FINAL

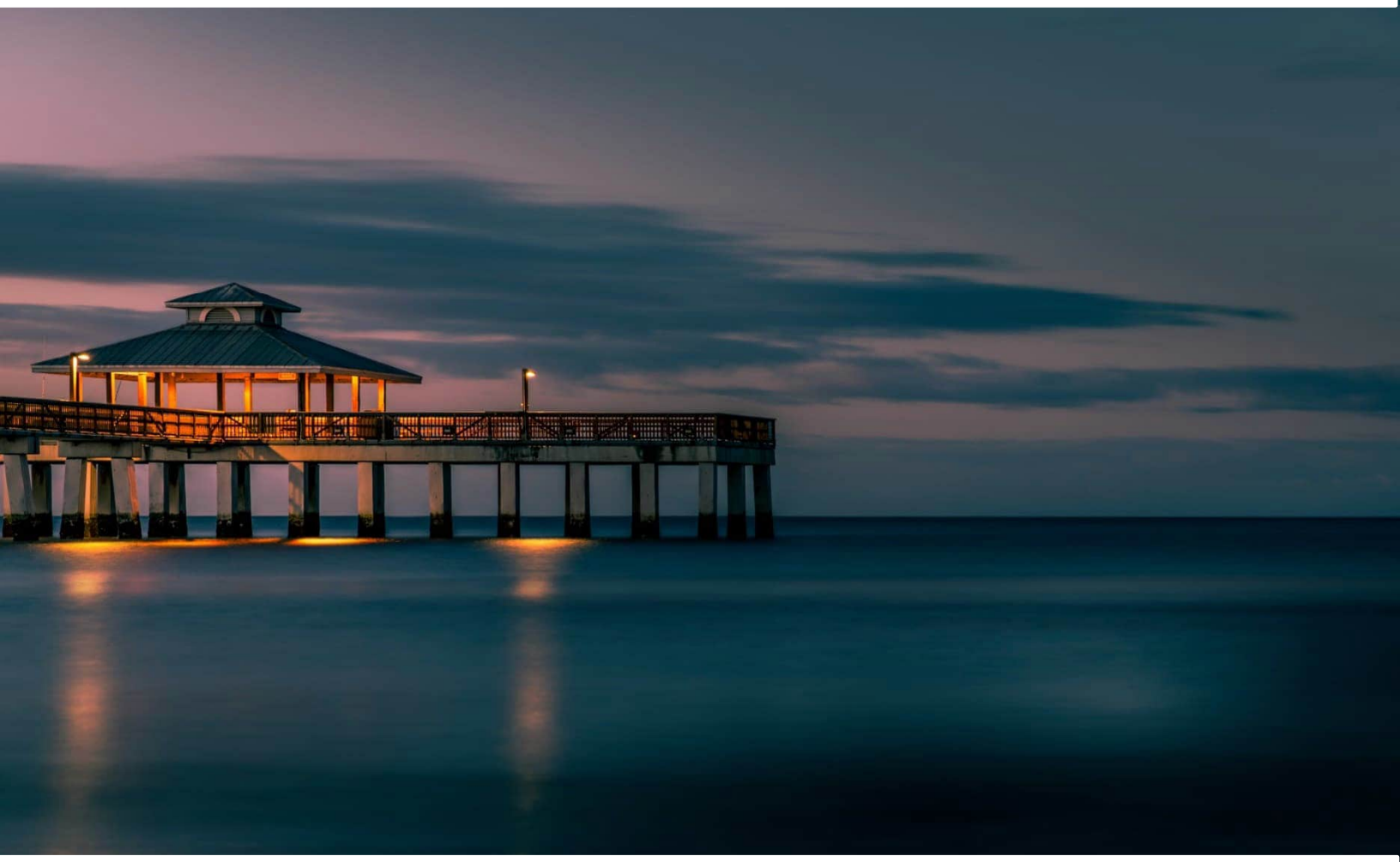
AECOM

Lee County

Countywide Wastewater Management Plan

Septic Conversion

March 2023



Delivering a better world

This report was prepared in accordance with our Agreement.

Respectfully Submitted,

AECOM Technical Services, Inc.

Approved by:

Ronald R Cavalieri

Digitally signed by Ronald R Cavalieri
DN: cn=Ronald R Cavalieri, c=US, o=Florida, email=ronald.cavalieri@aecom.com
Reason: I agree to the terms defined by the placement of my signature on this document
Date: 2023.03.21 15:53:10 -04'00'

_____

Ronald Cavalieri, P.E., BCEE
Project Director
Licensed Professional Engineer
Florida License No. P65850

TABLE OF CONTENTS

FIGURES

TABLES

EXECUTIVE SUMMARY

INTRODUCTION

The area of Southwest Florida now considered Lee County (County) was originally a part of Monroe County prior to gaining its independence in 1887. The City of Fort Myers serves as the County's Seat having been incorporated in 1886. As of 2020, Lee County is comprised of approximately 760,822 residents encompassing an area of approximately 1,212 square miles, and has grown from a population of fewer than 2,000 from the 1890s.

The growing population of the County and its associated rapid development has led to increased pollution that has declined the water quality in Lee County. While there are many causes of this degradation, a major pollutant of concern is nutrients – particularly nitrogen. To combat the rise of pollution, the County has invested in the implementation of local projects to improve water quality, and is working closely with state and federal partners to solve complex regional water quality problems. Regulatory drivers for water quality restoration activities include commitments to Basin Management Action Plans (BMAPs) for impaired County water bodies, as well as Senate Bill 712, which discusses provisions specifically related to water quality improvement such as onsite sewage treatment and disposal systems (OSTDS).

Prior to major development in the County, wastewater was managed by on-site septic systems and packaged plants for platted areas. With the population growth experienced in the County after the 1950s, the need for central sewer was realized across the County. Currently, Lee County has approximately 72,000 septic tanks.

The County retained AECOM Technical Services, Inc. (AECOM) to provide professional engineering services for the development of this Countywide Wastewater Management Plan (CWMP) which aims to fulfill BMAP and TMDL requirements, SB712, and the County's own environmental goals. The plan establishes a septic systems and wastewater treatment facilities inventory in the County and identifies high priority areas for septic conversion within unincorporated Lee County.

Preparation of this Countywide Wastewater Management Plan (CWMP) considers current and future regulatory and local water quality goals and objectives. Since this WMP is countywide, collaboration with other utility agencies in Lee County was vital to understand and account for ongoing and planned projects from cities within Lee County with separate utilities and agencies serving parts of unincorporated Lee County. AECOM coordinated with the following Utilities to identify planned septic conversion projects: the City of Cape Coral, the City of Bonita Springs, the Village of Estero, the City of Fort Myers, the Florida Governmental Utility Authority, and Captiva/Sanibel.

The CWMP utilizes existing conditions pertaining to 2021 as its baseline and does not capture the impact and damage that was caused by Hurricane Ian to Lee County in September 2022 . As of the writing of this CWMP, the effects of Hurricane Ian are still unfolding and the resulting potential impacts to population forecasts, infrastructure needs, and implementation schedules are difficult to determine.

EXISTING WASTEWATER INFRASTRUCTURE SERVICE AREAS

LCU's extensive wastewater system is comprised of six water reclamation facilities (WRFs), a collection and transmission system of gravity sewer and force mains, lift stations, and master pump stations. LCU also has an agreement with the City of Fort Myers to utilize approximately 50% of the capacity of the Fort Myers's South and Central WWTFs. Each of these treatments facilities has a service area where wastewater flows are collected and treated and there is limited ability to transfer flows from one service area to another. A summary of the treatment facilities is provided below with their current permitted treatment capacity in **Table ES-1**.

Table ES-1: Summary of Treatment Facilities

Wastewater Treatment Facility	Permitted Treatment Capacity (AADF Basis)
Fiesta Village WRF	5 MGD
Fort Myers Beach WRF	6 MGD
Gateway WRF	3 MGD
Pine Island WRF	0.383 MGD
Three Oaks WRF	6 MGD
High Point WRF	0.025 MGD
City of Fort Myers Central AWWTF	11 MGD (4.54 MGD from LCU)*
City of Fort Myers South AWWTF	12 MGD (6.96 MGD from LCU)*

**LCU portions estimated based on First Amendment Interlocal Wastewater Treatment Agreement Contract, 1986*

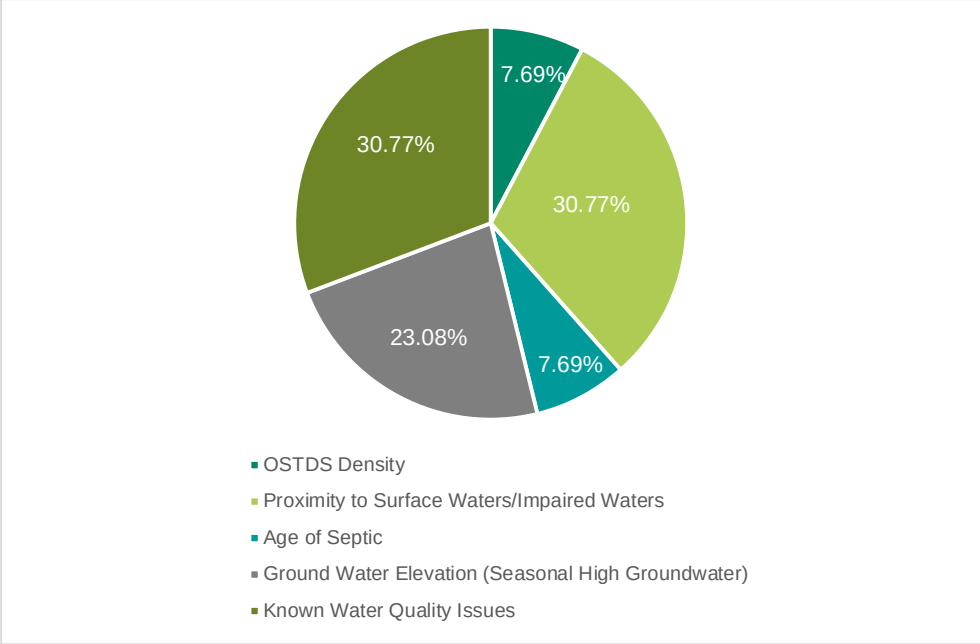
IDENTIFICATION OF SEPTIC CONVERSION AREAS AND PRIORTIZATION OF PROJECTS

Identification of septic conversion areas began with identifying all septic parcels in Lee County both inside and outside of the BMAP areas. Next, areas that fell within other cities' utility system service areas were removed from consideration. The remaining septic parcels were located in Lehigh Acres, FGUA, North Fort Myers, and other unincorporated parts of the County. Clusters of septic tanks in sub-divisions or residential communities were identified by AECOM and with the assistance of Lee County and were grouped as potential areas for septic conversion. The areas are located both within and outside of BMAPs and include a sample area in unincorporated Lee County. A total of 51 areas were identified as potential areas for septic conversion in Lee County and were then evaluated for prioritization.

Prioritization of septic conversion areas was based upon potential improvements to water quality when connecting to the central sewer. Initial screening criteria comprised of five environmental and spatial criteria, including: (a) OSTDS density, (b) proximity to surface waters/impaired waters, (c) age of septic, (d) groundwater elevation (seasonal high groundwater), and (e) known water quality issues was used to initially prioritize the septic conversion areas. A description of each criterion is discussed in further detail in Chapter 4. A scoring system was assigned for each of the criteria using an overall scale from 1 to 5, with 5 representing a higher priority to connect to the sewer system.

The relative importance or weight of each criterion was determined using a pairwise comparison which was completed through a workshop with LCU staff. As shown in **Figure ES-1**, the pairwise comparison indicated that the most critical criteria in prioritizing areas for septic conversion are known water quality issues and proximity to surface waters/impaired waters with weights of 31%. Age of septic and density criteria have the lowest weights at 8%.

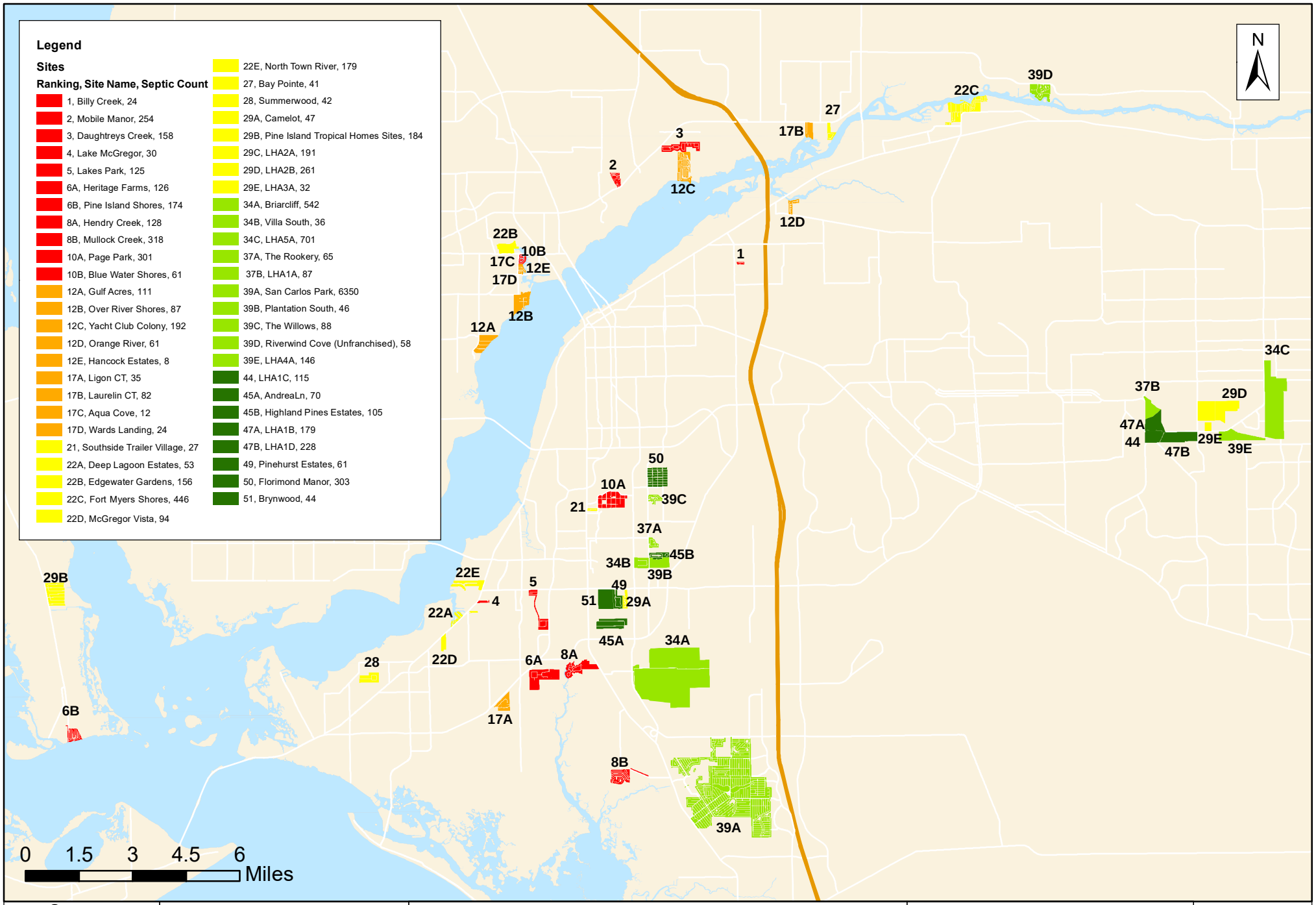
Figure ES-1: Initial Screening Criteria Weighting



For each potential area, each criterion score was multiplied by the criterion weight to calculate a weighted score. The weighted scores were used to rank the potential areas from highest priority to connect to central sewer to lowest priority, as shown in **Figure ES-2**.

The rankings of the individual areas were used to develop projects groupings that comprised the final study areas. **Figure ES-3** depicts the ten recommended project groupings as a result of the initial screening process. The general approach for the identification of the groupings was based on including:

- All top ten ranked areas and adjacent middle-ranked areas
- All areas that lie in the quarter mile buffer from the Caloosahatchee River and its tributaries



Source:
FDOT and ESRI
Date April 2021
County: Lee

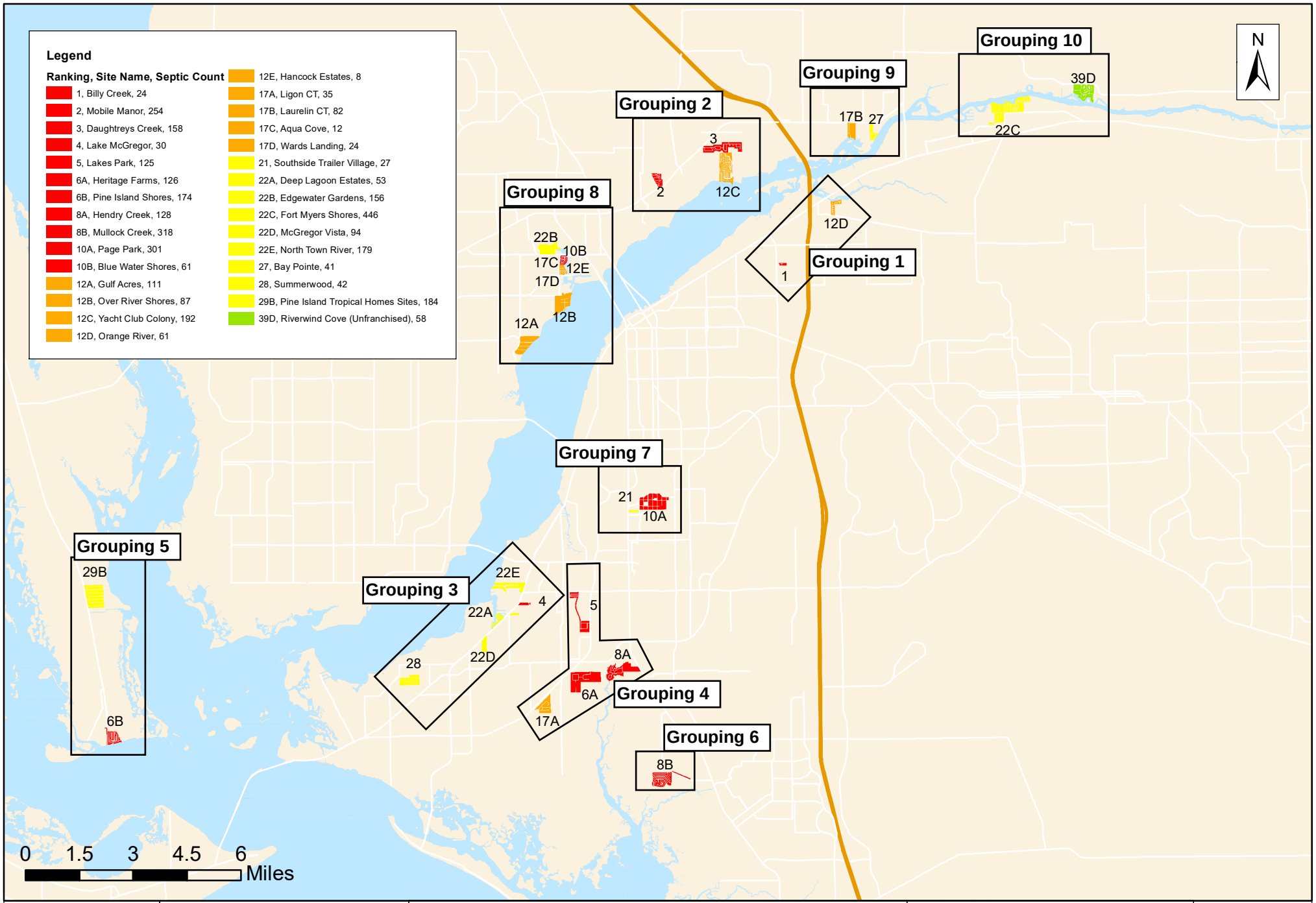
LEE COUNTY
SOUTHWEST FLORIDA

Countywide Wastewater Management Plan

Priority Ranking of Potential Areas for Septic Conversion

AECOM

Figure
ES-2



Source:
FDOT and ESRI
Date April 2021
County: Lee

LEE COUNTY
SOUTHWEST FLORIDA

Countywide Wastewater Management Plan

Recommended Project Groupings for Septic Conversion

AECOM

Figure

ES-3

POPULATION FORECASTS

In order to develop flow projections and analyze the capacity of the existing wastewater system, baseline and forecasted populations were established. **Chapter 5** provides detailed discussion on the methodology and data sources used to establish service area population forecasts. The population forecasts for the wastewater service areas based upon permanent population were provided by Metro Forecasting Models, LLC (MFM) for the period of 2020 – 2040 in 5-year intervals, as well as buildout. MFM also provided a breakdown of population that is being served by centralized sewer and population that is being served by OSTDs or packaged treatment plants. Separate population forecasts were also developed by MFM for the identified septic conversion areas in the groupings.

Population projections were developed using the Metro Forecasting Models Interactive Growth Model® (IGM). The IGM considers both the Baseline (2021) and Buildout condition to project a non-linear forecast of housing units and population growth. The IGM also forecasts the increase in non-residential building area over time. As the population grows, the non-residential building areas increase to accommodate the additional demand for goods and services, and the labor force.

Subsequent to the baseline and buildout estimates for residential population completed on a parcel basis, the parcels within each wastewater service area were aggregated based on whether they are served by centralized sewer or septic systems/packaged plants. For each of the wastewater service areas, the total served population projections consisted of the growth in the existing served population (by centralized sewer) and additional population served relating to septic conversion areas within the respective service area. **Table ES-2** summarizes the total served population forecasts for each current service area for permanent population.

Table ES-2: Summary of Served Population Forecasts by Wastewater Service Area

Year	Wastewater Service Area								
	Fort Myers Beach	Fiesta Village	Three Oaks	Pine Island	Gateway	High Point	Fort Myers Central (LCU)	Fort Myers South (LCU)	North Fort Myers (FGUA)*
2021	29,343	34,580	51,807	1,570	11,229	188	27,558	41,600	55,000
2025	30,248	35,380	57,318	1,579	12,623	191	31,166	43,161	66,786
2030	31,080	36,184	63,583	2,287	14,267	193	35,153	44,719	
2035	31,489	36,258	66,286	2,298	15,202	194	37,416	46,276	
2040	31,686	36,293	67,483	2,308	15,688	194	39,677	46,652	
Build out	32,477	36,594	88,378	12,052	16,158	195	44,927	52,616	

**The North Fort Myers served population forecast was based on projected flows and per capita demands from the 2019 Del Prado Wastewater Treatment Facility 10-year Planning Analysis report by Tetra Tech which had a planning horizon of 2019 though 2028.*

PLANNED SERVICE AREA MODIFICATIONS

The growth in Lee County has triggered the need for additional wastewater treatment capacity to handle increased flows. County treatment plant expansions considered in this CWMP include the Three Oaks WRF treatment capacity expansion to 9 MGD and the Gateway WRF treatment capacity expansion to 6 MGD. Additionally, a new treatment facility in the form of the Southeast WRF is also considered with an initial capacity of 6 MGD.

The planned treatment capacity expansions and the new SE WRF resulted in planned modifications to the existing wastewater service areas. The wastewater service areas that will experience modifications are Fort Myers South (LCU portion), Gateway, Three Oaks, and Southeast. For the Fort Myers South service area, the planned modification is a result of the implementation of the first phase of the flow diversion plan from the Fort Myers plants. Flows from Phase I are planned to be diverted from Fort Myers South AAWTF west of I-75 to the Gateway WRF in the east. Consequently, the Gateway service area will be modified to include the Phase I flow diversion area. Alternatively, LCU is also considering diverting those flows from the Fort Myers South service area to the Three Oaks WRF, rather than to the Gateway WRF. If the original timing for the Gateway WRF expansion to 6 MGD is delayed, then the flow diversion project should also be delayed to not exceed treatment capacity or the flows should be diverted to the Three Oaks WRF. The Gateway service area will also include two growth areas: one south of State Road 82 (SR82) and one south of Daniels Road.

As for the Three Oaks service area, the service area modification will coincide with the construction of the new Southeast WRF. Once the Southeast WRF comes online, the portion of the existing Three Oaks service area east of I-75 will be diverted to the new facility. The planned service area for the new Southeast WRF will accordingly be comprised of (a) the portions of existing Three Oaks service area to the east of I-75, including the two smaller areas along Corkscrew Rd and (b) five more growth areas identified along Corkscrew Rd.

Table ES-3 presents the served population for the identified growth areas contributing to the modified treatment plant service areas.

Table ES-3: Served Populations for Identified Growth Areas

Growth Area	2021	2025	2030	2035	2040	BO
Phase I Flow Diversion	5,046	5,331	5,627	5,779	5,853	7,998
Future Corkscrew NW	173	198	228	246	256	265
Future Corkscrew SW	209	500	1,934	5,383	8,940	11,035
Future Corkscrew NE	506	842	1,924	4,138	7,956	23,371
Future Corkscrew SE	107	179	414	907	1,805	6,171
Corkscrew North	25	41	95	208	413	1,406
SR82	470	560	745	987	2,436	14,108
Future S Daniels	0	128	1,176	3,576	4,295	4,374

POPULATION FORECASTS FOR SEPTIC CONVERSION AREAS

Population forecasts for the population not served by centralized sewer in each wastewater service area were developed separately. **Table ES-4** presents the baseline and buildout populations for the septic conversion areas in the groupings developed through the initial screening criteria process. Commercial and industrial areas were also considered to capture non-residential flows to develop flow projections from septic conversion areas as shown in Chapter 5 of the report.

Table ES-4: Contributing Projected Populations from Septic Conversion Area Groupings

WRF	Contributing Project Groupings	Baseline Population	Buildout Population
Fiesta Village	3 & 4	1,233	1,283
Fort Myers Beach	3	57	57
Three Oaks	6	554	607
Pine Island	5	426	694
Central Fort Myers	1 & 10	1,161	1,307
South Fort Myers	7	706	781
Del Prado	2, 8, 9	2,155	2,349

FLOW PROJECTIONS AND GAP ANALYSIS

A WRF gap analysis was completed to compare the projected flows for each service area with the capacities of the respective facilities. The analysis considered both the permitted and reliable capacities of each facility to evaluate future capacity needs. The “reliable capacity” of each WWTF is considered as 80% of the permitted capacity. This threshold is a design criterion used by Lee County to trigger the need for capacity expansions. The reliable capacity is used to determine the timeline for when recommended capacity expansions should be implemented.

TREATMENT PLANT EXPANSIONS/NEW FACILITIES RECOMMENDATIONS

Based on the gap analyses discussed above and in **Chapter 6**, no treatment capacity expansions are recommended for Fiesta Village WRF, Fort Myers Beach WRF, High Point WRF, and the Fort Myers Central and South AWWTFs.

For the Three Oaks WRF, the County is in the process of implementing a 3 MGD expansion to increase the facility’s total permitted capacity from 6 MGD to 9 MGD. The results of the gap analysis for the Three Oaks WRF indicate

a low utilization of the facility's planned 9 MGD capacity and further evaluation of diversion areas and treatment capacities is needed. It should be noted that additional capacity would be utilized if the flow diversion from Fort Myers South service area is sent to the Three Oaks WRF.

For the Gateway WRF, a facility expansion of 3 MGD is included in the County's 10-year CIP, bringing the proposed permitted capacity to 6 MGD. The results of the gap analysis indicate that the facility will require an expansion to meet this need, but it will require an expansion greater than the 3 MGD currently planned and budgeted to meet buildout. It is recommended that the 6 MGD facility be designed to add an additional 1 MGD of capacity as needed for buildout. If the flow diversion to the Gateway WRF from the Fort Myers South service area does not occur, LCU should reassess the capacity needs for the Gateway facility.

For the new Southeast WRF, the results of the gap analysis indicate that the AADF is slightly greater than the reliable capacity at buildout. However, it is anticipated the permitted capacity of 6 MGD will be adequate. It is recommended that the total Southeast WRF treatment capacity be 6 MGD as planned.

For FGUA Del Prado WWTF, the 2019 Del Prado WWTF 10-year Planning Analysis report recommends that FGUA pursue facility improvements to accommodate the projected quarterly ADFs for the facility service area, if future flows align with the worst case scenario.

WASTEWATER COLLECTION AND DISPOSAL ALTERNATIVES

Several wastewater collection and disposal alternatives were assessed to implement septic conversion of the identified project groupings. Wastewater system alternatives are categorized as either centralized collection and treatment or onsite treatment and disposal. Centralized collection systems include gravity sewers, low-pressure sewers, septic tank effluent pumping (STEP) systems, vacuum sewers, and distributed treatment systems. On-site treatment and disposal systems, which do not require any form of centralized collection system, include conventional OSTDS and advanced OSTDS including Performance Based Treatment Systems (PBTS).

A detailed description and assessment of the advantages and disadvantages of the alternatives is presented in **Chapter 7**. As shown in **Table ES-5**, a matrix was developed to compare the wastewater collection alternatives based on the following criteria: construction disruption, O&M needs, vulnerability, nutrient pollution, permitting requirements, homeowner responsibility, and supplier limitations. Based on this criteria comparison, gravity and low-pressure sewer systems were considered more favorable options for centralized wastewater systems, and advanced or PBTS OSTDS scored higher than conventional OSTDS regarding on-site systems.

Table ES-5: Comparison of Wastewater Collection System Alternatives

Wastewater System Alternative	Construction Disruption	O&M Needs	Vulnerability	Nutrient Pollution	Permitting Requirements	Homeowner Responsibility	Supplier Limitations
Centralized Wastewater Systems							
Gravity Sewer	High	Low	Low	Low	Low	Low	Low
Low-Pressure	Low	Medium	Medium	Low	Low	High	Medium
Vacuum Sewer	Medium	High	Low	Low	Low	Medium	High
STEP System	Medium	High	High	Medium	Medium	High	Medium
Distributed Wastewater Systems	Medium	High	High	Medium	High	Medium	High
On-Site Treatment and Disposal Systems							
Conventional	Low	Medium	Medium	High	Medium	Medium	Low
Advanced or PBTS	Low	High	High	Medium	High	High	Medium

Therefore, the wastewater collection alternatives considered for septic conversion were narrowed down to (1) gravity sewers, (2) low-pressure sewers, and (3) advanced or PBTS OSTDS. Planning level costs were developed for all three alternatives in Chapter 9. However, FDEP prefers centralized sewers over advanced OSTDS since connection to centralized sewer eliminates concerns about nitrogen loading to groundwater and the majority of LCU's wastewater collection system is comprised of gravity sewers.

PLANNING LEVEL COSTS

Cost estimates were prepared for connecting the septic conversion areas to centralized sewer or upgrading the areas with Advanced OSTDS, as well as for needed treatment and transmission capacity improvements. When develop planning level cost estimates, unit costs were established using contractor pay applications and other cost estimates for similar projects completed in Southwest Florida alongside input from contractors and manufacturers of various low pressure and advanced on-site systems. These unit costs are used to estimate the capital cost for each system and other recommended improvements. Unit costs were inflated to 2021 dollars based on Engineering News-Record historical construction costs indices.

For each of the septic conversion areas, capital cost and O&M cost estimates were developed for each of the three wastewater collection system alternatives. A comparison summary of the 40-year net present worth of each of the septic groups/areas is provided for the three collection system alternatives in **Table ES-6**. The results of the net present worth analysis show that the net cost of the low pressure system is the lowest at $46,182. The costs for the advanced OSTDS and gravity systems were greater, with the cost of advanced OSTDS being almost $20,000 per parcel over that for low pressure. Although the capital costs are higher for gravity systems, they are the preferred alternative for converting areas near to the existing system because the majority of the existing collection system in the County is gravity sewer and annual O&M costs are typically lower, as shown below.

Table ES-6: Summary of Wastewater System Alternative Average Costs

Cost Comparison Summary per Parcel

Wastewater Collection System Type	Avg. On-Lot Costs	Avg. Collection System Costs	Avg. Total Capital Cost	Annual O&M	40-Year Net Present Worth*
Gravity	$8,853	$41,884	$50,737	$447	$56,773
Low Pressure	$23,017	$16,454	$39,471	$497	$46,182
Advanced OSTDS	$43,000	$0	$43,000	$1,716	$66,173

**Note that the interest rate used in calculating the 40-year net present worth is 6.89% as determined by the January 2023 US Treasury bond interest rate.*

FINAL TIERED RANKING OF SEPTIC TO SEWER CONVERSION AREAS/GROUPINGS

Following the initial screening discussed in **Chapter 4**, ten (10) groupings were identified for septic to sewer conversion. The groupings, along with the results of the gap analysis and the consistency of the septic conversions with LCU's master plan, were discussed with LCU to develop a methodology to establish an order of priority for implementing the septic conversions. A three tier system was developed to prioritize the septic to sewer conversion areas for construction.

Tier 1 - Priority is given to groupings that convey wastewater flow to LCU's water reclamation facilities that have available wastewater treatment capacity. This limits flow to treatment facilities that are nearing permitted capacity such as the Del Prado WWTF.

Tier 2 - Priority is given to groupings in FGUA's service area in North Fort Myers. The groupings located in the FGUA service area in North Fort Myers are considered the next priority to be consistent with LCU's master planning efforts.

Tier 3 - Remainder of groupings which would require major upgrades to LCU's WRFs or the implementation of pressure systems and/or advanced OSTDSs along the eastern portion of the Caloosahatchee.

Table ES-7 below provides a list of the groupings included in each of the three tiers. It should be noted that the tiered system only provides an order of priority for the septic conversion of the priority groupings and not a detailed schedule. It is recommended that LCU develops an implementation schedule based on the tiered system, available plant capacity and capacity expansions, other County priority projects and availability of funding.

Table ES-7: Tiered System and Corresponding Septic Conversion Groupings

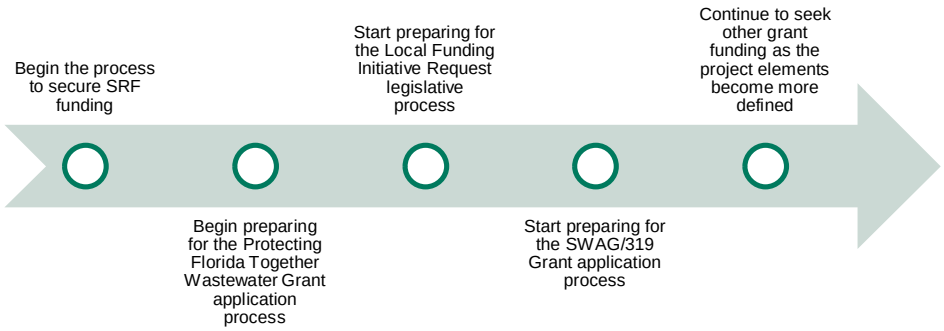
Tier	Septic Conversion Grouping
Tier 1	1, 4, 6, and 7
Tier 2	2, 8A, and 8B
Tier 3	3, 5, 9, and 10

Two additional methods of prioritization of septic conversion areas based on the Lee County Board of County Commissioners Work Session are presented in **Appendix E.**

FUNDING STRATEGY

Based on the proposed improvements, the primary recommended sources of funding for this collection of wastewater projects are the State of Florida Department of Environmental Protection Clean Water State Revolving Fund (SRF) Loan Program, Protecting Florida Together – Wastewater Grant Program and State Water-Quality Assistance Grant (SWAG)/319 Grant Program. Secondary sources recommended for consideration are the State of Florida Local Funding Initiative Request (Legislative Process).

The following list of actions presented below are the recommended path forward to provide valuable resources/services to the community at the lowest possible capital costs.



In addition to limiting the ultimate costs to the County through grant and low-interest financing, the strategic evaluation, implementation and collection of user fees and exploring the utilization of assessments and other internal revenue generation options will provide excellent match for grant funding opportunities. Also, with such a large program, creative combinations of fee and rate structures will be necessary to support debt service for financing such as SRF Loans. Opportunities that are recommended for consideration to reduce costs or improve the long-term financial viability of the program include public-private partnerships, Tax Increment Financing, Municipal Service Benefit Units (MSBU), etc. The successful integration of the County's internal funding mechanisms united with the potential funding sources identified will be vital to ensuring the cost-effectiveness and long-term viability of the projects.

HURRICANE IAN IMPACTS TO OVERALL WASTEWATER MANAGEMENT PLAN

The CWMP was initiated using 2021 existing conditions as the baseline for the wastewater management plan. In September of 2022, Hurricane Ian (a Category 4 hurricane) significantly impacted Lee County and caused severe damage to coastal communities. The impact of Hurricane Ian is still unfolding and therefore was difficult to capture in this CWMP. It is anticipated that the hurricane will impact reconstruction efforts and thus potentially affect population densities. Building codes, including materials of construction and locations of buildings, will also likely change to better account for hurricane impacts.

Continuous monitoring and evaluation of the impact of Hurricane Ian on the reconstruction effort should be carried out to determine how it will impact population forecasts, wastewater infrastructure needs, and implementation schedules of recommended improvements.

In addition - although it is early in the process - there will likely be changes to the long-term funding strategy resulting from Disaster Declarations for Hurricane Ian and Tropical Storm Nicole. Based on previously authorized funding for disaster mitigation, it will be critical to monitor ongoing funding developments related to the recent storms. It is anticipated that these funding opportunities may take 2-3 years to be available to Lee County for mitigation type activities.

There may also be increased funding allocations for resilience and coastal zone management projects. This may come in the form of new funding programs or increased dollars for existing programs. It is recommended to continually evaluate the funding environment as it relates to the County's selected projects. This will help to ensure that the maximum grant dollars are garnered, and out-of-pocket costs are offset by outside funding to the greatest extent possible.

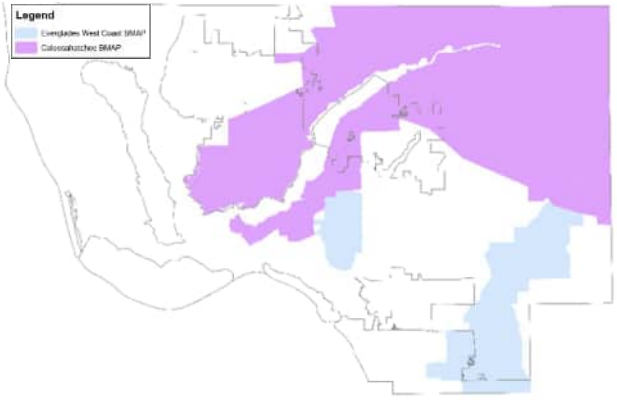
1. INTRODUCTION

1.1 PURPOSE

Water has long been a defining element in the environment and quality of life to residents and visitors in Lee County (County). The health of these waters is vital in keeping the beaches safe and aesthetic, the ecosystem and wildlife thriving, and tourism ongoing. The allure of Lee County as a permanent home or vacation destination has brought about a set of challenges including increased human activity due to growing populations and watershed alterations from development.

The protection and restoration of impaired waters are both a priority for the County and state and federal requirements. The County has invested in the implementation of local projects to improve water quality as well as working closely with state and federal partners to solve complex regional water quality problems. The environmental goals for Lee County are governed under the general umbrella of the Clean Water Act (CWA) which became a law in 1972.

Figure 1-1: BMAPs in Lee County



For water bodies that fail to meet state water quality standards, the Florida Department of Environmental Protection (DEP) develops a Total Maximum Daily Load (TMDL) for the pollutant of concern. Many of the water bodies in Lee County are verified impaired for several pollutants, i.e., the pollutant load in that water body exceeds the load set by the TMDL. To meet those TMDLs, the Florida DEP developed Basin Management Action Plans (BMAP) that act as a framework on restoring water quality by presenting possible solutions such as permit limits on wastewater facilities, best management practices, and conservation programs necessary to achieved pollutant reductions. The County's impaired waters and the associated TMDLs are covered in two BMAPs: the Caloosahatchee Estuary BMAP and the Everglades West Coast BMAP as shown in **Figure 1-1**.

The Caloosahatchee BMAP 2020 update replaced the original 2012 BMAP to incorporate new TMDLs for Total N (TN), Total Phosphorous (TP), and Biochemical Oxygen Demand (BOD) for the Caloosahatchee River and its tributaries and identified septic systems as a pollutant source. As of 2019, the County had completed 37 projects of the total 50 projects assigned to it by the BMAP. The Everglades West Coast BMAP was adopted in 2012 to implement TN TMDLs to address the Dissolved Oxygen (DO) impairment in Hendry Creek and the Imperial River. As of 2020, Lee County had completed 7 projects aimed at achieving TN reductions required by the BMAP.

Another regulatory driver for engaging in water quality restoration activities is Senate Bill 712 regarding environmental resource management. The bill, stemming from the environmental issues addressed in the CWA, includes several provisions specifically related to water quality improvement such as onsite sewage treatment and disposal systems (OSTDS). In addition to transferring the Onsite Sewage Program from the Department of Health (DOH) to the DEP, the bill (a) requires local governments to create septic remediation plans and wastewater facilities management plans for BMAPs, (b) revises provisions related to septic system setback rules, and (c) requires DEP to fast-track the approval for a nutrient reducing septic system.

1.2 OBJECTIVES

The County's efforts to improve the quality of water bodies are extensive and work towards meeting local environmental goals as well as implementing state and federal requirements. These efforts include a land conservation program, pollutant source identification through a microbial source tracking (MST) study, water quality monitoring programs, pollution source controls, hydrologic restoration projects, fertilizer and irrigation ordinances, and septic system strategies.

This Countywide Wastewater Management Plan (CWMP) aims to fulfill BMAP and TMDL requirements, SB712, and the County's own environmental goals. The plan focuses on a septic conversion plan as part of a cooperative effort between Lee County Utilities (LCU) and the Natural Resources Department. The plan establishes a septic system and wastewater treatment facilities inventory in the County and identifies high priority areas for septic

conversion within unincorporated Lee County based on a priority matrix to achieve the most environmental benefit at the most effective cost. The growth and flow projections from the identified septic conversion areas will be developed and compared against the capacity of the County's existing wastewater system and a capital improvement program will be developed accordingly.

1.3 BACKGROUND

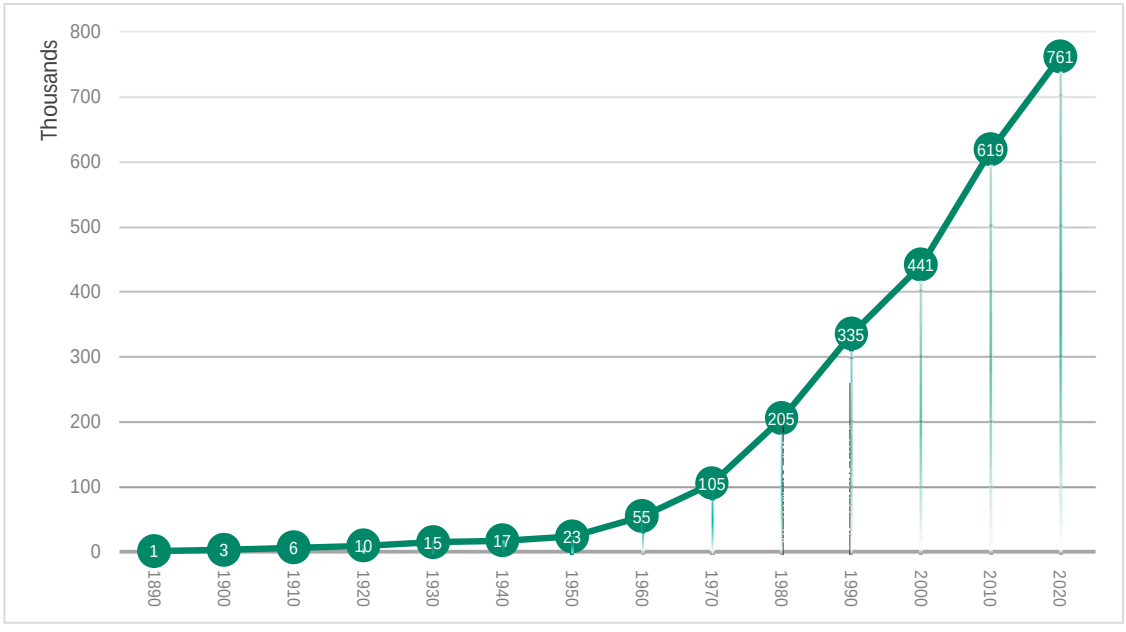
Figure 1-2: Historical Images of Lee County

Southwest Florida was originally inhabited by the Native American Calusa Tribes, long before the Spanish arrived in Florida in the 1500s. Following periods of Spanish and English rule in the 18th century, Spain surrendered Florida to the United States in 1819 and it became the 27th US state 26 years later. When settlers started moving to Florida, conflicts arose with the Seminole people who had inhabited southwest Florida at the time. During the Seminole wars, a fort was built and named after the general who was stationed there, Fort Myers. The fort was deserted at the end of the war in 1858 and then disassembled after the Civil War to build parts of Downtown Fort Myers.

Since the late 1860s, settlers started arriving in Fort Myers, and one of the first pioneer families of Lee County was the Padilla family who moved from the Charlotte Harbor area in the 1870s after the government claimed their land there. Fort Myers was incorporated in 1886 shortly after experiencing an influx of settlers in 1882. At the time, the area was considered part of Monroe County, from which Lee County gained independence in 1887. Lee County was named after General Robert E. Lee, and Fort Myers served as the County seat. Known nationally as a winter resort, Fort Myers became home for famous names such as Thomas Edison and Henry Ford. Another noteworthy growth spurt occurred in 1924 in Fort Myers following the construction of the Tamiami Trail bridge. A few historical images of Lee County are shown in **Figure 1-2**[1].

Today's Lee County, where there were 760,822 residents living across the 1,212 square mile area in 2020[2], grew from a population fewer than 2000 in the 1890s. The abundance of natural areas in the County, from parks to beaches, has historically contributed to the population growth shown in **Figure 1-3**.

Figure 1-3: Historical Population Growth in Lee County



[1] https://www.leegov.com/130/photos
[2] https://www.census.gov/quickfacts/leecountyflorida

This growing population and the associated rapid development have led to increased pollution that declined the water quality in Lee County. While there are many causes of this degradation, a major pollutant of concern are nutrients – particularly nitrogen. The source of excess nutrients is impacted by the seasonal variability experienced in Lee County. During the dry season, waters receive excess nutrients due to increased fertilizer use and increased septic tank use from a seasonal population. The stormwater and agricultural runoff and releases down the Caloosahatchee River from Lake Okeechobee increases nutrient release into local waters during rainy season.

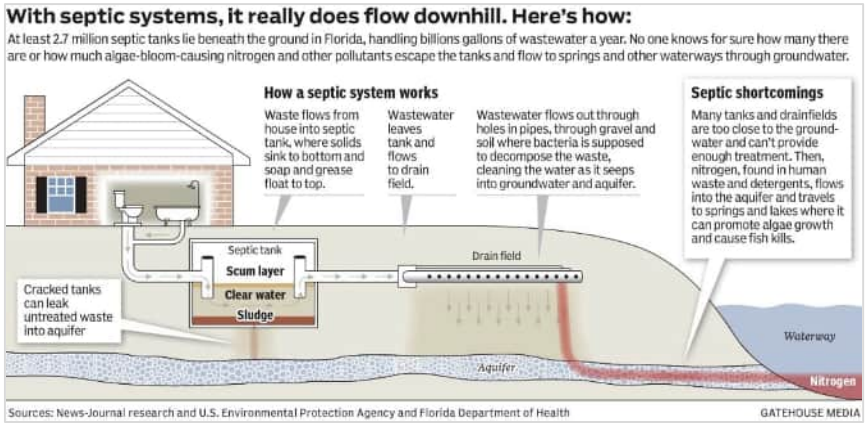
Currently, Lee County has approximately 72,000 septic tanks. As shown in **Figure 1-4**, the majority of the septic tanks in Lee County are within the unincorporated areas where there is limited or no direct access to the public sewer. In addition, there are 41 domestic wastewater facilities – or packaged plants – in Lee County. While packaged plants provide a slightly higher level of treatment than conventional OSTDS, nitrogen and phosphorous levels in the effluent are not regulated.

