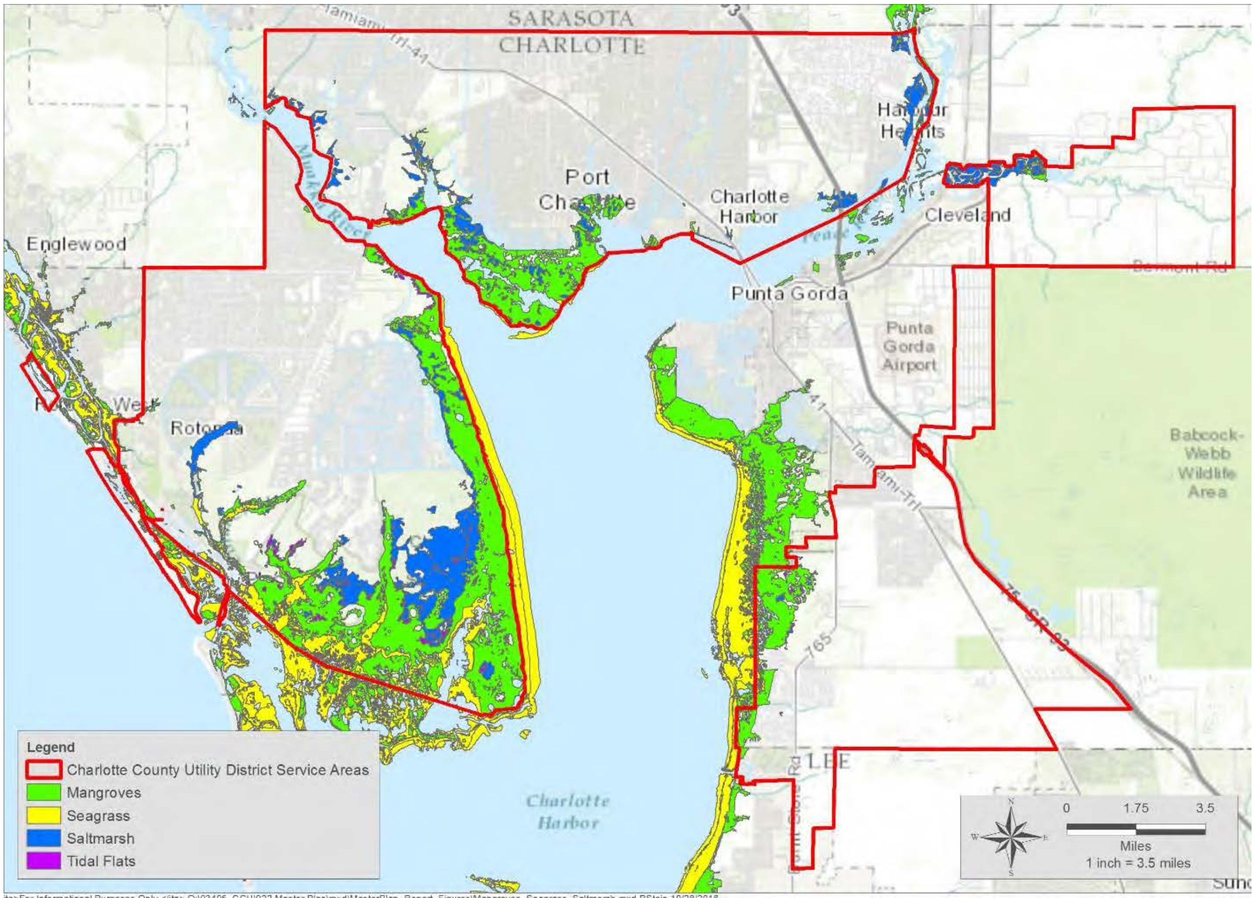


1.2.3 Biological Resources

1.2.3.1 Sensitive and Critical Habitats

Several habitats found in Charlotte County support listed wildlife species such as xeric scrub and wetlands. Additionally, coastal habitats such as mangroves, salt marsh, and oyster reefs located at the mouth of the Myakka and Peace Rivers and in Charlotte Harbor are critical areas that support local fisheries and other animals (Figure 7). Charlotte Harbor Estuary is a natural estuary spanning the west coast of Florida from Venice to Bonita Springs on the Gulf of Mexico and is one of the most productive wetlands in Florida. Shallow, near-shore shoals sustain an abundance of seagrasses, oysters, and mudflats. This variety of habitats support more than 100 invertebrate species, 200 fish species, and 150 shore and wading bird species.

Figure 7 Sensitive Habitats in Charlotte County



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In 1995, then-Governor Lawton Chiles nominated Charlotte Harbor as an "estuary of national significance." Because of this nomination, Charlotte Harbor was accepted into the National Estuary Program, becoming one of 28 other watersheds in the United States so designated. The Charlotte Harbor National Estuary Program (CHNEP) held its kickoff ceremony in September 1996 and began the process of writing a regional Comprehensive Conservation and Management Plan. Local problems were identified, goals were established, information was collected, and special projects were funded. The 20-year Comprehensive Conservation and Management Plan (CCMP) identifies the region's common priority environmental issues and the actions needed to solve them. The CCMP was accepted in 2001, marking the beginning of action to protect and restore the estuary and its watershed. It was updated in 2008 and again in 2013.

1.2.3.2 Listed Wildlife and Protected Species

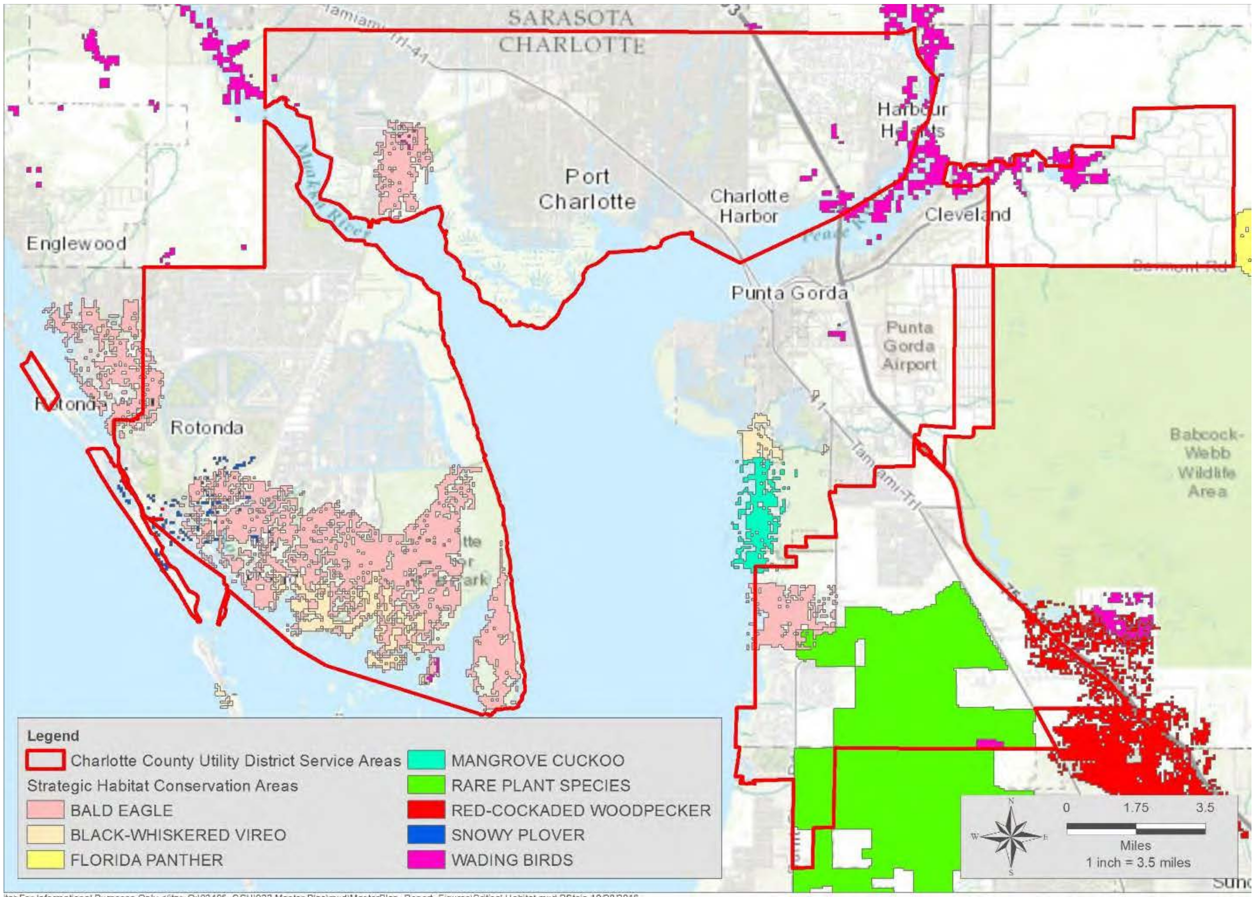
Charlotte County has 35 species that are Florida-listed as Species of Special Concern (14), Threatened (15), or Endangered (6), and Federally listed as Threatened or Endangered (Table 2) and range throughout the County (Figure 8). Over half of these are bird or bat species. The primary species that affect development and require state or federal agency consultation or permitting are the Florida scrub-jay, wood stork, bald eagle, several sea turtles, gopher tortoise, and Eastern indigo snake. The following section provides a brief description for each of these species.

Table 2 Summary of Listed Wildlife Species that Occur in Charlotte County

Scientific Name	Common Name	Federal Status*	State Status*
Acipenser oxyrinchus desotoi	Gulf Sturgeon	T	FT
Lithobates capito	Gopher Frog		SSC
Caretta caretta	Loggerhead Sea Turtle	T	FT
Chelonia mydas	Green Sea Turtle	T	FT
Dermochelys coriacea	Leatherback Sea Turtle	E	FE
Drymarchon corais	Eastern Indigo Snake	T	FT
Gopherus polyphemus	Gopher Tortoise	C	ST
Lepidochelys kempii	Kemp's Ridley Sea Turtle	E	FE
Pituophis melanoleucus	Pine Snake		SSC
Aphelocoma coerulescens	Florida Scrub-Jay	T	FT
Aramus guarauna	Limpkin		SSC
Athene cunicularia floridana	Florida Burrowing Owl		SSC
Caracara cheriway	Crested Caracara	T	FT
Charadrius melodus	Piping Plover	T	FT
Charadrius nivosus	Snowy Plover		ST
Egretta caerulea	Little Blue Heron		SSC
Egretta thula	Snowy Egret		SSC
Egretta tricolor	Tricolored Heron		SSC
Eudocimus albus	White Ibis		SSC
Falco sparverius paulus	Southeastern American Kestrel		ST
Grus canadensis pratensis	Florida Sandhill Crane		ST
Haematopus palliatus	American Oystercatcher		SSC
Mycteria americana	Wood Stork	T	FT
Pandion haliaetus	Osprey		SSC
Picoides borealis	Red-cockaded Woodpecker	E	FE
Platalea ajaja	Roseate Spoonbill		SSC
Rynchops niger	Black Skimmer		SSC
Sternula antillarum	Least Tern		ST
Eumops floridanus	Florida bonneted bat	E	FE
Neovison vison	Southern Mink		ST
Podomys floridanus	Florida Mouse		SSC
Puma concolor coryi	Florida Panther	E	FE
Sciurus niger avicennia	Mangrove Fox Squirrel		ST
Sciurus niger shermani	Sherman's Fox Squirrel		SSC
Trichechus manatus	West Indian Manatee	E, PT	FE

C = Candidate for Listing; E = Endangered; FE = Federally Endangered; FT = Federally Threatened; PT = Proposed Threatened; Potential Threatened; SSC = Species of Special Concern; ST = State Threatened

Figure 8 Habitat Conservation Areas in Charlotte County



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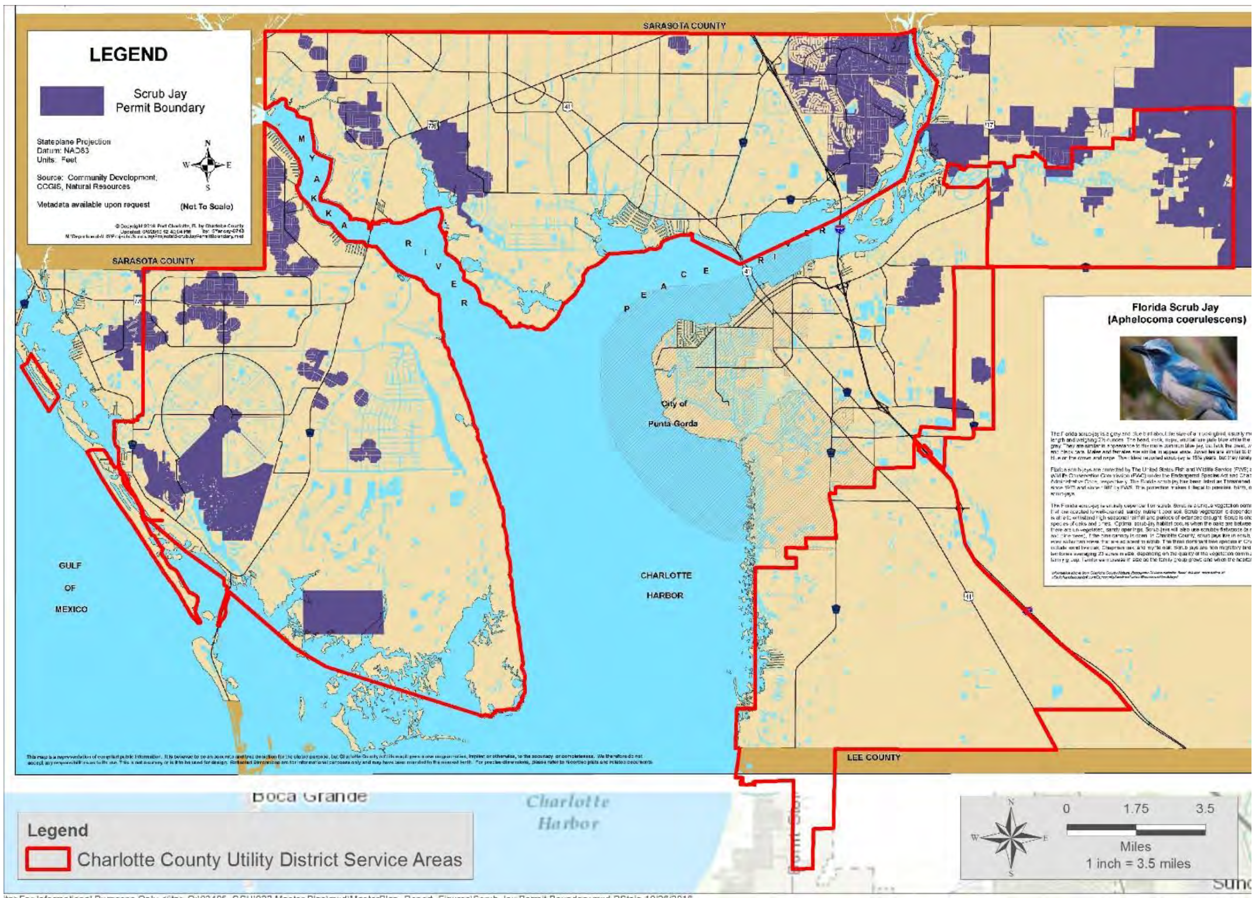
A. Florida Scrub-Jay

The Florida scrub-jay is an omnivorous gray and blue bird about the size of a mockingbird, usually measuring 10 to 12 inches in length and weighing 2½ ounces. The head, neck, nape, and tail are pale blue while the back and belly are pale gray. They are similar in appearance to the more common blue jay, but lack the crest, white tipped feathers, and black bars. Males and females are similar in appearance, and they form monogamous pairs.

The Florida scrub-jay is entirely dependent on scrub. Scrub is a unique vegetation community composed of plants that are adapted to well-drained, sandy, nutrient-poor soil. Scrub vegetation is dependent on periodic wildfire and is able to withstand high seasonal rainfall and periods of extended drought. In Charlotte County, scrub-jays live in scrub, scrubby flatwoods, and even suburban areas that are adjacent to scrub. The three dominant tree species in Charlotte County that occur in scrub are sand live oak, Chapman oak, and myrtle oak. Scrub-jays are non-migratory birds that defend permanent territories averaging 23 acres, depending on the quality of the vegetation community and the size of the family group. Territories increase in size as the family group grows and when the habitat is not optimal.

In 2013, Charlotte County was issued an Incidental Take Permit (ITP) and associated Habitat Conservation Plan (HCP) by the US Fish and Wildlife Service (USFWS) to address impacts to the state and federally protected Florida scrub-jay (CCPNRD, 2013). The HCP was developed as an effort to reduce and streamline the regulatory burden, provide regulatory certainty to land owners in Charlotte County, and will remain static for the 30-year duration of the ITP/HCP. The HCP defines a habitat reserve network to help ensure the long-term survival of the Florida scrub-jay and establishes a development fee system to implement the Plan for the 30-year duration of the ITP (Figure 9). Additionally, the County established a scrub-jay property search for the public to determine if a property is subject to the conditions of the HCP.

Figure 9 Scrub-Jay Permit Boundary



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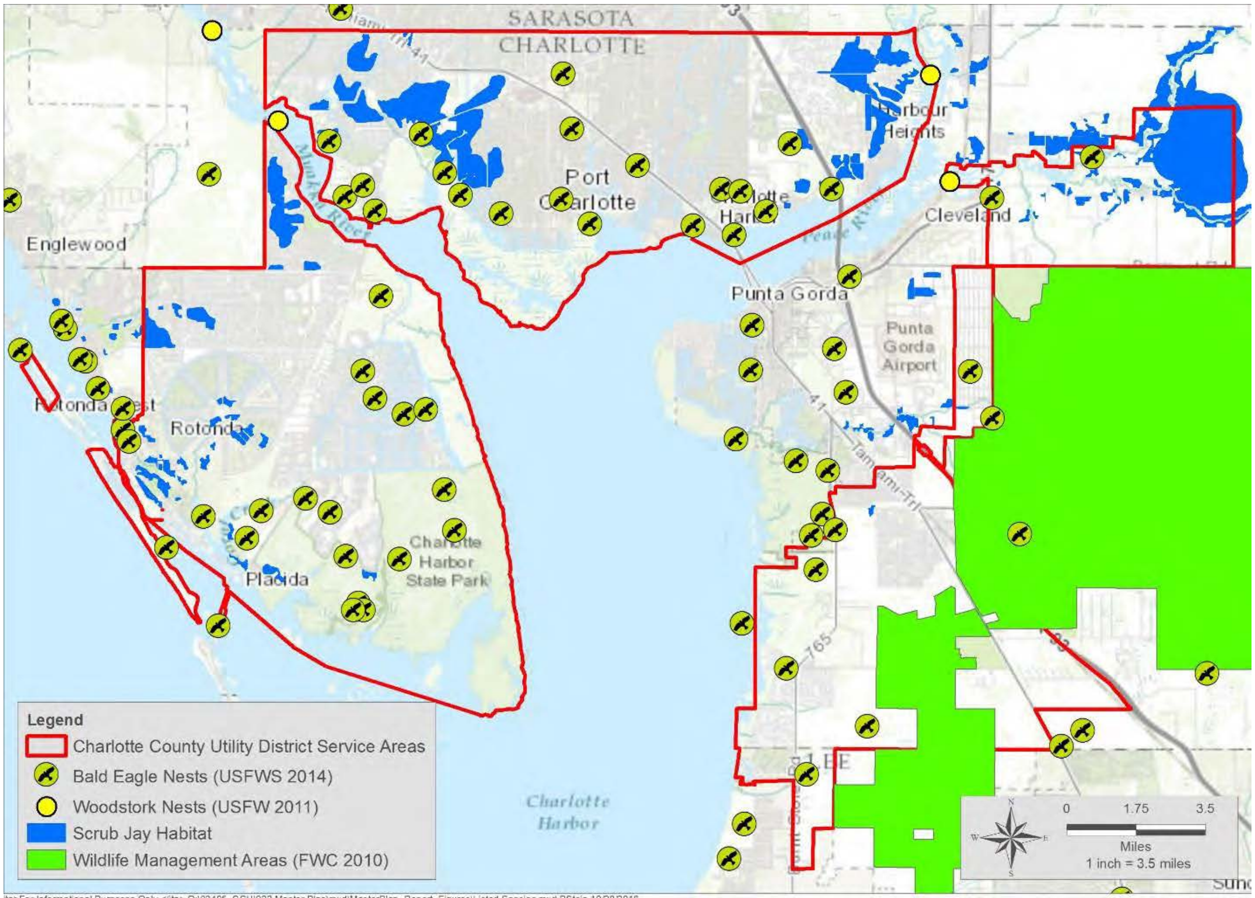
B. Wood Stork

Like many Florida birds associated with wetlands, the Wood Stork has suffered from the destruction and degradation of our state's wetlands. Today, the Wood Stork is classed "Threatened" by the State of Florida, and activities that may affect this species are regulated by the USFWS. Wood storks feed in shallow water, stirring the bottom with its unlikely pink feet and snapping up small prey that are unlucky enough to encounter the bird's sensitive bill. They nest in early spring, just in time for the traditional season of lowest water when prey items will be concentrated in shrunken wetlands, providing good hunting so the storks can feed their young. Figure 10 shows several wood stork nests have been documented within or near the service area. Since wood storks regularly forage in man-made ditches and swales, CCUD projects could be affected by this species. Determinations regarding whether wood stork impacts will occur is assessed via Section 7 USFWS consultation that occurs after a permit application has been submitted to the US Army Corps of Engineers (USACE).

Figure 10 Listed Species Locations Within Charlotte County



C. Bald Eagle

The bald eagle, our national bird, is a conservation success story. While no longer listed under the federal Endangered Species Act or state imperiled species rule, bald eagles remain protected by the state eagle rule (Florida Administrative Code [FAC] Rule 68A-16.002) and federal law. The USFWS removed the bald eagle from the federal endangered and threatened species list in 2007. The USFWS continues to manage eagles under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Bald eagles are continuing to make a recovery in Florida. Latest estimates show 1,457 active bald eagle nests in Florida according to the Florida Fish and Wildlife Conservation Commission (FFWCC). In 1973, there were 88 active nests.

Federal and state guidelines created buffers around eagle nests in which activities such as development or logging were restricted. Two buffer zones were established: a primary zone (0 to 750 through 1,500 feet from the nest) and a secondary zone (1,500 feet to 1 mile beyond the end of the primary zone). Recently, the USFWS (2007) published new federal guidelines that recommend a buffer zone that extends up to 660 feet from the nest.

The bald eagle nesting season is October 1 through May 15, and numerous nests are located within the CCUD service areas (Figure 10). If an eagle or eagle nest may be affected by the proposed project, it may be necessary to obtain both a federal and state eagle permit. Activities should be scheduled outside the nesting season to avoid disturbance. Activities that do not require a permit include (1) those conducted at any time more than 660 feet from an eagle nest, (2) any temporary activity conducted at any distance from a nest outside the nesting season, or (3) any activity conducted consistent with the FFWCC Eagle Management Guidelines.

D. Sea Turtles

Five of the world's eight remaining sea turtle species – the loggerhead, green, leatherback, hawksbill, and Kemp's ridley – may be found in Florida's coastal waters. Four of these species are classified as endangered in Florida by federal and state governments; the loggerhead is listed as threatened.

Each year, female sea turtles crawl onto the County's beaches to lay their eggs in the loose dune sands. Several types of human activities can interfere with nesting activity and the ability of hatchlings to find their way into the Gulf and is the #1 cause of hatchling mortality. Night pedestrian traffic can cause adult turtles to return to the ocean without nesting. Coastal development and beach nourishment activities that compact the sands can be equally detrimental. To address these problems, Charlotte County adopted a Sea Turtle Protection Ordinance (Ordinance 89-31) that provides standards and criteria for coastal development, obstructions on the beach such as beach furniture, and prohibits artificial light on the nesting zone during the nesting season.

In May 1989 and later amended in June 1998, Charlotte County adopted a Sea Turtle Protection Ordinance (Article XII) for the protection of sea turtle nesting. In 2005, the Sea Turtle Management Plan was developed to provide clarification and supplemental information on Article XII, Sea Turtle Protection Ordinance. The intent of this Plan was to provide a balance between the needs of residents and visitors and the threatened and endangered sea turtles. This document was also designed to provide the beachfront community a greater understanding of how the County will implement the Sea Turtle Protection Ordinance.

E. Gopher Tortoise

The gopher tortoise is a medium-sized land tortoise that averages 9 pounds and is usually 9 to 11 inches long. The gopher tortoise lives as long as 40 to 60 years under natural conditions and up to 100 years in captivity. Gopher tortoise populations in Florida have decreased by an estimated 30 percent in recent years. Gopher tortoises are protected by USFWS and FFWCC under the Endangered Species Act and Chapter 39, FAC, respectively. USFWS and FFWCC list the gopher tortoise as threatened, making it illegal to possess, harm, or harass gopher tortoises.

Gopher tortoises can be found in a variety of upland vegetation communities. Within the wastewater masterplan service area, gopher tortoises can be found in pine flatwoods, oak hammocks, scrub, and even on the beach. In urban-suburban areas, they can be found in fields, pastures, and roadsides. Their main requirements include well-drained sandy soil, herbaceous ground cover, and open spaces in the tree canopy where sunlight can penetrate through to the ground. The average home range for males is approximately 2-1/2 acres and 1/2 acre for females. The home ranges of different individuals often overlap.

The biggest threat to the gopher tortoise is loss of habitat due to construction of buildings and roads. As development increases, habitats become fragmented and can lead to isolation of populations or leave individuals without mates. Vehicles hit and kill many gopher tortoises. Additionally, fire suppression causes vegetation to become too thick, altering the physical structure of the habitat and screening out the vegetation that the tortoises eat. Other threats to the gopher tortoises include free-ranging or feral cats and dogs that eat many young tortoises and eggs.

F. Eastern Indigo Snake

Eastern indigo snakes are protected by USFWS and FFWCC under the Endangered Species Act and Chapter 39, FAC, respectively. The Eastern indigo snake has been listed as Threatened since 1971 by Florida and since 1978 by USFWS. This protection makes it illegal to possess, harm, or harass Eastern indigo snakes.

The Eastern indigo snake is the longest non-venomous snake in North America. Historically, the range of the Eastern indigo snake included the coastal plain of the southeastern United States, from South Carolina through Florida. The Eastern indigo snake can be found in a variety of upland and wetland vegetation communities. Within the wastewater masterplan service area, they can be found in pine flatwoods, oak hammocks, scrub, and along fresh water marshes and riverine systems. In south Florida, Eastern indigos are found in hardwood hammocks, fresh water marshes, and mangrove swamps. In north and central Florida, indigo snakes are found primarily in dry vegetation communities including scrub and pine flatwoods, where they use gopher tortoise burrows. Gopher tortoise burrows are used throughout their range to keep warm during the winter and to keep cool and prevent dehydration in the summer. In wetter areas, and those that lack gopher tortoise burrows, indigo snakes use armadillo holes, hollow logs, or other holes for dens. Home range size is highly variable; the home range of adult males in south Florida averages 180 to 470 acres and adult females usually have home ranges of 45 to 120 acres.

The Eastern indigo snake requires large amounts of undeveloped land. The largest threat to the Eastern indigo snake is loss of habitat due to construction of buildings and roads. As development increases, habitats become fragmented and can lead to the isolation of populations or leave individuals without mates. Vehicles hit and kill Eastern indigo snakes as they cross roads within their home ranges or as they warm themselves on the pavement. The County's 2013 Florida scrub-jay HCP also covers the Eastern indigo snake.

1.2.4 Water Resources

The main federal regulation governing wastewater collection and treatment is the Clean Water Act (CWA), which was enacted in 1972 by the USEPA. Under the CWA, the National Pollutant Discharge Elimination System (NPDES) program was established. Water quality standards and total maximum daily loads (TMDLs) are now regulated under federal and state agencies. Under Section 303(d) of the federal Clean Water Act and the Florida Watershed Restoration Act, TMDLs must be developed for all waters that are not meeting their designated uses and, consequently, are defined as "impaired waters."

The CWA requires that the surface waters of each state be classified according to designated uses. Florida has six classes with associated designated uses, which are arranged in order of the degree of protection required (FDEP, 2015). The classification and their uses include:

- Class I – Potable Water Supplies
- Class II – Shellfish Propagation or Harvesting
- Class III – Fish Consumption, Recreation, Propagation and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife
- Class III-Limited – Fish Consumption; Recreation or Limited Recreation; and/or Propagation and Maintenance of a Limited Population of Fish and Wildlife
- Class IV – Agricultural Water Supplies
- Class V – Navigation, Utility and Industrial Use

Figure 11 identifies the surface water classifications within Charlotte County.

Figure 11 Charlotte County Water Body Classification

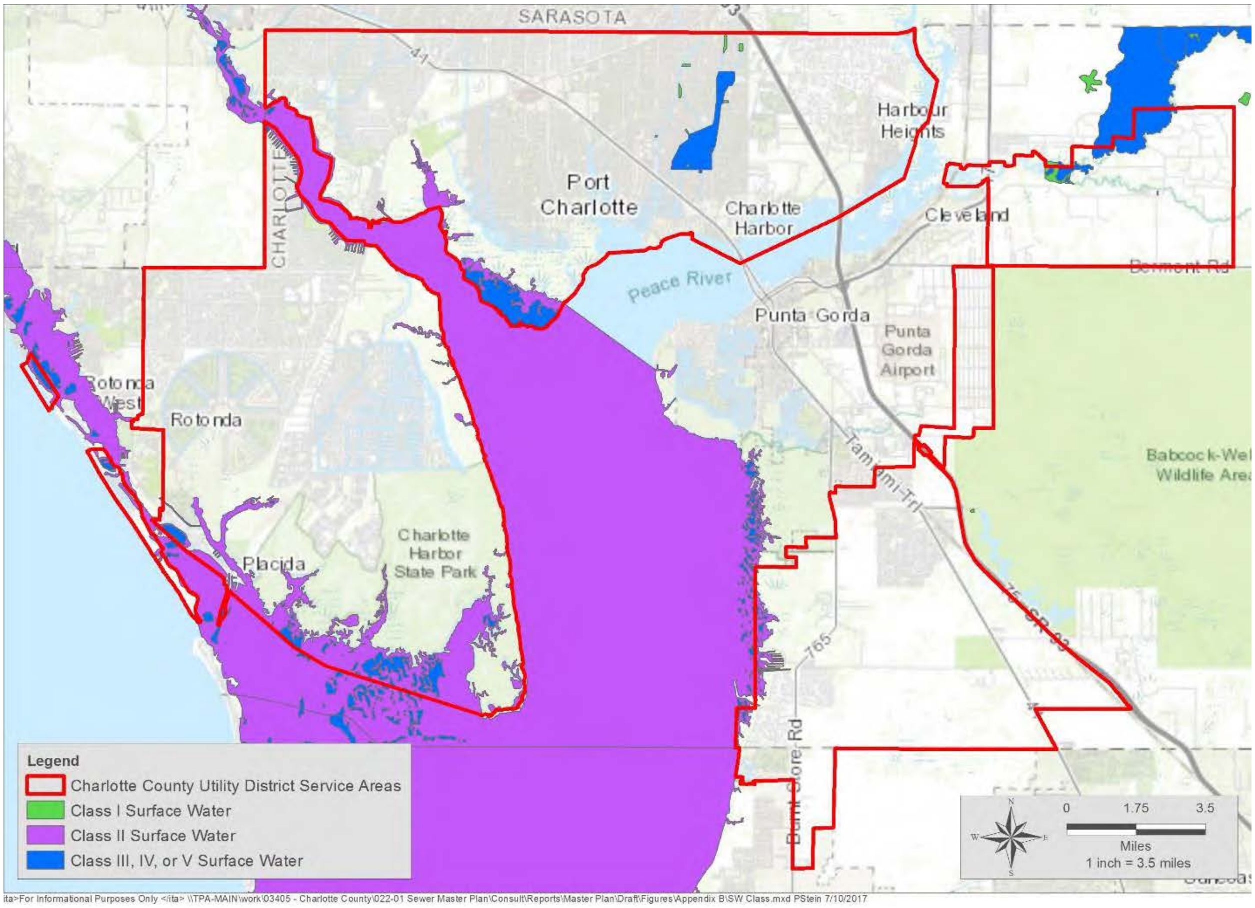
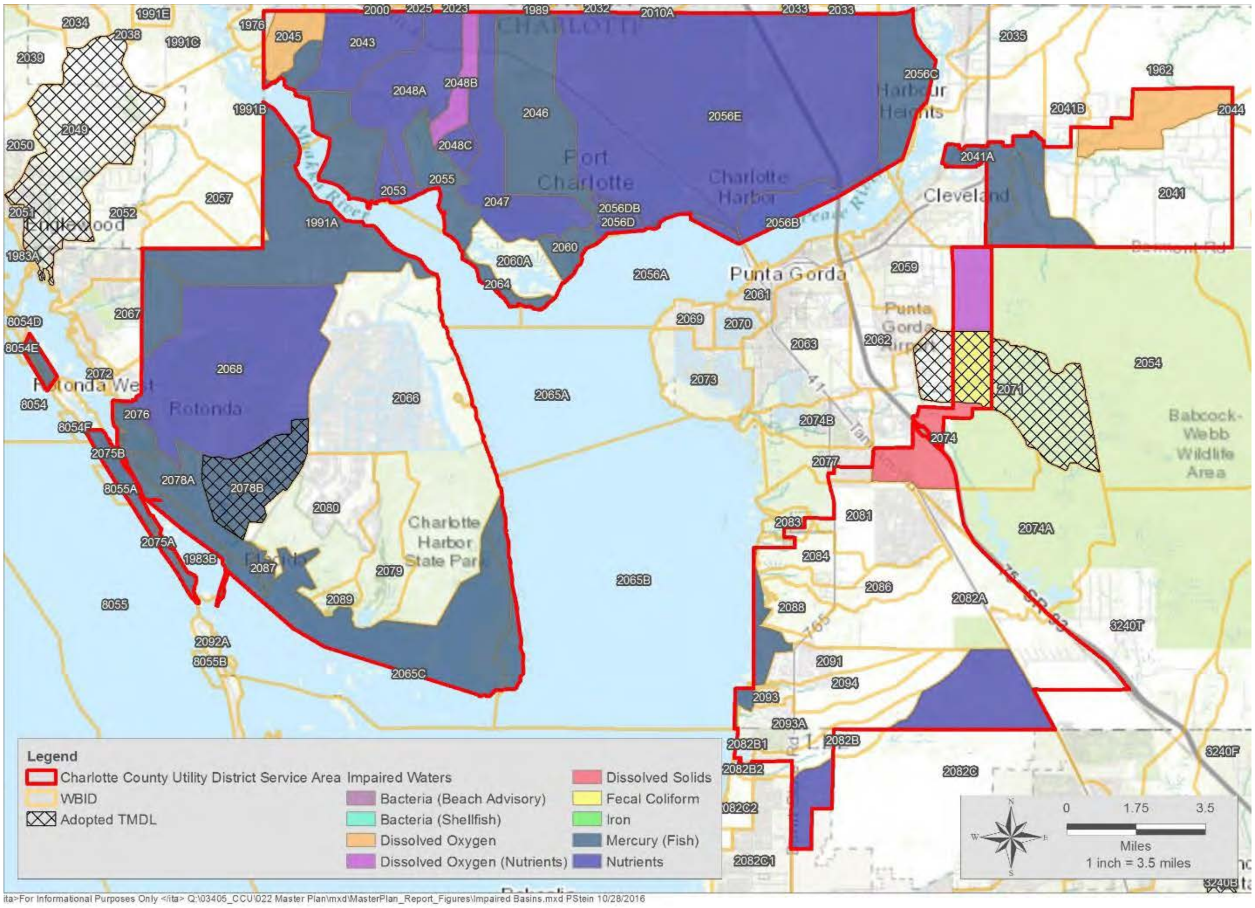


Figure 12 identifies the Water Body Identification (WBID) numbers within the Charlotte County region and displays the type and location of currently listed impaired waters under the FDEP Impaired Water Rule (FDEP, 2017). The type of impairments include:

- Bacteria on Beaches
- Bacteria in Shellfish
- Dissolved Oxygen
- Dissolved Oxygen For Nutrients
- Dissolved Solids
- Fecal Coliform
- Iron
- Mercury in Fish Tissue
- Nutrients (Chlorophyll-a, Total Nitrogen)

The location of the WBIDs that have adopted TMDLs within the CCUD's service area is also provided.

Figure 12 Charlotte County TMDLs and NNCs (CHWA, 2016)



There are a number of potential future regulations that could impact the collection and treatment of the County's wastewater, that should continue to be monitored. These include the following:

- State Safety Oversight (SSO) Rule
- Capacity, Management, Operation, and Maintenance (CMOM) Component
- Water Quality Standards
- Secondary Treatment Definition
- Nutrient Numerical Criteria (NNC)

1.3 Cultural Resources

There are many significant archaeological and historical sites located within Charlotte County. Figure 13 provides the locations of historical structures, bridges, districts, landscapes, and linear features located within Charlotte County. The location of archaeological sites and historical cemeteries have not been displayed due to the sensitive nature of the data; however, approximately 57 sites and cemeteries have been identified by the Florida Division of Historical Resources within Charlotte County. Table 3 lists the number of Florida-registered historical and cultural resources in the sewer areas of Charlotte County. Additionally, 17 of these resources have been recognized on the National Register of Historic Places (NRHP).

Figure 13 **Charlotte County Culture Resource Locations**

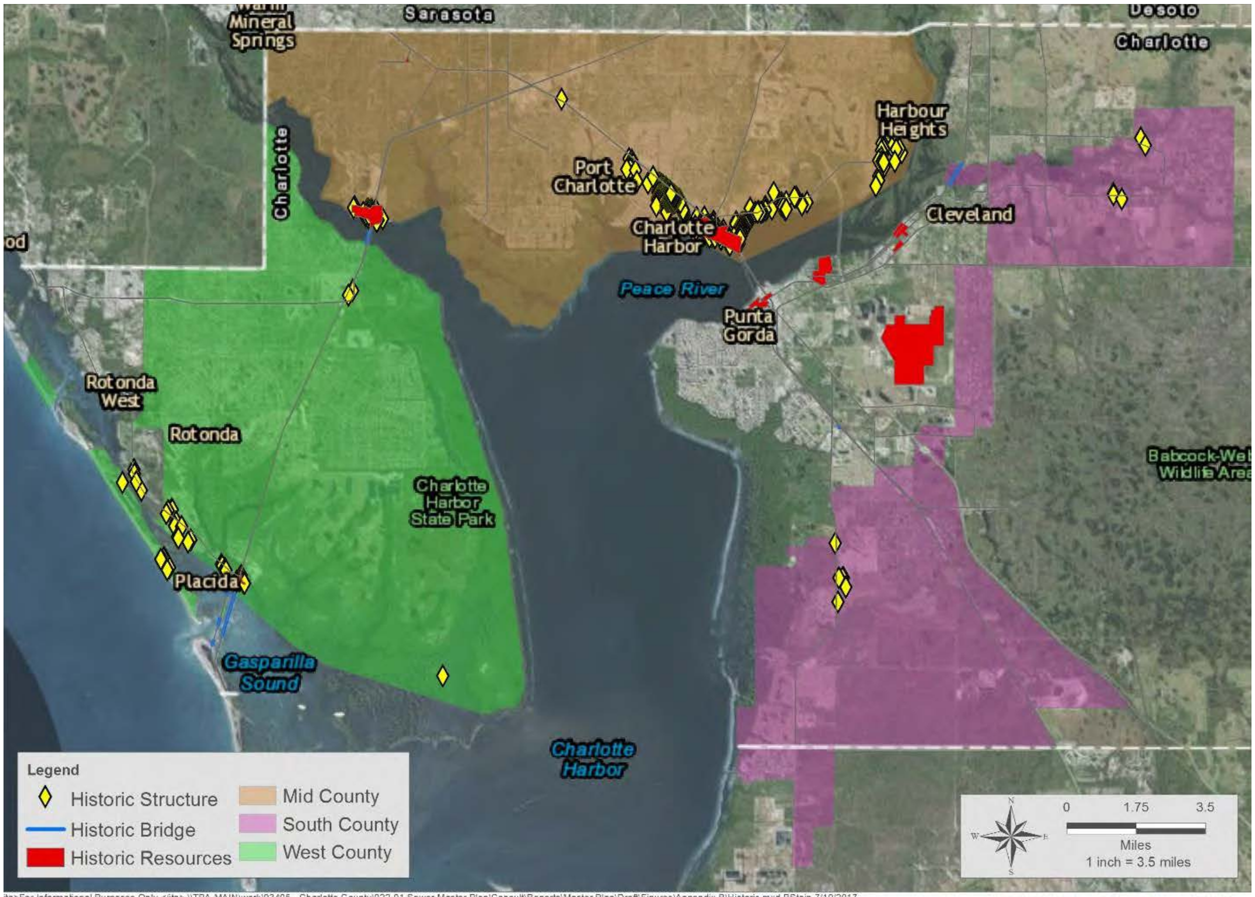


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Table 3 **Charlotte County Inventory of Historical and Cultural Resources (NPS, 2016)**

Historical/ Cultural Resource Category	Mid-County	West-County	South-County	County-Wide
Historical Structures	534	43	11	1841
Historical Bridges	2	5	1	10
Historic Resources	13	5	9	38
Archaeological Sites	26	70	7	198
Historical Cemeteries	3	0	0	6
NRHP	3	1	0	17

Note: NRHP = National Register of Historic Places; Historic Resources includes historic districts, landscapes, and linear features.

Appendix C

Capital Improvement Project Details

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M72A - El Jobean East

Predecessor CIP: None | **Project Area Served:** M72A

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The pump station will be constructed and discharged into an existing force main as shown in the figure.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.7/5.0

Nitrogen Load Reduction
6,800 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 2
End: Year 3

PROJECT DETAILS

Mid County

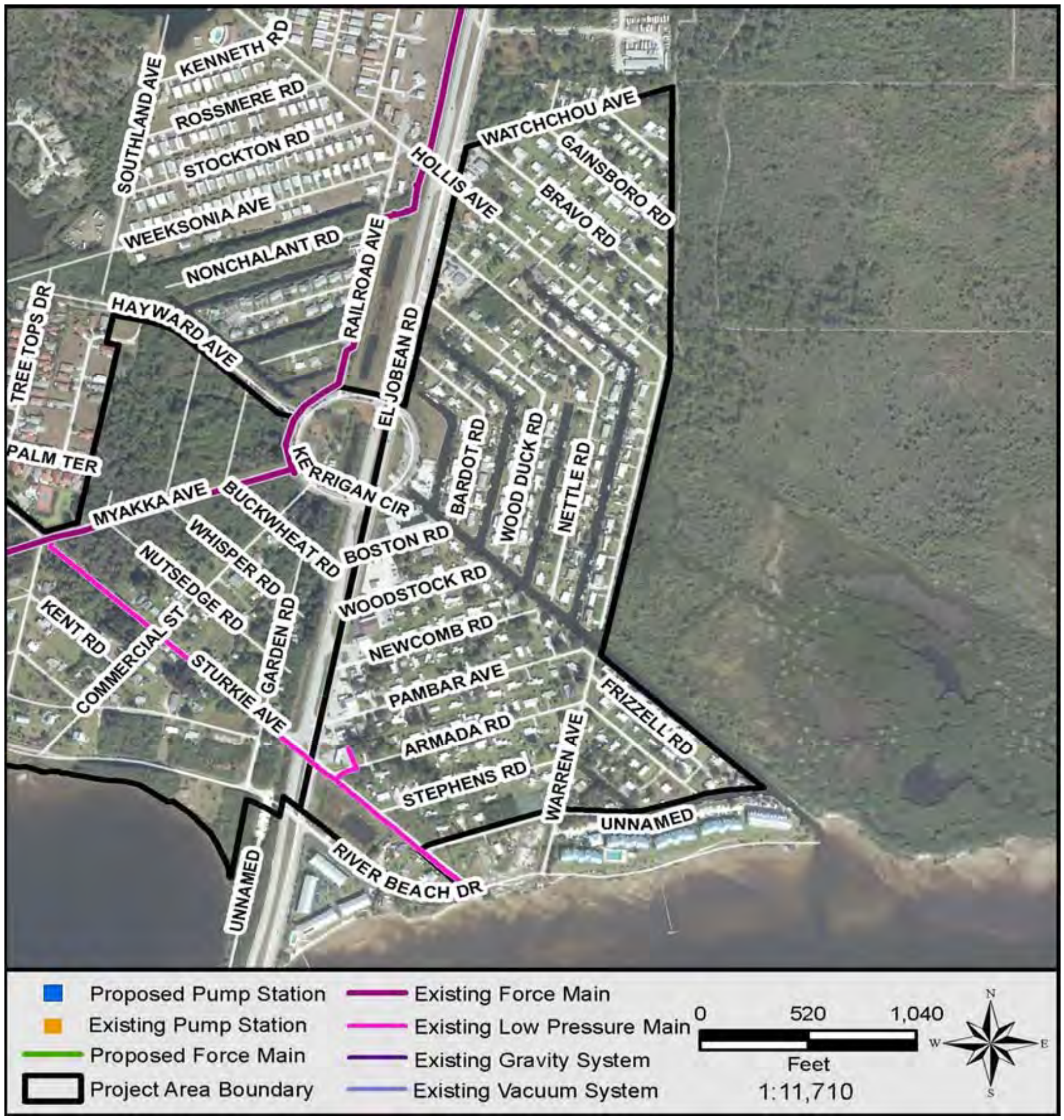
No. of Occupied Lots
297

No. of Vacant Lots
44

No. of Total Lots
341

PROJECT COMPONENTS

- ☑ Pump Station
- ☑ Force Mains
- ☑ Vacuum Mains
- ☑ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Professional Services	1,102	367				1,469
Land (or ROW)	30					30
Construction Cost		3,841	3,841			7,682
Total Project Cost	**1,132**	**4,208**	**3,841**			**9,181**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M70 - Ellicott Circle

Predecessor CIP: M-FM-6 | **Project Area Served:** M70

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force main specified as a predecessor CIP.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.7/5.0

Nitrogen Load Reduction
5,000 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [ ] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 3
End: Year 4

PROJECT DETAILS

Mid County

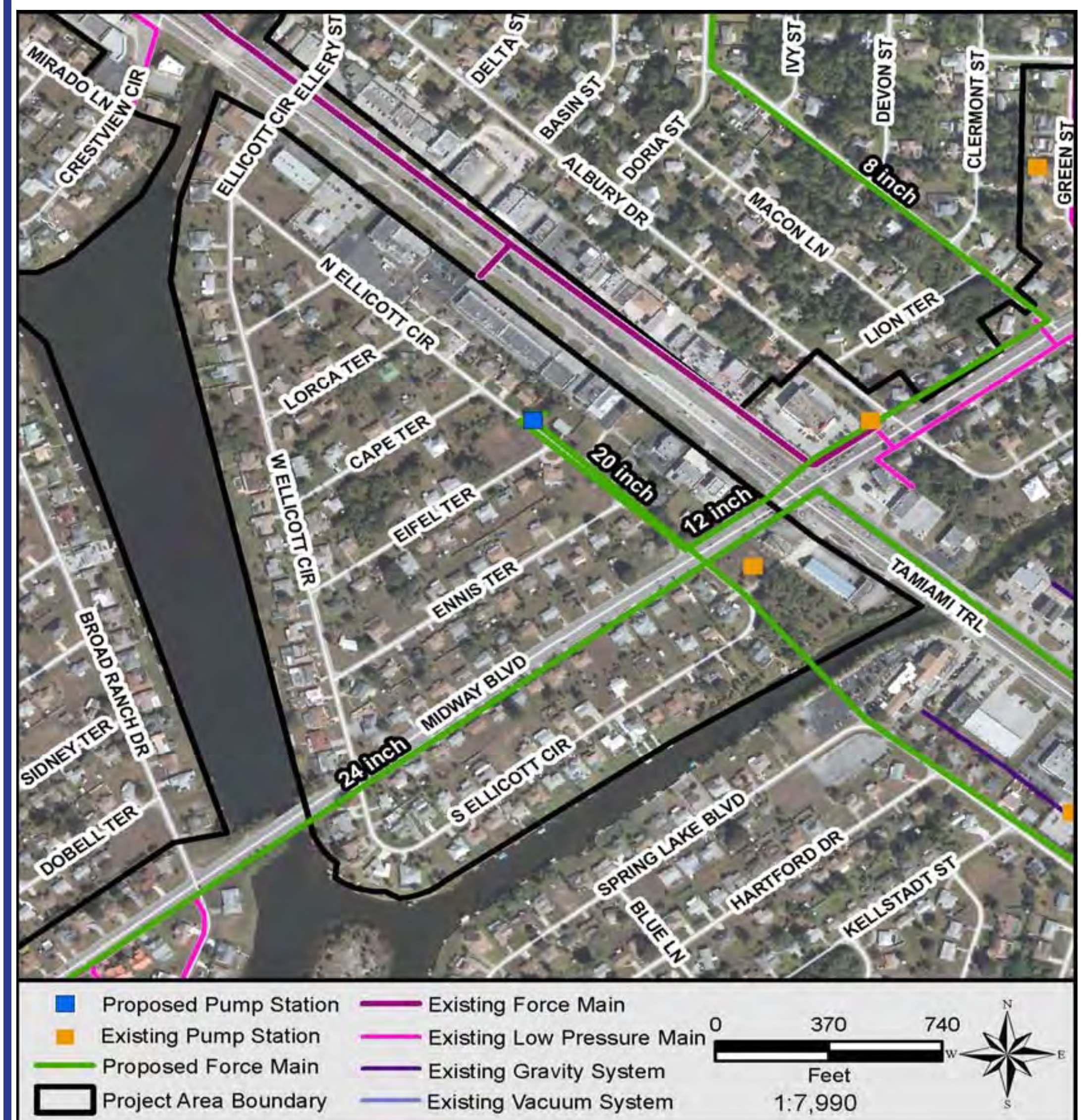
No. of Occupied Lots
212

No. of Vacant Lots
54

No. of Total Lots
266

PROJECT COMPONENTS

- [x] Pump Station
- [ ] Force Mains
- [ ] Vacuum Mains
- [x] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Professional Services	352	141	141			634
Land (or ROW)	30					30
Construction Cost		1,430	1,430			2,859
Total Project Cost	**382**	**1,571**	**1,571**			**3,524**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M67 - Crestview Circle

Predecessor CIP: M70, M-FM-6 | **Project Area Served:** M67

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. This project area will connect to a predecessor project area. The pump station and force main identified as predecessor projects will be used to convey wastewater to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.7/5.0

Nitrogen Load Reduction
1,400 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☐ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 3
End: Year 4

PROJECT DETAILS

Mid County

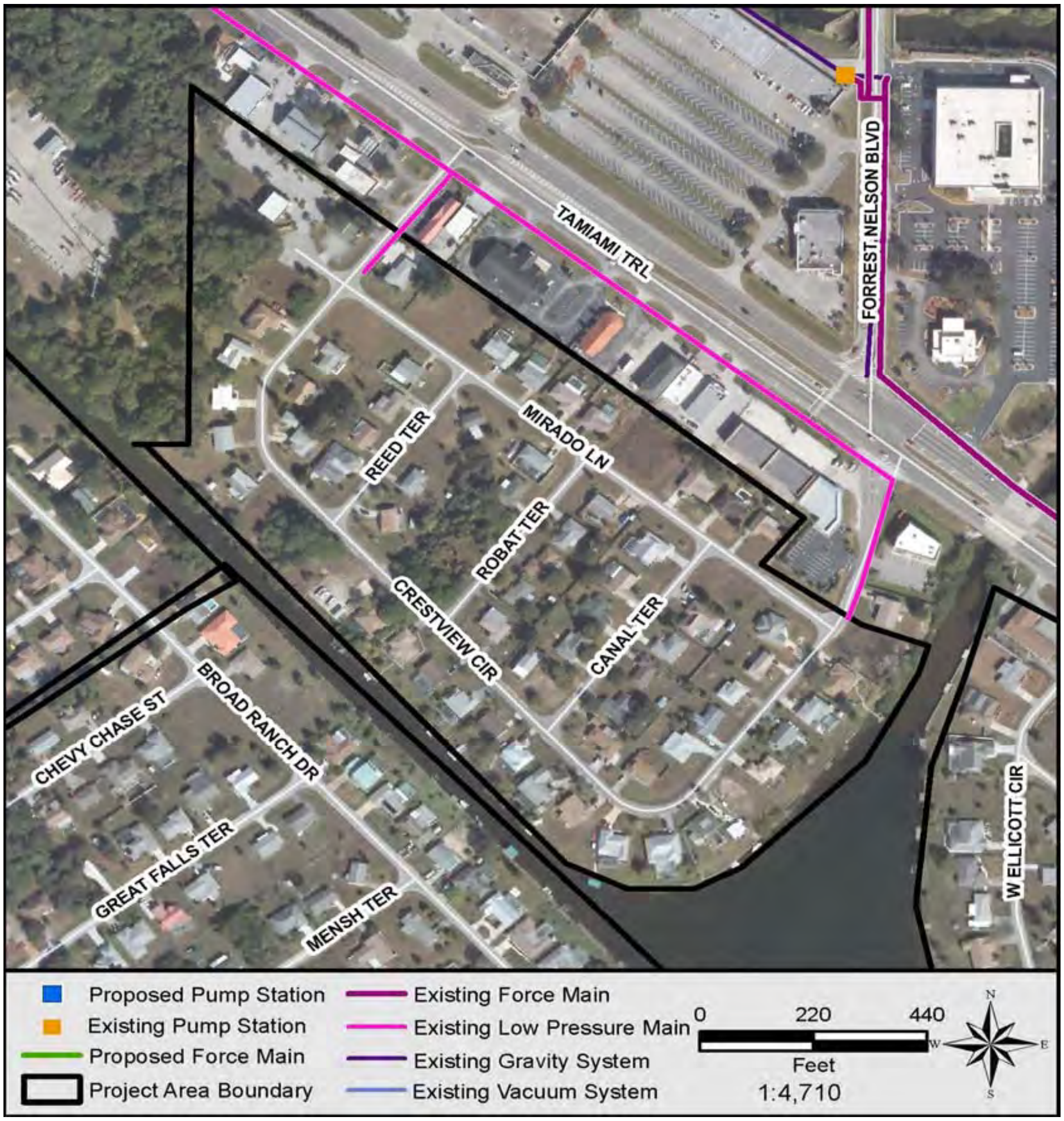
No. of Occupied Lots
64

No. of Vacant Lots
21

No. of Total Lots
85

PROJECT COMPONENTS

- ☐ Pump Station
- ☐ Force Mains
- ☐ Vacuum Mains
- ☑ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Professional Services	104	42	42			187
Land (or ROW)						
Construction Cost		426	426			853
Total Project Cost	**104**	**468**	**468**			**1,040**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M68 - Lakeview Corridor**

Predecessor CIP: **M-FM-4, M-FM-5** | **Project Area Served:** **M68**

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force mains specified as predecessor CIPs.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.7/5.0

Nitrogen Load Reduction
12,000 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☐ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 3
End: Year 4

PROJECT DETAILS

Mid County

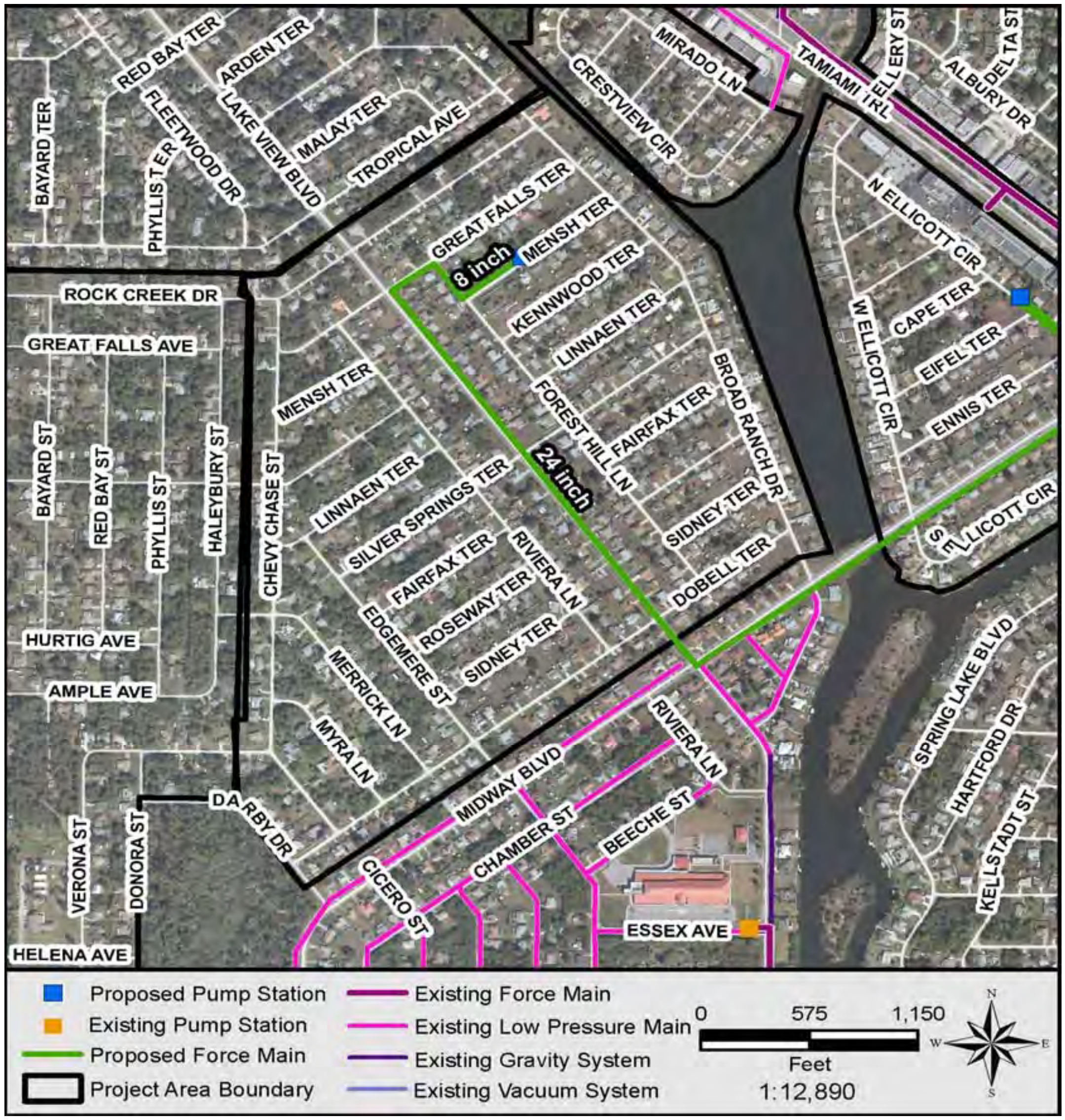
No. of Occupied Lots
498

No. of Vacant Lots
113

No. of Total Lots
611

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Professional Services	992	397	397			1,786
Land (or ROW)	48					48
Construction Cost		4,044	4,044			8,087
Total Project Cost	**1,040**	**4,440**	**4,440**			**9,921**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M61 - Seacrest

Predecessor CIP: M68, M-FM-4, M-FM-5 | **Project Area Served:** M61

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. This project area will connect to a predecessor project area. The pump station included in the predecessor project will be used to convey wastewater into an existing force main.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.7/5.0

Nitrogen Load Reduction
9,900 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☐ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 3
End: Year 4

PROJECT DETAILS

Mid County

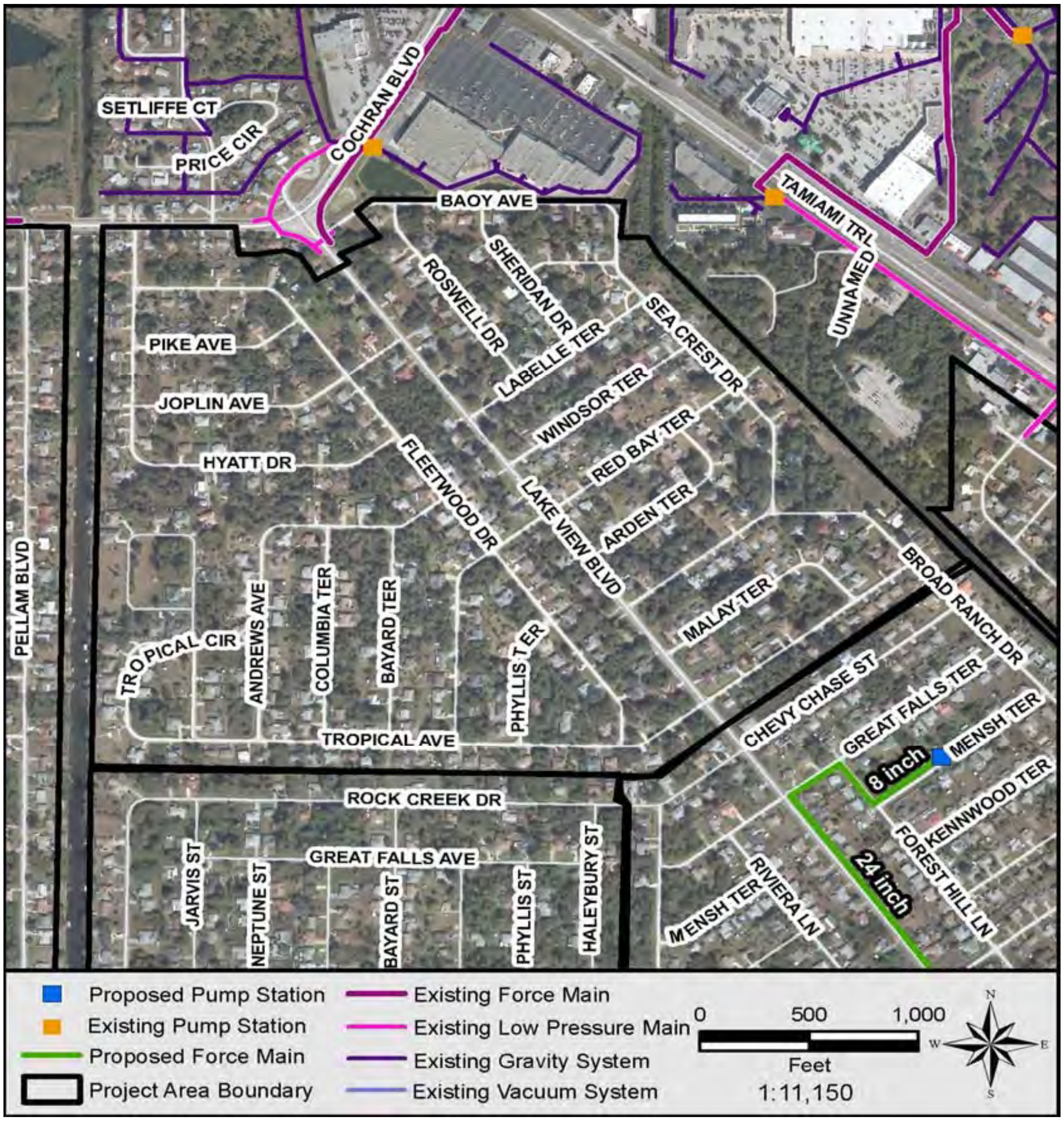
No. of Occupied Lots
409

No. of Vacant Lots
182

No. of Total Lots
591

PROJECT COMPONENTS

- ☐ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Professional Services	730	292	292			1,314
Land (or ROW)						
Construction Cost		2,993	2,993			5,986
Total Project Cost	**730**	**3,285**	**3,285**			**7,299**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M81 - Yorkshire Ph I**