Figure 1-4: Septic System Inventory in Lee County

A typical well-maintained septic system has four components including piping from property or home, the septic tank, a drain field, and the soil. Wastewater flows from the property through one main drainage pipe into a septic tank, where oils and grease are separated from the wastewater and organic matter is digested and solids allowed to settle at the bottom. The effluent is then discharged from the septic tank into a series of perforated pipes onto porous surfaces where the effluent can be filtered through the soil and eventually enter the groundwater. As the effluent moves through the soil layers and seeps into groundwater and aquifers, bacteria in the soil decomposes the waste and converts the nitrogen in the effluent into nitrogen gas that escapes into the atmosphere. **Figure 1-5** illustrates how a conventional septic system works.

However, this process is only successful when the septic tank is properly designed and maintained and adequate separation from groundwater is present. Septic system failures can also occur due to several reasons including aging infrastructure, cracks in the pipes, and clogs or overloading of the drain field. In Lee County, septic system failures allow for nitrogen and phosphorous to transport into the surficial groundwater that eventually migrates into nearby water bodies. Many of the septic systems are old and do not meet current or adequate groundwater separation requirements that prevent the effluent from immediately impacting groundwater. Furthermore, most of the packaged plants in the County only provide secondary treatment, where only BOD and TSS are regulated at a maximum concentration of 20 mg/L on an annual average basis[3]. As indicated in their FDEP permits, packaged plants often do not comply with effluent quality standards. In addition, some packaged plants dispose of effluent through drainfields which inherently introduces nutrients into the groundwater. For packaged plants that are located within the BMAP area, the FDEP is issuing permits with new and stricter effluent quality limitations.

Figure 1-5: Conventional Septic System Treatment



[3] FAC 62-600

SEPTIC TANK FAILURES

Besides poor maintenance and aging infrastructure, septic systems in regard to their location, density, and proximity to waterways can lead to water quality issues. In the particular case of Florida and coastal communities such as Lee County, the high groundwater table is one of the biggest factors affecting septic system functionality. Design of septic systems has long been dictated by the State under the Florida Administrative Code (FAC) and the Florida Statutes (FS), including requirements regarding groundwater separation. Prior to 1983, the separation between the bottom of the drain field and the seasonal high-water table was only 6 inches. When the Florida Legislature passed the Water Quality Assurance Act of 1983, one of the main directives was increasing the minimum separation distance between the bottom of the drain field and the seasonally high groundwater table to 24 inches. However, many of the septic systems in Lee County do not meet this requirement because they were installed prior to the rule change.

In Florida, another factor contributing to possible nutrient and bacterial contamination of groundwater is the dominance of porous sandy soils. These characteristics facilitate rapid percolation of septic system effluent into the groundwater. Where the depth of the adsorption zone of unsaturated soils is not sufficient, the nutrients that make their way into groundwater eventually travel into surrounding waterways. In Lee County, the Caloosahatchee River and Estuary is a major discharge area for contaminated groundwater and surface water. The concern over the water quality of surface waters prompted the increase of the setback distance from a septic system to surface water from 25-50 ft to 50-75 ft. Senate Bill 712 is anticipated to stipulate an even larger setback distance to further mitigate the adverse impacts potentially caused by nutrient travel through groundwater.

Between 2017 and 2020, a microbial source tracking (MST) study was conducted in North Fort Myers as part of a collaborative effort by Florida Atlantic University, Lee County Department of Natural Resources, and FDEP. The findings from groundwater and surface water sampling for areas with septic tanks indicated a strong influence of human wastewater on local water quality. The results showed significant nutrient pollution from the leachate of septic systems in some residential areas as groundwater samples contained ammonium concentrations 6.5 times those of nitrate. Among the reasons leading to high traces of sucralose - an indicator human waste presence and elevated nutrients were high septic density and a high seasonal ground water table. For many of the areas studied, most of the septic systems did not meet the separation requirements.

Those results promoted another MST study to cover a larger geographic scale and assess the sources of bacterial and nutrient pollution in the waterways of Lee County. The study focused on areas with impaired water quality and varying degrees of reliance on septic systems, with a reference area that was on centralized sewer. At each of the 24 sites, there was evidence of human waste contamination at varying degrees. Fecal indicator bacteria were found in high concentrations exceeding FDEP standards in 68% of all sites. The detailed findings and analysis of this study contributed to the prioritization of septic conversion areas identified in this master plan.

1.4 COLLABORATION AND RELATED PLANS

Preparation of this Countywide Wastewater Management Plan (CWMP) considers current and future regulatory and local water quality goals and objectives. Since this WMP is countywide, collaboration with other utility agencies in Lee County was vital to understand and account for ongoing and planned projects from cities within Lee County with separate utilities and agencies serving parts of unincorporated Lee County. **Figure 1-6** below summarizes the relevant regulatory plans which this WWMP addresses, and the entities collaborated with.

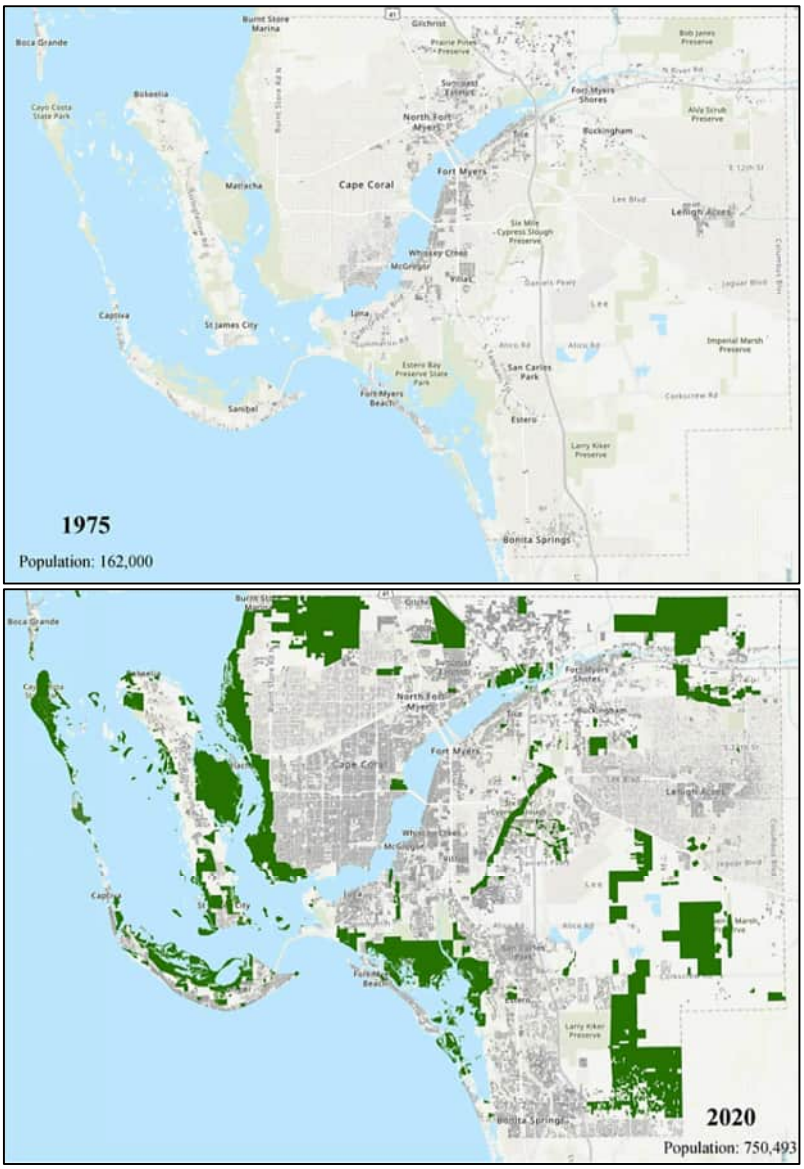
Figure 1-6: Relevant Studies, Regulatory Goals, and Collaboration

2. LEE COUNTY'S CENTRAL SEWER

Most of Lee County's significant growth occurred in the second half of the 20th century. Fort Myers, the County's seat, was mostly a farming and cattle community in the late 1860s and 70s and began developing a commercial core in the late 19th century. Cape Coral only started being developed as a pre-planned City in 1958 when the Rosen brothers of Maryland purchased tracts of land and formed the Gulf American Land Corporation (GALC) to begin developing and constructing the area. Bonita Springs was mainly a scattering of homesteaders leading up to the early 1930s.

Figure 2-1 illustrates the residential development in Lee County from 1975 to 2020.

Figure 2-1: Residential Development in Lee County from 1975 - 2020



Source: Population Growth in Lee County, FL Story Map

Prior to major development in the County, wastewater was managed by on-site septic systems and packaged plants for platted areas. With the population growth experienced in the County after the 1950s, the need for central sewer was realized across the County – at which time only the City of Fort Myers was incorporated in Lee County.

2.1 WASTEWATER UTILITIES IN LEE COUNTY

While the first established utility in Lee County was Lee County Utilities, it is worth noting the development of all other utilities in the County – both incorporated and unincorporated. **Table 2-1** presents a timeline of the establishment of wastewater utilities in the County.

Table 2-1: Select Dates for the Establishment of Wastewater Utilities in Lee County

1968	**Lee County Utilities is founded.**
Unknown	**Fort Myers Utility Department is established.**
1973	**Cape Coral Utilities Department is established.**
1991	**Water Company becomes Bonita Springs Utilities (BSU).**
	City of Sanibel owns sewer system.
2003	**FGUA acquires Lehigh Acres**
2010	**FGUA acquires North Fort Myers**
2013	**FGUA acquires South Seas**

Currently, there are 24 wastewater utility providers in Lee County. **Figure 2-2** shows the wastewater franchise areas in Lee County.

2.2 LEE COUNTY UTILITIES

A look at the County's wastewater GIS database shows that the first noted date for a sewer force main and lift station was in 1960. Starting as a small community water utility, Lee County Utilities (LCU) was founded in 1968. Ever since, LCU continued evolving and now provides services to more than a quarter million customers.

Today, LCU owns and operates a large and complex wastewater collection, conveyance, and treatment system. Serving a 180 square mile service area, LCU's wastewater system includes:

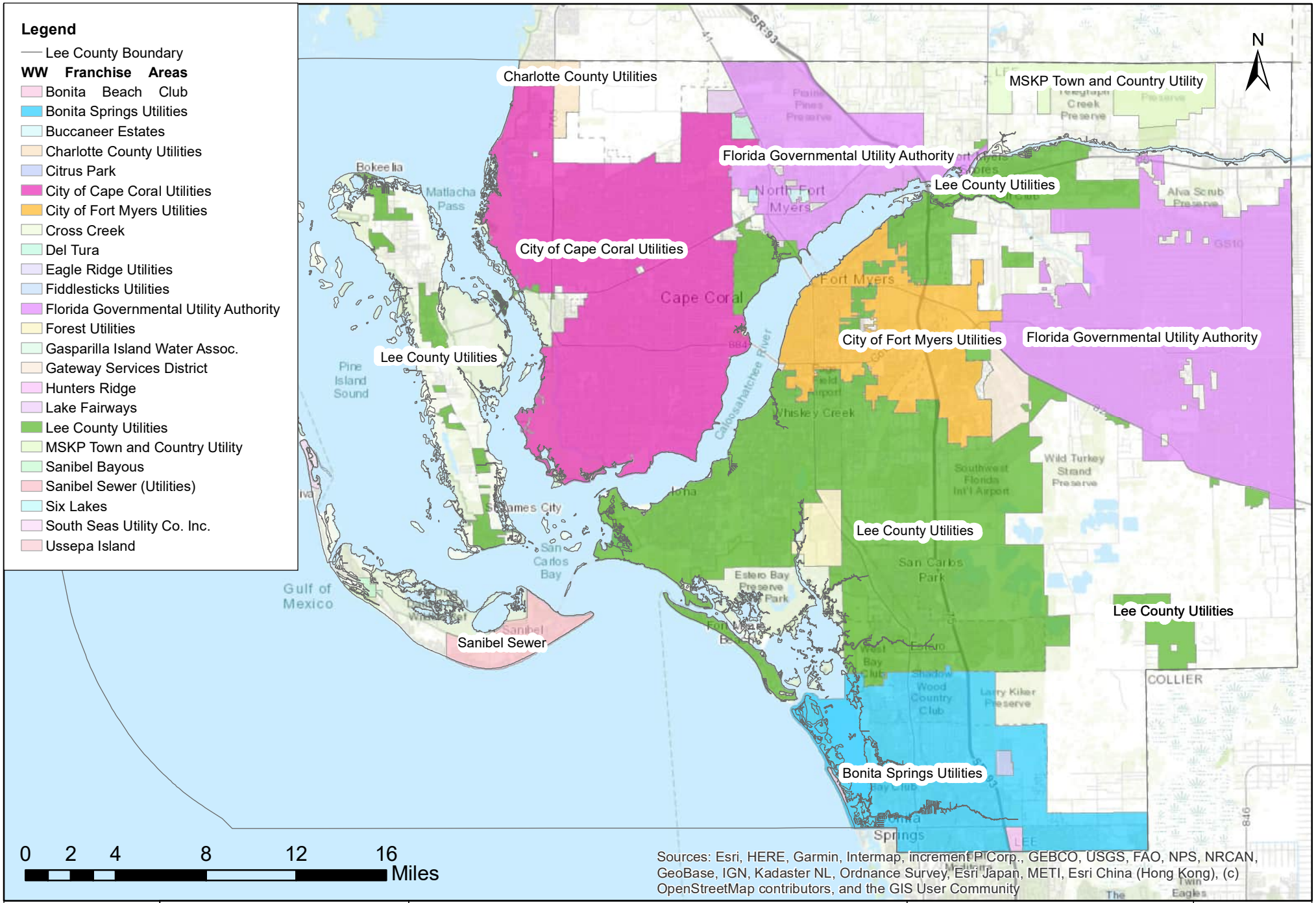
- Eight Water Reclamation Facilities (WRF)/Wastewater Treatment Facilities (WWTF), including:

  Six WRFs owned by LCU:

  - 5 MGD Fiesta Village Advanced WRF (AWRF)
  - 6 MGD Fort Myers Beach WRF
  - 3 MGD Gateway WRF
  - 0.383 MGD Pine Island WRF
  - 6 MGD Three Oaks WRF
  - 0.025 MGD High Point WRF

  Two Advanced WWTFs (AWWTF) owned by City of Fort Myers Utilities:

  - 11 MGD Fort Myers Central AWWTF, of which LCU is authorized to use 4.45 MGD.
  - 12 MGD Fort Myers South AWWTF, of which LCU is authorized to use 6.96 MGD.
- 1,093 wastewater lift stations (LS), consisting of:
  - 660 LCU-owned
  - 433 private stations
- 380 miles of LCU-owned force mains
- 750 miles of LCU-owned gravity mains
- 17,534 sewer manholes



Source:
FDOT and ESRI
Date July 2021
County: Lee

LEE COUNTY
SOUTHWEST FLORIDA

Countywide Wastewater Management Plan

Lee County Wastewater Franchise Areas

AECOM

Figure

2-2

3. EXISTING CONDITIONS AND SEWER INFRASTRUCTURE

3.1 OVERVIEW OF EXISTING CONDITIONS

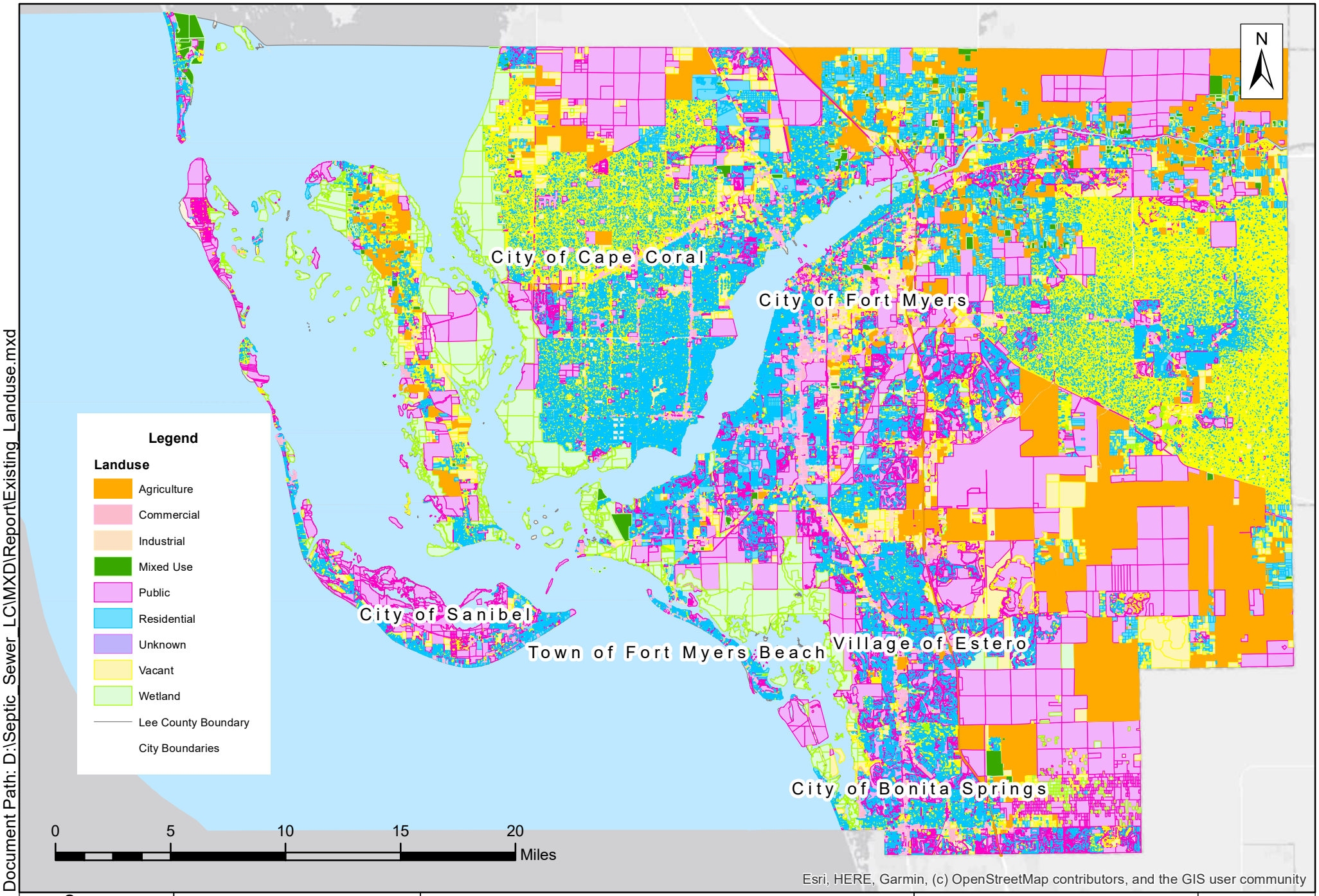
Lee County, Florida is Florida's 9th largest county with an estimated 2021 population of 787,976 people according to Census data. The County is predicted to maintain steady growth for the foreseeable future. The population almost doubled in the 1980s which led to high levels of residential development that included extensive septic tank installation. The location of these septic systems with reference to land use, BMAP areas, environmentally sensitive areas, and existing infrastructure feeds into determining the feasibility and priority of septic conversion. This subsection provides an overview of the existing conditions in Lee County.

With the County's consistent population growth, it is vital to make mindful development choices given the proximity of wetlands and impaired water bodies to residential, commercial, and industrial areas. Therefore, existing land use data and information was obtained by AECOM from the County's GIS open data portal. Existing land use in Lee County can be divided into 9 categories: agriculture, commercial, industrial, mixed use, public, residential, unknown, vacant, and wetland. **Figure 3-1** an overview map of Lee County's existing land use.

Within Lee County, there are impaired water bodies that are managed by Basin Management Action Plans. As mentioned previously, the two BMAPS contained with the County are the Caloosahatchee BMAP and the Everglades West Coast BMAP. Due to TMDLs developed in the BMAPs, septic systems within BMAP areas require more urgent intervention than others. The BMAP extents can be seen in **Figure 3-2**.

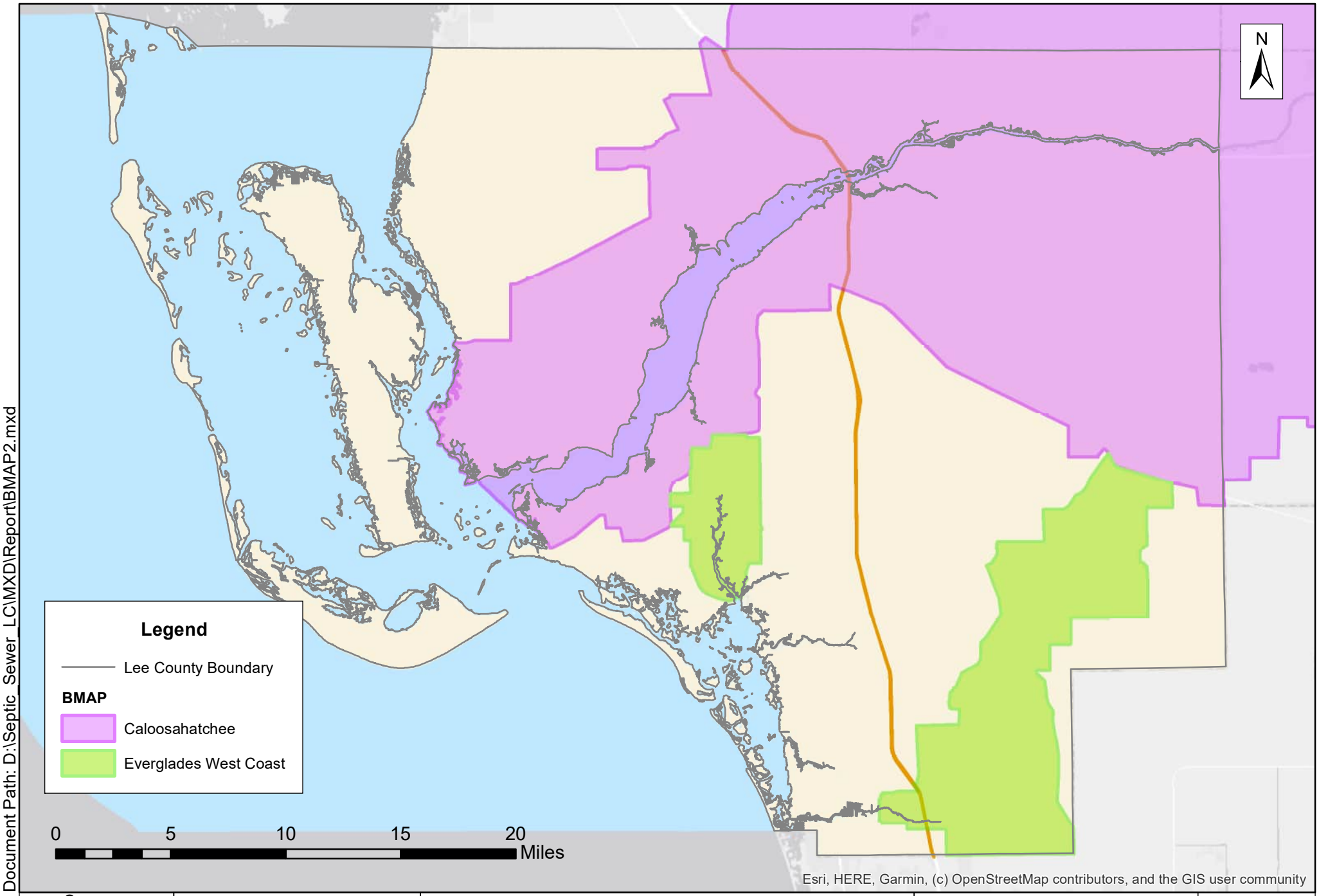
Other environmentally sensitive areas in the County include endangered animal habitats. An endangered animals database was located from the Florida Department of Environmental Protection's (FDEP) GIS open data portal in order to determine the species of greatest threat within the County. Three species identified to be threatened are Florida panthers, Florida woodstorks, and bald eagles. The habitats and active nests of these animals can be seen in **Figure 3-3**. Identification and consideration of these habitats will be critical during the construction that will arise from proposed projects in this CWMP as there are regulations governing construction activities in proximity to these habitats.

Proximity of infrastructure to the septic conversion areas is an indicator of feasibility of connection to the centralized sewer system and will be reflected in the cost of the planned areas. An inventory of LCU's existing wastewater infrastructure is displayed in **Figure 3-4**.



Document Path: D:\Septic_Sewer_LC\MXD\Report\Existing_Landuse.mxd

Source: FDOT and ESRI Date July 2021 County: Lee	Lee County Southwest Florida	**Countywide Wastewater Management Plan** **Lee County Existing Land Use**	AECOM	**Figure** **3-1**



Document Path: D:\Septic_Sewer_LC\MXD\Report\BMAP2.mxd

Source:
FDOT and ESRI
Date July 2021
County: Lee

Lee County Southwest Florida

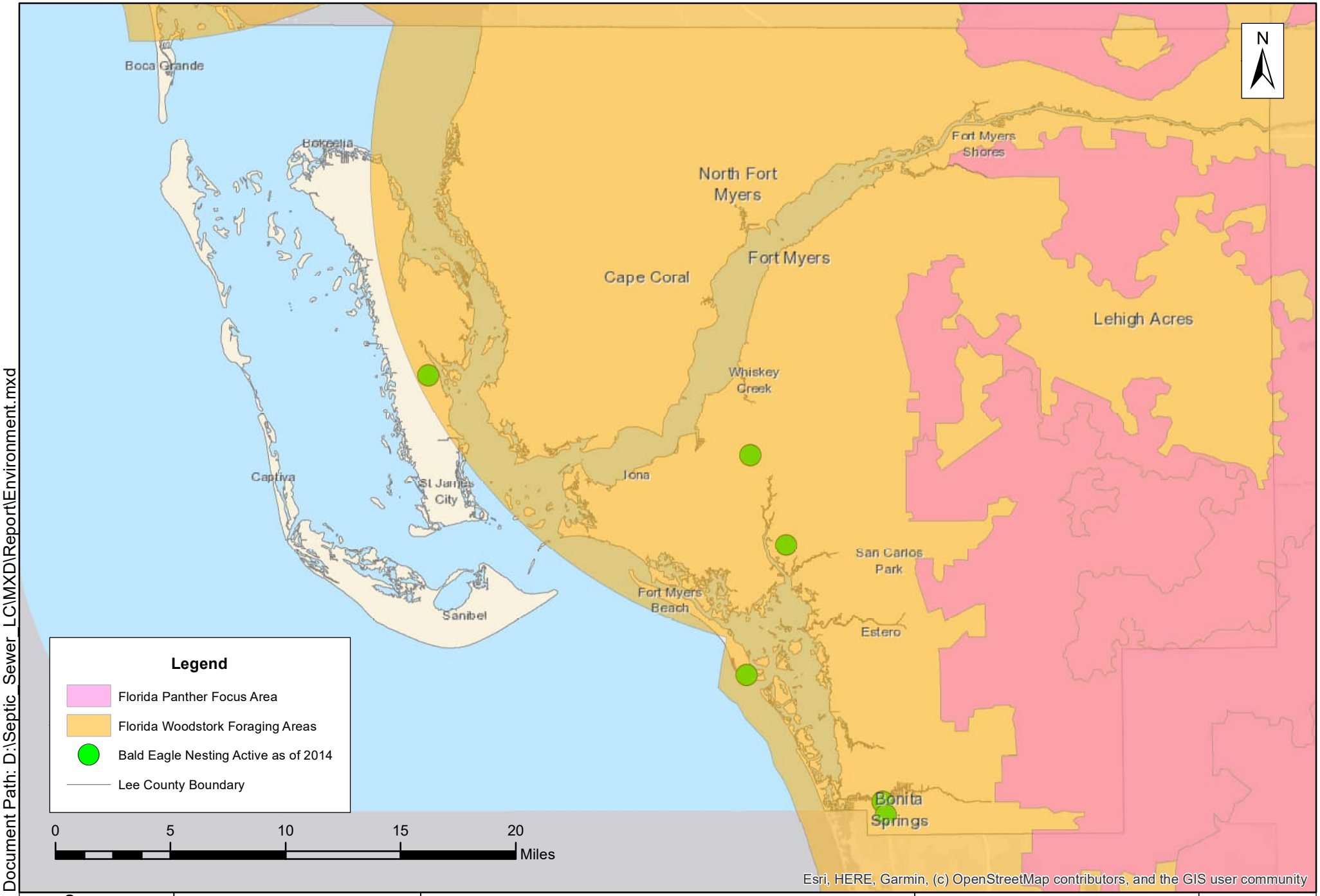
Countywide Wastewater Management Plan

BMAP Areas

AECOM

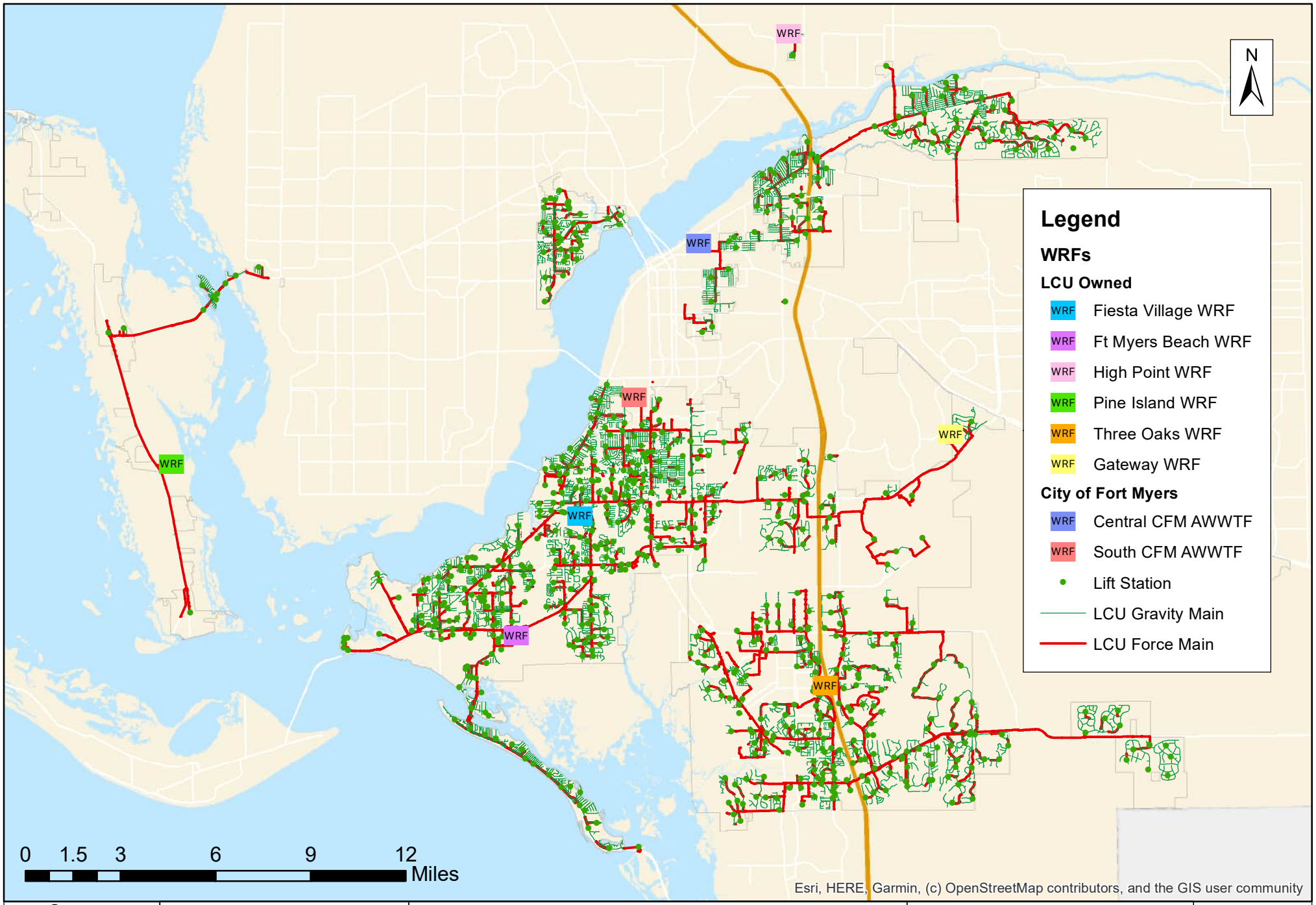
Figure

3-2



Document Path: D:\Septic_Sewer_LC\MXD\Report\Environment.mxd

Source: FDOT and ESRI Date July 2021 County: Lee	Lee County Southwest Florida	**Countywide Wastewater Management Plan** **Endangered Animal Habitat**	AECOM	**Figure** **3-3**



Source: FDOT and ESRI Date July 2021 County: Lee	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **LCU Existing Wastewater Infrastructure**	AECOM	**Figure** **3-4**

3.2 SEPTIC SYSTEM INVENTORY

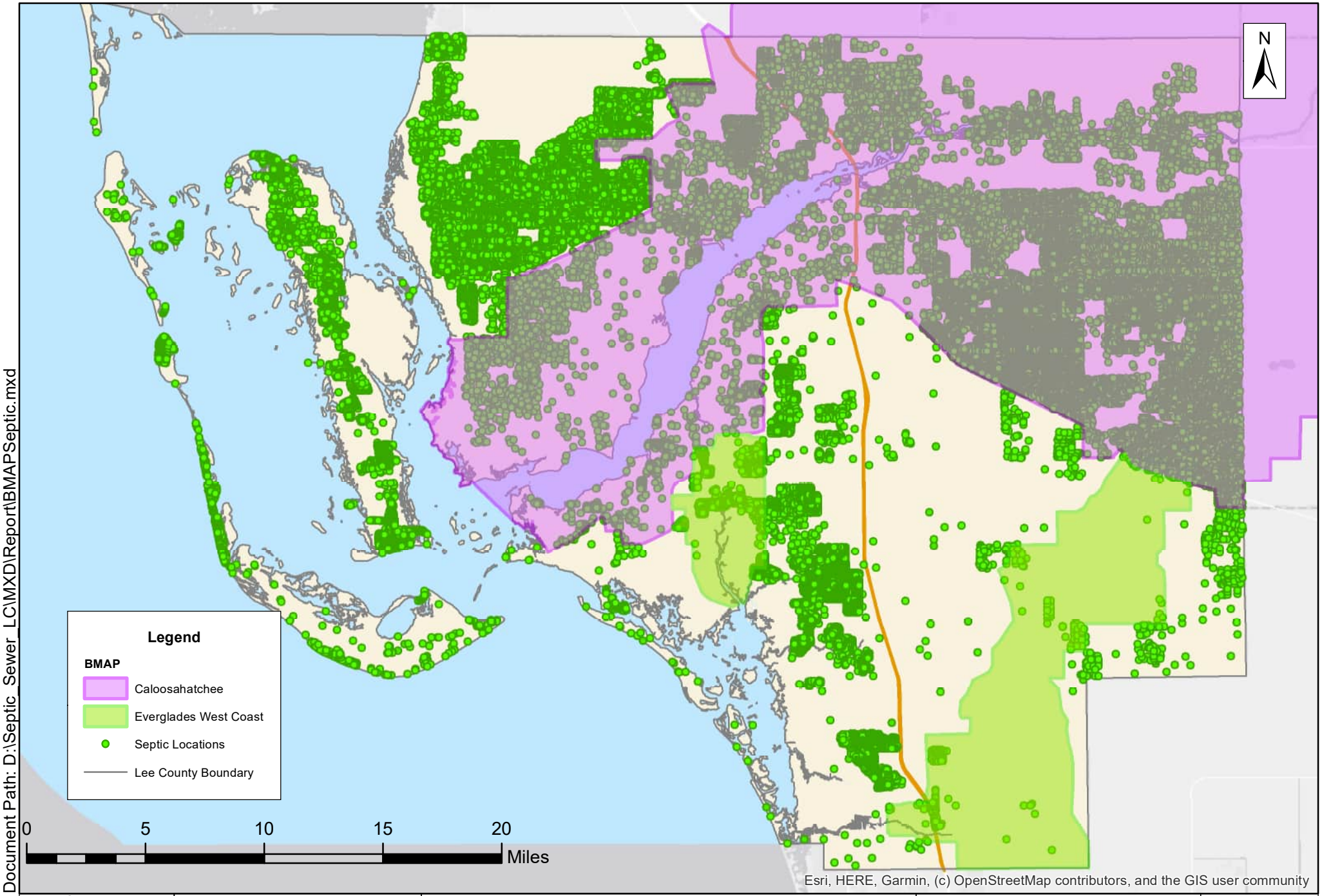
Prior to the transfer of the Onsite Sewage Program to the Department of Environmental Protection (DEP) as required by SB 712, the program was managed by the Department of Health (DOH). The County health departments, part of the Florida DOH (FDOH), continue their role in the permitting, inspection, data management, and tracking of OSTDS under the direction of the DEP.

Therefore, the septic system inventory in Lee County was obtained from the FDOH's data portal. Within the Florida Department of Health's (FDOH) data portal, there is a database containing septic tank permitting information. The latest date of data collected within that septic system inventory for Lee County was 2015, although the data was published in 2017. Consequently, AECOM downloaded the addresses of all new septic tank permits issued from 2016 to 2020 in excel spreadsheet form from the FDOH's database. These addresses were then geocoded, a tool in GIS that matches addresses with the geographical location, latitude, and longitude, according to the ESRI worldwide geographical database. Points received from geocoding were compared with the data received from FDOH and any missing addresses were accounted for in order to determine accurate and current septic densities through the year 2020.

However, the septic system inventory used for this CWMP was provided by County staff as a 'cleaned-up' version of the FDOH data. County staff informed AECOM that the data was edited to take out septic systems that have been abandoned and connected to sewer. The inventory provided by the County is dated in 2015, which corresponds to the date of the inventory published in the FDOH database.

As previously mentioned, it is helpful to correlate the location of septic systems in the County with existing conditions. **Figure 3-5** provides a map showing septic systems overlayed onto the BMAP areas. A high septic permit density can be seen within the Caloosahatchee BMAP.

Septic permit density was also overlayed onto wastewater franchise area polygons provided by the County. In **Figure 3-6**, the concentration of septic permits can be seen within the Lee County Franchise Area and Florida Governmental Utility Authority (FGUA). Determining the wastewater franchise areas that septic systems are in is a necessary step in determining required communications and coordination with other franchises and identifying optimal discharge points for projected flows.



Document Path: D:\Septic_Sewer_LC\MXD\Report\BMAPSeptic.mxd

Source:
FDOT and ESRI
Date July 2021
County: Lee

Lee County Southwest Florida

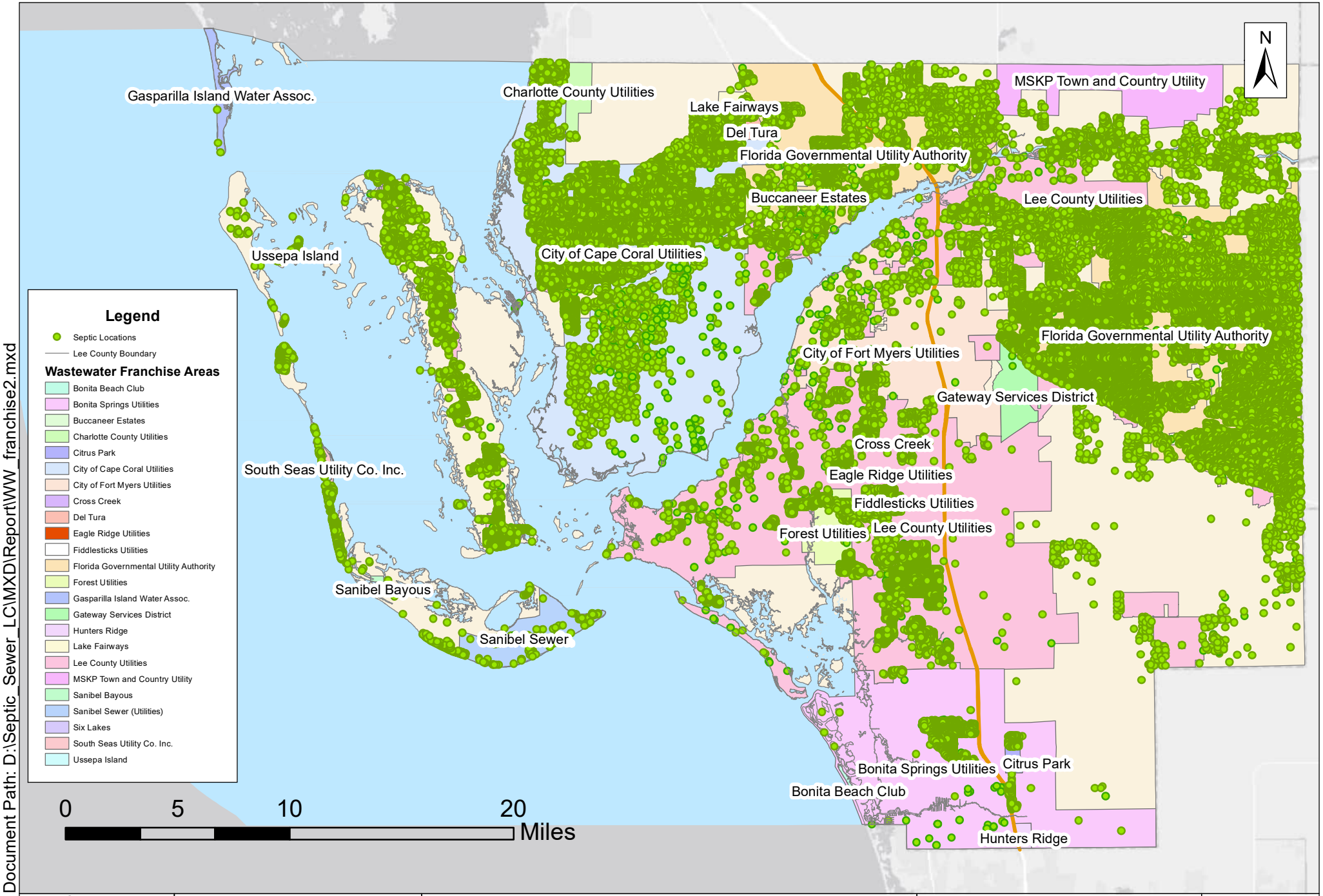
Countywide Wastewater Management Plan

Septic Locations Within the BMAP

AECOM

Figure

3-5



Document Path: D:\Septic_Sewer_LC\MXD\Report\WW_franchise2.mxd

Source:
FDOT and ESRI
Date July 2021
County: Lee

Lee County Southwest Florida

Countywide Wastewater Management Plan

Septic within Wastewater Franchise Areas

AECOM

Figure

3-6

3.3 SUMMARY AND LOCATION OF LCU SEWER INFRASTRUCTURE

The scope of work for this CWMP includes performing a comprehensive analysis of the County's existing wastewater system. The comprehensive analysis will be used in later efforts of this CWMP for a desktop evaluation of the WRFs, treatment capacity gap analysis, and identification of required system expansions. This subsection provides both an overview of the County's existing treatment facility and provides a detailed description of the WRFs in the County's wastewater system.

3.3.1 Overview of All Wastewater Treatment Facilities in Lee County

In addition to the LCU owned WRFs identified in Chapter 2, a search was conducted using the FDEP permitting database to identify additional wastewater treatment facilities within Lee County including small privately owned or municipal owned package facilities as well as facilities owned by FGUA. The results of this search are shown in **Table 3-1**, including information about each facility's ownership, permitted capacity, permit expiration date, as well as a summary of wastewater treatment and effluent disposal.

Table 3-1: Lee County Wastewater Treatment Facilities

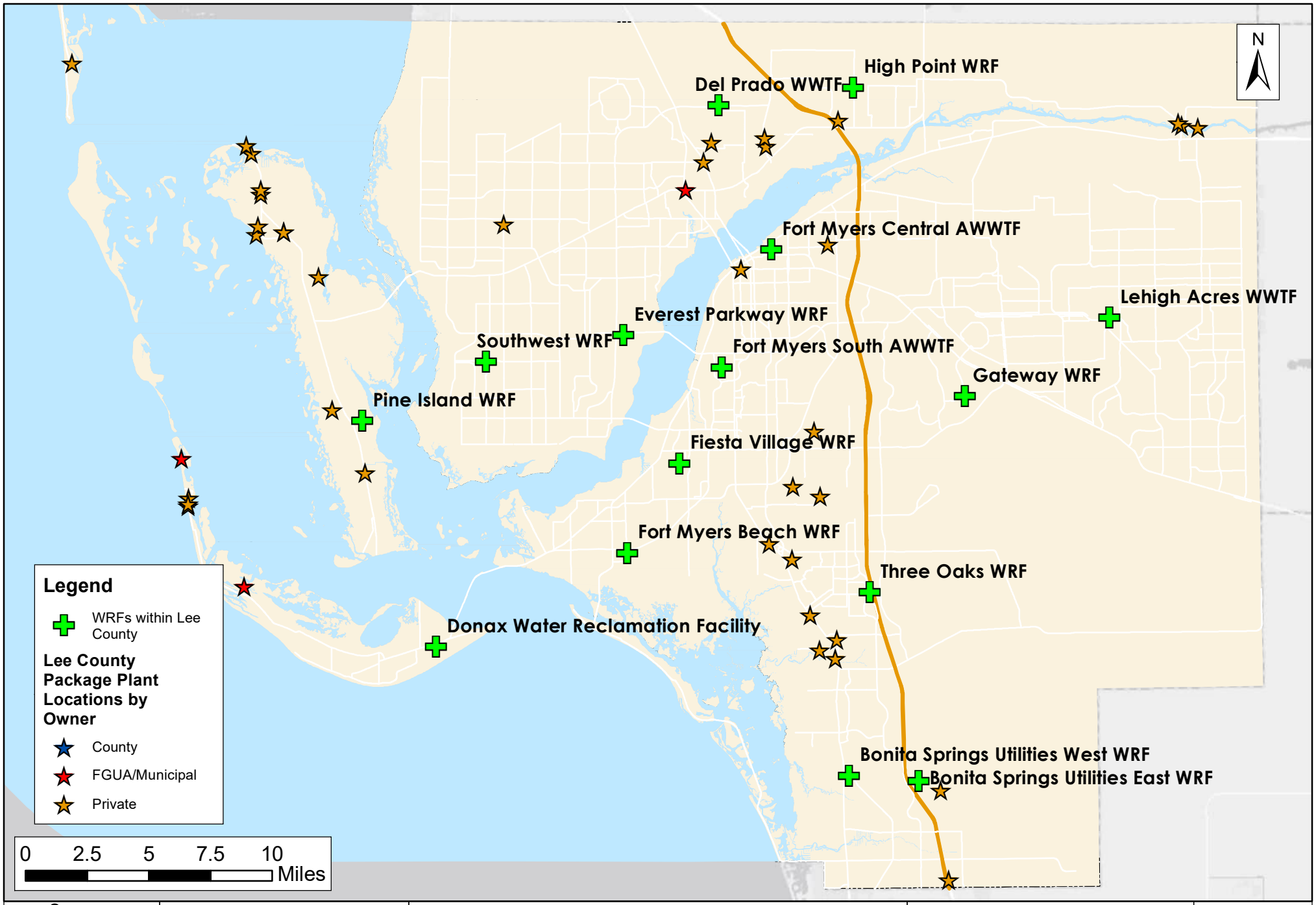
Facility Name	Facility Ownership	Capacity from Permit (MGD)	Treatment and Effluent Disposal Info	Permit Expiration
Everest Parkway WRF	Municipal	15.100	5 Stage Bardenpho Process and High-Level Disinfection to Reuse System	11/29/2022
Southwest WRF	Municipal	15.000	4 Stage Activated Sludge with Nutrient Removal and High-Level Disinfection to Reuse System	10/24/2026
Fort Myers South AWWTF	Municipal	12.000	Bardenpho Process Oxidation Ditch with Effluent to Caloosahatchee River	6/11/2022
Fort Myers Central AWWTF	Municipal	11.000	Bardenpho Process Oxidation Ditch with Effluent to Caloosahatchee River	6/11/2022
Bonita Springs Utilities East WRF	Municipal	9.749	MLE/biomembrane with High Level Disinfection	7/30/2024
Fort Myers Beach WRF	County	6.000	Contact Stabilization to Reuse System with Perc Pond Backup - No Discharge	9/29/2024
Fiesta Village WRF	County	5.000	Contact Stabilization to Surface Water Discharge and Golf Course Irrigation	2/18/2024
Del Prado WWTF	FGUA	4.25	Oxidation Ditch to Spray-Irrigation	11/12/2022
Bonita Springs Utilities West WRF	Municipal	4.250	Oxidation with Filtration and Chemical Addition to Spray Irrigation and Perc Ponds	6/16/2026
Gateway WRF	County	3.000	Slow Rate Public Access Application System	8/17/2026
Lehigh Acres WWTF	FGUA	2.760	Contact-Stabilization to Retention Pond	4/7/2024
Donax Water Reclamation Facility	Municipal	2.375	Contact Stabilization to Tertiary Filtration to Golf Course Irrigation	4/12/2023
Three Oaks WRF	County	1.357	Extended Aeration to Golf Course Irrigation	6/21/2022
Gasparilla Island Water Domestic DIW	Private	0.705	Contact-Stabilization to Retention Pond to Spray Irrigation and/or Injection Well	7/2/2024
Pine Island WRF	County	0.492	Post Anoxic Activated Sludge with High-Level Disinfection	9/29/2024
Eagle Ridge WWTP	Private	0.318	Dual Ring Steel Stp's, Extended Aeration with Effluent to Golf Course. Provides High Level Disinfection	3/29/2023
Lake Fairways WWTP	FGUA	0.300	Extended Aeration to Percolation Ponds or Spray-Irrigation	9/6/2022
South Seas Plantation	FGUA	0.264	Contact Stabilization/Conventional Activated Sludge. Treatment Includes Bar Screening, Aeration, Clarification, Disk Filter Units, and Chlorine Disinfection. A Reject Storage Tank is Located on Site. Effluent is Disposed in an Injection Well or Reused	3/29/2026
Cross Creek WWTF	Private	0.249	Extended Aeration, Sand Filters with Effluent to Storage Tanks, then to Golf Course	4/23/2023
Citrus Park North	Private	0.199	Contact-Stabilization to Polishing Pond & 2 Perc Ponds	7/13/2026
Fiddlesticks Country Club	Private	0.150	Contact Stabilization with Effluent to Golf Course Irrigation	12/13/2025
Wulfert Point WWTP	Municipal	0.125	Extended Aeration with High Level Disinfection and Reuse System	5/14/2014

Facility Name	Facility Ownership	Capacity from Permit (MGD)	Treatment and Effluent Disposal Info	Permit Expiration
River Trails Mobile Home Park	Private	0.097	Contact Stabilization to Remote Dual Perc Cells	8/12/2025
Isles of Pines Sub-Division	Private	0.0827	Extended Aeration with Basic Disinfection and Filters	4/11/2026
Hunter's Ridge WWTP	Private	0.079	0.079 MGD Extended Aeration Process And 0.100 MGD Contact Stabilization Process	8/21/2023
Cypress Bend RV Resort	Private	0.065	Extended Aeration with Basic Disinfection	1/16/2024
Pine Island Cove	Private	0.050	Extended Aeration to Perc Pond	10/30/2029
Captain's Cove	Private	0.040	Extended Aeration to a Drain field	3/31/2023
Fort Myers Campground	Private	0.040	Extended Aeration to Single Perc Pond Includes a Groundwater Monitoring Plan	12/22/2024
Tween Waters Inn WWTP	Private	0.040	Extended Aeration to Drain field	12/6/2027
Woodsmoke Camping Resort	Private	0.040	Extended Aeration to Polishing & Perc Ponds	11/22/2024
Pine Island KOA	Private	0.035	Extended Aeration to Dual Percolation Cells	6/11/2023
Tahiti Mobile Village	Private	0.030	Extended Aeration to Retention Pond	8/24/2024
High Point WRF	County	0.025	Contact Stabilization to Polishing Pond and Dual Retention Ponds	12/16/2025
Mariner High School	Private	0.025	Extended Aeration to Perc Ponds	3/29/2026
Blue Crab Key Condo	Private	0.025	Contact-Stabilization/Trickling Filter To Absorption Field (Flow Ltd. To 0.01 MGD)	12/12/2030
Granada Lakes RV WWTP	Private	0.025	Extended Aeration in Five Aeration Tanks, with Clarifier, Chlorine Contact Chamber, Sludge Digester, and a Surge Tank. Effluent is Reused in Perc Ponds	5/17/2026
Shady Acres Travel Park #2	Private	0.025	Extended Aeration to Polishing & Dual Retention Ponds	6/17/2022
Sunset Captiva WWTP	Private	0.025	Extended Aeration Effluent to Sand filter to a Drain field	10/23/2026
Swan Lake Mobile Home Park	Private	0.025	Extended Aeration to Perc Pond	4/14/2025
The Palms at Pine Island	Private	0.025	Extended Aeration with Basic Disinfection	8/13/2023
Alva Schools AKA: Alva Elem /Middle	Private	0.020	Extended Aeration to Dual Ponds	6/5/2026
Oak Park Mobile Home Village	Private	0.020	Extended Aeration and Chlorination for Disinfection with Effluent Disposal by Percolation	5/17/2023
Sunny Grove Park Inc	Private	0.020	Extended Aeration to Spray Irrigation	10/20/2024
Useppa Island WWTP	Private	0.020	Extended Aeration with Effluent to Polishing & Perc Ponds	8/20/2025
Charleston Park STP	Private	0.015	Extended Aeration	1/16/2023
Four Winds Marina	Private	0.015	Extended Aeration Process	1/24/2023
Julia Park	Private	0.015	Extended Aeration - Effluent to Perc Pond	7/7/2024
Tropic Isles RV Resort	Private	0.015	Extended Aeration to Perc Pond	8/30/2025
Bokeelia Island Club	Private	0.012	Capacity: 0.012 MGD. Category III Class C Extended Aeration Plant Providing Basic Disinfection. Disposal system: Two Absorption Beds	5/10/2023
Safety Harbor Club Village	Private	0.012	Extended Aeration	9/16/2024
Captiva Shores Condominium WWTP	Private	0.010	Extended Aeration to a Drain field	5/13/2025
Seminole Campground	Private	0.010	Extended Aeration to Three Perc Ponds	11/11/2024
Calusa Cove WWTP FKA Shady Acres Mobile Home Sd	Private	0.009999	Extended Aeration	8/2/2026

Facility Name	Facility Ownership	Capacity from Permit (MGD)	Treatment and Effluent Disposal Info	Permit Expiration
Labontes Garden RV Park WWTP	Private	0.005	Extended Aeration to Perc Pond	4/21/2024

As shown in **Table 3-1**, there are 55 facilities in total in Lee County, 14 of which are owned by the County or municipalities, 4 are facilities owned by FGUA, and 37 are small privately owned facilities.

Figure 3-7 below shows a map the locations of each of the facilities identified in **Table 3-1.**



Source:
FDOT and ESRI
Date April 2021
County: Lee

LEE COUNTY
SOUTHWEST FLORIDA

Countywide Wastewater Management Plan

Lee County Wastewater Treatment Facilities and Package Plants

AECOM

Figure

3-7

The green crosses shown on the map represent wastewater treatment facilities within the County with a permitted treatment capacity of 1 MGD or larger. Please note that High Point WRF, which has a permitted capacity of 0.025 MGD, is also represented as a green cross because this plant was identified for historical data analysis in this project. The stars shown on the map represent facilities that have a permitted capacity of less than 1 MGD. These facilities are being considered as package facilities. The stars are color coded to show ownership.

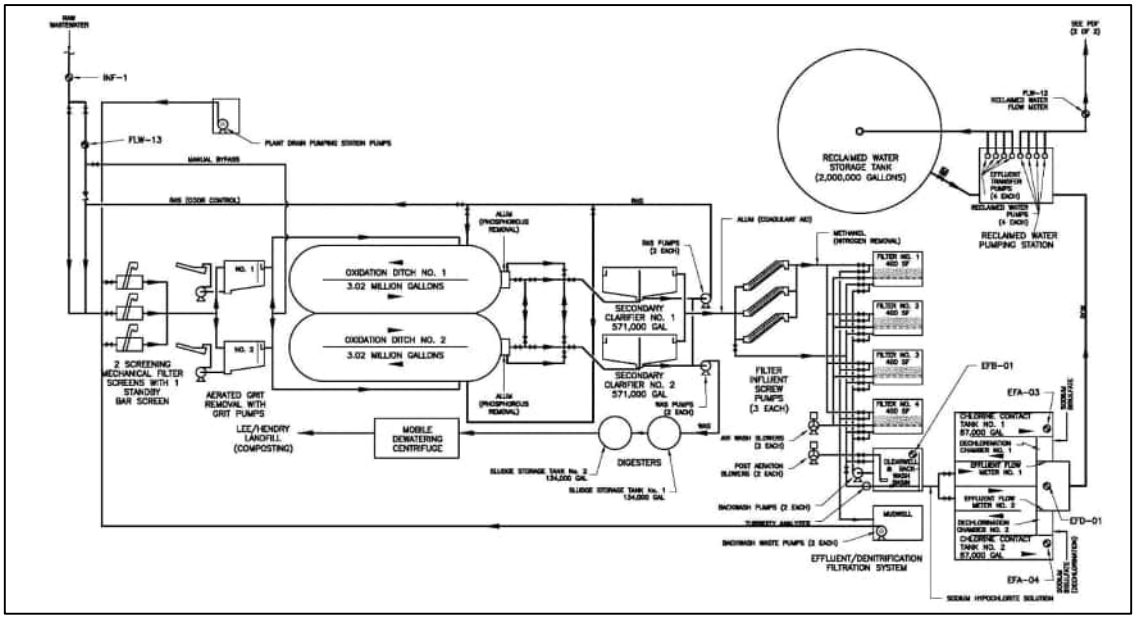
3.3.2 Description of Water Reclamation and Wastewater Treatment Facilities

FIESTA VILLAGE WRF

The Fiesta Village WRF is located in Fort Myers and was originally built in 1968 as a packaged treatment plant prior to transitioning to the advanced wastewater treatment plant that exists today. The water reclamation facility initially possessed a treatment capacity of 2.5 MGD in 1984 but has since been expanded to 5.0 MGD (AADF) as of 2001. The service area of Fiesta Village WRF consists of the east-central section of Lee County, and ranges south of Winkler Rd up to Brantley Rd, and west of A & W Bulb Rd to S Cleveland Ave (Fiesta Village WRF White Paper, n.d.). The service area does not include any master pump stations (Fiesta Village WRF White Paper, n.d.) and is instead comprised of 194 lift stations (LCU and private) independently directing flows to the facility. Approximately 265,830 feet of force main spans across the facility's service area (Black and Veatch, 2020).

The major process units at the facility's headworks include two mechanical bar screens and an additional standby bar screen, two grit removal units, and an odor control system. Biological treatment is provided by two oxidation ditches, and subsequent solids settling via two secondary clarifiers. An alum feed system is included to aid in phosphorus removal. Additional filtration needs are satisfied by four dentification filters prior to disinfection within two chlorine contact tanks using sodium hypochlorite (Florida Department of Environmental Protection (FDEP), 2019a). Biosolids handling consists of two aerobic digesters and a mobile dewatering centrifuge (Fiesta Village WRF White Paper, n.d.). A process flow diagram of the facility is provided below in **Figure 3-8**.

Figure 3-8: Process Flow Diagram of Fiesta Village WRF



From "Fiesta Village WRF White Paper", n.d.

The facility's current FDEP Operating Permit, No. FL0039829, has been active since February 19, 2019, and will expire in February of 2024 (FDEP, 2019a). Treated effluent is permitted to be discharged into the Caloosahatchee River but is preferred to be used in land applications as reclaimed water. Reclaimed water is either distributed to reuse customers within the facility's reuse service area or delivered to customers serviced by Fort Myers Beach WRF. A wastewater interconnect situated at the corner of Summerlin Rd and Bass Rd permits the transfer of reuse flows to Fort Myers Beach WRF service area. Excess treated effluent may also be stored in the facility's 2-MG storage tank. In addition to these permitted effluent options, deep well injection is anticipated to be included in the future and will include a shared aquifer storage recovery system (Fiesta Village WRF White Paper, n.d.).

Various facility improvements have previously been completed or are currently being pursued at Fiesta Village WRF. Included among these improvements are the following, which are referenced from the Fiesta Village WRF White Paper (n.d.):

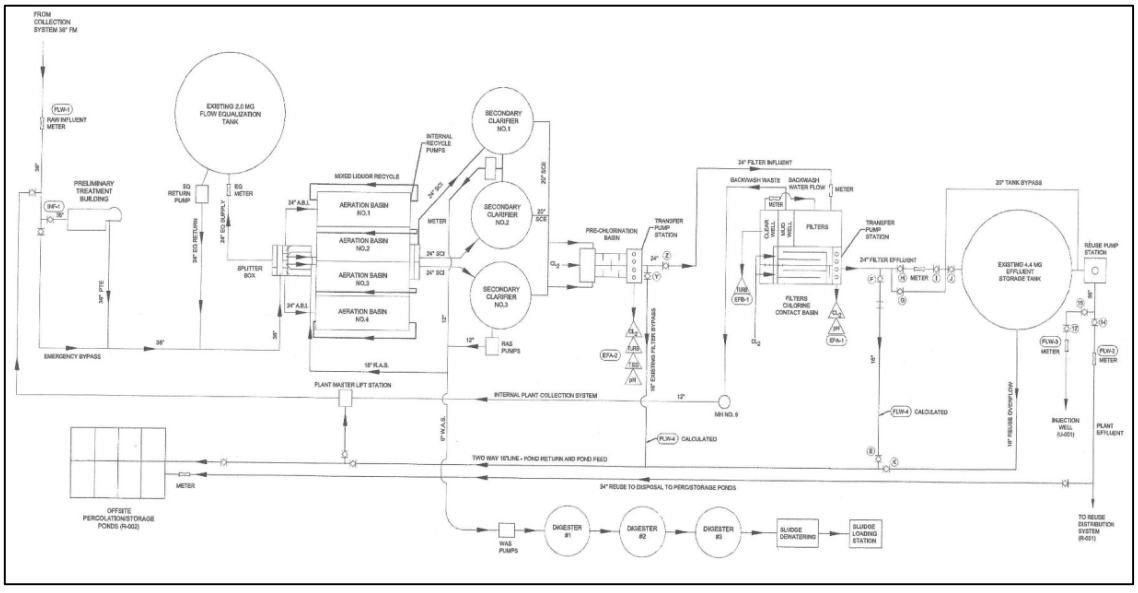
- Filter control upgrade construction. Includes new valves, electrical wiring, and instrumentation
- Installation of emergency screw pump bypass
- Motor control center room upgrades
- Replacement of mechanical parts for Clarifier #2
- Construction of a new permanent centrifuge. Includes new housing structure and replacement and relocation of sodium hypochlorite station
- Reuse ASR Test well construction and piping design
- Deep-injection well and reuse line design. Reuse line is to be shared with Fort Myers Beach WRF

FORT MYERS BEACH WRF

The Fort Myers Beach WRF is a 6.0 MGD (AADF) activated sludge treatment plant located in Fort Myers Beach. The facility was originally built in 1977 and currently operates and manages the southwest section of Lee County. This service area includes parts of Estero Blvd as well as the areas around Iona Rd and McGregor Blvd (Fort Myers Beach WRF White Paper, 2019). The facility operates under FDEP Permit No. FLA144215 and is permitted to accept biosolids from other LCU plants per its designation as a biosolids facility. The permit has been effective since September 30, 2019 and has a duration of five years prior to expiration (FDEP, 2019b). Wastewater influent is transferred to the facility via a capture and conveyance system consisting of 210 lift stations (LCU and private) and 336,411 feet of force main (Black and Veatch, 2020).

Biological treatment at the facility is performed within four aeration basins with pretreatment consisting of influent screening, grit removal, and flow equalization. Solids settling is provided by three secondary clarifiers prior to filtration and subsequent disinfection via two chlorine contact tanks. With regarding to biosolids management, process units include a gravity thickener, three aerobic digesters, and two belt filter presses (FDEP, 2019b). The facility's process flow diagram is shown below in **Figure 3-9**.

Figure 3-9: Process Flow Diagram of Fort Myers Beach WRF



From "Fort Myers Beach WRF White Paper", June 2019.

Reclaimed water produced by the facility is directly distributed to reuse customers or stored in a 4.4-MG effluent ground storage tank. During periods of low demand, reuse water is diverted to offsite percolation ponds with a permitted capacity of 0.55 MGD (AADF), or to a 7.92 MGD (AADF) Class I underground injection well (FDEP, 2019b; Fort Myers Beach WRF White Paper, 2019).

Various facility improvements have previously been completed or are currently being pursued at Fort Myers Beach WRF. Included among these improvements are the following, which are referenced from the 2019 Fort Myers Beach WRF White Paper:

- Containment areas construction for secondary contaminants such as bleach and caustic soda
- Deep-Injection Well #2 design
- Replacement of main switchgear
- Replacement of belt press
- Replacement of equalization tank
- Improvements to odor control system

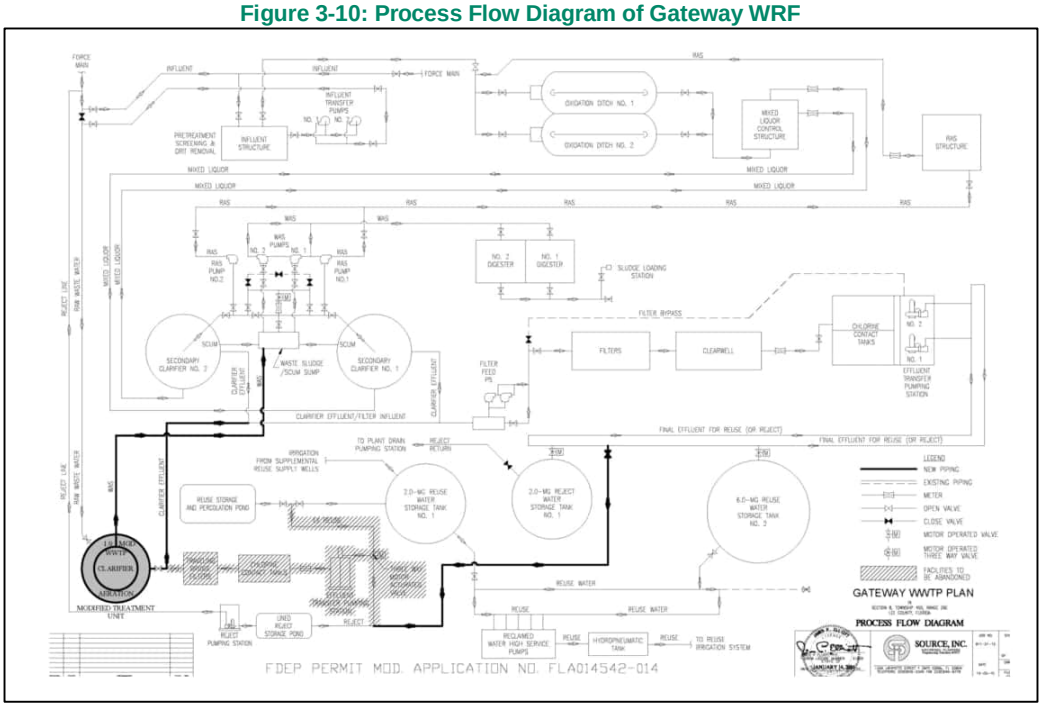
GATEWAY WRF

The Gateway WRF is located in Fort Myers and was originally built in 1991 as a DAVCO™ dual-path steel-ring plant. In 2010, a separate conventional treatment plant was constructed in addition to the DAVCO™ plant, with a permitted capacity of 2.0 MGD. As a part of the FDEP authorization to build the treatment plant, the DAVCO™ plant was rehabilitated in 2017, and is individually capable of treating 1.0 MGD. In total, Gateway WRF has a permitted capacity of 3.0 MGD (AADF) (Gateway WRF White Paper, n.d.).

The facility's service area is comprised of the Gateway Service District area, JetBlue Park, as well as the RSW Airport and its accommodating industrial park (Gateway WRF White Paper, n.d.). The capture and conveyance system includes 33 lift stations (LCU and private) and 85,709 feet of force main. The service area does not include any master lift stations and all lift stations individually direct flow to the facility (Black and Veatch, 2020). The facility operates under FDEP Permit No. FLA014542 which has been active since August 18, 2021 and includes a 5-year duration until expiration (FDEP, 2021).

For the 2.0 MGD plant, the headworks is comprised of two mechanical bar screens, a grit removal system, and an odor control system. Two oxidation ditches and two secondary clarifiers provide biological treatment and solids removal respectively. Secondary effluent undergoes filtration by three sand bed filters prior to disinfection via sodium hypochlorite in a chlorine contact chamber (Gateway WRF White Paper, n.d.). For the 1.0 MGD plant, the DAVCO™ treatment unit consists of an aerated outer ring compartment for biological treatment, and an interior central-located clarifier for solids settling. Prior to entering the treatment unit, flow may pass through the main plant's headworks or be bypassed entirely. Flow exiting the treatment unit follows the same remaining treatment processes as the main plant (Gateway WRF White Paper, n.d.). A process flow diagram of the facility's plants is provided in **Figure 3-10**.

Figure 3-10: Process Flow Diagram of Gateway WRF



From "Gateway WRF White Paper", n.d.

The facility's sole form of effluent disposal is reclaimed water reuse via land application. Effluent flow is either stored in the facility's two reuse storage tanks or single reuse storage pond or distributed to reuse customers

within the facility's 3.0 MGD (AADF) permitted capacity reuse service area (FDEP, 2021; Gateway WRF White Paper, n.d.).

Various facility improvements have previously been completed or are currently being pursued at Gateway WRF. Included among these improvements are the following, which are referenced from the Gateway WRF White Paper (n.d.):

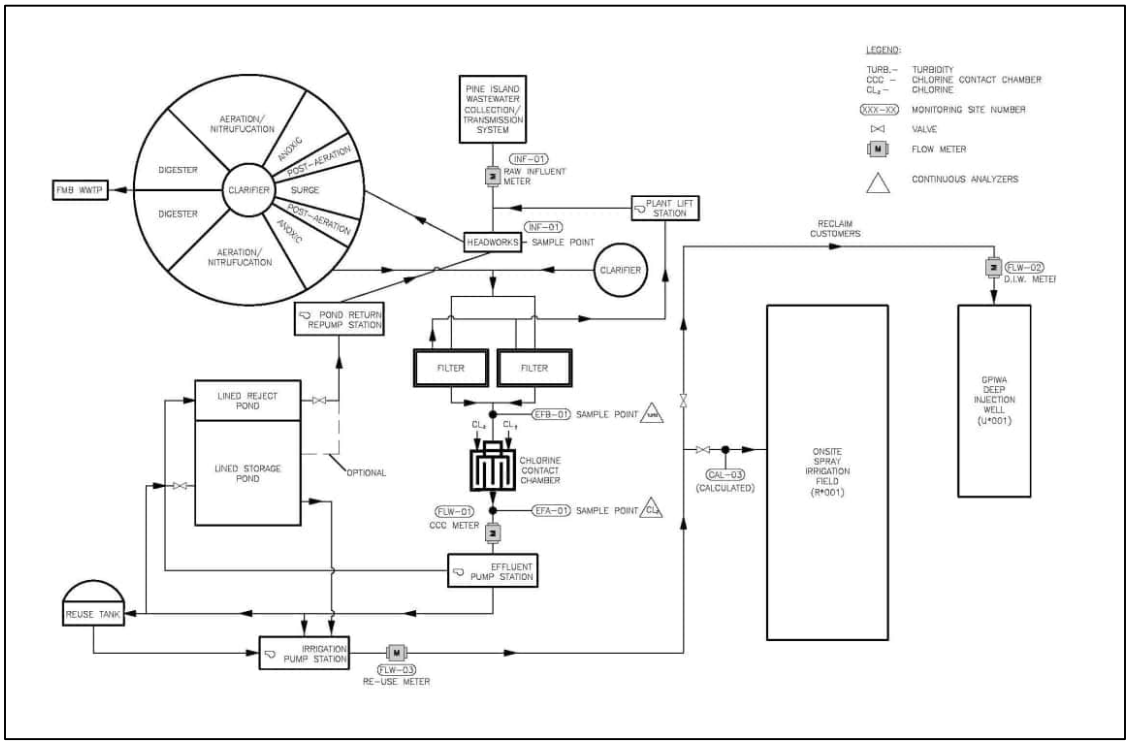
- Design and construction of a bleach containment area
- Design and construction of a canopy structure for the mobile centrifuge unit
- Gateway facility expansion project

PINE ISLAND WRF

The Pine Island WRF was built in 2001 and is located in St James City. The facility was originally built in Matlacha in 1982 but was relocated to its current location on Pine Island in 2001. The facility's design capacity is established at 0.5 MGD. However, the recent removal of one of the on-site spray fields as a discharge site, restricted the facility's permitted capacity to 0.383 MGD (AADF) due to disposal limitations (Pine Island WRF White Paper, n.d.). The facility is operated under FDEP Permit No. FLA176460 for an active duration of 5 years, having gone into effect on September 30, 2019 (FDEP, 2019c). The service area of Pine Island WRF consists of Matlacha, Pine Island, and a minor segment at the SW Pine Island Rd and Veterans Pkwy intersection (Pine Island WRF White Paper, n.d.). Included within the facility's capture and conveyance system are 40 lift stations (LCU and private) and 91,078 feet of force main (Black and Veatch, 2020). The lift stations direct flow to two master pump stations (Pine Island WRF White Paper, n.d.).

The facility's major process unit consists of a circular activated sludge treatment tank with outer-ring aerobic, anoxic, and digester treatment compartments, and a central clarifier. The facility also possesses a stand-alone clarifier, two disk filters, and two chlorine contact tanks with a sodium hypochlorite feed system (FDEP, 2019c). As the facility does not possess an on-site biosolids dewatering system, aerobically digested solids are transported to Fort Myers Beach WRF for further handling (Pine Island WRF White Paper, n.d.). A process flow diagram of the facility is provided in **Figure 3-11.**

Figure 3-11: Process Flow Diagram of Pine Island WRF



From "Pine Island WRF White Paper", n.d.

Effluent flow generated by the facility is stored in either a 0.5-MG reuse tank, a 1.0 MG reject storage pond, or a 10-MG reuse pond, reused as irrigation for the on-site spray fields, or disposed of in the 0.492 MGD (monthly average daily flow) deep injection well shared with the Greater Pine Island Water Association (FDEP, 2019c; Pine Island WRF White Paper, n.d.).

Various facility improvements have previously been completed or are currently being pursued at Pine Island WRF. Included among these improvements are the following, which are referenced from the Pine Island WRF White Paper (n.d.):

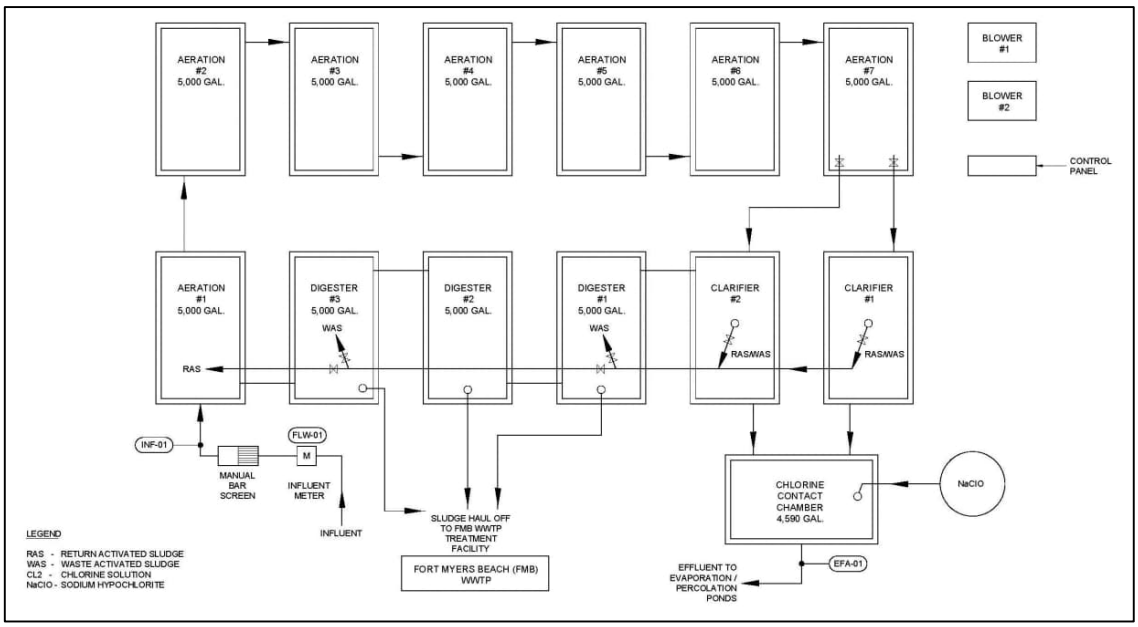
- Headworks rehabilitation and installation of new standby bar screen
- Drains installation for the facility's reuse tank and aerobic digesters

HIGH POINT WRF

The High Point WRF is located in North Fort Myers with a permitted capacity of 0.025 MGD (AADF). The facility was originally built in 1978 as a packaged treatment plant and operates under FDEP Permit No. FLA014491. The operating permit has been active since December 17, 2015 and includes a 10-year duration until renewal is required, although a capacity analysis report (CAR) is required on the 5th year of the permit's duration (FDEP, 2015; High Point WRF White Paper, n.d.). The service area of High Point WRF includes Sedgefield Rd, Sandy Pines Cir, and a section of Wells Rd in North Fort Myers. The capture and conveyance system are comprised of two lift stations which individually transfer flows to the facility (High Point WRF White Paper, n.d.).

The facility's treatment process units consist of a single manual bar screen for pretreatment, seven aeration tanks for biological treatment, two clarifiers/settling tanks for solids removal, a chlorine contact chamber for disinfection, and three digesters for biosolids decomposition (FDEP, 2015). The facility does not possess an on-site biosolids dewatering unit (High Point WRF White Paper, n.d.). A process flow diagram of the facility is provided in **Figure 3-12**.

Figure 3-12: Process Flow Diagram of the High Point WRF



From "High Point WRF White Paper", n.d.

As the facility does not manage any reuse customers, effluent flow is retained in two on-site percolation ponds with a permitted capacity of 0.025 MGD (AADF) (FDEP, 2015). The facility's biosolids are transported to Fort Myers Beach WRF for dewatering prior to composting (High Point WRF White Paper, n.d.).

No major facility improvements have taken place recently at High Point WRF. Staff have predominantly been focused on preventative maintenance (High Point WRF White Paper, n.d.).

THREE OAKS WRF

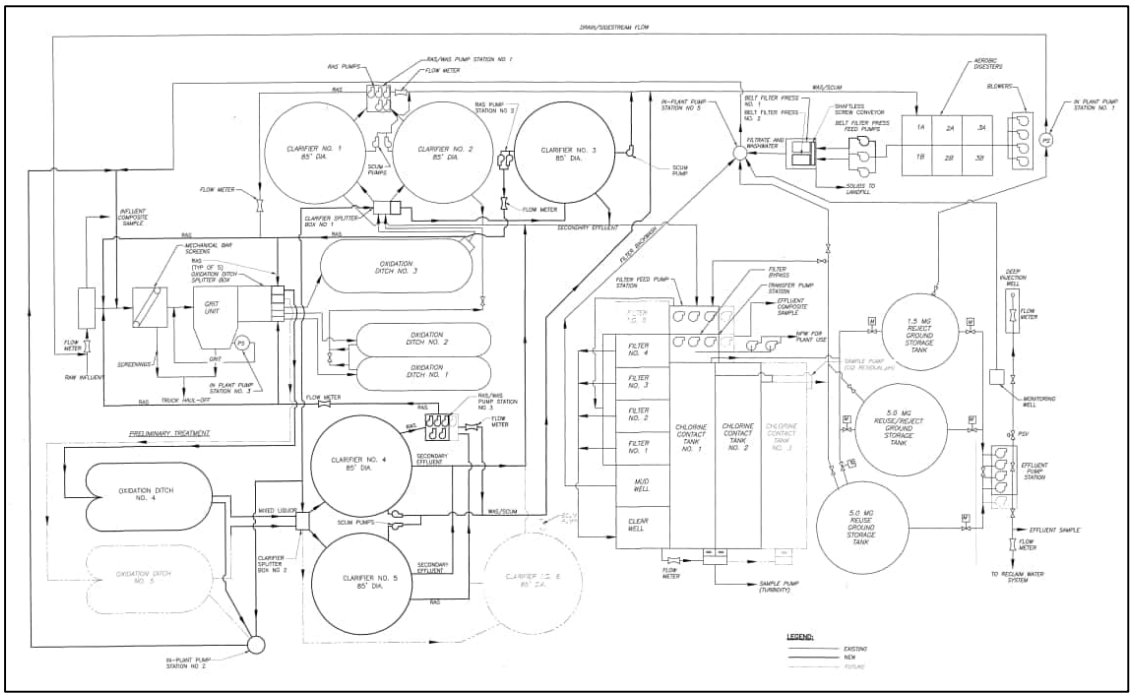
The Three Oaks WRF is an extended aeration treatment facility in Fort Myers. The facility operates under FDEP Permit No. FLA145190 with a permitted capacity of 6.0 MGD per AADF basis (White Paper for Three Oaks WRF, 2019). The operating permit expires on June 21, 2022 although LCU is currently within the renewal application process. The permit renewal includes a substantial facility modifications application for proposed future plant improvements that will increase the facility's design capacity to 9.0 MGD (CDM Smith, 2021).

Three Oaks WRF services the southern section of Lee County extending south of Corkscrew Rd to north of Alico Rd, and west of South Tamiami Trl to east of Ben Hill Griffin Pkwy. The facility also services areas east on Corkscrew Rd (White Paper for Three Oaks WRF, 2019). The capture and conveyance system consists of 282 lift stations (LCU and private) as well as 559,499 feet of force main (Black and Veatch, 2020).

Major process units at the facility include two mechanical bar screens, a manual bar screen, and a grit removal unit for preliminary treatment, and four oxidation ditches for biological treatment. Solids settling is handled by five secondary clarifiers, followed by filtration by four filters and disinfection within two chlorine contact tanks. Biosolids handling involves three aerobic digesters and two belt filter presses (White Paper for Three Oaks WRF, 2019). A process flow diagram of the facility's existing treatment system is provided in **Figure 3-13**. The process flow diagram also includes the proposed future plant improvements.

Facility effluent is stored among four storage tanks. Three Oaks WRF is permitted to use reclaimed water for land application in areas consisting of golf courses, athletic complexes, residential areas, industrial, business, commercial parks, as well as landscaping zones. The land application system has a permitted capacity of 6.0 MGD AADF, the largest in Lee County. Treated effluent may also be disposed of via deep well injection through the facility's two Class I underground injection wells. The underground injection well system has a permitted capacity of 6.0 MGD AADF (White Paper for Three Oaks WRF, 2019).

Figure 3-13: Process Flow Diagram of Three Oaks WRF



From "White Paper for Three Oaks WRF", August 2019.

Various facility improvements have previously been completed at Three Oaks WRF. Included among these improvements are the following, which are referenced from the Three Oaks WRF White Paper (2019):

- Headworks modification to accommodate flow distribution to planned future oxidation ditch
- Addition of 30 HP brush aerator to Oxidation Ditch #1 and Oxidation Ditch #2
- Modification to the splitter box of Clarifier #1 and Clarifier #2 to accommodate Clarifier #3
- Addition of 85-foot diameter secondary clarifier to the oxidation ditches

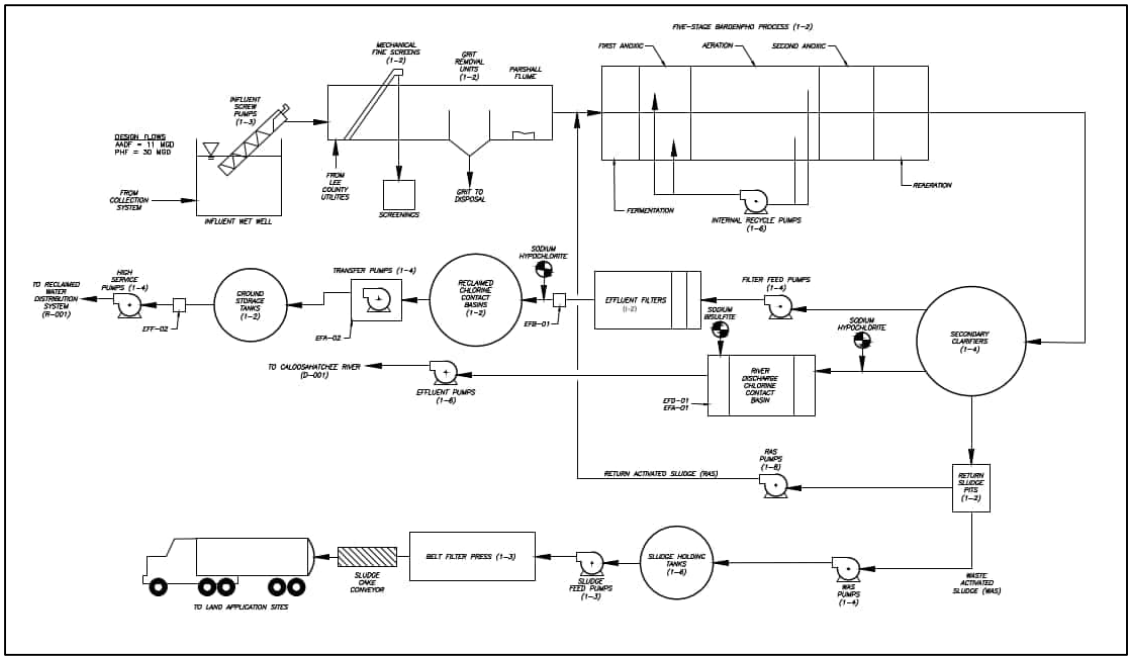
- Installation of 1.5-MG Oxidation Ditch #4
- Clarifier splitter box installation to accommodate Oxidation Ditch #4 and planned Oxidation Ditch #5
- Two 85-foot diameter secondary clarifiers to accommodate Oxidation Ditch #4 and planned Oxidation Ditch #5
- New feed pump for belt press
- New belt filter press
- New polymer feed and storage system
- Replacement of sodium hypochlorite storage tanks and canopy, as well as addition of a containment curb
- New shaftless screw conveyor for biosolids conveyance to truck loading station

FORT MYERS CENTRAL ADVANCED WWTF

The City of Fort Myers Central Advanced Wastewater Treatment Facility operates under FDEP Permit No. FL0021261, with an expiration date of June 11, 2022 (FDEP, 2017a). The advanced wastewater treatment facility as it is now, went on-line in 1985 and currently operates with an existing permitted capacity of 11.0 MGD AADF (Malcolm Pirnie, Inc., 2005). Per an agreement with the City of Fort Myers, LCU diverts flows to Central Advanced WWTF and may utilize up to 4.54 MGD of the facility's permitted capacity (Black and Veatch, 2020). County flows are transferred to the facility through two wastewater interconnects which are individually located at the Ballard Rd pump station, and at the intersection of Palm Ave and Canal St, respectively (Malcolm Pirnie, Inc., 2005). The capture and conveyance system of the facility's LCU service area includes 133 lift stations (LCU and private) and 273,695 feet of force main (Black and Veatch, 2020).

The facility's headworks is comprised of two mechanical bar screens, a back-up manual bar screen, two vortex grit removal systems, and an odor control system. Biological treatment is handled by two five-stage BARDENPHO™ nitrification-denitrification systems prior to solids settling via four secondary clarifiers. Basic disinfection for surface water discharge is provided using sodium hypochlorite in a single chlorine contact basin. Additional treatment for effluent reuse involves two disk filters and a disinfection system using sodium hypochlorite and two chlorine contact basins. Biosolids are processed at the facility using six aerobic biosolids holding tanks and three belt filter presses (FDEP, 2017a). A process flow diagram of FM Central Advanced WWTF is available below in **Figure 3-14**.

Figure 3-14: Process Flow Diagram of FM Central Advanced WWTF



From "City of Fort Myers Central Advanced Wastewater Treatment Facility Capacity Analysis Report Update", April 2021, CDM Smith.

Per the 2017 FDEP permit, FM Central Advanced WWTF is permitted to discharge 11.0 MGD monthly average daily flow into the Caloosahatchee River Estuary. The facility is also authorized to use treated effluent as reclaimed water for land application. A maximum of 6.0 MGD AADF is permitted within the reuse service area per limitations of the facility's high level disinfection system. Reclaimed water use is permitted in areas consisting of athletic

complexes, golf courses, residential developments, landscaped areas, as well as retail nurseries, ferneries, and sod farms. Furthermore, reclaimed water is also authorized for industrial uses, and at power plants.

Various facility improvements have previously been completed or are currently being pursued at FM Central Advanced WWTF. Included among these improvements are the following, which are referenced from the facility's 2018 FDEP Permit Revision:

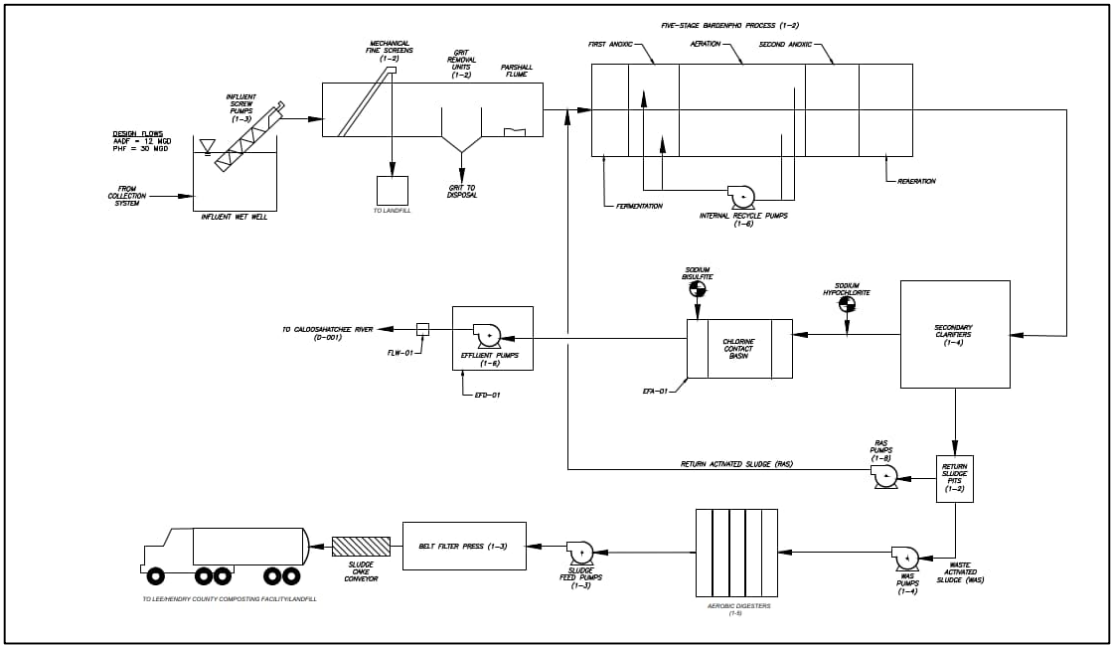
- Belt filter presses and sludge cake conveyors replacement
- Replacement of two aging polymer feed systems
- Aeration basin aerators replacement
- Alum storage tanks replacement
- Replacement of bisulfite bulk storage tanks
- Mechanical fine screens replacement
- Replacement or repair of grit removal systems
- Replacement of vertical shaft mixers in various BARDENPHO™ basins

FORT MYERS SOUTH ADVANCED WWTF

The City of Fort Myers South Advanced WWTF operates a 5-stage BARDENPHO™ nitrification-denitrification system as its primary means of biological treatment (Malcolm Pirnie, Inc., 2005). FM South Advanced WWTF has an existing permitted capacity of 12.0 MGD (AADF), of which 6.96 MGD is authorized for use by LCU per an agreement between the City and the County (Black and Veatch, 2020). The facility receives County flows via three wastewater interconnects: one situated at Red Cedar Dr, one located at the intersection of Summerlin Rd and Matthew Dr, and one at County LS 3358.The facility was originally equipped with the BARDENPHO™ treatment system in 1985, and currently operates under FDEP Permit No. FL0021270. The permit expires on June 11, 2022 (FDEP, 2017b). The facility receives LCU flows from a capture and conveyance system network consisting of 201 lift stations (LCU and private) and 309,880 feet of force main within the County service area (Black and Veatch, 2020).

The major treatment process units at FM South Advanced WWTF include two influent belt screens, two vortex grit removal systems, two 5-stage BARDENPHO™ systems, four clarifiers, and two chlorine contact tanks with a sodium hypochlorite feed system. Regarding biosolids management, process units include five aerobic digesters and three belt filter presses (FDEP, 2017b). The facility's process flow diagram is available in **Figure 3-15**.

Figure 3-15: Process Flow Diagram of FM South Advanced WWTF



From "City of Fort Myers South Advanced Wastewater Treatment Facility Capacity Analysis Report Update", April 2020, CDM Smith.

Per the 2017 FDEP permit, the facility is authorized to discharge 12.0 MGD maximum monthly average daily flow into the Caloosahatchee River Estuary. The facility is not permitted to use effluent water for reuse applications.

Various facility improvements have previously been completed or are currently being pursued at FM South Advanced WWTF. Included among these improvements are the following, which are referenced from the facility's 2019 FDEP Permit Revision:

- Replacement of sludge cake conveyors
- Replacement of belt filter presses
- Replacement of polymer feed systems
- Replacement/modification of grit removal system
- Replacement of mechanical screens
- Replacement of aeration basin aerators and vertical shaft mixers.

3.4 ONGOING LCU WASTEWATER INFRASTRUCTURE PROJECTS AND PROGRAMS – CAPITAL IMPROVEMENT PLAN

LCU continuously strives to improve and upgrade their wastewater infrastructure as needed for maintenance and to accommodate growth in its service areas. LCU's most recent Wastewater Master Plan was updated by Black & Veatch in 2020 and included a Capital Improvement Plan (CIP) which is comprised of separate improvement projects through 2040. Building on that effort, LCU developed a 10-year budgeted program that is revised each year. LCU's proposed budget for fiscal year (FY) 2021/2022 is approximately $50 million. The projects address improvements or new construction of force mains, pump stations, and treatment plants. **Table 3-2** lists some of the key CIP projects in the 10-year program.