Predecessor CIP: **M-FM-7** | **Project Area Served:** **M81**

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force main specified as a predecessor CIP.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.7/5.0

Nitrogen Load Reduction
12,000 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☐ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 4
End: Year 5

PROJECT DETAILS

Mid County

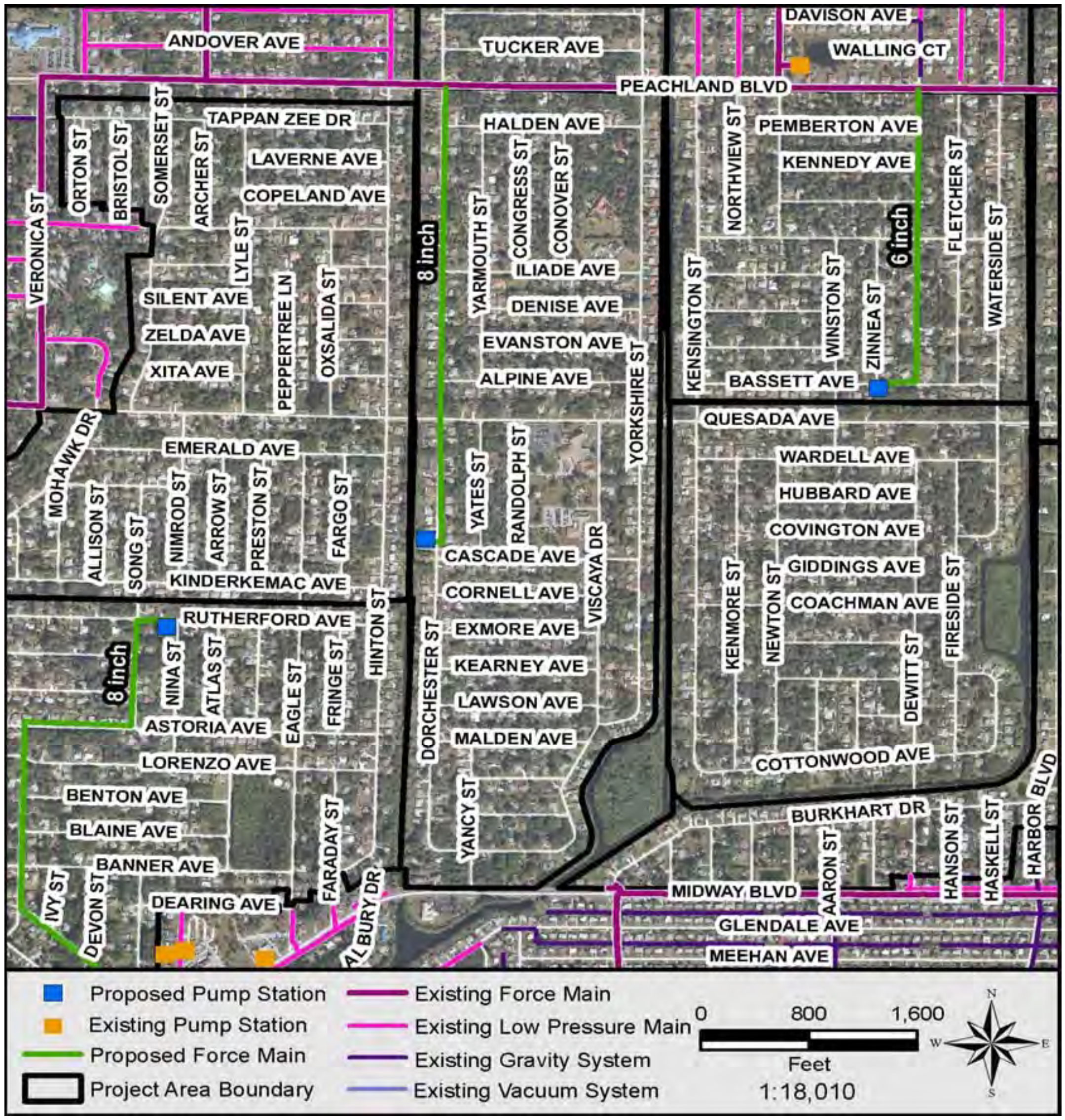
No. of Occupied Lots
487

No. of Vacant Lots
173

No. of Total Lots
660

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 3	Year 4	Year 5	Year 6	Year 7	Total
Professional Services	1,030	412	412			1,855
Land (or ROW)	48					48
Construction Cost		4,201	4,201			8,402
Total Project Cost	**1,078**	**4,613**	**4,613**			**10,305**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M62 - Hurtig**

Predecessor CIP: **M68, M-FM-4, M-FM-5** | **Project Area Served:** **M62**

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The pump station and transmission mains included in the predecessor project will be used to convey wastewater into the existing system.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.7/5.0

Nitrogen Load Reduction
9,000 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☐ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 5
End: Year 6

PROJECT DETAILS

Mid County

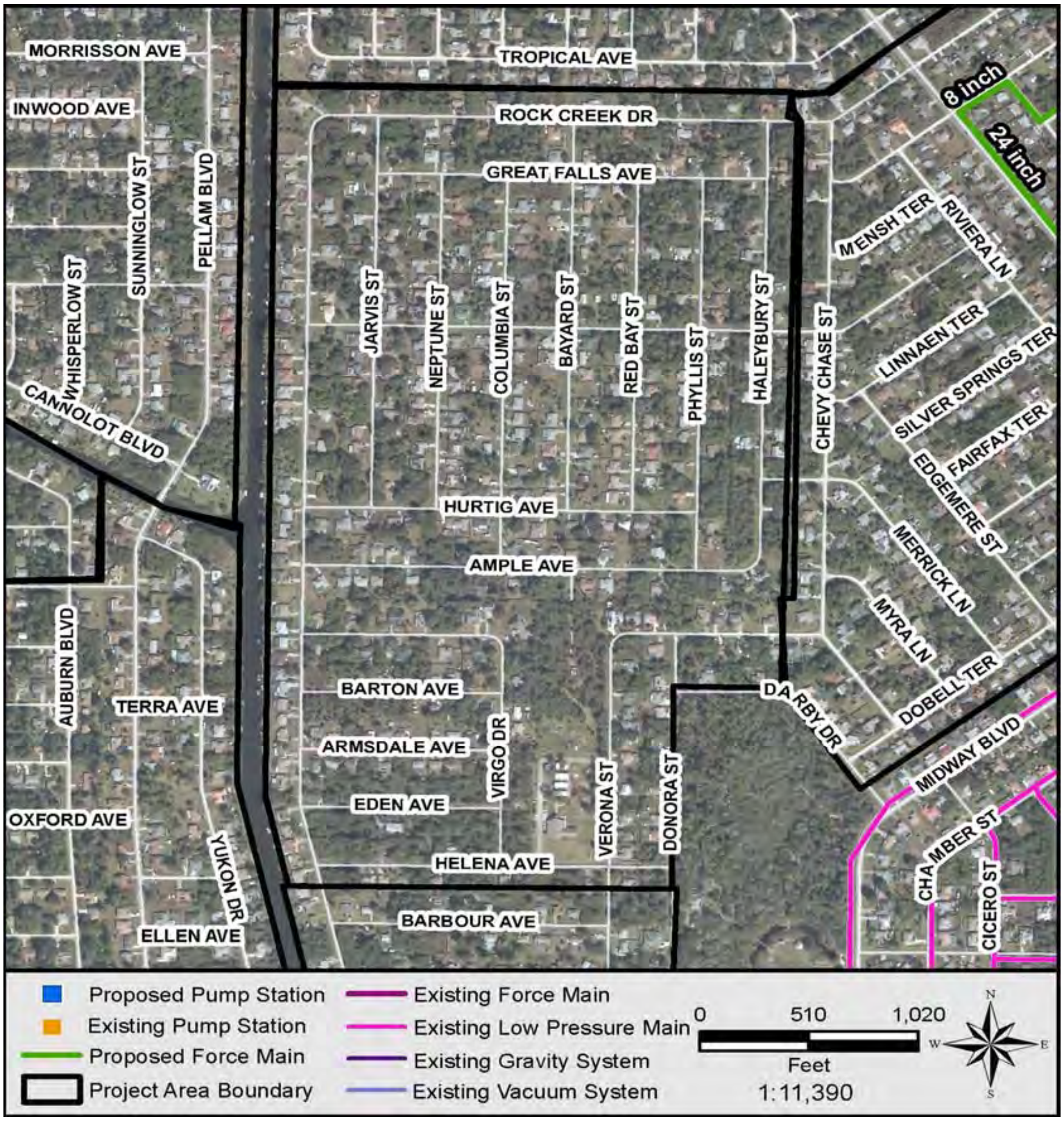
No. of Occupied Lots
362

No. of Vacant Lots
257

No. of Total Lots
619

PROJECT COMPONENTS

- ☐ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 4	Year 5	Year 6	Year 7	Year 8	Total
Professional Services	736	294	294			1,325
Land (or ROW)						
Construction Cost		3,019	3,019			6,037
Total Project Cost	**736**	**3,313**	**3,313**			**7,362**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M80 - Yorkshire Ph II**

Predecessor CIP: **M81, M-FM-7** | **Project Area Served:** **M80**

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The pump station and transmission main included in the predecessor project will be used to convey wastewater into the existing system.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
5,200 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [ ] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 5
End: Year 6

PROJECT DETAILS

Mid County

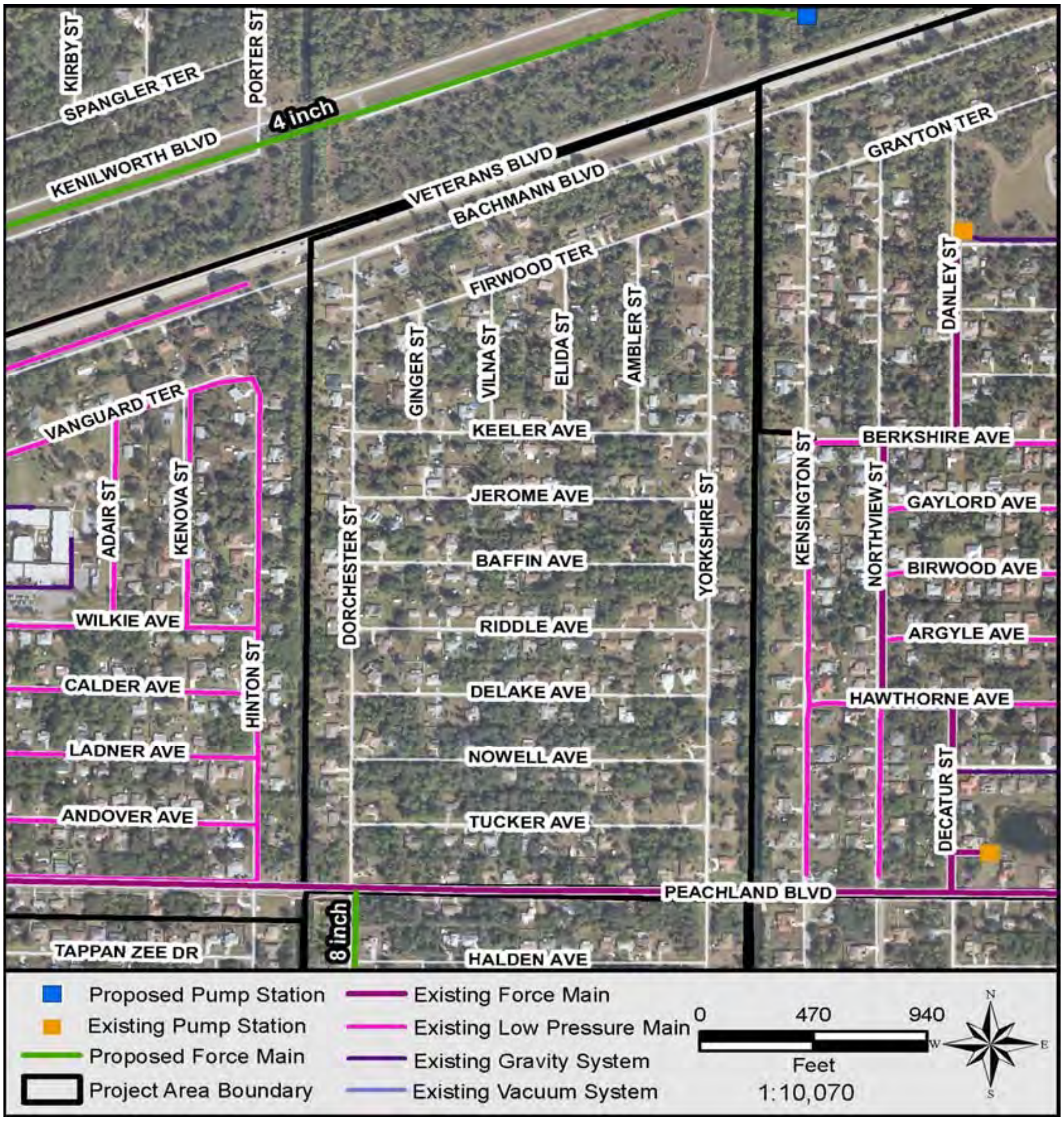
No. of Occupied Lots
217

No. of Vacant Lots
181

No. of Total Lots
398

PROJECT COMPONENTS

- [ ] Pump Station
- [ ] Force Mains
- [x] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 4	Year 5	Year 6	Year 7	Year 8	Total
Professional Services	458	183	183			824
Land (or ROW)						
Construction Cost		1,877	1,877			3,755
Total Project Cost	**458**	**2,061**	**2,061**			**4,579**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M56 - Ackerman East

Predecessor CIP: M-FM-8 | **Project Area Served:** M56

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force main specified as a predecessor CIP.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.7/5.0

Nitrogen Load Reduction
14,200 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [ ] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 5
End: Year 6

PROJECT DETAILS

Mid County

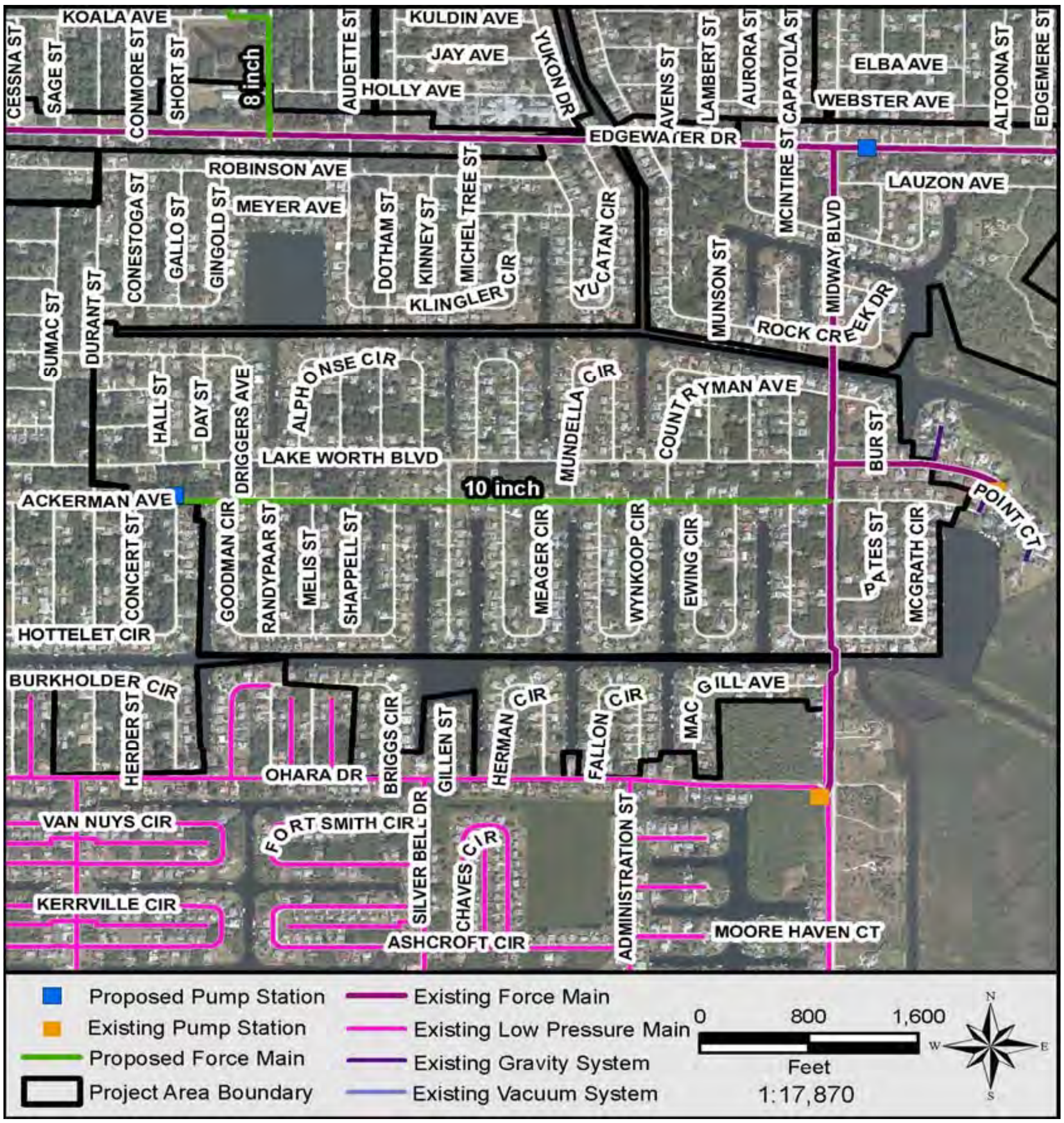
No. of Occupied Lots
598

No. of Vacant Lots
268

No. of Total Lots
866

PROJECT COMPONENTS

- [x] Pump Station
- [ ] Force Mains
- [x] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 4	Year 5	Year 6	Year 7	Year 8	Total
Professional Services	1,287	515	515			2,317
Land (or ROW)	48					48
Construction Cost		5,254	5,254			10,508
Total Project Cost	**1,335**	**5,769**	**5,769**			**12,873**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M55 - Ackerman West

Predecessor CIP: M56, M-FM-8 | **Project Area Served:** M55

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The pump station and transmission main included in the predecessor project will be used to convey wastewater into the existing system.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
15,600 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [ ] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 6
End: Year 7

PROJECT DETAILS

Mid County

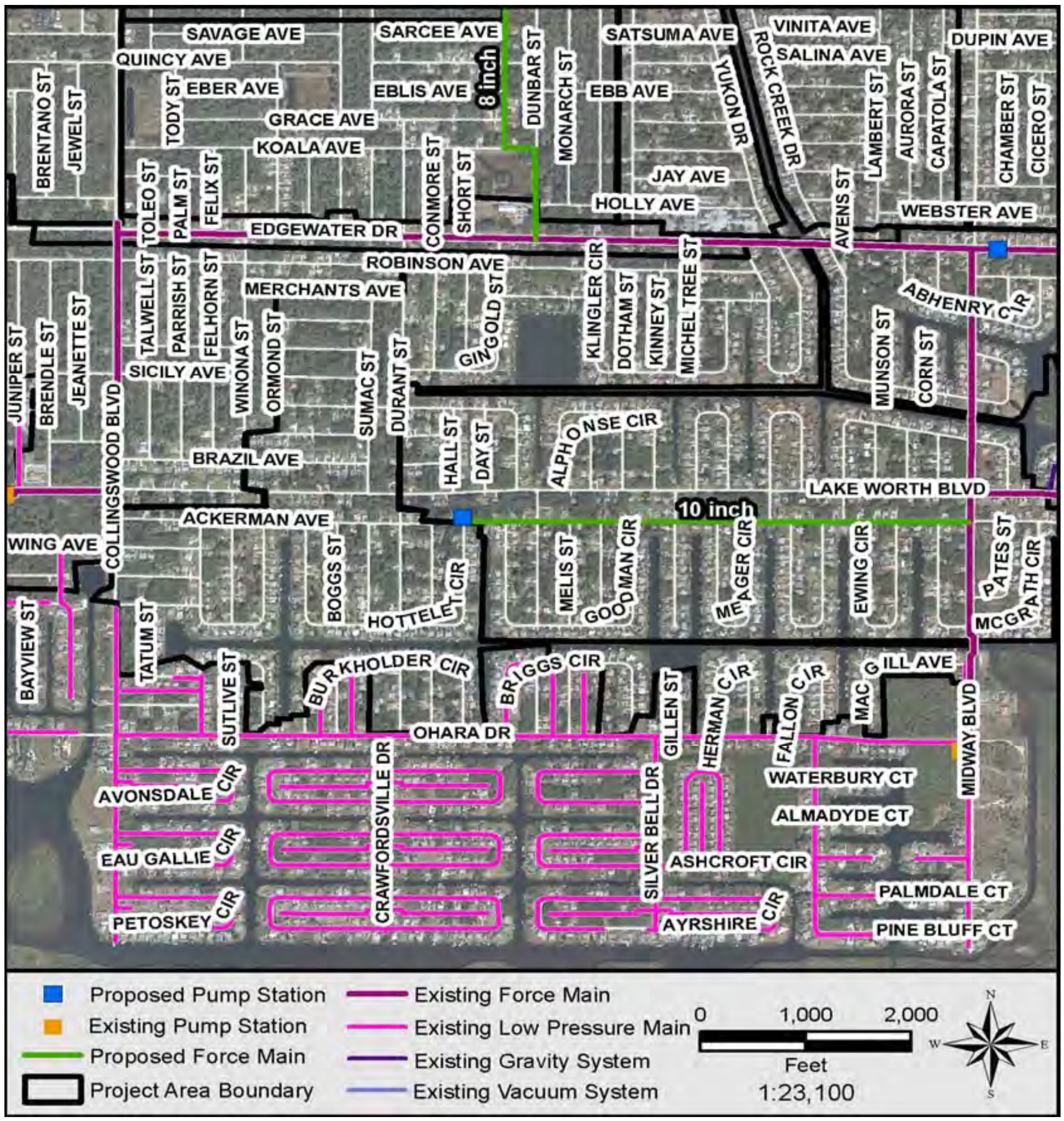
No. of Occupied Lots
649

No. of Vacant Lots
418

No. of Total Lots
1067

PROJECT COMPONENTS

- [x] Pump Station
- [ ] Force Mains
- [x] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 5	Year 6	Year 7	Year 8	Year 9	Total
Professional Services	1,346	538	538			2,423
Land (or ROW)						
Construction Cost		5,518	5,518			11,036
Total Project Cost	**1,346**	**6,057**	**6,057**			**13,459**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W4 - Cape Haze Ph I

Predecessor CIP: W-FM-11 | **Project Area Served: W4**

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force main specified as a predecessor CIP.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
2,300 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☐ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 6
End: Year 7

PROJECT DETAILS

West County

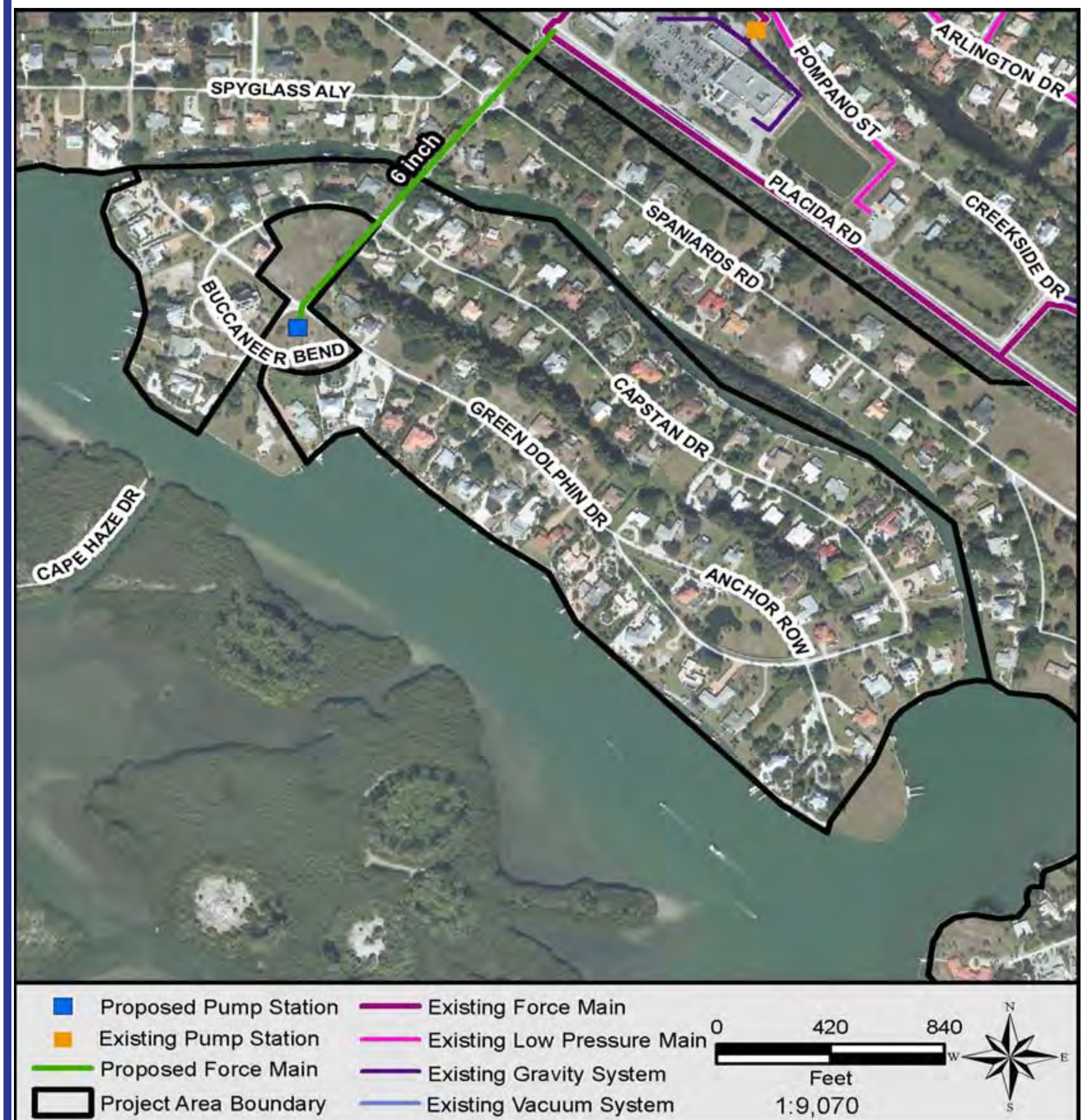
No. of Occupied Lots
89

No. of Vacant Lots
29

No. of Total Lots
118

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☐ Vacuum Mains
- ☑ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 5	Year 6	Year 7	Year 8	Year 9	Total
Professional Services	209	83	83			375
Land (or ROW)	30					30
Construction Cost		840	840			1,680
Total Project Cost	**239**	**924**	**924**			**2,086**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W3 - Cape Haze Ph II

Predecessor CIP: W4, W-FM-11 | **Project Area Served:** W3

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The pump station and transmission main included in the predecessor project will be used to convey wastewater into the existing system.

ENVIRONMENTAL DETAILS

Overall Impact Score
4/5.0

Nitrogen Load Reduction
2,600 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [ ] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 6
End: Year 7

PROJECT DETAILS

West County

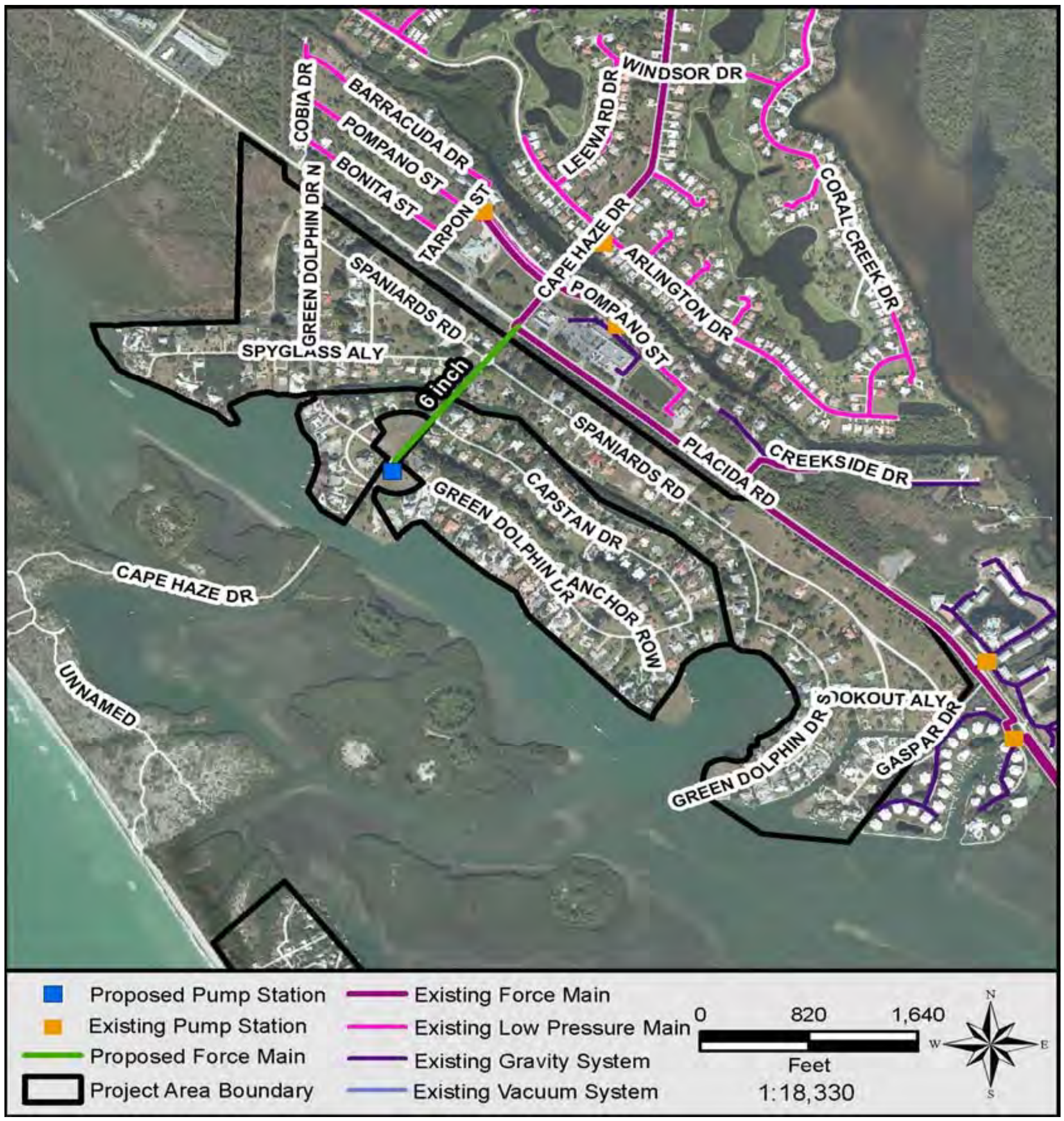
No. of Occupied Lots
126

No. of Vacant Lots
180

No. of Total Lots
306

PROJECT COMPONENTS

- [x] Pump Station
- [ ] Force Mains
- [ ] Vacuum Mains
- [x] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 5	Year 6	Year 7	Year 8	Year 9	Total
Professional Services	321	128	128			578
Land (or ROW)	30					30
Construction Cost		1,301	1,301			2,602
Total Project Cost	**351**	**1,429**	**1,429**			**3,210**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **W5 - L.G.I.**

Predecessor CIP: W-UTLCON-HBBC, W-FM-12 | **Project Area Served:** W5

DESCRIPTION: This project includes the connection of a private utility's service area. The existing sewer system infrastructure will be used for wastewater collection. The existing WWTP will be converted to a pump station and the force main identified in the predecessor CIP will be used to convey wastewater flows to the existing system.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.7/5.0

Nitrogen Load Reduction
10,500 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☐ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 4
End: Year 5

PROJECT DETAILS

West County

No. of Occupied Lots
500

No. of Vacant Lots
267

No. of Total Lots
767

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains

Expenditure Plan ($1000)

	Year 3	Year 4	Year 5	Year 6	Year 7	Total
Professional Services	1,040	416	416			1,872
Land (or ROW)	48					48
Construction Cost		4,240	4,240			8,480
Total Project Cost	**1,088**	**4,656**	**4,656**			**10,400**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **W2 - Don Pedro**

Predecessor CIP: **W-UTLCON-DP, W-FM-10** | **Project Area Served:** **W2**

DESCRIPTION: This project includes the connection of a private utility's service area. The existing sewer system infrastructure will be used for wastewater collection. The existing WWTP will be converted to a pump station and the force main identified in the predecessor CIP will be used to convey wastewater flows to the existing system.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
8,500 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☐ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 6
End: Year 7

PROJECT DETAILS

West County

No. of Occupied Lots
261

No. of Vacant Lots
168

No. of Total Lots
429

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains

Expenditure Plan ($1000)

	Year 5	Year 6	Year 7	Year 8	Year 9	Total
Professional Services	630	252	252			1,134
Land (or ROW)	30					30
Construction Cost		2,568	2,568			5,136
Total Project Cost	**660**	**2,820**	**2,820**			**6,300**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M-FM-1 - LS 123 "KHW" to Kings Highway**

Predecessor CIP: **None** | **Project Area Served:** **5-year CIPs**

DESCRIPTION: The project includes upsizing 200 linear feet (LF) of 4-inch force main to 6-inch force main from LS 123 "KHW" to Kings Highway in Mid County.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 3
End: Year 4

PROJECT DETAILS

Mid County

Force Main Length
200 linear feet

Force Main Material
PVC

Force Main Size
6 inches

PROJECT COMPONENTS

- [ ] Pump Station
- [x] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains

Expenditure Plan ($1000)

	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Professional Services	7	1	0			8
Land (or ROW)						
Construction Cost		9	9			19
Total Project Cost	**7**	**11**	**10**			**27**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M-FM-2 - Toledo Blade Road

Predecessor CIP: None | **Project Area Served:** 5-year CIPs

DESCRIPTION: The project includes installing 4,100 LF of 12-inch force main along Toledo Blade Road to increase system capacity and convey additional flows collected on the US 41 corridor from the Sarasota County line to Sherbourne Street and remove the flows through LS 4 Woodbury.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 3
End: Year 4

PROJECT DETAILS

Mid County

Force Main Length
4,100 linear feet

Force Main Material
PVC

Force Main Size
16 inches

PROJECT COMPONENTS

- [ ] Pump Station
- [x] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains

Expenditure Plan ($1000)

	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Professional Services	236	44	15			295
Land (or ROW)						
Construction Cost		335	335			671
Total Project Cost	**236**	**380**	**350**			**966**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M-FM-3 - Tamiami Trail**

Predecessor CIP: **None** | **Project Area Served:** **5-year CIPs**

DESCRIPTION: The project includes upsizing 300 LF of 8-inch force main to 12-inch force main crossing Tamiami Trail just north of Conway Boulevard to decrease the wastewater velocity in the transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 3
End: Year 4

PROJECT DETAILS

Mid County

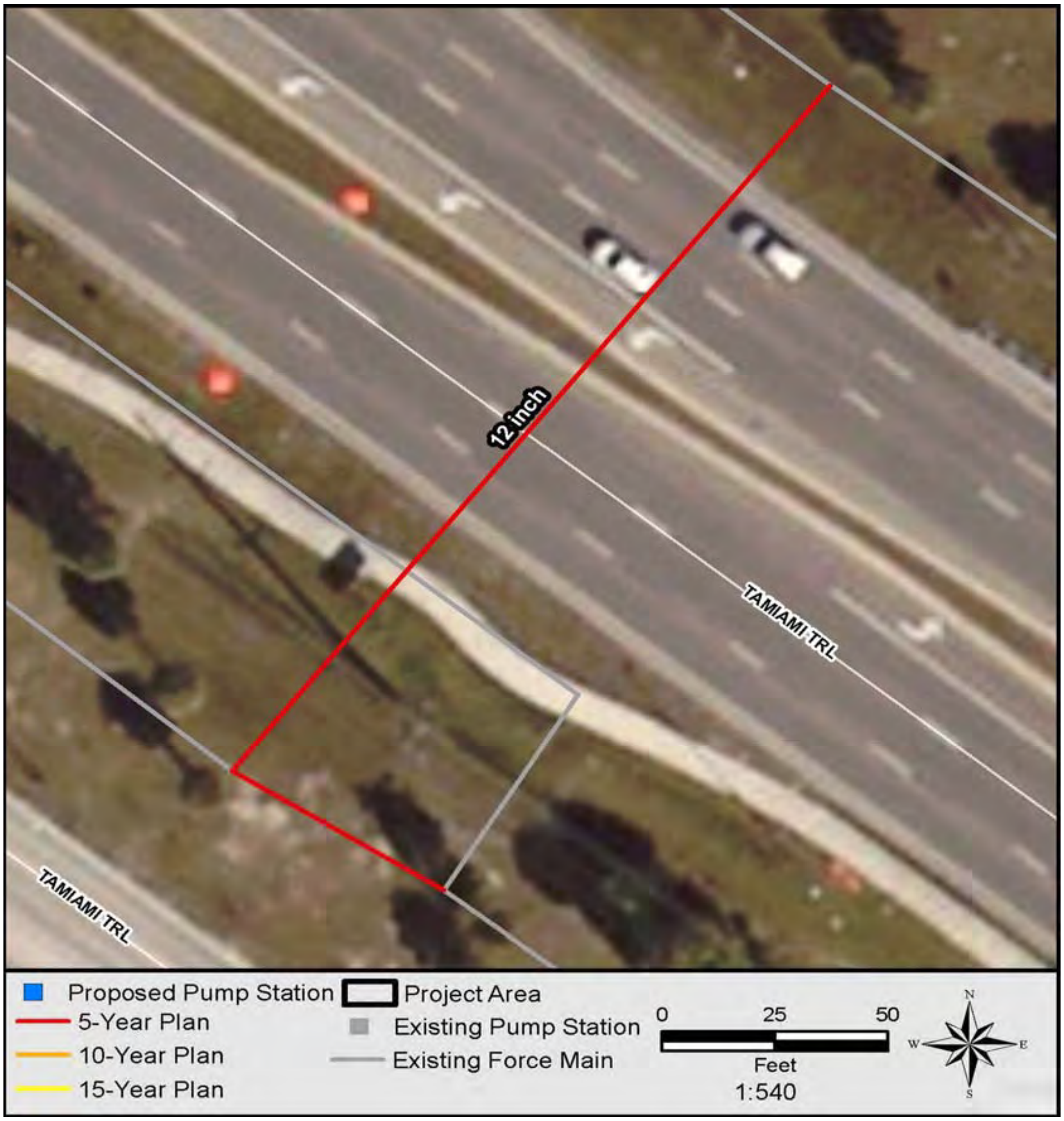
Force Main Length
300 linear feet

Force Main Material
PVC

Force Main Size
12 inches

PROJECT COMPONENTS

- ☐ Pump Station
- ☑ Force Mains
- ☐ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Professional Services	14	3	1			18
Land (or ROW)						
Construction Cost		20	20			40
Total Project Cost	**14**	**23**	**21**			**58**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M-FM-4 - Mensh Terrace**

Predecessor CIP: **None** | **Project Area Served:** **M61, M62, M68**

DESCRIPTION: The project includes installing 1,100 LF of 8-inch force main starting along Mensh Terrace and continuing along Forest Hills Lane to Great Falls Terrace NW. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 3
End: Year 4

PROJECT DETAILS

Mid County

Force Main Length
1,100 linear feet

Force Main Material
PVC

Force Main Size
8 inches

PROJECT COMPONENTS

- ☐ Pump Station
- ☑ Force Mains
- ☐ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains

Expenditure Plan ($1000)

	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Professional Services	43	8	3			53
Land (or ROW)						
Construction Cost		61	61			121
Total Project Cost	**43**	**69**	**63**			**174**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M-FM-5 - Lakeview Blvd to US 41**

Predecessor CIP: **None** | **Project Area Served:** **M61, M62, M68**

DESCRIPTION: The project includes installing 7,400 LF of 24-inch force main along Lakeview Boulevard, Midway Boulevard, crossing at Spring Lake North, and continuing southeast along US 41. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 3
End: Year 4

PROJECT DETAILS

Mid County

Force Main Length
7,400 linear feet

Force Main Material
PVC

Force Main Size
24 inches

PROJECT COMPONENTS

- ☐ Pump Station
- ☑ Force Mains
- ☐ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains

Expenditure Plan ($1000)

	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Professional Services	569	107	36			711
Land (or ROW)						
Construction Cost		808	808			1,616
Total Project Cost	**569**	**915**	**844**			**2,327**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M-FM-6 - Ellicott Circle to West Tarpon Blvd NW**

Predecessor CIP: None | **Project Area Served:** M67, M70

DESCRIPTION: The project includes installing 2,400 LF of 20-inch force main starting from the easternmost corner of Ellicott Circle NW and continuing across Morningstar Waterway, continuing southeast along North Spring Lake Boulevard NW, and ending at West Tarpon Boulevard NW. The force main will be used to convey wastewater from the pump station of the specified project area to the existing system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 3
End: Year 4

PROJECT DETAILS

Mid County

Force Main Length
2,400 linear feet

Force Main Material
PVC

Force Main Size
20 inches

PROJECT COMPONENTS

- ☐ Pump Station
- ☑ Force Mains
- ☐ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains

Expenditure Plan ($1000)

	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Professional Services	162	30	10			202
Land (or ROW)						
Construction Cost		230	230			459
Total Project Cost	**162**	**260**	**240**			**661**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M-FM-7 - Quesada Ave to Peachland Blvd**

Predecessor CIP: **None** | **Project Area Served:** **M81, M80**

DESCRIPTION: The project includes installing 3,800 LF of 8-inch force main starting along Dorchester Street and ending at Peachland Boulevard. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 4
End: Year 5

PROJECT DETAILS

Mid County

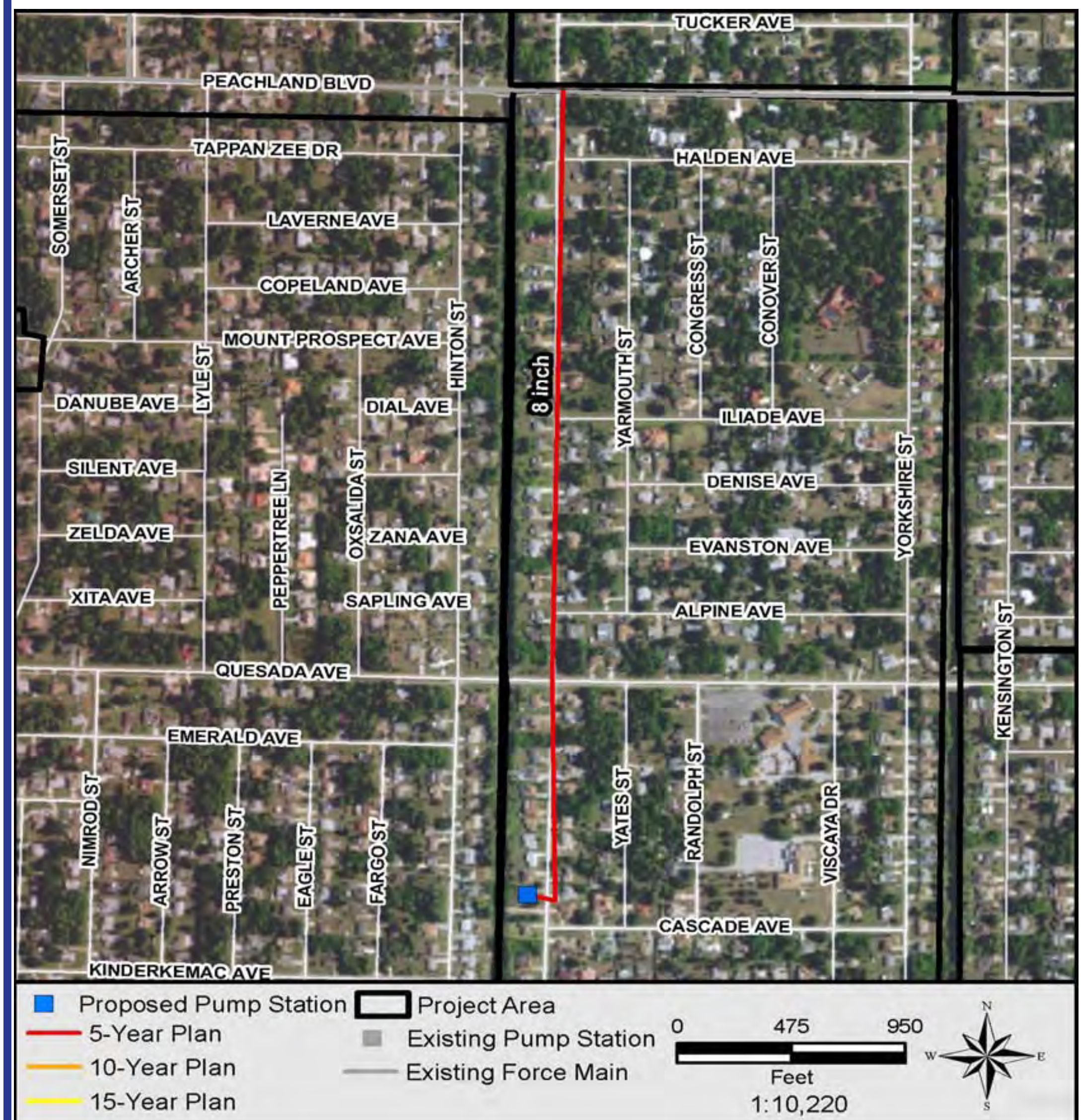
Force Main Length
3,800 linear feet

Force Main Material
PVC

Force Main Size
8 inches

PROJECT COMPONENTS

- [ ] Pump Station
- [x] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 3	Year 4	Year 5	Year 6	Year 7	Total
Professional Services	147	28	9			184
Land (or ROW)						
Construction Cost		209	209			417
Total Project Cost	**147**	**236**	**218**			**601**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M-FM-8 - Ackerman Ave**

Predecessor CIP: **None** | **Project Area Served:** **M55, M56**

DESCRIPTION: The project includes installing 4,900 LF of 10-inch force main along Ackerman Avenue heading east. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 5
End: Year 6

PROJECT DETAILS

Mid County

Force Main Length
4,900 linear feet

Force Main Material
PVC

Force Main Size
10 inches

PROJECT COMPONENTS

- ☐ Pump Station
- ☑ Force Mains
- ☐ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains

Expenditure Plan ($1000)

	Year 4	Year 5	Year 6	Year 7	Year 8	Total
Professional Services	213	40	13			266
Land (or ROW)						
Construction Cost		302	302			605
Total Project Cost	**213**	**342**	**316**			**871**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **W-FM-9 - Oldsmar Circle**

Predecessor CIP: None | **Project Area Served:** 5-year CIPs

DESCRIPTION: The project includes installing 1,000 LF of 12-inch force main crossing on Oldsmar Circle in LS 882. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 3
End: Year 4

PROJECT DETAILS

West County

Force Main Length
1,000 linear feet

Force Main Material
PVC

Force Main Size
12 inches

PROJECT COMPONENTS

- ☐ Pump Station
- ☑ Force Mains
- ☐ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains

Expenditure Plan ($1000)

	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Professional Services	48	9	3			61
Land (or ROW)						
Construction Cost		69	69			138
Total Project Cost	**48**	**78**	**72**			**198**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **W-FM-10 - Indiana Rd and Cape Haze Dr**

Predecessor CIP: W-UTLCON-DP | **Project Area Served:** W2

DESCRIPTION: The project includes installing 12,500 LF of 6-inch force main from the pump station and ending at intersection of Indiana Road and Cape Haze Drive. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 6
End: Year 7

PROJECT DETAILS

West County

Force Main Length
12,500 linear feet

Force Main Material
PVC

Force Main Size
6 inches

PROJECT COMPONENTS

- [ ] Pump Station
- [x] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains

Expenditure Plan ($1000)

	Year 5	Year 6	Year 7	Year 8	Year 9	Total
Professional Services	423	79	26			529
Land (or ROW)						
Construction Cost		601	601			1,203
Total Project Cost	**423**	**681**	**628**			**1,732**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **W-FM-11 - Green Dolphin and Placida Rd**

Predecessor CIP: **None** | **Project Area Served:** **W4**

DESCRIPTION: The project includes installing 1,600 LF of 6-inch force main starting from intersection of Green Dolphin Drive and Cape Haze Drive, continuing to north west on Cape Haze Drive, and ending at intersection of Cape Haze Drive and Placida Road. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 6
End: Year 7

PROJECT DETAILS

West County

Force Main Length
1,600 linear feet

Force Main Material
PVC

Force Main Size
6 inches

PROJECT COMPONENTS

- [ ] Pump Station
- [x] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains

Expenditure Plan ($1000)

	Year 5	Year 6	Year 7	Year 8	Year 9	Total
Professional Services	54	10	3			67
Land (or ROW)						
Construction Cost		77	77			153
Total Project Cost	**54**	**87**	**80**			**221**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W-FM-12 - Little Gasparilla Island and Placida Rd

Predecessor CIP: W-UTLCON-HBBC | **Project Area Served:** W5

DESCRIPTION: The project includes installing approximately 6,300 LF of 6-inch force main starting from intersection of Little Gasparilla Island and Plum Avenue, crossing Placida Harbour, and ending near intersection of Placida Road and Boca Grande Causeway. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 4
End: Year 5

PROJECT DETAILS

West County

Force Main Length
6,300 linear feet

Force Main Material
PVC

Force Main Size
6 inches

PROJECT COMPONENTS

- [ ] Pump Station
- [x] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains

Expenditure Plan ($1000)

	Year 3	Year 4	Year 5	Year 6	Year 7	Total
Professional Services	213	40	13			266
Land (or ROW)						
Construction Cost		302	302			604
Total Project Cost	**213**	**342**	**315**			**870**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **W-LS-805 - LS 805 Windward Preserve Upgrade**

Predecessor CIP: **None** | **Project Area Served:** **5-year CIPs**

DESCRIPTION: The project includes increasing the pumping capacity at LS 805 Windward Preserve located in West County.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [ ] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [x] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 3
End: Year 4

PROJECT DETAILS

West County

Force Main Length
Not Applicable

Force Main Material
PVC

Force Main Size
Not Applicable

PROJECT COMPONENTS

- [x] Pump Station
- [ ] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains

Expenditure Plan ($1000)

	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Professional Services	25	25	-			50
Land (or ROW)						
Construction Cost		200	-			200
Total Project Cost	**25**	**225**				**250**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W-LS-815 - LS 815 "Z" Upgrade

Predecessor CIP: None

Project Area Served: 5-year CIPs

DESCRIPTION: The project includes increasing the pumping capacity at LS 815 “Z” located in West County.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- ☐ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☑ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 3
End: Year 4

PROJECT DETAILS

West County

Force Main Length
Not Applicable

Force Main Material
PVC

Force Main Size
Not Applicable

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☐ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains

Expenditure Plan ($1000)

	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Professional Services	25	25	-			50
Land (or ROW)						
Construction Cost		200	-			200
Total Project Cost	**25**	**225**				**250**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **S-LS-403 - LS 403 Islamorada Upgrade**

Predecessor CIP: **None** | **Project Area Served:** **5-year CIPs**

DESCRIPTION: The project includes increasing the pumping capacity at LS 403 Islamorada in South County.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- ☐ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☑ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 3
End: Year 4

PROJECT DETAILS

South County

Force Main Length
Not Applicable

Force Main Material
PVC

Force Main Size
Not Applicable

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☐ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains

Expenditure Plan ($1000)

	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Professional Services	25	25	-			50
Land (or ROW)						
Construction Cost		200	-			200
Total Project Cost	**25**	**225**				**250**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M59 - Cannolot

Predecessor CIP: M-FM-13, M-FM-14 | **Project Area Served:** M59

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force mains specified as predecessor CIPs.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.7/5.0

Nitrogen Load Reduction
12,700 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 7
End: Year 8

PROJECT DETAILS

Mid County

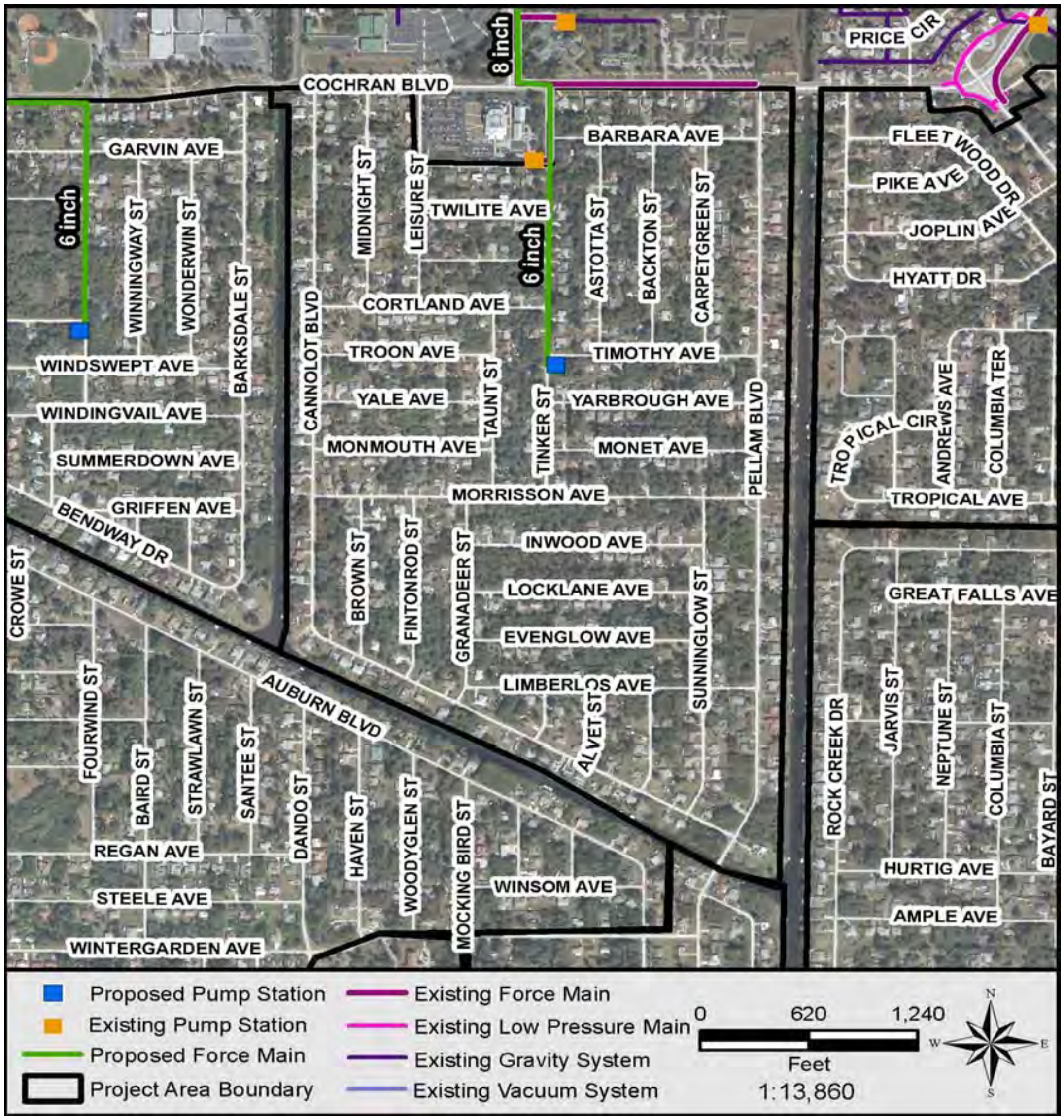
No. of Occupied Lots
533

No. of Vacant Lots
275

No. of Total Lots
808

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 6	Year 7	Year 8	Year 9	Year 10	Total
Professional Services	1,167	467	467			2,101
Land (or ROW)	48					48
Construction Cost		4,761	4,761			9,521
Total Project Cost	**1,215**	**5,227**	**5,227**			**11,670**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M79 - Blaine

Predecessor CIP: M-FM-15, M-FM-16 | **Project Area Served:** M79

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force mains specified as predecessor CIPs.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.7/5.0

Nitrogen Load Reduction
11,700 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 7
End: Year 8

PROJECT DETAILS

Mid County

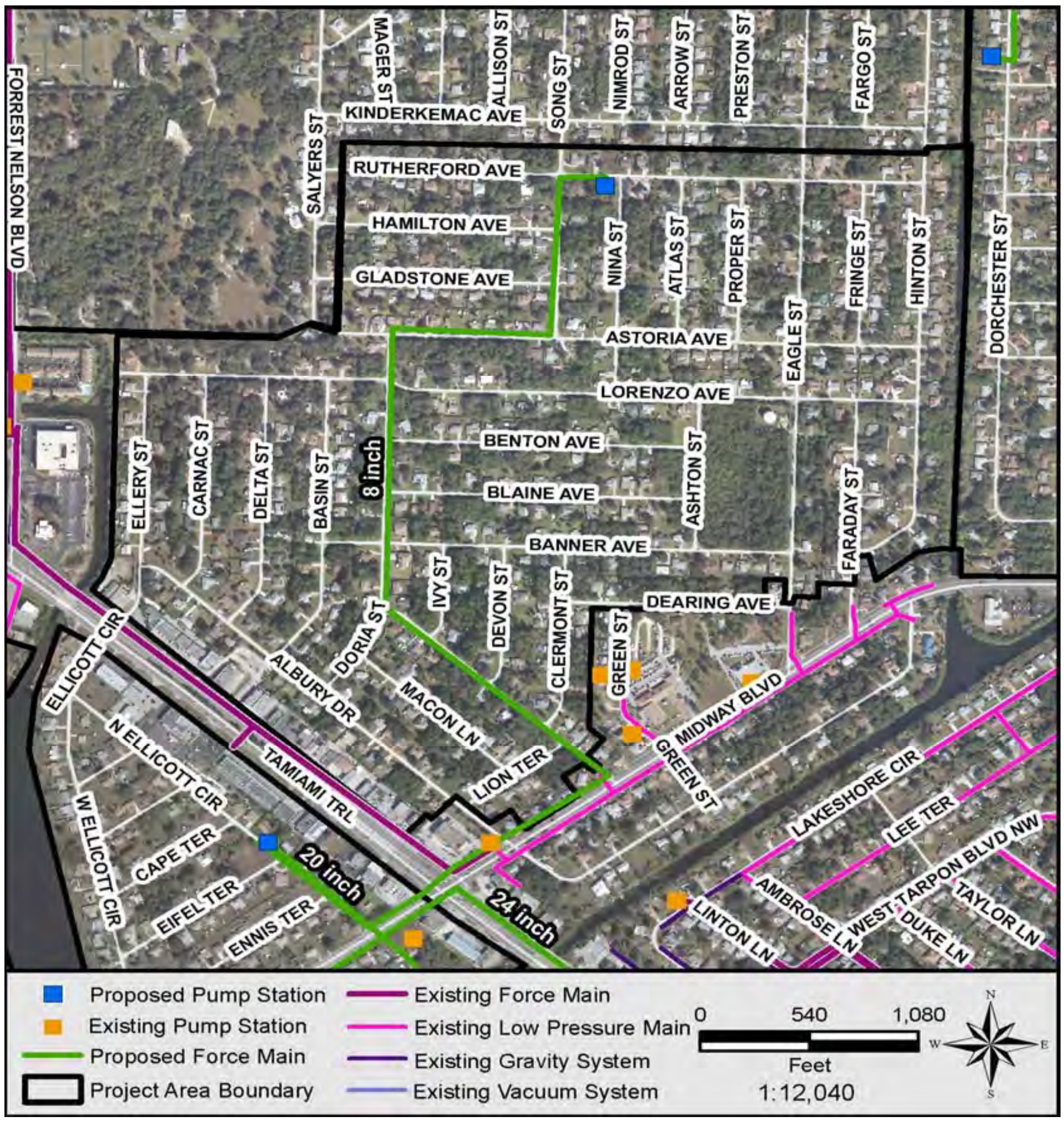
No. of Occupied Lots
500

No. of Vacant Lots
231

No. of Total Lots
731

PROJECT COMPONENTS

- [x] Pump Station
- [ ] Force Mains
- [x] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 6	Year 7	Year 8	Year 9	Year 10	Total
Professional Services	1,106	442	442			1,990
Land (or ROW)	48					48
Construction Cost		4,510	4,510			9,019
Total Project Cost	**1,154**	**4,952**	**4,952**			**11,058**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M83 - Hayworth**

Predecessor CIP: **M-FM-17** | **Project Area Served:** **M83**

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force main specified as a predecessor CIP.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.7/5.0

Nitrogen Load Reduction
7,000 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 8
End: Year 9

PROJECT DETAILS

Mid County

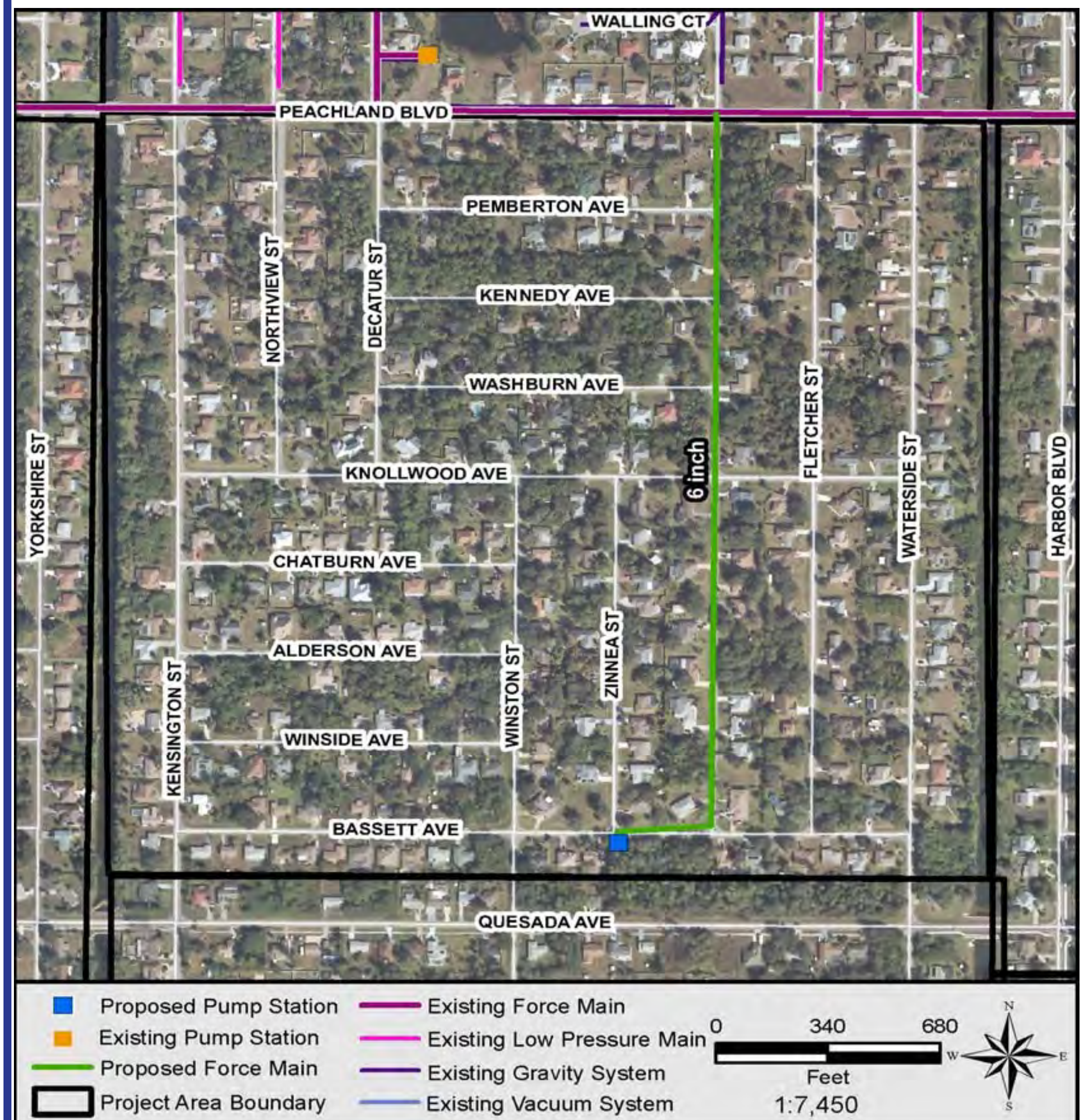
No. of Occupied Lots
297

No. of Vacant Lots
137

No. of Total Lots
434

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 7	Year 8	Year 9	Year 10	Year 11	Total
Professional Services	529	212	212			952
Land (or ROW)						
Construction Cost		2,169	2,169			4,337
Total Project Cost	**529**	**2,380**	**2,380**			**5,290**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M78 - Nimrod

Predecessor CIP: M79, M-FM-15, M-FM-16 **Project Area Served:** M78

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The pump station and transmission mains included in the predecessor project will be used to convey wastewater into the existing system.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
12,100 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 8
End: Year 9

PROJECT DETAILS

Mid County

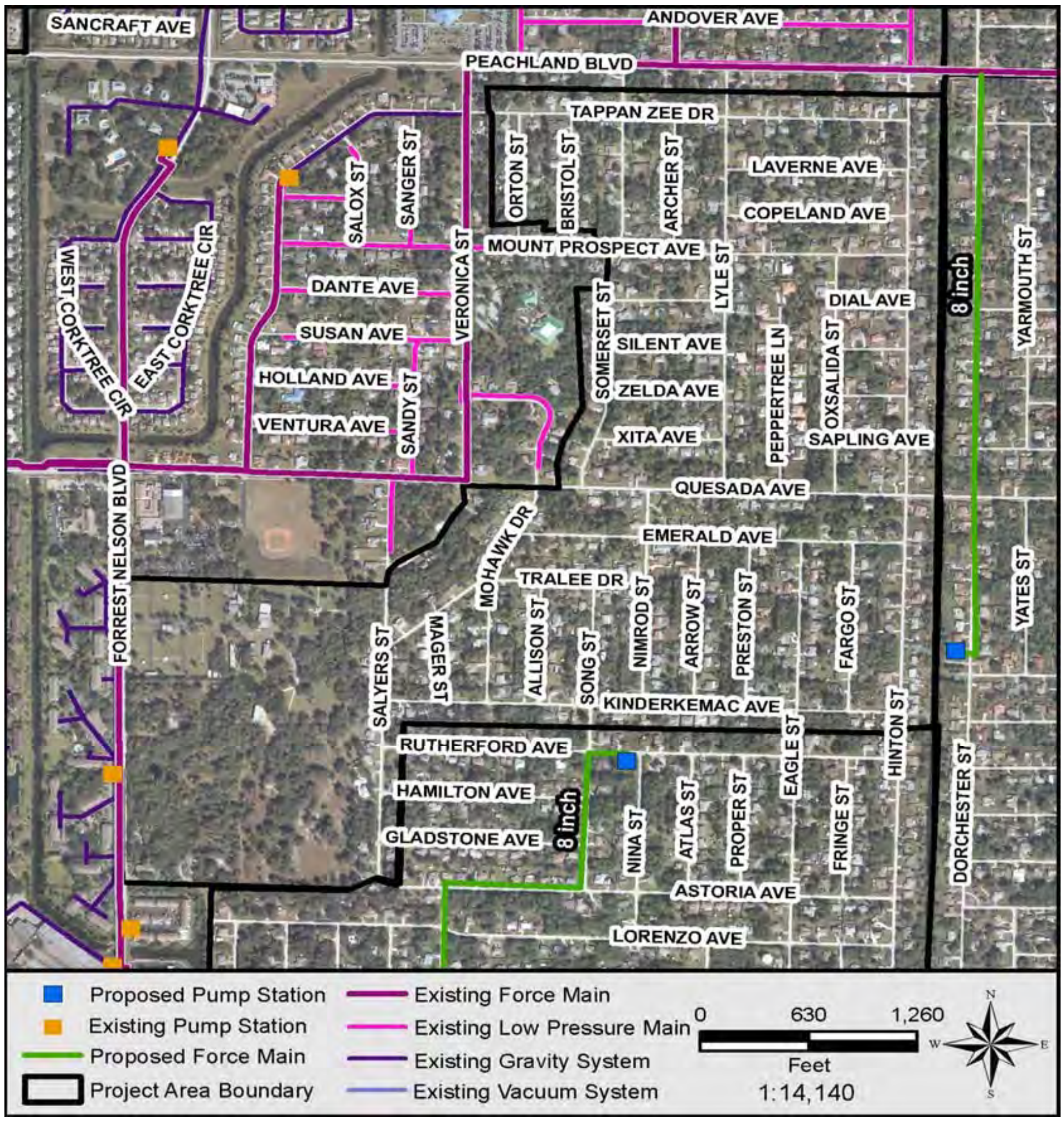
No. of Occupied Lots
492

No. of Vacant Lots
233

No. of Total Lots
725

PROJECT COMPONENTS

- ☐ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 7	Year 8	Year 9	Year 10	Year 11	Total
Professional Services	952	381	381			1,713
Land (or ROW)						
Construction Cost		3,902	3,902			7,804
Total Project Cost	**952**	**4,282**	**4,282**			**9,517**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M84 - Kensington**

Predecessor CIP: **M83, M-FM-17** | **Project Area Served:** **M84**

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The pump station and transmission main included in the predecessor project will be used to convey wastewater into the existing system.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.7/5.0

Nitrogen Load Reduction
9,400 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 8
End: Year 9

PROJECT DETAILS

Mid County

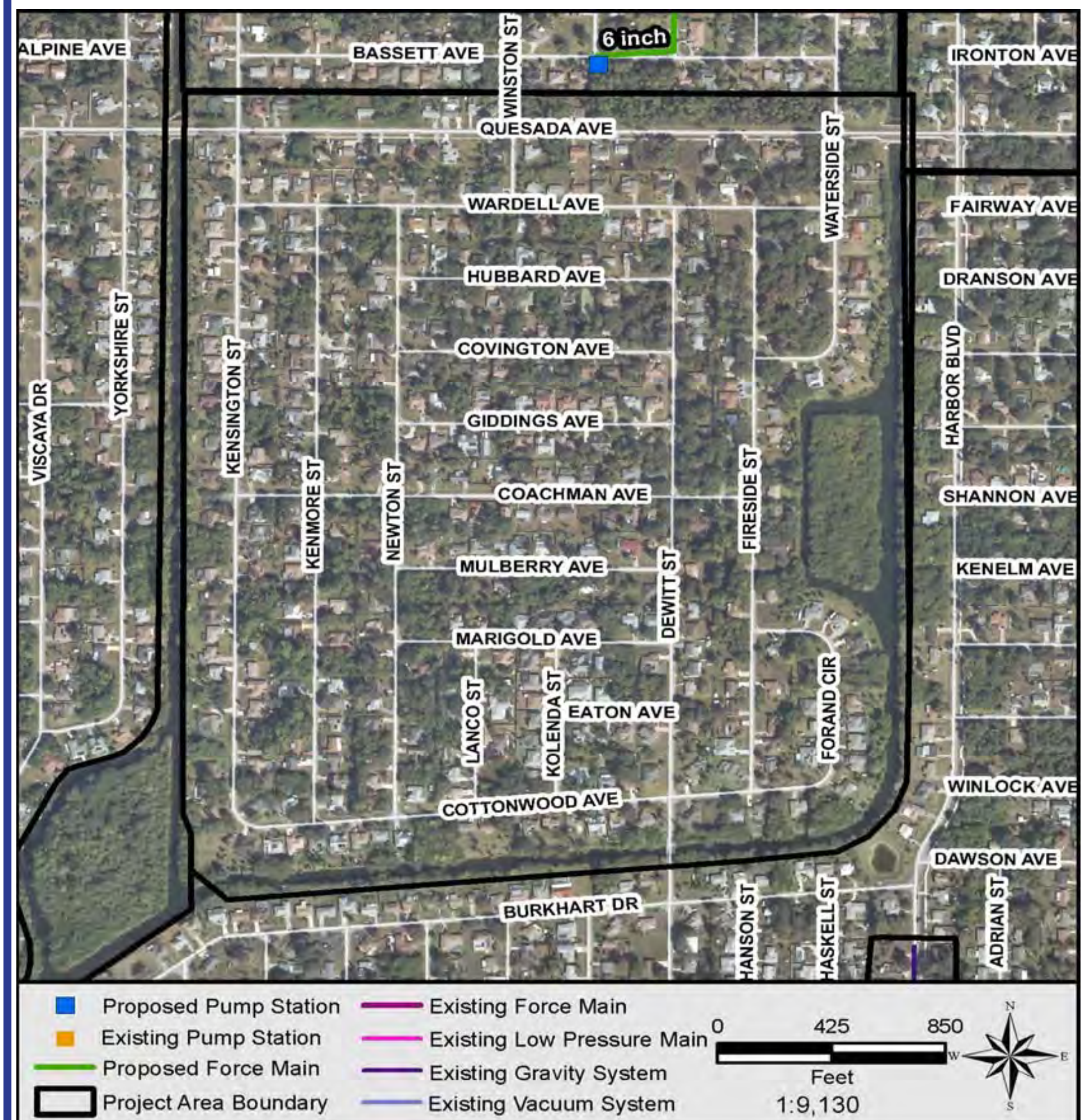
No. of Occupied Lots
372

No. of Vacant Lots
126

No. of Total Lots
498

PROJECT COMPONENTS

- ☐ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 7	Year 8	Year 9	Year 10	Year 11	Total
Professional Services	836	334	334			1,505
Land (or ROW)	48					48
Construction Cost		3,404	3,404			6,809
Total Project Cost	**884**	**3,739**	**3,739**			**8,362**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M86 - Birchcrest Ph I

Predecessor CIP: M87, M-FM-18 | **Project Area Served:** M86

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The pump station and transmission main included in the predecessor project will be used to convey wastewater into the existing system.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.7/5.0

Nitrogen Load Reduction
7,600 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 9
End: Year 10

PROJECT DETAILS

Mid County

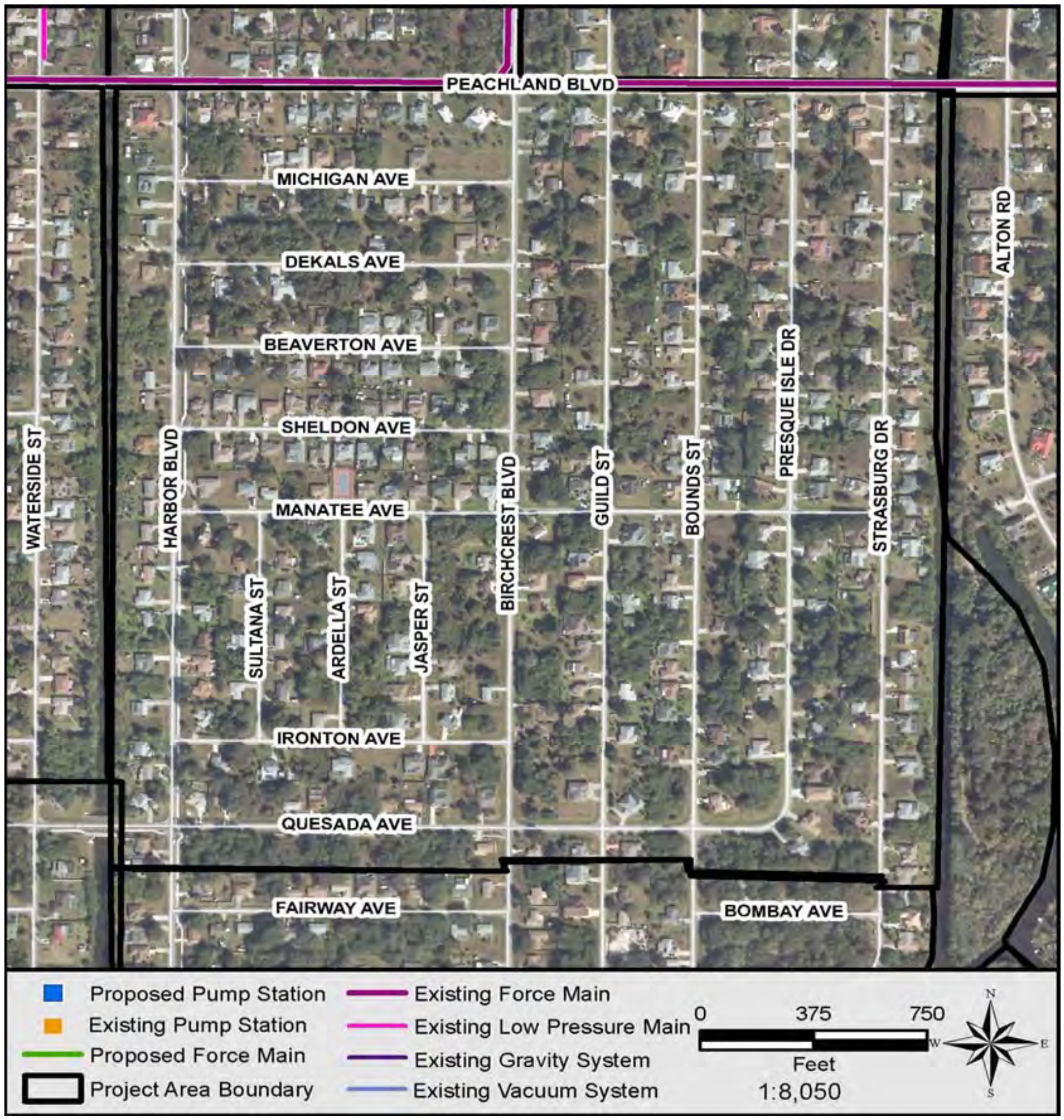
No. of Occupied Lots
327

No. of Vacant Lots
184

No. of Total Lots
511

PROJECT COMPONENTS

- [ ] Pump Station
- [ ] Force Mains
- [x] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 8	Year 9	Year 10	Year 11	Year 12	Total
Professional Services	624	250	250			1,123
Land (or ROW)						
Construction Cost		2,559	2,559			5,117
Total Project Cost	**624**	**2,808**	**2,808**			**6,241**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M87 - Birchcrest Ph II

Predecessor CIP: M-FM-18 | **Project Area Served:** M87

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force main specified as a predecessor CIP.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.7/5.0

Nitrogen Load Reduction
8,800 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 9
End: Year 10

PROJECT DETAILS

Mid County

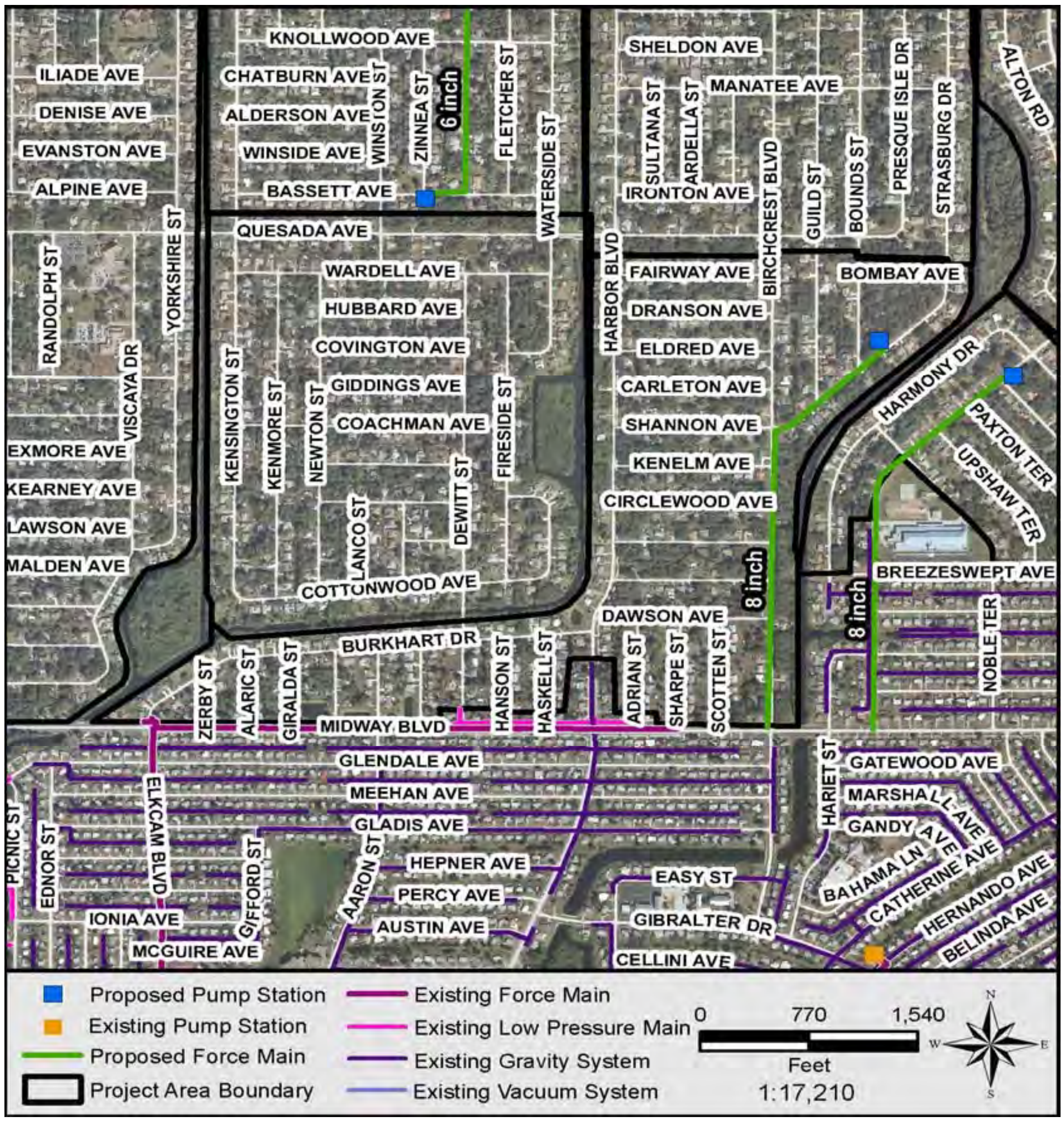
No. of Occupied Lots
384

No. of Vacant Lots
202

No. of Total Lots
586

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 8	Year 9	Year 10	Year 11	Year 12	Total
Professional Services	916	366	366			1,648
Land (or ROW)	48					48
Construction Cost		3,730	3,730			7,461
Total Project Cost	**964**	**4,097**	**4,097**			**9,157**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M92 - Laika**

Predecessor CIP: **M-FM-19** | **Project Area Served:** **M92**

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force main specified as a predecessor CIP.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.7/5.0

Nitrogen Load Reduction
10,800 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 9
End: Year 10

PROJECT DETAILS

Mid County

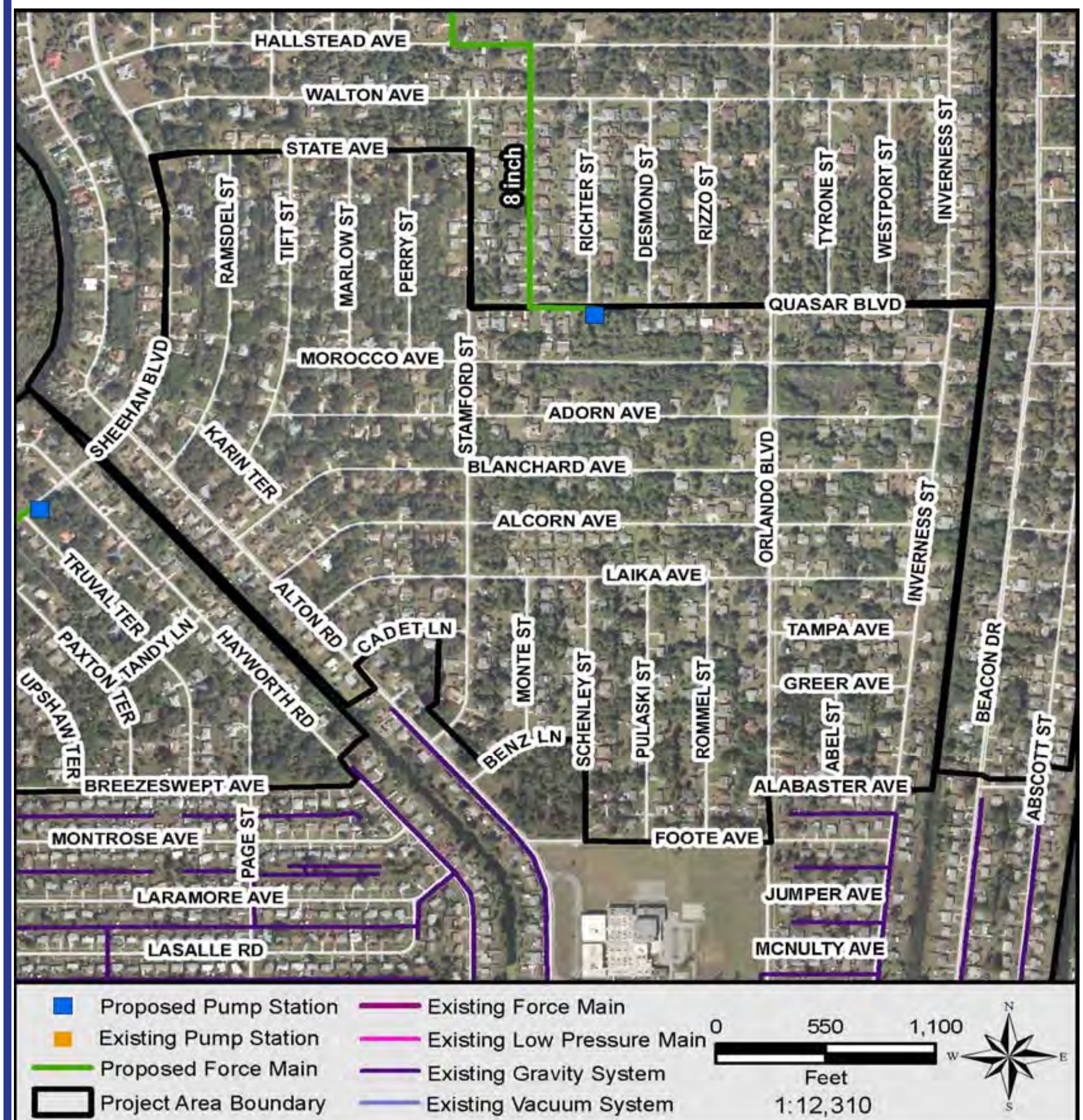
No. of Occupied Lots
444

No. of Vacant Lots
295

No. of Total Lots
739

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 8	Year 9	Year 10	Year 11	Year 12	Total
Professional Services	1,118	447	447			2,012
Land (or ROW)	48					48
Construction Cost		4,560	4,560			9,119
Total Project Cost	**1,166**	**5,007**	**5,007**			**11,180**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W18b - Seabrook

Predecessor CIP: W18a, W-FM-23 | **Project Area Served:** W18b

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The pump station and transmission main included in the predecessor project will be used to convey wastewater into the existing system.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
8,600 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 10
End: Year 11

PROJECT DETAILS

West County

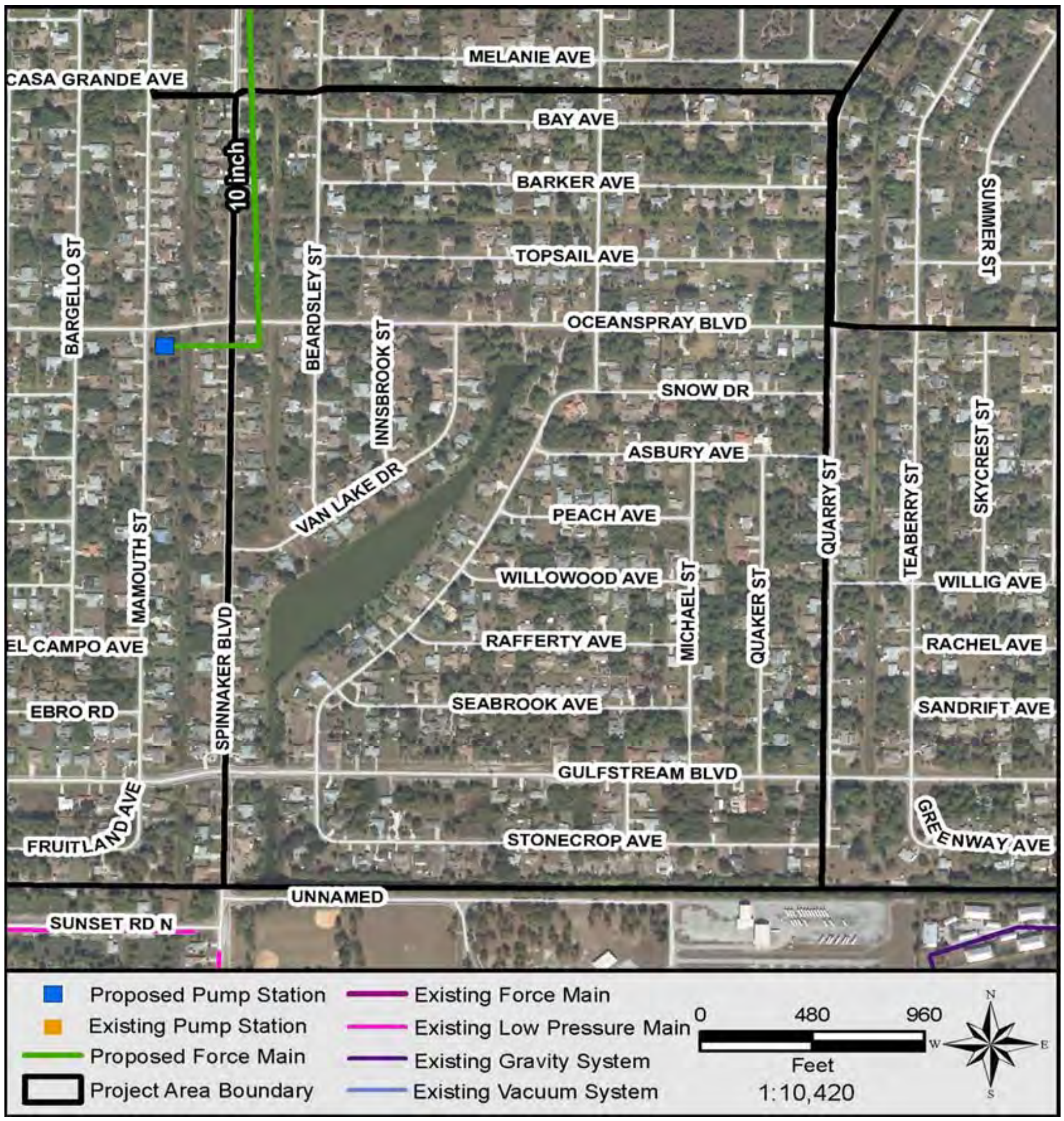
No. of Occupied Lots
328

No. of Vacant Lots
264

No. of Total Lots
592

PROJECT COMPONENTS

- [ ] Pump Station
- [ ] Force Mains
- [x] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 9	Year 10	Year 11	Year 12	Year 13	Total
Professional Services	676	270	270			1,216
Land (or ROW)						
Construction Cost		2,770	2,770			5,540
Total Project Cost	**676**	**3,040**	**3,040**			**6,756**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M91 - State

Predecessor CIP: M92, M-FM-19 | **Project Area Served:** M91

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The pump station and transmission main included in the predecessor project will be used to convey wastewater into the existing system.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
9,400 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 10
End: Year 11

PROJECT DETAILS

Mid County

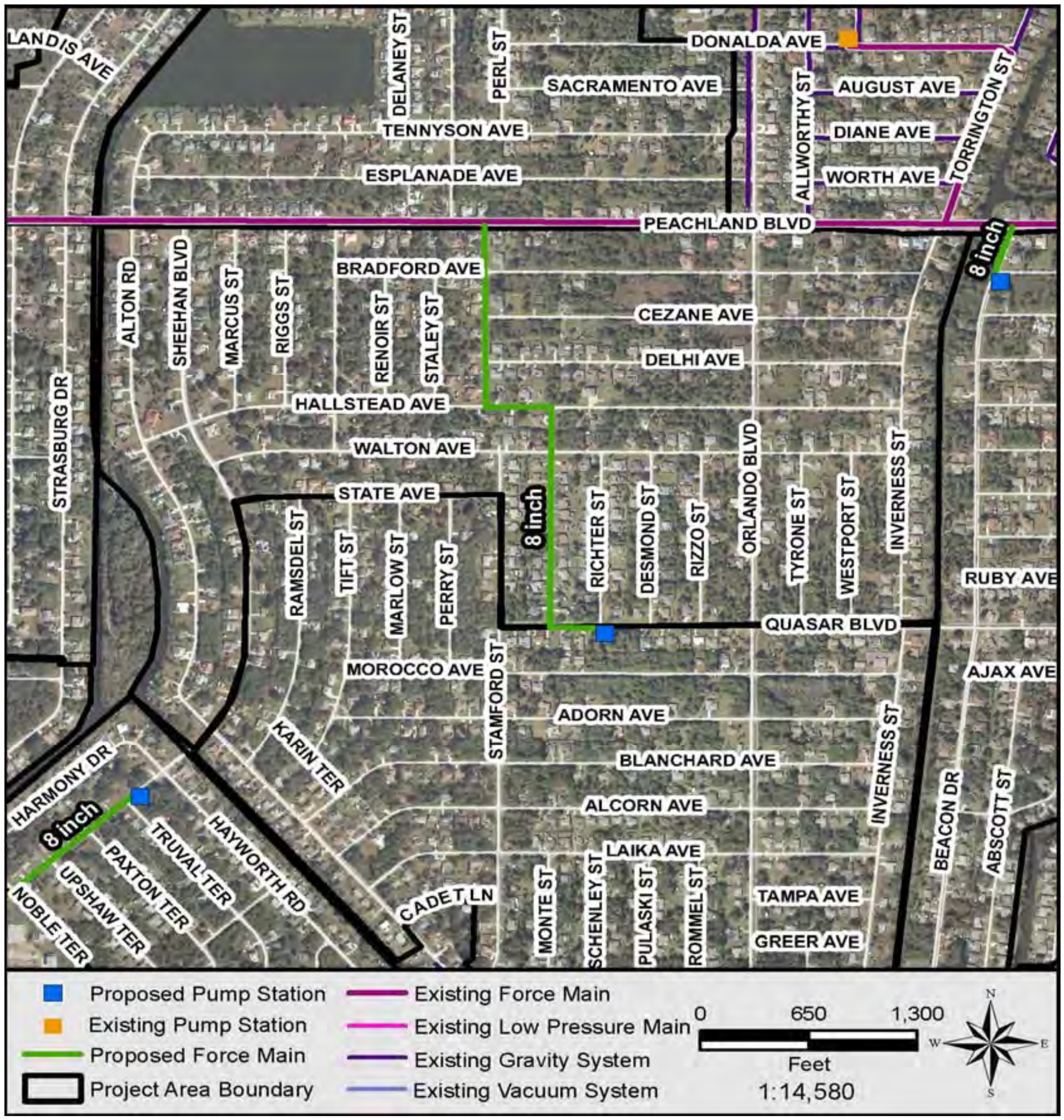
No. of Occupied Lots
402

No. of Vacant Lots
386

No. of Total Lots
788

PROJECT COMPONENTS

- ☐ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 9	Year 10	Year 11	Year 12	Year 13	Total
Professional Services	934	374	374			1,682
Land (or ROW)						
Construction Cost		3,830	3,830			7,660
Total Project Cost	**934**	**4,204**	**4,204**			**9,342**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W18a - Ebro

Predecessor CIP: W-FM-23 | **Project Area Served: W18a**

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force main specified as a predecessor CIP.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
9,900 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 10
End: Year 11

PROJECT DETAILS

West County

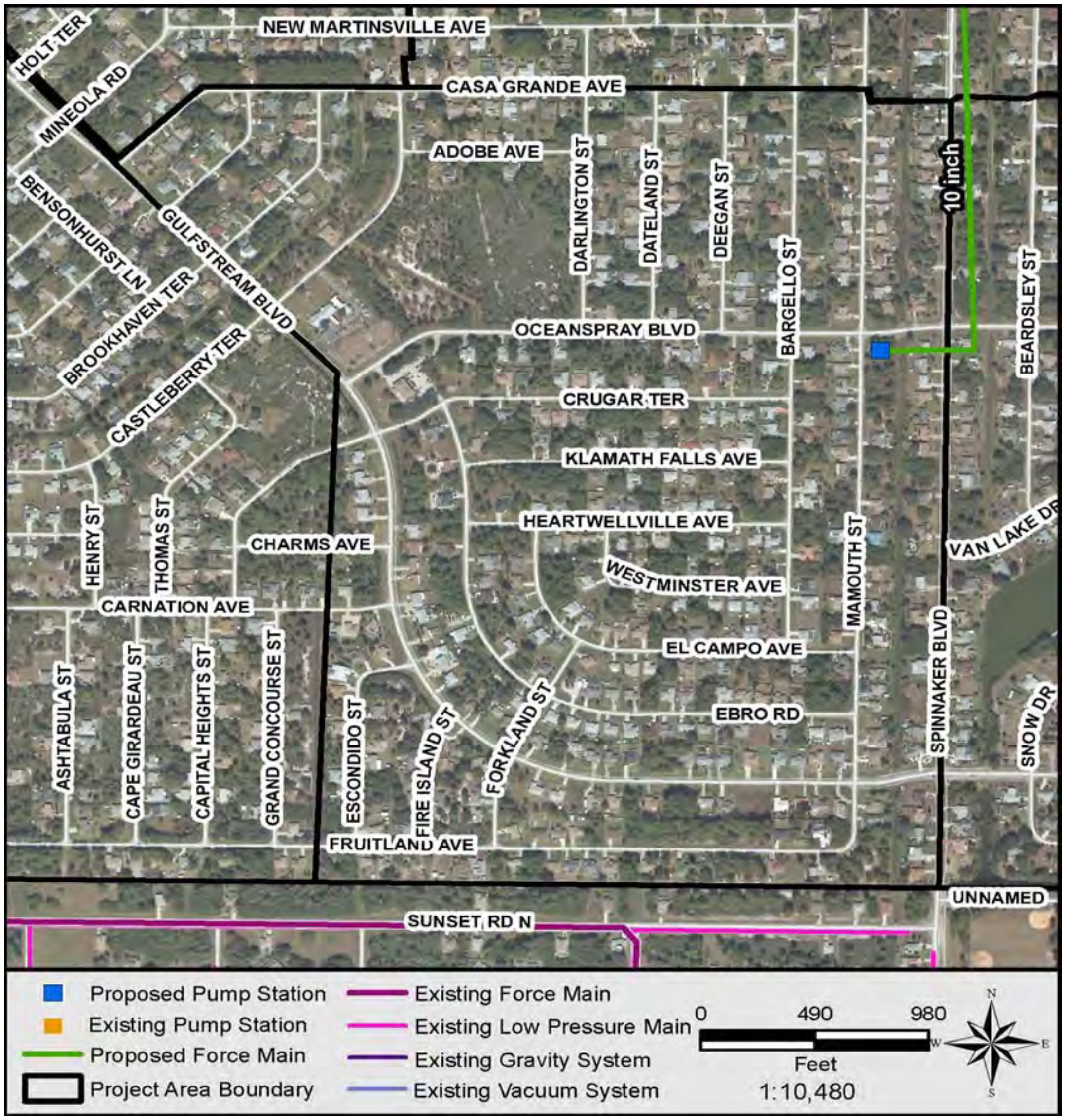
No. of Occupied Lots
398

No. of Vacant Lots
225

No. of Total Lots
623

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 9	Year 10	Year 11	Year 12	Year 13	Total
Professional Services	983	393	393			1,770
Land (or ROW)	48					48
Construction Cost		4,008	4,008			8,016
Total Project Cost	**1,031**	**4,402**	**4,402**			**9,835**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S10a - Royal Rd

Predecessor CIP: S-FM-20 | **Project Area Served: S10a**

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force main specified as a predecessor CIP.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
100 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 11
End: Year 12

PROJECT DETAILS

South County

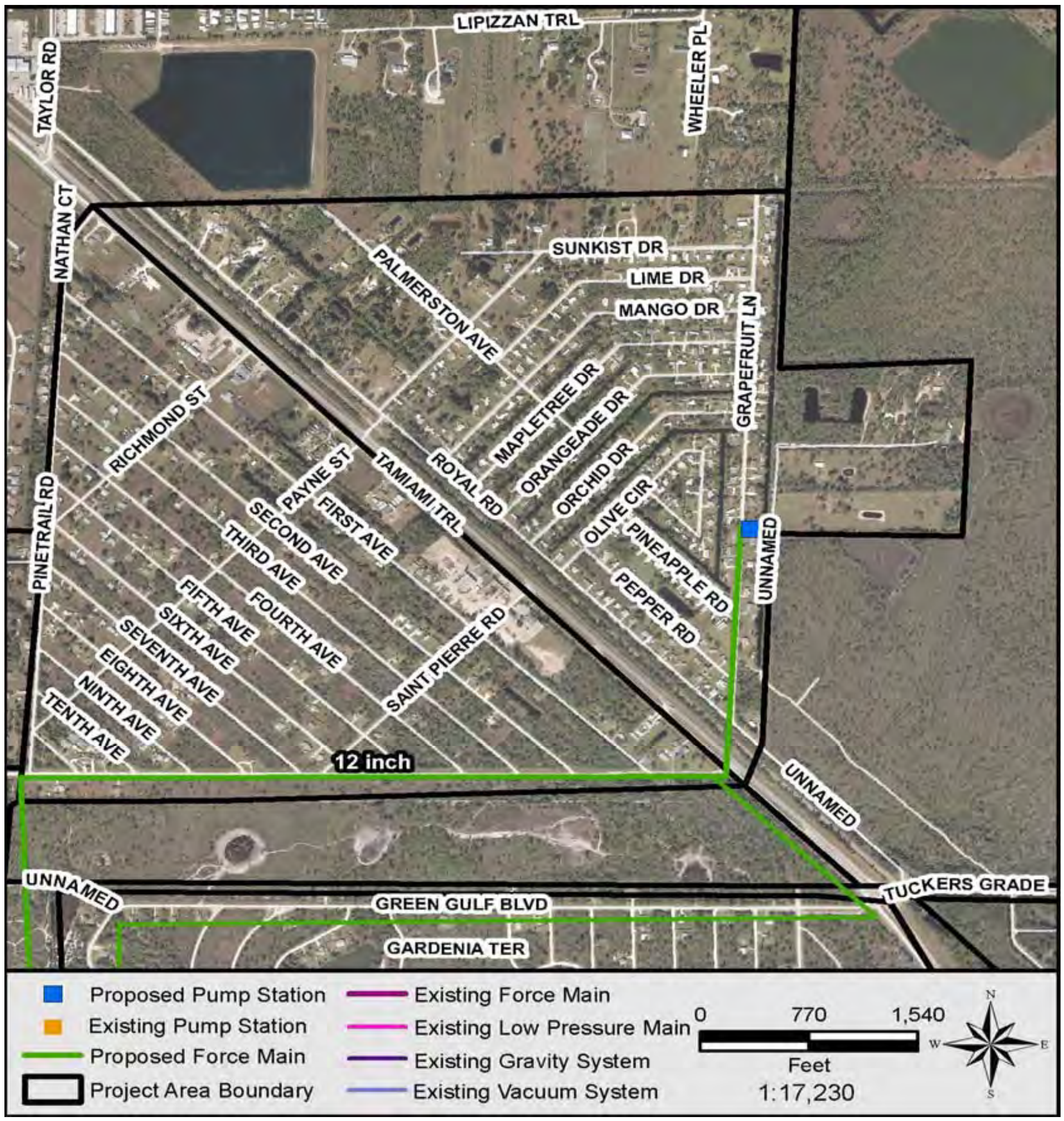
No. of Occupied Lots
382

No. of Vacant Lots
206

No. of Total Lots
588

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 10	Year 11	Year 12	Year 13	Year 14	Total
Professional Services	958	383	383			1,725
Land (or ROW)	48					48
Construction Cost		3,904	3,904			7,809
Total Project Cost	**1,006**	**4,288**	**4,288**			**9,582**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M63 - Beaumont**

Predecessor CIP: **None** | **Project Area Served:** **M63**

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The pump station will be constructed and discharged into an existing force main as shown in the figure.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.7/5.0

Nitrogen Load Reduction
7,800 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 11
End: Year 12

PROJECT DETAILS

Mid County

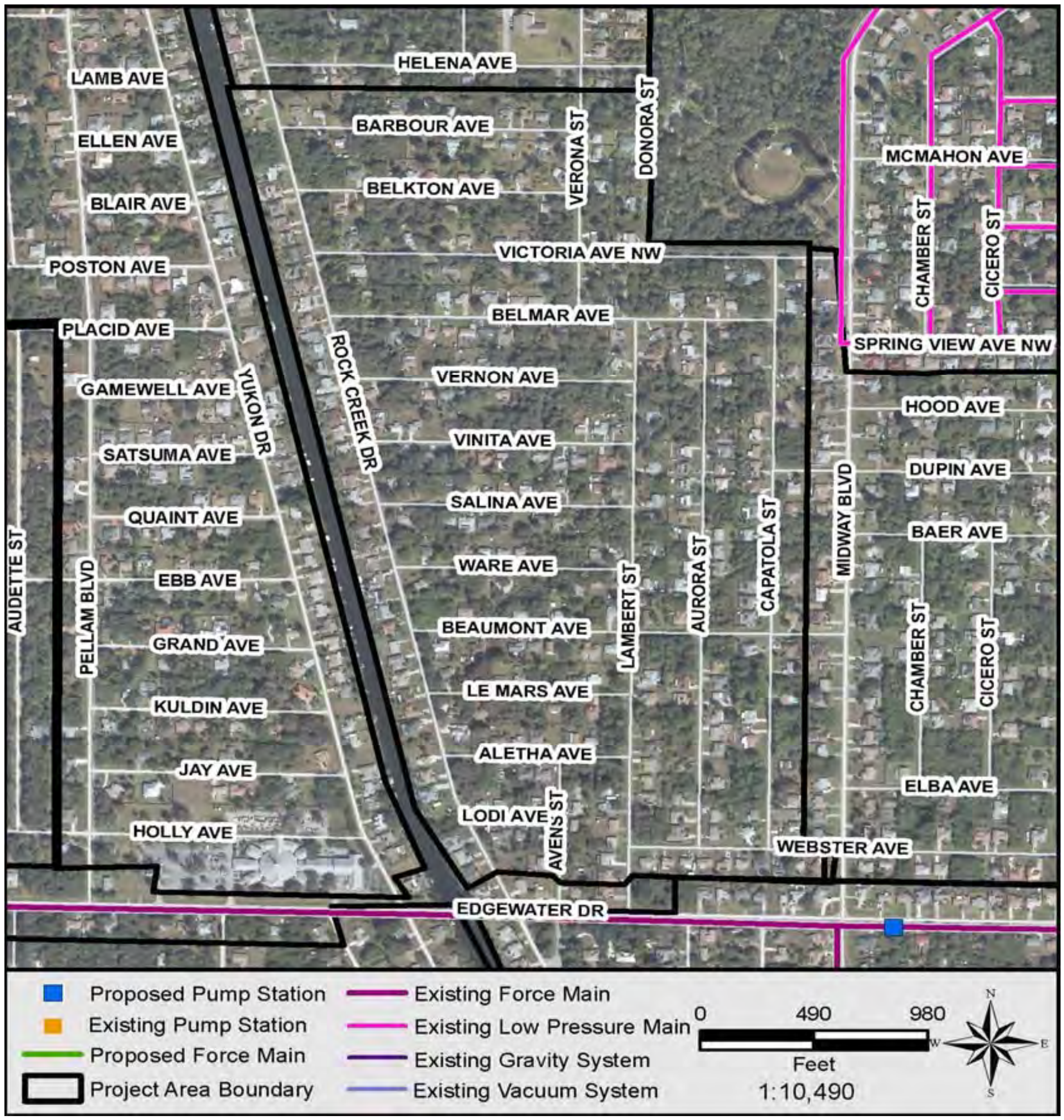
No. of Occupied Lots
315

No. of Vacant Lots
184

No. of Total Lots
499

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 10	Year 11	Year 12	Year 13	Year 14	Total
Professional Services	806	322	322			1,451
Land (or ROW)	48					48
Construction Cost		3,280	3,280			6,561
Total Project Cost	**854**	**3,603**	**3,603**			**8,059**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W16a - Denmark

Predecessor CIP: W-FM-21, W-FM-22 | **Project Area Served:** W16a

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force mains specified as predecessor CIPs.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
6,000 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 11
End: Year 12

PROJECT DETAILS

West County

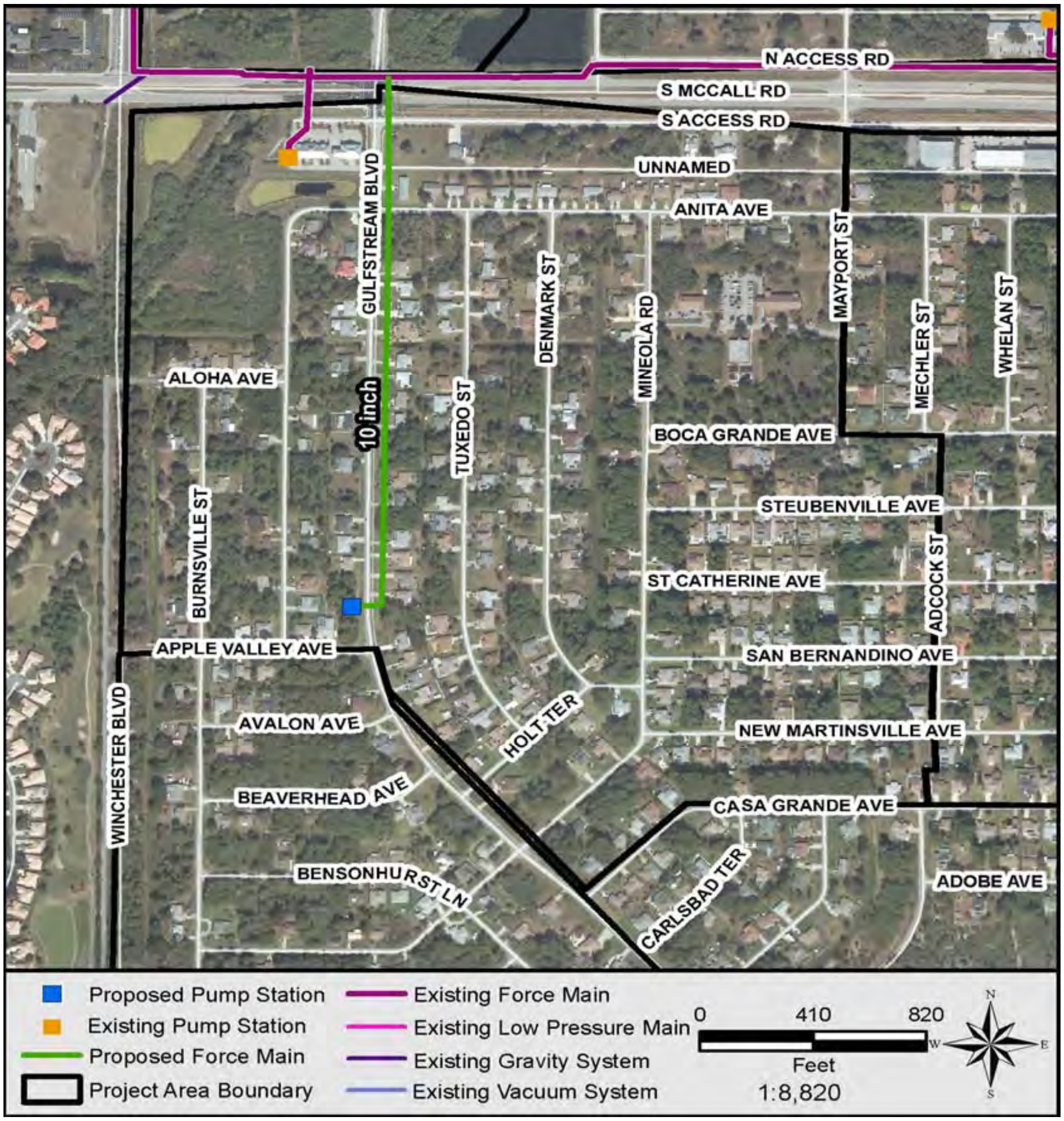
No. of Occupied Lots
302

No. of Vacant Lots
197

No. of Total Lots
499

PROJECT COMPONENTS

- [x] Pump Station
- [ ] Force Mains
- [x] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 10	Year 11	Year 12	Year 13	Year 14	Total
Professional Services	762	305	305			1,372
Land (or ROW)	48					48
Construction Cost		3,100	3,100			6,201
Total Project Cost	**810**	**3,405**	**3,405**			**7,620**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M-FM-13 - Tinker Street**

Predecessor CIP: None | **Project Area Served:** M59

DESCRIPTION: The project includes installing 1,500 LF of 6-inch force main proceeding north along Tinker Street. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 7
End: Year 8

PROJECT DETAILS

Mid County

Force Main Length
1,500 linear feet

Force Main Material
PVC

Force Main Size
6 inches

PROJECT COMPONENTS

- ☑ Pump Station
- ☑ Force Mains
- ☐ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains

Expenditure Plan ($1000)

	Year 6	Year 7	Year 8	Year 9	Year 10	Total
Professional Services	51	9	3			63
Land (or ROW)						
Construction Cost		72	72			144
Total Project Cost	**51**	**81**	**75**			**207**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M-FM-14 - Barbara Avenue to Murdock Circle

Predecessor CIP: None | **Project Area Served:** M59

DESCRIPTION: The project includes upsizing 1,900 LF of 4-inch force main to 8-inch force main starting at Barbara Avenue proceeding north along Tinker Street, continuing west along Cochran Boulevard, turning north on Education Way, and ending at Murdock Circle. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 7
End: Year 8

PROJECT DETAILS

Mid County

Force Main Length
1,900 linear feet

Force Main Material
PVC

Force Main Size
8 inches

PROJECT COMPONENTS

- [ ] Pump Station
- [x] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains

Expenditure Plan ($1000)

	Year 6	Year 7	Year 8	Year 9	Year 10	Total
Professional Services	74	14	5			92
Land (or ROW)						
Construction Cost		105	105			210
Total Project Cost	**74**	**119**	**110**			**302**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M-FM-15 - Rutherford Ave to US 41

Predecessor CIP: None | **Project Area Served:** M78, M79

DESCRIPTION: The project includes installing 5,800 LF of 8-inch force main along Rutherford Avenue, Song Street, Astoria Avenue, Doria Street, Navajo Lane, Midway Boulevard, and ending at US 41. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 7
End: Year 8

PROJECT DETAILS

Mid County

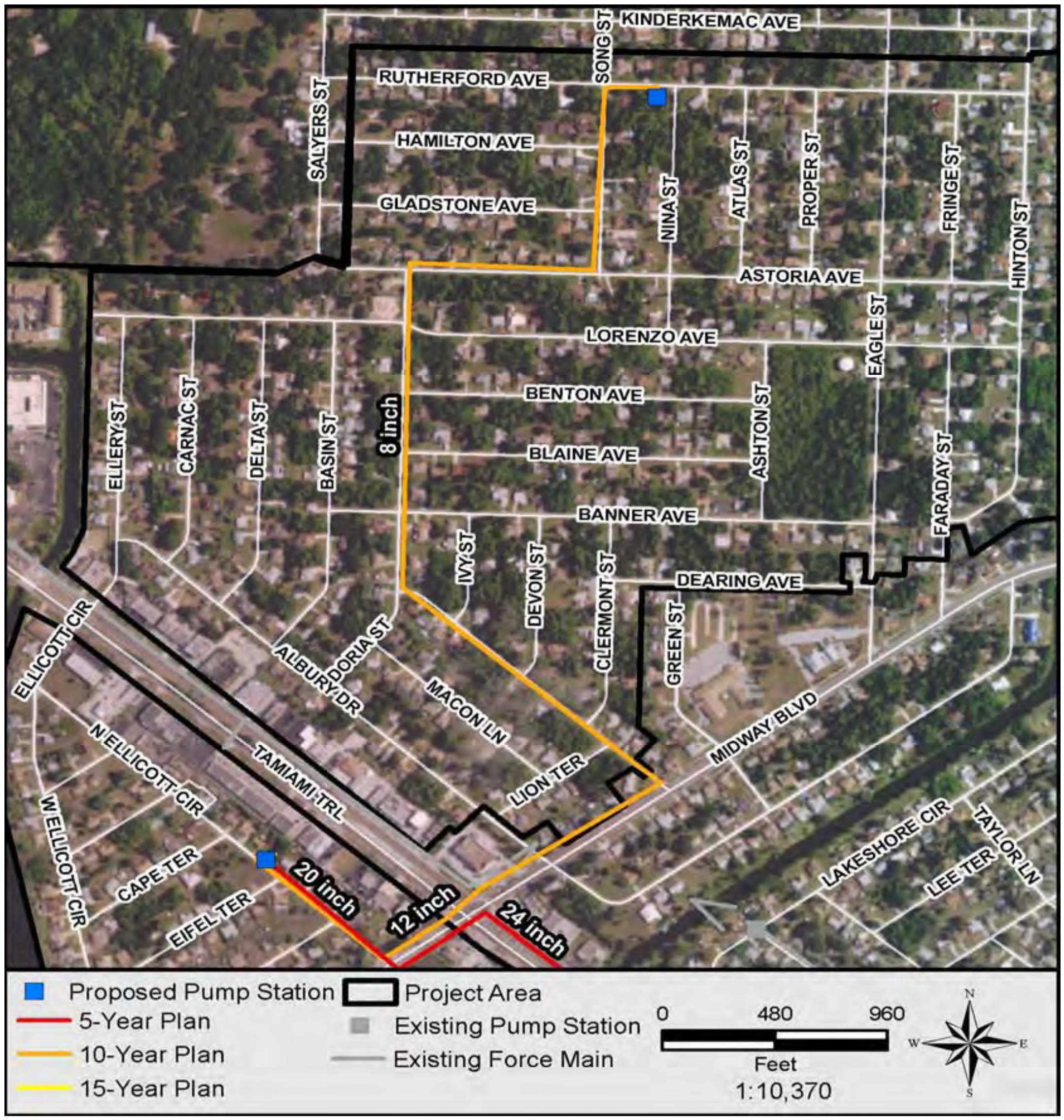
Force Main Length
5,800 linear feet

Force Main Material
PVC

Force Main Size
8 inches

PROJECT COMPONENTS

- [ ] Pump Station
- [x] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 6	Year 7	Year 8	Year 9	Year 10	Total
Professional Services	225	42	14			281
Land (or ROW)						
Construction Cost		319	319			638
Total Project Cost	**225**	**361**	**333**			**918**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M-FM-16 - US 41 to Ellicott LS**

Predecessor CIP: **None** | **Project Area Served:** **M78, M79**

DESCRIPTION: The project includes installing 1,400 LF of 12-inch force main starting at US 41 and ending at Ellicott LS The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 7
End: Year 8

PROJECT DETAILS

Mid County

Force Main Length
1,400 linear feet

Force Main Material
PVC

Force Main Size
12 inches

PROJECT COMPONENTS

- [ ] Pump Station
- [x] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains

Expenditure Plan ($1000)

	Year 6	Year 7	Year 8	Year 9	Year 10	Total
Professional Services	67	13	4			84
Land (or ROW)						
Construction Cost		96	96			191
Total Project Cost	**67**	**108**	**100**			**275**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M-FM-17 - Dewhurst to Peachland Blvd

Predecessor CIP: None

Project Area Served: M83, M84

DESCRIPTION: The project includes installing 2,800 LF of 6-inch force main proceeding north along Dewhurst to Peachland Boulevard. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 8
End: Year 9

PROJECT DETAILS

Mid County

Force Main Length
2,800 linear feet

Force Main Material
PVC

Force Main Size
6 inches

PROJECT COMPONENTS

- [ ] Pump Station
- [x] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains

Expenditure Plan ($1000)

	Year 7	Year 8	Year 9	Year 10	Year 11	Total
Professional Services	95	18	6			118
Land (or ROW)						
Construction Cost		134	134			269
Total Project Cost	**95**	**152**	**140**			**387**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M-FM-18 - Strasburg Dr to Midway Blvd

Predecessor CIP: None | **Project Area Served:** M86, M87

DESCRIPTION: The project includes installing 3,400 LF of 8-inch force main along Strasburg Drive and Birchcrest Boulevard to Midway Boulevard. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 9
End: Year 10

PROJECT DETAILS

Mid County

Force Main Length
3,400 linear feet

Force Main Material
PVC

Force Main Size
8 inches

PROJECT COMPONENTS

- [ ] Pump Station
- [x] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains

Expenditure Plan ($1000)

	Year 8	Year 9	Year 10	Year 11	Year 12	Total
Professional Services	132	25	8			165
Land (or ROW)						
Construction Cost		187	187			374
Total Project Cost	**132**	**212**	**195**			**539**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M-FM-19 - Quasar Blvd to Marlene Street**

Predecessor CIP: **None** | **Project Area Served:** **M91, M92**

DESCRIPTION: The project includes installing 3,400 LF of 8-inch force main on Quasar Boulevard, Talbot Street, Hallstead Avenue and Marlene Street to Peachland Boulevard. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