Table 3-2: Key Wastewater Infrastructure Improvement Projects in LCU's 10-year CIP

Category	Key Projects	Proposed 10-year Budget ($)
Force Main Improvements	Fiesta Village Sewer Collection System Improvements	2,300,000
	Summerlin Road 20'' FM Replacement	4,205,000
	CFM Flow Diversion *This project includes diverting approximately 3.66 MGD AADF of flows from 5 subbasins in the South-Central Fort Myers (CFM) WWTF service area to LCU treatment facilities, and approximately 2.3 MGD AADF of flows from 2 subbasins in the Central CFM WWTF service area to LCU treatment facilities.*	6,885,000* (budget in CIP does not include all diversion areas)
Treatment Plant Improvement	Three Oaks WRF Expansion	10,200,000
	Fiesta Village WRF Deep Injection Well	17,800,000
	Gateway WRF Expansion to 6 MGD	25,000,000
Pump Station Improvements	Upgrades for MPS 6600	2,300,000

The total budget proposed for these listed projects is $68 million, however, the total proposed 10-year budget for wastewater infrastructure improvement projects is approximately $213 million. Additional projects include electrical upgrades, process equipment upgrades, and utility relocations. All of the projects are meant to meet the capacity gap of the existing wastewater system due to projected growth in LCU's wastewater service area.

3.5 SEPTIC CONVERISON PROJECTS BY OTHER UTILITIES

As a part of the planning effort, Utilities located within Lee County were contacted to identify any planned septic conversion projects inside or outside the Caloosahatchee BMAP area. Provided in **Table 3-3** is a list of Utilities and staff members contacted to obtain this information.

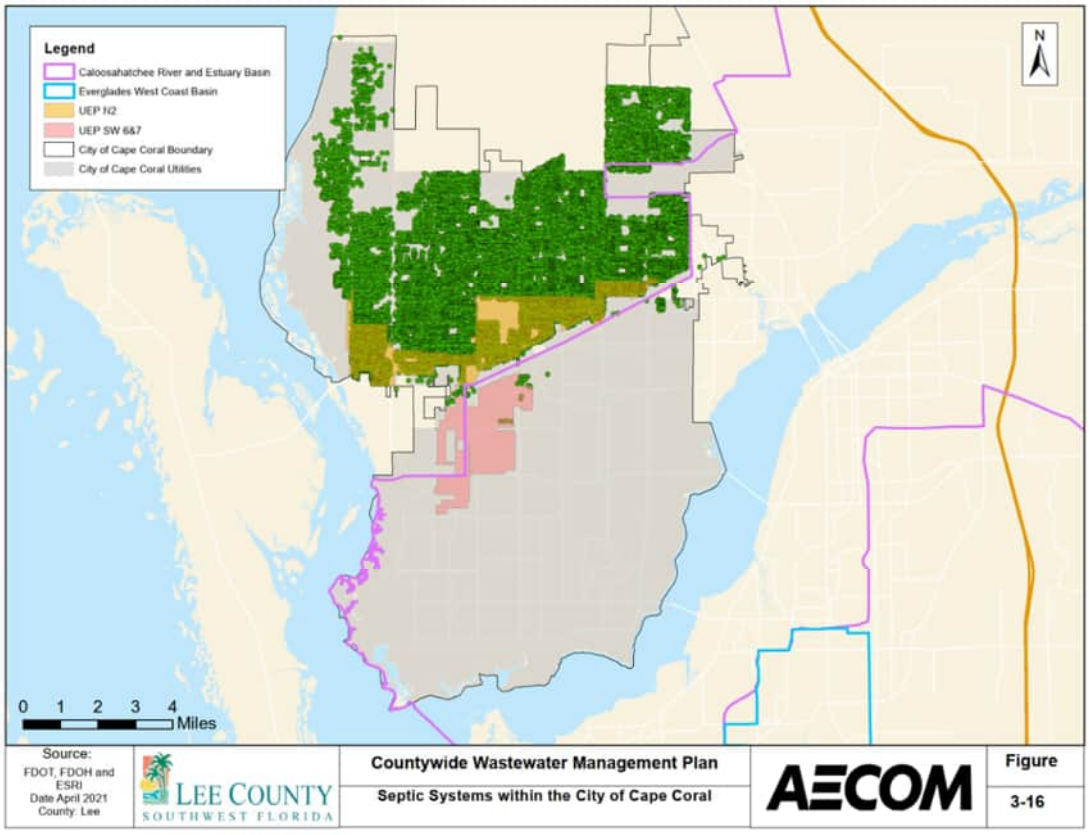
Table 3-3: List of Utilities and Staff Members Contacted to Obtain this Information

Utility Name	Point of Contact	Contact Information	
		Email	Phone Number
Cape Coral	Jody Sorrels - Civil Engineer - Utilities Dept	jsorrels@capecoral.gov	(239) 242-3227
Bonita Springs	Kim Hoskins PE - Director of Engineering	khoskins@bsu.us	(239) 390-4834
Village of Estero	David Willems	willems@estero-fl.gov	(239) 319-2823
Fort Myers	Nicole Monahan PE - City Engineer	nmonahan@cityftmyers.com	(239) 321-7459
FGUA	Mike Currier	mcurrier@govmserv.com	(239) 368-1615
Captiva/Sanibel	Doug Eckmann, PE - Kimley-Horn- Project Manager for Septic to Sewer Planning	douglas.Eckmann@kimley-horn.com	(239) 271-2652

3.5.1 Cape Coral

The City of Cape Coral continues to implement construction of a phased Utility Extension Program (UEP), which was initially started approximately thirty years ago to extend sanitary sewer, along with irrigation water and potable water throughout the City, with the more recent focus being to areas north of Pine Island Road. As shown in **Figure 3-16** approximately 75% of population is served by centralized sewer. There are some isolated parcels being served by septic South of Pine Island and within the Caloosahatchee BMAP area, but the City has no specific projects to tie these parcels to the centralized sewer at this time.

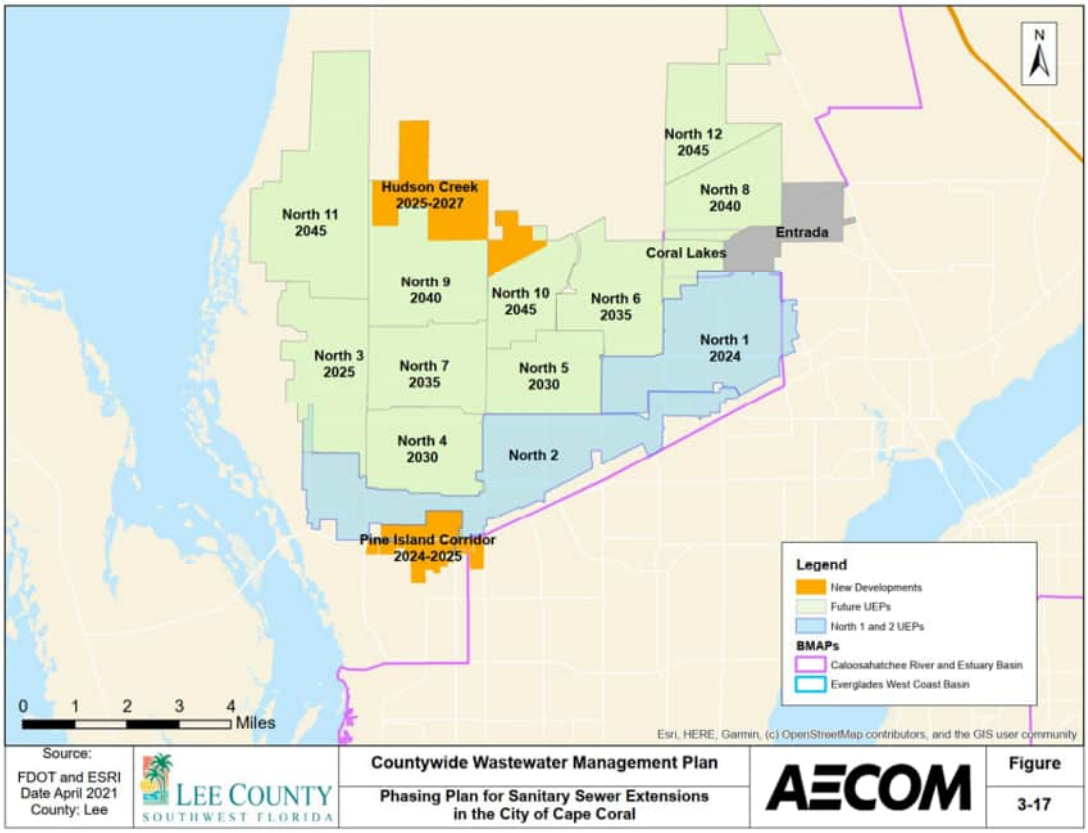
Figure 3-16: Septic Systems in Cape Coral



The area north of Pine Island Road is outside the Caloosahatchee River BMAP area. There is an area designated as an Environmental Management Area (EMA), which is located west of Burnt Store Road and south of Kismet Parkway. This area has been designated as such to help the City prioritize sanitary sewer improvements within this area to improve water quality for the North Spreader Canal and Matlacha Pass.

The City tracks and reports to the FDEP information regarding the septic densities for the unsewered areas north of Pine Island Road. The extension of sanitary sewers is prioritized based upon septic tank density, potential impacts to water quality (EMA areas are ranked highest), projected growth, and other factors. A phasing plan is shown in **Figure 3-17**. Sanitary sewer improvements located in the North 2 UEP area are complete, and connections are being made. The design and construction of the North 1 UEP area is underway and the North 3 UEP design and construction will commence next.

Figure 3-17: Phasing Plan for Sewer Extension in Cape Coral



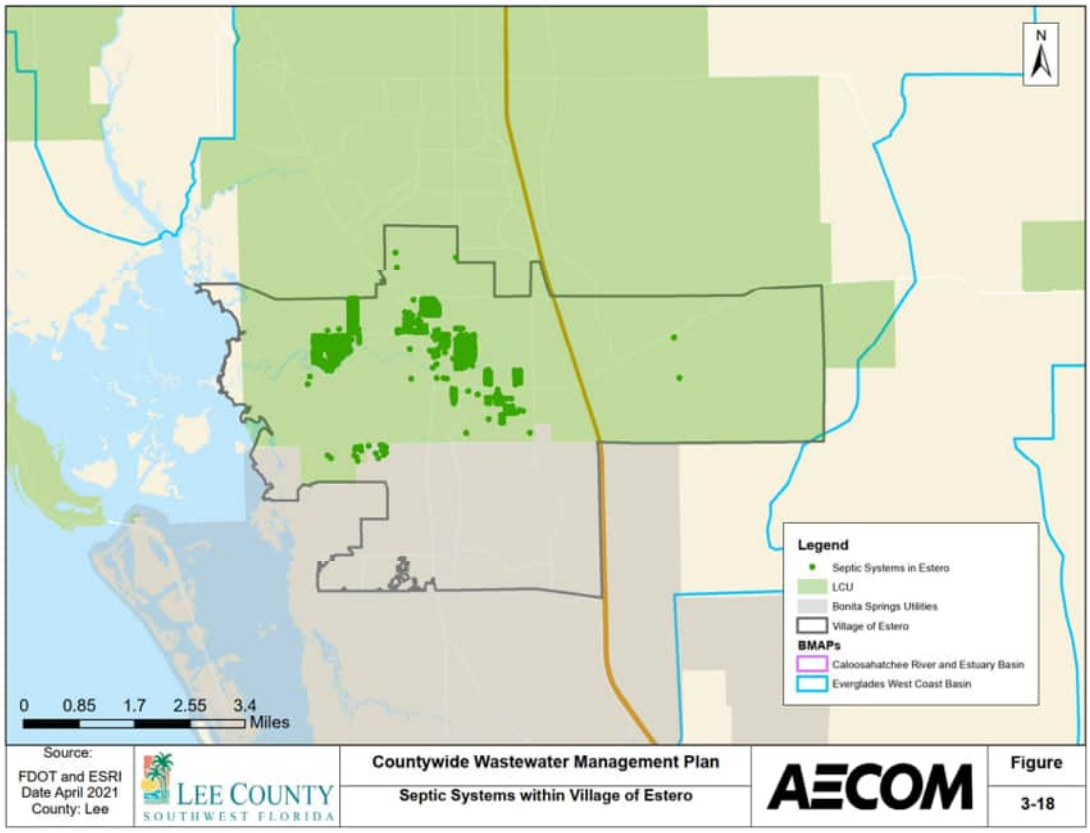
3.5.2 Village of Estero

There are many areas within the Village of Estero that are on septic systems and several areas are located along the Estero River as shown in **Figure 3-18**. The Estero Bay tributaries are classified as "Special Waters" Outstanding Florida Water (OFW) and the FDEP and SFWMD have put in place special protections so no new point sources for pollution are allowed.

In an effort to improve water quality, the Village initiated an Engineering Feasibility Study, which was completed in 2020, to determine how to best connect those properties served by septic systems or packaged treatment plants to the centralized sewer system. The study recommended Utility Expansion Projects within four priority areas. Three of the four areas are Mobile/RV Park Areas: Sunny Grove, Estero Bay and the Cypress Bend Area. Sunny Groves and Estero Bay areas were selected as priority areas due to the close proximity to the Estero River and high population density. The Cypress Bend Area was selected due to community interest and high population density. The River Ranch Road area was selected because current road improvements are underway. Currently, the Village is finalizing the design and starting permitting to remove the three existing package wastewater treatment plants at those three locations. The permits are expected to be completed by the end of 2022, with an expected construction start of early 2023. The Village is also working on contracts for the UEP projects and will create a schedule following their completion.

Because the Village does not provide utilities, a wastewater treatment plan – which is required by SB 712 - is not expected. However, the Village will work with LCU for an OSTDS remediation plan. The current plan initially expects the conversion of all septic systems to sewered areas but does not exclude advanced onsite treatment if it proves to be more cost-effective at providing the same benefit. As part of the OSTDS remediation plan, the Village is in the process of hiring Johnson Engineering and TetraTech to connect all the septic tanks near the Estero River to central sewer. The Village plans on addressing the relevant TMDL by removing package wastewater treatment plants and septic tanks from the BMAP watershed.

Figure 3-18: Septic Systems in the Village of Estero



3.5.3 Bonita Springs

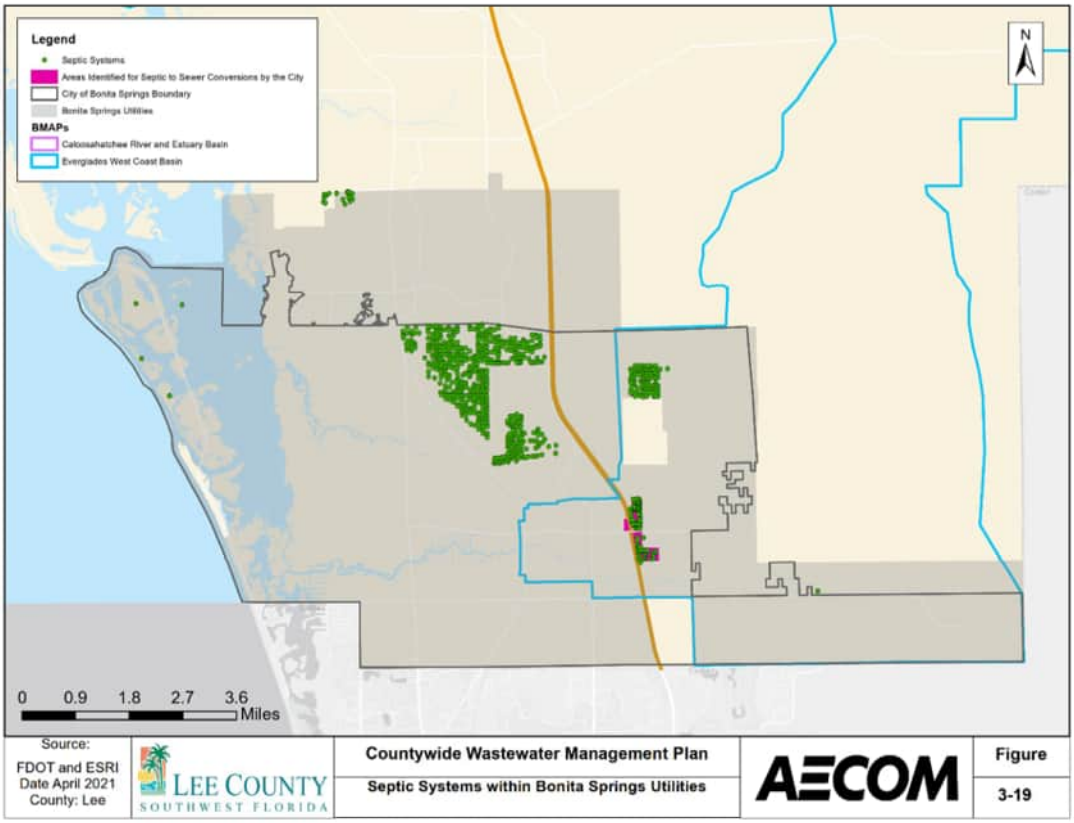
The majority of the City of Bonita Springs is served by Bonita Springs Utilities (BSU). BSU is a private member-owned water and wastewater utility provider and is not a part of the City. However, BSU has a franchise agreement with Lee County and the City of Bonita Springs to operate within its franchise boundary.

From the late 1990s through the early 2000s, BSU eliminated septic systems along the coast, bay, river and tributaries, with only a few limited areas still served by septic tanks. In addition to the work already done for OSTDS remediation, BSU maintains a Wastewater Master Plan and Annual Engineering Report to meet SB 712's requirements. The environmental benefit of some of the septic system elimination has been recognized in the City's BMAP.

Moreover, the City of Bonita Springs has obtained funding from FDEP for septic conversion in two residential subdivisions: Sun Village and Lakes of San Souci, which are shown in **Figure 3-19**. BSU has design plans for this effort and is working with the City on a joint project agreement and FDEP documentation. As for the areas identified in the Village of Estero Feasibility Study for septic conversion, BSU notified the Village of their relevant experience and willingness to participate in their planning process for prioritizing improvements since the areas are in BSU's franchise area.

The existing septic systems in the City of Bonita Springs and within the BSU franchise area are shown in **Figure 3-19**.

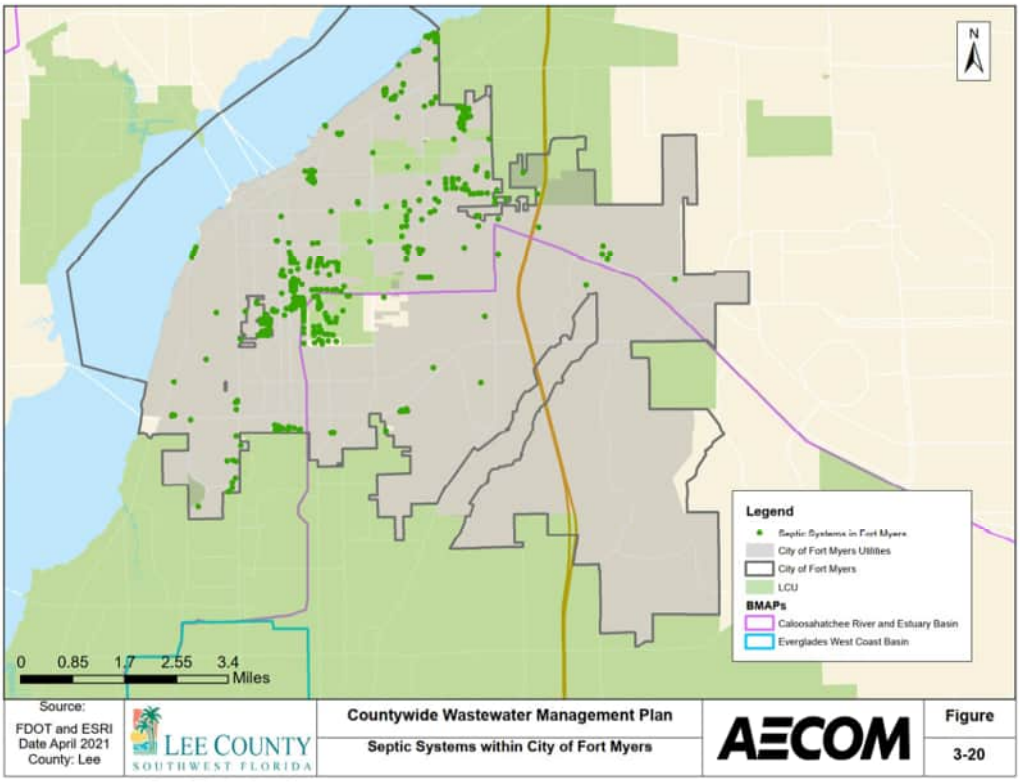
Figure 3-19: Septic Systems in Bonita Springs



3.5.4 Fort Myers

The City of Fort Myers Utilities Department does not have an ongoing project for septic conversions. The City is primarily served by the LCU and the City centralized sewer system with less than 100 parcels using septic systems as shown in **Figure 3-20**. There are isolated parcels within the Caloosahatchee BMAP area that will be tied to the City of Fort Myers sanitary sewer system in conjunction with the City's BMAP program.

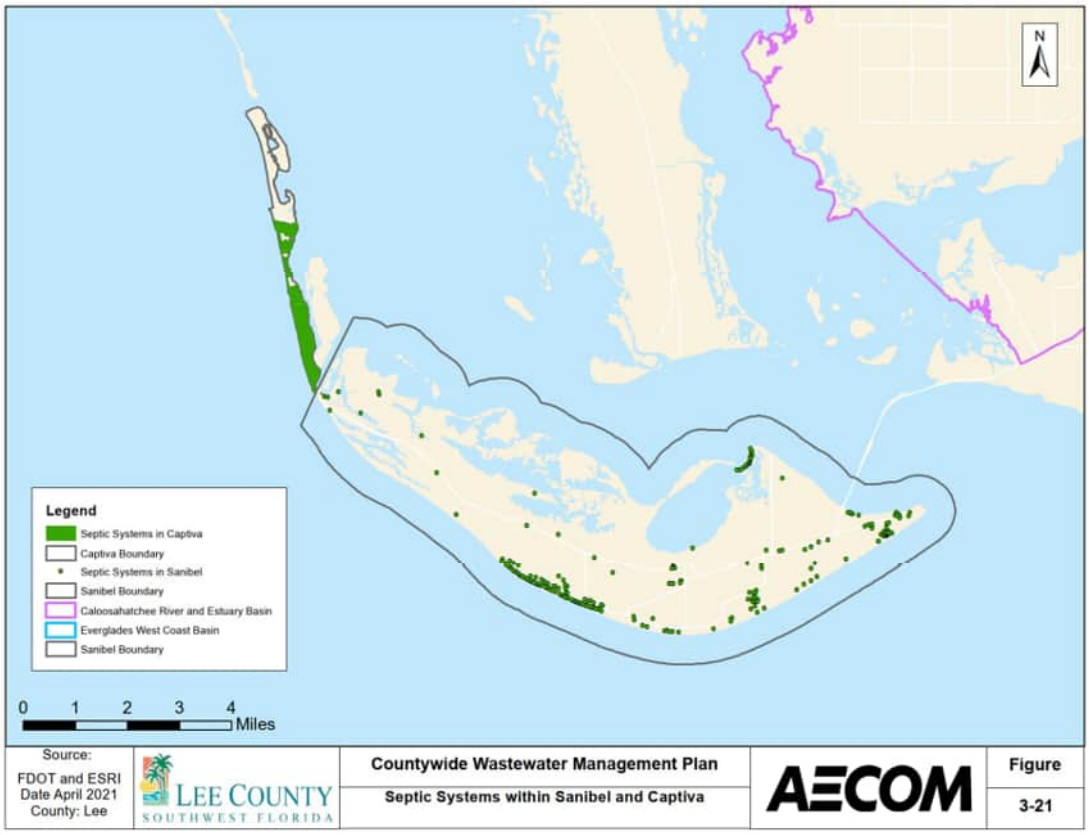
Figure 3-20: Septic Systems in Fort Myers



3.5.5 Captiva/Sanibel

Various areas located on Capita/Sanibel have septic systems as shown in **Figure 3-21**. The Captiva Community Panel has been investigating options for improved wastewater service on Captiva Island since 2011 when Sanibel-Captiva Conservation Foundation (SCCF) issued a report on water quality that identified migrating ground water from septic areas as a contributor to excessive nitrogen levels in near shore waters. Lee County at the request of the Panel commissioned a study to evaluate long term alternatives for wastewater service. The study, prepared by TKW Consulting Engineers, Inc. in 2018, determined partnering with Sanibel to extend their utility system into the unsewered portion of Captiva Island was the best option for long term wastewater management. Subsequently Lee County funded a follow-up study managed by the Panel to further develop the concept presented in the 2018 study which is on-going.

Figure 3-21: Septic Systems in Captiva and Sanibel



3.5.6 FGUA

Lehigh Acres and North Fort Myers both have many areas that are served by septic systems as shown in **Figure 3-22**. FGUA initiated an Engineering Study to evaluate potential septic conversion project areas as part of a planning strategy to expand the wastewater collection system. The $10 million septic to sewer conversion project proposes a conversion of 12 general areas in the Lehigh Acres service area that have approximately 300 existing septic tanks. **Figure 3-23** shows the general location of these 12 areas in the Lehigh Acres service area. Five of those areas (Areas 1 through 5) were designated as high priority areas and these areas are shown in **Figure 3-24.** FGUA has chosen these five areas for three primary reasons including: (a) these areas are currently served by FGUA's potable water system and thus include existing customers of the utility, (b) due to their proximity to centralized sewer systems, thereby making their connection to existing infrastructure easier, and (c) mitigation of potential negative influence to groundwater as there are three raw water wells in one of the areas. These five areas also being evaluated as a part of this Wastewater Management Plan for Lee County.

Figure 3-22: Septic Systems in FGUA

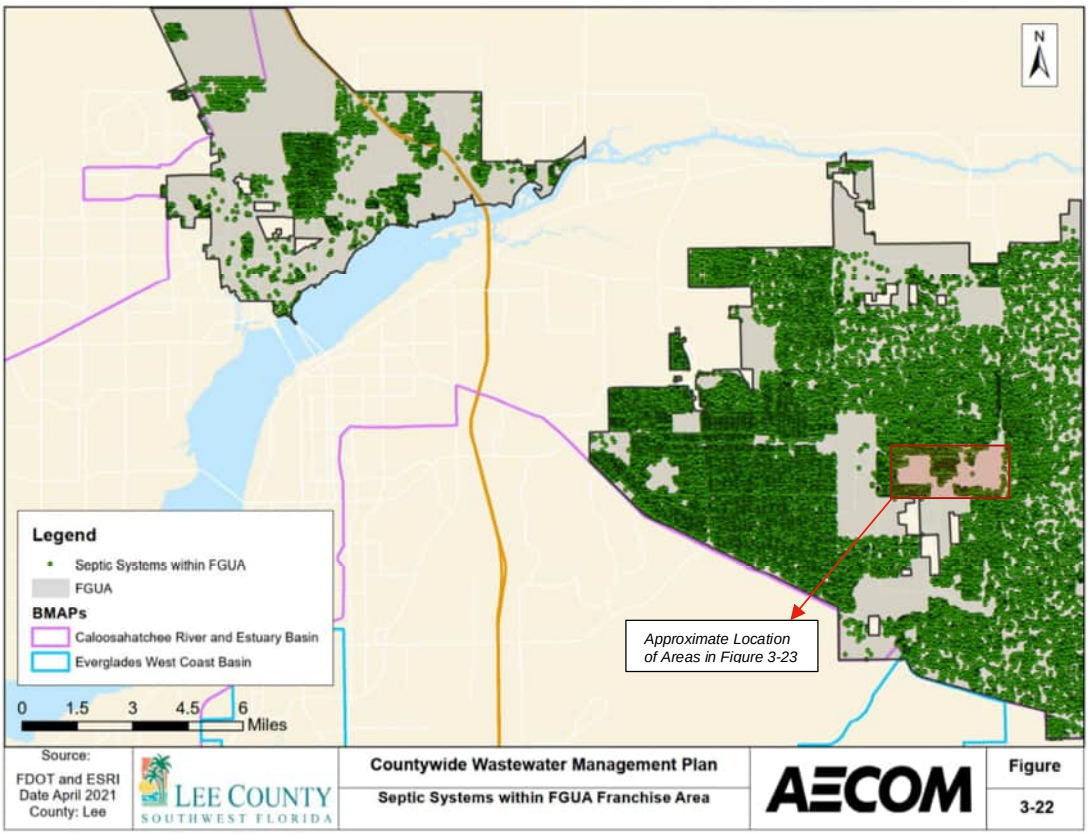
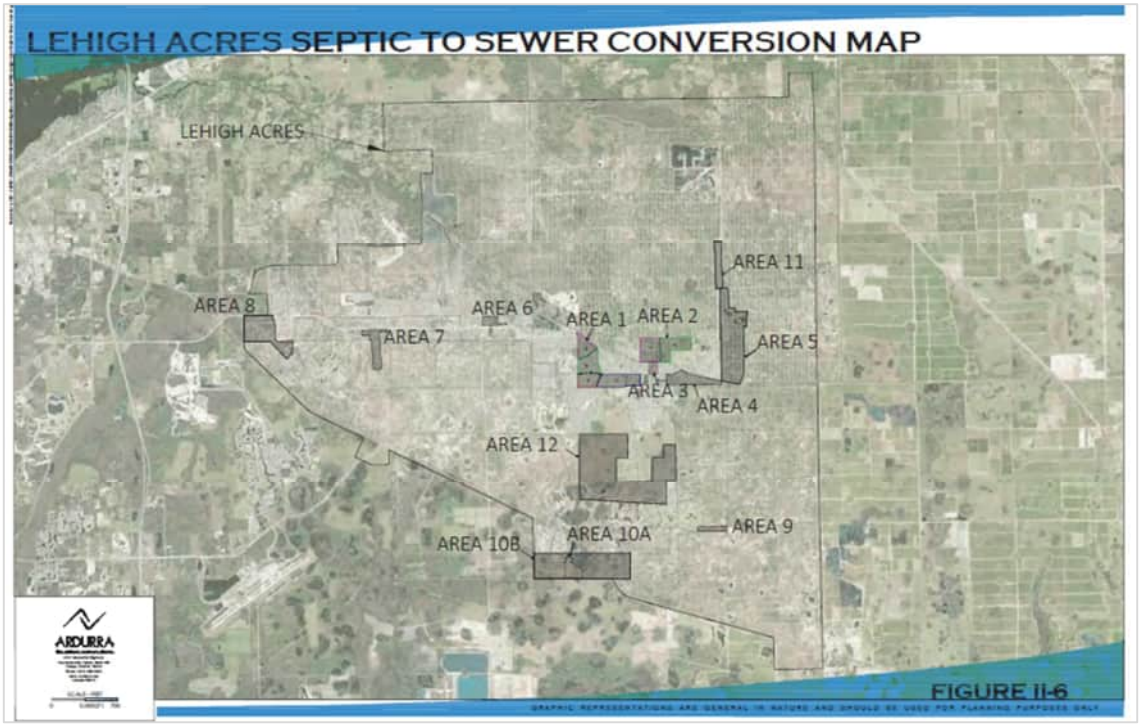
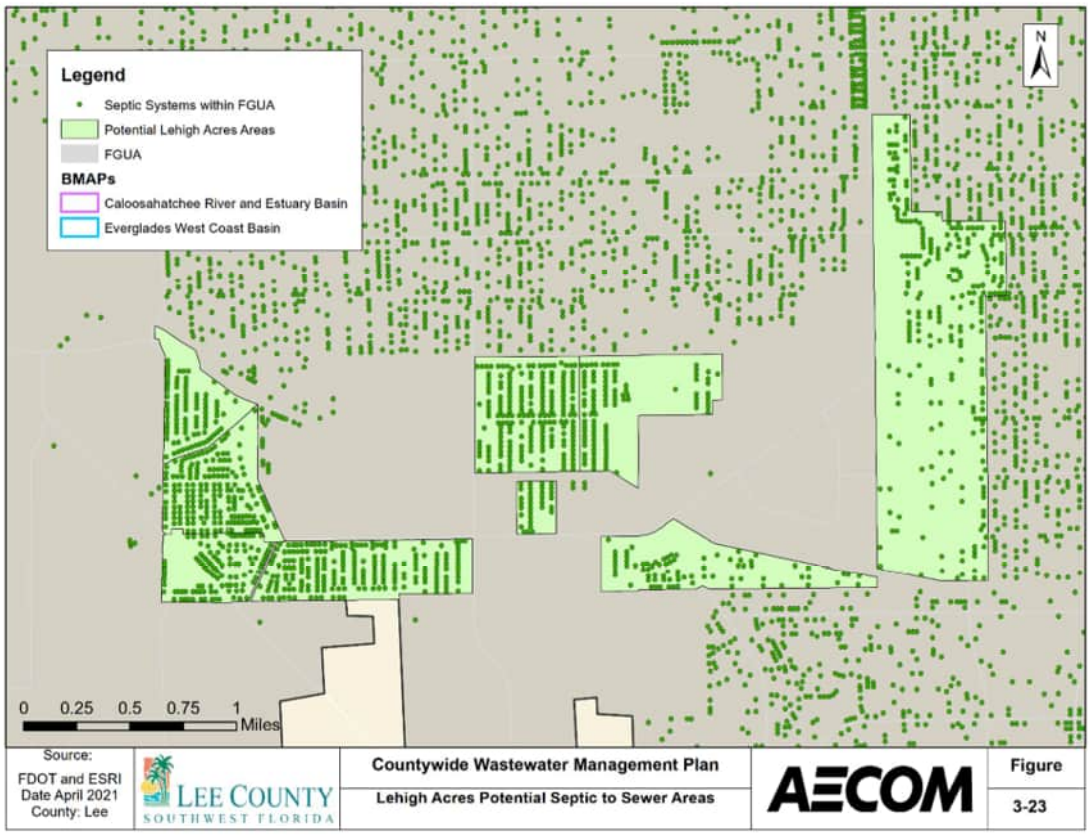


Figure 3-23: Lehigh Acres Overall Septic to Sewer Conversion Map



Source: FGUA's Lehigh Acres Water & Sewer Improvements Presentation (August 16, 2022), provided by LCU

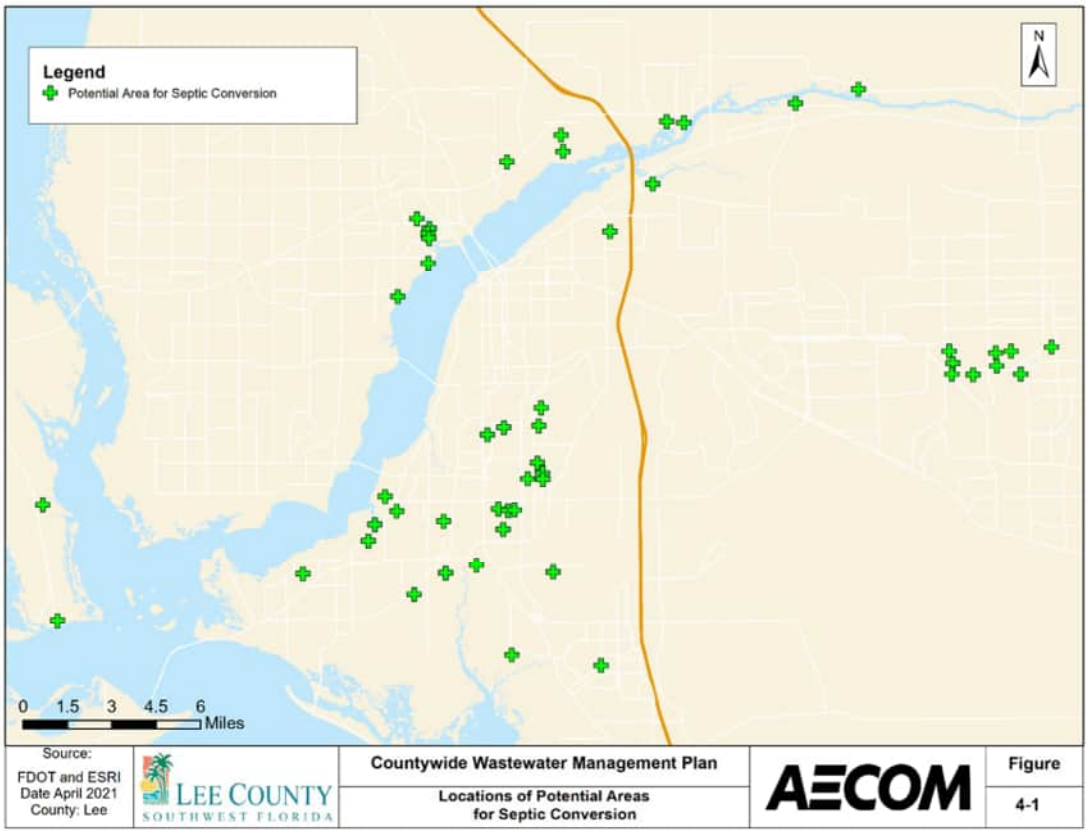
Figure 3-24: Septic Systems in Lehigh Acres



4. IDENTIFICATION OF INITIAL PLANNING AREAS FOR SEPTIC CONVERSION AND PROJECT PRIORITIZATION

Identification of the septic conversion areas began with the septic system inventory, presented in Chapter 3, which established all septic parcels in Lee County both inside and outside of the BMAP areas and within the different wastewater franchises within the County. Areas with septic systems that fell within service areas of other cities' utility systems were removed from consideration for the septic conversion areas. The remainder of the septic tanks in Lee County were within LCU's service areas and unincorporated Lee County such as Lehigh Acres, FGUA, and North Fort Myers. Clusters of septic tanks in sub-divisions or residential communities were identified and grouped as potential areas for septic conversion. Some of the areas were identified with the assistance of Lee County based on LCU's knowledge of dense areas and coordination with the Natural Resources Department for areas with water quality concerns. AECOM further identified other potential areas within LCU's service area, both within and outside the BMAPs in Lee County, as well as a sample area in unincorporated Lee County. The identified areas also included a few potential areas in Lehigh Acres, under FGUA operation, as this is a countywide master plan. As a result, a total of 51 areas were identified as potential areas for septic conversion. **Figure 4-1** below shows the locations of the identified potential areas in Lee County.

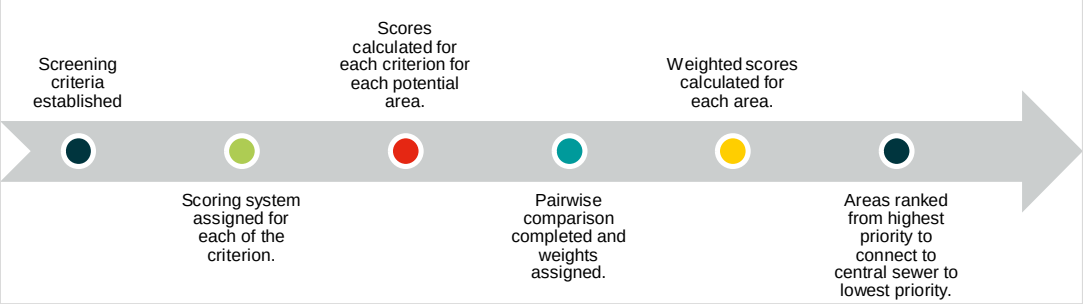
Figure 4-1: Locations of Potential Septic Conversion Areas



Prioritization of septic conversion areas was based upon potential improvements to water quality when connecting to the central sewer. Initial screening criteria was developed in conjunction with Lee County and FDEP best practices and is comprised of five environmental and spatial criteria, including: (a) OSTDS density, (b) proximity to surface waters/impaired waters, (c) age of septic, (d) groundwater elevation (seasonal high groundwater), and (e) known water quality issues. A scoring system was assigned for each of the criteria using an overall scale from 1 to 5, with 5 representing a higher priority to connect to the sewer system. In addition, a pairwise comparison was carried to assign relative importance (weights) for each of the criterion. A pairwise comparison is a widely used method where criteria are compared in pairs to determine the relative importance. For each area, a score was

assigned for each criterion and weighted using the results of the pairwise comparison, ultimately developing a weighted score for each of the potential 51 areas that was used for ranking and prioritization. **Figure 4-2** below provides a simplified depiction of the initial screening process.

Figure 4-2: Initial Screening Process



4.1 CRITERIA FOR INITIAL SCREENING

In this subsection, the description and scoring system assigned to each criterion is discussed. All the individual scoring maps for each criterion are presented consecutively following the end of this subsection.

ON-SITE TREATMENT AND DISPOSAL SYSTEMS DENSITY

Determining septic densities is critical in prioritizing areas for connection to sewer infrastructure. For each identified area, the wastewater classification data from the FDOH was used to identify which parcels were known or likely using septic systems. These parcels were intersected with the parcel data from Lee County using a geoprocessing tool. This data was collected and presented in a spreadsheet for each area.

For each area, the number of units was divided by the total acreage to find the septic density. An example scoring calculation for this criterion can be found in **Appendix A**. The highest and lowest septic densities calculated were 8.89 and 0.43 units/acre, respectively and were used to establish the scoring range for the septic density criteria as follows:

5	4	3	2	1
Density > 8	8 ≥ Density > 5.5	5.5 ≥ Density > 3	3 ≥ Density > 0.5	Density ≤ 0.5

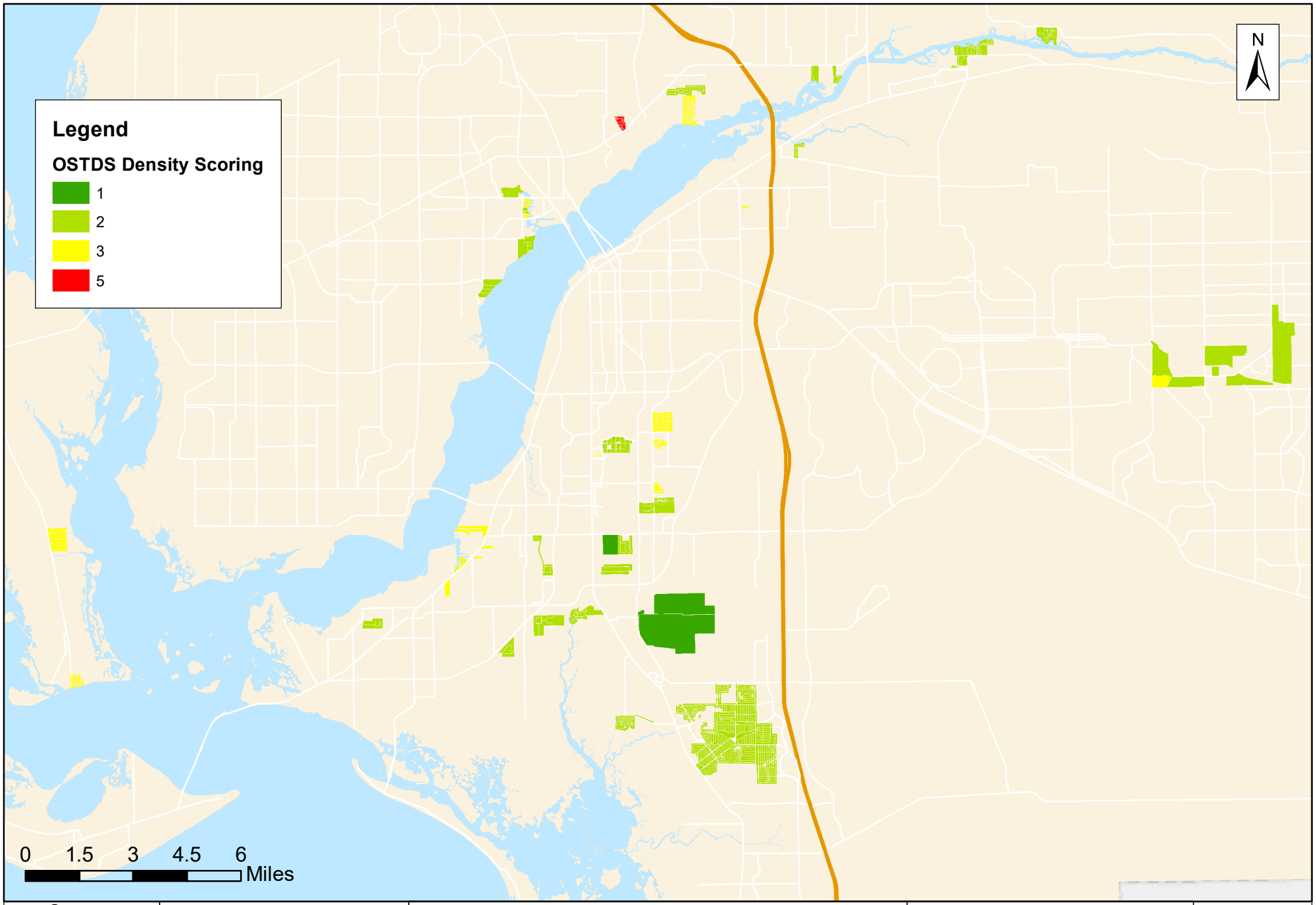
Of the 51 potential areas, Mobile Manor had the highest septic density and Brynwood had the lowest septic density. **Figure 4-3** presents the scoring results for this criterion.

PROXIMITY TO SURFACE WATERS/IMPAIRED WATERS

Project areas were also prioritized based on their distance from any surface water body (canals, creeks, streams, rivers, ponds, or the Caloosahatchee itself). To measure an area's proximity to surface waters or impaired waters, buffers with radii of 0.25 mi, 0.5 mi, 0.75 mi, and 1 mi were centered on the closest surface water body to the area. The radius of the buffer in which 50% of the area fell in was used as the distance of the area from the surface water body. An example scoring for this criterion can be found in **Appendix A** The scores were assigned as follows:

5	4	3	2	1
Distance ≤ 0.25	0.25 < Distance ≤ 0.50	0.50 < Distance ≤ 0.75	0.75 < Distance ≤ 1	Distance > 1.00

Nearly 65% of all potential areas are within a quarter mile buffer of a surface water or impaired water body. **Figure 4-4** presents the scoring results for this criterion.