☑ Reduce nitrogen loading to environment

☑ Increase capacity to accommodate design flows

☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 9
End: Year 10

PROJECT DETAILS

Mid County

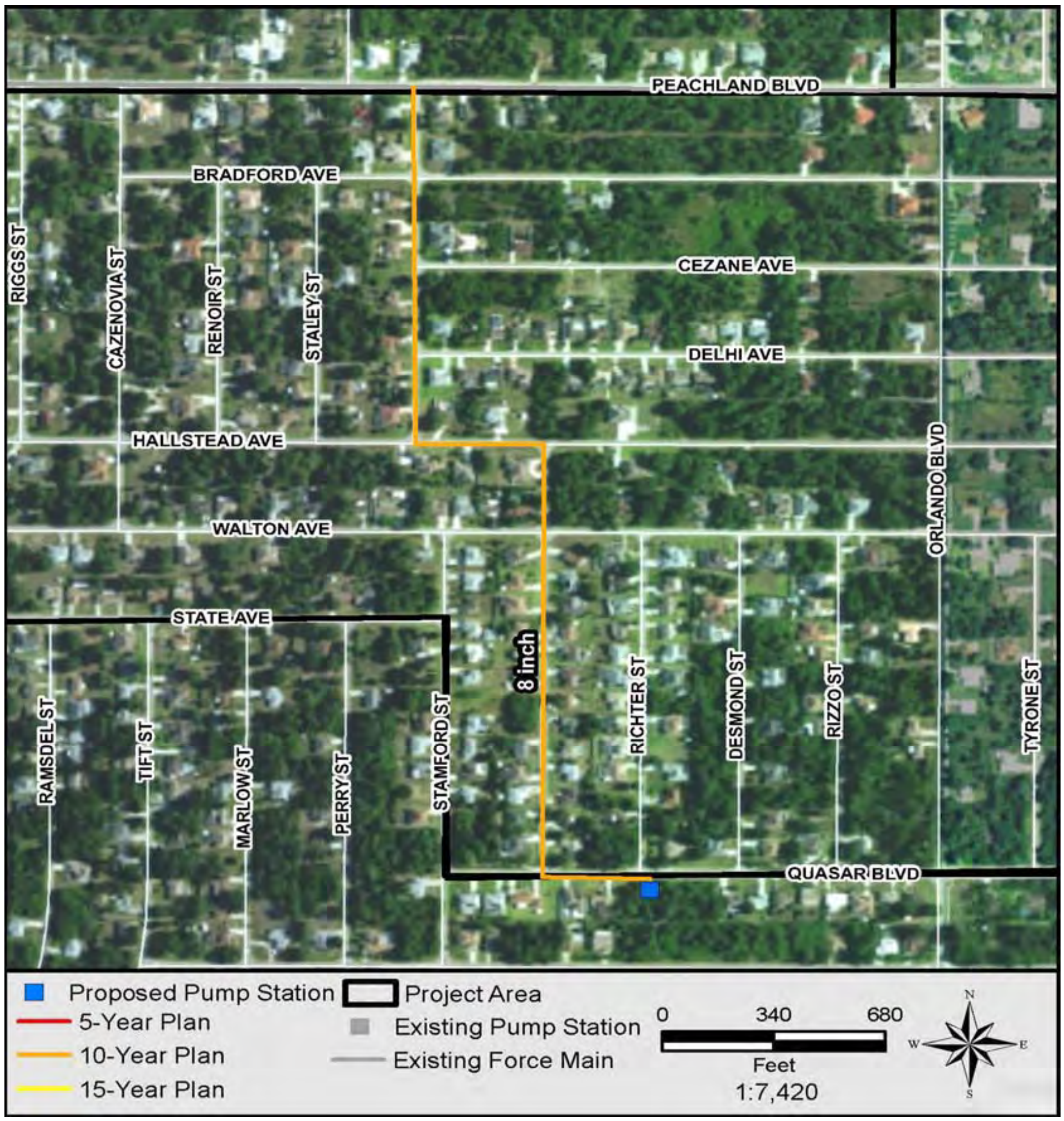
Force Main Length
3,400 linear feet

Force Main Material
PVC

Force Main Size
8 inches

PROJECT COMPONENTS

☐ Pump Station
☑ Force Mains
☐ Vacuum Mains
☐ Low Pressure Mains
☐ Gravity Mains



Expenditure Plan ($1000)

	Year 8	Year 9	Year 10	Year 11	Year 12	Total
Professional Services	132	25	8			165
Land (or ROW)						
Construction Cost		187	187			374
Total Project Cost	**132**	**212**	**195**			**539**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **S-FM-20 - Grapefruit Lane**

Predecessor CIP: **None** | **Project Area Served:** **S10a**

DESCRIPTION: The project includes installing 31,000 LF of 12-inch force main starting from Orchid Drive and Grapefruit Lane to an existing 12-inch force main on Burnt Store Road. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 11
End: Year 12

PROJECT DETAILS

South County

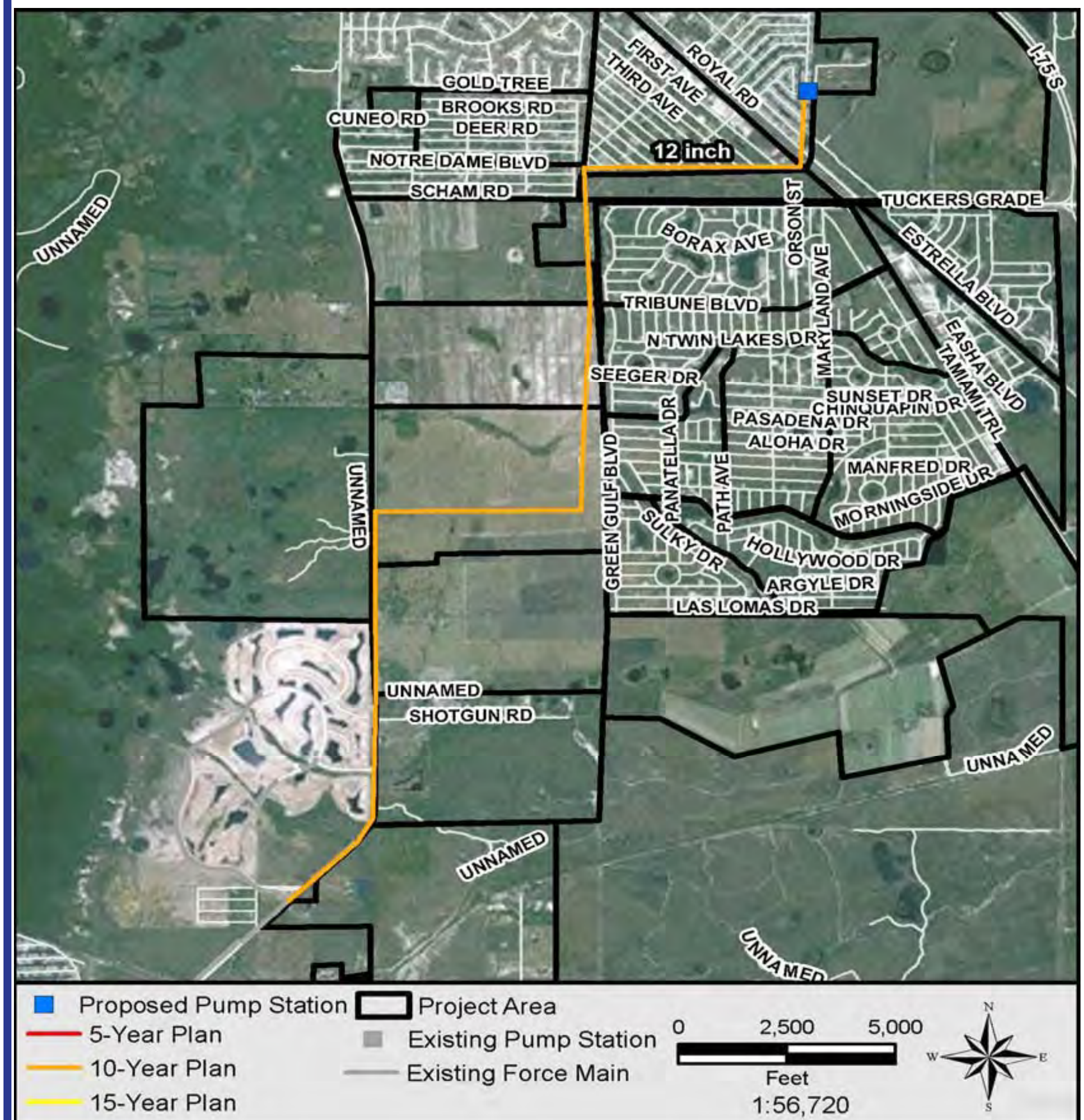
Force Main Length
31,000 linear feet

Force Main Material
PVC

Force Main Size
12 inches

PROJECT COMPONENTS

- ☐ Pump Station
- ☑ Force Mains
- ☐ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 10	Year 11	Year 12	Year 13	Year 14	Total
Professional Services	1,494	280	93			1,868
Land (or ROW)						
Construction Cost		2,123	2,123			4,245
Total Project Cost	**1,494**	**2,403**	**2,216**			**6,113**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **W-FM-21 - Apple Valley Ave to S McCall Rd**

Predecessor CIP: **None** | **Project Area Served:** **W16a, W16b**

DESCRIPTION: The project includes installing 2,300 LF of 10-inch force main starting from the intersection of Apple Valley Avenue and Gulfstream Boulevard , heading to north on Gulfstream Blvd, and ending at intersection of Gulfstream Boulevard and South McCall Road. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 11
End: Year 12

PROJECT DETAILS

West County

Force Main Length
2,300 linear feet

Force Main Material
PVC

Force Main Size
10 inches

PROJECT COMPONENTS

- [ ] Pump Station
- [x] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains

Expenditure Plan ($1000)

	Year 10	Year 11	Year 12	Year 13	Year 14	Total
Professional Services	100	19	6			125
Land (or ROW)						
Construction Cost		142	142			284
Total Project Cost	**100**	**161**	**148**			**409**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W-FM-22 - SR776 to Parade Circle

Predecessor CIP: None | **Project Area Served:** W16a, W16b

DESCRIPTION: The project includes installing 13,400 LF of 12-inch force main starting from intersection of Sunnybrook Boulevard and SR776 south to an existing manhole at Parade Circle and Sunnybrook Boulevard. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 11
End: Year 12

PROJECT DETAILS

West County

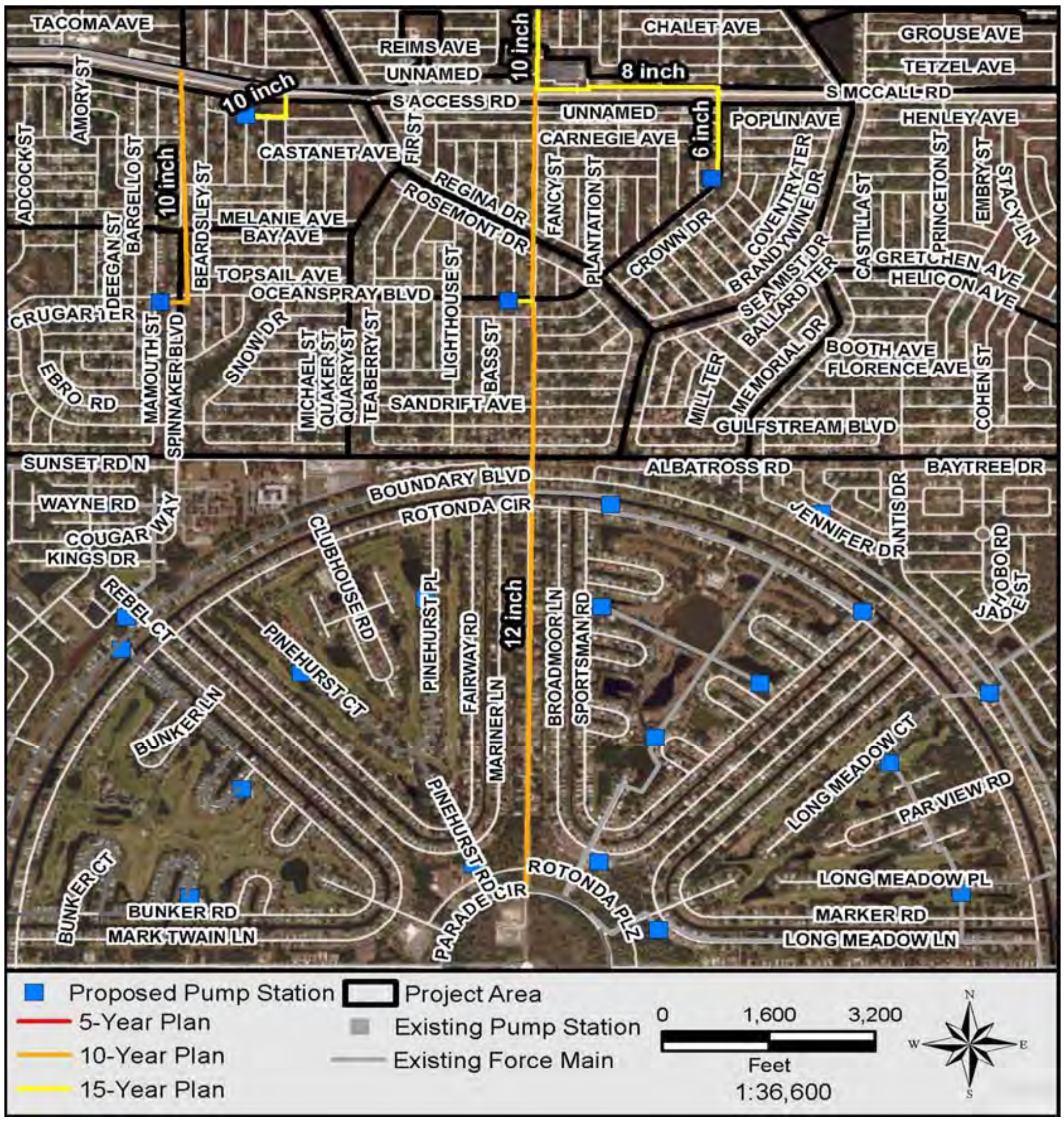
Force Main Length
13,400 linear feet

Force Main Material
PVC

Force Main Size
12 inches

PROJECT COMPONENTS

- [ ] Pump Station
- [x] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 10	Year 11	Year 12	Year 13	Year 14	Total
Professional Services	646	121	40			808
Land (or ROW)						
Construction Cost		918	918			1,836
Total Project Cost	**646**	**1,039**	**958**			**2,644**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **W-FM-23 - Oceanspray Blvd to S McCall Rd**

Predecessor CIP: **None** | **Project Area Served:** **W18a, W18b**

DESCRIPTION: The project includes installing 4,300 LF of 10-inch force main starting from intersection of Oceanspray Boulevard and Mamouth Street, heading west on Oceanspray Boulevard, continuing north on Spinnaker Boulevard, and ending at Spinnaker Boulevard and South McCall Road. The force main will be used to convey wastewater from the pump station of the specified project area to the existing system.

ENVIRONMENTAL DETAILS

Overall Impact Score

See Project Area Served

Nitrogen Load Reduction

See Project Area Served

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 10

End: Year 11

PROJECT DETAILS

West County

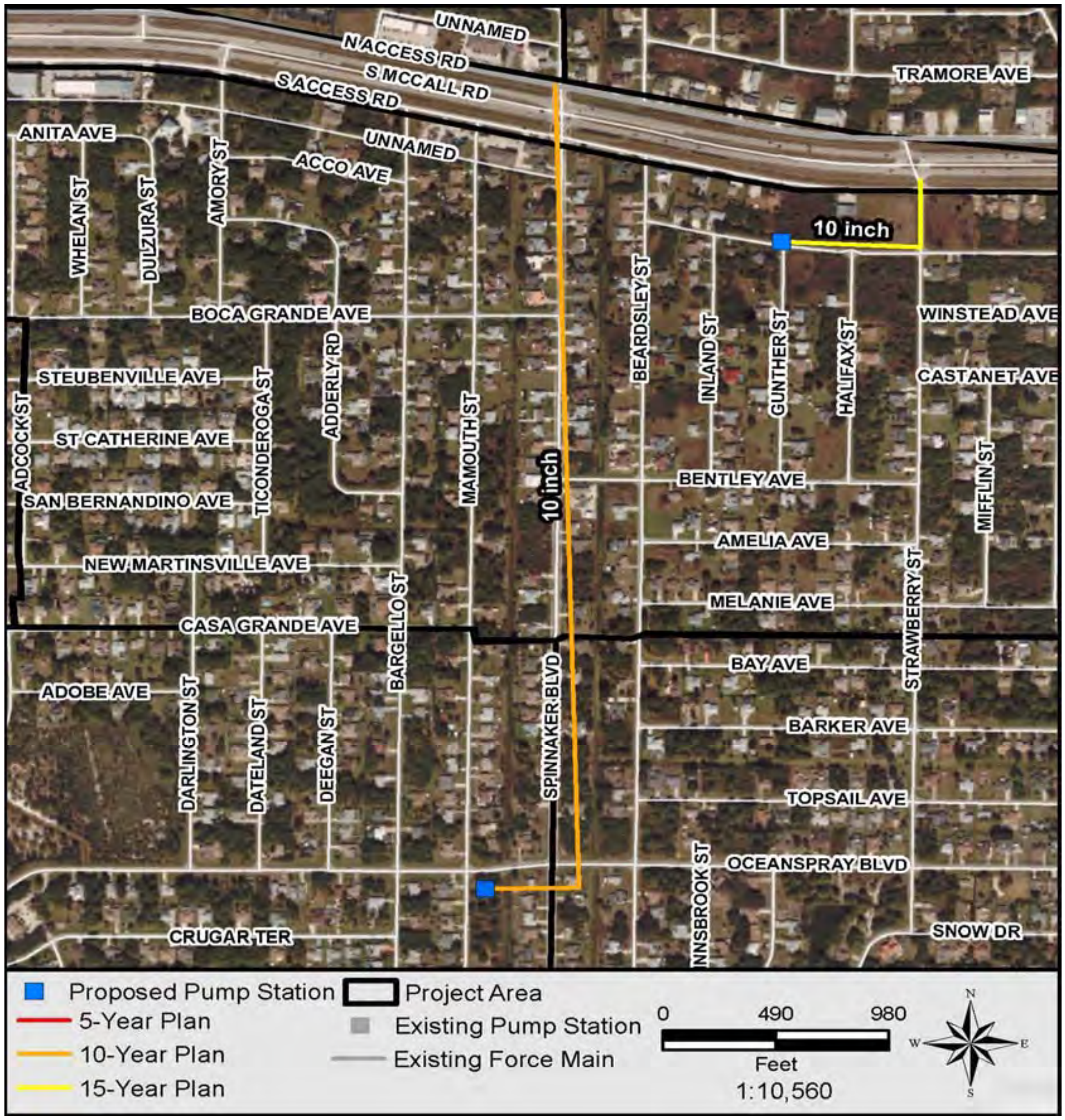
Force Main Length
4,300 linear feet

Force Main Material
PVC

Force Main Size
10 inches

PROJECT COMPONENTS

- [ ] Pump Station
- [x] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 9	Year 10	Year 11	Year 12	Year 13	Total
Professional Services	186	35	12			233
Land (or ROW)						
Construction Cost		264	264			529
Total Project Cost	**186**	**299**	**276**			**762**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M93 - Tandy

Predecessor CIP: M-FM-24 | **Project Area Served:** M93

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force main specified as a predecessor CIP.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.7/5.0

Nitrogen Load Reduction
4,100 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 12
End: Year 13

PROJECT DETAILS

Mid County

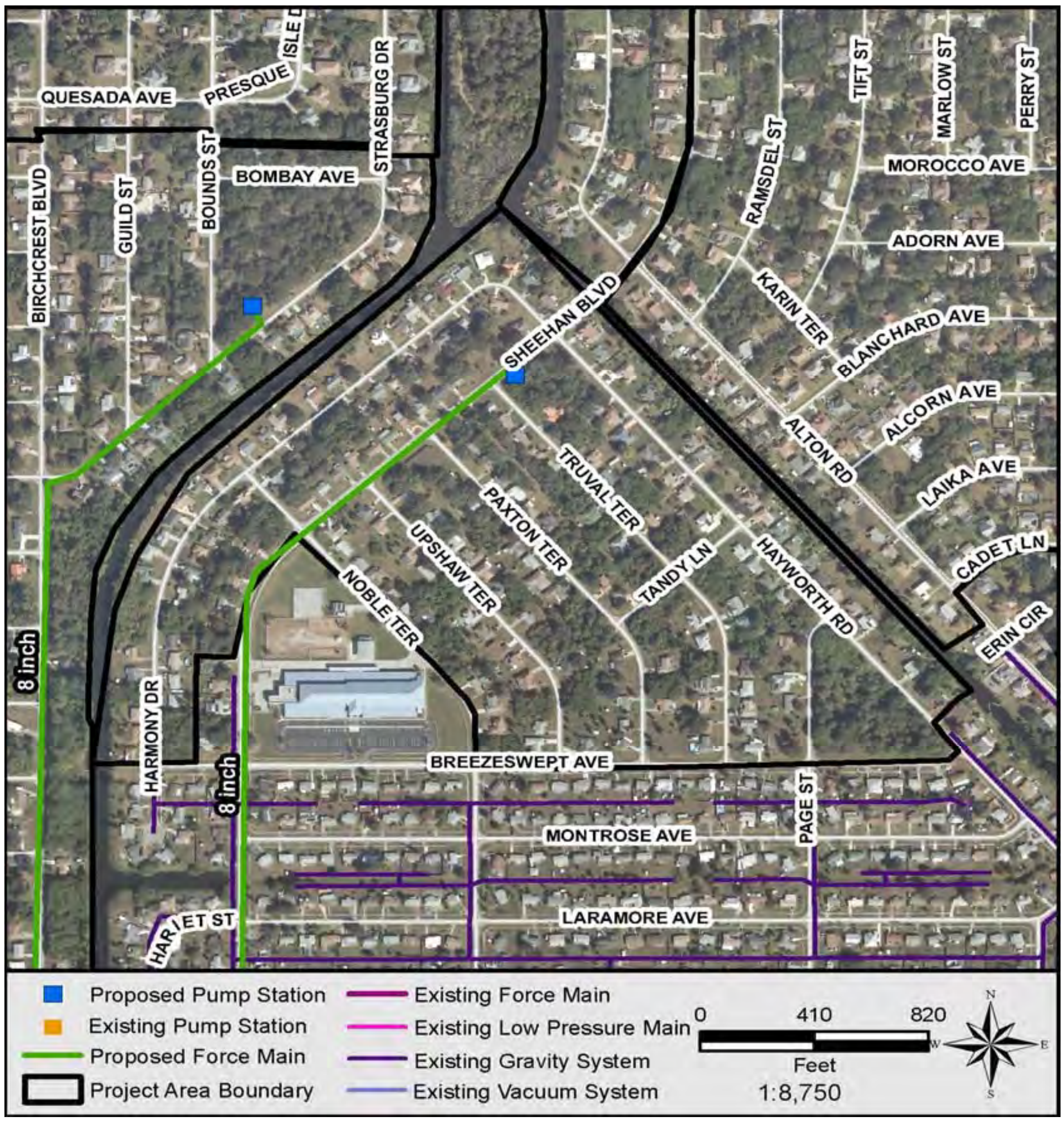
No. of Occupied Lots
168

No. of Vacant Lots
81

No. of Total Lots
249

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 11	Year 12	Year 13	Year 14	Year 15	Total
Professional Services	424	169	169			763
Land (or ROW)	30					30
Construction Cost		1,722	1,722			3,444
Total Project Cost	**454**	**1,892**	**1,892**			**4,237**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M100 - Rye

Predecessor CIP: M-FM-25 | **Project Area Served: M100**

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force main specified as a predecessor CIP.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
10,600 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 12
End: Year 13

PROJECT DETAILS

Mid County

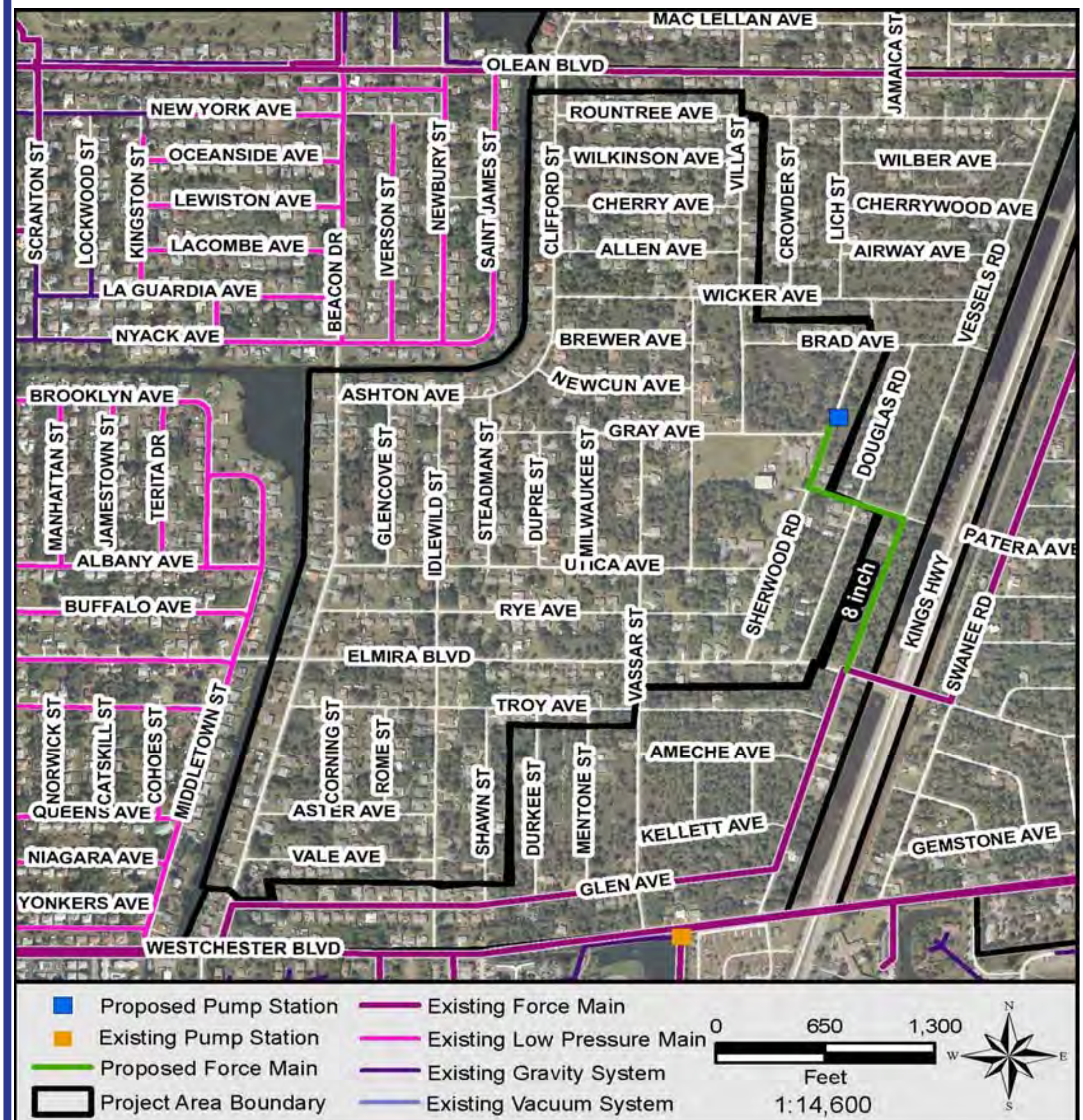
No. of Occupied Lots
437

No. of Vacant Lots
323

No. of Total Lots
760

PROJECT COMPONENTS

- [x] Pump Station
- [ ] Force Mains
- [x] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 11	Year 12	Year 13	Year 14	Year 15	Total
Professional Services	1,141	456	456			2,053
Land (or ROW)	48					48
Construction Cost		4,653	4,653			9,307
Total Project Cost	**1,189**	**5,110**	**5,110**			**11,408**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W17 - Gunther

Predecessor CIP: W-FM-37 | **Project Area Served:** W17

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force main specified as a predecessor CIP.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
11,200 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 12
End: Year 13

PROJECT DETAILS

West County

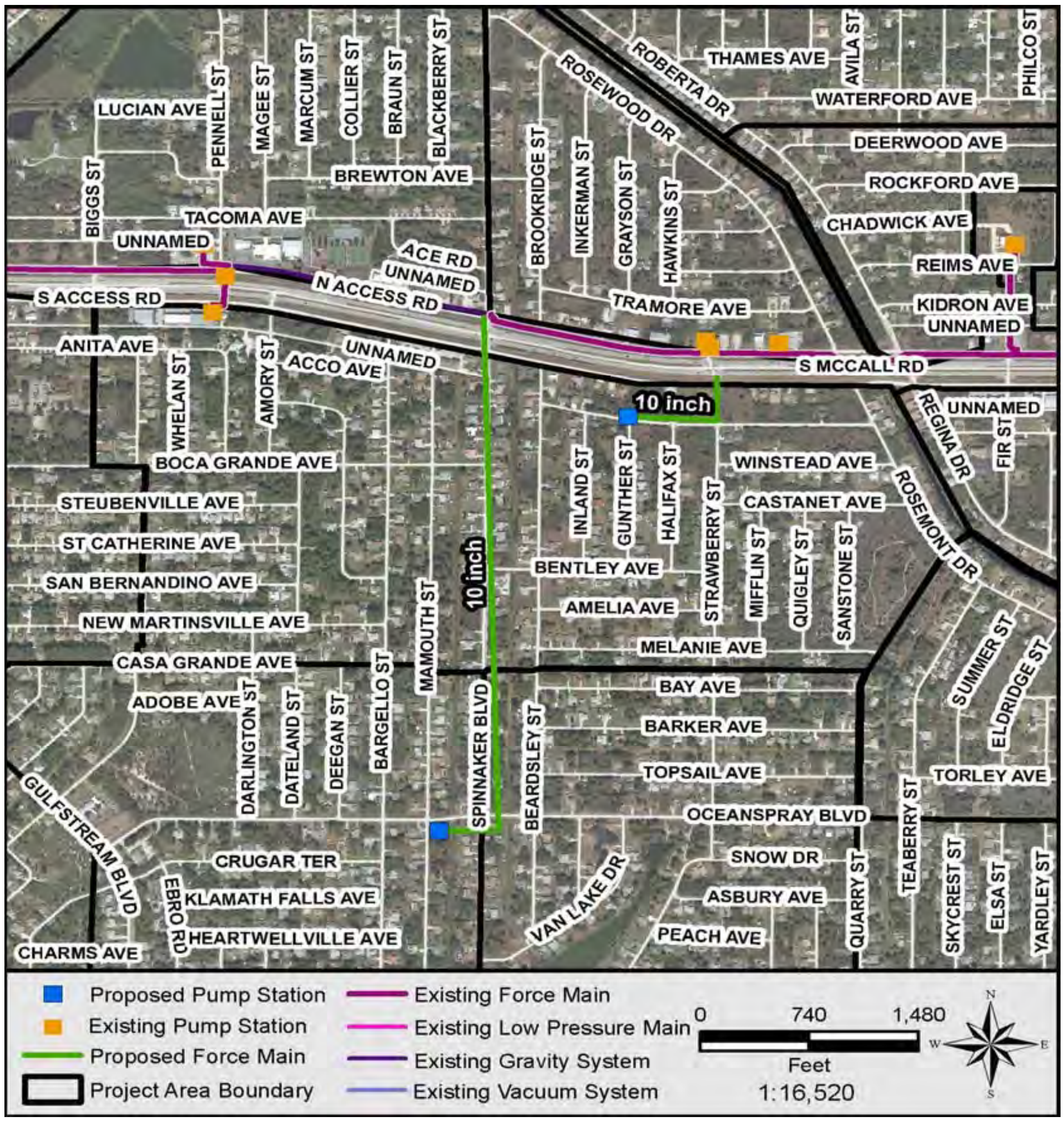
No. of Occupied Lots
482

No. of Vacant Lots
421

No. of Total Lots
903

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 11	Year 12	Year 13	Year 14	Year 15	Total
Professional Services	1,234	494	494			2,222
Land (or ROW)	48					48
Construction Cost		5,036	5,036			10,073
Total Project Cost	**1,282**	**5,530**	**5,530**			**12,342**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M69 - Seabold

Predecessor CIP: M63 | **Project Area Served:** M69

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The pump station included in the predecessor project will be used to convey wastewater into the existing system.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
5,200 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 13
End: Year 14

PROJECT DETAILS

Mid County

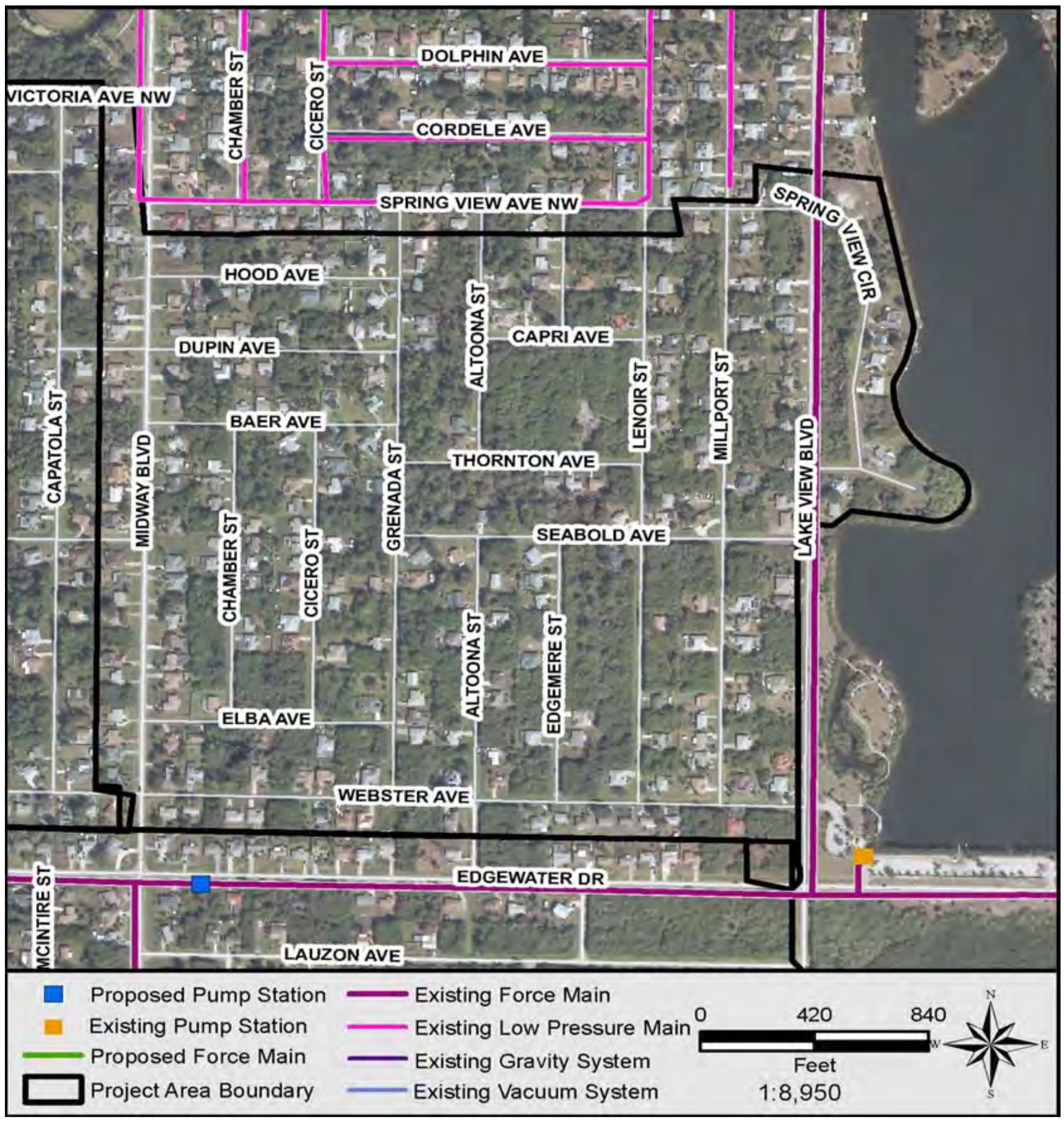
No. of Occupied Lots
233

No. of Vacant Lots
222

No. of Total Lots
455

PROJECT COMPONENTS

- [ ] Pump Station
- [ ] Force Mains
- [x] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 12	Year 13	Year 14	Year 15	Year 16	Total
Professional Services	557	223	223			1,003
Land (or ROW)						
Construction Cost		2,284	2,284			4,567
Total Project Cost	**557**	**2,506**	**2,506**			**5,570**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M94 - Ruby

Predecessor CIP: M-FM-26

Project Area Served: M94

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force main specified as a predecessor CIP.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
5,600 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 13
End: Year 14

PROJECT DETAILS

Mid County

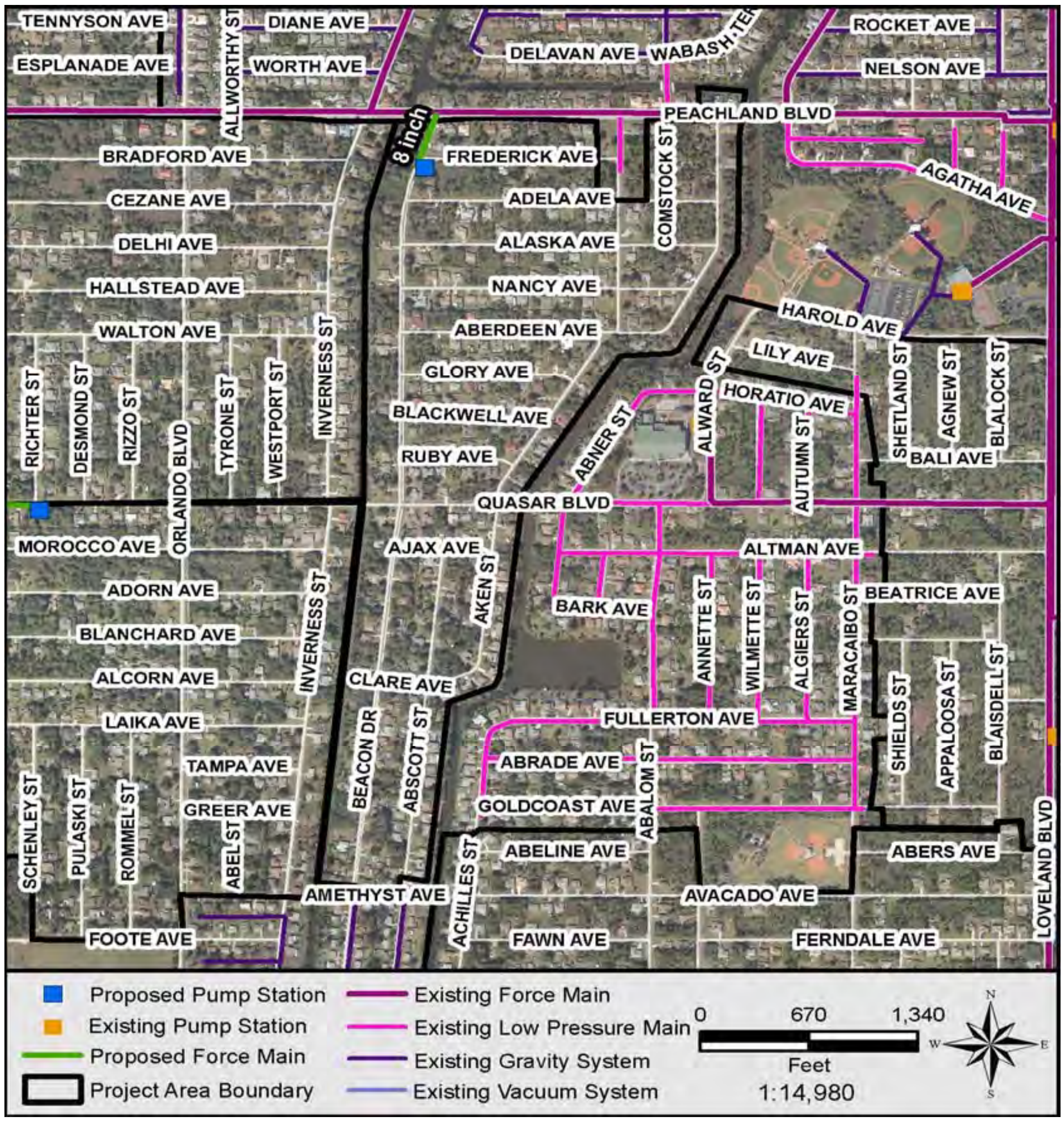
No. of Occupied Lots
244

No. of Vacant Lots
197

No. of Total Lots
441

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 12	Year 13	Year 14	Year 15	Year 16	Total
Professional Services	646	258	258			1,163
Land (or ROW)	30					30
Construction Cost		2,633	2,633			5,267
Total Project Cost	**676**	**2,892**	**2,892**			**6,460**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M113 - Dover**

Predecessor CIP: **M-FM-27**

Project Area Served: **M113**

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force main specified as a predecessor CIP.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
11,100 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 13
End: Year 14

PROJECT DETAILS

Mid County

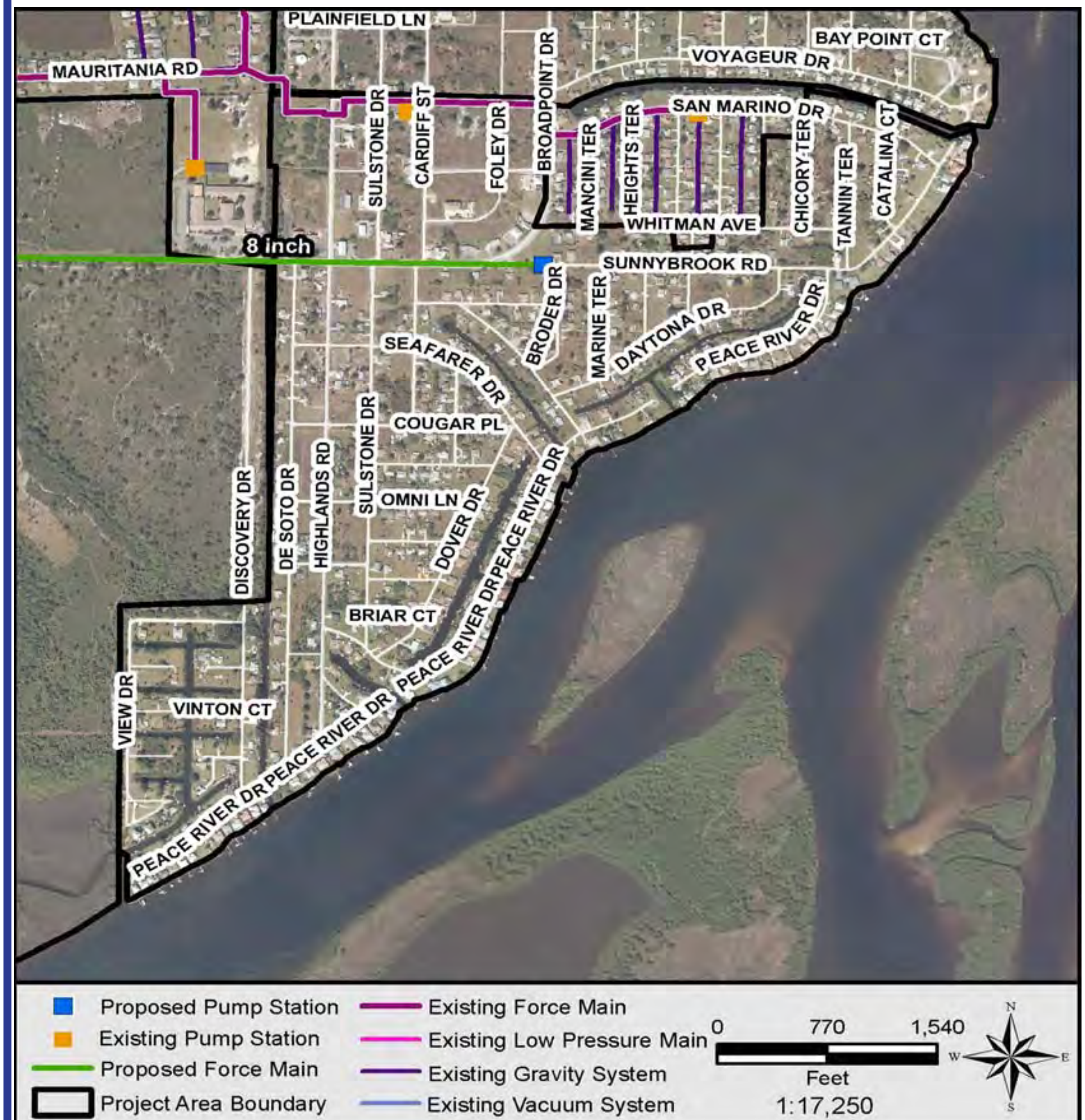
No. of Occupied Lots
572

No. of Vacant Lots
466

No. of Total Lots
1038

PROJECT COMPONENTS

- [x] Pump Station
- [ ] Force Mains
- [x] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 12	Year 13	Year 14	Year 15	Year 16	Total
Professional Services	1,451	580	580			2,611
Land (or ROW)	48					48
Construction Cost		5,923	5,923			11,847
Total Project Cost	**1,499**	**6,504**	**6,504**			**14,506**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W19b - Peacock

Predecessor CIP: W19a, W-FM-38, W-FM-39 | **Project Area Served:** W19b

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The pump station and transmission mains included in the predecessor project will be used to convey wastewater into the existing system.

ENVIRONMENTAL DETAILS

Overall Impact Score
4/5.0

Nitrogen Load Reduction
5,400 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 14
End: Year 15

PROJECT DETAILS

West County

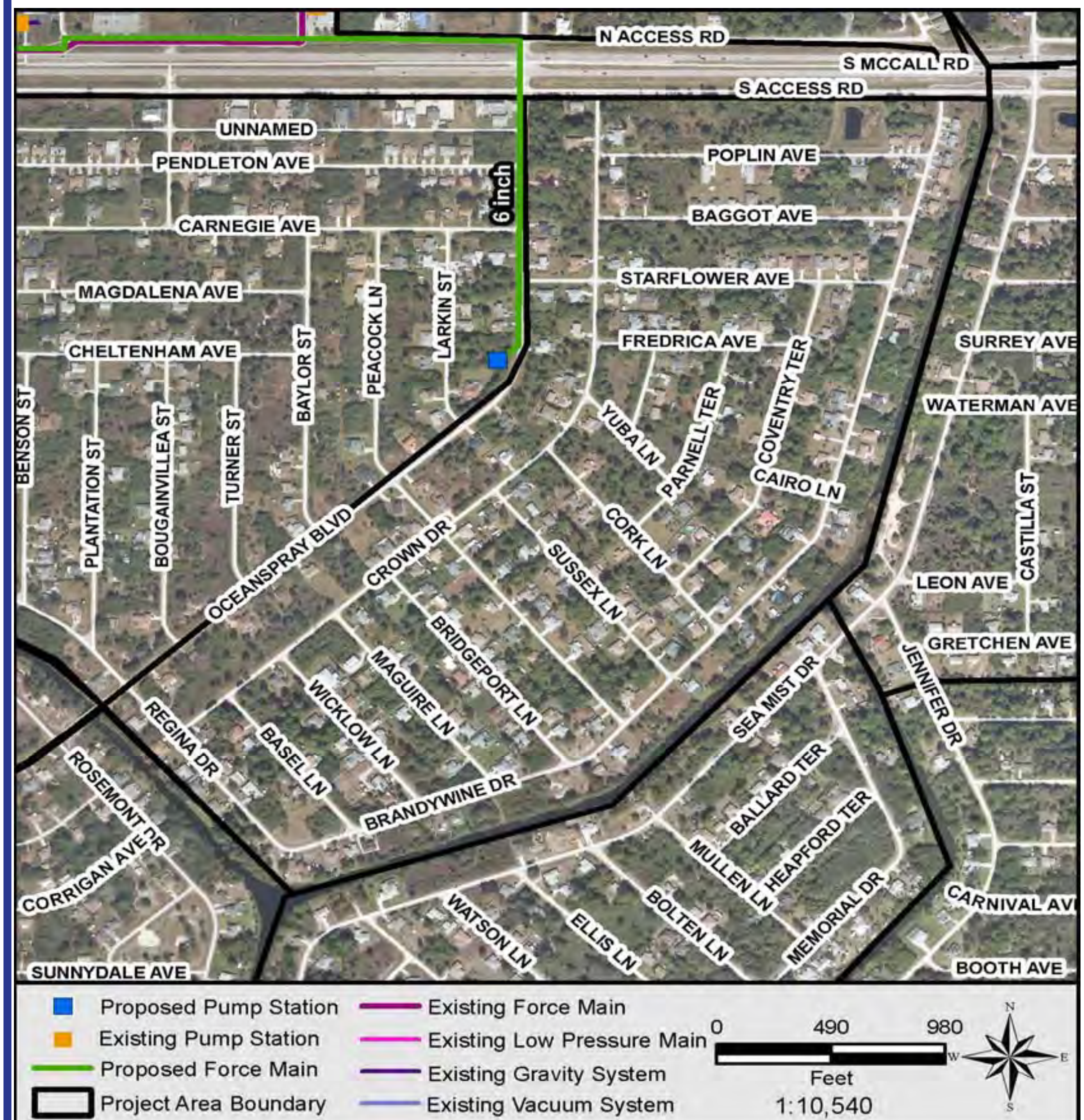
No. of Occupied Lots
254

No. of Vacant Lots
274

No. of Total Lots
528

PROJECT COMPONENTS

- [ ] Pump Station
- [ ] Force Mains
- [x] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 13	Year 14	Year 15	Year 16	Year 17	Total
Professional Services	587	235	235			1,057
Land (or ROW)						
Construction Cost		2,407	2,407			4,813
Total Project Cost	**587**	**2,642**	**2,642**			**5,870**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W19a - Carnegie

Predecessor CIP: W-FM-38, W-FM-39 | **Project Area Served:** W19a

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force mains specified as predecessor CIPs.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
6,700 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 14
End: Year 15

PROJECT DETAILS

West County

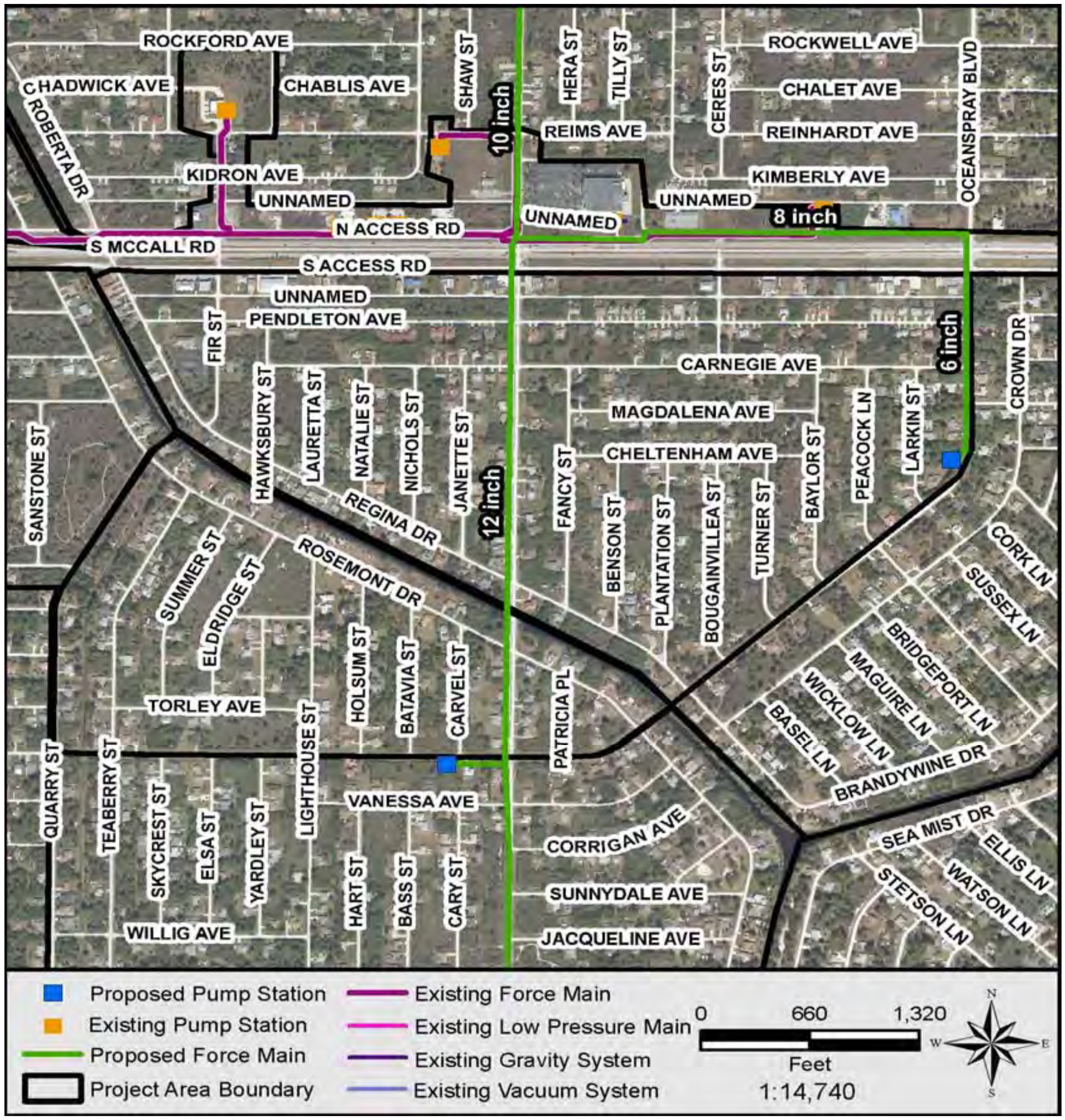
No. of Occupied Lots
424

No. of Vacant Lots
425

No. of Total Lots
849

PROJECT COMPONENTS

- [x] Pump Station
- [ ] Force Mains
- [x] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 13	Year 14	Year 15	Year 16	Year 17	Total
Professional Services	1,118	447	447			2,013
Land (or ROW)	48					48
Construction Cost		4,560	4,560			9,121
Total Project Cost	**1,166**	**5,008**	**5,008**			**11,181**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W16b - Henry

Predecessor CIP: W16a, W-FM-21, W-FM-22 **Project Area Served:** W16b

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. The pump station and transmission mains included in the predecessor project will be used to convey wastewater into the existing system.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
6,800 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 14
End: Year 15

PROJECT DETAILS

West County

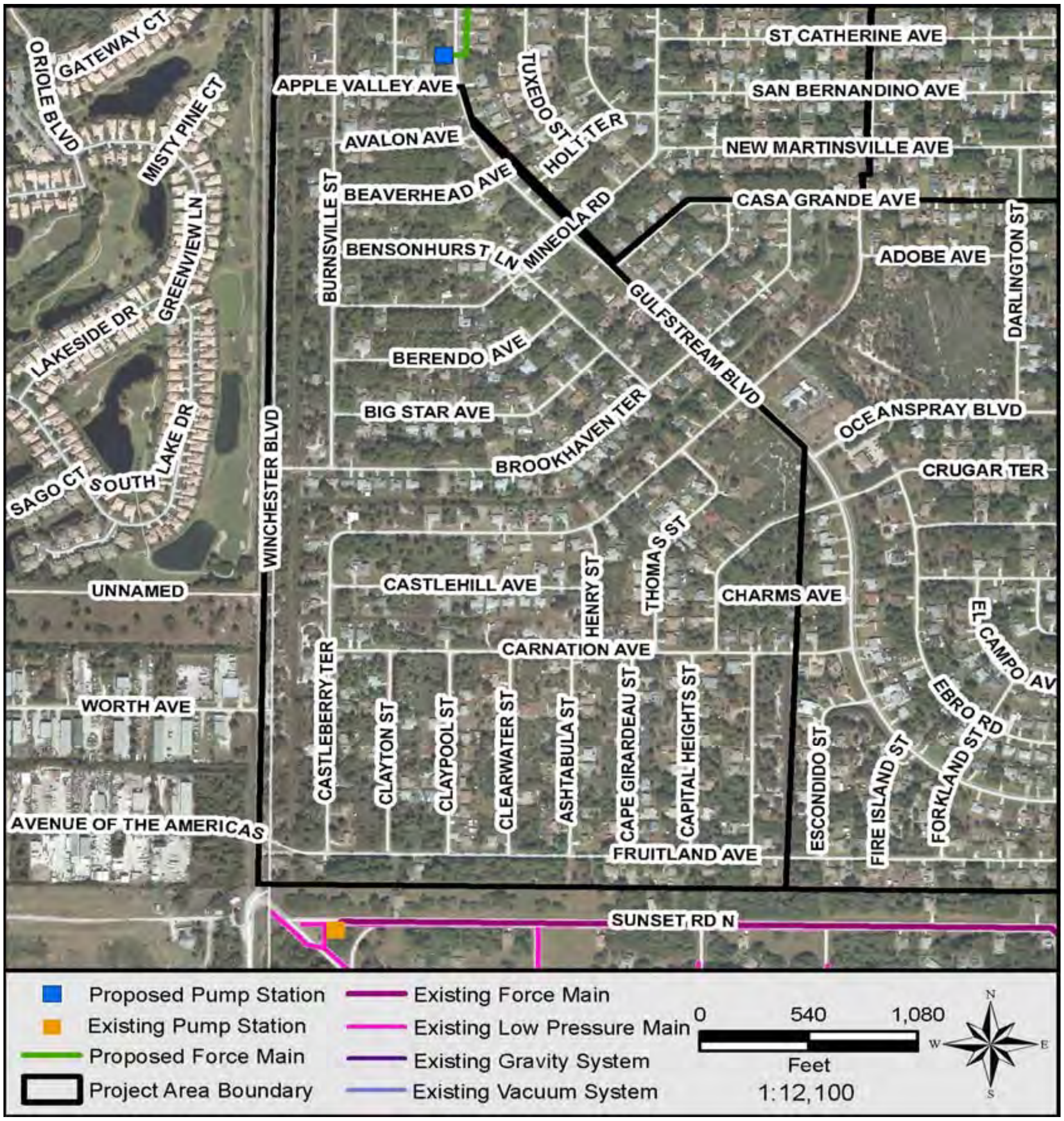
No. of Occupied Lots
265

No. of Vacant Lots
372

No. of Total Lots
637

PROJECT COMPONENTS

- ☐ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 13	Year 14	Year 15	Year 16	Year 17	Total
Professional Services	747	299	299			1,344
Land (or ROW)						
Construction Cost		3,062	3,062			6,124
Total Project Cost	**747**	**3,361**	**3,361**			**7,468**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M97 - Villa

Predecessor CIP: M-FM-28 | **Project Area Served: M97**

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force main specified as a predecessor CIP.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.7/5.0

Nitrogen Load Reduction
6,700 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 15
End: Year 16

PROJECT DETAILS

Mid County

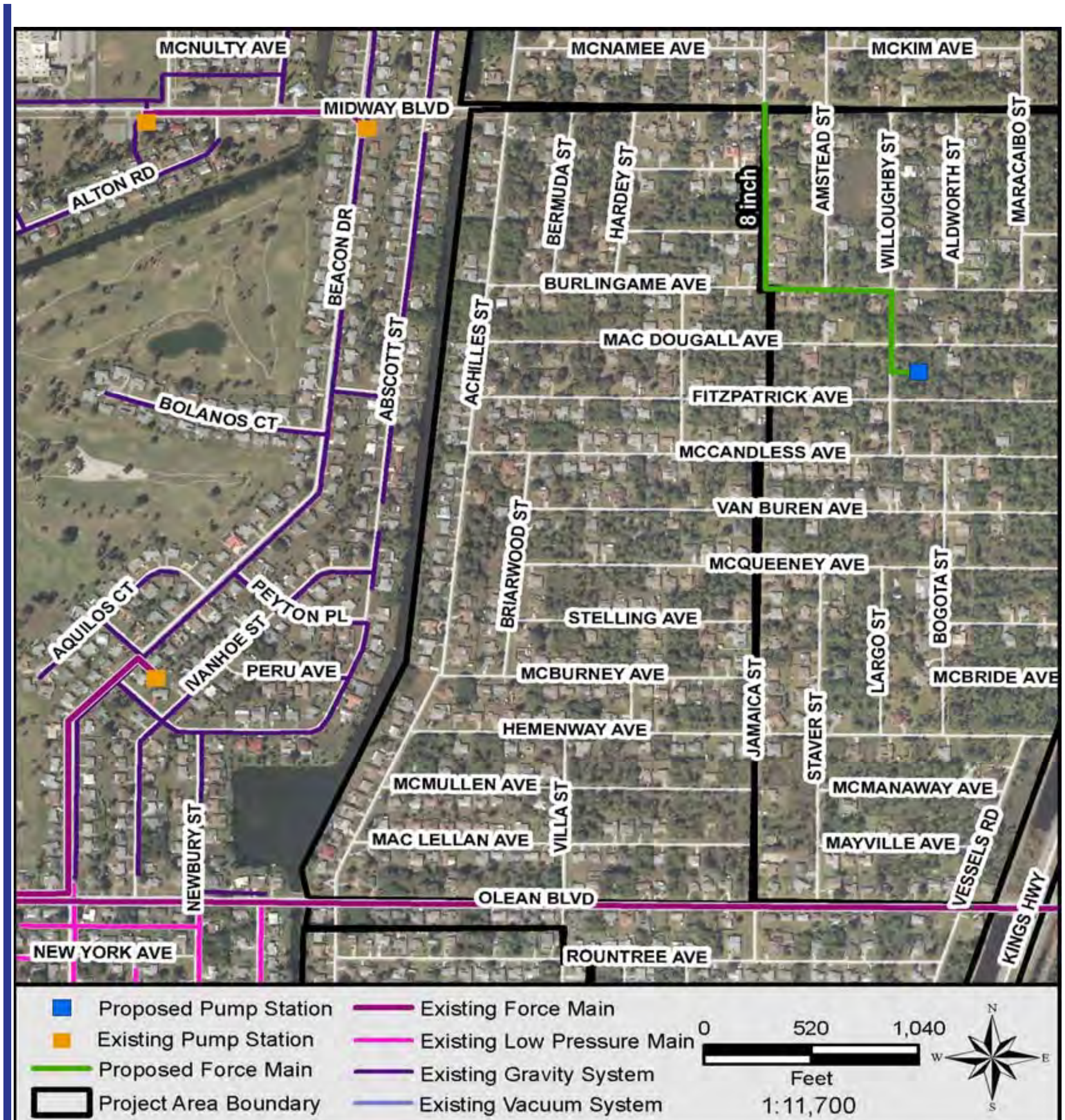
No. of Occupied Lots
284

No. of Vacant Lots
197

No. of Total Lots
481

PROJECT COMPONENTS

- [x] Pump Station
- [ ] Force Mains
- [x] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 14	Year 15	Year 16	Year 17	Year 18	Total
Professional Services	803	321	321			1,446
Land (or ROW)	48					48
Construction Cost		3,270	3,270			6,539
Total Project Cost	**851**	**3,591**	**3,591**			**8,033**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M60 - Placid

Predecessor CIP: M-FM-29 | **Project Area Served:** M60

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force main specified as a predecessor CIP.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
8,100 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 15
End: Year 16

PROJECT DETAILS

Mid County

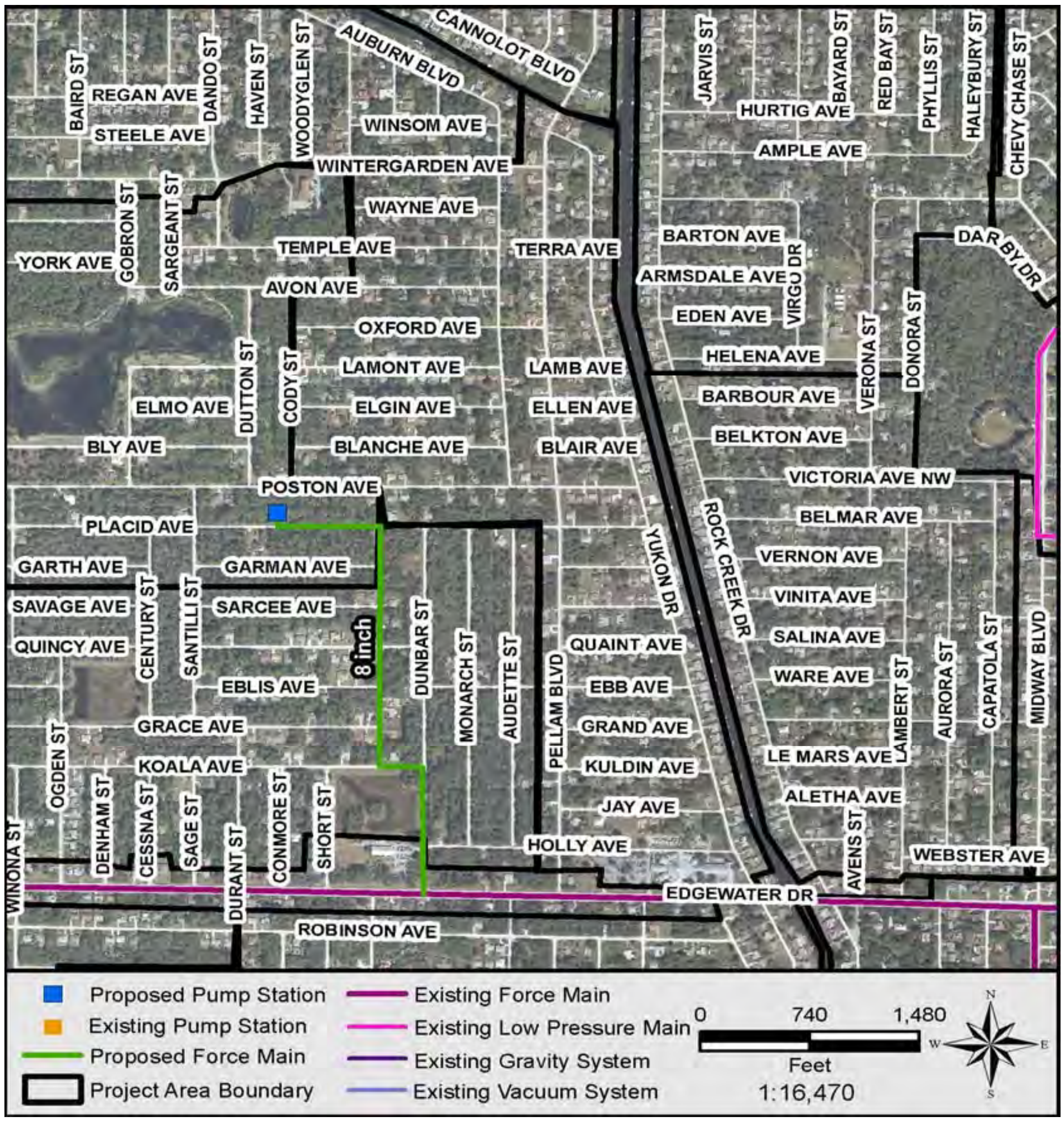
No. of Occupied Lots
321

No. of Vacant Lots
267

No. of Total Lots
588

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 14	Year 15	Year 16	Year 17	Year 18	Total
Professional Services	938	375	375			1,688
Land (or ROW)	48					48
Construction Cost		3,821	3,821			7,641
Total Project Cost	**986**	**4,196**	**4,196**			**9,377**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W20b - Del Ray

Predecessor CIP: W-FM-40 | **Project Area Served:** W20b

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force main specified as a predecessor CIP.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
9,100 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 15
End: Year 16

PROJECT DETAILS

West County

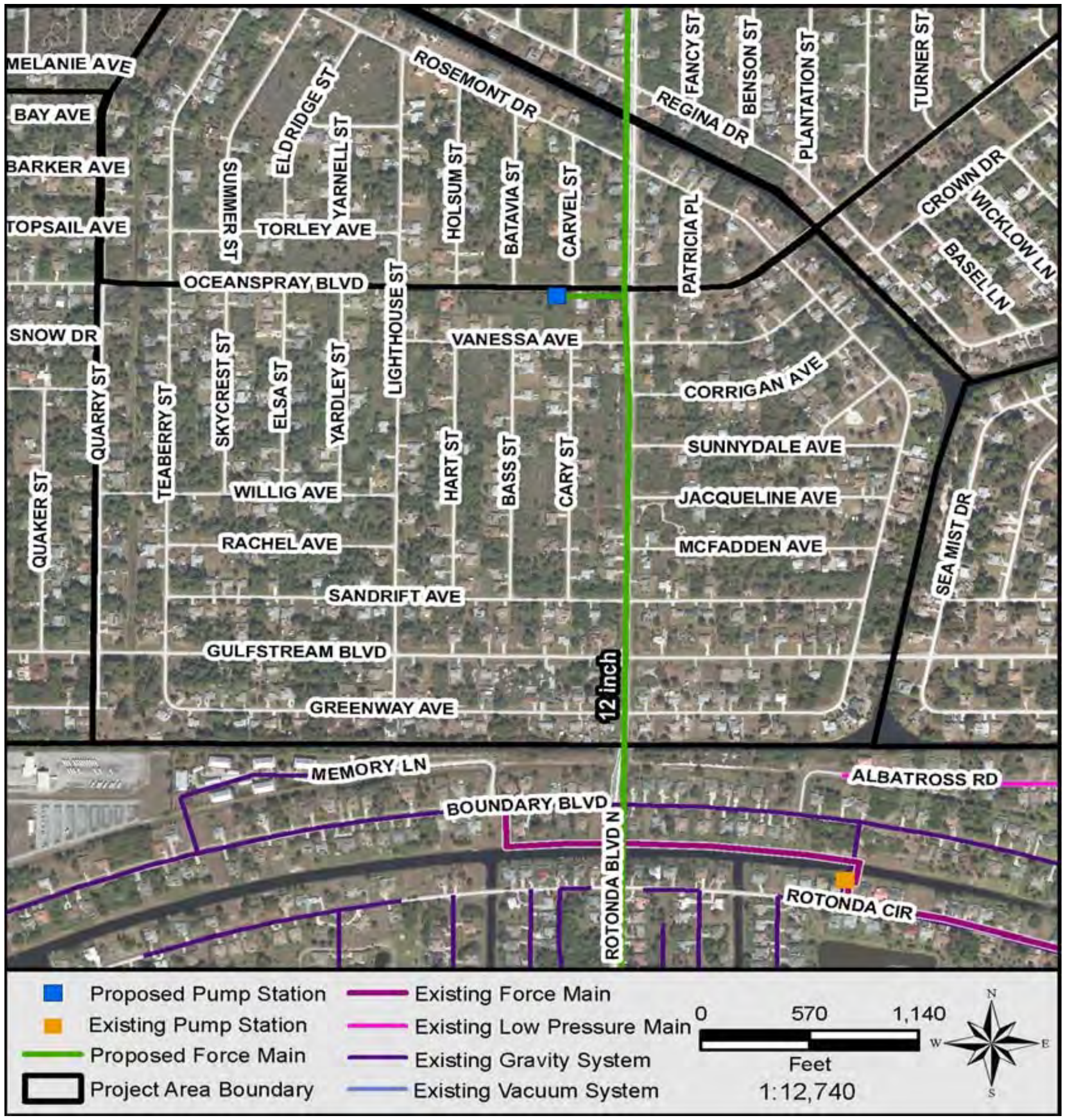
No. of Occupied Lots
357

No. of Vacant Lots
356

No. of Total Lots
713

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 14	Year 15	Year 16	Year 17	Year 18	Total
Professional Services	1,052	421	421			1,894
Land (or ROW)	48					48
Construction Cost		4,290	4,290			8,581
Total Project Cost	**1,100**	**4,711**	**4,711**			**10,523**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M51 - Windswept

Predecessor CIP: M-FM-30, M-FM-31, M-FM-32 | **Project Area Served:** M51

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force mains specified as predecessor CIPs.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
5,800 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 16
End: Year 17

PROJECT DETAILS

Mid County

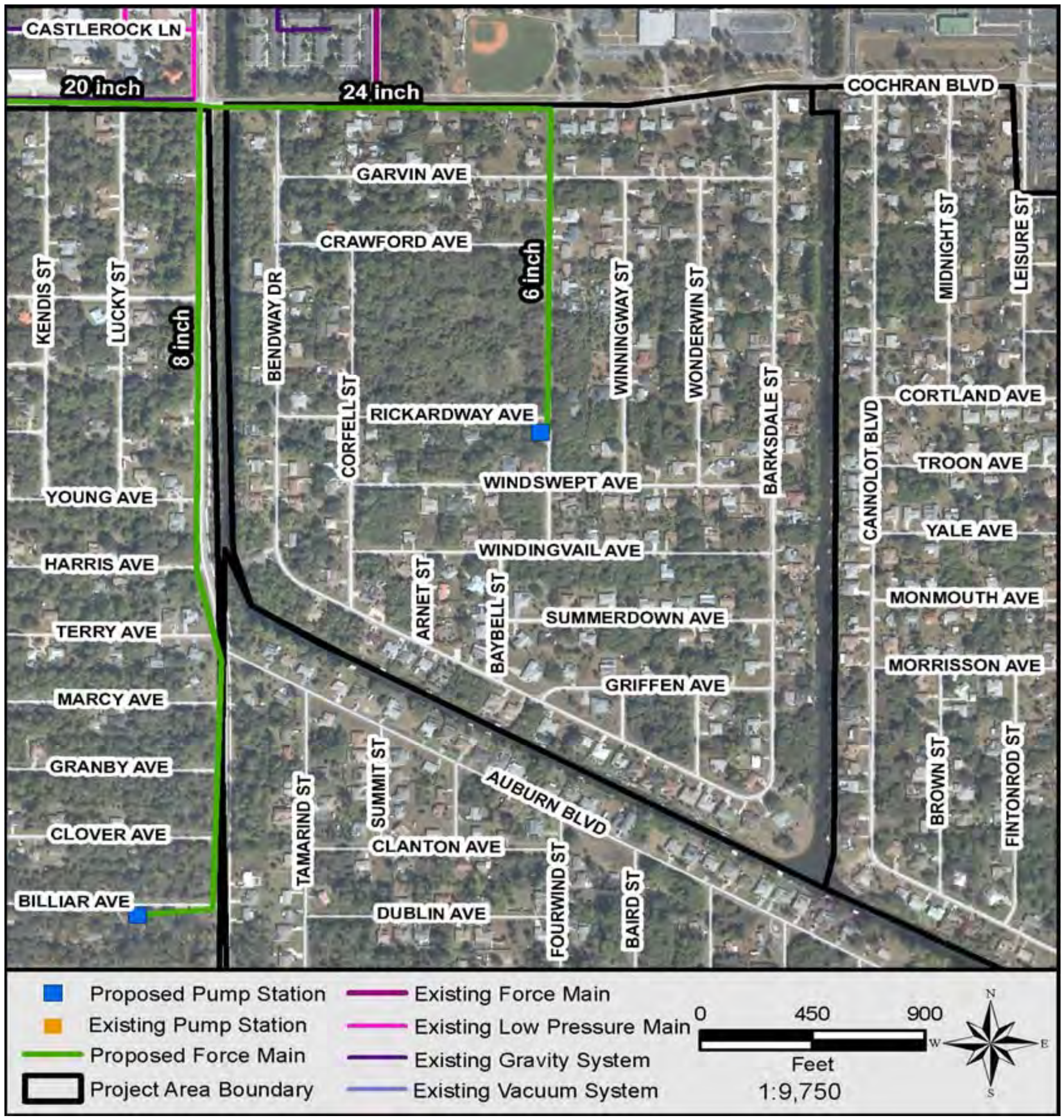
No. of Occupied Lots
230

No. of Vacant Lots
154

No. of Total Lots
384

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 15	Year 16	Year 17	Year 18	Year 19	Total
Professional Services	613	245	245			1,104
Land (or ROW)	30					30
Construction Cost		2,499	2,499			4,998
Total Project Cost	**643**	**2,744**	**2,744**			**6,132**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M52 - Auburn**

Predecessor CIP: **M-FM-33** | **Project Area Served:** **M52**

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force main specified as a predecessor CIP.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
7,900 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 16
End: Year 17

PROJECT DETAILS

Mid County

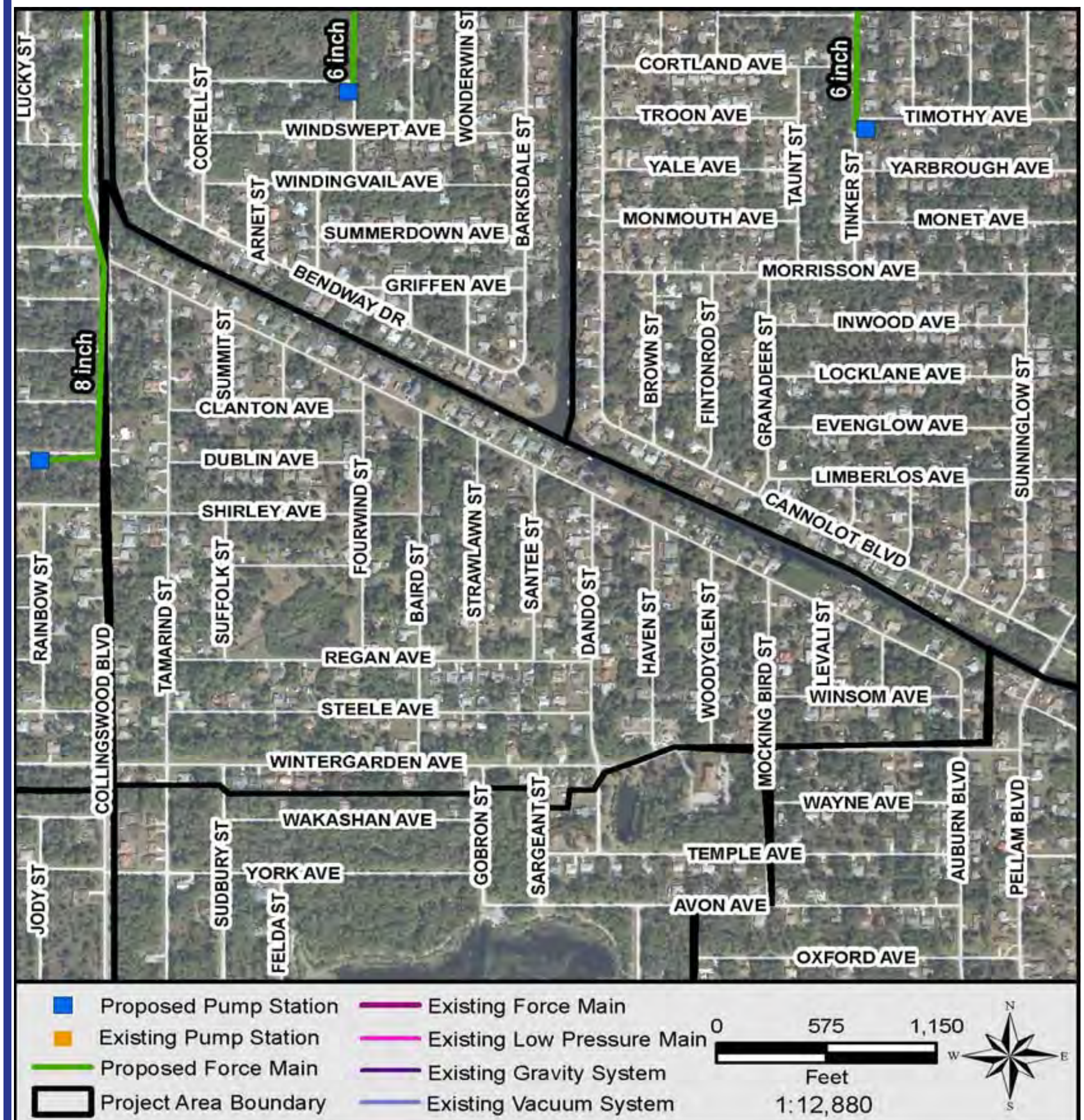
No. of Occupied Lots
318

No. of Vacant Lots
260

No. of Total Lots
578

PROJECT COMPONENTS

- [x] Pump Station
- [ ] Force Mains
- [x] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 15	Year 16	Year 17	Year 18	Year 19	Total
Professional Services	962	385	385			1,731
Land (or ROW)	48					48
Construction Cost		3,919	3,919			7,837
Total Project Cost	**1,010**	**4,303**	**4,303**			**9,616**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M82 - Danley

Predecessor CIP: M-FM-34 | **Project Area Served:** M82

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force main specified as a predecessor CIP.

ENVIRONMENTAL DETAILS

Overall Impact Score
4.4/5.0

Nitrogen Load Reduction
3,300 pounds per year

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 16
End: Year 17

PROJECT DETAILS

Mid County

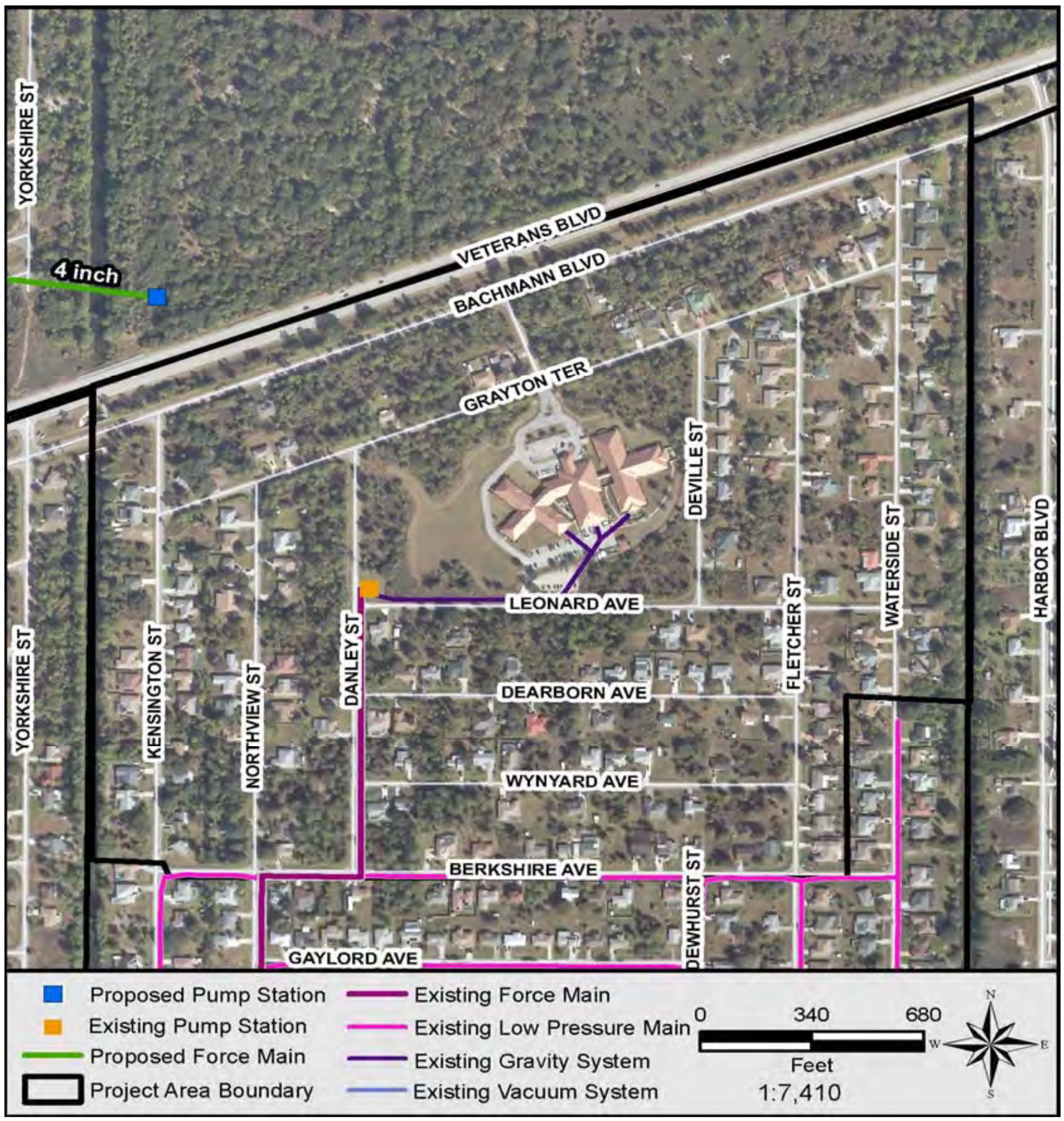
No. of Occupied Lots
157

No. of Vacant Lots
119

No. of Total Lots
276

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☑ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 15	Year 16	Year 17	Year 18	Year 19	Total
Professional Services	514	205	205			925
Land (or ROW)	30					30
Construction Cost		2,091	2,091			4,182
Total Project Cost	**544**	**2,296**	**2,296**			**5,136**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W12a - Thames

Predecessor CIP: W-FM-36 | **Project Area Served:** W12a

DESCRIPTION: This project includes removal of septic systems from service and construction of a centralized sewer system. A new pump station will be constructed in the location specified in the figure. The pump station will convey wastewater to the force main specified as a predecessor CIP.

ENVIRONMENTAL DETAILS

Overall Impact Score
4/5.0

Nitrogen Load Reduction
8,800 pounds per year

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 16
End: Year 17

PROJECT DETAILS

West County

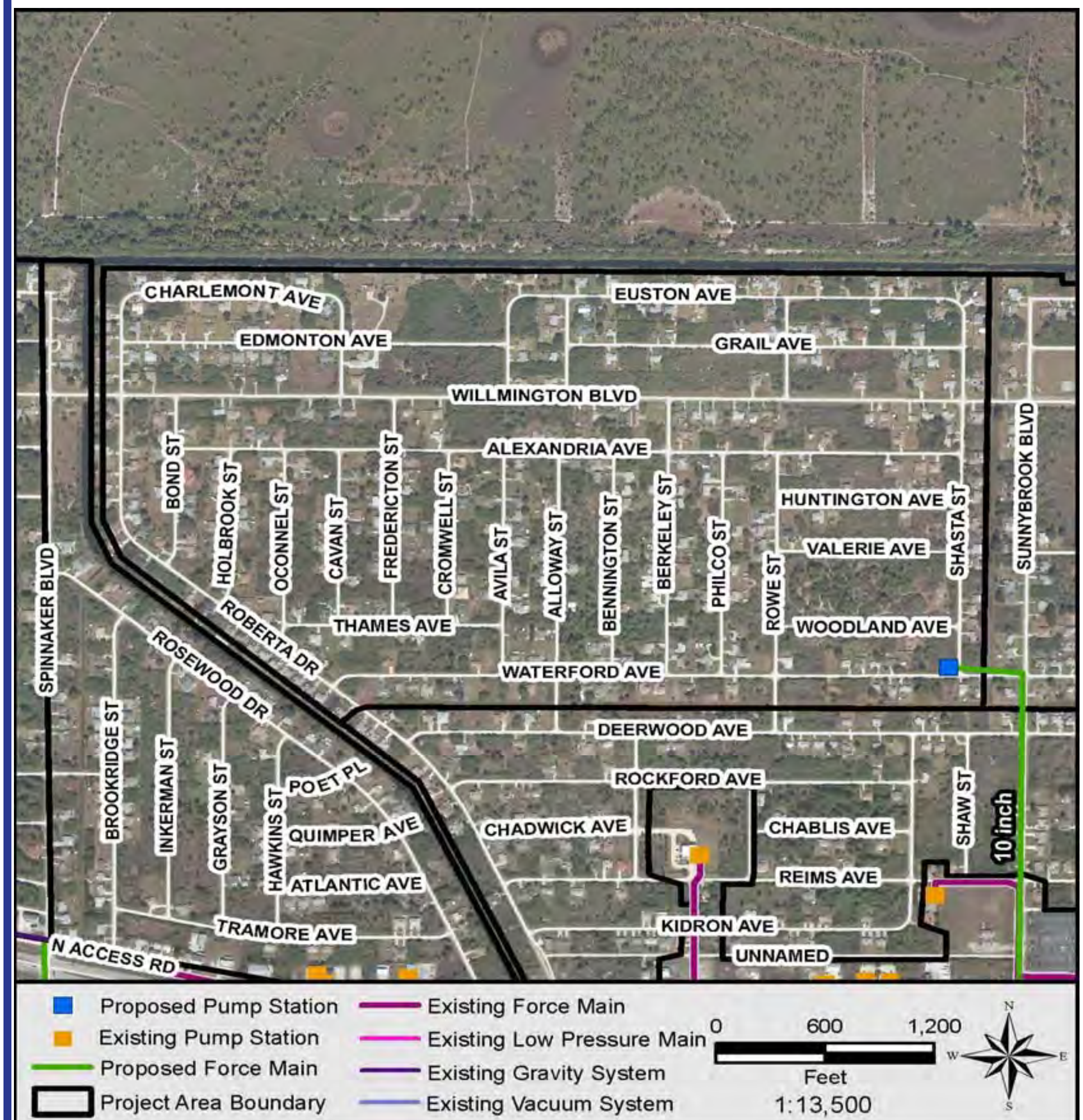
No. of Occupied Lots
348

No. of Vacant Lots
446

No. of Total Lots
794

PROJECT COMPONENTS

- [x] Pump Station
- [ ] Force Mains
- [x] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 15	Year 16	Year 17	Year 18	Year 19	Total
Professional Services	1,111	444	444			2,000
Land (or ROW)	48					48
Construction Cost		4,532	4,532			9,064
Total Project Cost	**1,159**	**4,976**	**4,976**			**11,112**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M-FM-24 - Sheehan Blvd**

Predecessor CIP: None | **Project Area Served:** M93

DESCRIPTION: The project includes installing 3,300 LF of 8-inch force main starting at the pump station and heading south along Sheehan Boulevard. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 12
End: Year 13

PROJECT DETAILS

Mid County

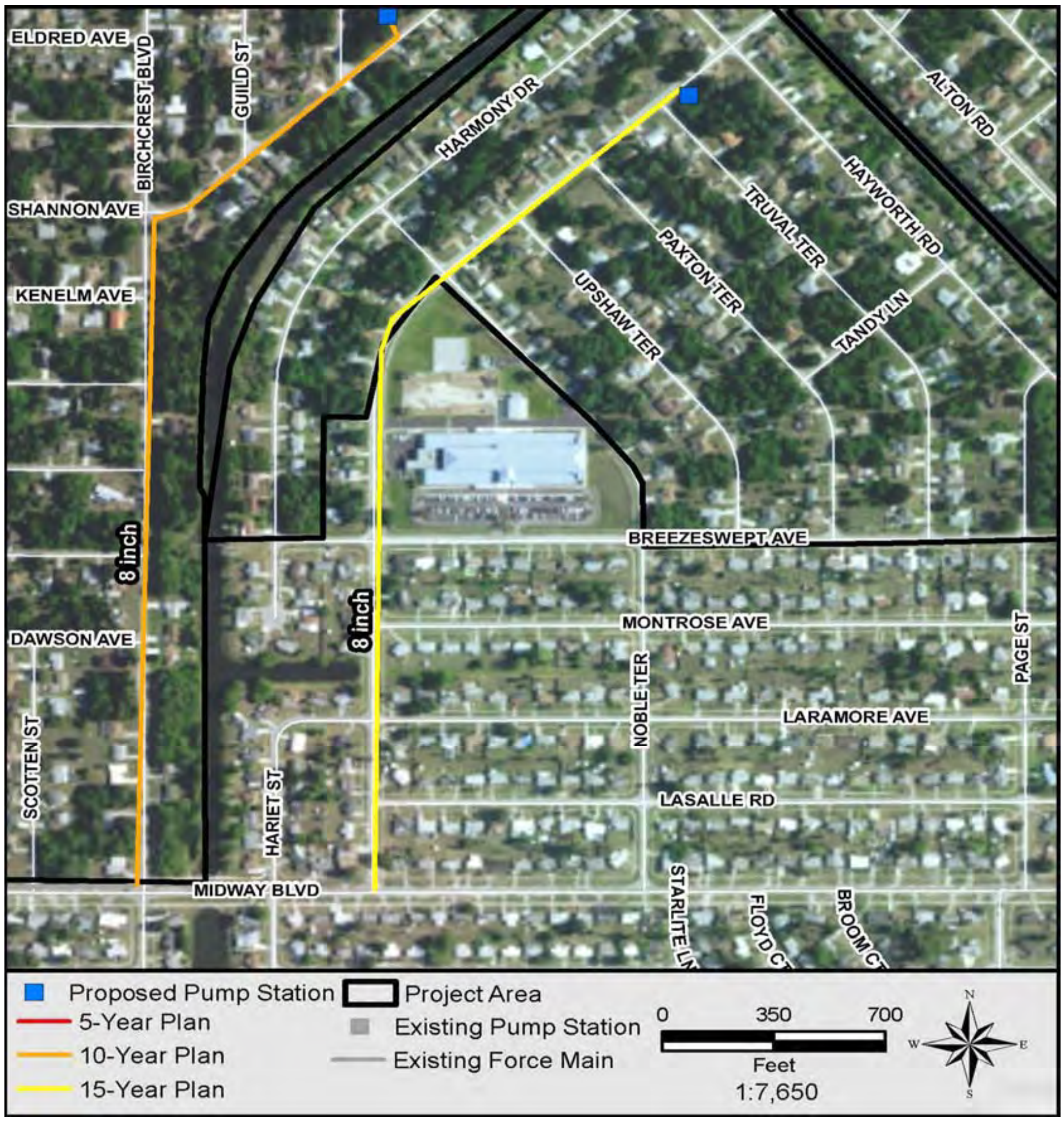
Force Main Length
3,300 linear feet

Force Main Material
PVC

Force Main Size
8 inches

PROJECT COMPONENTS

- [x] Pump Station
- [x] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 11	Year 12	Year 13	Year 14	Year 15	Total
Professional Services	128	24	8			160
Land (or ROW)						
Construction Cost		182	182			363
Total Project Cost	**128**	**206**	**190**			**523**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M-FM-25 - Sherwood Rd to Elmira Blvd

Predecessor CIP: None | **Project Area Served:** M100

DESCRIPTION: The project includes installing 2,100 LF of 8-inch force main starting at the pump station and heading south along Sherwood Road, east along Paragon Avenue, and south along Vessels Road to Elmira Boulevard. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 12
End: Year 13

PROJECT DETAILS

Mid County

Force Main Length
2,100 linear feet

Force Main Material
PVC

Force Main Size
8 inches

PROJECT COMPONENTS

- ☐ Pump Station
- ☑ Force Mains
- ☐ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains

Expenditure Plan ($1000)

	Year 11	Year 12	Year 13	Year 14	Year 15	Total
Professional Services	81	15	5			102
Land (or ROW)						
Construction Cost		116	116			231
Total Project Cost	**81**	**131**	**121**			**333**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M-FM-26 - Beacon Dr to Peachland Blvd**

Predecessor CIP: None | **Project Area Served:** M94

DESCRIPTION: The project includes installing 400 LF of 8-inch force main starting at the pump station and heading north along Beacon Drive to Peachland Boulevard. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 13
End: Year 14

PROJECT DETAILS

Mid County

Force Main Length
400 linear feet

Force Main Material
PVC

Force Main Size
8 inches

PROJECT COMPONENTS

- [ ] Pump Station
- [x] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains

Expenditure Plan ($1000)

	Year 12	Year 13	Year 14	Year 15	Year 16	Total
Professional Services	15	3	1			19
Land (or ROW)						
Construction Cost		22	22			43
Total Project Cost	**15**	**24**	**22**			**62**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M-FM-27 - Broder Dr to Eastport Master

Predecessor CIP: None | **Project Area Served:** M113

DESCRIPTION: The project includes installing 11,500 LF of 8-inch force main along Sunnybrook Drive, Harbor View Road, and I-75 to the 16-inch force main near the old LS 126 Eastport Master. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 13
End: Year 14

PROJECT DETAILS

Mid County

Force Main Length
11,500 linear feet

Force Main Material
PVC

Force Main Size
8 inches

PROJECT COMPONENTS

- ☐ Pump Station
- ☑ Force Mains
- ☐ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains

Expenditure Plan ($1000)

	Year 12	Year 13	Year 14	Year 15	Year 16	Total
Professional Services	444	83	28			555
Land (or ROW)						
Construction Cost		631	631			1,262
Total Project Cost	**444**	**714**	**659**			**1,817**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M-FM-28 - Willoughby St to Abalon St**

Predecessor CIP: **None** | **Project Area Served:** **M97**

DESCRIPTION: The project includes installing 2,200 LF of 8-inch force main from Mac Dougall Avenue and Willoughby Street to the intersection of Midway Boulevard and Abalon Street. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 15
End: Year 16

PROJECT DETAILS

Mid County

Force Main Length
2,200 linear feet

Force Main Material
PVC

Force Main Size
8 inches

PROJECT COMPONENTS

- [ ] Pump Station
- [x] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains

Expenditure Plan ($1000)

	Year 14	Year 15	Year 16	Year 17	Year 18	Total
Professional Services	85	16	5			107
Land (or ROW)						
Construction Cost		121	121			242
Total Project Cost	**85**	**137**	**126**			**349**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M-FM-29 - Edgewater Dr

Predecessor CIP: None | **Project Area Served:** M60

DESCRIPTION: The project includes installing 3,800 LF of 8-inch force main from the pump station to the intersection of Edgewater Drive and Dunbar Street. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 15
End: Year 16

PROJECT DETAILS

Mid County

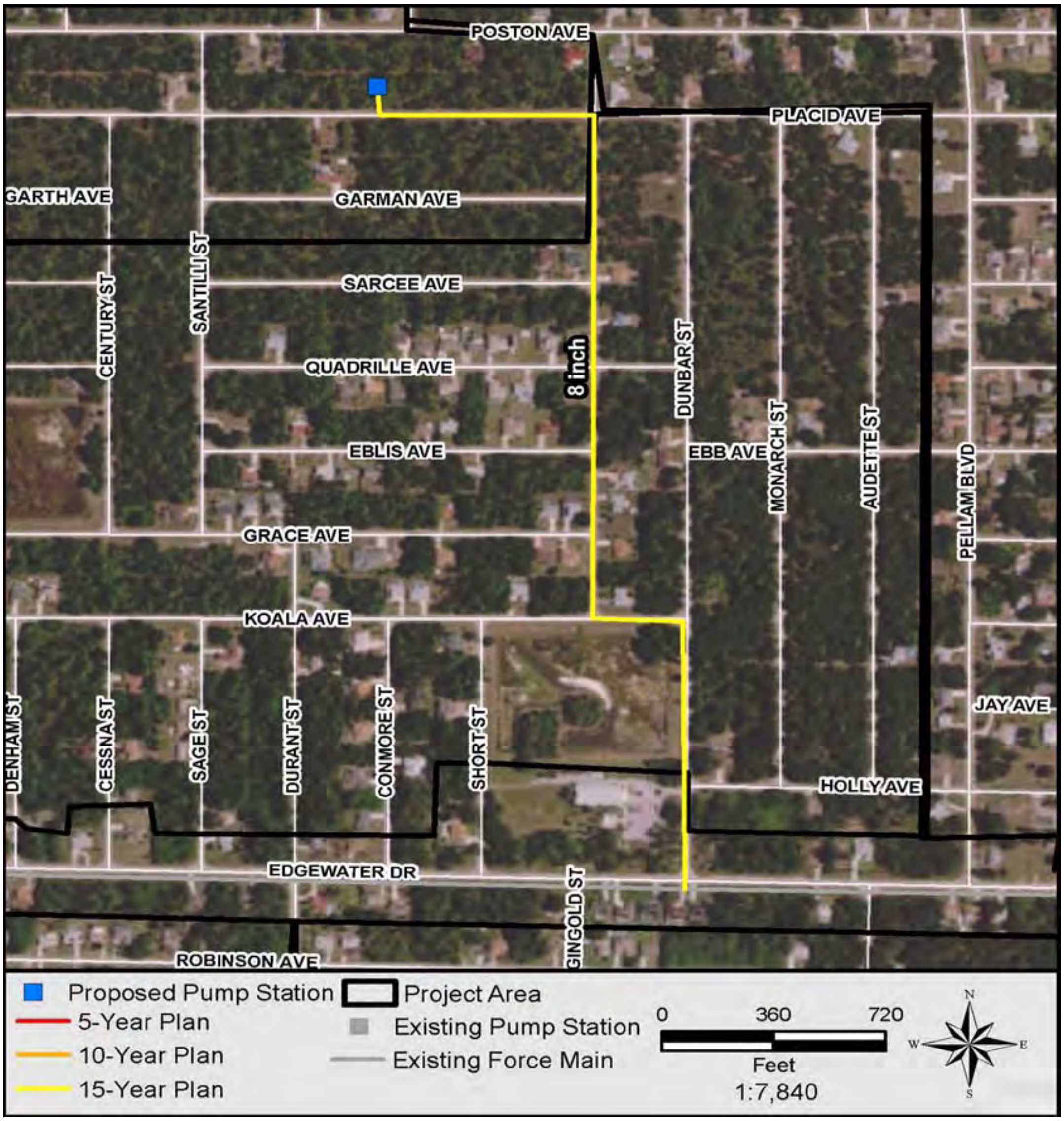
Force Main Length
3,800 linear feet

Force Main Material
PVC

Force Main Size
8 inches

PROJECT COMPONENTS

- [ ] Pump Station
- [x] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 14	Year 15	Year 16	Year 17	Year 18	Total
Professional Services	147	28	9			184
Land (or ROW)						
Construction Cost		209	209			417
Total Project Cost	**147**	**236**	**218**			**601**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M-FM-30 - Cochran Blvd**

Predecessor CIP: None

Project Area Served: M51

DESCRIPTION: The project includes installing 1,400 LF of 24-inch force main from Lantern Light Street to Collingswood Boulevard along Cochran Boulevard. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 16
End: Year 17

PROJECT DETAILS

Mid County

Force Main Length
1,400 linear feet

Force Main Material
PVC

Force Main Size
24 inches

PROJECT COMPONENTS

- ☐ Pump Station
- ☑ Force Mains
- ☐ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains

Expenditure Plan ($1000)

	Year 15	Year 16	Year 17	Year 18	Year 19	Total
Professional Services	107	20	7			134
Land (or ROW)						
Construction Cost		152	152			305
Total Project Cost	**107**	**172**	**159**			**439**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M-FM-31 - Lantern Light St**

Predecessor CIP: None | **Project Area Served:** M51

DESCRIPTION: The project includes installing 1,500 LF of 6-inch force main from Rickardway Avenue to Cochran Boulevard Avenue along Lantern Light Street. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 16
End: Year 17

PROJECT DETAILS

Mid County

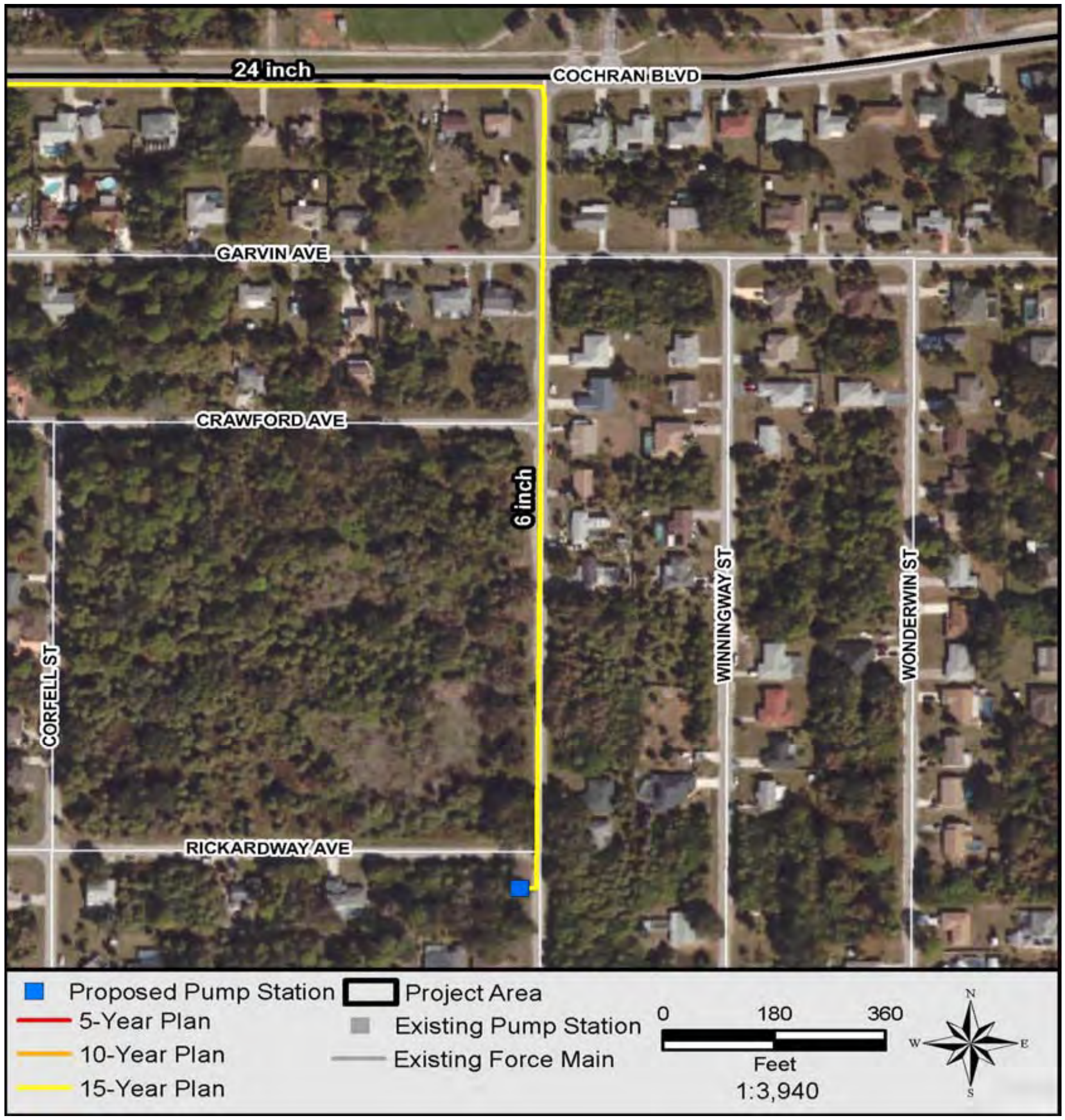
Force Main Length
1,500 linear feet

Force Main Material
PVC

Force Main Size
6 inches

PROJECT COMPONENTS

- [ ] Pump Station
- [x] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 15	Year 16	Year 17	Year 18	Year 19	Total
Professional Services	51	9	3			63
Land (or ROW)						
Construction Cost		72	72			144
Total Project Cost	**51**	**81**	**75**			**207**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M-FM-32 - Toledo Blade Blvd

Predecessor CIP: None | **Project Area Served:** M51

DESCRIPTION: The project includes installing 3,000 LF of 20-inch force main from Collingswood Boulevard to El Jobean Road along Toledo Blade Boulevard. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 16
End: Year 17

PROJECT DETAILS

Mid County

Force Main Length
3,000 linear feet

Force Main Material
PVC

Force Main Size
20 inches

PROJECT COMPONENTS

- ☐ Pump Station
- ☑ Force Mains
- ☐ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains

Expenditure Plan ($1000)

	Year 15	Year 16	Year 17	Year 18	Year 19	Total
Professional Services	201	38	13			251
Land (or ROW)						
Construction Cost		285	285			571
Total Project Cost	**201**	**323**	**298**			**822**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M-FM-33 - Collingswood Blvd

Predecessor CIP: None | **Project Area Served:** M52

DESCRIPTION: The project includes installing 3,600 LF of 8-inch force main from Billiar Avenue to Cochran Boulevard along Collingswood Boulevard. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 16
End: Year 17

PROJECT DETAILS

Mid County

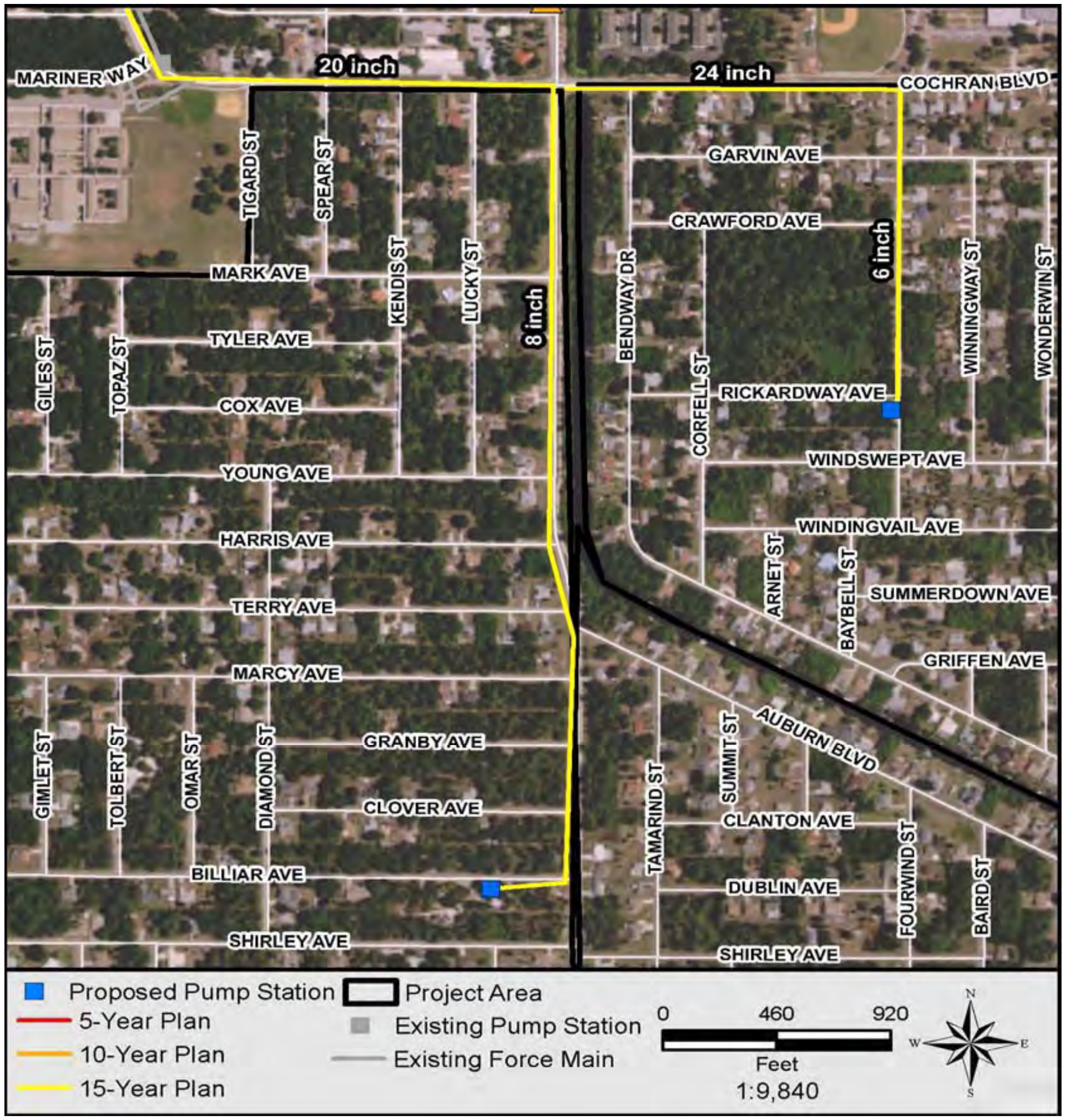
Force Main Length
3,600 linear feet

Force Main Material
PVC

Force Main Size
8 inches

PROJECT COMPONENTS

- ☐ Pump Station
- ☑ Force Mains
- ☐ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 15	Year 16	Year 17	Year 18	Year 19	Total
Professional Services	139	26	9			174
Land (or ROW)						
Construction Cost		198	198			396
Total Project Cost	**139**	**224**	**207**			**570**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M-FM-34 - Kenilworth Blvd

Predecessor CIP: None

Project Area Served: M82

DESCRIPTION: The project includes installing 3,800 LF of 4-inch force main from Yorkshire Street to Atwater Street along Kenilworth Boulevard. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 16
End: Year 17

PROJECT DETAILS

Mid County

Force Main Length
3,800 linear feet

Force Main Material
PVC

Force Main Size
4 inches

PROJECT COMPONENTS

- ☐ Pump Station
- ☑ Force Mains
- ☐ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains

Expenditure Plan ($1000)

	Year 15	Year 16	Year 17	Year 18	Year 19	Total
Professional Services	111	21	7			138
Land (or ROW)						
Construction Cost		157	157			314
Total Project Cost	**111**	**178**	**164**			**452**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **W-FM-35 - LS 801 to Rotonda WRF**

Predecessor CIP: None | **Project Area Served:** 15-year CIPs

DESCRIPTION: The project includes installing 1,800 LF of 18-inch force main capacity upgrades from 801 to the Rotonda WRF. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 12
End: Year 13

PROJECT DETAILS

West County

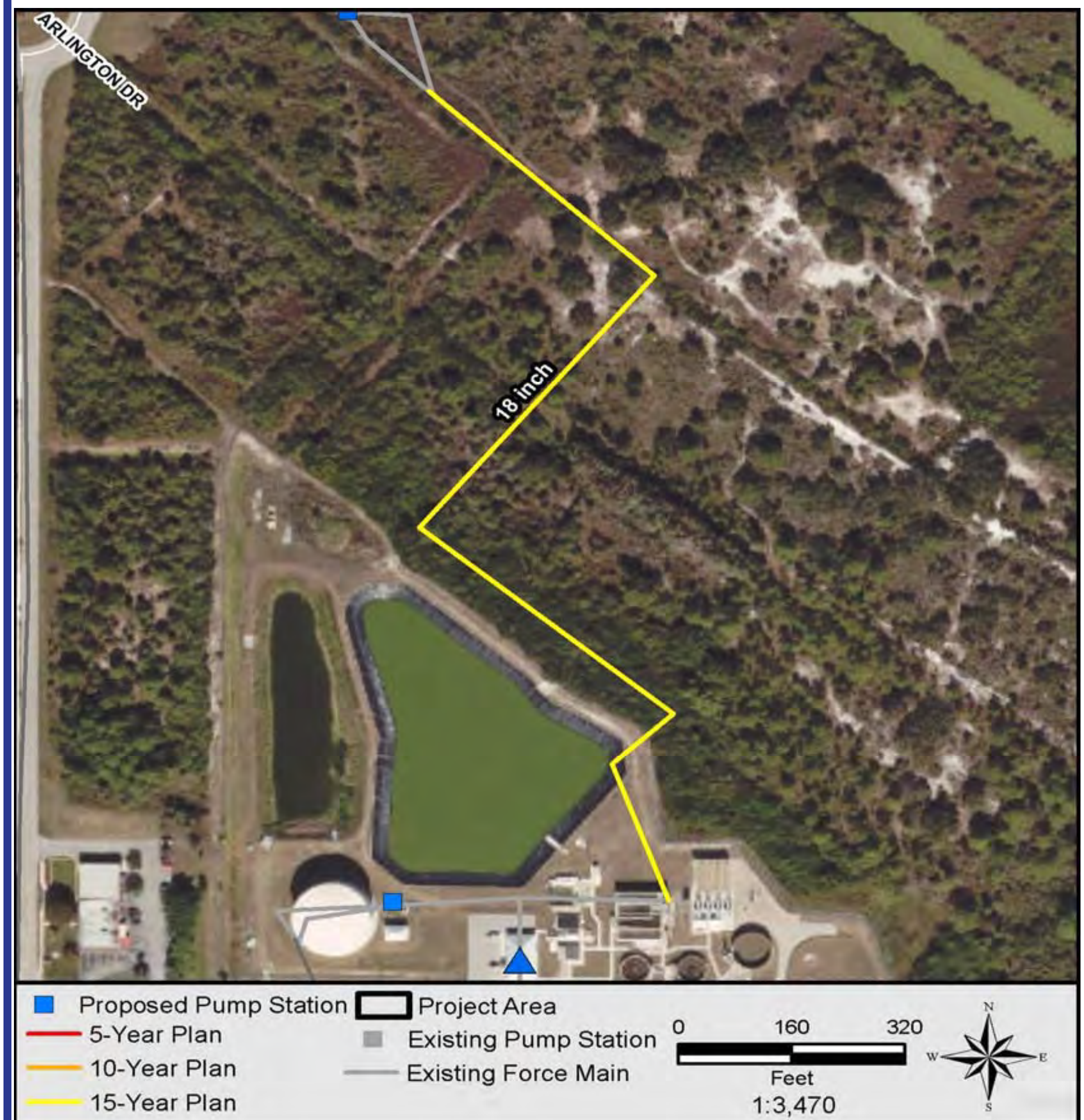
Force Main Length
1,800 linear feet

Force Main Material
PVC

Force Main Size
18 inches

PROJECT COMPONENTS

- ☐ Pump Station
- ☑ Force Mains
- ☐ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 11	Year 12	Year 13	Year 14	Year 15	Total
Professional Services	112	21	7			139
Land (or ROW)						
Construction Cost		158	158			317
Total Project Cost	**112**	**179**	**165**			**456**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W-FM-36 - Waterford Ave to SR776

Predecessor CIP: None | **Project Area Served:** W12a

DESCRIPTION: The project includes installing 2,400 LF of 10-inch force main starting from the intersection of Sunnybrook Boulevard and Waterford Avenue, continuing south and ending at the intersection of SR 776 and Sunnybrook Boulevard. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 16
End: Year 17

PROJECT DETAILS

West County

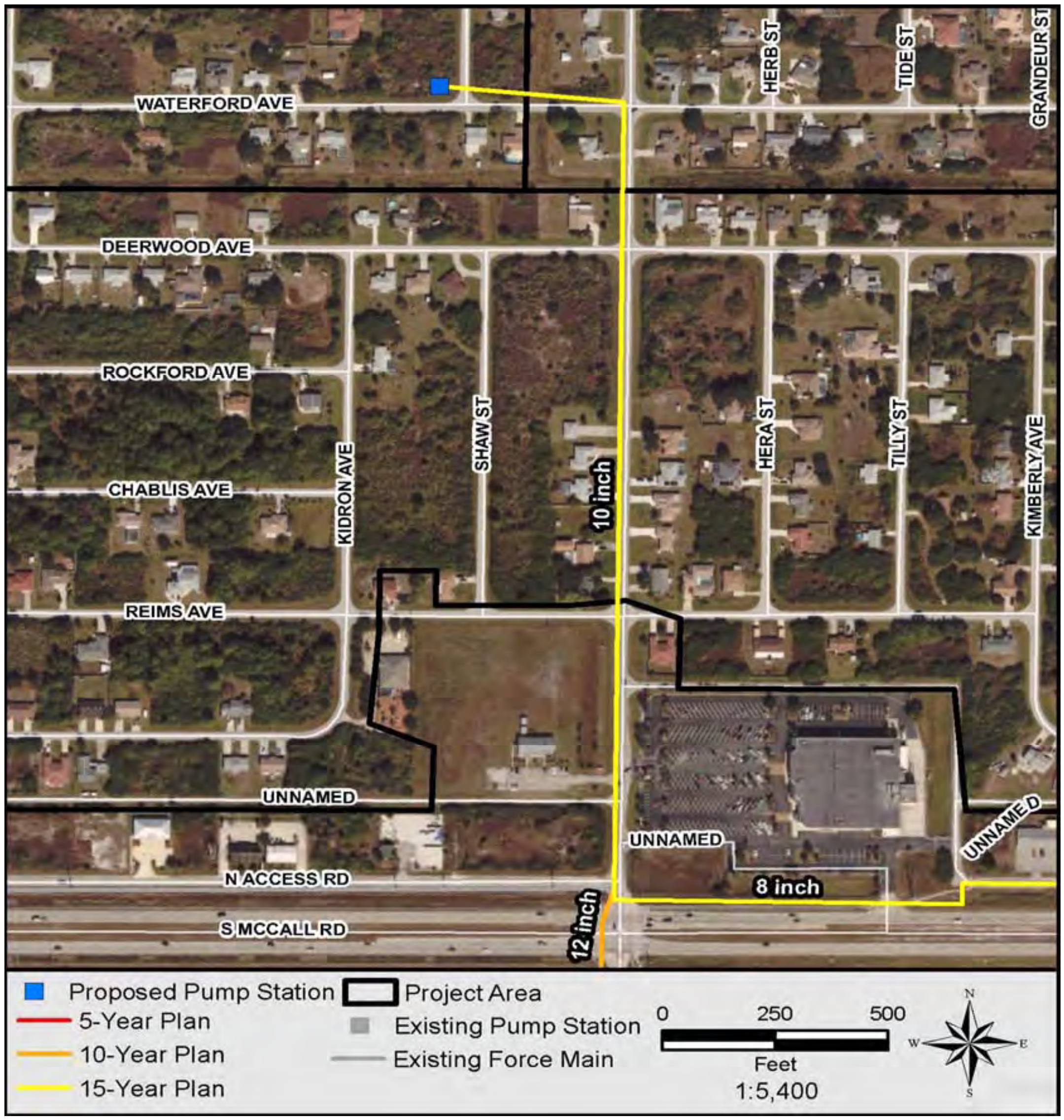
Force Main Length
2,400 linear feet

Force Main Material
PVC

Force Main Size
10 inches

PROJECT COMPONENTS

- [ ] Pump Station
- [x] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 15	Year 16	Year 17	Year 18	Year 19	Total
Professional Services	104	20	7			130
Land (or ROW)						
Construction Cost		148	148			296
Total Project Cost	**104**	**168**	**155**			**427**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W-FM-37 - Burlington Ave to Strawberry St

Predecessor CIP: None | **Project Area Served:** W17

DESCRIPTION: The project includes installing 1,200 LF of 10-inch force main starting from the intersection of Burlington Avenue and Gunther Street, heading east on Burlington Avenue, continuing north on Strawberry Street, and ending at the intersection of Strawberry Street and SR 776. The force main will be used to convey wastewater from the pump station of the specified project area to the existing system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 12
End: Year 13

PROJECT DETAILS

West County

Force Main Length
1,200 linear feet

Force Main Material
PVC

Force Main Size
10 inches

PROJECT COMPONENTS

- ☐ Pump Station
- ☑ Force Mains
- ☐ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains

Expenditure Plan ($1000)

	Year 11	Year 12	Year 13	Year 14	Year 15	Total
Professional Services	52	10	3			65
Land (or ROW)						
Construction Cost		74	74			148
Total Project Cost	**52**	**84**	**77**			**213**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W-FM-38 - Larkin St to SR776

Predecessor CIP: None | **Project Area Served:** W19a, W19b

DESCRIPTION: The project includes installing 1,600 LF of 6-inch force main starting from the intersection of Larkin Street and Oceanspray Boulevard, heading north on Oceanspray Boulevard, and ending at the intersection of Oceanspray Boulevard and SR 776. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 14
End: Year 15