Source:
FDOT and ESRI
Date April 2021
County: Lee

LEE COUNTY
SOUTHWEST FLORIDA

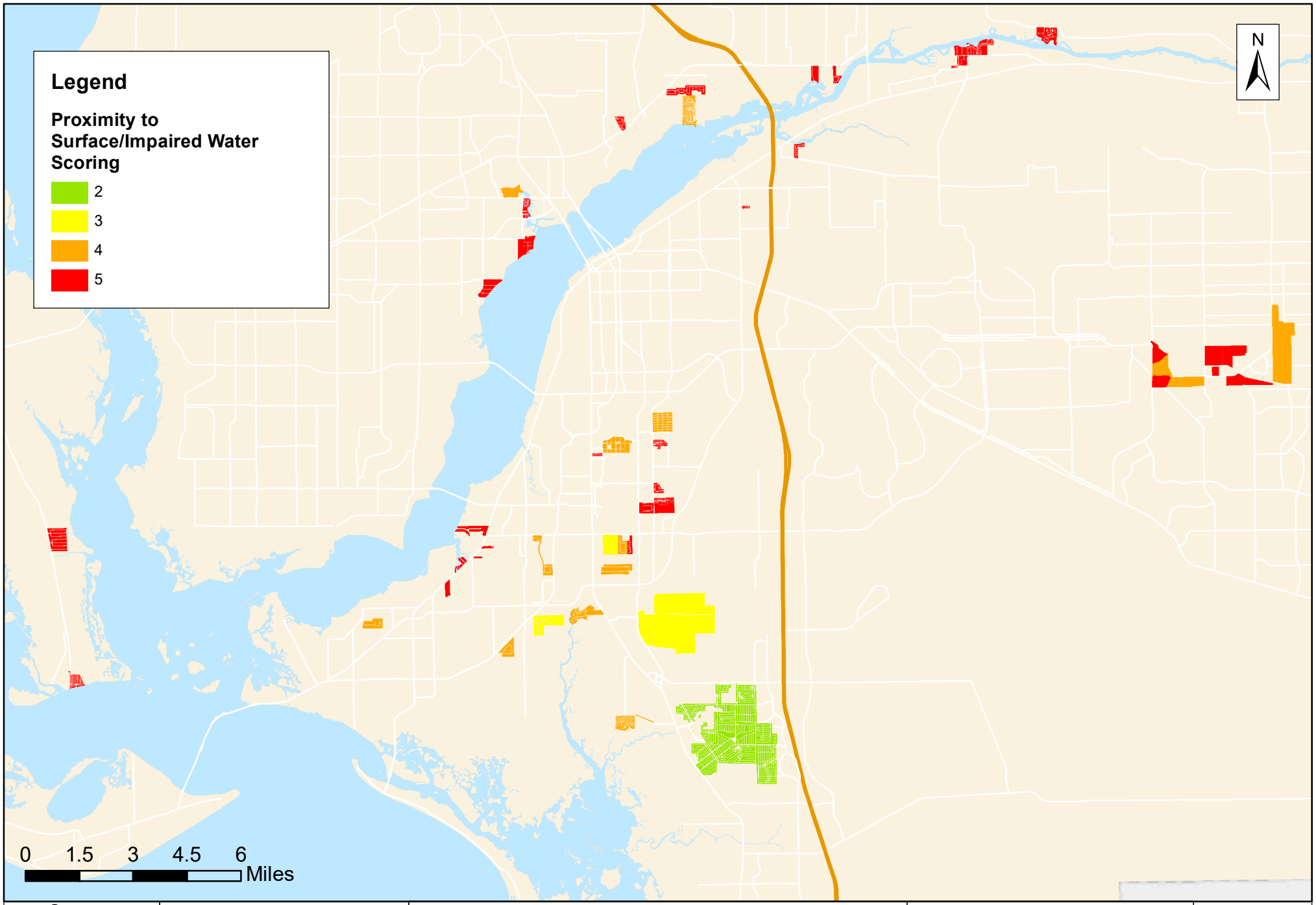
Countywide Wastewater Management Plan

OSTDS Density Scoring

AECOM

Figure

4-3



Source:
FDOT and ESRI
Date April 2021
County: Lee

LEE COUNTY
SOUTHWEST FLORIDA

Countywide Wastewater Management Plan

Proximity to Surface Waters/Impaired Waters Scoring

AECOM

Figure

4-4

AGE OF SEPTIC

The age of a septic system is indicative of a system's functionality and its likelihood of failure, as well as the fact that older systems do not meet the current separation criterion from the bottom of the drain field to the seasonal high-water table. The scoring range was delineated based on the upper and lower limit. The lower limit representing lowest priority to convert to sewer is based on an average septic system lifespan of 15 years according to the EPA. The highest priority is given to septic systems installed before 1983 which do not follow current State requirements for groundwater separation and surface water setbacks.

Due to the lack of available data on the age of septic systems, the age of the building/structure on each parcel was used to represent the age of the OSTDS. The scoring for this criterion was conducted in two parts, but the basis of the scoring was established for the following age groups:

5	4	3	2	1
> 35 years	30-35 years	25-30 years	15 to 25 years	0-15 years

The age for each parcel within an area was identified and grouped within an age group and corresponding score. Since each area has more than one parcel, a weighted age was calculated for each area. An example scoring calculation for this criterion can be found in **Appendix A**.

The scoring results for this criterion show that approximately 87% of parcels in all project areas have septic tanks installed more than 30 years ago. **Figure 4-5** presents the scoring results for this criterion.

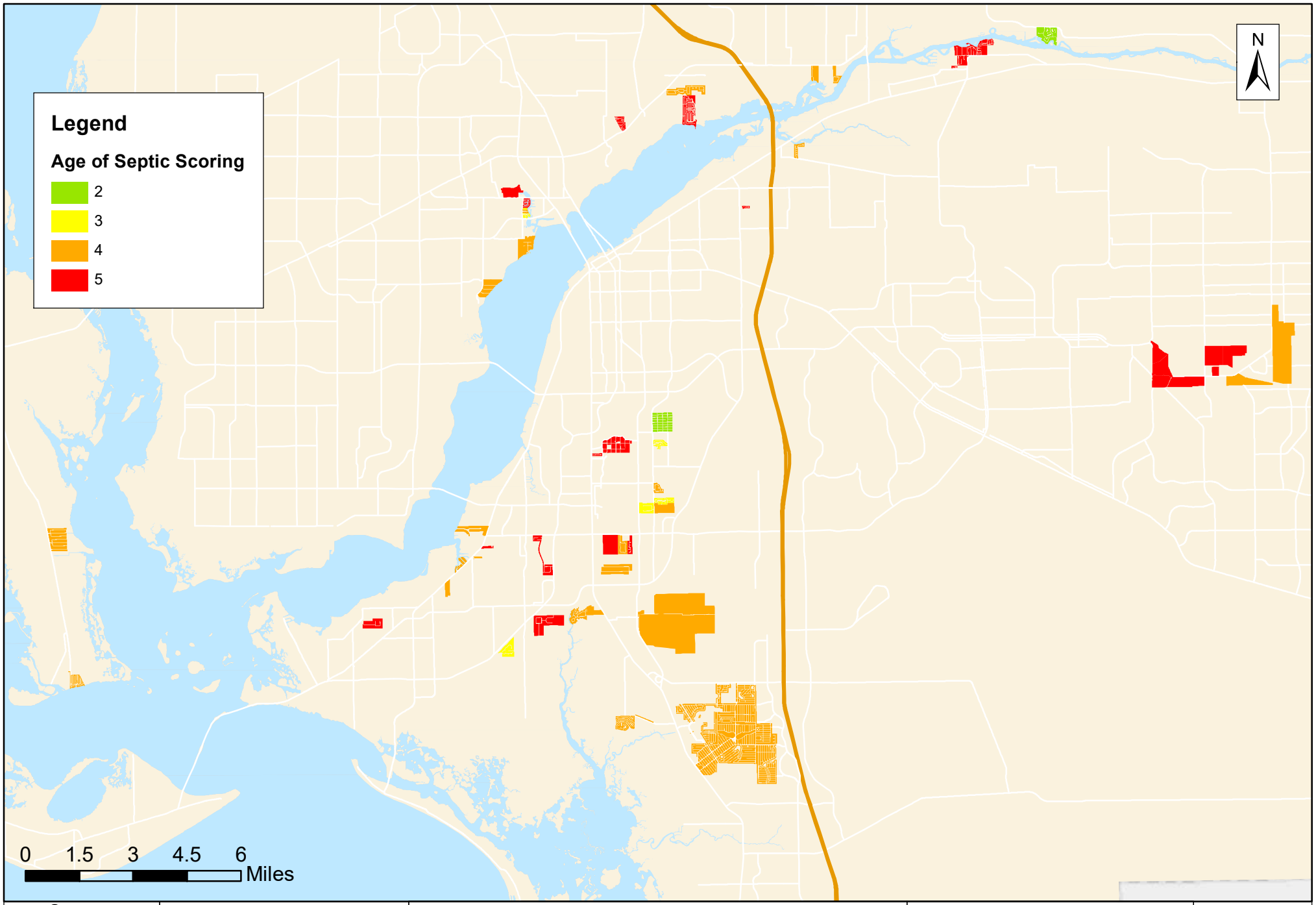
GROUNDWATER ELEVATION (SEASONAL HIGH GROUNDWATER)

As previously mentioned, current State guidelines related to OSTDS requires a minimum separation distance of 48 inches between the top of the drain field and seasonal high groundwater. Since it is difficult to obtain the elevations of the drain fields, this criterion represents the separation distance between the ground elevation and the wet season high water table elevation. Ground elevation data was obtained from SFWMD in the form of 5 ft contour shapefiles. Wet season high water table elevations were estimated from a 5-year (2015-2019) PDF contour map published by Lee County Natural Resources. An example scoring calculation for this criterion can be found in **Appendix A**

Each score range was established based on the calculated separation distances, in inches, as follows:

5	4	3	2	1
Distance < 0”	0” < Distance ≤ 14”	14” < Distance ≤ 28”	28” < Distance ≤ 42”	Distance > 42”

Most of the septic systems in the areas identified fall within areas with 14 inches and less of separation between ground elevation and seasonal high groundwater. This is consistent with the findings from the septic age scoring, as many of the old septic systems were installed with separation requirements of only 6 to 12’’. **Figure 4-6** presents the scoring results for this criterion.



Source:
FDOT and ESRI
Date April 2021
County: Lee

LEE COUNTY
SOUTHWEST FLORIDA

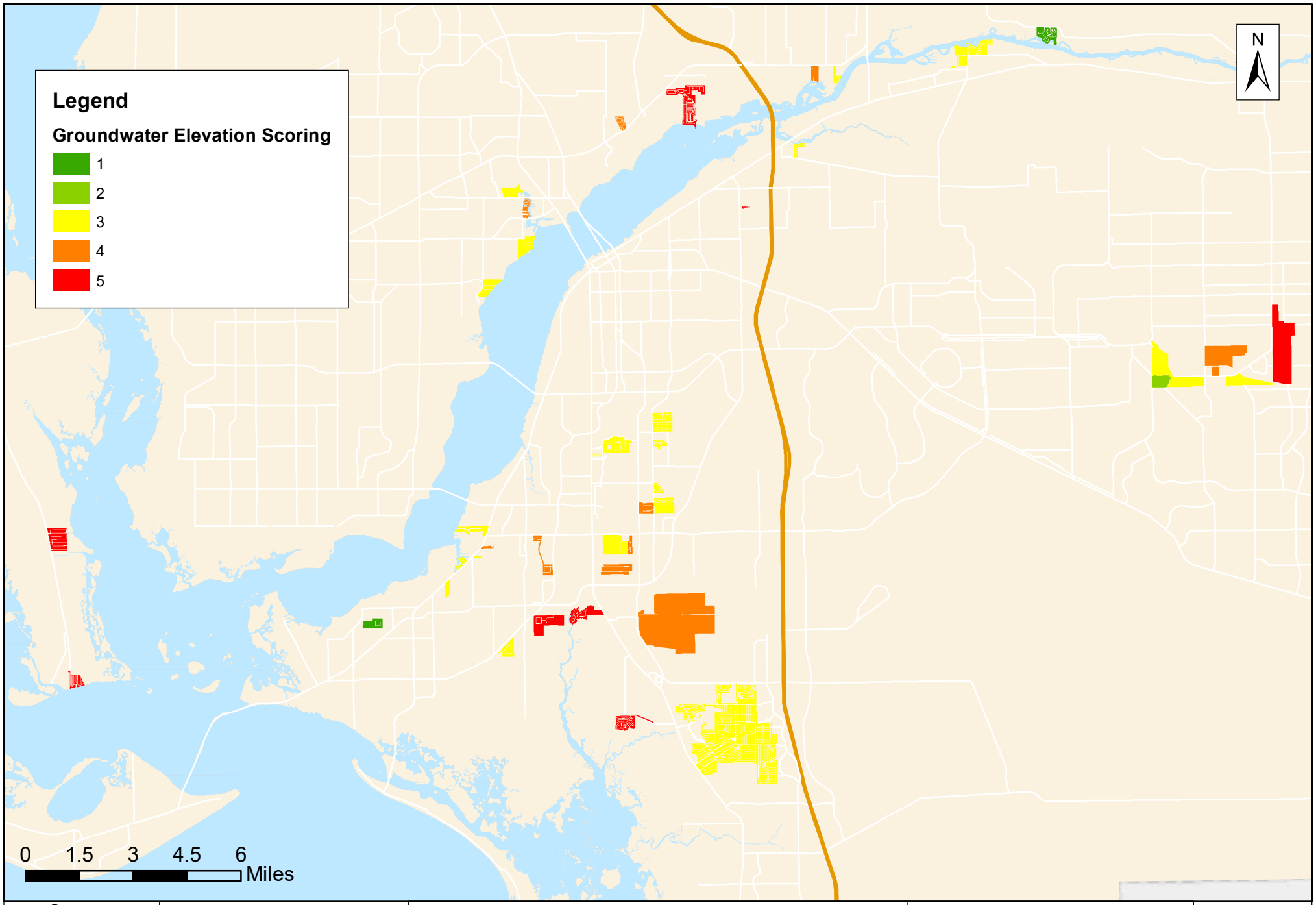
Countywide Wastewater Management Plan

Age of Septic Scoring

AECOM

Figure

4-5



Source:
FDOT and ESRI
Date April 2021
County: Lee

LEE COUNTY
SOUTHWEST FLORIDA

Countywide Wastewater Management Plan

Groundwater Elevation Scoring (Seasonal High Ground Water)

AECOM

Figure

4-6

KNOWN WATER QUALITY ISSUES

Septic conversion is driven by regulatory changes and local water quality goals founded on environmental concerns. The majority of the study area is encompassed within the Caloosahatchee River and Estuary and Everglades West Coast BMAPs. To determine whether an area was associated with any known water quality issues, two sources of information were used:

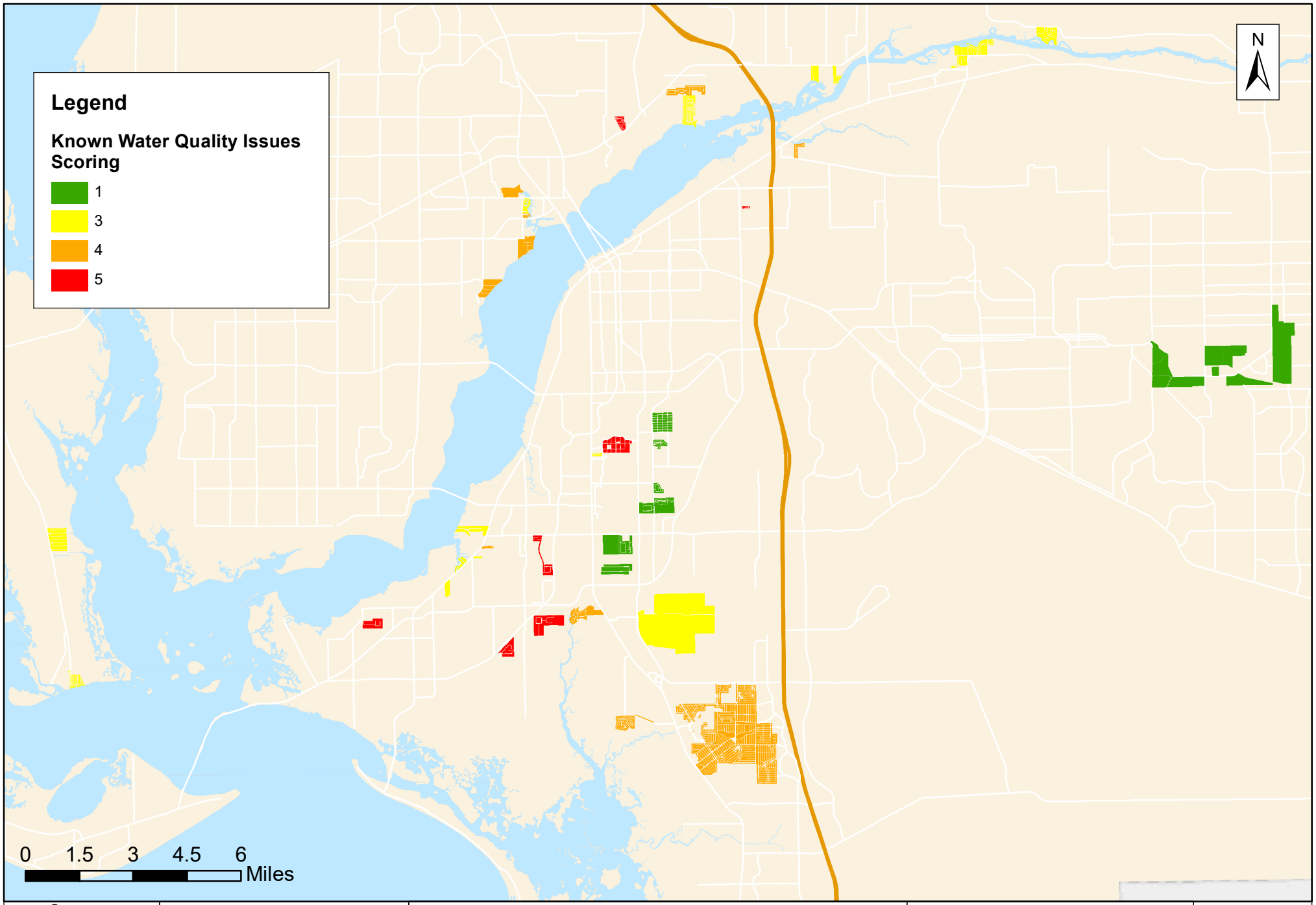
- The FDEP 303(d) Impaired Waters List: This was used to verify whether the surface water body closest to an area was identified in the list.
- The MST study carried out by Lee County Natural Resources Department: This study was conducted independently of this CWMP and covered 22 areas of the 51 areas identified in this plan. In the MST study, a total score was given for each of the study areas based on the results of environmental and bacterial quality sampling. The range of MST scores was distributed over a scoring range of 3 to 5 for this criterion as established in **Appendix A**.

Based on a combination of both sources, the scoring system for this criterion was established as follows:

5	4	3
Based on scoring from MST study (refer to Appendix A)		Based on scoring from MST study (refer to Appendix A) **AND/OR** Area **is close** to an impaired water body according to the FDEP Impaired Water List.

1
Area not considered in MST study **AND/OR** Area **is not close** to any impaired water body according to the FDEP Impaired Waters List.

An example scoring for this criterion can be found in **Appendix A**. Based on this criterion, more than 60% of all identified potential areas have some degree of water quality impairment and/or are close to a verified impaired water body according to the FDEP's list. **Figure 4-7** presents the scoring results for this criterion.



Source:
FDOT and ESRI
Date April 2021
County: Lee

LEE COUNTY
SOUTHWEST FLORIDA

Countywide Wastewater Management Plan

Known Water Quality Issues Scoring

AECOM

Figure

4-7

4.2 RESULTS OF PAIRWISE COMPARISON FOR WEIGHTING CRITERIA

The pairwise comparison is an effective method of comparing pairs of criteria together to establish whether one criterion holds more importance than another or if a pair of criteria are equally significant. This method was utilized to determine the weight of each of the 5 initial screening criteria. The resulting pairwise comparison results are shown in **Table 4-1** below.

Table 4-1: Completed Pairwise Comparison for the Initial Screening Criteria

Evaluation Criteria		1 OSTDS Density	2 Proximity to Surface Waters/Impaired Waters	3 Age of Septic	4 Ground Water Elevation (Seasonal High Groundwater)	5 Known Water Quality Issues
1	OSTDS Density		2	1	4	5
2	Proximity to Surface Waters/Impaired Waters			2	Equal	Equal
3	Age of Septic				Equal	5
4	Ground Water Elevation (Seasonal High Groundwater)					5
5	Known Water Quality Issues					

The first step for calculating the weight for each criterion was counting the number of times each criterion was selected over another and the number of times it was selected equal. The pairwise comparison was completed through a workshop with LCU staff. These numbers were added for all the criteria to find the total – which was 13. The percent weight for each criterion was calculated as follows:

$$Weight_{criterion} = \frac{times\ criterion\ was\ selected + times\ criterion\ was\ equal}{total} \times 100$$

For example, the known water quality issues criterion was selected over other criteria 3 times and it was selected as equal with the proximity to surface waters/impaired waters criterion. Therefore, the weight assigned to it is 31%. Based on the previous calculation, the weight assigned to each criterion is shown in **Figure 4-8** below.

Figure 4-8: Initial Screening Criteria Weighting

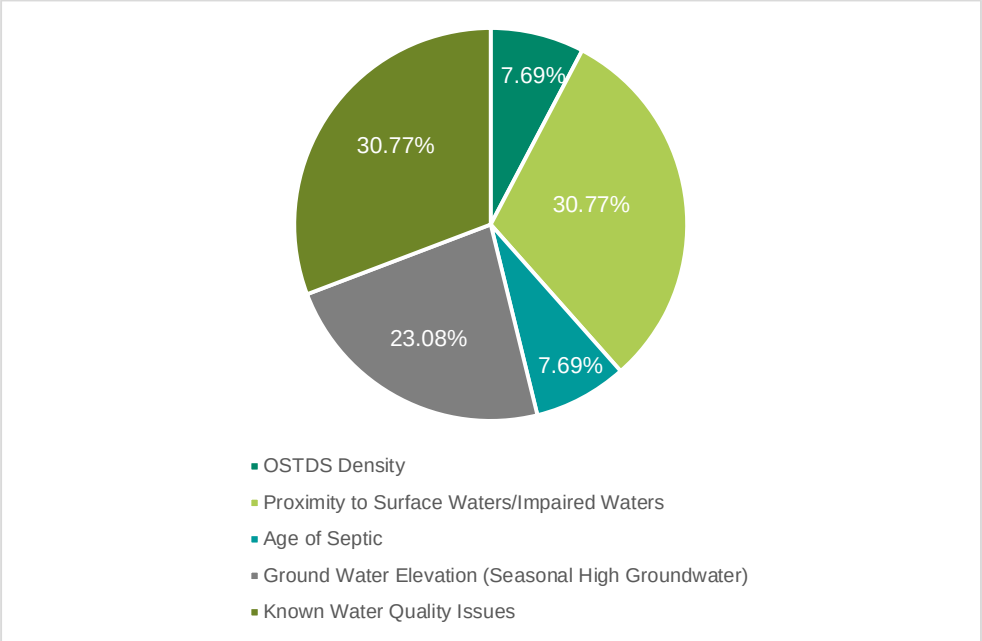
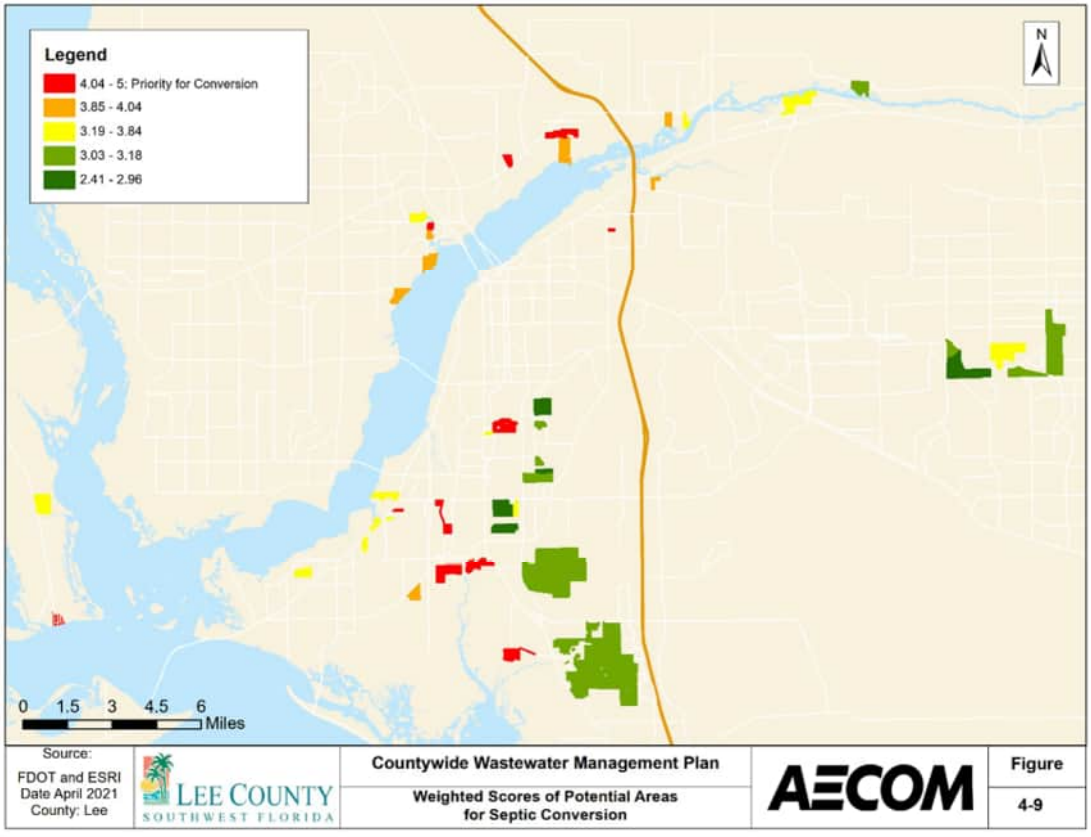


Figure 4-8 shows that the most critical criteria in prioritizing areas for septic conversion are known water quality issues and proximity to surface waters/impaired waters with weights of 31%. Age of septic and density criteria have the lowest weights at 8%. The higher weights assigned to criteria directly related to water quality issues ensures that this priority translates to the weighted scores, ultimately highlighting the potential areas that currently have an adverse impact on water quality or poses a threat to it.

4.3 INITIAL SCORING AND RANKING

For each potential area, each criterion score was multiplied by the criterion weight to calculate a weighted score. The resulting weighted scores ranged from 2.41 to 4.89, and **Figure 4-9** below shows the weighted scores for the potential 51 areas.

Figure 4-9: Weighted Scores of Potential Areas



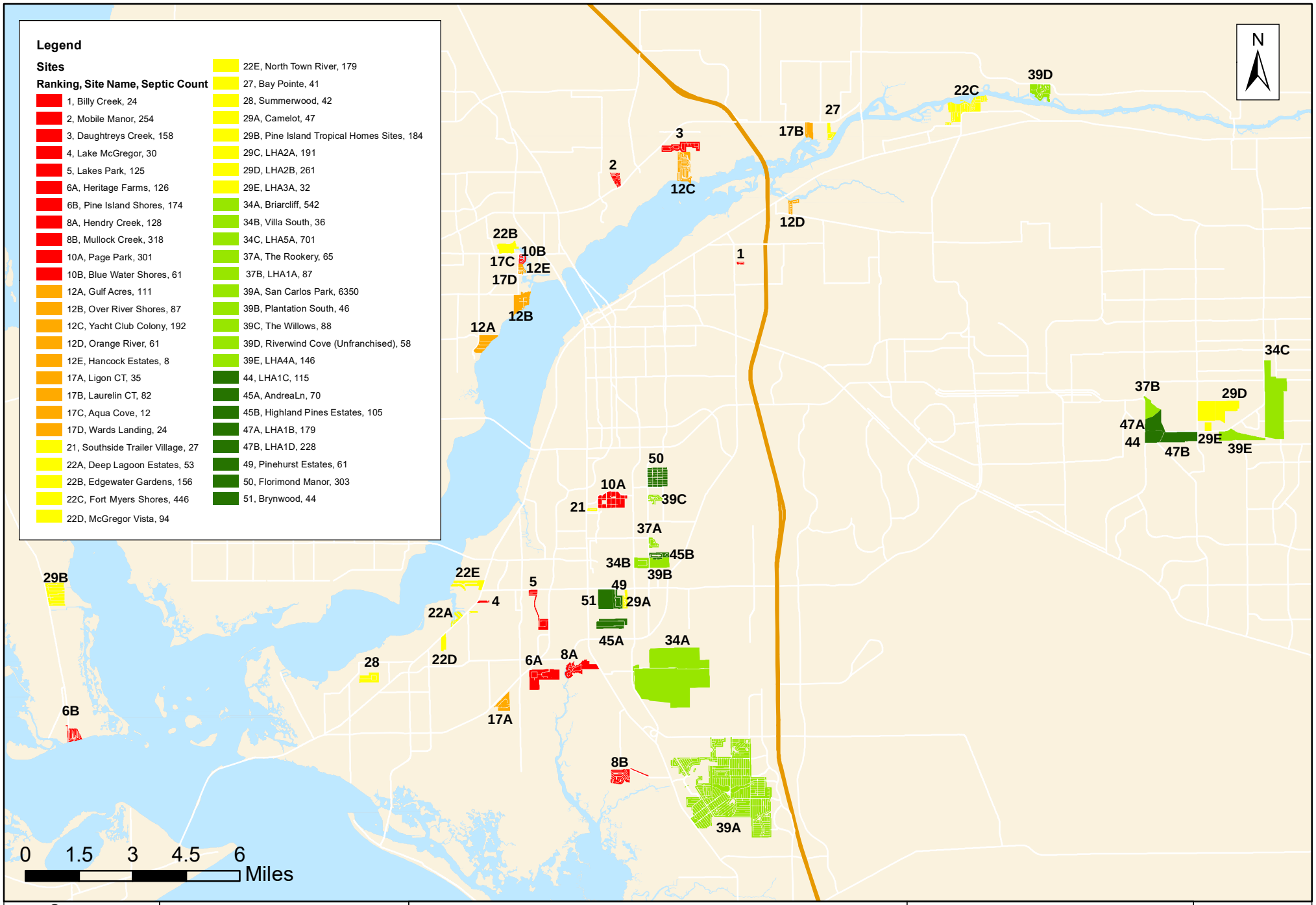
The weighted scores were then used to rank the potential areas from highest priority to connect to central sewer (#1 priority) to lowest priority (#51 priority). Due to the generalized 1-5 scoring, groups of areas had the same weighted score and therefore received the same ranking. The ranking of all 51 potential areas is presented in **Figure 4-10**.

The rankings of the individual areas were used to develop projects groupings that will comprise the final study areas. **Figure 4-11** depicts the ten recommended project groupings as a result of the initial screening process.

The general approach for the identification of the groupings was based on including:

- All top ten ranked areas and adjacent middle-ranked areas
- All areas that lie in the quarter mile buffer from the Caloosahatchee River and its tributaries

As seen in **Figure 4-11**, all project groupings except for grouping no. 10 have at least one area ranked 10 or higher. Areas ranking from 10 – 30 adjacent to an area ranked 10 or higher were picked up in that same grouping, such is the case with groups 4, 7, and 8 for example. In grouping 3, while the area ranked 28 is a little bit further away than the main cluster of areas, the infrastructure is available, and the area falls within the buffer from the Caloosahatchee. Once the top 10 ranked areas were already included in groups, the remaining areas within the Caloosahatchee quarter mile buffer were picked up in groupings such as groupings 9 and 10.



Source:
FDOT and ESRI
Date April 2021
County: Lee

LEE COUNTY
SOUTHWEST FLORIDA

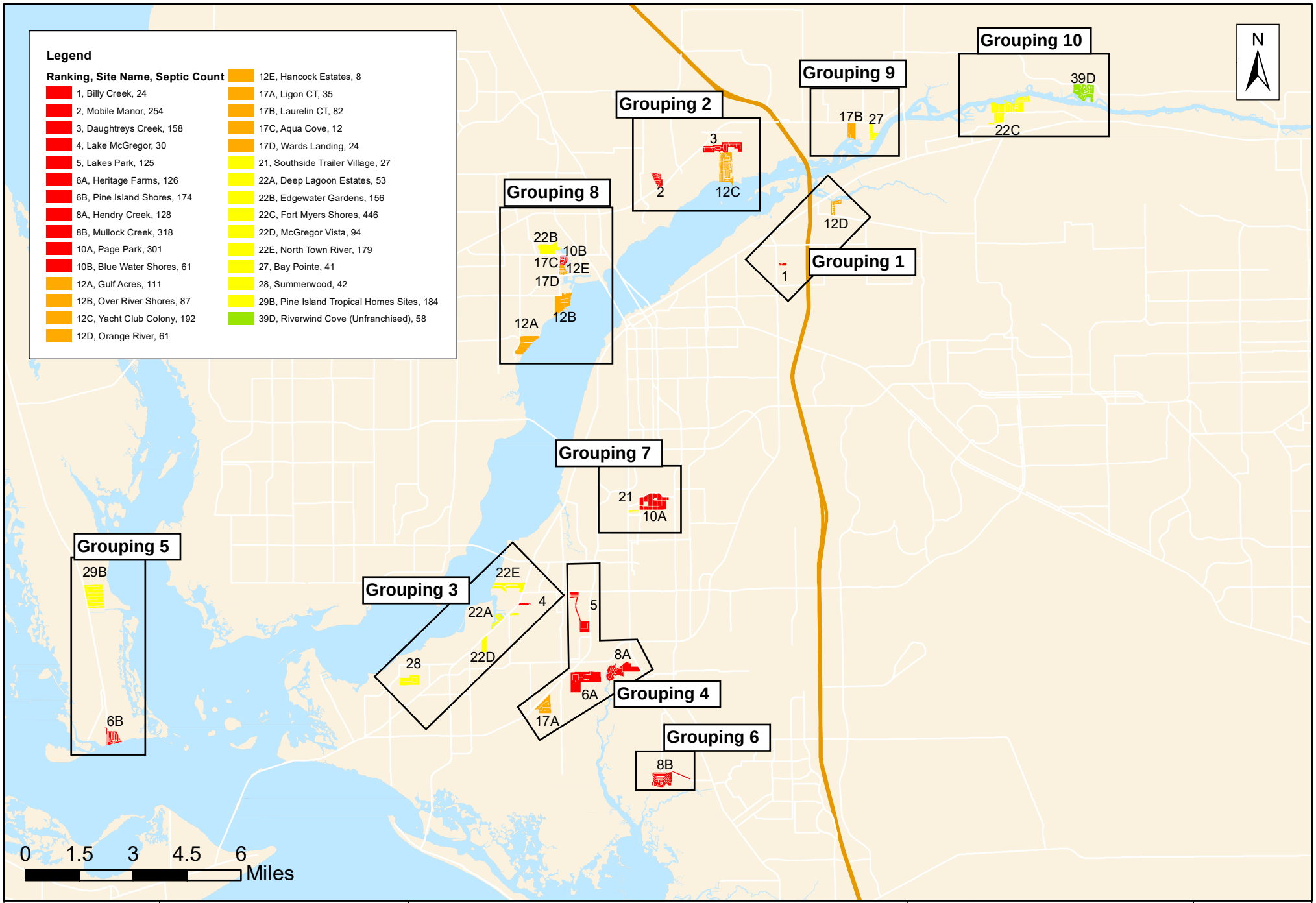
Countywide Wastewater Management Plan

Priority Ranking of Potential Areas for Septic Conversion

AECOM

Figure

4-10



Source:
FDOT and ESRI
Date April 2021
County: Lee

LEE COUNTY
SOUTHWEST FLORIDA

Countywide Wastewater Management Plan

Recommended Project Groupings for Septic Conversion

AECOM

Figure

4-11

5. POPULATION AND FLOW PROJECTIONS

5.1 INTRODUCTION

As part of the development of the CWMP for Lee County Florida, baseline estimates for existing wastewater flows and future wastewater flow projections for the County are needed to evaluate future capacity needs. The future capacity needs, along with a timeline for wastewater system improvements, are required to maintain reliable service. This section of the report will identify:

- Existing County wastewater service areas
- Population estimates and forecasts for each existing service area
- Historical analysis of wastewater treatment plant flows to establish per capita flow rates and peaking factors
- Wastewater flow projections for each current service area
- Planned treatment plant expansions and new treatment facilities
- Planned service area modifications
- Wastewater flow projections for the planned service areas

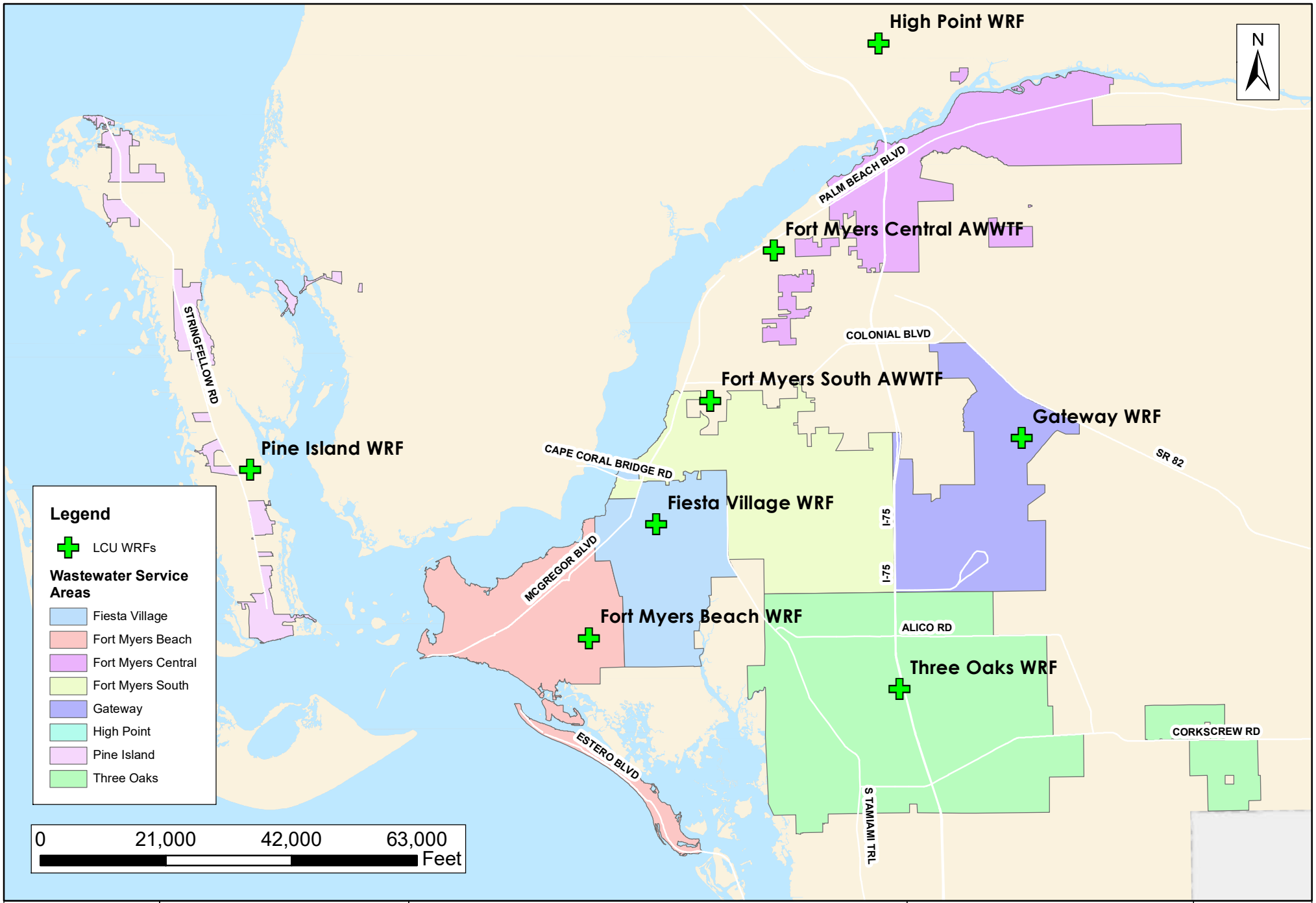
5.2 EXISTING WASTEWATER SERVICE AREAS

As noted previously in Chapter 2 of this report, LCU owns and operates a wastewater collection, conveyance and treatment system that provides service to the unincorporated areas of Lee County. The wastewater treatment system consists of six regional WRFs. LCU also has an agreement with the City of Fort Myers to utilize approximately 50% of the capacity of the Fort Myers's South and Central advanced WWTFs. Each of these treatment facilities has a service area where wastewater flows are collected and treated and there is limited ability to transfer flows from one service area to another. A summary of the treatment facilities is provided below with their current permitted treatment capacity in **Table 5-1**. **Figure 5-1** shows the location of each wastewater treatment facility (WWTF) and its respective service area.

Table 5-1: Summary of Treatment Facilities

Wastewater Treatment Facility	Permitted Treatment Capacity (AADF Basis)
Fiesta Village WRF	5 MGD
Fort Myers Beach WRF	6 MGD
Gateway WRF	3 MGD
Pine Island WRF	0.383 MGD
Three Oaks WRF	6 MGD
High Point WRF	0.025 MGD
City of Fort Myers Central AWWTF	11 MGD (4.54 MGD from LCU)*
City of Fort Myers South AWWTF	12 MGD (6.96 MGD from LCU)*

**LCU portions estimated based on First Amendment Interlocal Wastewater Treatment Agreement Contract, 1986*



Date Created: July 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Existing Wastewater Service Areas**	AECOM	**Figure** **5-1**

5.3 PLANNED TREATMENT CAPACITY EXPANSIONS AND NEW TREATMENT FACILITIES

The anticipated growth in Lee County has triggered the need for additional wastewater treatment capacity to handle increased flows. The planned treatment plant expansions and new treatment facilities identified in this CWMP are based on information received from County staff and several planning efforts conducted by others including the 2020 Wastewater Master Plan by Black&Veatch. The following are the planned treatment capacity expansions and new treatment facility that were considered in this CWMP:

- Three Oaks WRF treatment capacity expansion to 9 MGD (expected to be online by 2025).
- Gateway WRF treatment capacity expansion to 6 MGD (timing unknown).
- New Southeast WRF (expected to be online by 2028 with an assumed initial capacity of 6 MGD; expandable to 10 MGD).

The proposed location of the new SE WRF is shown in **Figure 5-3**. The planned treatment capacity expansions and their respective timing are discussed and evaluated further in the gap analysis effort in Chapter 6.

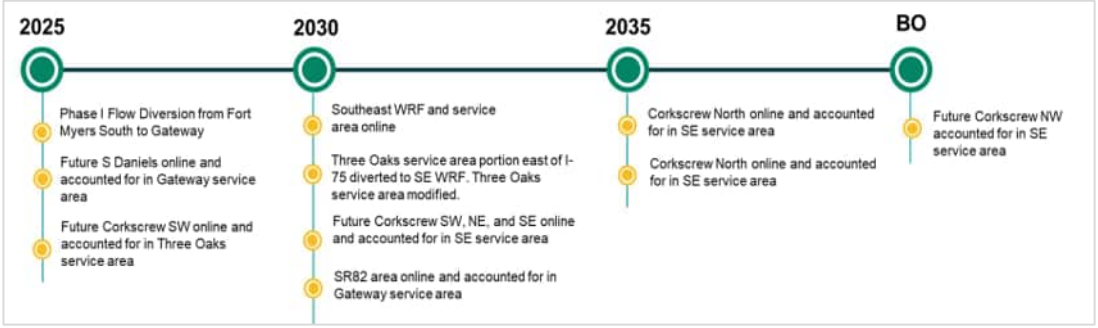
5.4 PLANNED WASTEWATER SERVICE AREA MODIFICATIONS

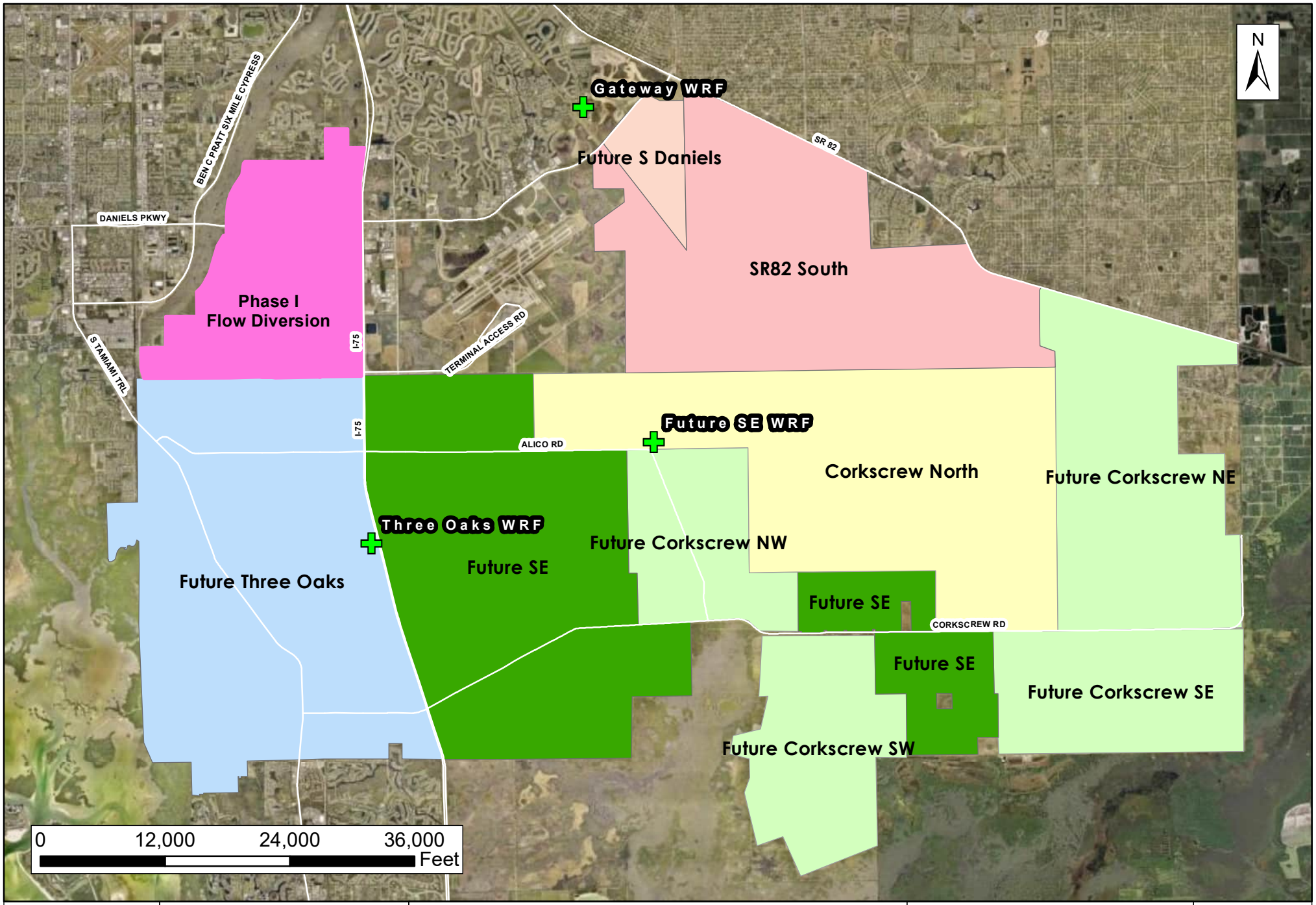
The planned treatment capacity expansions and the new SE WRF resulted in planned modifications to the existing wastewater service areas. The wastewater service areas that will experience modifications are Fort Myers South (LCU portion), Gateway, Three Oaks, and Southeast. The planned service area modifications and incorporation of future growth areas are anticipated to occur as described in the brief timeline presented in **Figure 5-2** for this planning effort. **Figure 5-3** illustrates the resulting planned service area modifications and future growth areas to be incorporated.

For the Fort Myers South service area, the planned modification is a result of the implementation of the first phase of the flow diversion plan from the Fort Myers plants. Flows from Phase I, as shown in **Figure 5-3**, are planned to be diverted from Fort Myers South AAWTF west of I-75 to the Gateway WRF in the east. The remaining phases of the flow diversion plan are not considered in this CWMP. Consequently, the Gateway service area will be modified to include the Phase I flow diversion area. In addition, and along the 20-year planning horizon of this CWMP, the Gateway service area will include two growth areas identified as shown in **Figure 5-3**: one south of State Road 82 (SR82) and one south of Daniels Road. The anticipated timing for the incorporation of these areas is shown in **Figure 5-2**. Alternatively, LCU is also considering diverting Phase I flows from the Fort Myers South service area to the Three Oaks WRF, rather than to the Gateway WRF. If the original timing for the Gateway WRF expansion to 6 MGD is delayed, then the flow diversion project should also be delayed to not exceed treatment capacity or the flows should be conveyed to the Three Oaks WRF.