PROJECT DETAILS

West County

Force Main Length
1,600 linear feet

Force Main Material
PVC

Force Main Size
6 inches

PROJECT COMPONENTS

- ☐ Pump Station
- ☑ Force Mains
- ☐ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains

Expenditure Plan ($1000)

	Year 13	Year 14	Year 15	Year 16	Year 17	Total
Professional Services	54	10	3			67
Land (or ROW)						
Construction Cost		77	77			153
Total Project Cost	**54**	**87**	**80**			**221**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W-FM-39 - Oceanspray to Sunnybrook Blvd

Predecessor CIP: None

Project Area Served: W19a, W19b

DESCRIPTION: The project includes installing 2,300 LF of 8-inch forcemain heading west on SR 776 from Oceanspray to Sunnybrook Boulevard. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- ☑ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☐ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 14
End: Year 15

PROJECT DETAILS

West County

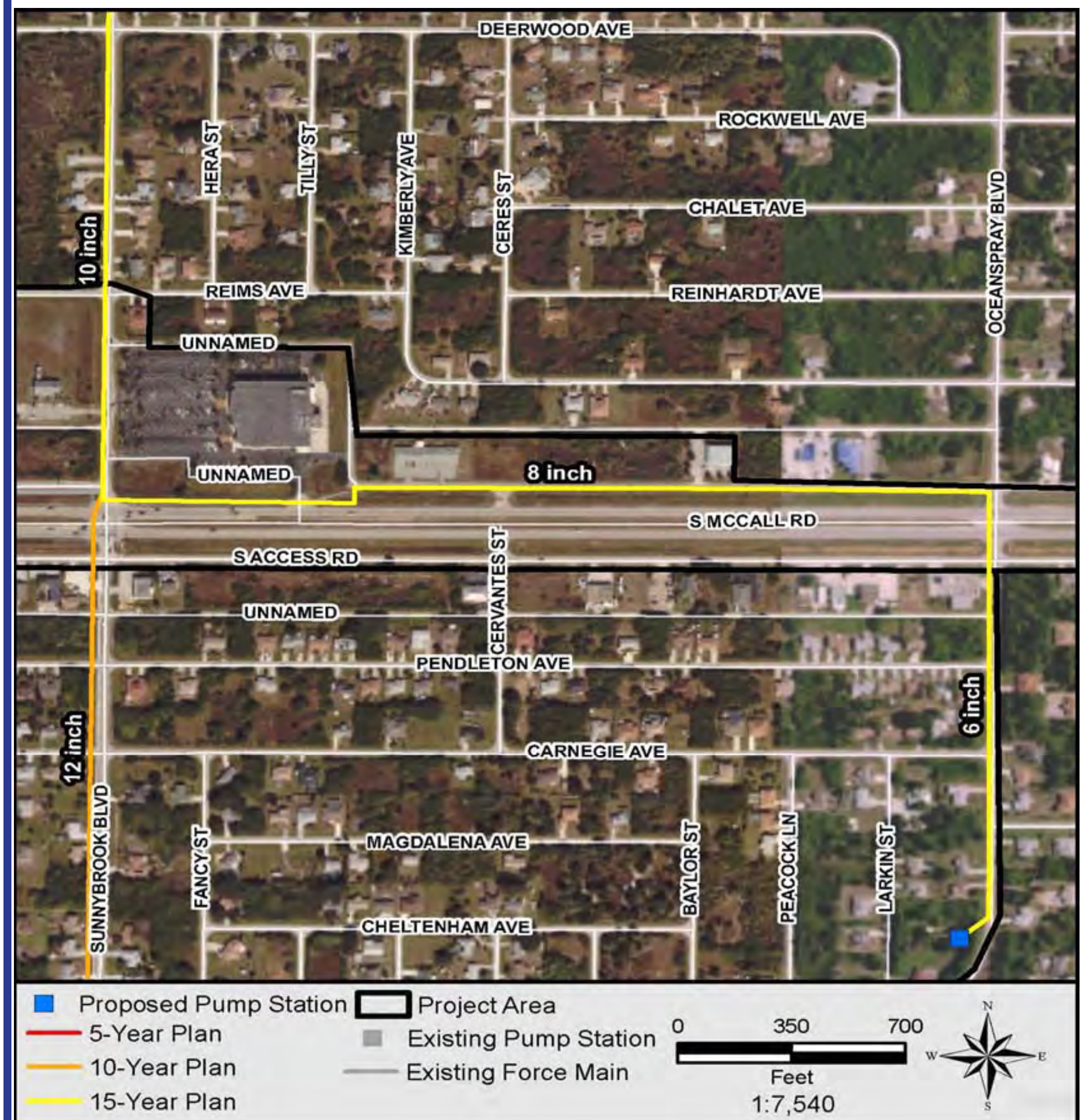
Force Main Length
2,300 linear feet

Force Main Material
PVC

Force Main Size
8 inches

PROJECT COMPONENTS

- ☐ Pump Station
- ☑ Force Mains
- ☐ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains



Expenditure Plan ($1000)

	Year 13	Year 14	Year 15	Year 16	Year 17	Total
Professional Services	89	17	6			111
Land (or ROW)						
Construction Cost		126	126			253
Total Project Cost	**89**	**143**	**132**			**364**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W-FM-40 - Carvel St. to Sunnybrook Blvd

Predecessor CIP: None | **Project Area Served:** W20b

DESCRIPTION: The project includes installing 400 LF of 8-inch force main starting from the intersection of Oceanspray Boulevard and Carvel Street, heading east on Oceanspray Boulevard to Sunnybrook Boulevard. The force main will be used to convey wastewater from the pump station of the specified project area to the existing transmission system.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [x] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [ ] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 15
End: Year 16

PROJECT DETAILS

West County

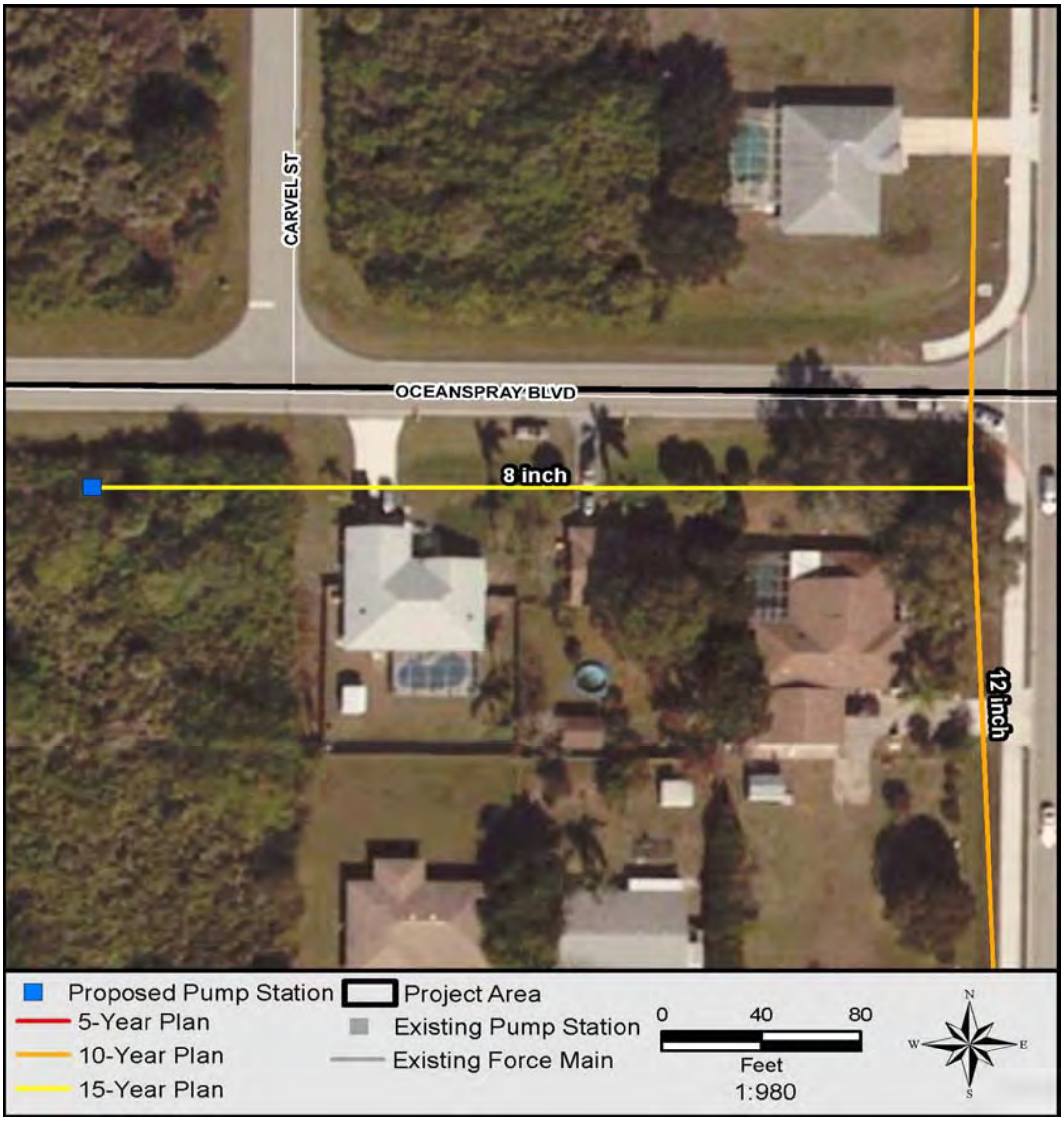
Force Main Length
400 linear feet

Force Main Material
PVC

Force Main Size
8 inches

PROJECT COMPONENTS

- [ ] Pump Station
- [x] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains



Expenditure Plan ($1000)

	Year 14	Year 15	Year 16	Year 17	Year 18	Total
Professional Services	15	3	1			19
Land (or ROW)						
Construction Cost		22	22			43
Total Project Cost	**15**	**24**	**22**			**62**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **W-LS-815 - LS 815 Upgrade**

Predecessor CIP: None | **Project Area Served:** 15-year CIPs

DESCRIPTION: The project includes increasing the pumping capacity at the existing lift station 815.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- [ ] Reduce nitrogen loading to environment
- [x] Increase capacity to accommodate design flows
- [x] Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 12
End: Year 13

PROJECT DETAILS

West County

Force Main Length
Not Applicable

Force Main Material
PVC

Force Main Size
Not Applicable

PROJECT COMPONENTS

- [x] Pump Station
- [ ] Force Mains
- [ ] Vacuum Mains
- [ ] Low Pressure Mains
- [ ] Gravity Mains

Expenditure Plan ($1000)

	Year 11	Year 12	Year 13	Year 14	Year 15	Total
Professional Services	25	25	-			50
Land (or ROW)						
Construction Cost		200	-			200
Total Project Cost	**25**	**225**				**250**

(Costs expressed in 2017 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **W-LS-801 - LS 801 Upgrade**

Predecessor CIP: **None**

Project Area Served: **15-year CIPs**

DESCRIPTION: The project includes increasing the pumping capacity at the existing lift station 801.

ENVIRONMENTAL DETAILS

Overall Impact Score
See Project Area Served

Nitrogen Load Reduction
See Project Area Served

PROJECT NEED

- ☐ Reduce nitrogen loading to environment
- ☑ Increase capacity to accommodate design flows
- ☑ Reduce O&M requirements

EST. CONSTRUCTION TIME

Start: Year 12
End: Year 13

PROJECT DETAILS

West County

Force Main Length
Not Applicable

Force Main Material
PVC

Force Main Size
Not Applicable

PROJECT COMPONENTS

- ☑ Pump Station
- ☐ Force Mains
- ☐ Vacuum Mains
- ☐ Low Pressure Mains
- ☐ Gravity Mains

Expenditure Plan ($1000)

	Year 11	Year 12	Year 13	Year 14	Year 15	Total
Professional Services	25	25	-			50
Land (or ROW)						
Construction Cost		200	-			200
Total Project Cost	**25**	**225**				**250**

(Costs expressed in 2017 dollars)

Appendix D

Public Outreach Material

Public Presentations
Website Engagement
Survey & Public Input
Media Coverage
Additional Content

1 PUBLIC PRESENTATIONS

Date	Audience	Notification	Location	Note
12/13/17	General Public	TBD	Tringali Park Facility, Englewood	Overview presentation, maps, visuals, survey, open house format for Q&A
11/08/17	General Public	TBD	Charlotte Harbor Event & Conference Center, Punta Gorda	Overview presentation, maps, visuals, survey, open house format for Q&A
09/21/17	Charlotte Harbor National Estuary Program Policy Committee and guests	Membership invited, CCUD also posted online	Charlotte Community Foundation, Punta Gorda	
09/15/17	Charlotte Harbor National Estuary Program Management Committee and guests	Membership invited, CCUD also posted online	Charlotte Community Foundation, Punta Gorda	
08/30/17	Charlotte Harbor National Estuary Program Citizens Advisory Committee and guests	Membership invited, CCUD also posted online	Wauchula	
08/17/17	Charlotte Harbor National Estuary Program Technical Advisory Committee and guests	Membership invited, CCUD also posted online	Wauchula	
05/16/17	BCC, General Public	BCC Public notice, CCUD also posted online	Murdock Administration, Port Charlotte	Update & RESTORE Act Prioritization
03/05/17	Charlotte Harbor Flatwoods Initiative members and guests	Membership invited, CCUD also posted online	SFWMD, Ft. Myers	Update Presentation

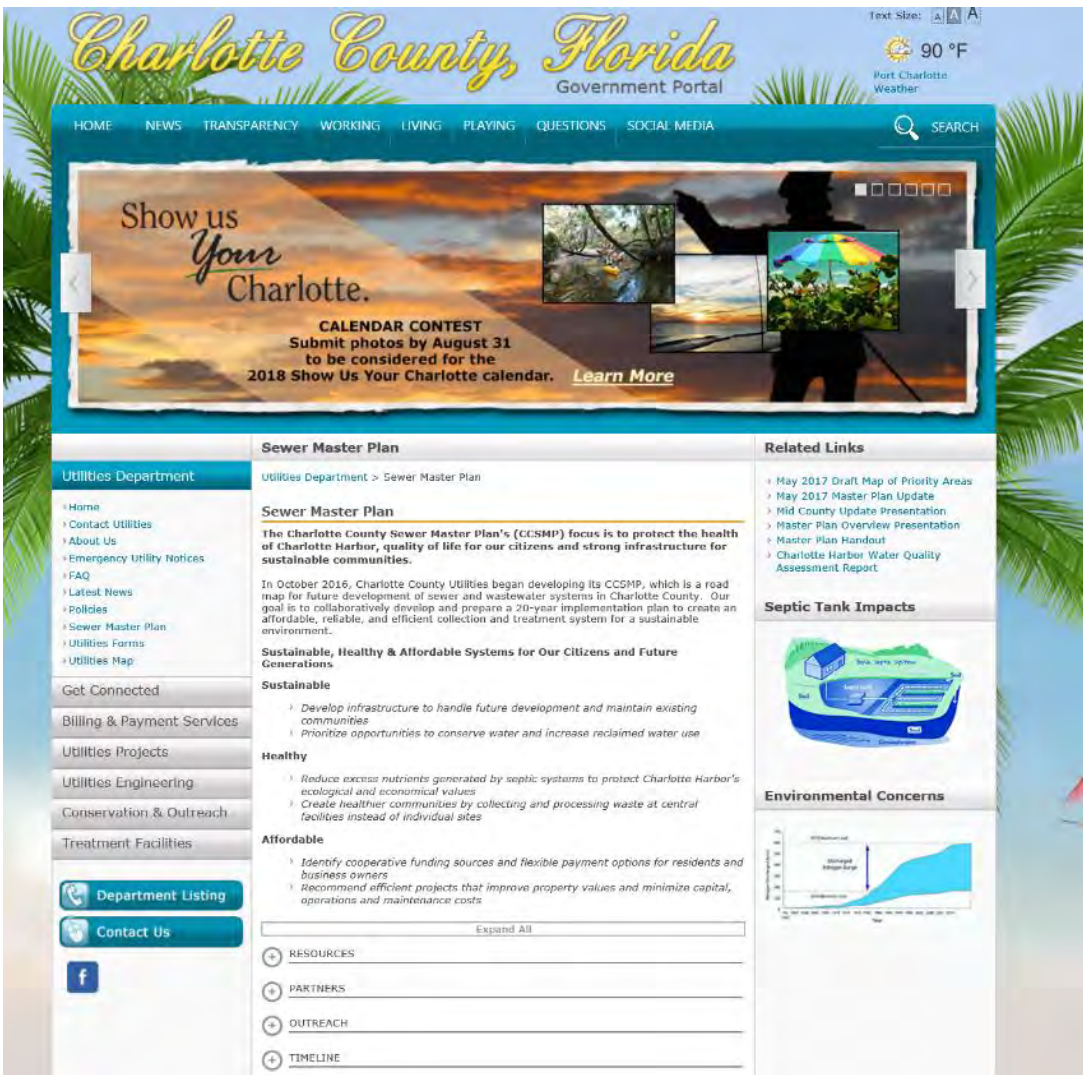
Date	Audience	Notification	Location	Note
02/21/17	BCC, General Public	BCC Public notice, CCUD also posted online	Murdock Administration, Port Charlotte	Mid County Update Presentation
01/09/17	CCSMP Stakeholders	CCUD emailed invitation, CCUD also posted online	East Port Environmental Campus, Port Charlotte	Stakeholder Work Session
12/05/16	CCSMP Stakeholders	CCUD emailed invitation, CCUD also posted online	East Port Environmental Campus, Port Charlotte	Initial Stakeholder Presentation
11/15/16	BCC, General Public	BCC Public notice, CCUD also posted online	Murdock Administration, Port Charlotte	Sewer System Expansion Funding Methodology
10/18/16	BCC, General Public	BCC Public notice, CCUD also posted online	Murdock Administration, Port Charlotte	Sewer Master Plan Overview

The development of the CCSMP was also discussed, and overview handouts were distributed, during each of these outreach opportunities:

- 06/06/17 - Charlotte DeSoto Building Industry Assn.
- 06/22/17- Utilities map info session – targeted to realtors
- 06/14/17- Utilities map info session – targeted to realtors
- 05/09/17- Utilities map info session – targeted to realtors
- 05/16/17 – Utilities map info session – targeted to realtors
- 04/25/17 – Utilities map info session – targeted to realtors
- 04/11/17 - Utilities map info session – targeted to realtors
- 03/13/17 - Water Quality Seminar - Reclaimed Water
- 03/08/17 – Charlotte County Citizens Government Academy
- 03/06/17 – Charlotte & Water Conservation District
- 03/01/17 – Heritage Oak Park Disaster Readiness Day
- 02/13/17 - Water Quality Seminar - Tracing Pollutants
- 02/08/17 – Pt. Charlotte Beach Neighborhood Watch
- 02/06/17 – Pt Charlotte NY Section Neighborhood Watch
- 12/20/17 - Utilities map info session – targeted to realtors
- 12/13/16 – Dr. Lapointe's Charlotte Harbor Water Quality Assessment
- 11/30/16 - Utilities map info session – targeted to realtors
- 11/11/16 – Port Charlotte Kiwanis Club
- 11/19/16 – Charlotte Harbor Nature Festival
- Facility Tours – 02/08/17, 02/22/17, 04/12/17, 05/17/17

2 WEBSITE ENGAGEMENT

Month	Total Page Views	Unique Page Views	Seconds on Page	Bounce Rate	% Exit
Nov-16	166	34	92.09	30.00%	9.64%
Dec-16	572	290	141.76	54.55%	26.75%
Jan-17	462	287	135.96	42.86%	22.51%
Feb-17	572	290	141.76	54.55%	26.75%
Mar-17	616	374	122.47	28.00%	24.51%
Apr-17	544	342	132.04	29.07%	25.55%
May-17	491	308	127.67	32.86%	22.81%
Jun-17	459	290	155.27	36.90%	27.67%
Total	3,882	2,215			



3 SURVEY & PUBLIC INPUT

The focus of the Charlotte County Sewer Master Plan (CCSMP) is to protect the health of Charlotte Harbor, ensure the quality of life for our citizens and improve our infrastructure for sustainable communities.

To better understand the CCSMP and make informed selections, please:

- Watch this 3-minute overview video (*to be linked)*
- Browse the Executive Summary and/or review the draft CCSMP (*to be linked)*
- Review the priority five-year interval maps *(to be linked)*
- Review the proposed structure for connection fees (to be linked)

Please provide your input on all 15 questions below**.** At the end of the survey, feel free to share optional comments, information or concerns about your property.

SURVEY - Agree | Neutral | Disagree | NA | Comment

Please rate each question on a scale from strongly agree to strongly disagree and provide optional comments.

QUALITY OF LIFE

1) The Charlotte County area has been recognized as one of the best places in the United States to fish, golf, live, and retire. In many respects, Charlotte Harbor represents our livelihood, economic development opportunities, and offers a strong sense of place for our citizens and families.

2) Pressures from the increasing population have had a negative environmental impact on Charlotte Harbor over time.

3) Increasing levels of bacteria, nutrients, and man-made sweeteners have been documented over recent years. Septic systems near waterways are contributing these impairments.

4) Most of Florida's sandy soil types are unsuitable for proper septic system function because the water table is high, especially in coastal areas during the rainy season. In older septic systems, effluent is absorbed into the groundwater and/or surface water that feeds streams and canals that lead to Charlotte Harbor.

5) A home connected to the sewer system is generally more marketable than one that relies on a septic system (all else being equal) because the owner is not responsible for maintenance.

THE CCSMP

6) The CCSMP is a 20-year road map to build sewer systems that support the health of our Harbor in an affordable, sustainable, efficient, and reliable manner. It should be interpreted as a working plan flexible enough to fluctuate as critical priorities and issues emerge.

7) The CCSMP evaluates the entire service area, including costs and infrastructure, and then prioritizes areas to convert from septic to sewer (S2S). The plan appropriately prioritizes areas based on the average age of septic systems in low-lying, densely-populated areas.

8) Charlotte County should have a long-term comprehensive approach for monitoring the changes in nutrient loading throughout the S2S conversion process.

9) The CCSMP should have an interactive map component that's updated annually to help current and potential property owners and builders make informed decisions.

FUNDING & AFFORDABILITY

10) Because factors like the size of the project, type of system, density and elevation varies, costs range between $11,500 and $22,0000 for each individual connection. Property owners required to connect to the system should pay the same fee for each residential unit, regardless of property size or varying project costs.

11) To decrease the burden on residents, owners with properties in the CCSMP should be offered a consistent, affordable rate to connect to the central sewer system that includes the cost of physically connecting to the home and abandoning the septic tank.

12) Charlotte County should incentivize property owners to pay connection fees ahead (prior to physical connection) by approving staged annual increases that reflect projected inflation and cost increases. This allows owners to lock in the lowest possible rate, even if sewer connections are not scheduled for several more years when higher rates will likely prevail.

13) Charlotte County should offer owners the opportunity to pay in full, or to finance the connection fees over several years.

14) Current rules state that it is mandatory for buildings to connect to sewer within 180 days of availability. However, if a homeowner replaced the septic within five years, he/she should be able to request a payment deferral and delay connecting to the sewer system for up to five years.

15) A homeowner that applies for and meets extremely low income and asset criteria should be able to receive sewer service and defer the connection fees until the home is sold or deed is transferred.

16) The County's penny sales tax is paid by all residents and visitors purchasing goods and services in Charlotte County. If the County's penny sales tax is extended in 2020, a portion of the revenue should go toward funding these S2S projects that improve Charlotte Harbor's water quality.

OPEN ENDED QUESTIONS

a. Generally, which commercial areas, streets and neighborhoods in Charlotte County do you feel should be a priority for sewer development?
b. Would you like Charlotte County to consider your geographic area for S2S conversion projects?
c. Would you like to stay informed of our future S2S project plans?
    i. If yes to b or c, please list your name, property address, phone and email address.

4 MEDIA COVERAGE

- Charlotte Sun: Sewer Master Plan Prompts Questions (05/16/17)
- CHNEP News: Improving Water Quality with Infrastructure (05/01/17)
- Harbor Style Magazine: What's the H2O (04/01/17)
- OW&WD Magazine: Septic Sewer Swap (03/06/17)
- Charlotte Sun: Study Selects Sewer Target Areas (03/01/17)
- Charlotte Sun: Charlotte County to Unveil Finance Method (02/20/17)
- NBC 2 TV: Sewer Switch-Up for Charlotte County Residents (02/21/17)
- Charlotte Sun: WMU to Study Charlotte's Water Quality (01/25/17)
- Charlotte Sun: A Life on the Water (01/05/17)
- Charlotte Sun: Greatest Challenges & Priorities (01/01/17)
- Charlotte Sun: Reconsider Sewers on Manasota Key (12/30/16)
- Charlotte Sun: All Should Shoulder Sewer Upgrade Costs (12/24/16)
- Charlotte Sun: Necessity of Sewers Made Clear (12/18/16)
- NBC 2 TV: Alarming Amount of Human Waste in Charlotte Water (12/13/16)
- Charlotte Sun: Charlotte Stakeholders Preview Sewer Master Plan (12/09/16)
- Charlotte Sun: County Lays Groundwork for Sewer Master Plan (10/19/16)
- Charlotte Sun: Work Begins on Sewer Master Plan (10/16/16)

5 ADDITIONAL CONTENT

5.1 OVERVIEW FACT SHEET

5.2 ENVIRONMENTAL CONCERNS HANDOUT

5.3 SEPTIC IMPACTS TANK HANDOUT

5.4 CCTV SPOTLIGHT VIDEO *(TO BE LINKED)*

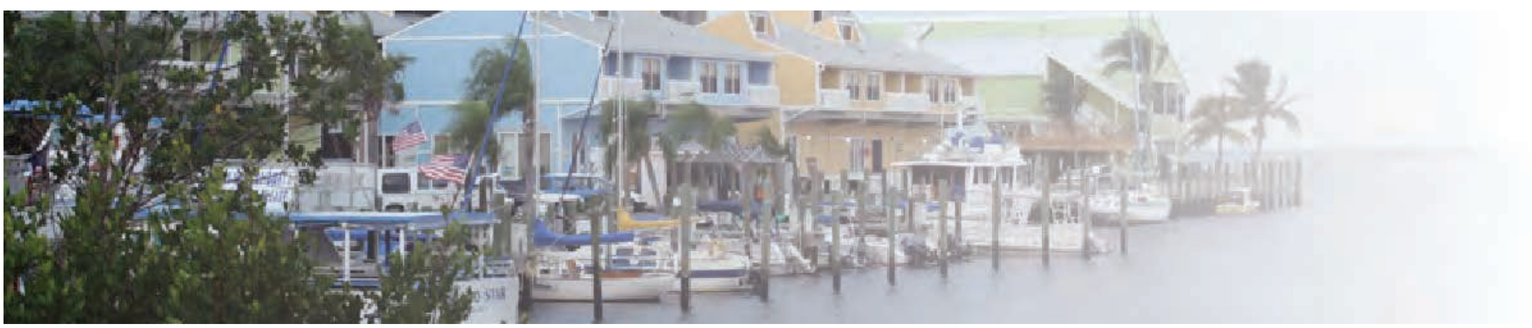
CHARLOTTE HARBOR:

Protecting the Heart of Charlotte County

Committed to Sustainable Infrastructure for Our Community

Affordable, reliable, and efficient water quality is key to sustainable population growth, economic development, and the health of the County's natural resources and landscape. Charlotte Harbor's rich historical and aesthetic features have and continue to attract businesses and residents to the County. Maintaining our County's water quality is critical to the health and future growth of our neighborhoods and local economy.

Working together with Charlotte County's communities, the Charlotte County Utilities Department along with several local and regional partners are moving forward with developing a county-wide Sewer Master Plan. This collaborative effort strives to improve the watershed and protect Charlotte Harbor's water quality in an affordable, sustainable, efficient, and reliable manner.



AN ENVIRONMENTAL TREASURE

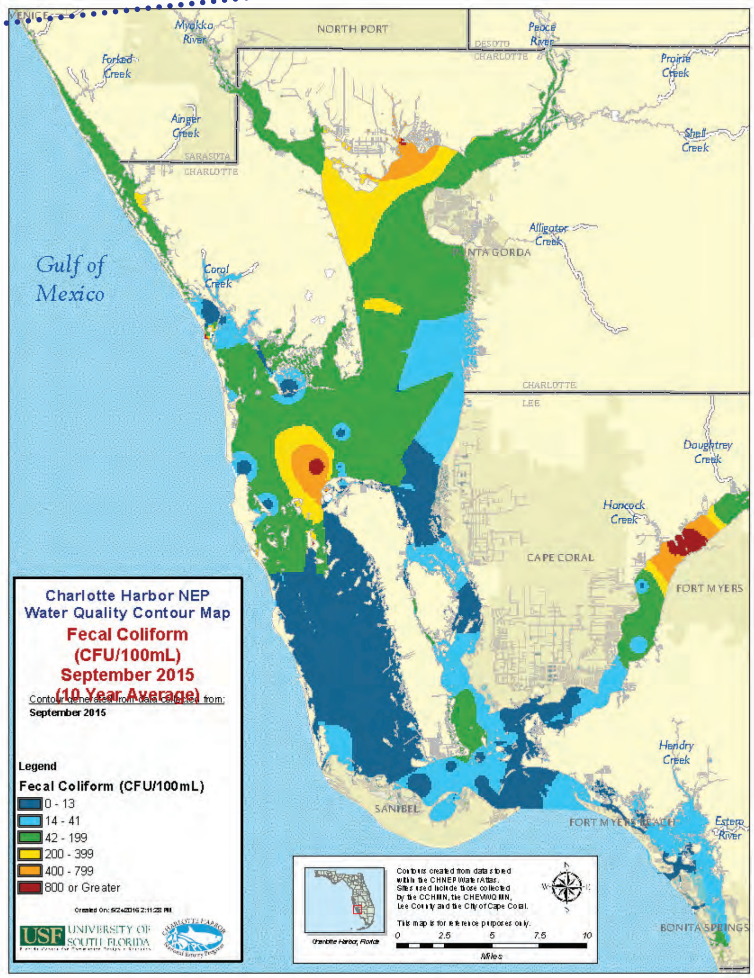
- Designated an Estuary of National Significance
- 2nd Largest Estuary in Florida
- 5 Aquatic Preserves
- Extensive Wildlife and Marine Life

AN ECONOMIC ENGINE

- $526 Million in Annual Economic Impact
- Charlotte Harbor is known as a world-class destination for recreational fishing
- 830 Miles of Shoreline

WATER QUALITY & ENVIRONMENTAL CONCERNS

- Charlotte Harbor is on EPA's 303d List of Impaired and Threatened Waters for nutrients, dissolved oxygen, chlorophyll a, bacteria in shellfish, and mercury in fish tissue
- Reducing pollutants entering the water bodies translates into fewer beach closures, which improves the quality of life for residents and tourists to the County's shorelines



WATER QUALITY THREATS

- ▶ Nutrient Loading
- ▶ Algae Blooms
- ▶ Red Tide
- ▶ Fish Kills

RESULTS IN

- ▶ Closed Beaches
- ▶ Reduced Tourism
- ▶ Reduced Fishing

MAJOR POLLUTANTS

High Concentrations of:

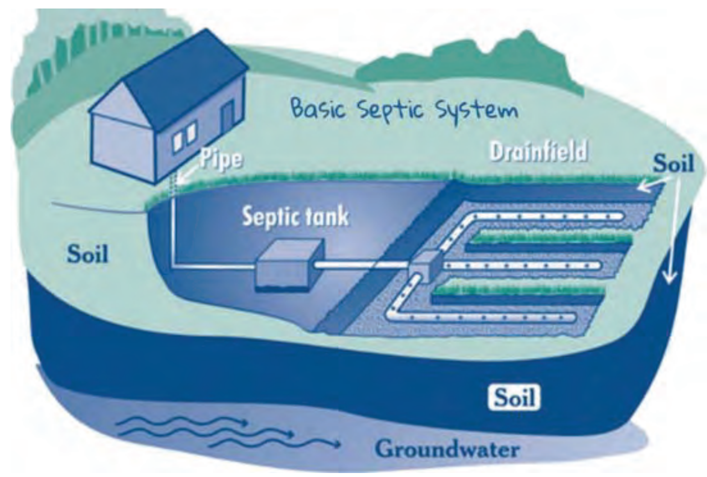
- ▶ Nitrate
- ▶ Biological Oxygen Demand
- ▶ Ammonia

Rising Levels of:

- ▶ Phosphorus
- ▶ Chlorophyll a

Increasing Levels of:

- ▶ Fecal Contamination



LEARN MORE ONLINE

Check out the Sewer Master Plan web page for meeting announcements and links to resources, presentations, articles, reasearch and more.

Charlottecountyfl.gov/dept/utilities/Pages/Sewer-Master-Plan.aspx

SEPTIC TANK TECHNOLOGY

- ▶ County's service area has 27,000 septic tanks within an average distance of 700 feet, and a maximum distance of 3,175 feet of water bodies connected to the Harbor
- ▶ As lots develop, significantly more septic tanks are possible
- ▶ With our seasonal high water table and unsuitable soils, aging systems send pollutants & bacteria into waterways

WHAT CAN I DO TO HELP?

- ▶ Stay Informed! Sign up to receive our quarterly e-newsletter
- ▶ Participate in public meetings, workshops, and discussions
- ▶ Write a letter to the editor or an elected official
- ▶ Join a local organization/core support group

CHARLOTTE COUNTY FLORIDA 1921

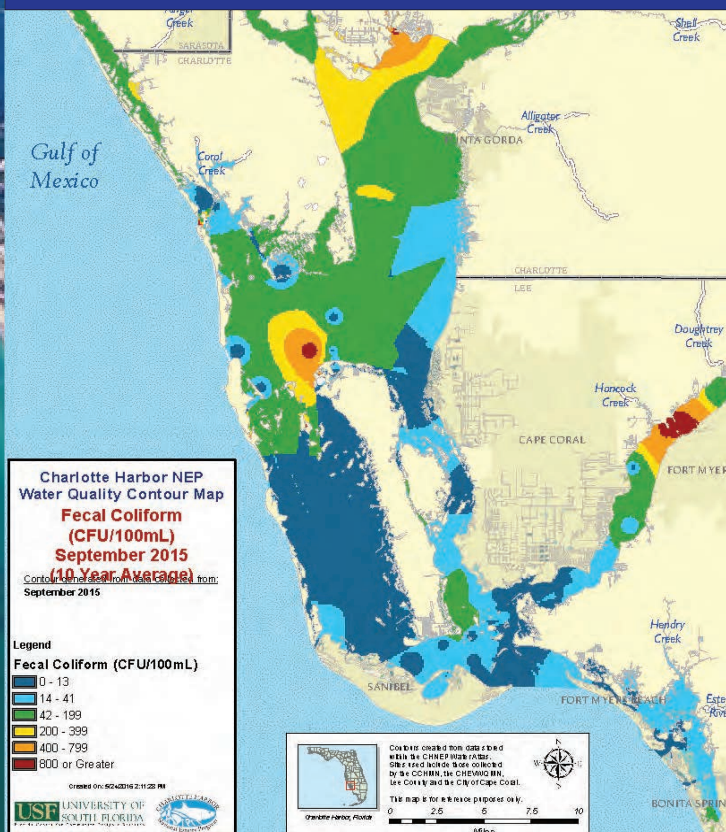
Questions or concerns? Please contact Kaley Miller, Public Relations Manager, kaley.miller@charlottecountyfl.gov

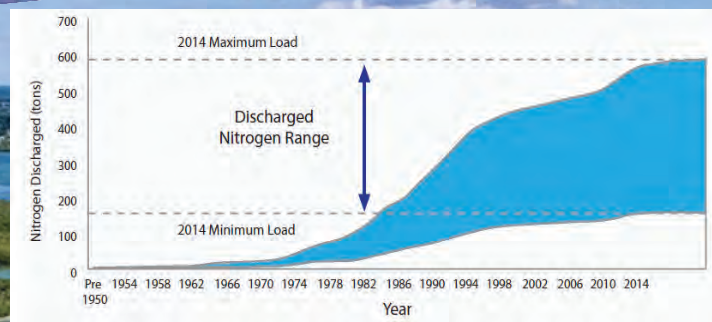
CHARLOTTE HARBOR
Protecting the Heart of Charlotte County

WATER QUALITY & ENVIRONMENTAL CONCERNS

» Charlotte Harbor Impairment Status

- Charlotte Harbor is on EPA's 303d List for nutrients, dissolved oxygen, Chlorophyll a, bacteria in shellfish, mercury in fish tissue





» The excessive amount of nitrogen promotes algae growth within the waterways leading to aquatic hypoxia that is linked to red tide events and ecological degredation.

» Maintaining Charlotte Harbor Estuary's water quality is critical to the future of the community.

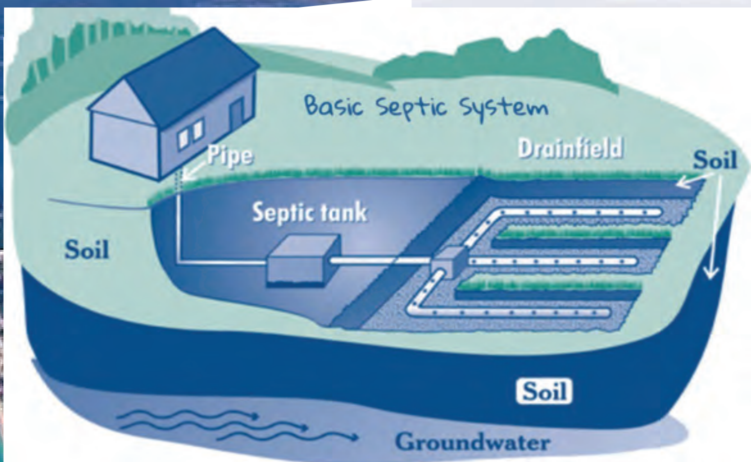
» Charlotte Harbor is known as a world-class destination for recreational fishing.

» Reducing pollutants entering the water bodies translates into fewer beach closures, which improves the quality of life for residents and tourists to the County's shorelines.

CHARLOTTE COUNTY FLORIDA 1921

CHARLOTTE HARBOR
Protecting the Heart of Charlotte County

SEPTIC TANK IMPACTS



- County's service area has 27,000 septic tanks within an average distance of 700 feet, and a maximum distance of 3,175 feet of water bodies connected to the Harbor
- As lots develop, significantly more septic tanks are possible
- With our seasonal high water table and unsuitable soils, aging systems send pollutants & bacteria into waterways

Major Pollutants

» *High Concentration*
- *Nitrate*
- *Biological Oxygen Demand*
- *Ammonia*

» *Rising Levels of:*
- *Nitrogen*
- *Phosphorus*
- *Chlorophyll a*

» *Increasing Levels of:*
- *Fecal Contamination*

CHARLOTTE COUNTY FLORIDA 1921

Appendix E

Manchester Waterway Boat Lock Removal Plan

July 19, 2017

Dear Mr. Iglehart:

Charlotte County Utilities Department (CCUD) is pleased to introduce this revised report following the County's initial submittal in May 2017, and the FDEP's request for additional information in June 2017.

Outlined below is a summary of how CCUD modified its approach to better align with the requested framework:

1) Separated FY 2007-11 CIP area data from the other CCUD projects or expansions, and aligned the information with both the Manchester and Little Alligator basins
2) Cross referenced and analyzed data using geographical location (GIS), property appraiser resources and utility account information
3) Use the unique property identification number (property ID) as defined by the County's property appraiser as the standard across all properties and project areas – in lieu of lot counts and a variety of data sources
4) Compared CIP areas against multiple sources of records to verify the connection information for billable customers

In reviewing this report, please note that:

- To maintain consistency across all projects areas by using the property ID, including those where the predominant lot is half the size of a standard single family lot (such as area HH-1), the numbers will be different from what was previously reported.
- One property ID number represents only one connection in most cases.
- Property IDs can contain multiple customers (i.e. duplex/apartment/retirement home/condo); multiple undeveloped combined-lot properties; single-family connections housed on two lots; and combined-lots in neighborhoods that will generally not support a standard sized single-family residence without combining lots (HH-1).
- Information beyond the CIP and permit boundaries was incorporated to illustrate the "big picture" progress with septic to sewer (S2S) conversions, line extensions and larger wastewater infrastructure projects.

It was our intent to develop an annual report that more accurately defined the number of existing and potential future sewer connections in a form that was easily repeatable year after year.

Additionally, enclosed is a cross reference between the request for additional information in June 2017 and the sections in the revised report.

Sincerely,

G. M. Hubbard

Gary M. Hubbard, P.E.
Department Director
Charlotte County Utilities
Gary.Hubbard@CharlotteCountyFL.gov
941.764.4502

SC 18 & 19 – Phased Sewer Expansion

SUMMARY OF MANCHESTER BASIN PROJECTS The submittal states "Charlotte County has overlapped and expanded upon the boundaries of the original 2006-2007 Capital Improvement plan (CIP) identified in the FDEP Manchester lock removal permit"

Question: How do the original and new project areas compare?

Answer: The report has been modified to separate the original 2007-11 CIP areas from the additional septic to sewer projects by preparing Table 3 which includes information only about the original CIP areas and Table 5 which includes data specific to the additional septic 2 sewer areas. Figure 11 provides a map that shows both the original CIP areas and additional septic 2 sewer areas for a geographical comparison.

Question: How many connections were required under the 2006-2007 CIP.

Answer: The total number of connections required at the present time is 7,705. This numbers represents all occupied properties in the original areas. See Table 3 for more detail.

Question: Are more connections included in the current CIP?

Answer: Additional connections have been included beyond the original CIP whether in the planning, design, construction, or completed stages – but not necessarily in the current CIP. At the present time, the only septic 2 sewer projects in the current CIP are areas AB-2 (1,565 connections, see Table 3) and the additional septic 2 sewer project area Contract D (300 connections, see Table 5).

Question: Detail the benefits, if more connections are proposed for each area.

Answer: The general benefits of the additional connections include removing additional nitrogen loading from Charlotte Harbor. The report narrative describes the benefits and decisions that led to the additional project areas in more detail. See section 'Supportive Projects' and 'Overall Project Progression' for further information.

Question: Provide a summary table that includes: Year (2017 & into the future)/ Total No. Connections Required (8,953)/ Total Connections Projected to be completed each year / Total Connections completed for each year (787 to date) / % Completed for each year (8.8% to date). This table should be updated for each yearly report.

Answer: This information has been provided in multiple tables.

Table 3 Provides the following for the original CIP areas:

- **Year (2017 & into the future)**
- **Total No. Connections Required (7,705)**
- **Total Connections Projected to be completed each year**

Table 4 Provides the following for the original CIP areas:

- **Total Connections completed for each year (784 to date)**
- **% Completed for each year (10.2% to date).**

Table 2 Provides the following for Manchester Basin and Little Alligator basins:

- **Total Connections completed for each year (6,929 to date)**
- **% Completed for each year (49.8% to date).**

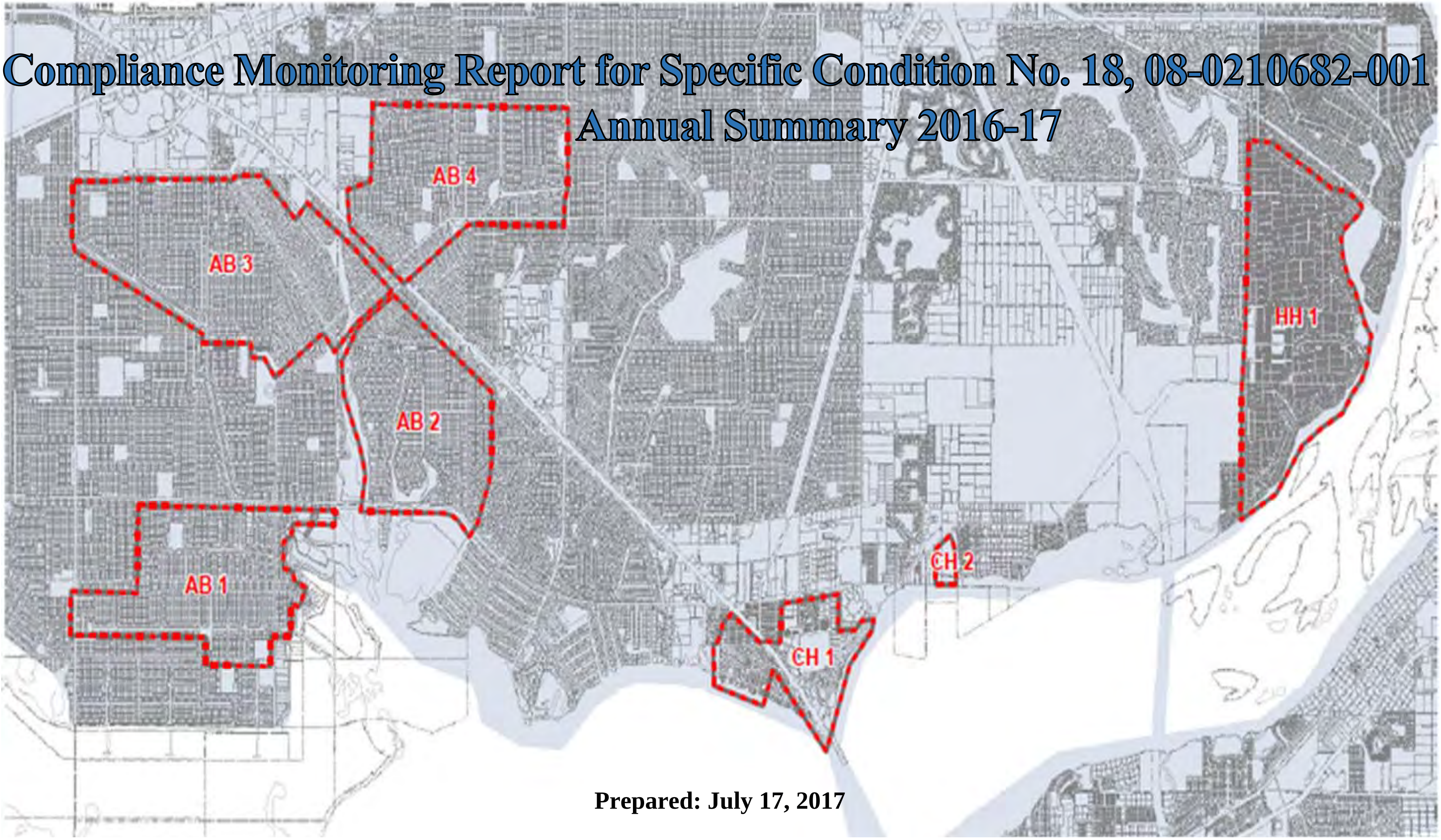
Question: There are discrepancies between **Summary Table for each Area and the Exhibits.** Example Table AB1 shows 1,735 required connections, Exhibit 2-1 shows 1,210 required connections. Table shows 360 connections to be completed by 2020. Will the report be updated when timelines have been established for construction of the remaining required connections? If yes, state so.

Answer: The report has been modified to separate the original 2007-11 CIP areas from the additional septic to sewer projects by preparing Table 3 which includes information only about the original CIP areas and Table 5 which includes data specific to the additional septic 2 sewer areas. Figure 11 provides a map that shows both the original CIP areas and additional septic 2 sewer areas for a geographical comparison.

Question: **SUPPORTIVE PROJECTS** Detail how the SRF loans and resultant septic 2 sewer conversions for areas outside of the permit requirements will benefit the Charlotte Harbor ecosystem. Detail all the good (pollutant reduction) things the county has done.

Answer: The SRF loans and resultant septic 2 sewer conversions for areas outside of the permit requirements are outlined in Table 5. Additional detail related to all of the pollutant load reduction related projects are outlined in the sections 'Supportive Projects' and 'Overall Project Progression'.

Compliance Monitoring Report for Specific Condition No. 18, 08-0210682-001
Annual Summary 2016-17



Prepared: July 17, 2017

Prepared by: Charlotte County Utilities Department
25500 Harborview Rd., Suite 1
Port Charlotte, FL 33980
www.CharlotteCountyFL.gov

On behalf of the Permittee:
Charlotte County Board of County Commissioners

Table of Contents

Background

Charlotte County Utilities Department has been working on compliance with the following Specific Conditions, outlined in the Florida Department of Environmental Protection permit number 08-0210682-001.

> ***Phased Sewer Expansion***
>
> *SC 18. The permittee has included the area as referenced in "Figure Phased Sewer Expansion NEB Location Map" in the Charlotte County Sewer Expansion Plan. These areas include portions of the Little Alligator drainage basin that have been identified as having on-site disposal systems that do not treat wastewater to current standards (i.e. those on-site disposal systems built prior to 1983). The permittee shall first focus on the area between West and East Spring Lake. The permittee shall commence and complete the installation of the sanitary sewer system in accordance with the attached "FY2007 Capital Improvements Budget/FY 2007-FY 2011 Project Detail.".*
>
> *SC 19. The permittee shall submit to the Department an annual status report that shall include the following information:*
>
> *a) The notations "Compliance monitoring report for Specific Condition No. 18, 08-0210682-001" and name of the permittee.*
> *b) The areas where the sanitary sewer system has been completed and is in service.*
> *c) The areas that are projected to be initiated within the next year.*
> *d) A contact person that is responsible for implementing Specific Condition No. 18.*
>
> *The annual report shall be due annually on the anniversary date of this permit. Upon verification by the Department that the system is in place and has been transferred to the Operation Phase of the permit, the permittee is hereby released from the above monitoring requirements.*
>
> *This NEB is to provide an improvement to water quality by decreasing nutrient loading from removing the septic systems.*

SC 18 outlined priority areas for sewer expansion that included portions of the Little Alligator drainage basin that have been identified as having on-site disposal systems that do not treat wastewater to current standards (i.e. those on-site disposal systems built prior to 1983). The condition required that Charlotte County focus on the area between West and East Spring Lake and commence and complete the installation of the sanitary sewer system in accordance with the enclosed "FY 2007 Capital Improvements Budget/FY 2007-FY2011 Project Detail", which we will call the FY 2007-11 CIP (see Figure 1A and Figure 1B).

The Charlotte County Utilities Department (CCUD) currently provides service to over 35,000 sewer customers within Charlotte County and a small portion of Lee County over its 45-square mile service area. However, many areas of Charlotte County are still served by septic systems dating back to the 1950's. There are approximately 27,000 septic systems in CCUD's entire service area. The areas identified in the FY 2007-11 CIP were a preliminary outline of areas with high density, aging or failing septic systems, whose receiving waters are the Charlotte Harbor and the Peace River. Most of the areas identified in the FY 2007-11 CIP, areas AB-2, AB-3, and AB-4, are all within or drain into the Little

Alligator drainage basin outlined in condition SC 18. Area AB-1 lies between the Manchester and Little Alligator drainage basins as shown in Figure 1B. The areas identified in the FY 2007-11 CIP as CH-1, CH-2, and HH-1 are directly adjacent to the Charlotte Harbor and Peace Rivers with aging on-site systems prioritizing them for septic to sewer (S2S) conversion as well.

Little Alligator and Manchester Drainage Basin Status

Little Alligator drainage basin is an area containing 16,887 properties, 11,723 of which are primarily occupied as single family residences (see Figure 2). To date 5,647 central sewer connections have been completed out of the 11,723 required (see Table 1 and Figure 2). This drainage basin contains portions, if not all, of the three FY2007-11 CIP areas AB-2, AB-3 and AB-4 (see Figure 1B). AB-2 is in the southern part of Little Alligator drainage basin, closest to Charlotte Harbor.

Manchester Lock basin contains 8,141 properties, 2,200 of which are occupied and 5,941 of which are vacant (see Table 1 and Figure 3). To date, 1,203 central sewer connections have been made, out of the 2,200 required (see Table 1). This basin does not intersect with any of the original 2007-11 CIP areas as outlined in condition SC 18. In 2008, CCUD proposed a project that would provide central sewer service to approximately 569 properties directly impacting the Manchester drainage basin. However, the area had less than 50% density, which negatively impacted the economic feasibility of the project and the project did not move forward.

Table 1: Properties Connected Inside Manchester and Little Alligator Drainage Basins

Table 1: Properties Connected Inside Manchester and Little Alligator Drainage Basins		
CONNECTION STATUS	**Little Alligator**	**Manchester**
COMPLETED	5,647	1,203
REQUIRED	11,723	2,200
% COMPLETED TO DATE	48%	55%

The table below show a numerical summary of connections completed on an annual basis since 2008. Table 4 shows the yearly connection rate for both the Manchester and Little Alligator drainage basins based on a total of 13,923 required connections.

Table 2: Yearly Connection Rate for the Manchester and Little Alligator C Basins Combined for Existing Homes

Table 2: Yearly Connection Rate for Manchester and Alligator Basins (13,923 Total Required)		
YEAR	**# CONNECTED**	**% PER YEAR**
2007	79	0.57
2008	39	0.28
2009	37	0.27
2010	17	0.12
2011	29	0.21
2012	36	0.26
2013	28	0.20
2014	27	0.19
2015	21	0.15
2016	214	1.54
2017	141	1.01
Total	**668**	**4.80**

Figure 1A: Original 2007-11 CIP Areas

NOTE: Areas "AB1", "AB2", & "AB3" have been identified in the new Sewer Expansion Plan as "Area 1"
"CH1" has been completed with the Charlotte Harbor CRA program.

CIP - 2

ACCOUNT # 40??.378???.535.63.0001 PRIORITY# 2

FY2007 Capital Improvements Budget / FY 2007 - FY 2011 Project Detail Project No. C350202

GENERAL PROJECT DATA:
Project Title: Utility System Redevelopment Plan

Functional Area: Wastewater
Department: Utilities
Location: System Wide

COMPREHENSIVE PLAN INFORMATION:
Project listed in CIE? No
Comp. Plan reference: N/A

LOS/Concurrency Related:

PROJECT NEED CRITERIA	
Safety	
Mandate	
Replace	
Growth	X

PROJECT SCHEDULE	FY07 1 2 3 4	FY08 1 2 3 4	FY09 1 2 3 4	FY10 1 2 3 4	FY11 1 2 3 4
Design/Arch					
Land/ROW					
Construct					
Equipment					

PROJECT DESCRIPTION:
There are numerous areas in Charlotte County that are currently without central sewer service.
There is a need to replace septic systems with central sewer service in areas that are located within 150 feet of surface water and also in high population density areas. A feasibility study will be conducted and used with the Master Plan (currently being updated) to prioritize areas for expansion of central sewer service. Project will require grant monies to offset homeowners' cost or MSBU system will be used.

PROJECT RATIONALE (Include Additional LOS Detail, if necessary):

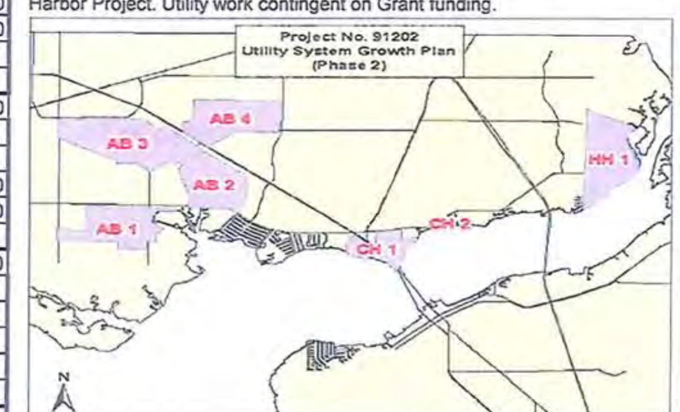
This project would allow examination of growth patterns and identification of areas with a high concentration of septic systems, so that efficient implementation of central sewer service could be achieved.

OPERATING BUDGET IMPACT:
Additional staffing may be required in correlation with customer growth. Additional revenue will support cost.

REPLACEMENT COUNTY PROPERTY NO.:

	Prior Actual	Budget FY06	Est FY06	(1) Calc. for FY07 Orig. FY07	(2) Est c/o to FY07	(3) New FY07	FY07	FY08	FY09	FY10	FY11	FUTURE	Total
EXPENDITURE PLAN (000'S)													
Design/Arch/Eng		550		500	550	-850	200	900	250			1,000	2,350
Land (or ROW)		200		200	200	-400		400	200			600	1,200
Construction				3,325		-3,325		5,825	2,500			6,305	14,630
Other													
Equipment													
Total Project Cost		750		4,025	750	-4,575	200	7,125	2,950			7,905	18,180
FUNDING PLAN (000'S)													
Grant		550		4,025	550	-4,575		7,125	2,950			7,905	17,980
O & M Fund		200			200		200						200
Total Funding		750		4,025	750	-4,575	200	7,125	2,950			7,905	18,180
OPERATING BUDGET IMPACT (000'S)													
Personal Svc.													
Non-personal													
Capital													
Total Operating													

FY 07 includes $2,000,000 for sewer component of CRA Charlotte Harbor Project. Utility work contingent on Grant funding.

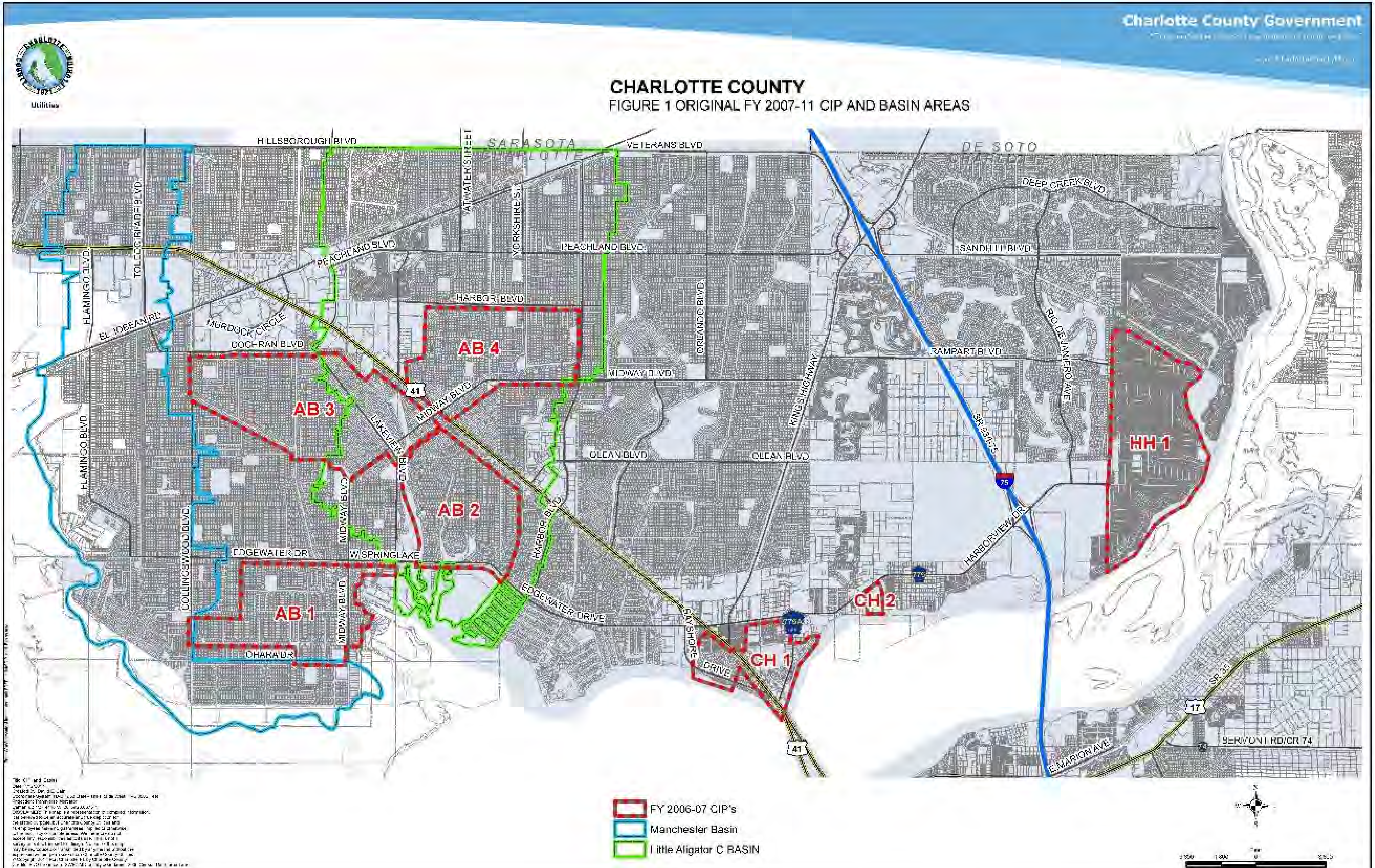


(1) This dollar amount is found on the Adopted FY06 CIP project page as the FY07 expenditure amount.
(2) The carryover number is the difference between the adopted FY06 budget and the amount estimated to be expended in FY06
(3) New dollars are due to an increase in project expenditures or an acceleration of the project.