As for the Three Oaks service area, the service area modification will coincide with the construction of the new Southeast WRF. Once the Southeast WRF comes online, the portion of the existing Three Oaks service area east of I-75 will be diverted to the new facility. The future Three Oaks service area will maintain its north boundary north of Alico Rd up to the airport terminal access road, south boundary of Williams Rd, west boundary of Estero Bay, and will have I-75 as its new east boundary. In addition, a growth area identified along Corkscrew Rd called Future Corkscrew SW as shown in **Figure 5-3** is anticipated to be part of the SE service area and is expected to be online in 2025. Since the Southeast facility is not planned to be online and operational at that time, the population and corresponding flows from this area will be conveyed to the Three Oaks WRF and therefore are accounted for in the Three Oaks service area for the planning year 2025 only. The planned service area for the new Southeast WRF will comprise of (a) the portions of existing Three Oaks service area to the east of I-75, including the two smaller areas along Corkscrew Rd and (b) five more growth areas identified along Corkscrew Rd.

Figure 5-2: Timeline of Planned Service Area Modifications





Date Created: July 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Future Three Oaks, Gateway, and Southeast Service Areas**	AECOM	**Figure** **5-3**

5.5 POPULATION ESTIMATES AND FORECASTS

The population forecasts for the wastewater service areas based upon permanent population were provided by Metro Forecasting Models, LLC (MFM) for the period of 2020 – 2040 in 5-year intervals, as well as buildout. MFM also provided a breakdown of population that is being served by centralized sewer and population that is being served by OSTDS or packaged treatment plants. Separate population forecasts were also developed by MFM for the identified septic conversion areas in the groupings developed in Chapter 4 of this report and included baseline and buildout residential population and non-residential square footage.

While Lee County experiences a seasonal influx of residents and tourists, the seasonal impact on wastewater flows is captured in this plan through the evaluation of wastewater flows over 12 months and analysis of potential impacts from Max Month Average Daily Flows (MMDF) on treatment capacities, rather than through incorporating a seasonal population.

The following subsections summarize the development of population estimates and projections through buildout.

5.5.1 Data Sources and Methodology

Estimates for the number of housing units and non-residential space were determined using a parcel database established from the Lee County property appraiser dataset. Florida Department of Revenue (DOR) codes and aerial photography were used to determine existing building area by type: residential, retail, office, industrial, government, or institutional.

MFM used the Housing Unit Method to determine population for each wastewater service area. The Housing Unit Method applies household demographics to the number of housing units in each wastewater service area. The number of housing units is verified using a combination of techniques including GIS address points, E911 doorknob data, permit data, heated building area where parcels show heated area but no unit count, review of aerial photography, and parcel-specific research. If the number of units from the property appraiser data varied significantly from the census counts and permit survey, then further review was conducted for the property appraiser data and the number of housing units was adjusted accordingly. The forecast data also accounted for approved projects and projects under construction at the time of the analysis.

After the baseline housing units were quantified, 2020 Census block group demographics were used as the basis for development of baseline population estimates and population projections for the wastewater service areas. Spatial group housing data from the 2020 Census was also reviewed so that students living in dorms on the Florida Gulf Coast University (FGCU) campus were also captured in the analysis.

With the baseline housing units and population established, population projections were developed using the Metro Forecasting Models Interactive Growth Model® (IGM). The IGM considers both the Baseline (2021) and Buildout condition to project a non-linear forecast of housing units and population growth. The IGM also forecasts the increase in non-residential building area over time. The non-residential building areas were categorized by land use including office, retail, industrial, institutional, and government. As the population grows, the non-residential building areas increase to accommodate the additional demand for goods and services, and the labor force.

5.5.2 Planning Analysis/Buildout Analysis

A planning analysis was conducted to determine the buildout potential of each wastewater service area on a parcel basis. Zoning, Future Land Use, additional land use policies, wetland inventory data (i.e., areas that cannot be developed) and parcel geometry were used to determine the buildout potential of each parcel. Research and interviews with landowners, developers, and planning staff (Lee County, City of Fort Myers, and the Village of Estero) were used to ascertain the most realistic buildout scenario. Potential for redevelopment was assessed using existing land use policies and interviews.

5.5.3 Residential Population Estimates and Projections

The 2022 population estimates are based on a reviewed parcel database of existing housing units. Household demographic data was derived from the 2020 Census and applied to each housing unit. Population projections were provided in five-year increments from 2025 to 2040. Non-linear regression analysis was used to model the population growth from the baseline year, 2021, through the buildout year, assumed to be 2100. The wastewater service areas were modeled separately with regression factors suitable for the characteristics of the specific service area. In other words, a “one-size fits all” approach was not used in the analysis. The population projection methodology used herein is the same approach used in the 2045 Long Range Transportation Plan (LRTP).

5.5.4 Non-Residential Population Estimates and Projections

As population increases, demand for commercial and industrial services also increases. The non-residential buildout determines where there is vacant land assigned for commercial and industrial space based on current land use policies. Accordingly, the increase in building area is spatially distributed over time to areas with population growth.

MFM considers complex relationships, such as the development potential near existing residential land uses in the commercial and industrial projections. Over time, as southeast Lee County grows, zoned non-residential land is forecasted to develop, resulting in increased employment. Similarly, in certain mixed-use projects (i.e. Verdanna on east Corkscrew Road), the housing and population is forecasted to increase prior to commercial space developing, as these projects require a critical mass of population to support them.

5.5.5 Wastewater Service Area and Septic Conversion Area Population Forecasts

Population Forecasts for Existing Wastewater Service Areas

Subsequent to the baseline and buildout estimates for residential population completed on a parcel basis, the parcels within each wastewater service area were aggregated based on whether they are served by centralized sewer or septic systems/packaged plants. The determination of which parcels were served by central service versus OSTDS was provided by Lee County. The parcels with central service and parcels with septic systems were forecasted independently for each wastewater service area.

For each of the wastewater service areas, the total served population projections consisted of the growth in the existing served population (by centralized sewer) and the future additional population to be served (population currently served by OSTDS). The future additional served population for each service area was determined using the buildout population from the septic conversion areas within that service area (as discussed in Appendix D).

Table 5-2 summarizes the total served population forecasts for each current service area for permanent population.

Table 5-2: Summary of Served Population Forecasts by Wastewater Service Area

Year	Wastewater Service Area								
	Fort Myers Beach	Fiesta Village	Three Oaks	Pine Island	Gateway	High Point	Fort Myers Central (LCU)	Fort Myers South (LCU)	North Fort Myers (FGUA)
2021	29,343	34,580	51,807	1,570	11,229	188	27,558	41,600	55,000
2025	30,248	35,380	57,318	1,579	12,623	191	31,166	43,161	66,786
2030	31,080	36,184	63,583	2,287	14,267	193	35,153	44,719	
2035	31,489	36,258	66,286	2,298	15,202	194	37,416	46,276	
2040	31,686	36,293	67,483	2,308	15,688	194	39,677	46,652	
Build out	32,477	36,594	88,378	12,052	16,158	195	44,927	52,616	

*The North Fort Myers served population forecast was based on projected flows and per capita demands from the 2019 Del Prado Wastewater Treatment Facility 10-year Planning Analysis report by Tetra Tech which had a planning horizon of 2019 through 2028.

The population forecasts in **Table 5-2** show varying growth rates in the wastewater service areas. Fort Myers Beach, Fiesta Village, and High Point service areas have the lowest population increases from baseline to 2040 at 8%, 5%, and 3% respectively. Pine Island, Gateway, and Fort Myers Central (LCU) service areas exhibit growth in the served population of 40% or higher. The significant difference in growth rates can be attributed to the existing population served by septic systems or packaged plants as well as whether the wastewater service area is currently near buildout. For example, Fort Myers Beach service area is near buildout and has minimal septic systems and therefore does not have significant growth. The overall growth rate for the entire LCU service area is about 21% over the 20-year planning period.

Population Forecasts for Modified/New Wastewater Service Areas

Using the same methodology for population projections as described in subsection 5.5, population forecasts were developed for the modified and new wastewater service areas. **Table 5-3** presents the served population for the identified growth areas contributing to the modified treatment plant service areas.

Table 5-3: Served Populations for Identified Growth Areas

Growth Area	2021	2025	2030	2035	2040	BO
Phase I Flow Diversion	5,046	5,331	5,627	5,779	5,853	7,998
Future Corkscrew NW	173	198	228	246	256	265
Future Corkscrew SW	209	500	1,934	5,383	8,940	11,035
Future Corkscrew NE	506	842	1,924	4,138	7,956	23,371
Future Corkscrew SE	107	179	414	907	1,805	6,171
Corkscrew North	25	41	95	208	413	1,406
SR82	470	560	745	987	2,436	14,108
Future S Daniels	0	128	1,176	3,576	4,295	4,374

It should be noted that these populations were incorporated into the appropriate modified service area according to the timeline in **Figure 5-2**. The total served population for the modified service areas are presented in **Table 5-4** below.

Table 5-4: Modified Wastewater Service Area Served Population Projections

Year	Wastewater Service Area			
	Gateway	Three Oaks	Southeast	Fort Myers South (LCU)
2021	11,229	51,806	-	41,600
2025	18,082	57,818	-	37,830
2030	21,815	38,416	29,438	39,092
2035	25,544	40,021	36,900	40,497
2040	28,272	40,731	45,865	40,799
Buildout	42,638	61,267	69,358	44,618

The population projections presented in **Table 5-4** will be used to develop flow projections for the modified service areas. It can be noted that no populations are shown for the baseline year and planning year 2025 as the SE WRF is not expected to be online until 2030. **Table 5-4** identifies an increase in served population for Gateway in 2025 and a decrease in served population for Fort Myers South (LCU portion) as a result of the planned flow diversion. For Three Oaks, **Table 5-4** also shows an increase in served population in 2025 for the modified service area versus the existing service area due to the incorporation of Future Corkscrew SW, as well as a decrease in served population in 2030 when the new SE WRF comes online. The population projections in **Table 5-4** do not reflect the County's consideration of diverting Phase I flows from Fort Myers South to the Three Oaks WRF as an alternative to the Gateway WRF.

Population Forecasts for Septic Conversion Areas

As mentioned previously, population forecasts for the population not served by centralized sewer in each wastewater service area were developed separately. In addition, MFM provided baseline and buildout population forecasts for the septic conversion areas identified in this study. **Table 5-5** presents the baseline and buildout populations and commercial/industrial areas for the septic conversion areas in the groupings developed through the initial screening criteria process. The commercial and industrial areas were used to capture non-residential flows to develop flow projections from septic conversion areas.

Table 5-5: Grouping Septic Conversion Area Population Forecasts

Area Name	Area Grouping	Baseline Population	Buildout Population	Baseline Commercial/Industrial Area (square foot.)	Buildout Commercial/Industrial Area (square foot.)
Billy Creek	1	79	102	0	0
Orange River	1	106	119	0	0
Daughtreys Creek	2	340	362	0	0
Mobile Manor	2	335	340	0	0
Yacht Club Colony	2	414	446	0	0
Deep Lagoon Estates	3	98	113	0	0
Lake McGregor	3	59	59	3,514	3,514
McGregor Vista	3	114	128	7,017	7,017
North Town River	3	330	334	0	0
Summerwood	3	57	57	0	0
Hendry Creek	4	171	179	18,076	18,076
Heritage Farms	4	205	210	0	0
Lakes Park	4	193	195	2,947	2947
Ligon Court	4	63	65	0	0
Pine Island Shores	5	192	225	2,340	2,340
PIne Island Tropical Homesites	5	234	469	0	0
Mullock Creek	6	554	607	0	7,000
Page Park	7	652	723	338,654	418,798
Southside Trailer Village	7	54	58	6,562	6,562
Aqua Cove	8	23	23	0	0
Blue Water Shores	8	119	135	0	0
Edgewater Gardens	8	331	369	24,280	36,780
Gulf Acres	8	213	244	0	0
Hancock Estates	8	16	18	0	0
Over River Shores	8	169	194	0	0
Wards Landing	8	47	57	0	0
Bay Pointe	9	49	60	0	0
Laurelin Court	9	99	101	0	0
Fort Myers Shores	10	834	895	0	0
River Wind Cove	10	142	191	0	0

The buildout populations presented in **Table 5-5** above were included in the additional served population for each wastewater service area corresponding to the location of the septic conversion area.

5.6 HISTORICAL ANALYSIS OF WASTEWATER

LCU provided daily wastewater flow data for the years 2016 through 2021 for all six of the County WRFs. In addition, the flow data for the City of Fort Myers Central and South AWWTFs was obtained from the 2021 Capacity Analysis Reports prepared for the City of Fort Myers.

5.6.1 Historical Flows at the Treatment Facilities

Historical flow analysis is required to identify flow trends at each of the treatment facilities and to determine historical peaking factors and per capita flow rates for subsequent use in developing flow projections. Historical flows are expressed in the following terms for each of the LCU owned facilities for FY 2017 – FY 2021 and are presented in **Table 5-6** and in **Figures 5-3** through **5-8.**

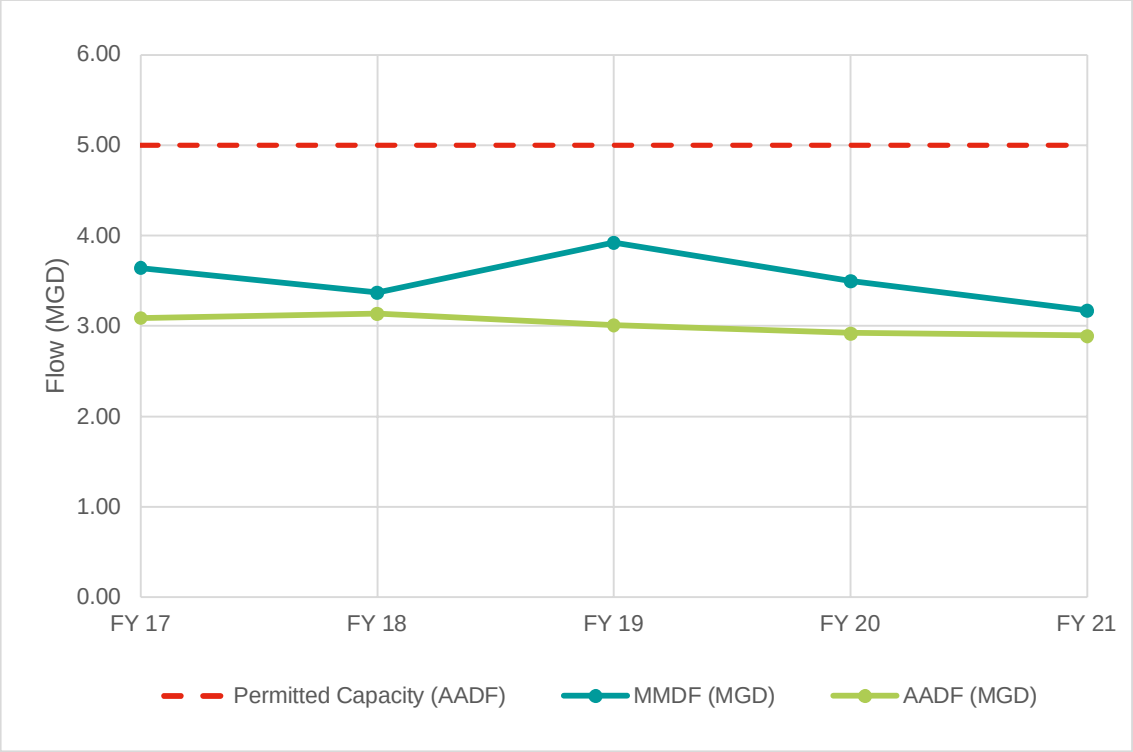
- Annual Average Daily Flow (AADF)
- Maximum Monthly Average Daily Flow (MMDF)

Table 5-6: Historical AADF and MMDF Flow Summary at Each LCU WRF

Fiscal Year	Fiesta Village WRF		Fort Myers Beach WRF		Three Oaks WRF		Gateway WRF		Pine Island WRF		Highpoint WRF	
	AADF	MMDF	AADF	MMDF	AADF	MMDF	AADF	MMDF	AADF	MMDF	AADF	MMDF
	(MGD)											
2017	3.09	3.64	3.43	4.15	3.10	3.51	1.32	1.69	0.13	0.15	0.011	0.017
2018	3.14	3.37	3.29	4.02	3.27	3.66	1.40	1.52	0.12	0.15	0.008	0.009
2019	3.01	3.93	3.24	4.27	3.59	4.22	1.35	1.47	0.12	0.16	0.007	0.009
2020	2.92	3.50	3.18	4.33	3.70	4.31	1.33	1.47	0.13	0.16	0.008	0.008
2021	2.90	3.18	3.50	3.98	3.78	4.14	1.44	1.61	0.14	0.17	0.011	0.013
2-Year Average	2.91	3.34	3.34	4.15	3.74	4.23	1.39	1.54	0.13	0.16	0.009	0.011
5-Year Average	3.01	3.52	3.33	4.15	3.49	3.97	1.37	1.55	0.13	0.16	0.009	0.011

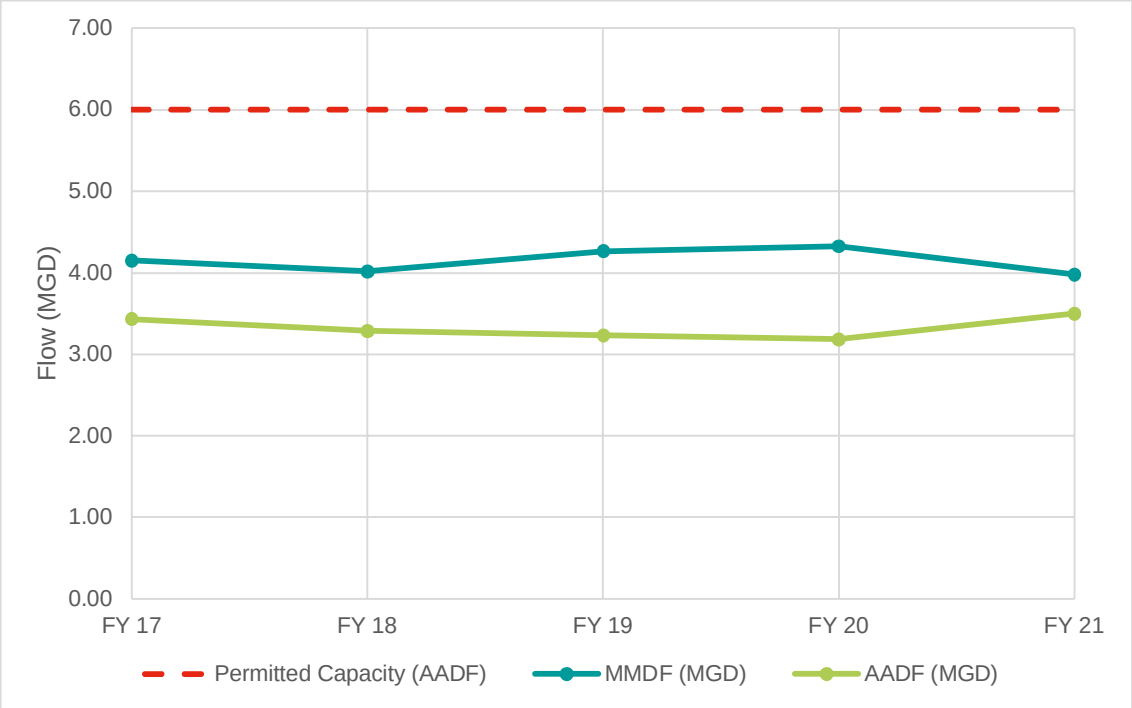
Historical flow data for 2016 – 2021 obtained from daily plant flow data provided by Lee County Utilities.

Figure 5-3: 5-Year Historical Flows at Fiesta Village WRF



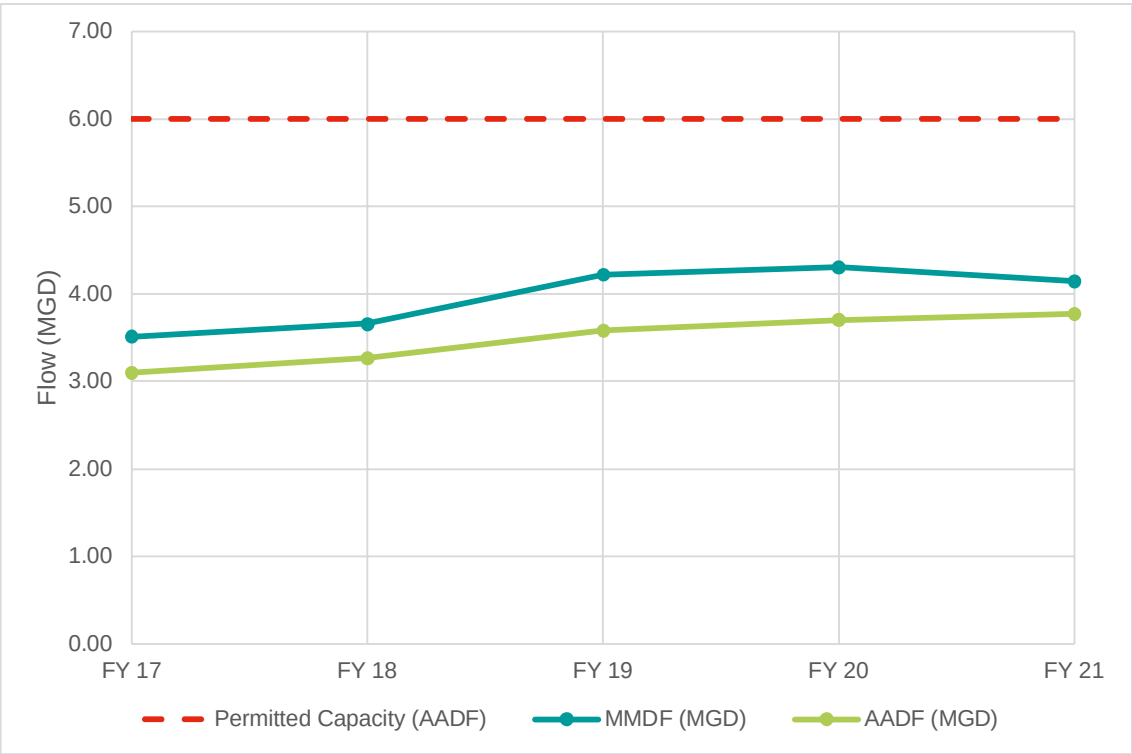
The average historical AADF flow at the Fiesta Village WRF was 3.01 MGD and the maximum was 3.14 MGD in 2018. The maximum historical MMDF was observed in 2019 at 3.93 MGD. **Figure 5-3** shows that the historical AADF flows are below the WRF's permitted treatment capacity of 5 MGD.

Figure 5-4: 5-Year Historical Flows at Fort Myers Beach WRF



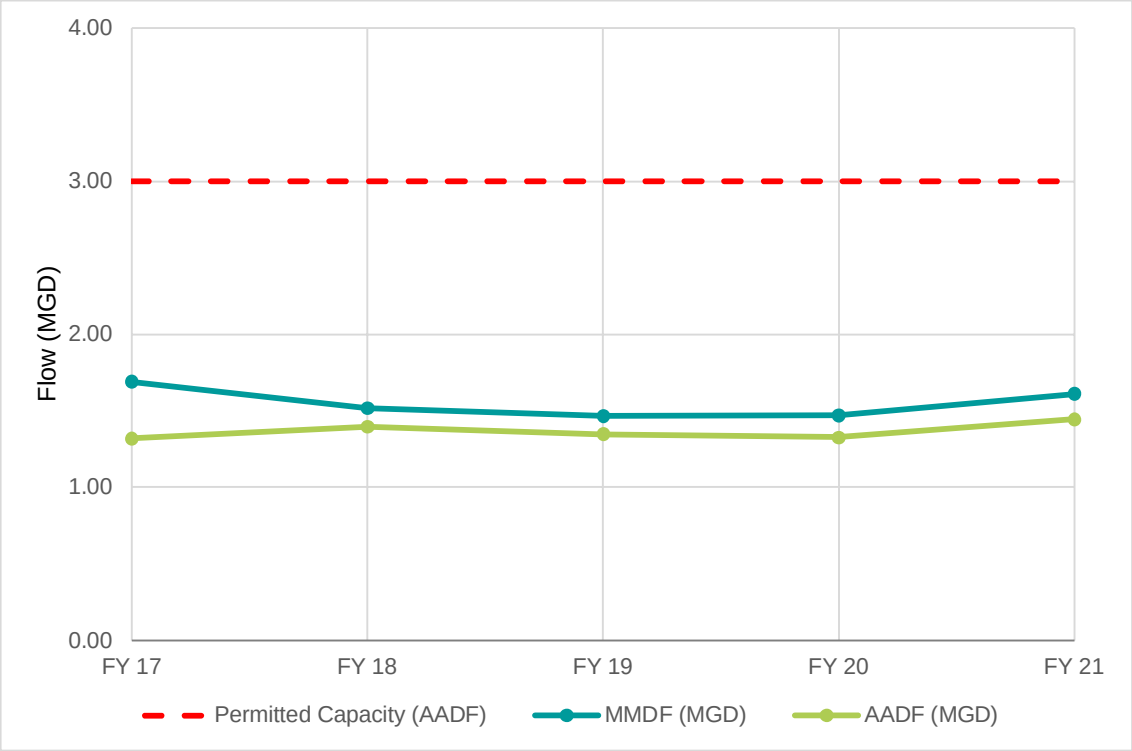
The average historical AADF flow at the Fort Myers Beach WRF was 3.33 MGD and the maximum was 3.50 MGD in 2021. The maximum historical MMDF was observed in 2020 at 4.33 MGD. **Figure 5-4** shows that the historical AADF flows are below the WRF's permitted treatment capacity of 6 MGD.

Figure 5-5: 5-Year Historical Flows at Three Oaks WRF



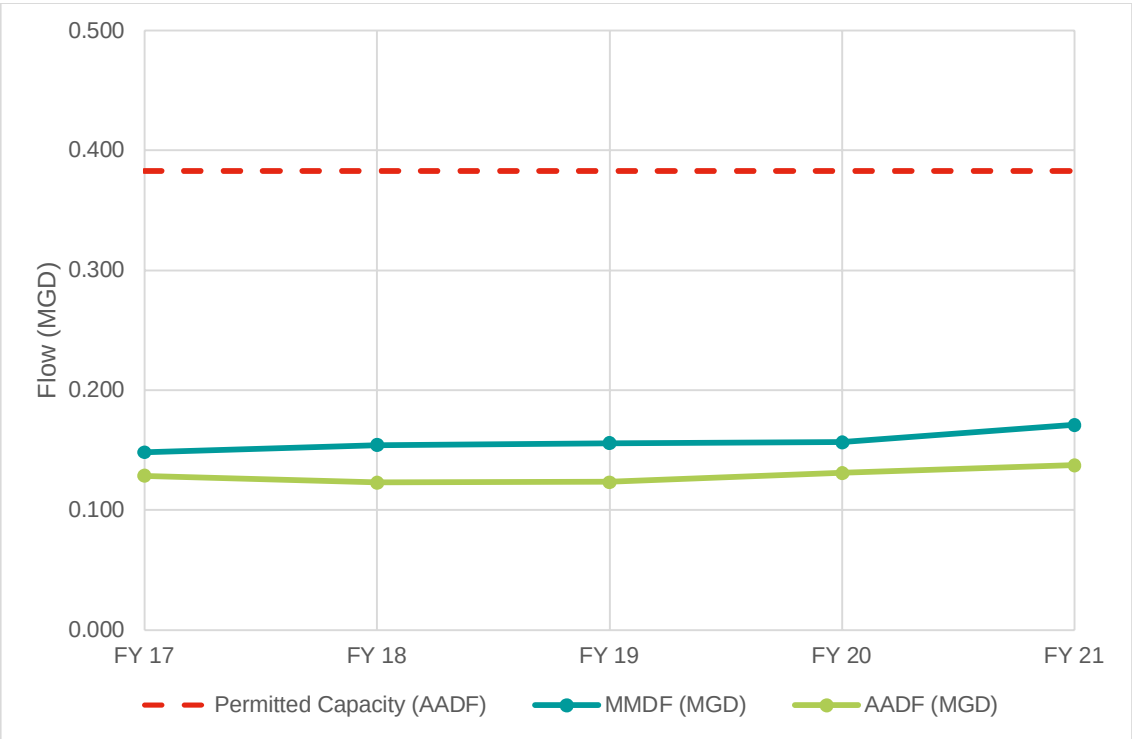
The average historical AADF flow at the Three Oaks WRF was 3.49 MGD and the maximum was 3.78 MGD in 2021. The maximum historical MMDF was observed in 2020 at 4.31 MGD. **Figure 5-5** shows that the historical AADF flows are below the WRF's permitted treatment capacity of 6 MGD.

Figure 5-6: 5-Year Historical Flows at Gateway WRF



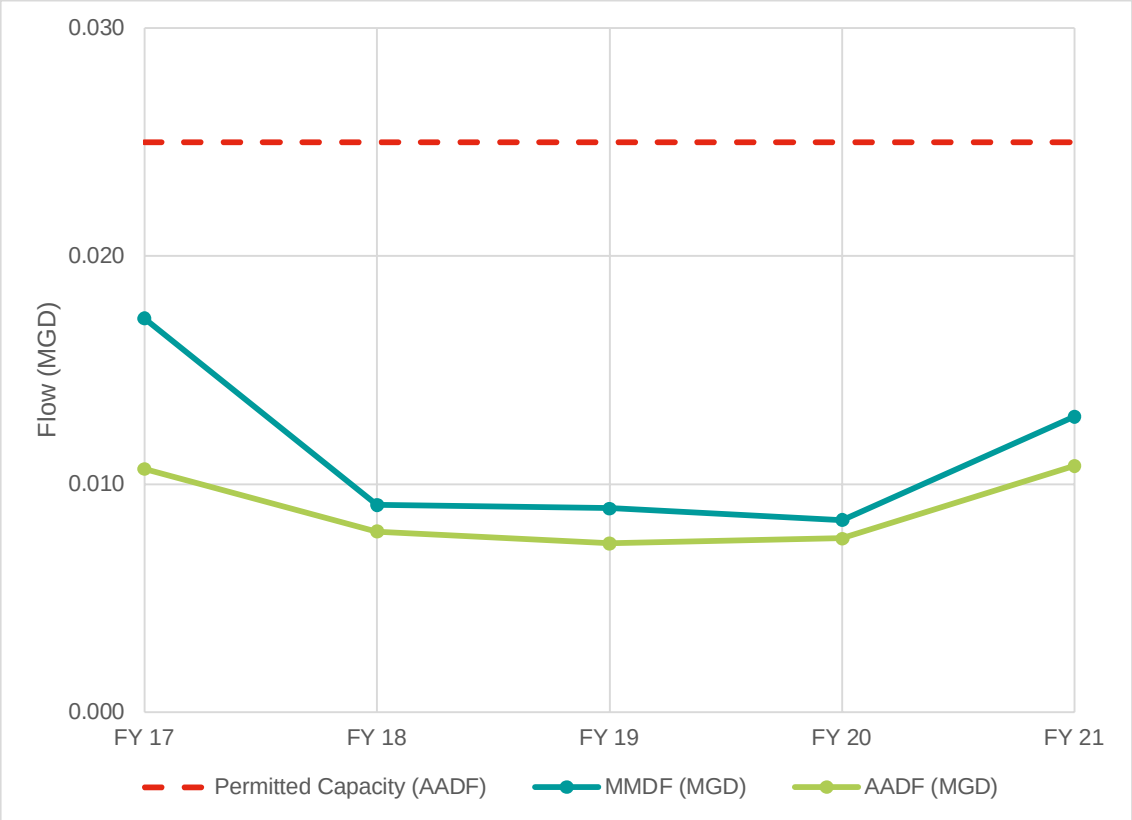
The average historical AADF flow at the Gateway WRF was 1.37 MGD and the maximum was 1.44 MGD in 2021. The maximum historical MMDF was observed in 2017 at 1.69 MGD. **Figure 5-6** shows that the historical AADF flows are below the WRF's permitted treatment capacity of 3 MGD.

Figure 5-7: 5-Year Historical Flows at Pine Island WRF



The average historical AADF flow at the Pine Island WRF was 0.13 MGD and the maximum was 0.14 MGD in 2021. The maximum historical MMDF was observed in 2021 at 0.17 MGD. **Figure 5-7** shows that the historical AADF flows are below the WRF's permitted treatment capacity of 0.383 MGD.

Figure 5-8: 5-Year Historical Flows at High Point WRF



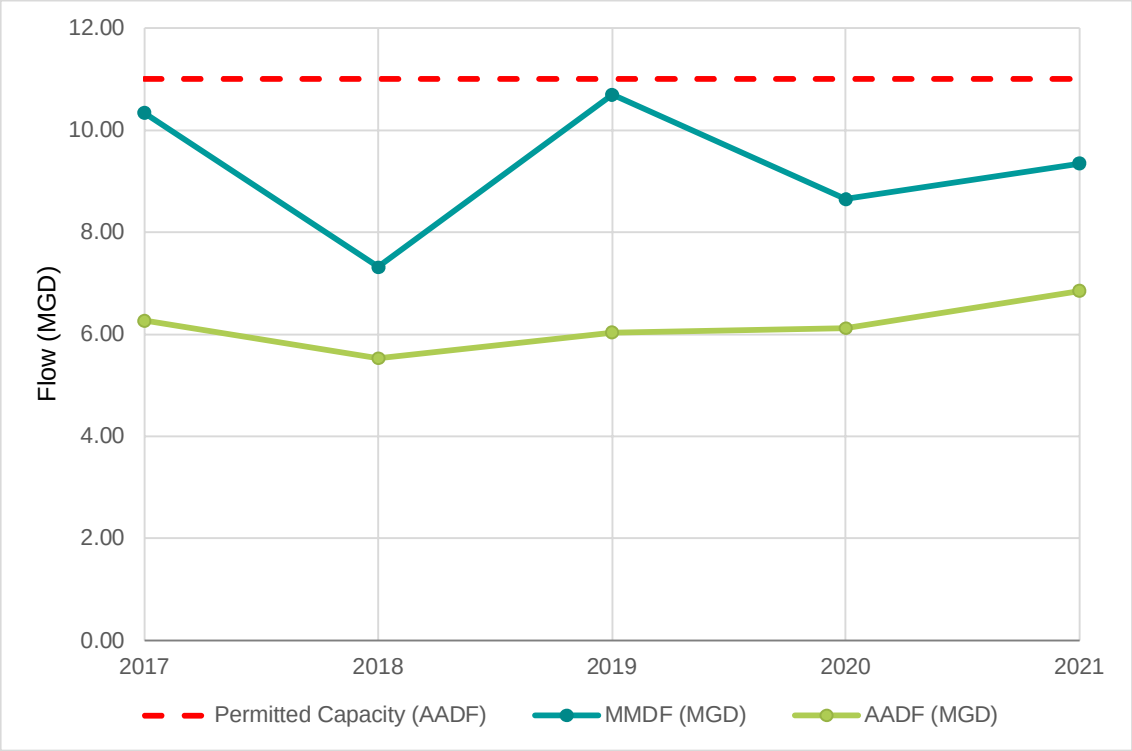
The average historical AADF flow at the High Point WRF was 0.009 MGD and the maximum was 0.011 MGD in 2021. The maximum historical MMDF was observed in 2017 at 0.017 MGD. **Figure 5-8** shows that the historical AADF flows are below the WRF's permitted treatment capacity of 0.025 MGD.

Considering LCU has an agreement to use 50% of the treatment capacity of the Central and South Fort Myers AWWTFs, the historical AADF and MMDF flows from these plants is included in the historical analysis for this CWMP. Five years of historical flows for Central and South Fort Myers AWWTFs were obtained from the 2021 Capacity Analysis Reports prepared for the City of Fort Myers. These flows are for the entire service areas and are not limited to the portion of flow contributed by the LCU subservice area. **Table 5-7** and **Figures 5-9** and **5-10** below present the historical AADF and MMDF flows for the Central and South Fort Myers AWWTFs.

Table 5-7: 5-Year Historical Flows for Central and South Fort Myers AWWTFs

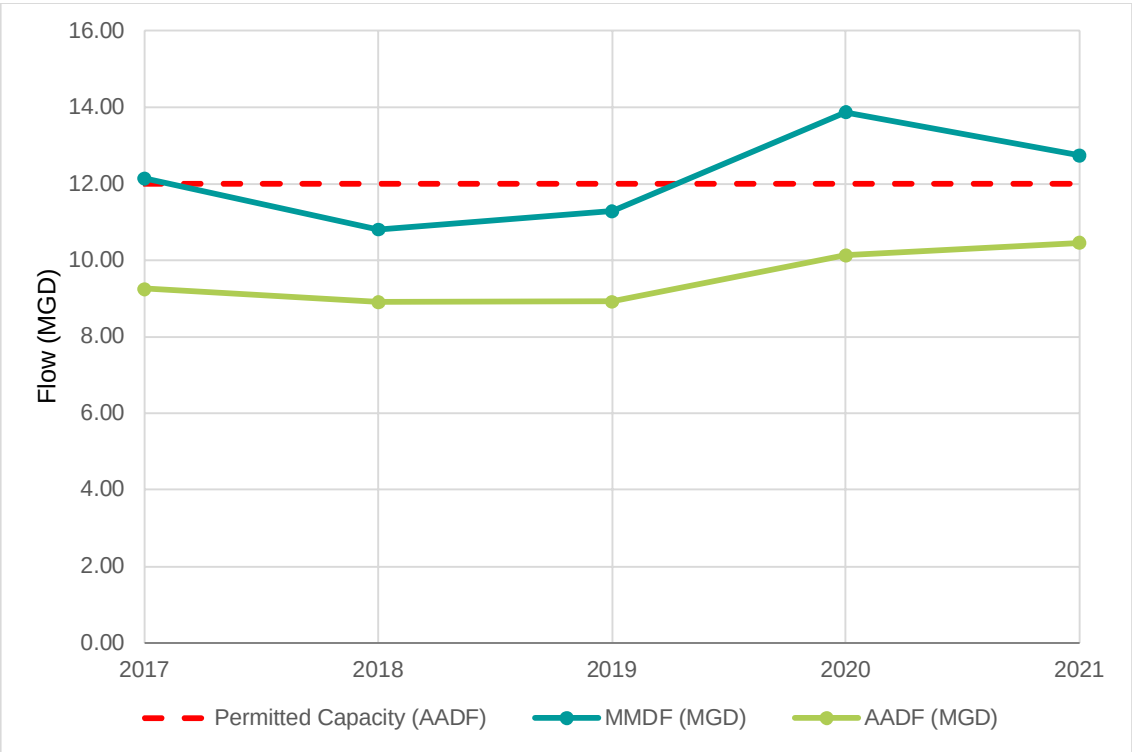
Fiscal Year	Central Fort Myers AWWTF		South Fort Myers AWWTF	
	AADF (MGD)	MMDF (MGD)	AADF (MGD)	MMDF (MGD)
2017	6.27	10.34	9.25	12.14
2018	5.53	7.32	8.91	10.80
2019	6.04	10.70	8.92	11.28
2020	6.12	8.65	10.13	13.87
2021	6.85	9.35	10.46	12.74
Average	6.16	9.27	9.53	12.17

Figure 5-9: 5-Year Historical Flows at Central Fort Myers AWWTF



The average historical AADF flow at the Central Fort Myers AWWTF was 6.16 MGD and the maximum was 6.85 MGD in 2021. The maximum historical MMDF was observed in 2019 at 10.70 MGD. **Figure 5-9** shows that the historical AADF flows are below the AWWTF's permitted treatment capacity of 11 MGD.

Figure 5-10: 5-Year Historical Flows at South Fort Myers AWWTF



The average historical AADF flow at the South Fort Myers AWWTF was 9.53 MGD and the peak was 10.46 MGD in 2021. The maximum historical MMDF was observed in 2020 at 13.87 MGD. **Figure 5-10** shows that the

historical AADF flows are below the AWWTF's permitted treatment capacity of 12 MGD. The historical MMDF flow in 2017, 2020, and 2021 exceeded the plant's AADF permitted capacity.

5.6.2 Per Capita Flow Rates

Per capita analysis of wastewater flow was completed as part of this planning effort as the per capita rate for each wastewater service area will be used to project future wastewater flows on an AADF basis. The total service area AADF for the year was divided by the total service area permanent population for that year to calculate a per capita flow rate. Since historical populations are not available, the average AADF flow of 2020 and 2021 was divided by the baseline served population for each wastewater service area to develop the per capita rate.

The results of this analysis are presented in **Table 5-8** below.

Table 5-8: Summary of Recommended Per Capita Flow Development

Service Area	Average AADF (MGD)	Baseline Served Population	Recommended Per Capita Flow (gpcd)*
Fort Myers Beach	3.34	29,343	115
Fort Myers Central (LCU)	2.50	27,558	90**
Fort Myers South (LCU)	5.11	41,600	125**
Fiesta Village	2.91	34,580	85
Gateway	1.39	11,229	125
High Point	0.01	188	75
Pine Island	0.13	1,570	85
Three Oaks	3.74	51,807	75

**Recommended per capita flow rates were rounded up to the nearest 5 gpcd.*

***Per capita flow rates for the Central and South Fort Myers plants are based on flows from the City of Fort Myers and populations developed by MFM, and represents per-capita flow rates for LCU served areas.*

The per capita flows presented in **Table 5-8** above were used to develop the flow projections for each wastewater service area. It should be noted that the per capita flow of 75 gpcd for the High Point service area is not the calculated per capita flow, but rather the recommended based on the lowest calculated per capita flow for the other service areas which was for Three Oaks. This was done to provide a conservative flow projection for the small service area as the calculated per capita was too low in comparison to the referenced studies below.

The recommended per capita flow rates were compared to the per capita flow presented in other reports/studies including the LCU 2020 Wastewater Master Plan by Black&Veatch, the 2021 LCU Rate Sufficiency Study by Stantec, the Corkscrew Overlay Report by Johnson Engineering (related to Three Oaks), and the 2021 CAR reports for the Fort Myers' AWWTFs by CDM Smith. These were used as references only to ensure that the per capita flow rates recommended are aligned with previous work conducted by others, which they did.

5.6.3 Peaking Factors

Both LCU and City of Fort Myers establish treatment capacity requirements for wastewater facilities based on guidelines determined by the FDEP, the U.S. Environmental Protection Agency (EPA), and the Ten States Standards. Identification of historical peaking factors is a critical element to determining projected peak flows and corresponding treatment and hydraulic capacity requirements. All six of the County's and both City of Fort Myers' WWTFs are permitted on an AADF basis as noted in **Table 5-1**.

The MMDF is the highest monthly average flow rate observed in a 12-month period and is used to estimate the MMDF peaking factor (PF) by dividing the MMDF by the AADF for a given year. For planning purposes, the highest observed peaking factor is recommended for projecting wastewater flows as a means of providing a conservative approach (except for High Point WRF, where the maximum MMDF PF of 1.62 in 2017 was considered an outlier per discussions with County and was therefore excluded). In addition, as the magnitude of historical influent flows noticeably varies by wastewater facility, individual facility MMDF PFs are recommended. It should be noted that the MMDF peaking factors developed below for the Fort Myers' AWWTFs are based on total flows for the entire plant service area and not just the LCU contributing area.

A summary of the MMDFs and associated peaking factors for FY 2017 – FY 2021 is provided in **Table 5-9**.

Table 5-9: Recommended MMDF Peaking Factors for each Wastewater Service Area

Year	Wastewater Service Area							
	Fiesta Village	Fort Myers Beach	Gateway	High Point	Pine Island	Three Oaks	Fort Myers Central	Fort Myers South
2017	1.18	1.21	1.28	1.62	1.15	1.13	1.65	1.31
2018	1.08	1.22	1.09	1.15	1.25	1.12	1.32	1.21
2019	1.31	1.32	1.09	1.21	1.26	1.18	1.77	1.26
2020	1.20	1.36	1.11	1.11	1.20	1.16	1.41	1.37
2021	1.10	1.14	1.12	1.20	1.24	1.10	1.36	1.22
Avg MMDF PF	1.17	1.25	1.14	1.26	1.22	1.14	1.50	1.28
Max MMDF PF	**1.31**	**1.36**	**1.28**	**1.21**	**1.26**	**1.18**	**1.77**	**1.37**

The max MMDF PF, which is presented in the last row of **Table 5-9**, for each service area is recommended to be used to project MMDF flows, although the gap analysis will be conducted on an AADF basis.

5.7 FLOW PROJECTIONS

5.7.1 Existing Wastewater Service Areas

The CWMP effort utilizes unique per capita flow and peaking factors established for each wastewater service area to forecast wastewater flows. Projected annual average daily wastewater flows for each service area were estimated by multiplying the total population for each service area by its unique per capita factor. The MMDF flow projections were calculated by multiplying each service area's estimated AADF flows by its unique MMDF peaking factor. Recall that the flow projections for the wastewater service areas include the flows from the residential population of the septic conversion areas shown in **Table 5-5**. It should be noted that this subsection presents the flow projections for the existing wastewater service areas without any of the planned modifications to the service areas or the new Southeast service area, which are presented in subsection 5.7.2.

In order to understand the impact of the septic conversion on treatment capacities, wastewater flows for the septic conversion areas were also projected separately. Buildout AADF and MMDF flows were calculated for each septic conversion area in the groupings as follows:

1. Residential AADF flows: The buildout population for each septic conversion area was multiplied by the per capita value determined for that wastewater service area.
2. Non-residential AADF flows: The buildout commercial and industrial area (square footage) for each septic conversion area in **Table 5-5** was multiplied by 0.15 gpd per square foot as referenced in Table I Section 62-6 of the FAC.
3. Total MMDF flows: The sum of the residential and non-residential AADF flows was multiplied by the MMDF peaking factor.

The projected flows for the septic conversion areas in groups 2, 8, and 9 are anticipated to flow to the Del Prado WWTF. A Level of Service (LOS) per capita value of 56 gpcd is estimated for the Del Prado WWTF based on the 2019 Del Prado Wastewater Treatment Facility 10-Year Planning Analysis Report. Therefore, the per capita flow rate used for the septic conversion areas flowing to Del Prado was 56 gpcd. The MMDF peaking factor for Del Prado, which is 2.68, was determined from historical AADF and MMDF obtained from its FDEP renewal permit application dated 2022.

A summary of the buildout AADF and MMDF flows contributing to each wastewater service area from the septic conversion areas based on their grouping is presented in **Table 5-10**.

Table 5-11 presents the projected AADF and MMDF flows for each wastewater service area and **Figure 5-11** through **5-18** illustrate each service area's AADF and MMDF flow projections.