Charlotte County

P:\FINANCE\CIPs - CAPITAL IMPROV PROJS\CIPs FY 2001 to 2009-10\CIP FY 06-07\Drafts of CIPs\Copy of CIP 06 - 07 2-2-06.xls

Figure 1B: Enlarged FY 2007-11 CIP and Basin Areas Enlarged



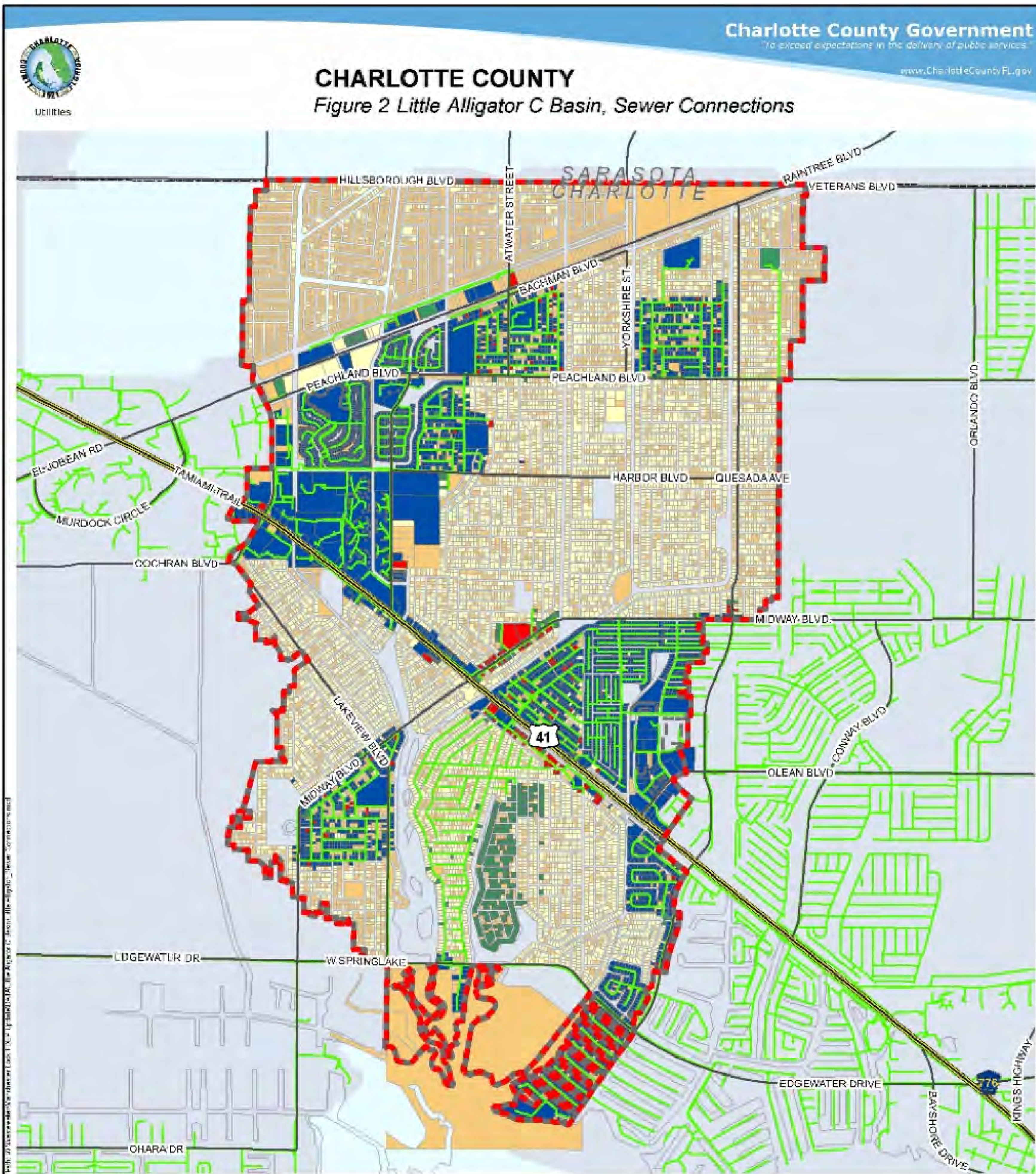


Figure 2: Little Alligator C Drainage Basin, Original FY 2007-11 CIP Boundary

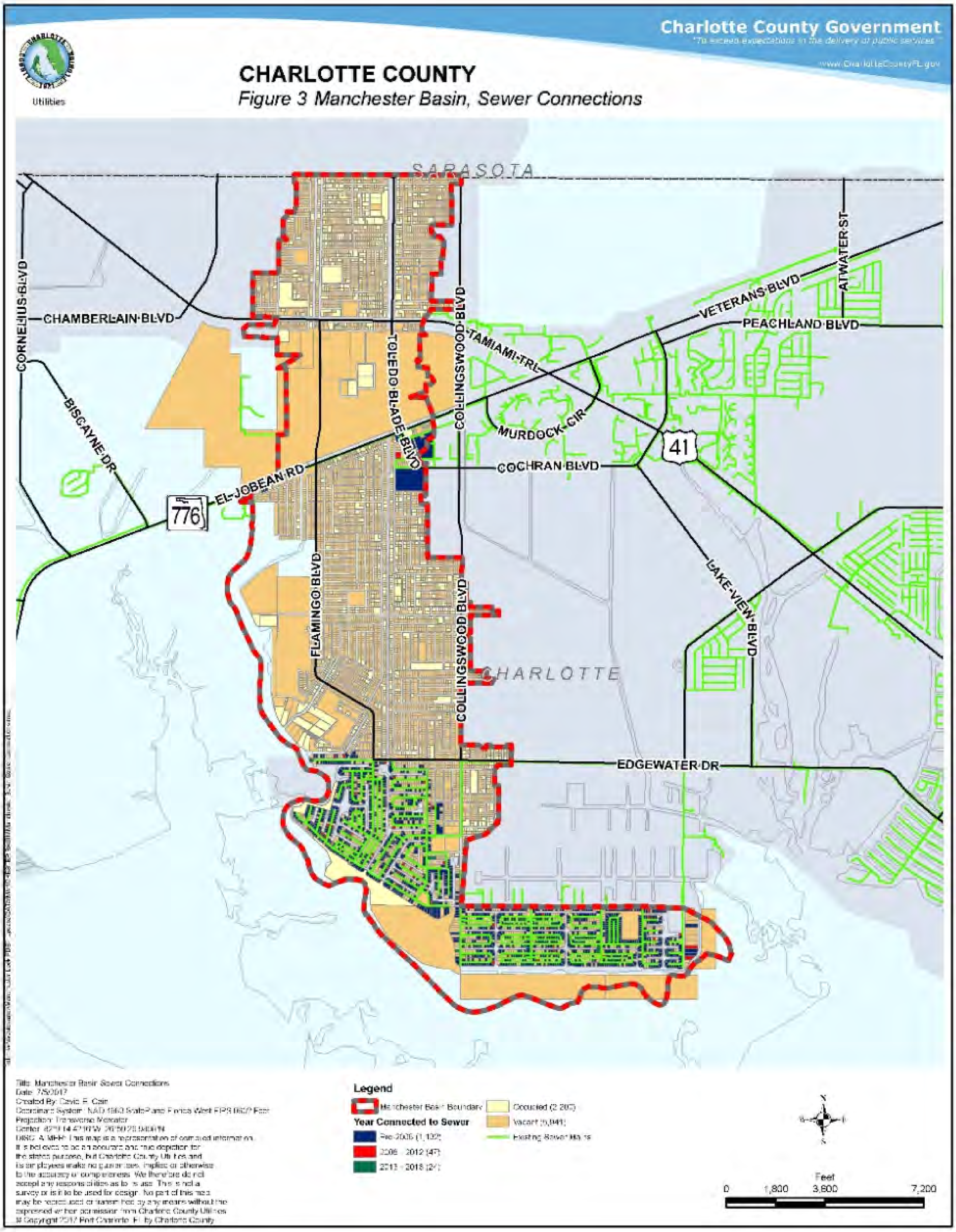


Figure 3: Manchester Drainage Basin, Original FY 2007-11 CIP Boundary

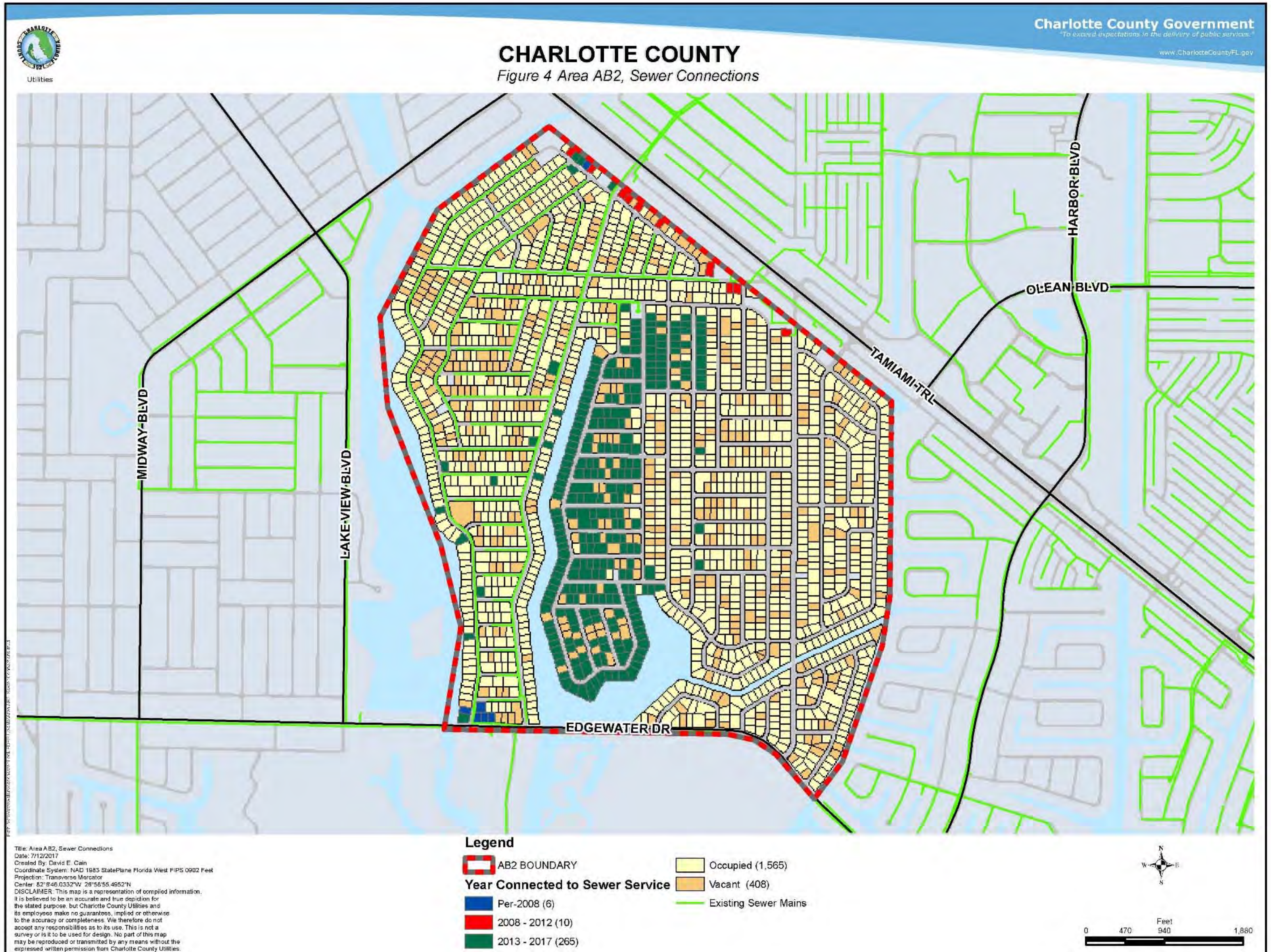
FY2007-11 CIP Area Status

AB-2 (West and East Spring Lake)

The FY 2007-11 CIP includes project AB-2 (West and East Spring Lakes). The project commenced planning in 2008 and is now approximately 75% complete (see Figure 4). The original FY 2007-11 CIP area is now in the construction stage and 281 connections out of the 1,565 connections required have been completed (see Table 2). This is a turn-key project where CCUD is coordinating the efforts to complete the on lot sewer connections whether through CCUD staff or contract work to plumbers. SRF funding in the amount of $19M allowed CCUD the ability to finance this project at low interest rates to increase the affordability of the project to property owners. Once this project is completed, it is estimated that nitrogen loading will be reduced by approximately 25 tons annually to Charlotte Harbor * .

> * Charlotte County has conducted its own field testing to obtain an estimate of nitrogen loading due to failed septic systems. The testing was performed at a lift station site that only receives effluent from Low Pressure Sewer Systems that are configured in Septic Tank Effluent Pump format.

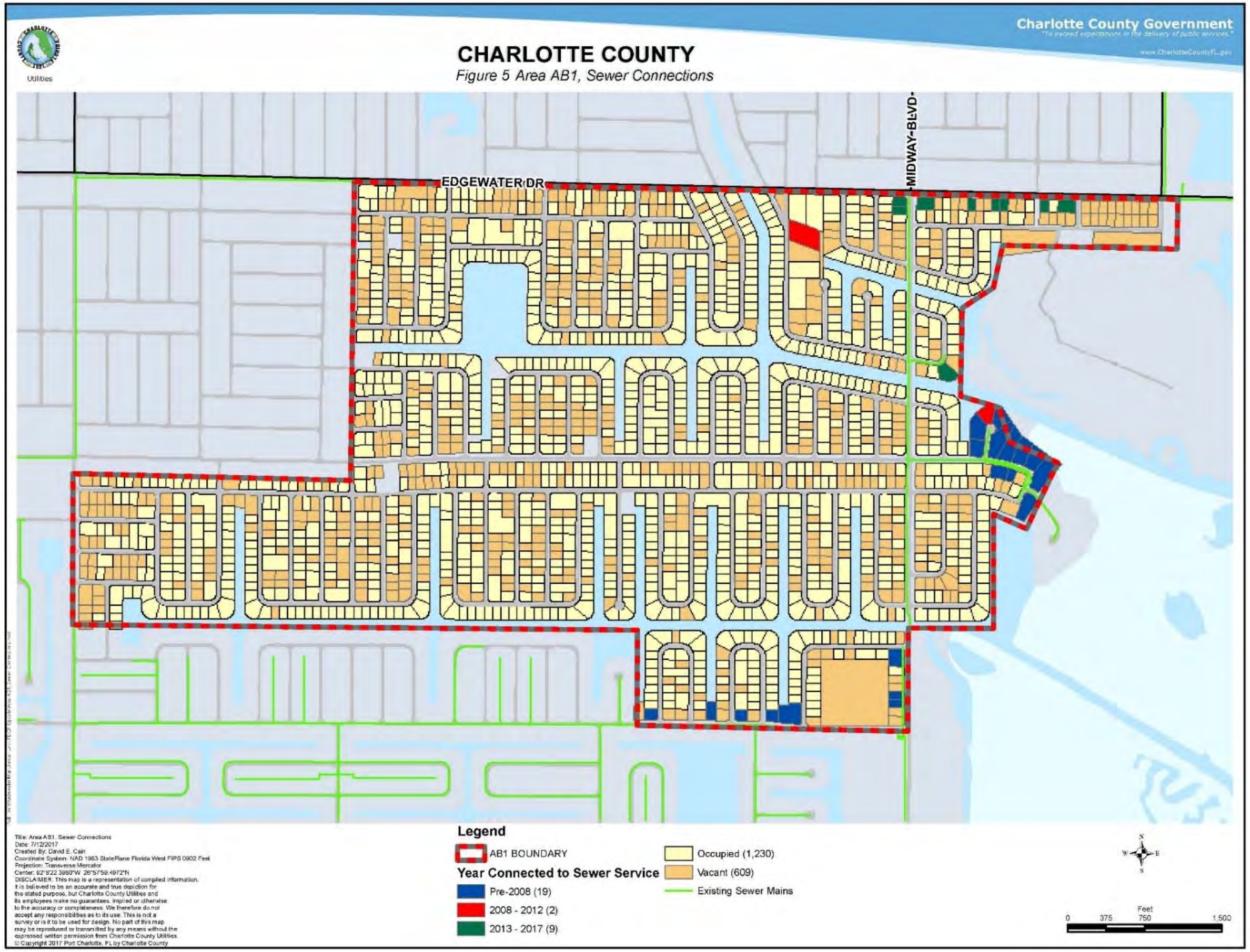
Figure 4: Project Area AB-2 (West and East Spring Lakes) Original FY 2007-11 CIP Boundary



AB-1

Figure 5 shows the boundary of area AB-1 and connection status. See Table 2 for connection summary and future projected connections for this area. The entire project area is currently under design with anticipated completion by 2018.Construction will proceed as funding becomes available. Line extensions will be completed as requested and where economically feasible to expedite sewer connections in this area.

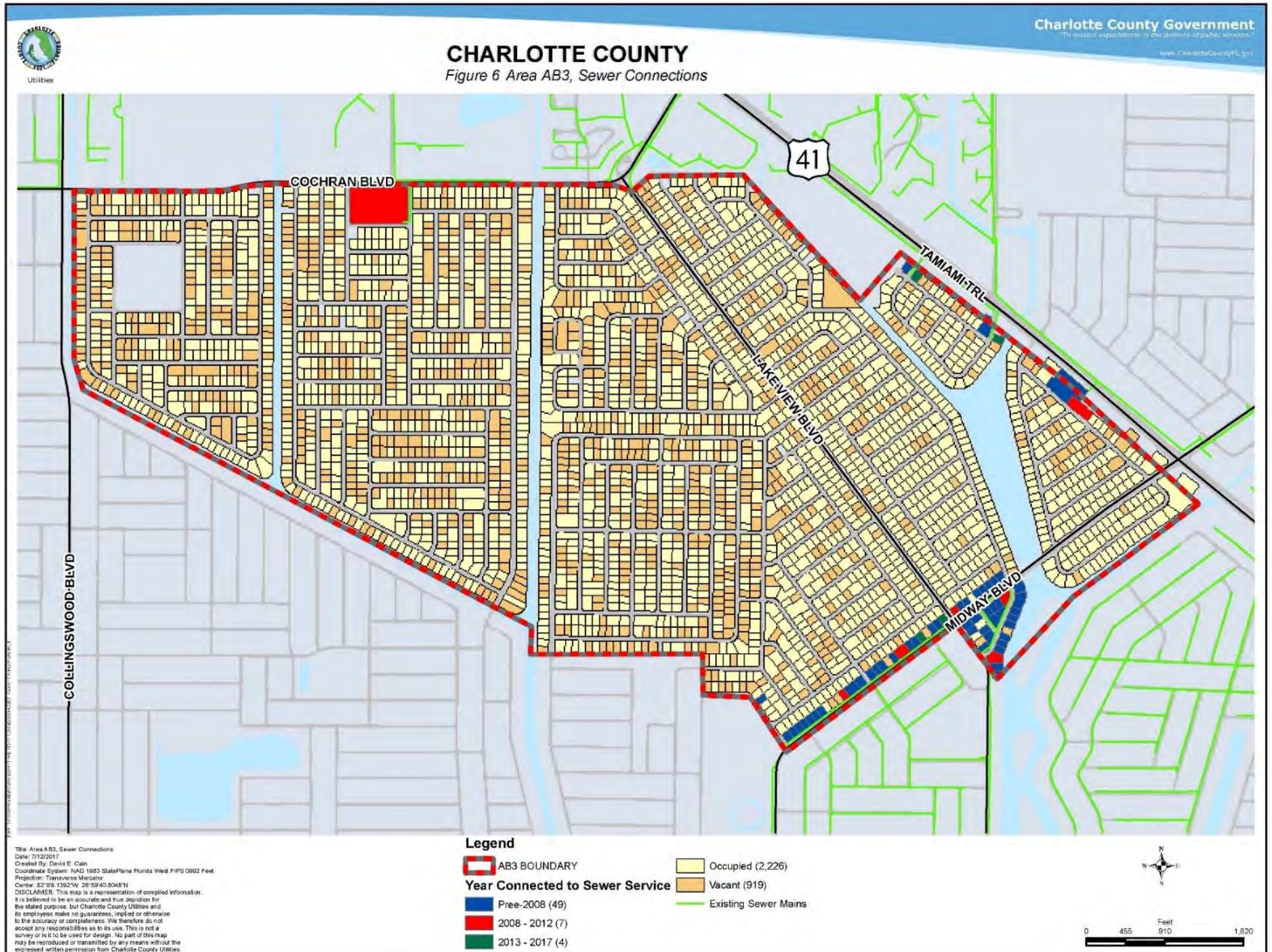
Figure 5: Project Area AB-1, Original FY 2007-11 CIP Boundary



AB-3

Figure 6 shows the boundary of area AB-3 and connection status. See Table 2 for connection summary and future projected connections for this area. A sub-area within AB-3 named Ellicott Circle is in the planning stages and will address approximately 297 connections. Any other connections in this area will occur through line extensions pending funding availability until a full project proceeds.

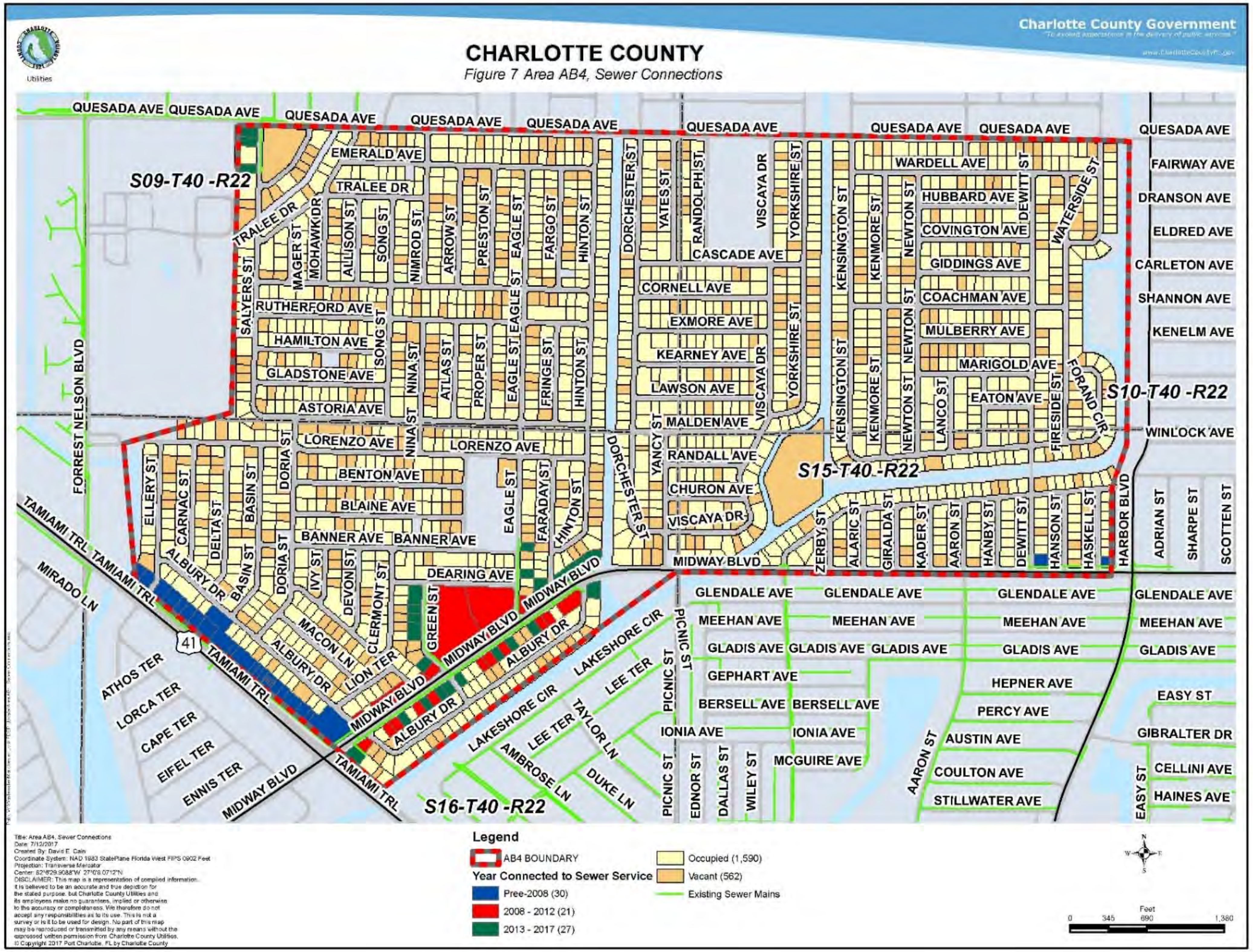
Figure 6: Project Area AB-3, Original FY 2007-11 CIP Boundary



AB-4

Figure 7 shows the boundary of area AB-4 and connection status. See Table 2 for connection summary and future projected connections for this area. Sub-areas withinAB-4 have been identified as priority central sewer expansion areas in the draft Charlotte County Sewer Master Plan (CCSMP). Future connections will be based on funding availability and requests for economically feasible line extensions until a full project proceeds.

Figure 7: Project Area AB-4, Original FY 2007-11 CIP Boundary



CH-1

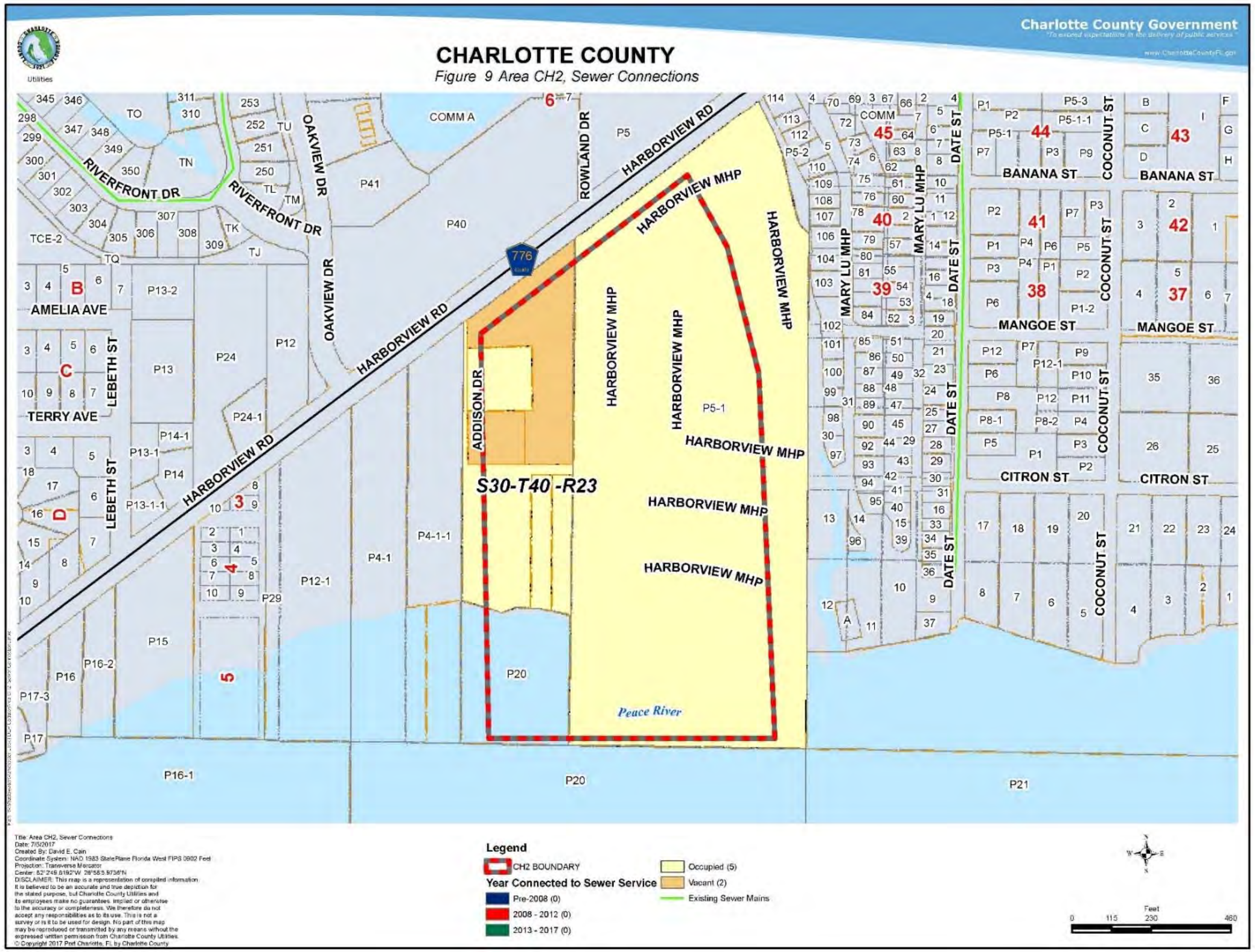
The project CH-1 is complete. Any remaining connections are subject to the mandatory connection ordinance.

Figure 8: Project Area CH-1, Original FY 2007-11 CIP Boundary

CH-2

Figure 9 shows the boundary of area CH2 and connection status. See Table 2 for connection summary and future projected connections for this area. One of the seven properties in this boundary is a mobile home park named the Harborview Mobile Home Park, with 120 connections. The park's sewer treatment facility has an FDEP permit (FL A 014116) that expires in December 2018. The draft CCSMP identifies this mobile home community for future connection.

Figure 9: Project Area CH-2, Original FY 2007-11 CIP Boundary



HH-1

Figure 10 shows the boundary of area HH-1 and connection status. See Table 2 for connection summary and future projected connections for this area. HH-1 has also been identified in the draft CCSMP for future central sewer expansion. However, due to the population density compared to other priority areas, and other infrastructure improvements scheduled, this project is not currently within the first 15 years priority list in the CCSMP draft. Line extensions will occur as requested and where economically feasible.

Figure 10: Project Area HH-1, Original FY 2007-11 CIP Boundary

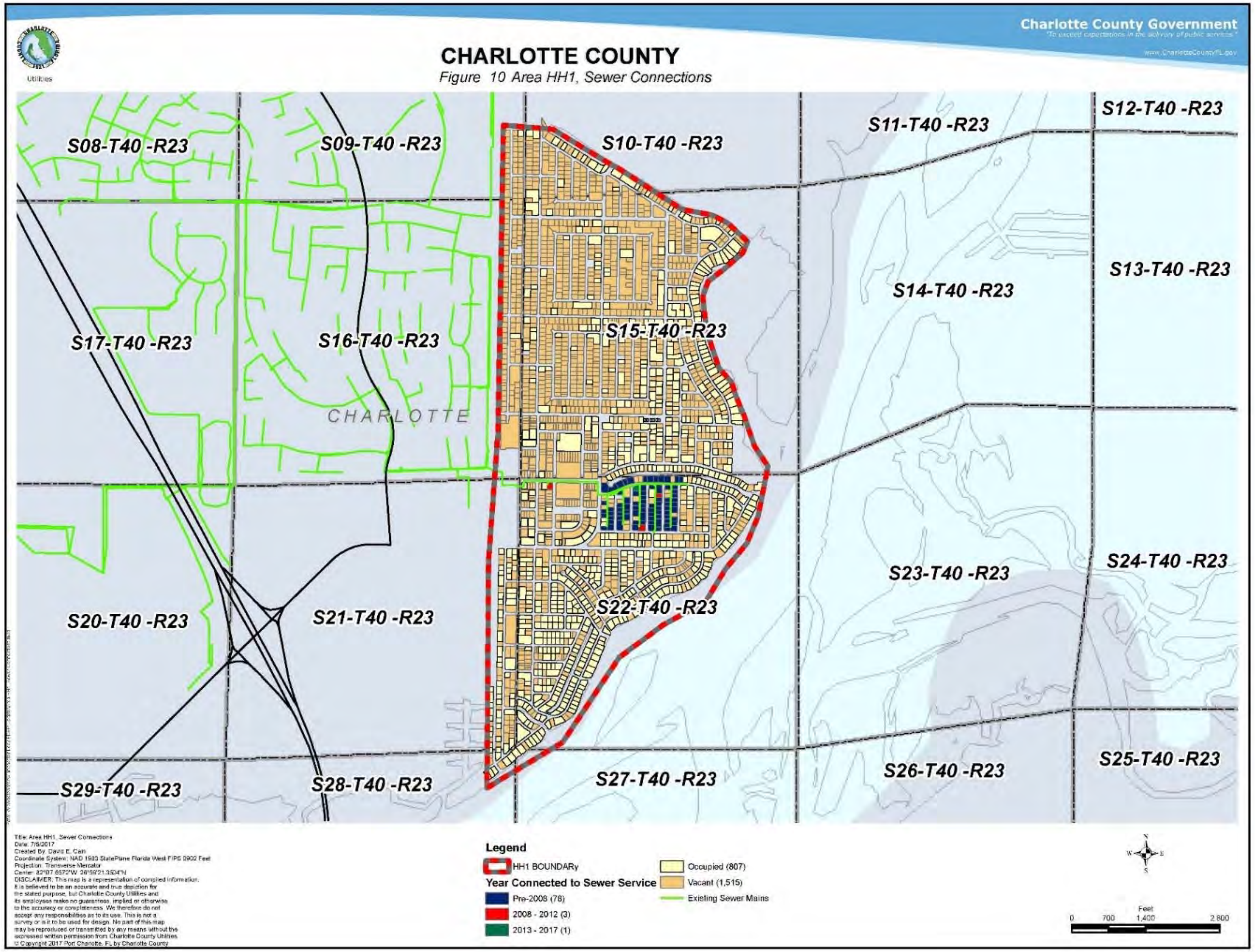


Table 3 summarizes the past and future projections for the areas outlined in the FY 2007-11CIP.

Table 3: Original FY 2007-11 CIP Connections and Expansions

Table 3: Original FY 2007-11 CIP Past and Future Area Connections													
PROJECT NAME	**FIGURE NUMBER**	**TOTAL PROPERTIES**	**VACANT**	**# CONNECTIONS REQUIRED**	**# CONNECTIONS COMPLETED**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**BEYOND 2022**	**% CONNECTIONS COMPLETED TO DATE**
AB-1	5	1,839	609	1,230	30	5	5	300	300	300	290	-	2.4
AB-2	4	1,973	408	1,565	281	100	700	484	-	-	-	-	18.0
AB-3	6	3,145	919	2,226	60	5	5	279	409	498	362	608	2.7
AB-4	7	2,152	562	1,590	78	5	5	5	5	234	244	1,014	4.9
CH-1	8	400	118	282	253	15	14	-	-	-	-	-	89.7
CH-2	9	7	2	5	-	-	-	-	-	-	-	5	0.0
HH-1	10	2,322	1,515	807	82	-	-	-	-	-	-	725	10.2
	TOTAL	11,838	4,133	7,705	784	130	729	1,068	714	1,032	896	2,352	10.2

The table below show a numerical summary of connections completed on an annual basis since 2008. Table 3 shows a numerical summary of connections completed on an annual basis since 2007, the yearly connection rate, and overall percentage completed for the FY 2007-11 CIP Areas.

Table 4: Yearly Connection Rate for the Original FY 2007-11 CIP Areas of Existing Homes

Table 4: Yearly Connection Rate for FY 2007-11 CIP (7,839 Total Required)		
YEAR	**# CONNECTED**	**% PER YEAR**
pre-2008	254	3.24
2008	16	0.20
2009	34	0.43
2010	56	0.71
2011	23	0.29
2012	22	0.28
2013	30	0.38
2014	19	0.24
2015	33	0.42
2016	151	1.93
2017	146	1.86
Total	**784**	**10.00**

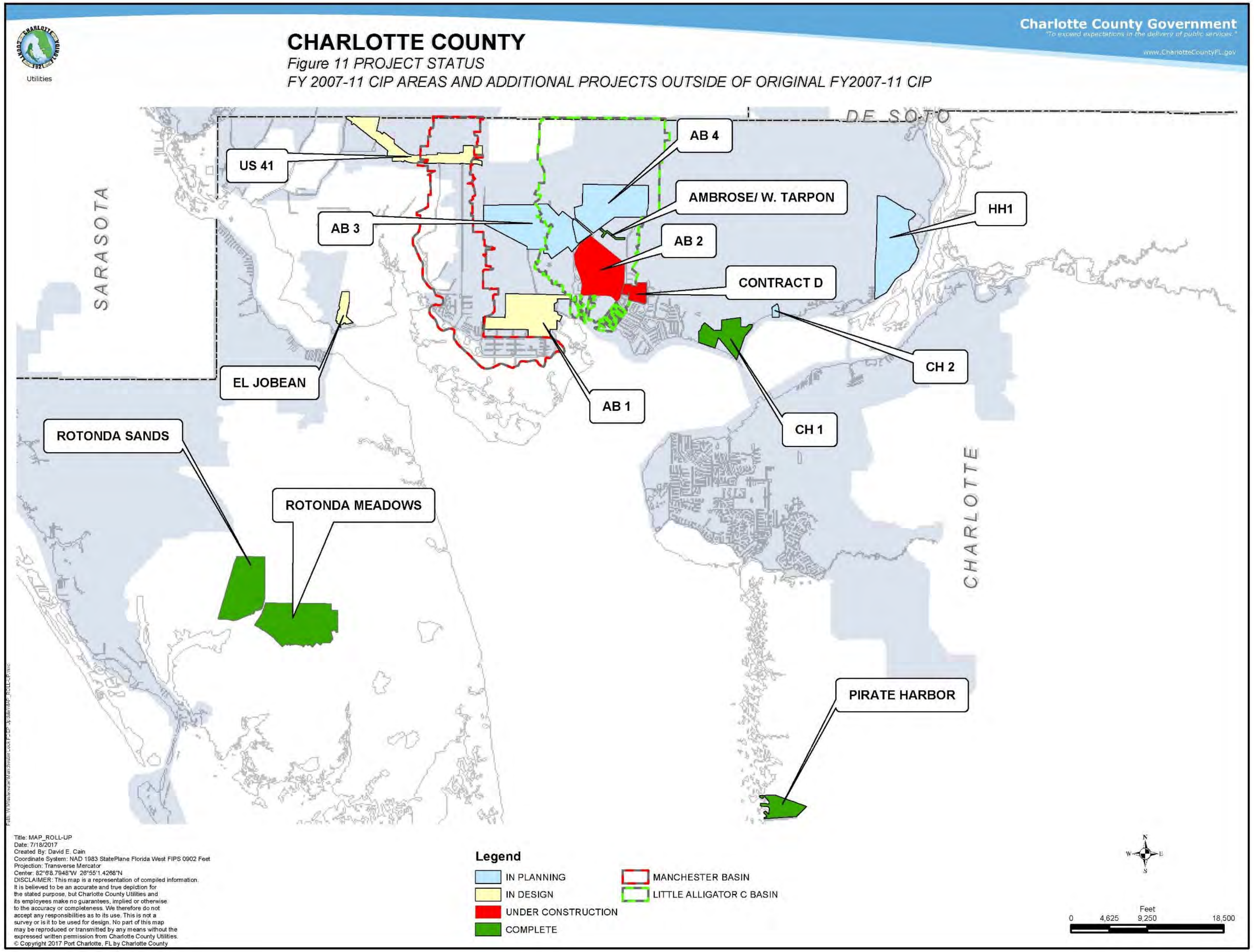
Septic 2 Sewer Additional Projects

Below is a Table showing the additional S2S projects since 2008 not shown in the original FY 2007-11 CIP. These projects provide for an additional 1,220 connections that will contribute towards improving water quality in Charlotte Harbor.

Table 5: Additional Septic 2 Sewer (S2S) Projects Outside of Original FY 2007-11 CIP

Table 5: Additional Septic 2 Sewer Projects Outside of Original FY 2007-11 CIP						
PROJECT NAME	**FIGURE NUMBER**	**TOTAL PROPERTIES**	**VACANT**	**# CONNECTIONS REQUIRED**	**# CONNECTIONS COMPLETED**	**FUNDING**
PIRATE HARBOR	11	378	173	205	157	This project was funded through property owners and Charlotte County resources.
ROTONDA SANDS and MEADOWS	11	5,229	5,150	79	79	This project was funded through property owners and Charlotte County resources.
Ambrose/West Tarpon	11	18	9	9	9	SRF Funds: $1,800,000
CONTRACT D	11	399	99	300	0	SRF Funds: $3,700,000
US 41	11	1,347	1,017	330	0	SRF Funds: $1,280,000. SRF Funding has facilitated the Planning and Design of this project
El Jobean East	11	341	44	297	0	SRF Funds: $700,000. SRF Funding has facilitated the Planning and Design of this project.
				1,220	245	TOTAL ADDITIONAL SEPTIC 2 SEWER CONNECTIONS

Figure 11: FY 2007-11 CIP Areas and Additional Septic 2 Sewer Project Status in Charlotte County



Supportive Projects to Benefit Charlotte Harbor Ecosystem

Systems to Support New Connections

New transmission force mains and lift stations must be constructed to provide the capacity to transport the new connections sewage to the treatment plant, and the treatment plant must be expanded to accommodate additional flows. These efforts are completed or underway through several projects comprised of; the Regional Transmission System, the Loveland Grand Master Lift Station, and the East Port Facility Expansion projects. The Regional Transmission System is composed of transmission force mains and master lift stations constructed throughout the Mid-County area, which will serve the new sewer connections identified in the FY 2007-11 CIP (Table 2) and additional S2S projects (Table 5). The Regional Transmission System has an estimated completion date of 2019. These projects are beneficial to the Charlotte Harbor ecosystem because they are integral in transporting and treating wastes that may have otherwise ended up in the Harbor through septic tank use.

Table 6: Supportive Projects Status and Funding

PROJECT AREA	PROJECTED SEWER COSTS and STATUS	CWSRF Loan Amount	Local Funding Amount
REGIONAL TRANSMISSION SYSTEM: FORCE MAINS AND MASTER LIFT STATIONS Project Name: Parkside CRA - Gertrude/Aaron - Harbor Blvd. - Ambrose/West Tarpon Deep Creek Force Main Morningstar/Spring Lake Blvd. US 41 Midway Blvd. Phase 2 Edgewater Drive Phase 2	Project Costs and Completion Status: $2.1M bid phase, completion 2018 $1.8M bid phase, completion 2019 $2.5M completed $0.9M design $3.0M bid phase, completion 2018 $1.2M construction completion 2018 $2.1M construction completion 2017/18 $4.0M construction completion 2017/18$1.2M bid awaiting award, completion 2017 $2.5M completed $2.5M completion 2017	$2.1M $0.0M $2.5M $3.0M $1.2M $0.0M $0.0M $0.0M	$0.0M $1.8M $0.0M $0.0M $0.0M $2.1M $4.0M $2.5M
LOVELAND GRAND MASTER LIFT STATION Construction of a gravity interceptor and master lift station to convey existing and future wastewater flows to support S2S projects from Mid-County to the East Port Water Reclamation Facility.	This project is in the bidding stage. The estimated project cost is approximately $20M. Target Construction Completion Date: 2019	$17.8M	$2.2M

PROJECT AREA	**PROJECTED SEWER COSTS and STATUS**	**CWSRF Loan Amount**	**Local Funding Amount**
EAST PORT FACILITY EXPANSION, EQUALIZATION BASIN, RECLAIMED WATER RESERVOIR Associated projects incorporate phases that have been completed, are in progress or in design. SRF funding is being utilized for a portion of the reservoir expansion in Stage 5.			
Stage 1 & 2: Rehabilitation and Expansion	$12.2M completed in 2016	$0.0M	$12.2M
Stage 5: Reservoir Improvements and High Service Pump Station	$5.1M construction completion 2018	$3.0M	$2.1M
Stage 3: Additional Treatment Train Capacity Improvements	$30M targeted Completion in 2022	$30M	$0.0M
Stage 4: Additional Treatment Train Capacity Improvements	$36M targeted Completion in 2030	$36M	$0.0M

State Revolving Fund (SRF) Loan Contribution towards Improving Water Quality in Charlotte Harbor

SRF loans have been instrumental in a number of the projects currently underway in the original FY 2007-11 CIP, additional S2S projects, the Regional Transmission System, the Loveland Grand Master Lift Station and the East Port Facility Expansion projects as outlined in Tables 3, 5, and 6. All of these projects have been identified as key components towards either converting septic to central sewer or supporting the transportation of sewage from new connections to the treatment plant as well as treatment plant upgrades resulting in overall water quality improvement to the Charlotte Harbor ecosystem.

Other Septic to Sewer Projects

Please see Table 5 and *Figure 11*.

Additional Efforts by Charlotte County to Measure Water Quality

To measure the impacts of the S2S projects on the water quality of Charlotte Harbor, CCUD has secured partnerships with Western Michigan University, Florida Atlantic University, Johnson Engineering, Benchmark Labs, and Tetra-Tech to monitor the pre-and post-conditions on water quality surrounding and within the sewer expansion areas. These monitoring efforts have been underway since 2009 and CCUD continues to develop new programs to increase our knowledge of water quality improvement trends in the area resulting from these projects. This monitoring consists of over 70 groundwater monitoring wells, over 20 canal surface water monitoring sites, and storm water sampling. CCUD contracted with Florida Atlantic University in 2016 to complete a baseline study of water quality in Charlotte Harbor. The results of this study identified septic systems as a key contributor to declining water quality in Charlotte Harbor. CCUD is also partnering with Western Michigan University to evaluate groundwater velocity to measure the transport of nutrient pollution from septic systems into Charlotte Harbor. Another project with the University will develop a predictive model for algal blooms based upon remote sensing of pollutants in surrounding project waterways. These efforts will result in a baseline of nutrients present in Charlotte Harbor and can be used with additional computer modeling to track sources of contamination - as well as provide information to the public on overall water quality and status of impairments.

Overall Project Progression

Timeline

Based on FY 2007 Capital Improvements Budget/FY 2007-11 Project Detail (FY 2007-11 CIP), CCUD initiated a number of efforts over the years to address the permit conditions. Table 7 below shows the timeline for these projects, as well as additional sewer projects that have been initiated or completed in conjunction with completing the proposed FY 2007-11 CIP Areas.

Table 7: Timeline and Activities Completed

Table 7: Timeline and Activities Completed	
Year	Action Items Completed Towards Meeting Specific Condition No. 18
2008	• Initial *planning* for S2S in AB-2 and Manchester Basin areas. • Pirate Harbor project *completed* providing central sewer service to 205 connections located on Charlotte Harbor. • CH-1 Charlotte Harbor low pressure sewer project *completed*. Completes approximately 95% of CH-1 CIP area centralized sewer infrastructure. • Line Extension program initiated providing opportunity for individual property owners to extend service. Allows option for service if septic failure occurs prior to a larger sewer expansion effort. • Rotonda Sands and Meadows project in design, providing for approximately 79 S2S connections. • East Port WRF sewer expansion design from 6 to 9 MGD initiated.
2009	• Feasibility study initiated by CCUD to investigate most economical and feasible sewer treatment alternatives and identifying issues causing on-site system failures inclusive of areas between Manchester Basin and Little Alligator drainage basins south of US 41 and 776 encompassing approximately 17,000 properties, also known as ‘Area 1.’ Initiates groundwater and surface water monitoring program to evaluate impacts of failing on-site systems on water quality. • Line Extension program on-going; provides opportunity for individual property owners to extend service. • Rotonda Sands and Meadows project under construction, providing for approximately 79 S2S connections. • East Port WRF sewer expansion design from 6 to 9 MGD on-going.

2010	• Area 1 feasibility study completed. Initiated public outreach. It was determined to focus on one priority area, the area between West and East Spring Lakes, AB-2, as a Pilot Program with over 50% density. Project name is 'East and West Spring Lakes'. • Additional S2S project area Contract D added to Pilot Program. • Line Extension program on-going; provides opportunity for individual property owners to extend service. • Rotonda Sands and Meadows project completed, providing for approximately 79 S2S connections. • East Port WRF sewer expansion design from 6 to 9 MGD on-going.
2011	• Planning for AB-2 and Contract D is in progress. • Planning completed to provide Regional Transmission System force main to commercial area located on US 41 between Enterprise Drive and Sarasota County line. • Line Extension program on-going; provides opportunity for individual property owners to extend service. • Planning completed for area within CH-1 called 'North Shore' impacting 37 connections. • East Port WRF sewer rehabilitation/expansion design and permitting from 6 to 9MGD completed, Stages 1-2 portion of expansion including new aerobic digester, mechanical and electrical upgrades, and filter rehabilitation was bid.
2012	• Proposed AB-2 project with Contract D to BCC; directed to re-evaluate project costs and central sewer alternatives. • Line Extension program on-going; provides opportunity for individual property owners to extend service. • Design in progress to provide Regional Transmission System force main to commercial area located on US 41 between Enterprise Drive and Sarasota County line. • East Port Water Reclamation Facility Stage 1-2 rehabilitation/expansion construction commences. • County approves moving forward with project within CH-1 called 'North Shore' impacting 37 connections. Design commences. Partial funding by Section 319 grant.
2013	• BCC approves AB-2 project and Contract D. Full design commences. • Developed cost estimates and feasibility to provide sewer service to Cape Haze and El Jobean areas, both approximately 300 properties. Conducted public outreach. Property owner survey completed. • Line Extension program on-going; provides opportunity for individual property owners to extend service. • East Port Water Reclamation Facility Stages 1-2 rehabilitation/expansion construction on-going. • Design completed for CH-1 project called 'North Shore' impacting 37 connections.
2014	• AB-2 and Contract D design completed and project was bid, redesigned, repackaged, and bid again. • Line Extension program on-going; provides opportunity for individual property owners to extend service.

	• CCUD presents central sewer expansion to BCC in a workshop, recommending areas of more than 50% population density as priority, and reviewing the associated transmission and treatment improvements required. • Construction commences on Regional Transmission System force main to commercial area located on US 41 between Enterprise Dr. and Sarasota County line. • East Port Water Reclamation Facility Stage 1-2 rehabilitation/expansion is under construction. • Construction completed for CH-1 project called ‘North Shore’ impacting 37 connections.
2015	• Line Extension program on-going; provides opportunity for individual property owners to extend service. • Construction on-going on Regional Transmission System force main to commercial area located on US 41 between Enterprise Drive and Sarasota County line. • Construction commences on Regional Transmission System force main to serve AB-2, Contract D and other Little Alligator drainage basin areas in Ambrose St./W. Tarpon Drive areas and Midway Blvd. areas. • Design on-going for additional Regional Transmission System areas. • East Port Water Reclamation Facility Stage 1-2 rehabilitation/expansion is under construction. • Connections completed for CH-1 project called ‘North Shore’ impacting 37 connections. • AB-2 and Contract D design completed and project was bid, redesigned, repackaged, and bid again. Construction begins on portion of AB-2.
2016	• AB-2 construction underway and connections begin. Contract D in redesigned and rebid. • Modification to Line Extension program provides for more affordable payment option for property owners requesting or requiring service. • Mandatory connection ordinance modified to require connection within 180 days of notice of availability. • Design on-going for additional Regional Transmission System areas. East Port WRF Stage 5 Reclaimed Water expansion design completed and bid. • CCUD proposes Mid-County sewer expansion program to BCC showing design, construction, and connection phases for all areas greater than 50% density. BCC directs utility to secure consulting services to complete CCSMP for entire service area. Consultant Jones Edmunds commences on the CCSMP where goal is to create 20 year implementation plan for affordable, reliable, and efficient collection and treatment system for a sustainable environment. • CCUD proposes three major sewer expansion projects, the areas known as El Jobean (approximately 600 properties); Countryman Ackerman (includes AB-1 and expanded area north and west) and US 41 (approximately 1,000 commercially zoned properties; intersects Manchester drainage basin). Projects not approved due to costs to property owners. • Construction continues on the Regional Transmission System force main to serve AB-2, Contract D, and other Little Alligator drainage basin areas in Ambrose St./W. Tarpon Drive areas and Midway Blvd. areas. • CCUD contracts with Florida Atlantic University which completes baseline water quality study of Charlotte Harbor prior to commencing overall sewer expansion

	plan. Surface water sampling and analysis for the N isotope and sucralose indicating pollution from septic tanks. • Design commences for AB-1 as well as expanded area to the east and northwest.
2017	• Over 80 line extensions in progress. Property owners continuing to request service. • Construction completed on Regional Transmission System force main to serve AB-2 and other Little Alligator drainage basin areas in Ambrose St./W. Tarpon Drive areas and Midway Blvd. areas. • The preliminary engineering report and environmental report were submitted to USDA-RUS for funding assistance. Design commences for El Jobean area. The portion of El Jobean east of SR 776, the most densely populated area in El Jobean, will be the initial stage to be constructed. The west side will be constructed as requests are received for service via Charlotte County's Line Extension program. • Design on-going for additional Regional Transmission System areas. Construction commences on portion located at Morningstar Waterway adjacent to and within AB-2. • Bid awarded and construction commencing for East Port WRF Stage 5 Reclaimed Water expansion project. • Design continues for AB-1 as well. Construction completed for a portion of AB-1 on Edgewater Drive. • AB-2 construction continues and connections are on-going. Contract D construction commences. • Consultant Jones Edmunds continues to work on the CCSMP. May 2017, presentation made to BCC with priority sewer expansion areas over 15-year period along with project costs.
2018-Future	• AB-3, AB-4, HH-1, CH-2 being evaluated and ranked as part of the CCSMP. Will provide updates in future compliance reports. Line extensions in these areas will continue to accommodate septic failures and new construction. • Finalize AB-2 connections. Contract D connections commence.

The Strategy for the Future

The main obstacle to proceeding further with all S2S projects is affordability. Based upon affordability calculations performed by the CCSMP consultant, Charlotte County property owners have a threshold of affordability towards contributing towards the cost of sewer infrastructure. The CCSMP cost analysis has shown that certain areas are more economical to provide service such as densely occupied properties located near or adjacent to existing facilities compared to others that are less densely populated and not located near existing facilities. The final CCSMP, to be completed in early 2018, will provide an analysis and recommendation on the method for funding sewer infrastructure projects. Until that time, funding is limited based upon projected and existing CCUD fiscal resources. CCUD is applying for assistance through water quality improvement grants and legislative appropriation as well as the RESTORE Act. However, there is a substantial funding gap between available grants, the affordable amount to be paid by the property owners, and total project costs. SRF loans provide a significant relief on financing costs and will continue to be pursued, however CCUD resources are at a threshold for obtaining additional financing. No sewer expansion projects have been identified for SRF loans at this time beyond planning and design loans and construction loans for the Regional Transmission System, the Loveland Grand Master Lift Station, and the East Port Expansion projects listed in Table 4.

Below summarizes the highlights planned for the coming year to address the FY 2007-11 CIP areas:

- The main emphasis for the coming year will be to complete all connections associated with AB-2, and Contract D.
- AB-1 is currently under design and it will be connected through multiple smaller projects pending completion of the overall design and as funding becomes available.
- In AB-3, the design for Ellicott Circle, a sub-area located within AB-3, will be completed; after which portions of the project will be permitted and construction will commence as funding resources become available.

Additional S2S project areas will continue in the coming year as follows:

- The design for El Jobean will be completed and; portions of El Jobean permitted and construction initiated prior to completion of the overall design, including the proposed pump station.
- The US 41 FDOT project will be completed and sewer connections will occur as line extensions and developers move into the largely undeveloped areas and as existing commercial properties connect to the system under the mandatory connection requirements. The US 41 project will service commercially zoned properties.
- The line extension program will continue to proceed and be available, where economically feasible, to extend service to properties as service is requested and for new construction.

For all other areas where there are occupied lots with sewer facilities available, CCUD will continue to proceed with enforcing the County’s mandatory connection ordinance. The ordinance, section 3-8-41 in Charlotte County code, provides for a notification of service availability requirements and step-wise procedures for compliance.

Contact

The contact person responsible for implementing Specific Condition No. 18 is the following:

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SUMMARY OF MANCHESTER BASIN PROJECTS

The Charlotte County Utilities Department currently provides service to over 35,000 sewer customers within Charlotte County and a small portion of Lee County over its 45-square mile service area. However, many areas of Charlotte County are still served by septic systems dating back to the 1960's.

Charlotte Harbor Water Quality Initiative is a partnership between local and state agencies to work towards implementing projects to improve water quality within the Lower Charlotte Harbor basin, primarily through septic to sewer (S2S) conversions, wastewater infrastructure and stormwater improvements. These types of projects reduce nutrient and bacterial pollution, which protect estuarine ecosystems and maintain the health and safety of residents. Preliminary Charlotte County studies indicate that for every 1,000 S2S conversions approximately 100 pounds per day of nitrogen loading is eliminated.

In October 2016, Charlotte County Utilities began developing its Charlotte County Sewer Master Plan (CCSMP), which is a road map for future development of sewer and wastewater systems in Charlotte County. Our goal is to collaboratively develop and prepare a 20-year implementation plan to create an affordable, reliable, and efficient collection and treatment system for a sustainable environment. Low-interest loans and grants are necessary to continue converting septic systems to the central sewer system more quickly and efficiently, while minimizing the economic impact on our residents.

In development of the draft CCSMP, we have focused on identifying high-density areas contributing higher nutrient loading for conversion to a central sewer system throughout the Charlotte County sewer certificated area. As reflected in the project area numbers provided in this report and the project areas shown on Exhibit 1, Charlotte County has overlapped and expanded upon the boundaries of the original 2006-2007 Capital Improvement Plan (CIP) identified in the FDEP Manchester Lock removal permit conditions.

Report prepared by Charlotte County Utilities May 2, 2017.

PROJECT AREA	TOTAL LOTS	VACANT	# CONNECTIONS REQUIRED	# CONNECTIONS COMPLETED
AB-1 (Ackerman)	3,309	1,574	1,735	7
AB-1 (Edgewater)	81	17	64	20
AB-2 (EWSL)	2,455	601	1,854	250
AB-3	3,425	1,244	2,181	-
AB-4	2,495	841	1,654	20
CH-1	675	193	482	449
CH-1 (North Shore)	42	6	36	36
CH-2	137	17	120	-
HH-1	5,812	4,985	827	5
TOTAL	**18,431**	**9,478**	**8,953**	**787**

PROJECT AREA and COMPLETION DATES	LOT INFORMATION	# OF CONNECTIONS REQUIRED	# OF CONNECTIONS COMPLETED	% COMPLETED CONNECTIONS	PROJECTED # CONNECTIONS PER YEAR	SRF FUNDING USED TO FACILITATE PROJECT and STATUS
AB-1 ACKERMAN / COUNTRYMAN S2S S2S IN CCSMP AREAS: M49, M55, M56, M64 Target Construction Completion Date: July 2020 Map: Exhibit 1, Exhibit 2-1 (AB-1)	Total: 3,309 Occupied: 1,735 Vacant: 1,574	1,735	0	0	2017: 0 2018: 0 2019: 0 2020: 360	SRF Funding has facilitated the Planning and Design of this project. The Ackerman Countryman project boundary currently under design encompasses both a section of the boundary delineated as Manchester Basin submitted in the permit and an expanded scope of the area identified on the 2007 CIP as AB-1. The design process has been underway for a number of months. Portions of this project should have plans and specifications completed by the end of 2017 which would then proceed to bidding stage. This project area is extensive and it is intended to complete this work in several stages similar to East West Springs Lake. SRF Funds: $1,920,000
AB-1 EDGEWATER DRIVE S2S Completion Date: May 2017 Map: Exhibit 1, Area is adjacent to north of AB-1	Total: 84 Occupied: 64 Vacant: 17	64	20	31%	2017: 24 2018: 20	SRF funding was not utilized. This project is substantially complete.
AB-2 EAST & WEST SPRING LAKES S2S Construction Completion Dates: Contract A: Completed Contract B: Sept. 2017 Contract C: July 2017 Contract D: June 2018 Map: Exhibit 2-2 (AB-2)	Total: 2,455 Occupied: 1,854 Vacant: 601	1,854	250	14%	2017: 900 2018: 704	SRF Funding has facilitated in the construction of new wastewater collection and transmission facilities for residential properties. In addition, this project will reduce nutrient loading into the Charlotte Harbor estuary and tributary water bodies, including the Alligator Basin, by removing the septic tanks that are currently being used in the project area. In addition to SRF funding, legislative appropriations, and TMDL funding is assisting with stormwater rehabilitation further contributing to water quality improvement. The East and West Spring Lakes project boundary encompasses and expands on the original scope of the area identified on the 2007 CIP as AB-2. The Vacuum Station (Contract A) is in-service with approximately 250 now connected to the central sewer system and disconnected from their on-site wastewater treatment system. The Contractors continue to install the vacuum system connections daily with completion dates as noted in this table along with occupied/vacant lot numbers. Additionally, Charlotte County is now in the process of awarding contracts to plumbers to assist in expediting home

PROJECT AREA and COMPLETION DATES	LOT INFORMATION	# OF CONNECTIONS REQUIRED	# OF CONNECTIONS COMPLETED	% COMPLETED CONNECTIONS	PROJECTED # CONNECTIONS PER YEAR	SRF FUNDING USED TO FACILITATE PROJECT and STATUS
						connections to the central sewer system. The goal is to have all 1,854 occupied lots within this project area connected to the central sewer by end of 2018. SRF Funds: $22,872,319 The FY 2017 CIP outlines the expenditures for this project showing expenditures of $5.025M in FY 2017. The expenditures shown FY 2018 – future represent repayment of financing obtained to complete construction. The total project cost is $30.3M.
AB-3 S2S IN CCSMP AREAS: M51, M52, M59, M61, M62, M67, M68 & M70 Construction Completion Date: TBD Map: Exhibit 1, Exhibit 2-3 (AB-3)	Total: 3,425 Occupied: 2,181 Vacant: 1,244	2,181	0	0	TBD	These project areas are being evaluated and ranked as part of the CCSMP. Future reporting will include required permit compliance.
AB-4 S2S IN CCSMP AREAS: M78, M79, M81, M84, & M87 Construction Completion Date: TBD Map: Exhibit 1, Exhibit 2-4 (AB-4)	Total: 2,495 Occupied: 1,654 Vacant: 841	1,654	0	0	TBD	These project areas are being evaluated and ranked as part of the CCSMP. Future reporting will include required permit compliance.
CH-1 CHARLOTTE HARBOR S2S Completion Date: 2008	Total: 675 Occupied: 482 Vacant: 193	482	449	93%	2017: 15 2018: 18	This project was partially funded by a CDBG grant. SRF funding was not utilized. This project is complete.

PROJECT AREA and COMPLETION DATES	LOT INFORMATION	# OF CONNECTIONS REQUIRED	# OF CONNECTIONS COMPLETED	% COMPLETED CONNECTIONS	PROJECTED # CONNECTIONS PER YEAR	SRF FUNDING USED TO FACILITATE PROJECT and STATUS
Map: Exhibit 2-5 (CH-1)						
CH-1 NORTHSHORE S2S Completion Date: June 2016 Map: Exhibit 2 (CH-1)	Total: 42 Occupied: 36 Vacant: 6	36	36	100%	0	This project was funded by property owner assessments and a Section 319 grant. The grant funding contributed towards stormwater rehabilitation and improvements in this project area further contributing to water quality improvement. This project is complete.
CH-2 S2S IN CCSMP AREAS: M108 Construction Completion Date: TBD Map: Exhibit 1, Exhibit 2-6 (CH-2)	Total: 137 Occupied: 120 Vacant: 17	120	0	0	TBD	Although this is a private utility currently being evaluated and ranked as a potential connection as part of the CCSMP, it was included in the Manchester Lock removal permit conditions. The Harborview Mobile Home Park treatment facility has an FDEP permit (FL A 014116) that expires in December 2018. Future reporting will include required permit compliance.
HH-1 HARBOR HEIGHTS S2S in CCSMP areas: M113, M114 & M115 Construction Completion Date: TBD Map: Exhibit 1, Exhibit 2-7 (HH-1)	Total: 5,812 Occupied: 827 Vacant: 4,985	745* *82 properties connected under previous program	0	0	TBD	These project areas are being evaluated and ranked as part of the CCSMP. Future reporting will include required permit compliance.

PROJECT AREA and COMPLETION DATES	LOT INFORMATION	# OF CONNECTIONS REQUIRED	# OF CONNECTIONS COMPLETED	% COMPLETED CONNECTIONS	PROJECTED # CONNECTIONS PER YEAR	SRF FUNDING USED TO FACILITATE PROJECT and STATUS
EL JOBEAN S2S Target Construction Completion Dates: EAST: 2019 WEST: > 10 YRS Map: Exhibit 3	Total: 557 Occupied: 350 Vacant: 207 Subdivided: **EAST**: Total: 341 Occupied: 297 Vacant: 44 **WEST** Total: 216 Occupied: 53 Vacant: 163	350	0	0	2017: 5 2018: 10 2019: 100 2020: 182	SRF Funding has facilitated the Planning and Design of this project. The preliminary engineering report and environmental report have been completed and submittal to USDA-RUS is now underway for additional funding assistance. The actual design of the project area is scheduled to begin in May 2017. The portion of El Jobean east of SR 776 will be the initial stage to be constructed which includes the vast majority of the occupied lots. The west side will be constructed as requests are received for service via Charlotte County's Line Extension program. SRF Funds: $700,000
U.S. 41 S2S Target Construction Completion Date: May 2018 Map: Exhibit 4	Total: 1,347 Occupied: 330 Vacant: 1,017	330	2	0.6%	2017: 5 2018: 5 2019: 10 2020: 40	SRF Funding has facilitated the Planning and Design of this project. The US41 project boundary currently under design encompasses a section of the boundary delineated as Manchester Basin. This project is awaiting completion of the U.S. 41 roadway improvements. Charlotte County entered an Agreement with FDOT to include all the utility mains needed for this area within the U.S. 41 roadway improvement project. This project is now at a point where FDEP in-service approval for these utility mains should be received within the month of May 2017. Various property owners are already working with the Charlotte County Utilities Department to obtain sewer service as soon as these utility mains in the U.S. 41 are placed in-service. It is anticipated that the existing commercial properties as well as new commercial developments will be connected on an on-going basis over the next few years to eliminate the existing on-site wastewater treatment systems. SRF Funds: $1,280,000
WEST TARPON/AMBROSE S2S Completion Date: April 2017 Area is south of AB-4	Total: 18 Occupied: 9 Vacant: 9	9	2	28%	2017: 4 2018: 3	Funded with SRF low-interest loans. This project is substantially complete. SRF Funds: $1,800,000

PROJECT AREA and COMPLETION DATES	LOT INFORMATION	# OF CONNECTIONS REQUIRED	# OF CONNECTIONS COMPLETED	% COMPLETED CONNECTIONS	PROJECTED # CONNECTIONS PER YEAR	SRF FUNDING USED TO FACILITATE PROJECT and STATUS
LINE EXTENSION PROGRAM S2S Completion Date: Various	Total Extensions Completed: 114	continuous	41	varies	*Subject to requests & new construction permits*	This relatively new program allows property owners to request service from the Utilities to address on-site wastewater treatment system problems if they are within 500 feet of the existing sewer system for a standard rate. The Utilities has a loan program to assist homeowners finance payment of these costs. This program is continually assisting homeowners throughout the county.

SUPPORTIVE PROJECTS
Numerous projects are underway to provide a regional transmission system and sufficient wastewater treatment capacity to support S2S projects in the entire utility service area. Connections were completed where existing homes within force main project areas were not previously connected. These projects were partially, if not all, financed or have an application pending with SRF Clean Water loans unless indicated otherwise. While these projects are not included in the original Manchester Lock Removal permit, each is essential to improving the Utilities Department's infrastructure, wastewater treatment and capacity in support of S2S projects. The list below provides the key projects supporting S2S projects in the 2006-2007 Capital Improvement Plan (CIP) identified in the FDEP Manchester Lock removal permit conditions *Report prepared by Charlotte County Utilities May 2, 2017.*

PROJECT AREA and COMPLETION DATES	ESTIMATED SRF FUNDING & PROJECTED COSTS and STATUS
REGIONAL TRANSMISSION SYSTEM: FORCE MAINS AND MASTER LIFT STATIONS Project Name: Parkside CRA - Gertrude/Aaron - Elkcam Blvd. - Ambrose/West Tarpon Deep Creek Blvd. Ellicott Circle (Morningstar/Spring LakeBlvd.) US 41 Midway Blvd. Edgewater Drive Phase 2	 Project Costs and Completion Status: $2.1M bidding phase $0.9M completed $1.8M substantially complete $2.0M design phase $1.2M bid awaiting award, completion 2017 $2.2M completion 2017 $5.6M completion 2017/18 $2.5M completion 2017
LOVELAND GRAND MASTER LIFT STATION Target Construction Completion Date: 2019	This project is in the bidding stage. SRF funding will be used for construction of a gravity interceptor and master lift station to convey existing and future wastewater flows to support S2S projects from Mid-County to the East Port Water Reclamation Facility. The estimated project cost is approximately $20M.

PROJECT AREA **and** **COMPLETION DATES**	**ESTIMATED SRF FUNDING & PROJECTED COSTS** **and** **STATUS**
EAST PORT FACILITY EXPANSION, EQUALIZATION BASIN, RECLAIMED WATER RESERVOIR	Associated projects incorporate phases that have been completed, are in progress or in design. SRF funding is being utilized for a portion of the reservoir expansion.
Stage 1 & 2: Completed in 2016	$12.2M
Stage 5: Targeted Completion in 2018	$5.1M
Stage 3: Targeted Completion in 2022	$30M
Stage 4: Targeted Completion in 2030	$36M

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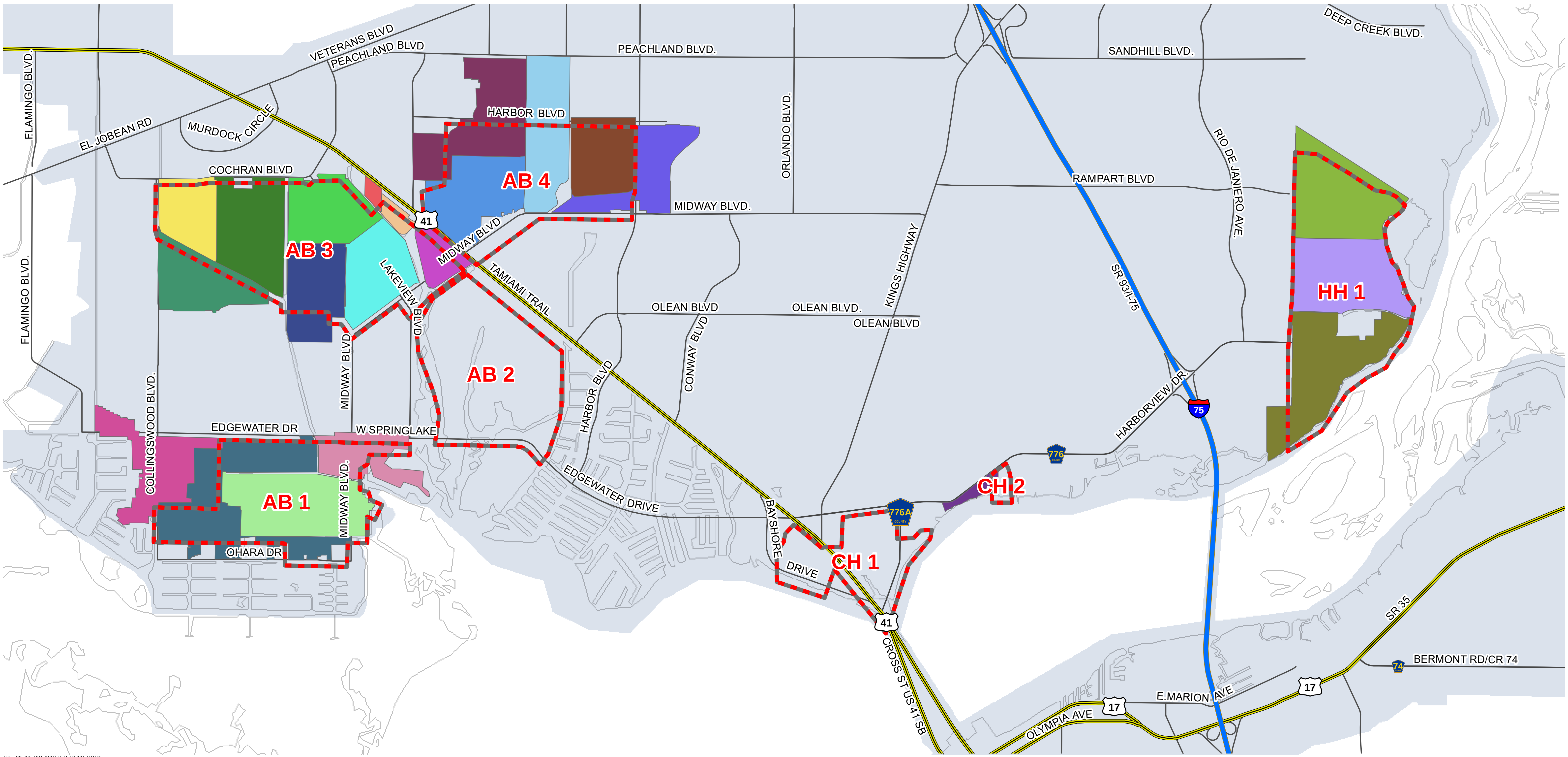
CIP AREAS / 2017 SEWER MASTER PLAN

EXHIBIT 1



FY 2006-07 CIP's

2017 Sewer Master Plan

Project Area ID

M108, M113, M114, M115, M49, M51, M52, M55, M56, M59, M61, M62, M64, M66, M67, M68, M70, M78, M79, M81, M84, M87

N, W, E, S

Miles: 1, 0.5, 0, 1

Title: 06_07_CIP_MASTER_PLAN_POLY
Date: 4/27/2017
Created By: David E. Cain
Coordinate System: NAD 1983 StatePlane Florida West FIPS 0902 Feet
Projection: Transverse Mercator
Center: 82°4'30.9324"W 26°58'49.3896"N

DISCLAIMER: This map is a representation of compiled information. It is believed to be an accurate and true depiction for the stated purpose, but Charlotte County Utilities and its employees make no guarantees, implied or otherwise to the accuracy or completeness. We therefore do not accept any responsibilities as to its use. This is not a survey or is it to be used for design. No part of this map may be reproduced or transmitted by any means without the expressed written permission from Charlotte County Utilities.

Credits: FDOT-road data; SWFWMD-county boundaries; 2000 Census Data- urban area

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CIP AREAS AB 1

EXHIBIT 2-1

Title: 06_07_CIPBoundaris
Date: 4/26/2017
Created By: David E. Cain
Coordinate System: NAD 1983 StatePlane Florida West FIPS 0902 Feet
Projection: Transverse Mercator
Center: 82°8'24.2700"W 26°57'58.2840"N

Credits: FDOT-road data; SWFWMD-county boundaries; 2000 Census Data- urban area

FY 2006-07 CIP's

Existing Sewer Mains

AB 1 OCCUPIED (1210)

Miscellaneous (3)

Single Family Residential (1207)

N W E S

Feet

670 335 0 670

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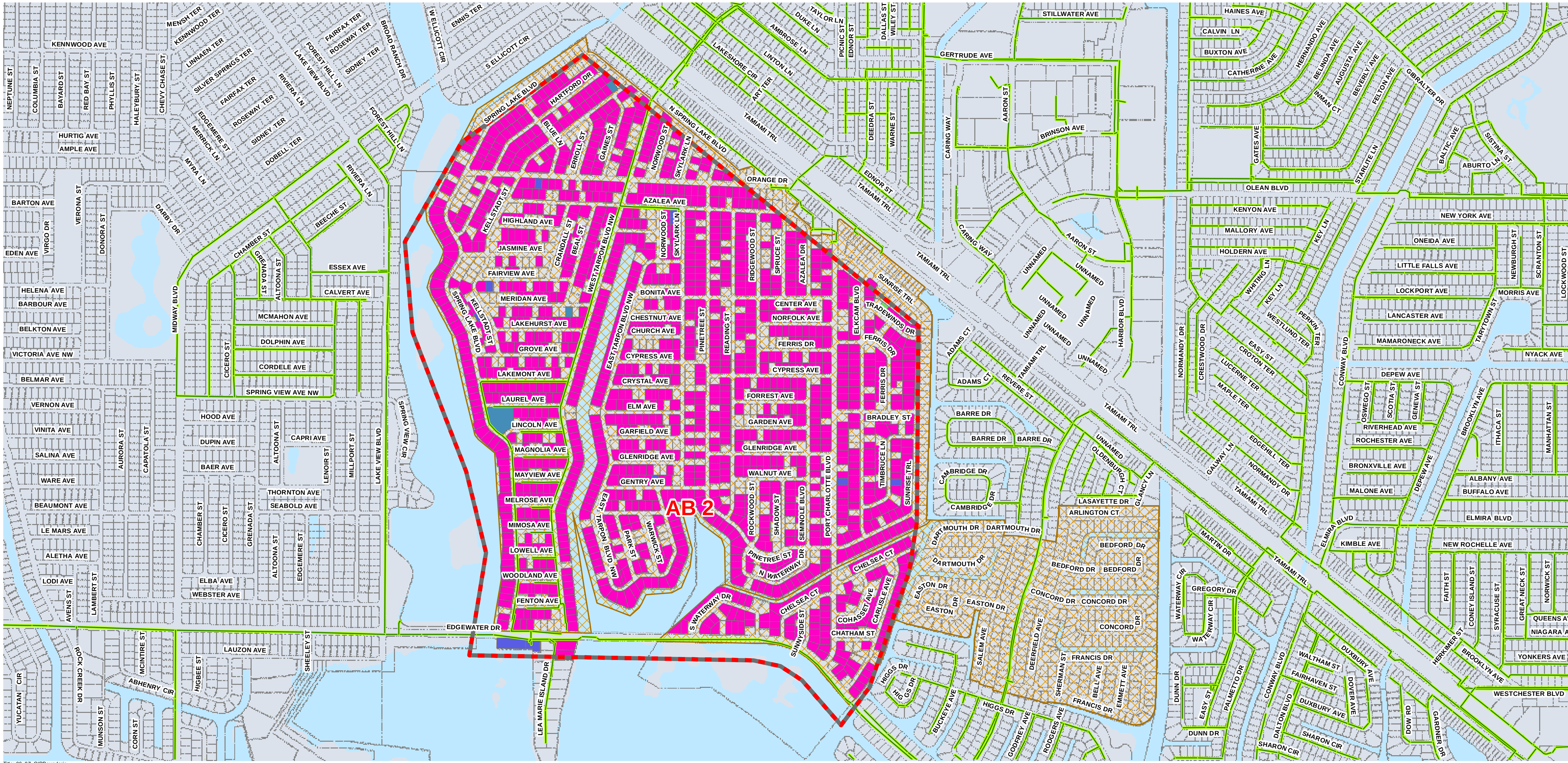
CIP AREAS AB 2

EXHIBIT 2-2



FY 2006-07 CIP's

Existing Sewer Mains

Spring Lake MSBU - Under Construction

AB 2 OCCUPIED (1478)

Government (3)

Miscellaneous (9)

Multi-Family < 10 Units (1)

Single Family Residential (1465)

N W E S

Feet 1,000 500 0 1,000

Path: W:\Wastewater\Master Plan\MP SEWER STUDY 2016\06_07_CIPBoundaris.mxd

Title: 06_07_CIPBoundaris
Date: 4/26/2017
Created By: David E. Cain
Coordinate System: NAD 1983 StatePlane Florida West FIPS 0902 Feet
Projection: Transverse Mercator
Center: 82°6'30.6648"W 26°58'54.1812"N

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Credits: FDOT-road data; SWFWMD-county boundaries; 2000 Census Data- urban area

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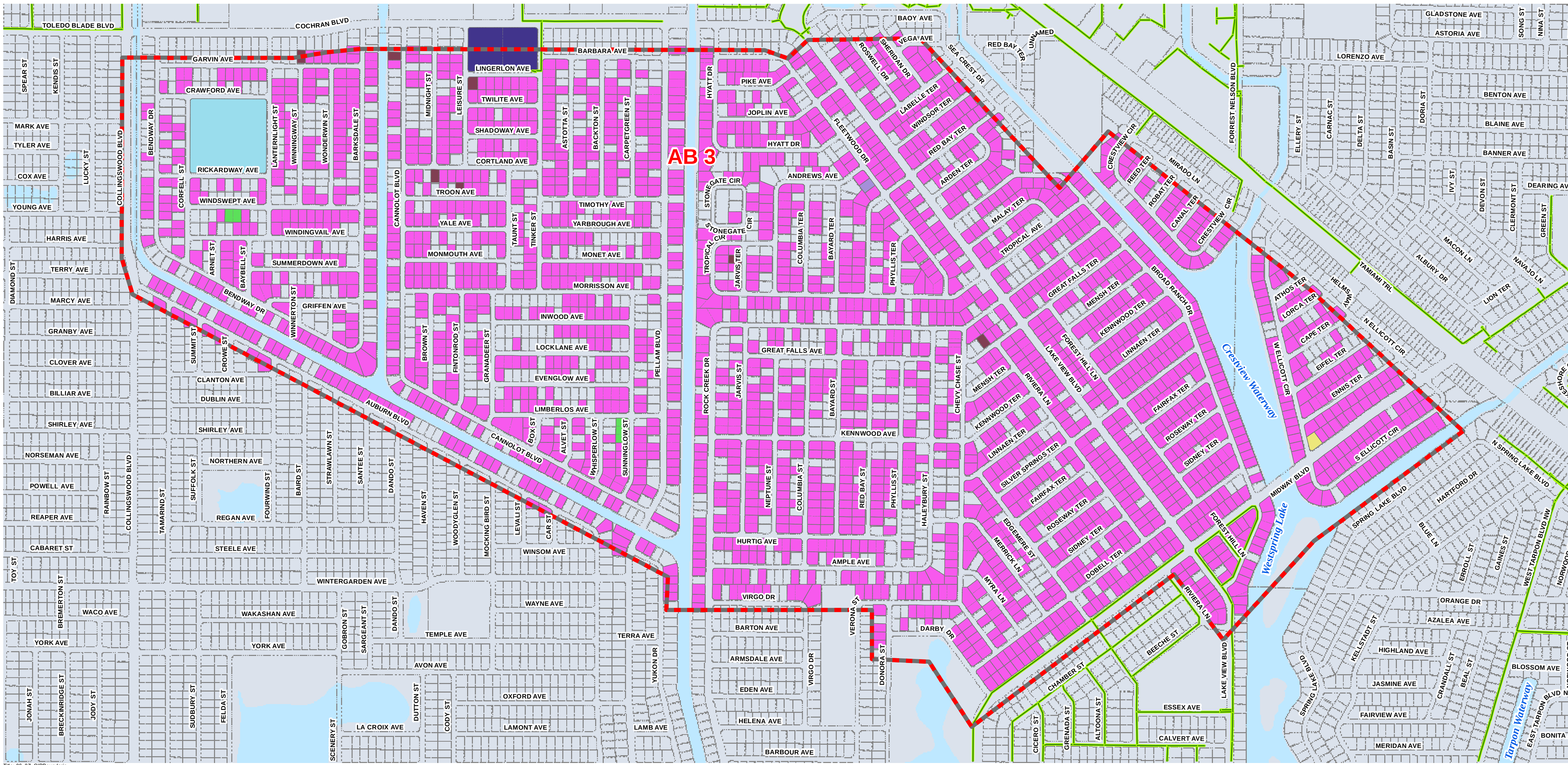
CIP AREAS AB 3

EXHIBIT 2-3



FY 2006-07 CIP's

Existing Sewer Mains

AB 3 OCCUPIED (2181)

Government (1)

Improved Commercial (1)

Institutional (1)

Miscellaneous (7)

Multi-Family < 10 Units (2)

Ret. Homes (1)

Single Family Residential (2,168)

Feet

825 412.5 0 825

Path: W:\Wastewater\Master Plan\MP SEWER STUDY 2016.11\06_07_CIPBoundaris.mxd

Title: 06_07_CIPBoundaris
Date: 4/26/2017
Created By: David E. Cain
Coordinate System: NAD 1983 StatePlane Florida West FIPS 0902 Feet
Projection: Transverse Mercator
Center: 82°8'11.0760"W 26°59'38.5512"N

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Credits: FDOT-road data; SWFWMD-county boundaries; 2000 Census Data- urban area

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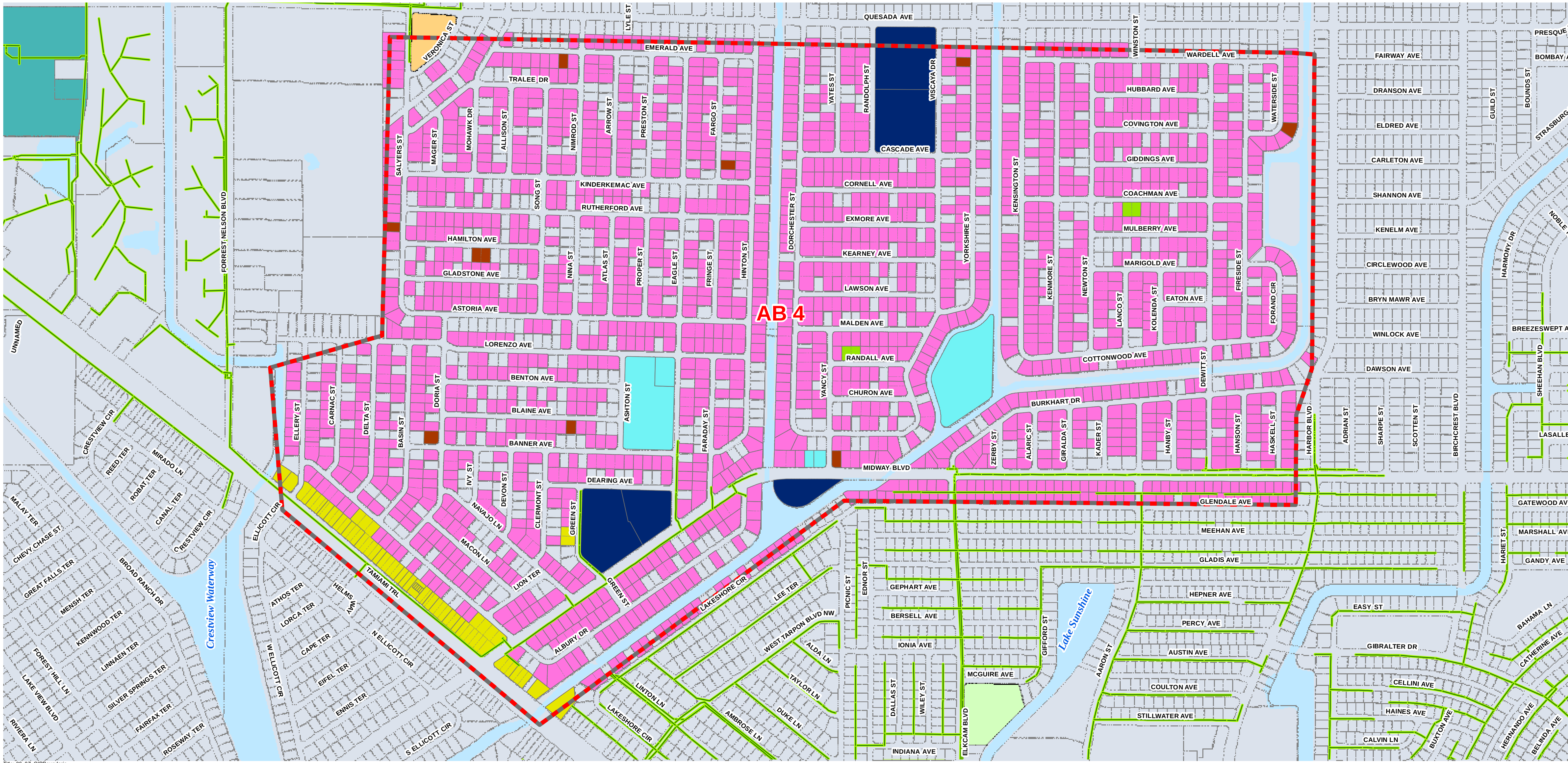
CIP AREAS AB 4

EXHIBIT 2-4



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Title: 06_07_CIPBoundaris
Date: 4/26/2017
Created By: David E. Cain
Coordinate System: NAD 1983 StatePlane Florida West FIPS 0902 Feet
Projection: Transverse Mercator
Center: 82°6'29.6028"W 27°0'5.9040"N
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Credits: FDOT-road data; SWFWMD-county boundaries; 2000 Census Data- urban area

FY 2006-07 CIP's

Existing Sewer Mains

AB 4 OCCUPIED (1654)

Government (5)

Improved Commercial (31)

Institutional (5)

Miscellaneous (9)

Multi-Family < 10 Units (2)

Single Family Residential (1602)

N W E S

Feet

730 365 0 730

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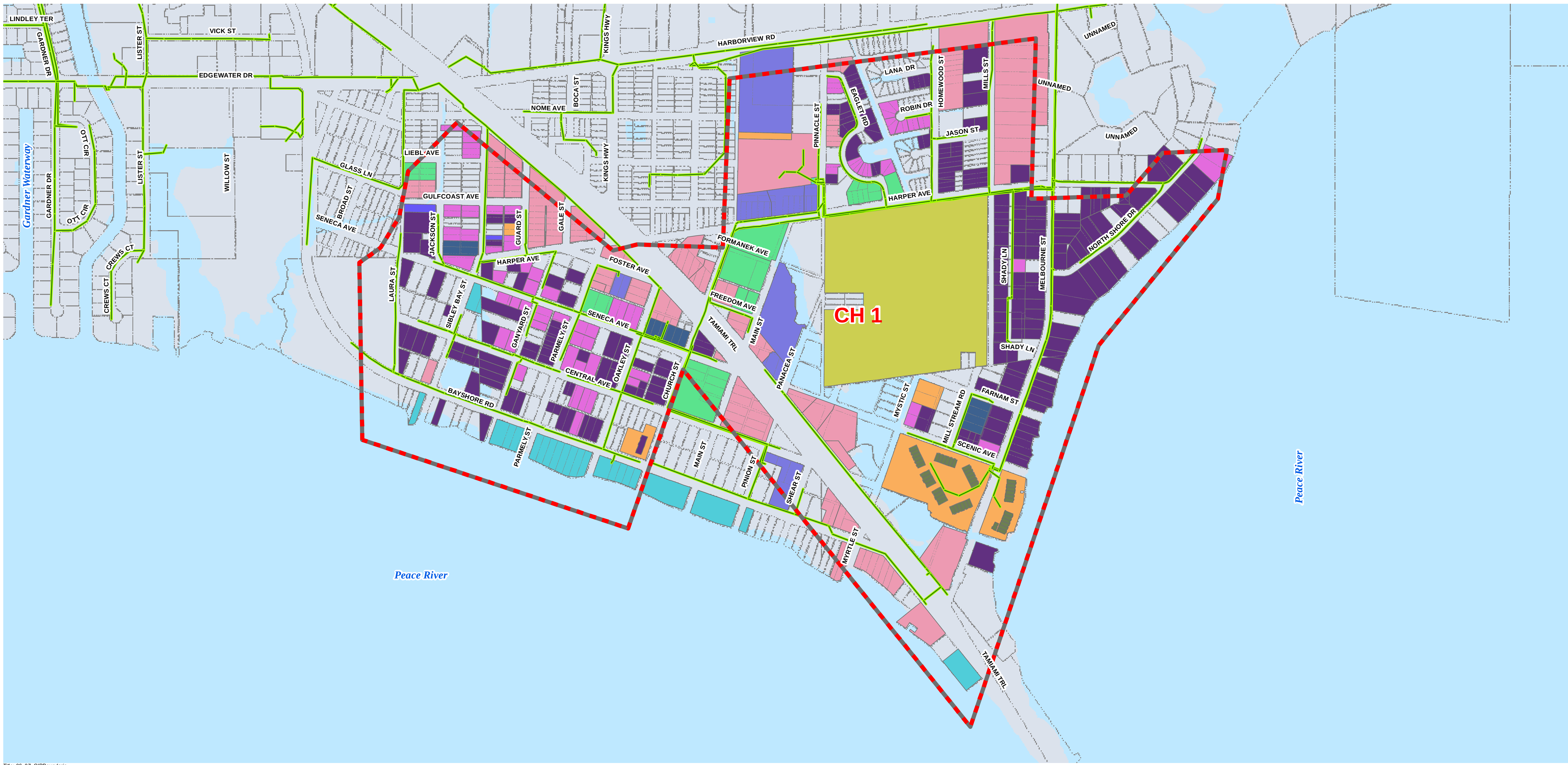
CHARLOTTE COUNTY

CIP AREAS CH 1

EXHIBIT 2-5



FY 2006-07 CIP's	Improved Commercial (34)
Existing Sewer Mains	Improved Industrial (8)
CH 1 OCCIPIED (420)	Institutional (9)
Condominium (134)	Miscellaneous (6)
Government (5)	Mobile Home (2)
Multi-Family 10 Unit or More (3)	
Multi-Family < 10 Units (51)	
Non-agricultural Acreage (1)	
Single Family Residential (167)	

N W E S

Feet

640 320 0 640

Title: 06_07_CIPBoundaris
Date: 4/26/2017
Created By: David E. Cain
Coordinate System: NAD 1983 StatePlane Florida West FIPS 0902 Feet
Projection: Transverse Mercator
Center: 82°3'58.3056"W 26°57'29.1312"N
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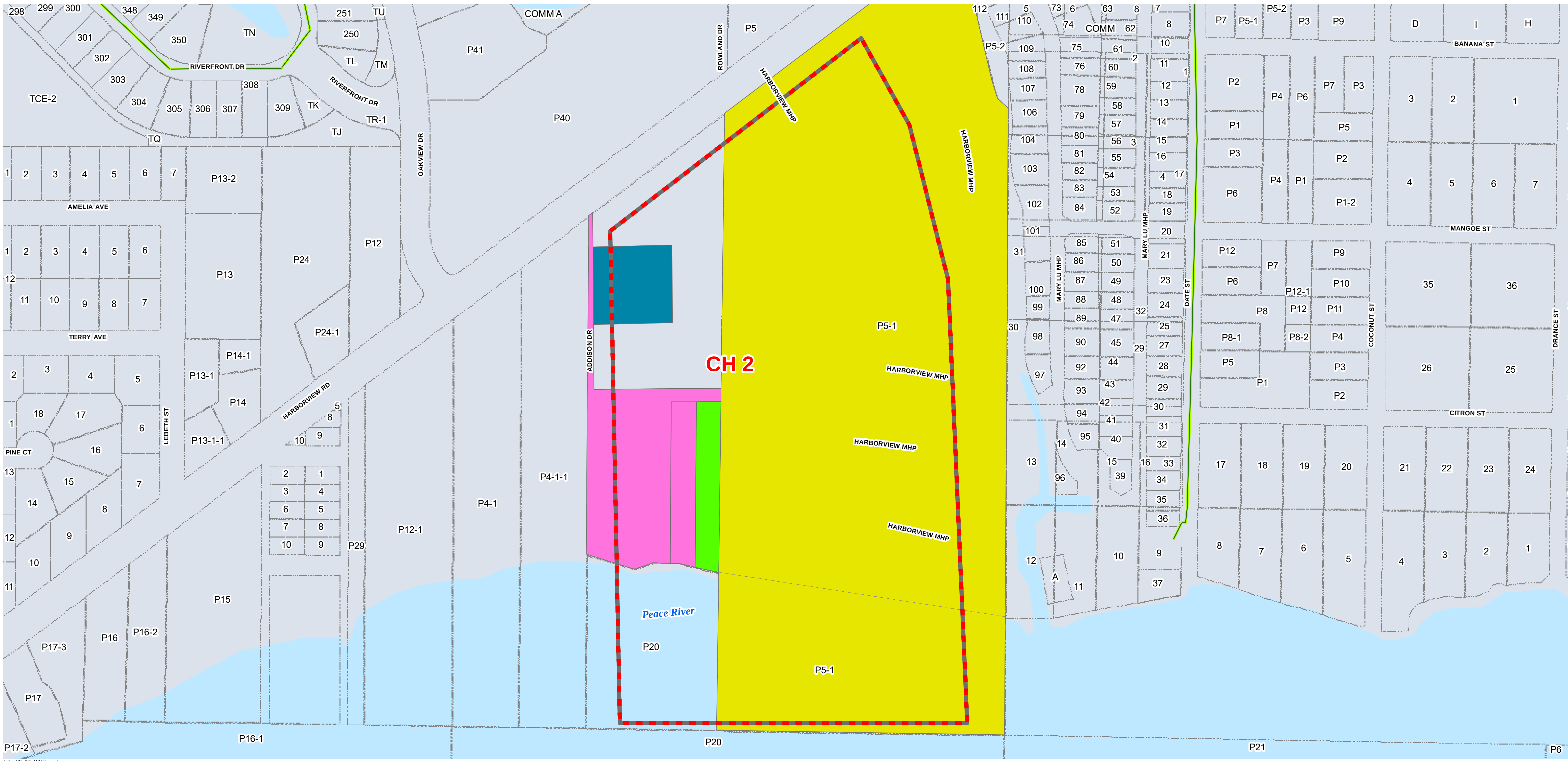
Utilities

CHARLOTTE COUNTY

CIP AREAS CH 2

EXHIBIT 2-6



FY 2006-07 CIP's

Existing Sewer Mains

CH 2 OCCIPIED (7)

Improved Commercial (1)

Multi-Family < 10 Units (1)

Ret. Homes (1)

Single Family Residential (2)

Title: 06_07_CIPBoundaris
Date: 4/26/2017
Created By: David E. Cain
Coordinate System: NAD 1983 StatePlane Florida West FIPS 0902 Feet
Projection: Transverse Mercator
Center: 82°2'49.8192"W 26°58'5.9736"N

Credits: FDOT-road data; SWFWMD-county boundaries; 2000 Census Data- urban area

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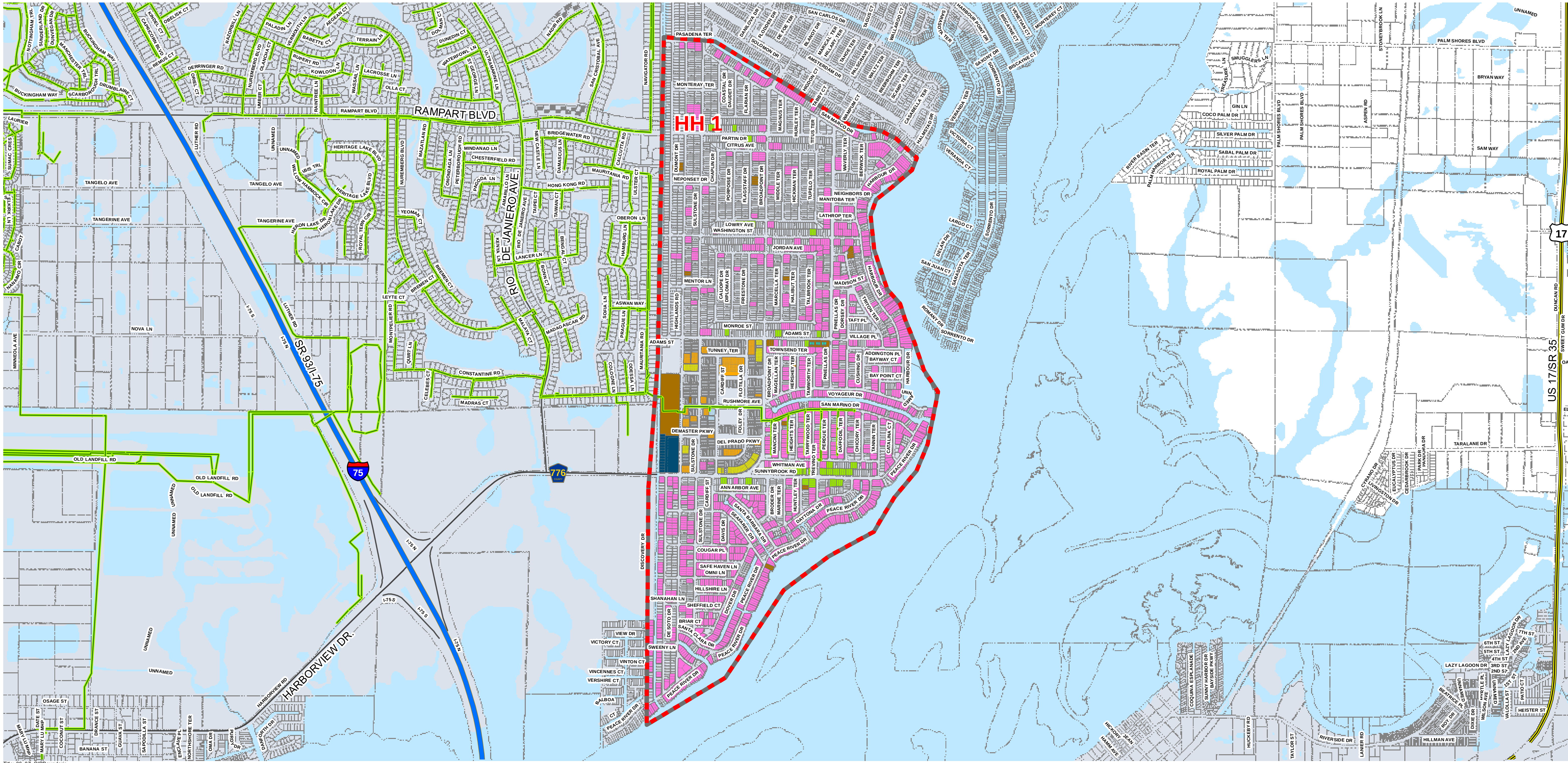
CIP AREAS HH 1

EXHIBIT 2-7



FY 2006-07 CIP's

Existing Sewer Mains

HH OCCUPIED (827)

Condominium (9)

Government (3)

Improved Commercial (10)

Improved Industrial (17)

Institutional (2)

Miscellaneous (15)

Multi-Family < 10 Units (35)

Single Family Residential (736)

Feet: 1,500 750 0 1,500

Title: 06_07_CIPBoundaris
Date: 4/26/2017
Created By: David E. Cain
Coordinate System: NAD 1983 StatePlane Florida West FIPS 0902 Feet
Projection: Transverse Mercator
Center: 82°0'7.6572"W 26°59'21.3504"N

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EXHIBIT 3

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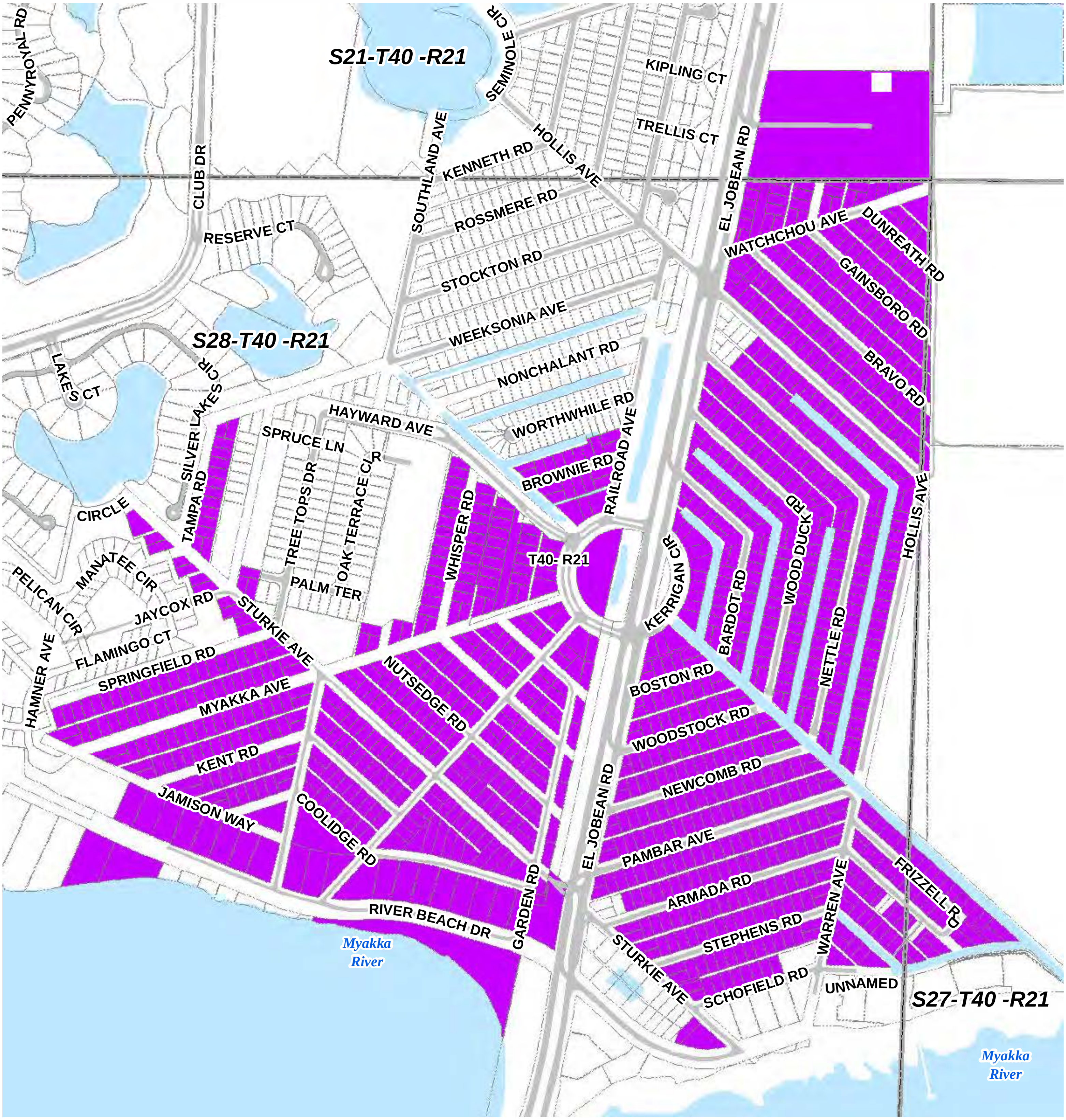
PHASE 2 CHARLOTTE HARBOR WATER QUALITY INITIATIVE

EL JOBEAN SEWER EXPANSION



Title: El Jobean MSBU
Date: 4/20/2016
Created By: David E Cain
Coordinate System: NAD 1983 StatePlane Florida West FIPS 0902 Feet
Projection: Transverse Mercator
Center: 82°12'42.3000"W 26°58'9.3900"N

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ASSESSED PARCELS

N W E S

Feet
0 325 650 1,300

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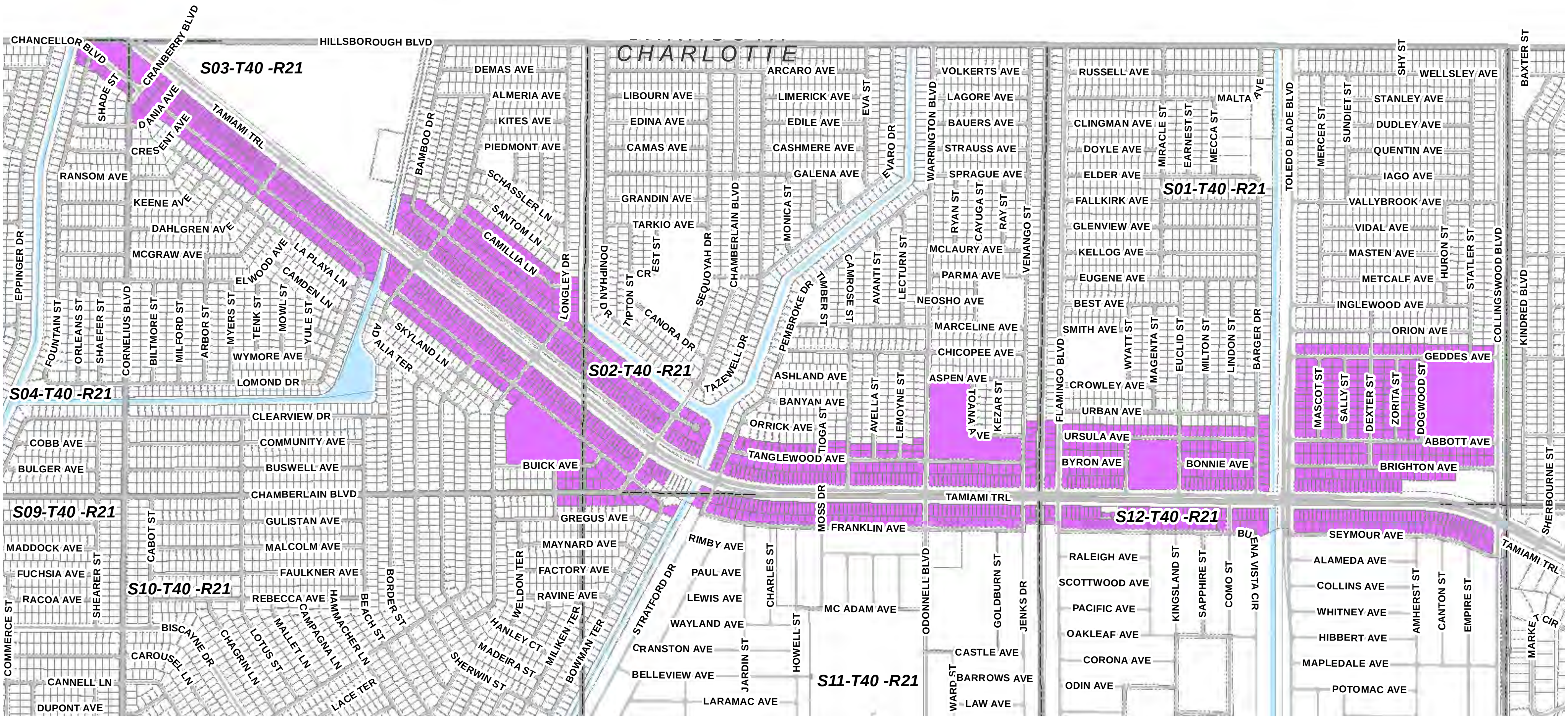
PHASE 2 US 41 CHARLOTTE HARBOR WATER QUALITY INITIATIVE

SEWER EXPANSION

EXHIBIT 4



ASSESSED SEWER PARCELS

N
W
E
S

Feet
0 650 1,300 2,600

Title: US 41 SEWER MSBU
Date: 4/20/2016
Created By: David E Cain
Coordinate System: NAD 1983 StatePlane Florida West FIPS 0902 Feet
Projection: Transverse Mercator
Center: 82°10'54.1704"W 27°1'28.8228"N
DISCLAIMER: This map is a representation of compiled information. It is believed to be an accurate and true depiction for the stated purpose, but Charlotte County Utilities and its employees make no guarantees, implied or otherwise to the accuracy or completeness. We therefore do not accept any responsibilities as to its use. This is not a survey or is it to be used for design. No part of this map may be reproduced or transmitted by any means without the expressed written permission from Charlotte County Utilities.

Appendix F

Interlocal Agreements

AMENDED AND RESTATED WATER, SEWER, AND RECLAIMED WATER INTERLOCAL AGREEMENT BETWEEN CHARLOTTE COUNTY AND LEE COUNTY

This Amended and Restated Interlocal Agreement is made and entered into this 12th day of January, 2016, by and between CHARLOTTE COUNTY, FLORIDA, a political subdivision of the State of Florida (hereinafter "CHARLOTTE"), and LEE COUNTY, FLORIDA, a political subdivision of the State of Florida (hereinafter "LEE").

RECITALS

WHEREAS, Section 163.01, Florida Statutes, known as the "Florida Interlocal Cooperation Act of 1969" permits local governmental units to enter into agreements in order to make the most efficient use of their powers by enabling them to cooperate with other localities on a basis of mutual advantage and thereby to provide services and facilities in a manner and pursuant to forms of governmental organization that will accord best with geographic, economic, population, and other factors influencing the needs and development of local communities; and

WHEREAS, the parties previously entered into an Interlocal Agreement, dated February 3rd, 2004, which authorizes CHARLOTTE to provide water and sewer service in certain areas of northern unincorporated Lee County where LEE does not currently have utility infrastructure nor is it feasible for LEE to provide water, sewer, and reclaimed water service; and

WHEREAS, there are additional areas in northern unincorporated Lee County where it is not feasible for LEE to provide utility services and CHARLOTTE has sufficient water, sewer, and reclaimed water capacity to serve; and

Item 18
2-16-16

WHEREAS, it is the intent of the parties in entering into this Amended and Restated Interlocal Agreement to cooperate in the provision of water, sewer, and reclaimed water service to those areas in northern Lee County where LEE does not currently have utility infrastructure, nor is it feasible for LEE to provide water, sewer, and reclaimed water service; and

WHEREAS, the parties desire to amend and restate the existing Interlocal Agreement in order to expand the service area where CHARLOTTE is authorized to provide water, sewer, and reclaimed water service in northern unincorporated Lee County and to further clarify and define the parties' rights and obligations with respect to the provision of water, sewer, and reclaimed water service in certain areas of northern unincorporated Lee County.

NOW, THEREFORE, in consideration of the mutual covenants and promises contained herein, the parties agree as follows:

1. RECITALS. The above recitals are true and correct and are incorporated herein.

2. PROVISION OF SERVICE BY CHARLOTTE. LEE hereby consents to the provision of retail and wholesale water, sewer, and reclaimed water service by CHARLOTTE within the area depicted in **Exhibit "A"** which is attached hereto and incorporated herein by reference (hereinafter "Service Area").

3. RATES AND OPERATING STANDARDS. CHARLOTTE agrees that the rates and fees charged for water, sewer, and reclaimed water service in the Service Area shall be the same as those charged to customers located in Charlotte County.

CHARLOTTE shall at all times operate its utility facilities in compliance with all federal and state rules and regulations.

4. RECLAIMED WATER PROGRAMS. CHARLOTTE and LEE will cooperate in the implementation of programs designed to encourage reclaimed water use.

5. SYSTEM FACILITIES DESIGN AND CONSTRUCTION STANDARDS. CHARLOTTE, at its sole expense, shall design, permit, construct, and operate the collection and distribution system that is located in the Service Area, including any required pumping or lift stations, force mains, and appurtenant facilities. All facilities shall be designed, permitted, and constructed in conformance with all applicable local, state, and federal laws, permits, rules and regulations. All infrastructure, if not designed and constructed in accordance with LEE's utility design and construction standards must meet all of LEE's utility design and construction standards prior to termination under paragraph eight (8) and turnover of any facilities to LEE.

6. LEE shall allow CHARLOTTE to locate its water, sewer, and reclaimed water facilities in public rights of way or utility easements whenever possible and at no cost to CHARLOTTE. CHARLOTTE will coordinate its activities within the right-of-way according to applicable LEE permitting procedures and shall execute such authorizations as required by LEE for construction within and use of LEE rights of way. CHARLOTTE will be responsible for all costs of relocation of any of its facilities located within Lee County public rights of way or utility easements if required pursuant to Section 337.403, Florida Statutes.

7. UTILITY EXTENSION AGREEMENTS. All proposed agreements with developers for the provision of water, sewer, or reclaimed water services within the

Service Area shall be provided by CHARLOTTE to LEE for review and comment. If LEE has any objections to any provisions in a proposed agreement, LEE shall promptly notify CHARLOTTE within thirty (30) days from receipt of the complete proposed agreement_and the parties shall meet to resolve the objection(s). Failure to resolve any objections shall not, however, prevent CHARLOTTE from proceeding with the Utility Extension Agreement unless LEE can demonstrate that the objectionable provisions constitute an immediate threat to the public health, safety and welfare or are conflict with this Agreement, Lee County codes or ordinances.

8. TERM OF AGREEMENT. This Agreement shall be effective upon execution by both parties. There shall be no fixed term for this Agreement, provided, however, that this Agreement may be terminated at any time by mutual agreement of the parties or by one (1) year advance written notice by a party desiring to terminate. When the parties mutually agree to terminate or notice of intent to terminate is provided by either party, the parties shall jointly determine the effective date of termination and shall agree on a transition plan that will provide continuity of service to utility customers. The transition plan shall include provision for transfer of ownership of CHARLOTTE's facilities in Lee County to LEE, including any steps needed to bring the facilities into compliance with LEE's utility design and construction standards, and agreed upon compensation for CHARLOTTE's facilities in Lee County.

9. ABANDONMENT. CHARLOTTE shall provide written notice of any plan to return or abandon any portion of the Utility System which could potentially have an adverse impact on water or wastewater customers within the Service Territory or the

ability of LEE to provide water and/or wastewater services to such customers in the future.

10. DISCLAIMER OF THIRD PARTY BENEFICIARIES. This Agreement is solely for the benefit of the parties and no right or cause of action shall accrue to or for the benefit of any third party that is not a formal party hereto. Nothing in this Agreement, express or implied, is intended or shall be construed to confer upon or give any person or corporation other than the parties any right, remedy, or claim under or by reason of this Agreement or any provisions or conditions of it; and all of the provisions, covenants, and conditions herein contained shall inure to the sole benefit of and shall be binding upon the parties hereto.

11. NOTICE. Any notice or document required to be delivered under this Agreement shall be in writing and shall sent to the following addresses:

AS TO CHARLOTTE:

Charlotte County Utilities Department Director
25550 Harbor View Road, Suite 1
Port Charlotte, FL 33980

AS TO LEE:

Lee County Utilities Director
P.O. Box 398
Fort Myers, FL 33902

12. ENTIRE AGREEMENT. This Agreement constitutes the entire agreement between the parties and supersedes all prior oral or written agreements pertaining to the provision of water, sewer, and reclaimed water service that are now incorporated into this Agreement. All other provisions of agreements between CHARLOTTE and

LEE not pertaining to the provision of water, sewer, and reclaimed water service in the Service Area remain in full force and effect and are not changed by this Agreement. Any amendment to this Agreement must be in writing and signed by both parties.

13. FORCE MAJEURE. Neither party shall be in default of the terms of this Agreement if such action is due to a natural calamity, act of a government other than either of the parties, or similar force majeure causes beyond the control of either party.

14. GOVERNING LAW. The validity, construction and performance of this Agreement shall be governed by the laws of the State of Florida.

15. ASSIGNMENT. This Agreement may not be assigned by either party without the prior written consent of the other party.

16. SEVERABILITY. If any portion of this Agreement, the deletion of which would not adversely affect the receipt of any material benefit by either party, is for any reason held or declared to be invalid or unenforceable, such determination shall not affect the remaining portions of this Agreement.

IN WITNESS WHEREOF, the parties have executed this Agreement on the date and year first above written.

BOARD OF COUNTY COMMISSIONERS
OF CHARLOTTE COUNTY

By: William G. Truex
William G. Truex, Chairman

ATTEST:
Barbara T. Scott, Clerk of Circuit
Court and Ex-Officio Clerk to the
Board of County Commissioners

By: ____________________
Deputy Clerk Agr 2016-005

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY:

By: ____________________
Janette S. Knowlton, County Attorney
LR2015-3715 MWM

BOARD OF COUNTY COMMISSIONERS
OF LEE COUNTY

By: ____________________
FRANK MANN, Chairman

ATTEST:
Linda Doggett, Clerk of Circuit
Court and Ex-Officio Clerk to the
Board of County Commissioners

By: ____________________
Deputy Clerk

BOARD OF COUNTY COMMISSIONERS
SEAL
LEE COUNTY, FLORIDA

Approved as to Form for the
Reliance of Lee County Only

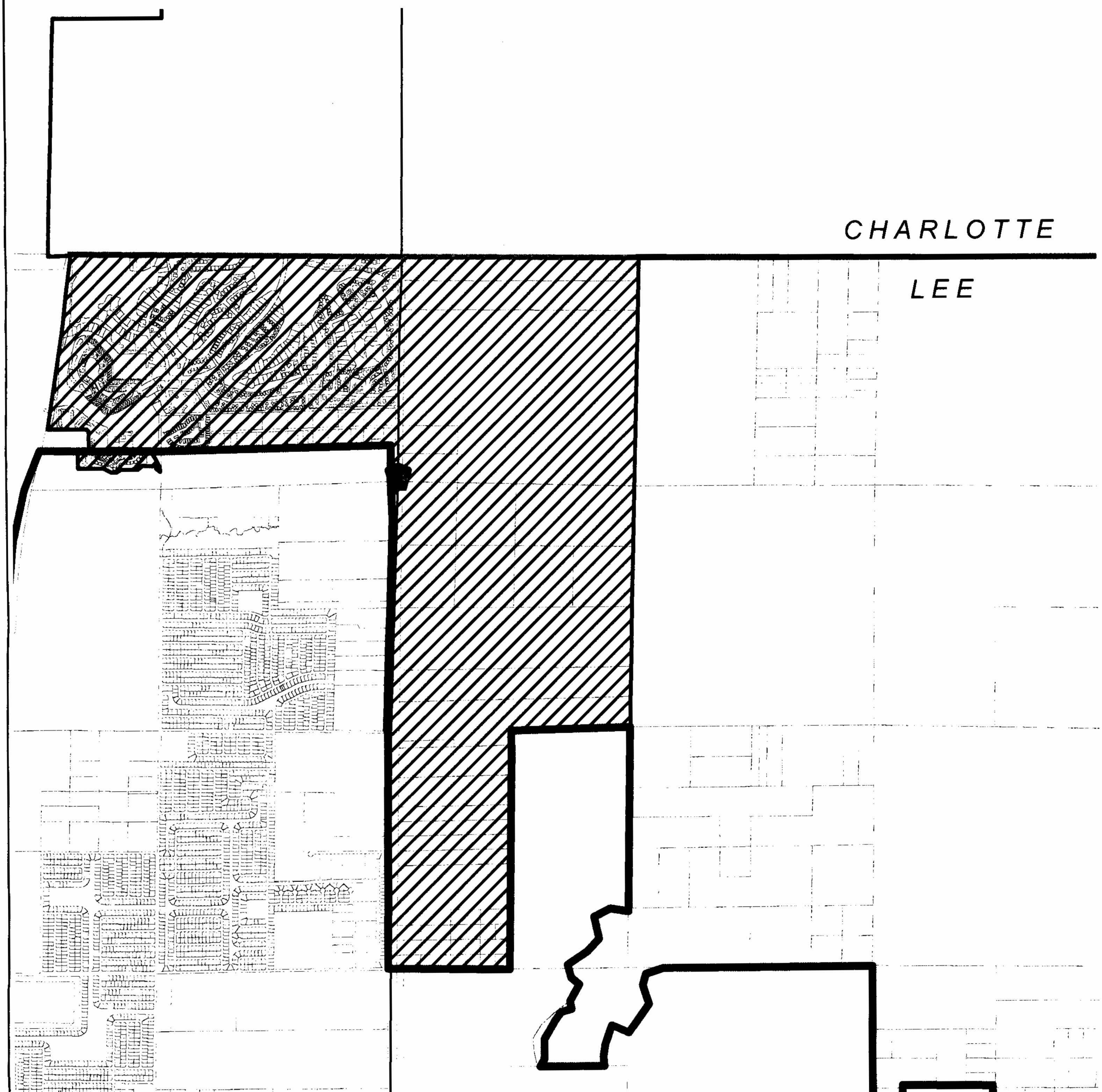
By: ____________________
Office of the County Attorney

Charlotte County Government

www.CharlotteCountyFL.com

Utilities

CHARLOTTE COUNTY
CCU SERVICE AREA
Exhibit A



Title: Final_Burnt Store Service Area.LeeCo_Propsed
Date: 12/22/2015
Created By: David E. Cain
Coordinate System: NAD 1983 StatePlane Florida West FIPS 0902 Feet
Projection: Transverse Mercator
Center: 82°1'40.2168"W 26°45'7.6032"N
DISCLAIMER: This map is a representation of compiled information. It is believed to be an accurate and true depiction for the stated purpose, but Charlotte County Utilities and its employees make no guarantees, implied or otherwise to the accuracy or completeness. We therefore do not accept any responsibilities as to its use. This is not a survey or is it to be used for design. No part of this map may be reproduced or transmitted by any means without the expressed written permision from Charlotte County Utilities.

CCU Service Area
Service Area Inside Lee County
CITY OF CAPE CORAL LIMITS

N
W E
S

0 0.25 0.5 1
Miles