Table 5-10: Contributing Flow Projections from Septic Conversion Areas

WWTF	Contributing Project Groupings	Buildout AADF (MGD)	Buildout MMDF (MGD)	AADF Permitted Capacity (MGD)
Fiesta Village	3 & 4	0.114	0.149	5.000
Fort Myers Beach	3	0.007	0.009	6.000
Three Oaks	6	0.047	0.055	6.000
Pine Island	5	0.059	0.075	0.383
Central Fort Myers	1 & 10	0.131	0.231	11.000
South Fort Myers	7	0.161	0.221	12.000
Del Prado	2, 8, 9	0.137	0.367	4.250
Total Flow (MGD)		**0.655**	**1.108**	-

Table 5-11: Existing Wastewater Service Area Flow Projections

Year	Wastewater Service Area															
	Fiesta Village		Fort Myers Beach		Three Oaks		Gateway		Pine Island		High Point		Fort Myers Central (LCU)		Fort Myers South (LCU)	
	AADF	MMDF	AADF	MMDF	AADF	MMDF	AADF	MMDF	AADF	MMDF	AADF	MMDF	AADF	MMDF	AADF	MMDF
	(MGD)															
2021	2.94	3.85	3.37	4.59	3.89	4.58	1.40	1.80	0.13	0.17	0.0141	0.0171	2.48	4.39	5.20	7.12
2025	3.01	3.94	3.48	4.73	4.30	5.07	1.58	2.02	0.13	0.17	0.0143	0.0173	2.80	4.96	5.40	7.39
2030	3.08	4.03	3.57	4.86	4.77	5.63	1.78	2.28	0.19	0.24	0.0145	0.0175	3.16	5.60	5.59	7.66
2035	3.08	4.04	3.62	4.92	4.97	5.87	1.90	2.43	0.20	0.25	0.0146	0.0176	3.37	5.96	5.78	7.92
2040	3.08	4.04	3.64	4.96	5.06	5.97	1.96	2.51	0.20	0.25	0.0146	0.0176	3.57	6.32	5.83	7.99
Buildout	3.11	4.07	3.73	5.08	6.63	7.82	2.02	2.59	1.02	1.29	0.0146	0.0177	4.04	7.16	6.58	9.01

Due to the magnitude of values, flow projections for High Point WRF are rounded to ten-thousandth place to better show change in flow across the planning horizon.

Figure 5-11: Fiesta Village Service Area Flow Projections

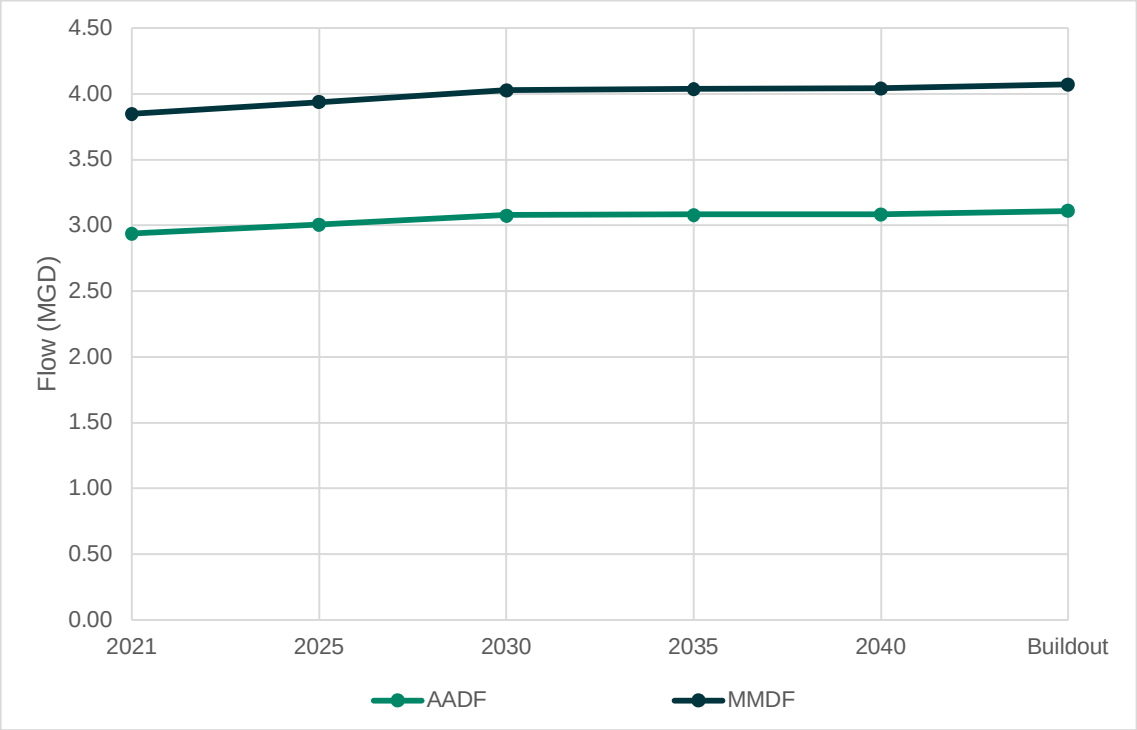


Figure 5-11 shows that the projected AADF flows for the Fiesta Village service area increase from 2.94 MGD to 3.08 MGD in 2040 and to 3.11 MGD at buildout. The projected MMDF flows increase by about 5% from 2021 to 2040.

Figure 5-12: Fort Myers Beach Service Area Flow Projections

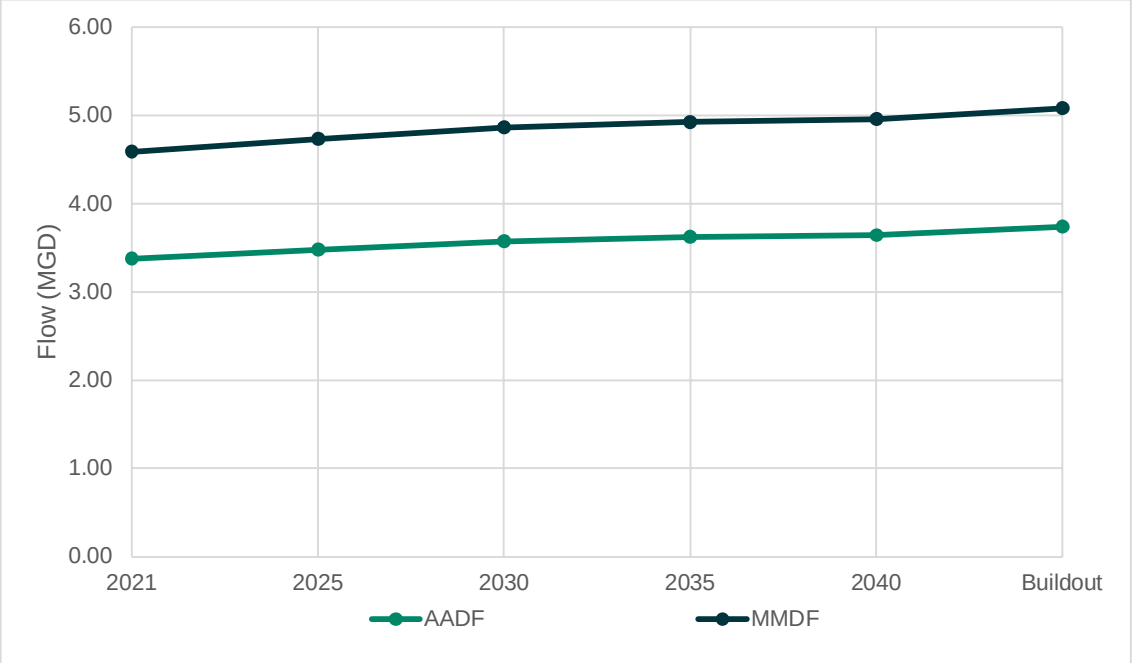


Figure 5-12 shows that the projected AADF flows for the Fort Myers Beach service area increase from 3.37 MGD in 2021 to 3.64 MGD in 2040 and to 3.73 MGD at buildout. The projected MMDF flows increase by about 8% from 2021 to 2040.

Figure 5-13: Three Oaks Service Area Flow Projections

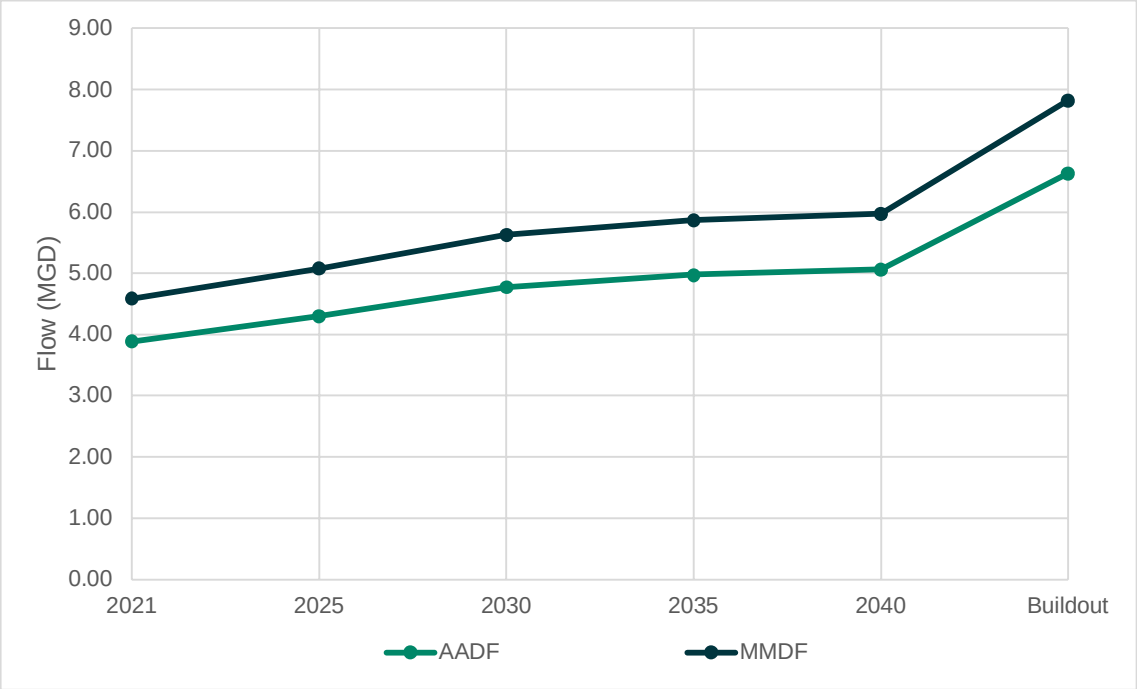


Figure 5-13 shows that the projected AADF flows for the Three Oaks service area increase from 3.89 MGD in 2021 to 5.06 MGD in 2040 and to 6.63 MGD at buildout. The projected MMDF flows increase by about 30% from 2021 to 2040.

Figure 5-14: Gateway Service Area Flow Projections

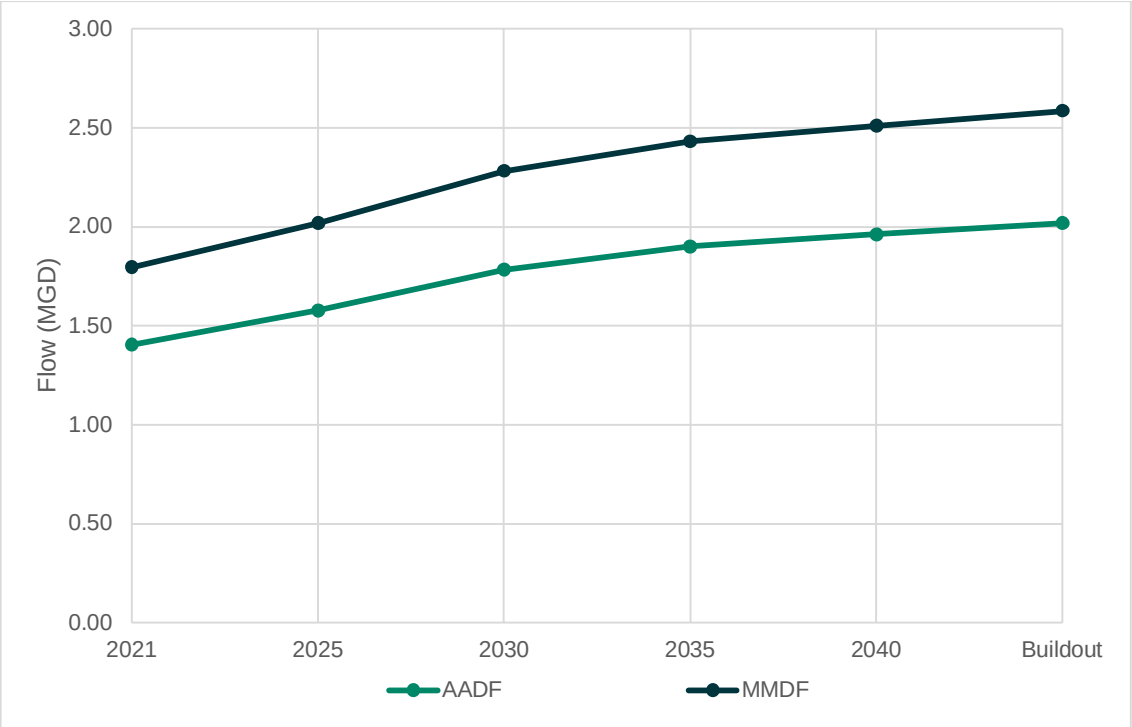


Figure 5-14 shows that the projected AADF flows for the Gateway service area increase from 1.40 MGD in 2021 to 1.96 MGD in 2040 and to 2.02 MGD at buildout. The projected MMDF flows increase by about 40% from 2021 to 2040.

Figure 5-15: Pine Island Service Area Flow Projections

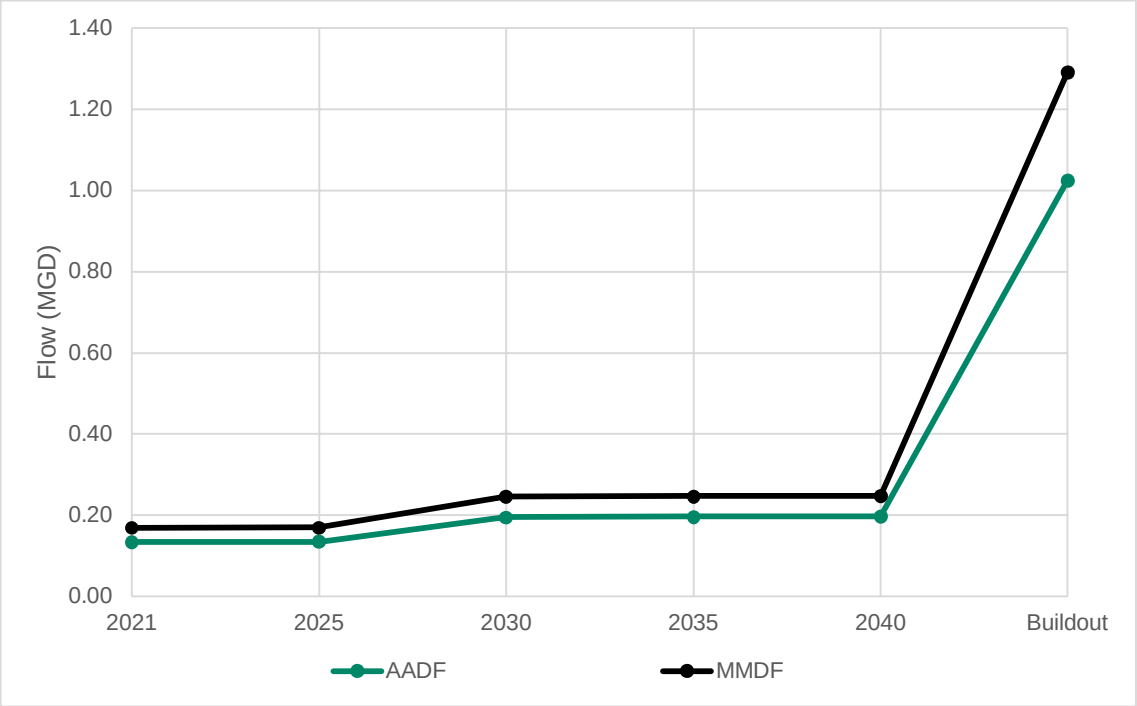


Figure 5-15 shows that the projected AADF flows for the Pine Island service area increase from 0.13 MGD in 2021 to 0.20 MGD in 2040 and to 1.02 MGD at buildout. The projected MMDF flows increase by about 47% from 2021 to 2040.

Figure 5-16: High Point Service Area Flow Projections

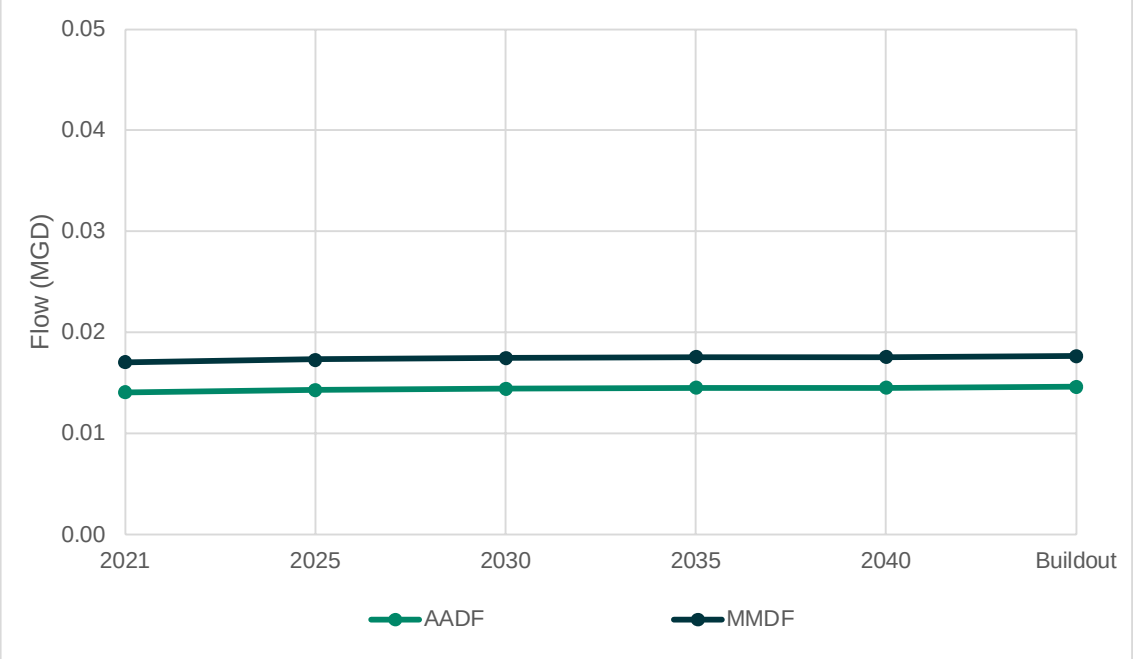


Figure 5-16 shows that the projected AADF flows for the High Point service area increase by a very small quantity as indicated by the magnitude of flow across the planning horizon. The projected MMDF flows increase by about 3% from 2021 to 2040.

Figure 5-17: Central Fort Myers (LCU) Service Area Flow Projections

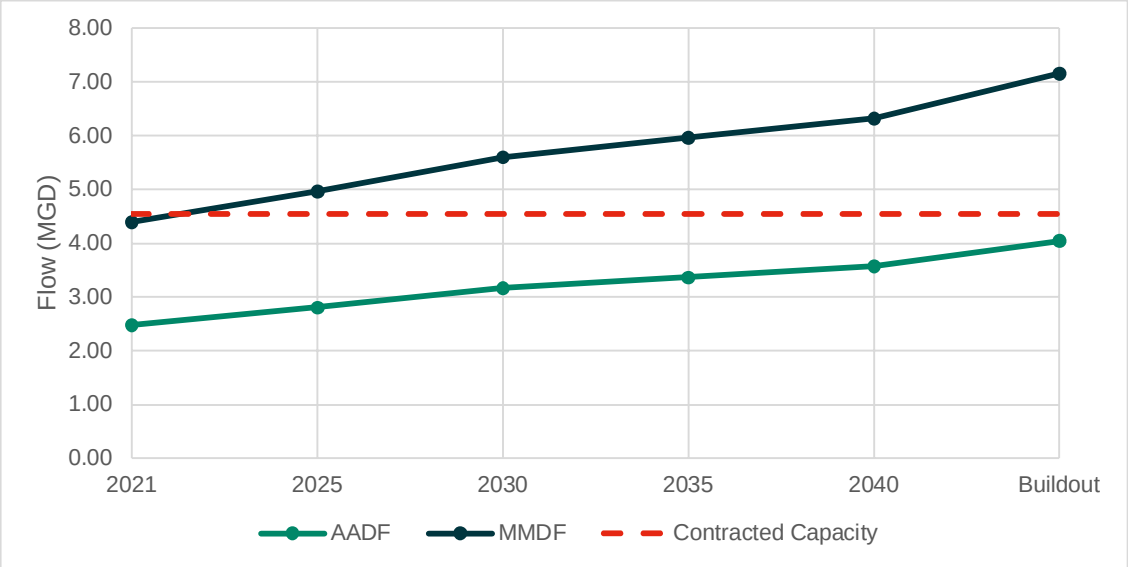


Figure 5-17 shows that the projected AADF flows for the LCU portion of the Central Fort Myers service area increase from 2.48 MGD in 2021 to 3.57 MGD in 2040 and to 4.04 MGD at buildout. The projected MMDF flows increase by about 43% from 2021 to 2040. The projected AADF flows at the end of the planning period in 2040 and at buildout will not exceed the 4.54 MGD that LCU is contracted to utilize for this plant.

Figure 5-18: South Fort Myers (LCU) Service Area Flow Projections

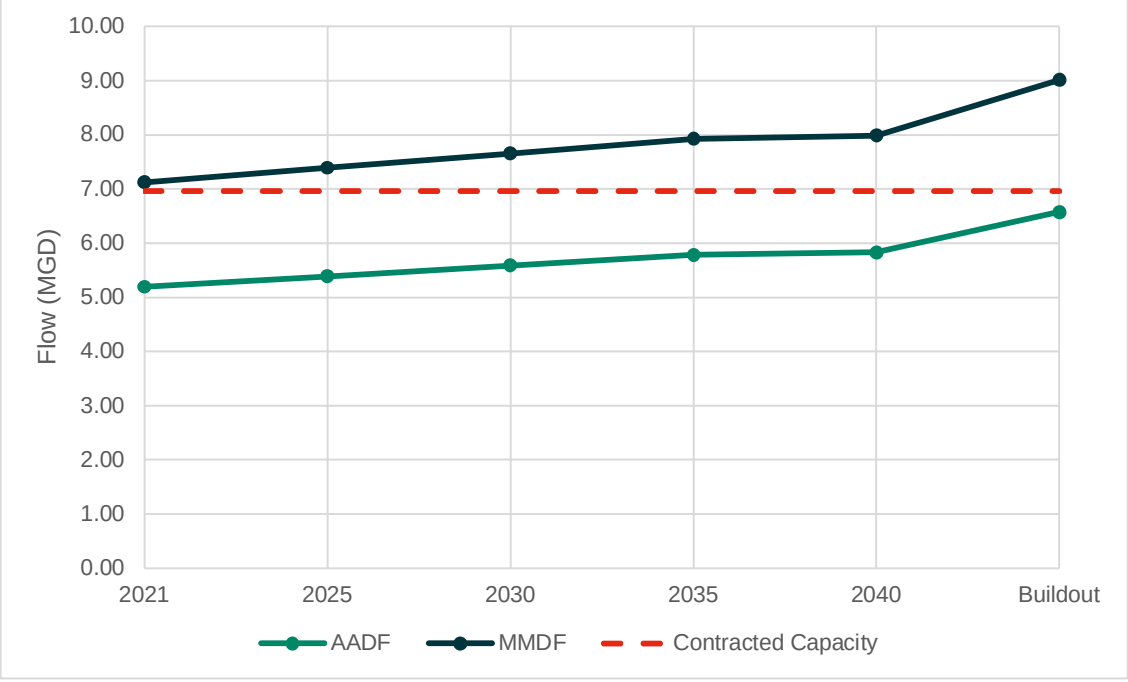


Figure 5-18 shows that the projected AADF flows for the LCU portion of the South Fort Myers service area increase from 5.20 MGD in 2021 to 5.83 MGD in 2040 and to 6.58 MGD at buildout. The projected MMDF flows increase by about 12% from 2021 to 2040. The projected AADF flows at the end of the planning period in 2040 will reach approximately 83% of the contracted treatment capacity of the AWWTF LCU is authorized for.

5.7.2 Planned/Modified Service Areas

Using the same methodology for flow projections as described in 5.7.1, this subsection presents the flow projections for the planned and modified wastewater service areas. It should be noted that the Three Oaks' service area per capita flow and MMDF PF were used to project flows for the SE service area considering it is comprised of a portion of the existing Three Oaks service area.

Table 5-12 and **Figures 5-19** to **5-22** presents the AADF and MMDF flow projections for the planned and modified service areas.

Table 5-12: Planned/Modified Service Area Flow Projections

Year	Planned/Modified Wastewater Service Area							
	Fort Myers South (LCU)		Gateway		Three Oaks		SE	
	AADF	MMDF	AADF	MMDF	AADF	MMDF	AADF	MMDF
	(MGD)							
2021	5.20	7.12	1.40	1.80	3.89	4.58	-	-
2025	4.73	6.48	2.26	2.89	4.34	5.12	-	-
2028*	4.82	6.61	2.38	3.05	3.46	4.08	1.82	2.15
2030	4.89	6.69	2.73	3.49	2.88	3.40	2.21	2.61
2035	5.06	6.94	3.19	4.09	3.00	3.54	2.77	3.27
2040	5.10	6.99	3.53	4.52	3.05	3.60	3.44	4.06
Buildout	5.58	7.64	5.33	6.82	4.60	5.42	5.20	6.14

*Interim year 2028 was added to highlight the projected wastewater flows for the Southeast WRF when it comes online in 2028.

Figure 5-19: Modified South Fort Myers (LCU) Service Area Flow Projections

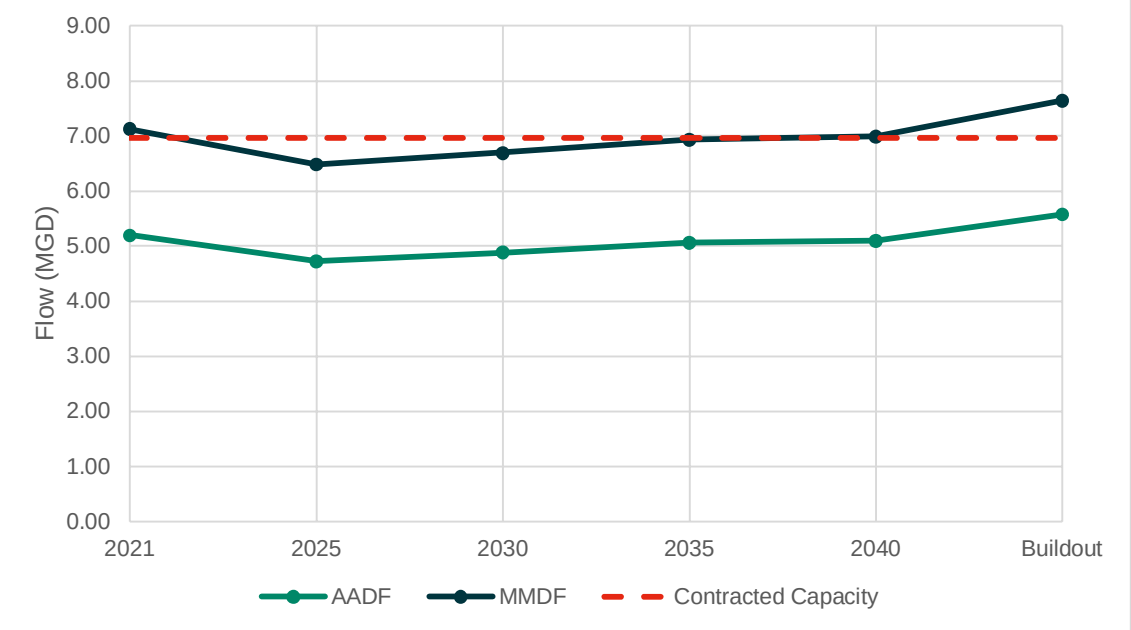


Figure 5-19 shows that the projected AADF flows for the LCU portion of the South Fort Myers service area decrease from 5.20 MGD in 2021 to 4.73 MGD in 2025 following the first phase of the planned flow diversion. The projected flows increase again to 5.10 MGD in 2040 and to 5.58 MGD at buildout. The projected MMDF flows decrease by about 9% following the flow diversion and then increases by about 8% from 2025 to 2040.

Figure 5-20: Modified Gateway Service Area Flow Projections

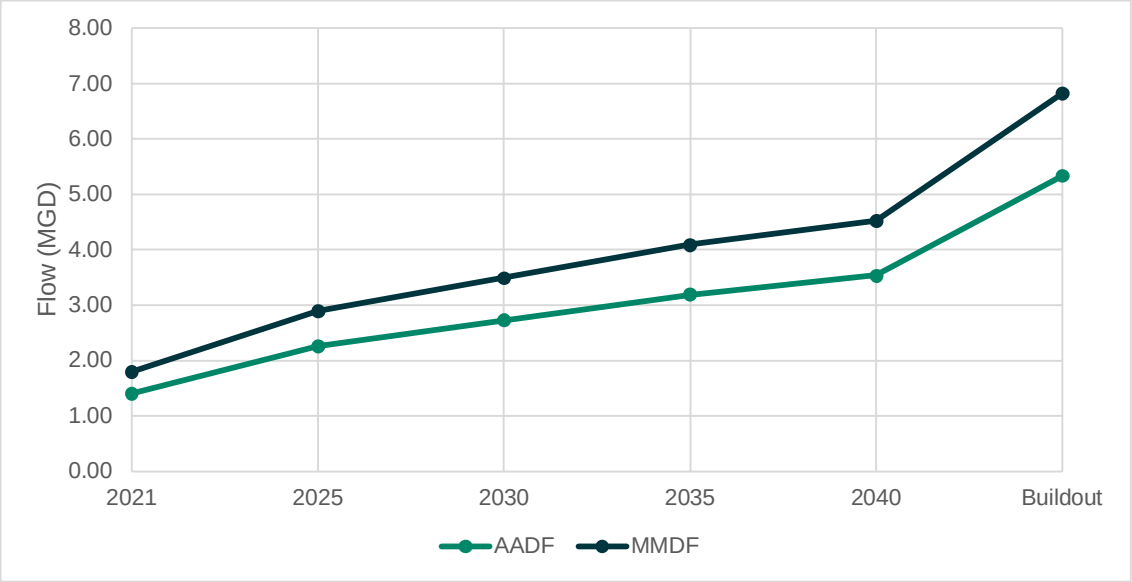


Figure 5-20 shows that the projected AADF flows for the Gateway service area increase from 1.40 MGD in 2021 to 2.26 MGD in 2025 after receiving diverted flows from the Fort Myers South service area and from developments south of Daniels. The projected AADF increases to 2.73 MGD following the addition of growth area SR82 in 2030 and increases to 3.53 MGD in 2040. The projected MMDF flows increase by about 152% from 2021 to 2040.

Figure 5-21: Modified Three Oaks Service Area Flow Projections

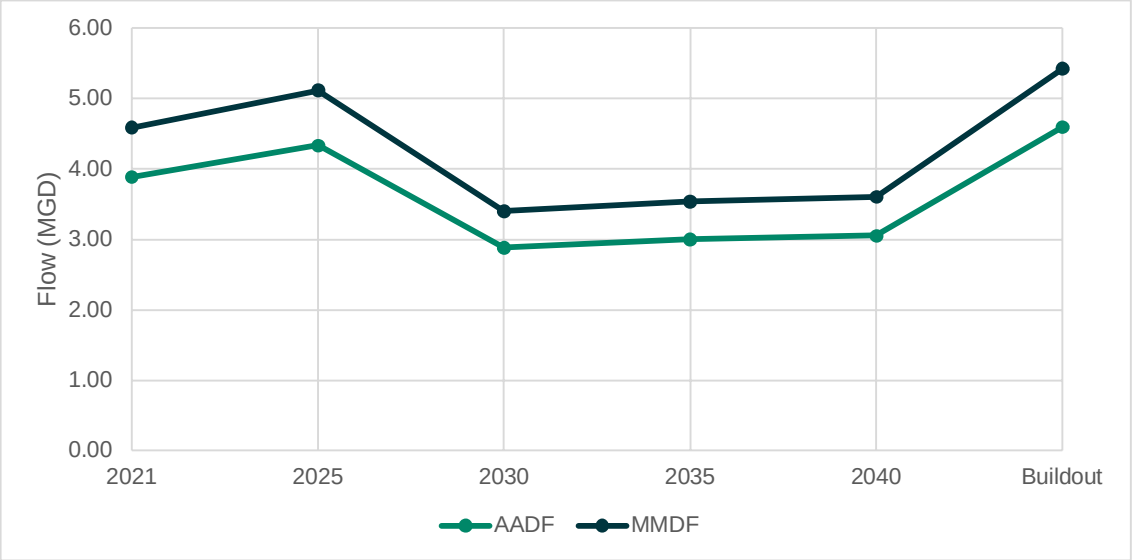


Figure 5-21 shows that the projected AADF flows for the Three Oaks service area increase from 3.89 MGD in 2021 to 4.34 MGD in 2025 with the addition of the Future Corkscrew SW area to the service area. As the new Southeast facility comes online, it can be seen that the projected AADF flows decrease to 2.88 MGD as the service area gets smaller and the Future Corkscrew SW area is diverted back to the Southeast facility. The projected AADF then increases to 3.05 MGD in 2040 and to 4.60 MGD at buildout when it is assumed that all septic systems flows will be routed to the WRF. For the modified service area in 2030, the projected MMDF flows increase by about 6% from 2030 to 2040. The flow projections shown in **Figure 5-21** would be increased if the flow diversion from Fort Myers South service area is conveyed to the Three Oaks WRF.

Figure 5-22: Planned Southeast Service Area Flow Projections

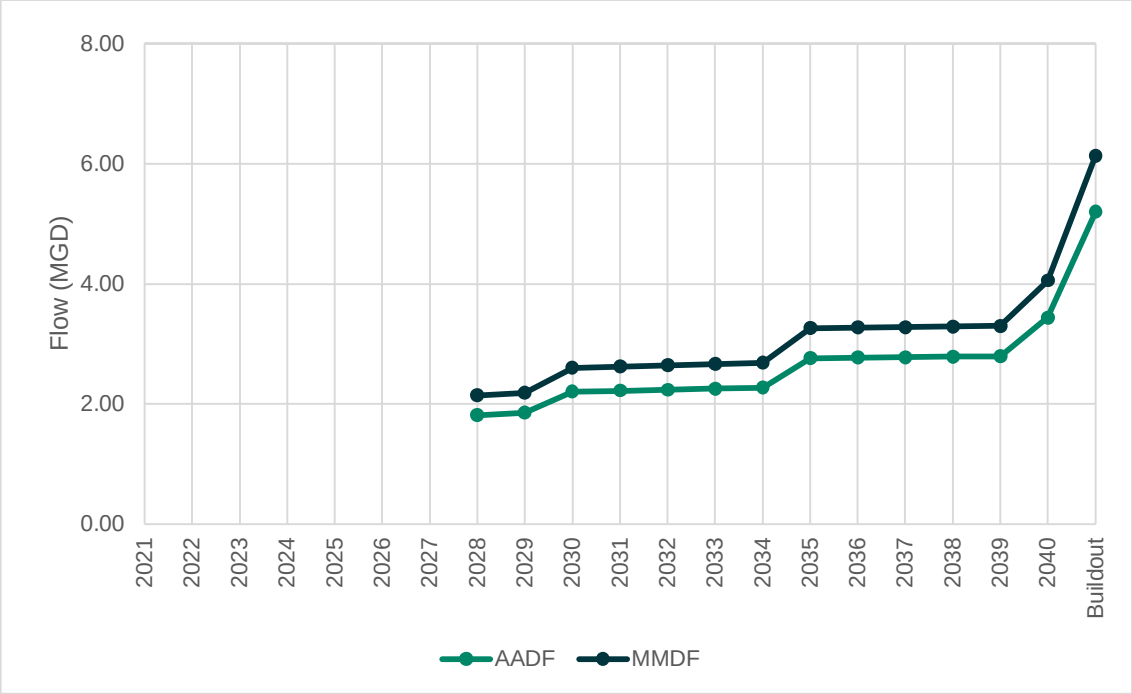


Figure 5-22 shows that the projected AADF flows for the Southeast service area increase from 1.82 MGD in 2028 when the facility is online to 3.44 MGD in 2040 with the addition of the identified growth areas along Corkscrew. At buildout, when the future Corkscrew NW area is anticipated to be connected to central sewer, the projected AADF is 5.20 MGD. The projected MMDF flows increase by 56% in 2040.

6. WASTEWATER TREATMENT FACILITY GAP ANALYSIS

6.1 INTRODUCTION

As part of the development of the CWMP for Lee County Florida, a wastewater treatment facility (WWTF) gap analysis is needed to project the future capacity needs. The gap analysis is also used to determine a timeline for WWTF improvements which may be required to maintain reliable service. This section of the report identifies:

- Permitted and reliable capacities of the County's WRFs
- Planned WWTF capacity expansions and new treatment facilities
- WWTF capacity to treat projected wastewater flows
- A recommended timeline for WWTF capacity expansions to maintain reliable service

6.2 IDENTIFICATION OF EXISTING RELIABLE TREATMENT CAPACITY

A WWTF gap analysis compares projected flows for the corresponding wastewater service area with the capacity of the WWTF to treat the projected flows. A summary of LCU wastewater service areas, their respective treatment facilities, and facility permitted capacities were presented in Chapter 5 of this report. Also presented in Chapter 5 are the Annual Average Daily Flow (AADF) and Maximum Month Daily Flow (MMDF) projections for each service area.

This gap analysis considers both the permitted and reliable capacities of each facility to evaluate future capacity needs, as well as when a Capacity Analysis Report (CAR) to FDEP should be conducted. A summary of the treatment capacities for each of the WWTFs is shown in **Table 6-1**.

Table 6-1: Summary of Wastewater Treatment Facility Treatment Capacities

Summary of Wastewater Treatment Facility Capacities

WWTF Name	Permitted Capacity (AADF - MGD)	Reliable Capacity (AADF - MGD)	50% Capacity (AADF - MGD)
Fort Myers Beach WRF	6.00	4.80	3.00
Fiesta Village WRF	5.00	4.00	2.50
High Point WRF	0.025	0.020	0.013
Pine Island WRF	0.383	0.306	0.192
Gateway WRF	3.00	2.40	1.50
Three Oaks WRF	6.00	4.80	3.00
Southeast WRF	6.00	4.80	3.00
City of Fort Myers: Central AWWTF (LCU Contracted)	4.54	NA	NA
City of Fort Myers: South AWWTF (LCU Contracted)	6.96	NA	NA
Florida Governmental Utility Authority Del Prado WWTF	4.25	3.40	2.125

The "reliable capacity" of each WWTF is considered as 80% of the permitted capacity. This threshold is a design criterion used by Lee County to trigger the need for capacity expansions. The reliable capacity is used to determine the timeline for when recommended capacity expansions should be implemented.

Rule 17-600.405 of the Florida Administrative Code (FAC) requires that each permitted WWTF assess its capacity on a regular basis and to submit an initial CAR to the FDEP "when the three-month average daily flow (3MADF) exceeds 50% of the permitted capacity of the treatment plant or reuse and disposal systems". Although the WWTF gap analysis will not project the 3MADF, the analysis will identify the 50% capacity which would trigger a CAR.

6.3 WASTEWATER RECLAMATION FACILITIES GAP ANALYSES

As previously stated, the WWTF gap analysis compares the projected flows for each service area with the facility capacities presented in the previous section. The projected AADF and MMDF for each wastewater service area were presented in Chapter 5 of this report.

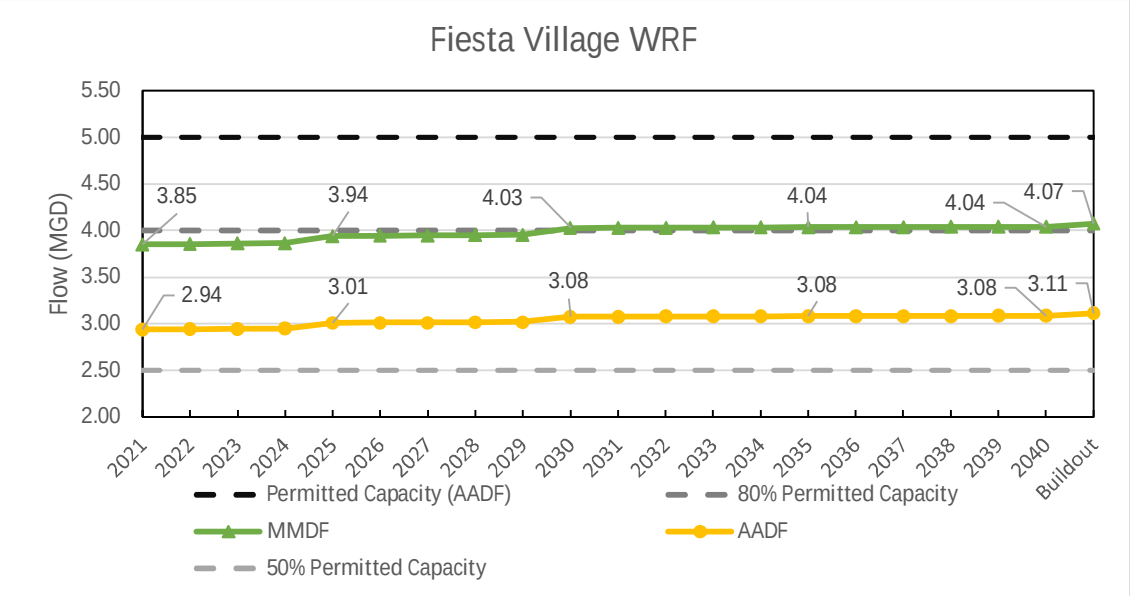
The following subsections summarize the results of the gap analysis for each WWTF. They also identify any planned capacity improvements for each facility. It should be noted that this analysis focuses on projected flow rates and hydraulic facility capacities rather than biological loading.

6.3.1 Fiesta Village WRF

Figure 6-1 shows the results of the gap analysis for the Fiesta Village WRF. As previously stated in Chapter 5, the flow projections for the Fiesta Village wastewater service area use a per capita flow rate of 85 gallons per capita per day (gpcd) for the AADF and a peaking factor (PF) of 1.31 to determine the MMDF.

There are currently no planned capacity improvements for the Fiesta Village WRF.

Figure 6-1: Fiesta Village WRF Gap Analysis



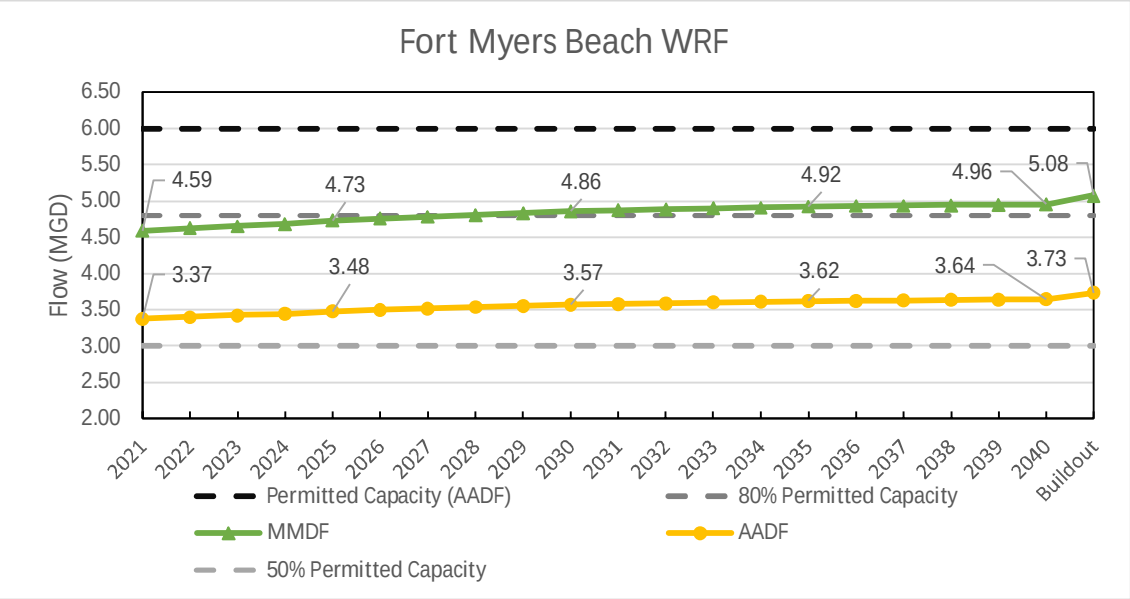
The AADF for the Fiesta Village service area is projected to increase from 2.94 MGD to 3.11 MGD from 2021 to buildout, an increase of approximately 6%. The Fiesta Village WRF gap analysis shows that the projected flows **will not exceed** the permitted or reliable capacity of the facility, and that the facility will have excess permitted capacity of 1.89 MGD and excess reliable capacity of 0.89 MGD at buildout for the service area. The projected MMDF at buildout is 4.07 MGD. Since the projected AADF exceeds 50% of the plant capacity in 2021, this indicates that the 3MADF also exceeds 50% and the County should consider submitting an initial CAR to FDEP.

6.3.2 Fort Myers Beach WRF

Figure 6-2 shows the results of the gap analysis for the Fort Myers Beach WRF. As previously stated in Chapter 5, the flow projections for the Fort Myers Beach wastewater service area use a per capita flow rate of 115 gpcd for the AADF and a PF of 1.36 to determine the MMDF.

There are currently no planned capacity improvements for the Fort Myers Beach WRF.

Figure 6-2: Fort Myers Beach WRF Gap Analysis



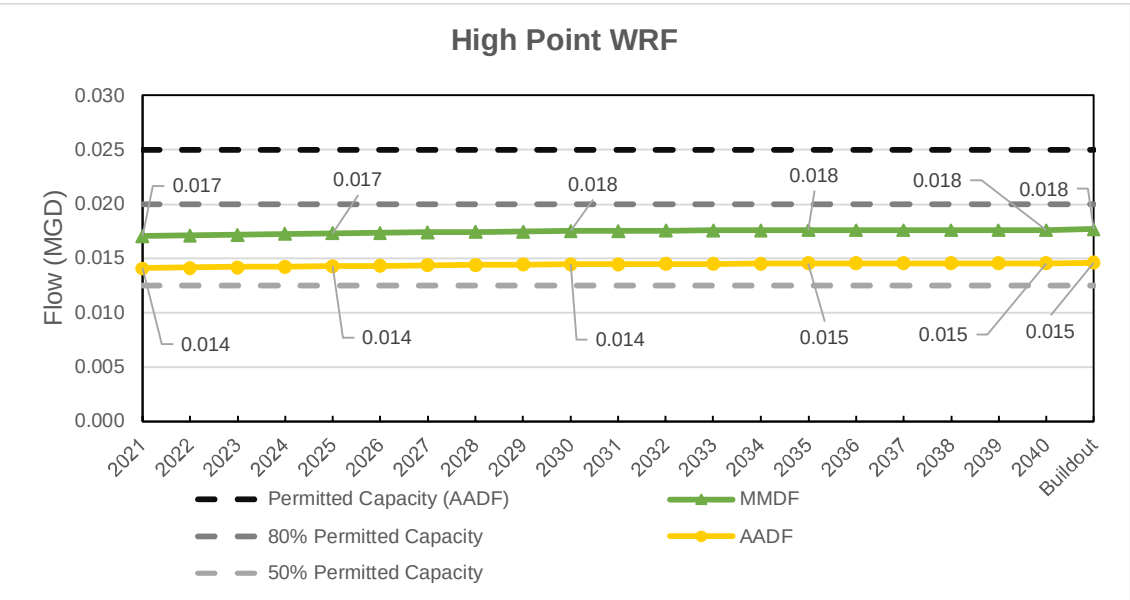
The AADF for the Fort Myers Beach service area is projected to increase from 3.37 MGD to 3.73 MGD from 2021 to buildout, an increase of approximately 11%. The Fort Myers Beach WRF gap analysis shows that the projected flows **will not exceed** the permitted or reliable capacity of the facility, and that the facility will have excess permitted capacity of 2.27 MGD and excess reliable capacity of 1.07 MGD at buildout for the service area. The projected MMDF at buildout is 5.08 MGD. Since the projected AADF exceeds 50% of the plant capacity in 2021, this indicates that the 3MADF also exceeds 50% and the County should consider submitting an initial CAR to FDEP.

6.3.3 High Point WRF

Figure 6-3 shows the results of the gap analysis for the High Point WRF. As previously stated in Chapter 5, the flow projections for the High Point wastewater service area use a per capita flow rate of 75 gpcd for the AADF and a PF of 1.21 to determine the MMDF.

There are currently no planned capacity improvements for the High Point WRF.

Figure 6-3: High Point WRF Gap Analysis



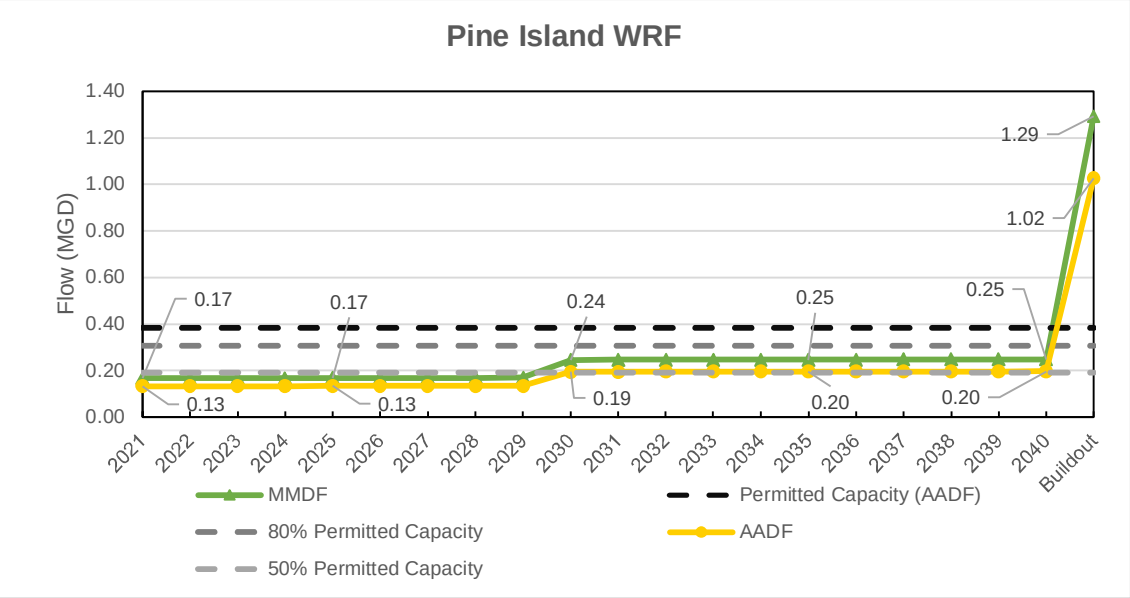
The AADF for the High Point service area is projected to increase from 0.014 MGD to approximately 0.015 MGD from 2021 to buildout, an increase of approximately 4%. The High Point WRF gap analysis shows that the projected flows **will not exceed** the permitted or reliable capacity of the facility, and that the facility will have excess permitted capacity of 0.01 MGD and excess reliable capacity of 0.005 MGD at buildout for the service area. The projected MMDF at buildout is 0.018 MGD. Since the projected AADF exceeds 50% of the plant capacity in 2021, this indicates that the 3MADF also exceeds 50% and the County should consider submitting an initial CAR to FDEP.

6.3.4 Pine Island WRF

Figure 6-4 shows the results of the gap analysis for the Pine Island WRF. As previously stated in Chapter 5, the flow projections for the Pine Island wastewater service area use a per capita flow rate of 85 gpcd for the AADF and a PF of 1.26 to determine the MMDF.

There are currently no planned capacity improvements for the Pine Island WRF.

Figure 6-4: Pine Island WRF Gap Analysis



The AADF for the Pine Island service area is projected to increase from 0.13 MGD to 1.02 MGD from 2021 to buildout, an increase of approximately 668%. The Pine Island WRF gap analysis shows that the projected flows **will exceed** both the reliable capacity and the permitted capacity of the facility by buildout. At buildout, the projected AADF exceeds the permitted capacity of the facility by 0.64 MGD and the buildout MMDF is 1.29 MGD. Since the projected AADF exceeds 50% of the plant capacity in 2030, this indicates that the 3MADF will also exceed 50% and the County should consider preparing to submit an initial CAR to FDEP within the next 8 years.

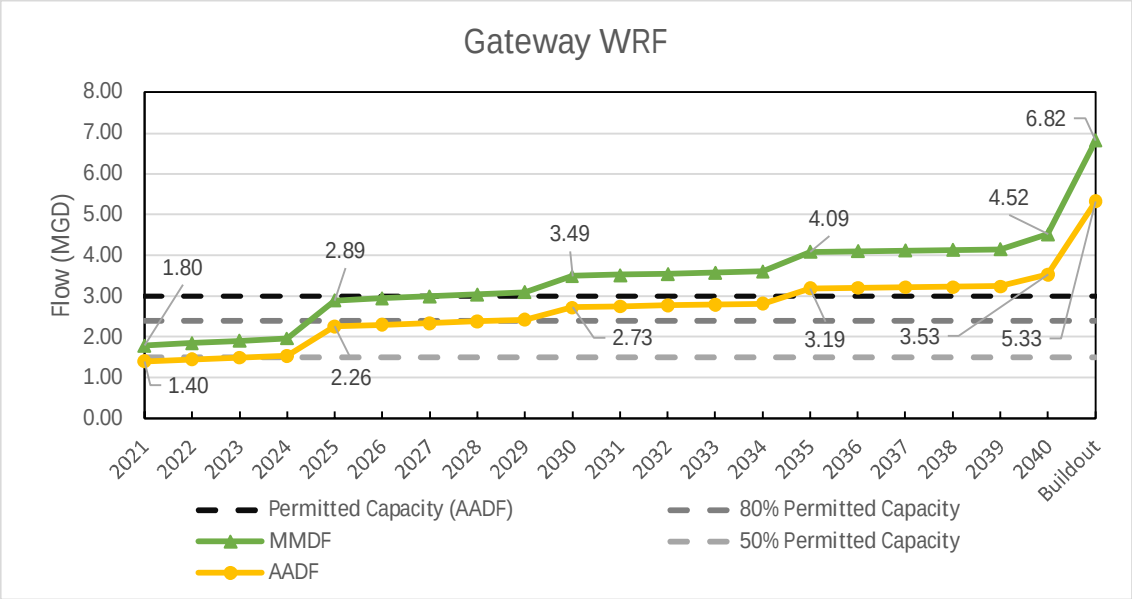
6.3.5 Gateway WRF

Figure 6-5 shows the results of the gap analysis for the Gateway WRF. As previously stated in Chapter 5, the flow projections for the Gateway wastewater service area use a per capita flow rate of 125 gpcd for the AADF and a PF of 1.28 to determine the MMDF.

LCU has plans to free up capacity at the City of Fort Myers South AWWTF by diverting flows to the Gateway WRF. The flow projections for the identified flow diversion area are presented in Chapter 5 and it is assumed the diversion will begin operations in 2025. However, given the current proposed developments in the existing service area, LCU may delay the implementation schedule for the diversion, or divert the flows to Three Oaks WRF to accommodate the County's wastewater treatment capacity expansion schedule.

The County has included plans in the LCU 10-year CIP to expand the Gateway WRF from 3 MGD to 6 MGD. The exact timing of the expansion is unknown, and the sizing of the expansion may be subject to change based on the facility gap analysis provided in this report.

Figure 6-5: Gateway WRF Gap Analysis



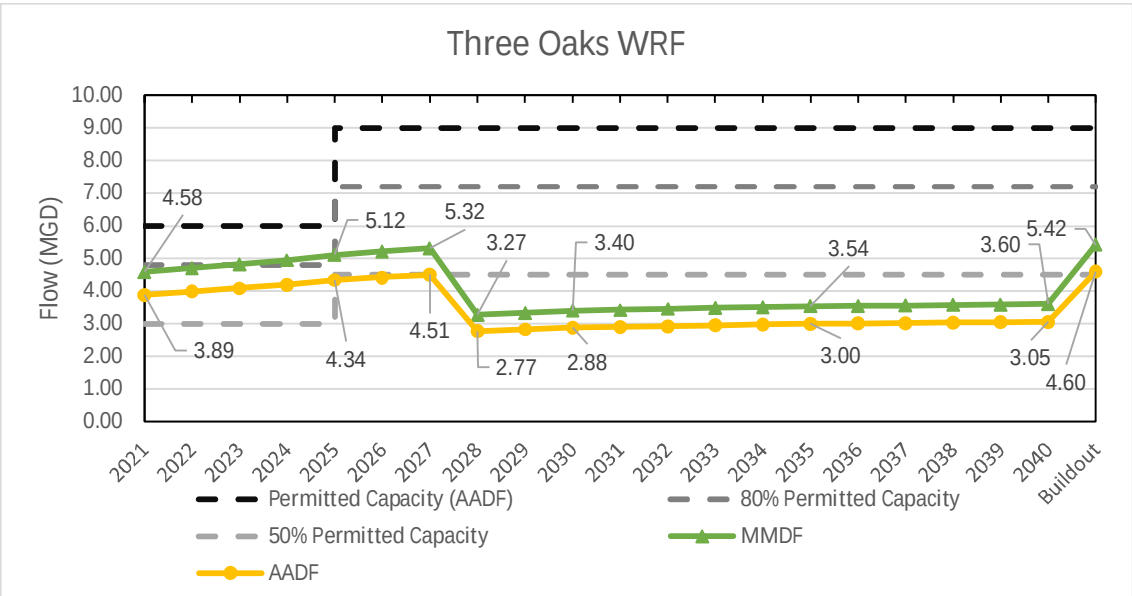
The AADF for the Gateway service area is projected to increase from 1.40 MGD to 5.33 MGD from 2021 to buildout, an increase of approximately 280%. The Gateway WRF gap analysis shows that the projected flows **will exceed** the reliable capacity of the facility in 2029 and the permitted capacity in 2035. At buildout, the projected AADF exceeds the permitted capacity of the facility by 2.33 MGD and the buildout MMDF is 6.82 MGD. Since the projected AADF exceeds 50% of the plant capacity in 2024, this indicates that the 3MADF will also exceed 50% and the County should consider preparing to submit an initial CAR to FDEP within the next 2 years.

6.3.6 Three Oaks WRF

Figure 6-6 shows the results of the gap analysis for the Three Oaks WRF. As previously stated in Chapter 5, the flow projections for the Three Oaks wastewater service area use a per capita flow rate of 75 gpcd for the AADF and a PF of 1.18 to determine the MMDF.

LCU has plans to expand the Three Oaks WRF from 6 MGD to 9 MGD, with the expansion coming online in December of 2024. This expansion capacity will be considered available starting in 2025.

Figure 6-6: Three Oaks WRF Gap Analysis

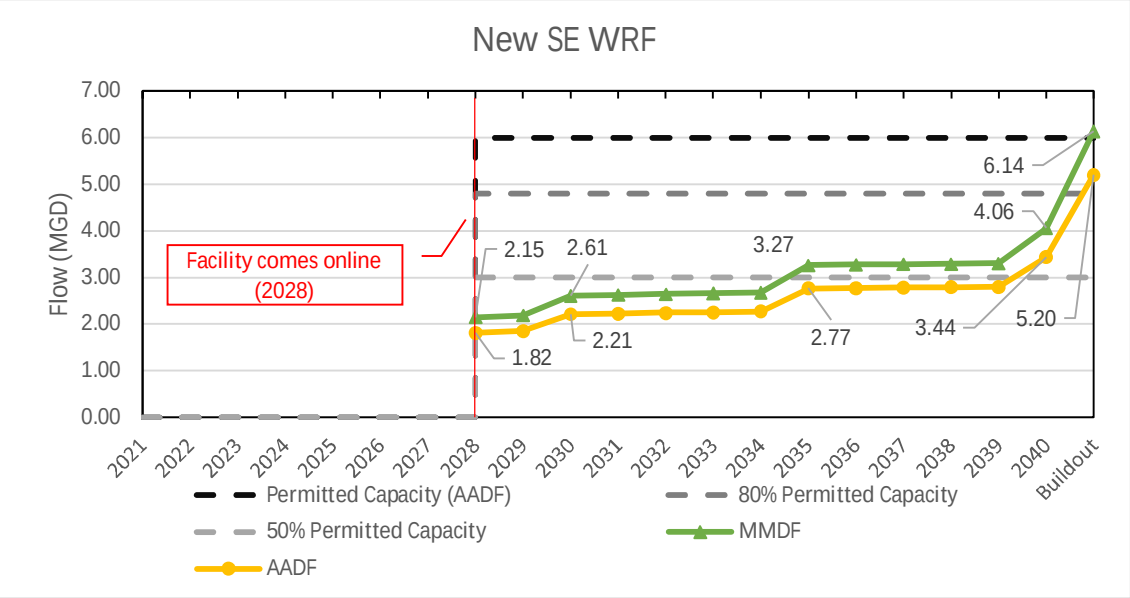


The AADF for the Three Oaks service area is projected to initially increase from 2021 through 2027 (3.89 MGD to 4.51 MGD), prior to decreasing from 2027 to 2040 (4.51 MGD to 3.05 MGD). The projected decrease in flows is associated with the proposed completion of the Southeast WRF in 2028, and the subsequent reduction of the Three Oaks service area. Based on this service area modification and the planned 3.0 MGD facility expansion, the Three Oaks gap analysis shows that projected flows **will not exceed** the permitted or reliable capacity of the facility. The facility will have excess permitted capacity of 4.40 MGD and excess reliable capacity of 2.60 MGD at buildout for the service area. The projected MMDF at buildout is 5.42 MGD. Since the projected AADF exceeds 50% of the plant capacity in 2021, this indicates that the 3MADF also exceeds 50% and the County should consider submitting an initial CAR to FDEP. It should be noted that additional capacity would be utilized if the flow diversion from Fort Myers South service area is conveyed to the Three Oaks WRF.

6.3.7 Southeast WRF

LCU has plans to build a new WRF in the Southeast portion of the County where the wastewater service area will be expanded to accommodate new development adjacent to Corkscrew Road. The current service area for Three Oaks WRF will be modified when the new SE WRF is placed online as discussed in Chapter 5. Based on discussion with County staff, the new facility is recommended to have an initial capacity of 6 MGD (expandable to 10 MGD), although this may be subject to change based on the gap analysis provided in this report. **Figure 6-7** shows the results of the gap analysis for the Southeast WRF. As previously stated in Chapter 5, the flow projections for the Southeast wastewater service area use the same per capita flow rate and PF as the Three Oaks WRF which is 75 gallons gpcd for the AADF and a PF of 1.18 to determine the MMDF.

Figure 6-7: Southeast WRF Gap Analysis



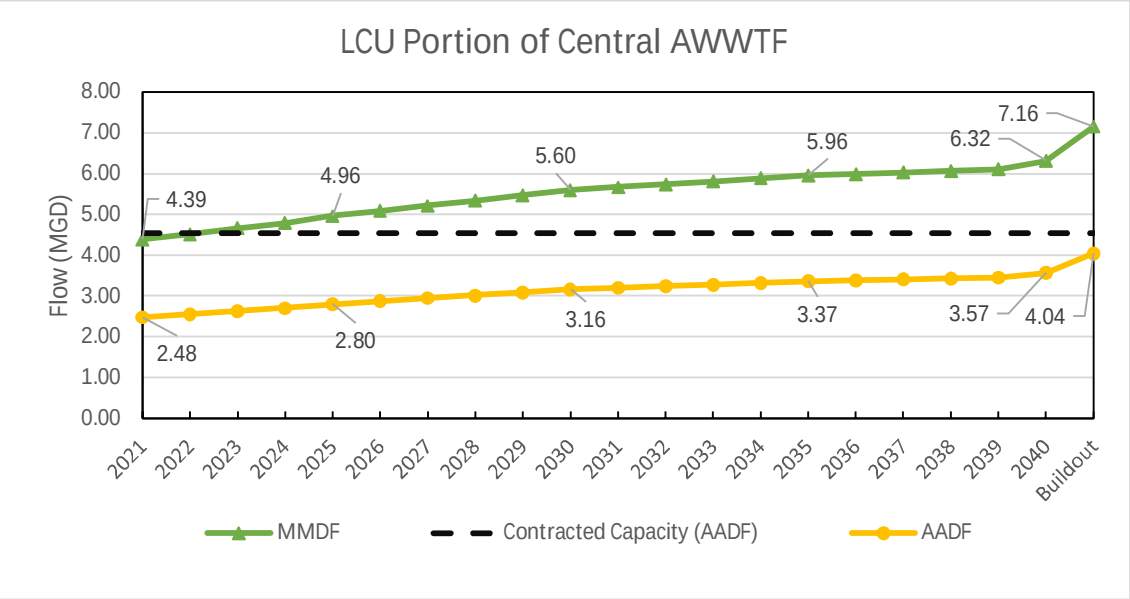
The AADF for the planned Southeast service area is projected to increase from 1.82 MGD to 5.20 MGD from 2028 to buildout, an increase of approximately 186%. Assuming a 6 MGD permitted capacity, the Southeast WRF gap analysis shows that projected flows **will exceed** the reliable capacity of the facility by buildout, but **will not exceed** the permitted capacity. The facility will have excess permitted capacity of 0.80 MGD. At buildout, the projected AADF is 5.20 MGD and the projected MMDF is 6.14 MGD.

6.3.8 City of Fort Myers Central AWWTF

Figure 6-8 shows the results of the gap analysis for the LCU portion of the City of Fort Myers Central AWWTF. As discussed in Chapter 5, LCU has a contractual agreement to use approximately 50% of the total combined capacity of the two City of Fort Myers facilities, therefore the gap analysis was conducted using the contracted capacity LCU has with this facility (4.54 MGD). Since the facility is owned and operated by the City of Fort Myers, both the reliable and 50% capacity thresholds were not identified in this analysis. As previously stated in Chapter 5, the flow projections for the LCU portion of the Central Fort Myers wastewater service area use a per capita flow rate of 90 gpcd for the AADF and a PF of 1.77 to determine the MMDF.

There are currently no planned capacity improvements for the Central AWWTF that would influence this analysis.

Figure 6-8: LCU Portion of Central AWWTF Gap Analysis



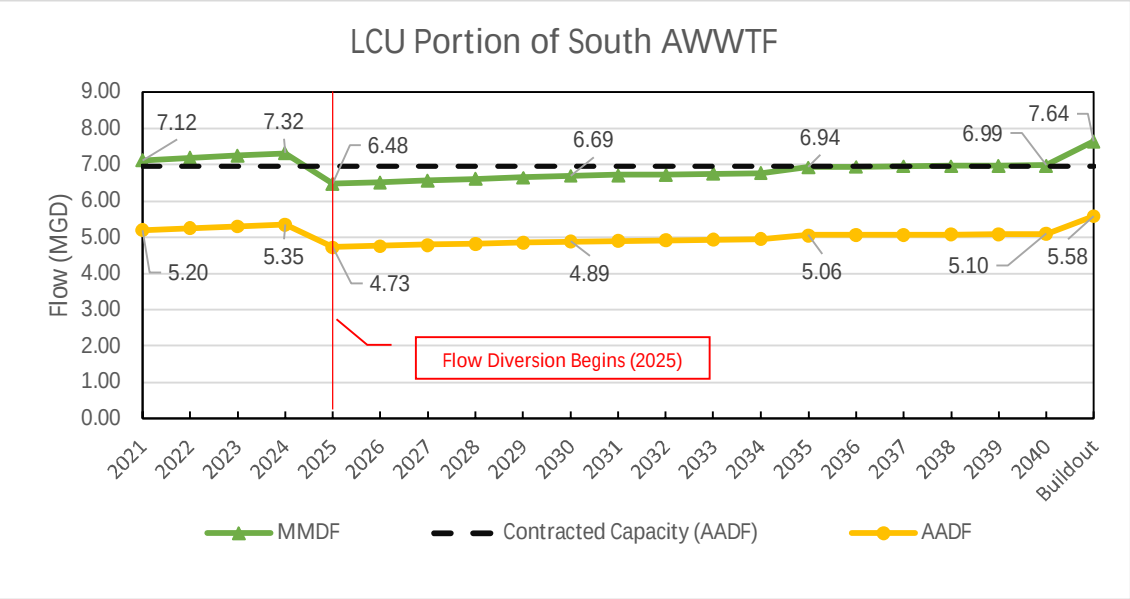
The AADF for the LCU portion of the Central City of Fort Myers service area is projected to increase from 2.48 MGD to 4.04 MGD from 2021 to buildout, an increase of 63%. The Central AWWTF gap analysis shows that the projected AADF **will not exceed** the capacity of the facility contracted by LCU, and that the facility will have excess contracted capacity of 0.50 MGD at buildout for the service area. The projected MMDF at buildout is 7.16 MGD.

6.3.9 City of Fort Myers South AWWTF

Figure 6-9 shows the results of the gap analysis for the LCU portion of the City of Fort Myers South AWWTF. As discussed in Chapter 5, LCU has a contractual agreement to use approximately 50% of the total combined capacity of the two City of Fort Myers facilities, therefore the gap analysis was conducted using the contracted capacity LCU has with this facility (6.96 MGD). Since the facility is owned and operated by the City of Fort Myers, both the reliable and 50% capacity thresholds were not identified in this analysis. As previously stated in Chapter 5, the flow projections for the LCU portion of the South Fort Myers wastewater service area use a per capita flow rate of 125 gpcd for the AADF and a PF of 1.37 to determine the MMDF.

LCU has plans to free up capacity at the City of Fort Myers South AWWTF by diverting flows to the Gateway WRF. The flow projections for the identified flow diversion area are presented in Chapter 5 and it is assumed the diversion will begin operations in 2025 when evaluating the treatment capacity gap shown in **Figure 6-9**.

Figure 6-9: LCU Portion of South AWWTF Gap Analysis



However, as previously noted, given the current proposed developments in the Gateway WRF existing service area, LCU may delay the implementation schedule for the diversion or reduce the quantity of flow to be diverted, to accommodate the County's wastewater treatment capacity expansion schedule. This will have an impact on the gap analysis for the South AWWTF.

The AADF for the LCU portion of the South City of Fort Myers service area is projected to increase from 5.20 MGD to 5.58 MGD from 2021 to buildout, an increase of approximately 7%. The South AWWTF gap analysis shows that with the diversion of flow to the Gateway WRF, the projected flows **will not exceed** the contractual capacity of the facility, and that the facility will have excess contractual capacity of 1.38 MGD at buildout for the service area. The projected MMDF at buildout is 7.64 MGD.

6.3.10 Florida Governmental Utility Authority Del Prado WWTF

Table 6-2 shows the 3MADF projections for the Florida Governmental Utility Authority (FGUA) Del Prado WWTF for 2018 to 2028, with the resulting gap analysis made available in **Figure 6-10**. The Del Prado WWTF has a permitted capacity of 4.25 MGD on an AADF basis as well as a permitted capacity of 4.80 MGD on a quarterly average daily flow (ADF) basis. The gap analysis presented in **Figure 6-10** was conducted using the quarterly ADF permitted capacity and a 75% quarterly ADF capacity threshold.

Table 6-2: Maximum 3MADF Projections and Growth Increases at FGUA Del Prado WWTF

Year	Growth Increase (TMADF)	Projections Maximum (TMADF)
	(MGD)	(MGD)
2018	-	3.75
2019	0.15	3.90
2020	0.17	4.07
2021	0.12	4.19
2022	0.12	4.31
2023	0.21	4.52
2024	0.24	4.76
2025	0.24	5.01
2026	0.18	5.19
2027	0.18	5.37
2028	0.19	5.55

Table from "Del Prado Wastewater Treatment Facility 10-year Planning Analysis Final Draft", November 19, 2019, Tetra Tech.

The 3MADF projections shown in **Figure 6-10** are provided using three different starting positions in 2018. These starting positions are based on the following: the highest observed historical maximum 3MADF (2016), the average maximum 3MADF of the past three years, and the maximum 3MADF in 2018. As these flow projections are referenced from the 2019 Del Prado WWTF 10-year Planning Analysis report, projections are only provided for 2018 to 2028.

Figure 6-10: Maximum 3MADF Projections at FGUA Del Prado WWTF

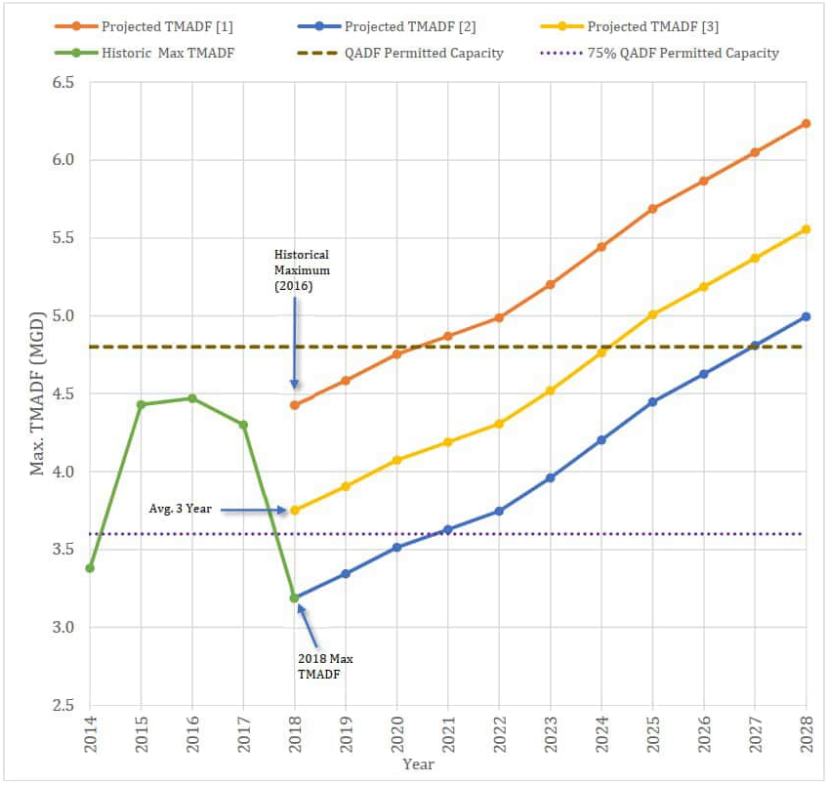


Figure from "Del Prado Wastewater Treatment Facility 10-year Planning Analysis Final Draft", November 19, 2019, Tetra Tech.

Assuming the worst case scenario for the FGUA Del Prado service area (starting point based on the historical maximum 3MADF (2016)), 75% of the facility's permitted quarterly ADF capacity is identified to **have been exceeded** in 2018, and the permitted capacity is identified to **have been exceeded** in 2021. Using the 3-year average maximum 3MADF as a starting position, the 75% capacity threshold is also **already exceeded** in 2018, but the permitted capacity **will first exceed** the permitted capacity in 2025.

6.4 RECOMMENDATIONS FOR TREATMENT PLANT EXPANSIONS/NEW FACILITIES

To maintain reliable service, some wastewater service areas will require treatment capacity expansions or new facilities due to growth in the wastewater service areas. This section identifies recommended facility or treatment capacity expansions and a recommended timeline for improvements based on the results of the treatment capacity gap analyses.

6.4.1 Facilities Not Requiring Future Expansions

The results of the gap analyses for the Fiesta Village WRF, Fort Myers Beach WRF, and High Point WRF show that the projected AADFs **will not exceed** the reliable or permitted capacities of each facility. Therefore, no treatment capacity expansions are recommended at this time.

The results of the gap analyses for the Fort Myers Central and South AWWTFs show that the projected AADFs **will not exceed** the contractual capacities that LCU has with Fort Myers, although the limit is nearly reached for the Central AWWTF at buildout. Therefore, no treatment capacity expansions are recommended at this time.

It should be noted that projections should be reviewed intermittently to refine long-term projections and capture changes in growth within the service area.

6.4.2 Facilities with Expansions in Progress

Three Oaks WRF

The County is in the process of implementing a 3 MGD expansion for the Three Oaks WRF to increase the facility's total permitted capacity from 6 MGD to 9 MGD. The expansion is planned to come online in December 2024, and is currently under design.

The results of the gap analysis for the Three Oaks WRF indicate a low utilization of the facility's planned 9 MGD capacity. Upon the completion of the 3 MGD expansion in December 2024 (completion considered in 2025 for this report), the projected AADF at the facility is only 4.34 MGD which indicates an excess permitted capacity of 4.66 MGD. With the completion of the Southeast WRF in 2028 and the subsequent modifications to the Three Oaks service area, the projected AADF decreases to 2.77 MGD which indicates an excess permitted capacity of 6.23 MGD.

The County should consider evaluating the sewershed for the future Southeast service area, and possibly reduce the diversion flow from the Three Oaks service area, to further utilize the future capacity of the Three Oaks WRF. With less flow being diverted to the new Southeast service area, the proposed capacity of the Southeast WRF could correspondingly be reduced as well.

Further evaluation of diversion areas and treatment capacities is needed. For a preliminary analysis, it is suggested that the Three Oaks service areas remains as it is today. For this scenario, the projected 2040 and buildout flow to the 9 MGD Three Oaks WRF would be 5.06 MGD and 6.63 MGD, respectively. This results in an excess capacity of 0.57 MGD and 2.37 MGD compared to the reliable (0.8 x permitted capacity) and permitted treatment capacity, respectively. This would allow for better utilization of the treatment capacity at Three Oaks and a reduction of treatment capacity for the proposed Southeast facility. Furthermore, the County is considering diverting Phase I flows from the Fort Myers South service area to Three Oaks WRF instead of Gateway WRF, which would utilize additional treatment capacity at the plant.

6.4.3 Facilities Requiring Future Expansions

The results of the gap analyses indicate that the reliable and/or permitted capacities of the facilities summarized below will require treatment capacity expansions or new facilities to maintain reliable service.

Pine Island WRF

The results of the gap analysis for the Pine Island WRF indicate that the AADF will exceed both the reliable capacity and the permitted capacity at buildout. Therefore, the facility will require an expansion to meet this need.

The projected buildout flows for the Pine Island service area are 1.02 MGD AADF and 1.29 MGD MMDF. It is recommended that the total Pine Island WRF treatment capacity be increased from the current 0.383 MGD to 1.275 MGD, an expansion of 0.892 MGD. The recommended total capacity was calculated so that the projected buildout AADF of 1.02 MGD would equal the reliable treatment capacity (80% of the permitted capacity).

It is recommended that planning and design of the 0.892 MGD expansion begin prior to buildout, since permitting, design, and construction may take 5 years and the facility expansion should come online by buildout. Because the 0.892 MGD expansion is required by the buildout condition, but not by 2040, the expansion is recommended to come online some time outside of the planning horizon. The exact timing is not indicated in this analysis.

Gateway WRF

A facility expansion of 3 MGD is included in the County's 10-year CIP, bringing the proposed permitted capacity of the Gateway WRF to 6 MGD. The results of the gap analysis for this facility indicates that the AADF will exceed the reliable capacity in 2029 and the permitted capacity in 2035 and the facility will therefore require an expansion to meet this need.

The projected buildout flows for the Gateway service area are 5.33 MGD AADF and 6.82 MGD MMDF. The total capacity was calculated so that the projected buildout AADF of 5.33 MGD would equal the reliable treatment capacity (80% of the permitted capacity). The total capacity was correspondingly calculated to be 6.66 MGD and therefore, it is recommended that the 6 MGD facility be designed to add an additional 1 MGD of capacity as needed for buildout. If the flow diversion to the Gateway WRF from the Fort Myers South service area does not occur, LCU should reassess the capacity needs for the Gateway facility.

It is recommended that planning and design of the expansion begin in 2029, since the permitting design, and construction may take 5 years and the facility expansion should come online in 2034.

Southeast WRF

Assuming a 6 MGD permitted capacity, the results of the gap analysis for the new Southeast WRF indicate that the AADF will exceed the reliable capacity by buildout. Therefore, the facility will require an expansion to meet this need. Based on discussions with LCU, the new Southeast WRF will be able to accommodate expansion up to 10 MGD.

Based on the currently planned service area boundary and the Three Oaks flow diversion, the projected buildout flows for the Southeast service area are 5.20 MGD AADF and 6.14 MGD MMDF. The total capacity is calculated so that the projected buildout AADF of 5.20 MGD would equal the reliable treatment capacity (80% of the permitted capacity). The total capacity was correspondingly calculated to be 6.5 MGD which would require a permitted capacity of 7 MGD. However, since a 6 MGD permitted capacity would meet the flow projections through 2040 and the County may further modify the proposed service area, it is recommended that the planned treatment facility capacity be 6 MGD with the ability to expand to 7 MGD.

In another approach, the County may opt to have the Southeast WRF come online in 2028 with a permitted capacity of 5 MGD as opposed to 6 MGD. If the total capacity is calculated so that the projected 2040 AADF of 3.44 MGD is equal to the reliable treatment capacity (80% of the permitted capacity), then the calculated total capacity would be 4.3 MGD. Therefore, with a recommended 5 MGD permitted capacity, the facility would still be able to maintain the projected AADFs from 2028 to 2040. After 2040, buildout flows would still require the facility to be expanded to a recommended total capacity of 7 MGD.

Another alternative would be further evaluation of diversion areas. The County may consider, on a preliminary basis, not diverting any flows from the existing Three Oaks service area to the new Southeast facility. If the proposed Southeast service area only includes the identified growth areas along Corkscrew Rd, the projected AADF flows will be 1.43 MGD in 2040 and 3.17 MGD at buildout. Since this similar analysis for Three Oaks indicated that the expansion would provide adequate treatment capacity to treat all flows without diversion, the Southeast WRF can be sized for 2 MGD of permitted capacity till 2040, with a 2 MGD expansion needed by buildout. With these treatment capacities and aforementioned projected flows, the Southeast WRF will have an excess reliable and permitted capacity of 0.17 MGD and 0.57 in 2040, respectively.

FGUA Del Prado WWTF

The results of the gap analysis for the FGUA Del Prado WWTF show that projected quarterly ADFs have exceeded the 75% capacity threshold (based on average 3-year maximum 3MADF and historical maximum 3MADF (2016) starting positions) by 2018, and will exceed the permitted capacity in either 2021 (based on historical maximum 3MADF (2016)) or 2025 (based on 3-year average maximum 3MADF).

The 2019 Del Prado WWTF 10-year Planning Analysis report recommends the FGUA pursue facility improvements to accommodate the projected quarterly ADFs for the facility service area, if future flows align with the worst case scenario.

6.4.4 Recommended Improvements Summary

Table 6-3 gives a timeline summarizing the recommended improvements resulting from the gap analysis.

Table 6-3: Summary of Recommended Improvements Identified in the Gap Analysis

Facility	Description	Start Design and Construction	Online Timing
Pine Island WRF	0.892 MGD Expansion to 1.275 MGD	TBD	Buildout

Table 6-4 presents a summary of the planned expansions or new facilities which were analyzed in the gap analysis. These improvements are separated from **Table 6-3** as they are already accounted for in the County's CIP.

Table 6-4: Summary of Planned Expansions and New Facilities

Facility	Description	Start Design and Construction	Online Timing
Gateway WRF	3.0 MGD Expansion to 6.0 MGD*	2029	2034
Three Oaks WRF	3.0 MGD Expansion to 9.0 MGD	Underway	2025
Southeast WRF	New 6.0 MGD Facility*	TBD-	2028

* Further evaluation is required to evaluate the modified service area and projected flows to accommodate buildout conditions .

7. SUMMARY OF WASTEWATER COLLECTION AND DISPOSAL ALTERNATIVES

Conventional OSTDS are one among several methods of wastewater treatment and disposal. This chapter provides a description of the alternative wastewater collection systems that can be considered for transitioning from conventional OSTDS and highlights the advantages and challenges of each alternative. Wastewater system alternatives are categorized as either centralized collection and treatment or onsite treatment and disposal. Centralized collection systems include gravity sewers, low-pressure sewers, septic tank effluent pumping (STEP) systems, vacuum sewers, and distributed treatment systems. On-site treatment and disposal systems, which do not require any form of centralized collection system, include conventional OSTDS and advanced OSTDS (including or performance based systems and advanced treatment units).

7.1 CENTRALIZED WASTEWATER COLLECTION AND TREATMENT

7.1.1 Gravity Collection Systems

Gravity collection systems have long been used by public utilities as a traditional method for domestic wastewater collection. The system is comprised of (a) gravity service laterals from each customer's property, (b) gravity sewer mains which the laterals connect to, and (c) manholes along the sewer mains at every few hundred feet and bends. Wastewater in the gravity sewer mains then flows by gravity to a local lift station. Intermediate lift stations are often needed to avoid excessive depths in areas with relatively flat topography and high groundwater such as Lee County. The lift stations then pump the wastewater flows into force mains to be conveyed to a master wastewater pumping station or directly to a wastewater treatment facility.

Design standards such as depths, slopes, and minimum pipe sizes are well established for gravity sewers. Following design, gravity systems, excluding the service lateral to the dwelling, are constructed in the public Right of Way (ROW). While this facilitates public ownership and access for maintenance, it creates disturbance to roadways, sidewalks, and other utilities and requires restoration of disrupted infrastructure as seen in Figure 7-1[1]. The maintenance of gravity systems is not as demanding as their construction, as mechanical and electrical components are only installed at the lift stations. This equipment can include standby power systems or connections for portable generators, which increases the reliability of the system during power outages. Although it is not practical to equip the smaller/intermediate lift stations with standby power, gravity systems have inherently high storage capacities in the manholes, larger gravity pipes, and pump station wet wells. The customer's maintenance responsibility is limited to the service lateral up to the ROW, which contributes to reducing the long-term maintenance costs for the utility.

Although gravity systems are installed deeper than pressurized or vacuum systems, they generally have the lowest maintenance cost once built to a "municipal grade" standard. They tend to have the lowest long term life cycle costs for projects in high-density single-family areas (especially with lot sizes a quarter of an acre or smaller), even in septic replacement programs with significant infrastructure impacts. There are many domestic suppliers of the components such as wastewater pumps, manholes, and piping needed to construct a gravity collection system.

Figure 7-1: Gravity Sewer Installation

[1] Source: Kimley Horn Presentation: Gravity and Beyond – A Discussion of Sewage Collection Technologies and Costs

7.1.2 Low-Pressure Sewers

Low-pressure sewers begin with a gravity sewer lateral draining to a grinder pumping station for each dwelling. The grinder pumping station, which is placed in a small pit, may be a simplex (single pump) for single family homes or duplex (double pump) for larger dwellings and commercial properties or shared systems. Each grinder pumping station is connected to the collection system by a small diameter pressurized pipe, which in turn feeds a central pumping station where flows are conveyed to a wastewater treatment facility through transmission force mains. Essentially, each dwelling or pair of dwellings has its own pumping system which includes automatic pumps and control devices. The pumping station also has a small holding tank with capacities ranging from 100 to 400 gallons, providing some wastewater retention capacity.

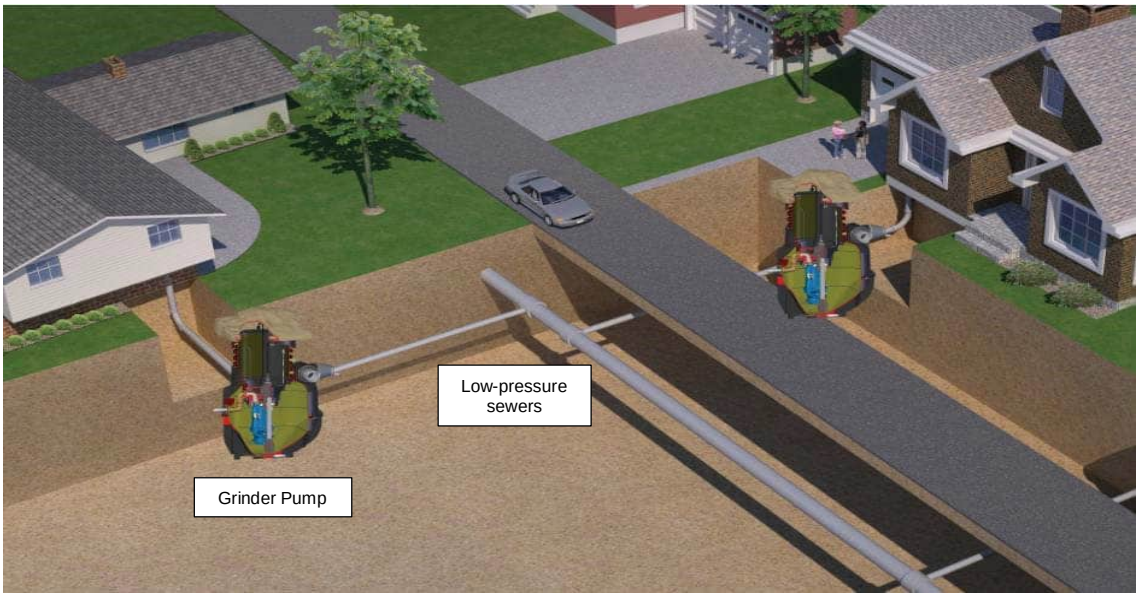
Figure 7-2: Forcemain Pipe Installation

In terms of construction, low-pressure system construction is generally less disruptive than gravity sewers. The service lateral on the property is typically 1.25 to 2.0 inches in diameter and does not need to be installed at a sloped grade or as deep as larger gravity laterals, and the smaller low-pressure sewers from the grinder pumps can be installed by directional drilling which further reduces impacts on the property.

In terms of ownership and maintenance, the property owner is typically responsible for the maintenance and power of the grinder pump and pipe up to the property line. However, in some communities, the utility has taken ownership of the system and is granted a maintenance easement.

Low-pressure sewer systems offer reliability, albeit less than gravity systems, as the pump station has a small holding tank with capacities ranging from 100 to 400 gallons which provides some wastewater retention capacity during power outages (for about one day) and the grinder pumps can be connected to a whole-house standby generator, if available. Low-pressure systems are generally less costly to construct than comparable gravity systems in areas of lower density and lot sizes 1/2 acre or larger. Generally, the smaller pressure lines are less costly because their installation causes less disturbance to developed property, and they can be directionally drilled at a cost lower than gravity mains with comparable capacity. In addition, if adequate check valves are provided, the low-pressure pipes from the grinder pumps can be connected directly to existing force mains in the ROW (see **Figure 7-2**[2]), thereby reducing the number of lift stations needed in the system. **Figure 7-3**[3] shows a general layout of low-pressure sewer system.

Figure 7-3: Low-Pressure Sewer System Layout



[2] Source: Crane Pumps (from Kimley Horn Presentation: Gravity and Beyond – A Discussion of Sewage Collection Technologies and Costs)
[3] Source: Crane Pumps (from Kimley Horn Presentation: Gravity and Beyond – A Discussion of Sewage Collection Technologies and Costs)

7.1.3 Septic Tank Effluent Pumping Systems (STEP)

STEP systems are a modification of low-pressure sewers that utilize the existing septic tank as a wastewater storage vessel that also provides partial treatment. In a STEP system, the conventional septic tank captures the solids, but the liquid effluent flows to a holding tank containing a pump and control devices from which it is then pumped to a pressure lateral. The small-diameter pipes are usually shallow and collect effluent to be conveyed to treatment facilities via force mains.

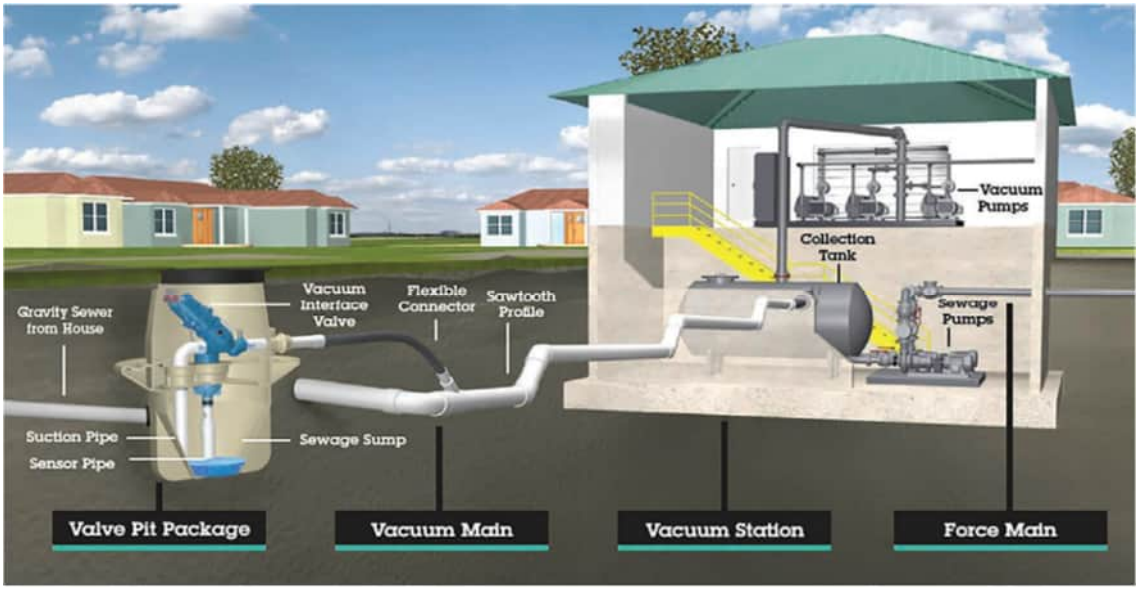
In a STEP system, the property owner is typically responsible for the maintenance and power supply of the septic effluent pump. Maintenance of the septic tank and pumping out the contents is also the responsibility of the property owner. Ideally, the capital cost of a STEP system is lower due to the incorporation of the existing septic tank. However, it is often the case that the existing septic tanks are in poor condition and require rehabilitation, which eliminates the potential cost saving and leads to disruption on the property due to new construction or rehab work. If the septic tank is in good condition, the associated storage volume provides reliability during power outages. The drainfield could also serve as a back-up system during power outages if retained.

The small-diameter pipes and ease of their constructability in comparison to gravity systems make STEP systems generally less costly in terms of capital, with comparable costs to low pressure sewers. The on-lot costs may also be lower because the continued use of a septic tank allows some gravity service connections. However, the operation and maintenance costs of this system are projected to be higher.

7.1.4 Vacuum Sewer Systems

In a vacuum sewer system, wastewater from up to four customers flows to a vacuum pit via a small-diameter gravity pipe. The wastewater in the vacuum pit, which is equipped with a pneumatically controlled vacuum valve, is periodically flushed into the vacuum main by a pulse of atmospheric air (vacuum collection) and is ultimately discharged into a large collection tank in a vacuum collection station. The station also contains the vacuum pumps that operate the system under constant negative pressure and use traditional sewer pumps to pump the sewage through a force main for transmission to a wastewater treatment facility. The vacuum pumping station is equipped with odor control on the discharge side of the vacuum pumps, and standby power for the vacuum and wastewater pumps. **Figure 7-4**[4] illustrates a typical vacuum sewer system layout.

Figure 7-4: Vacuum Sewer System Layout



The vacuum pits are usually installed in the ROW and maintained by the utility. The property owner is typically responsible for the maintenance of the system up to the property line, which includes the gravity lateral, air intake to the vacuum pit (referred to as candy cane because of its shape), and the associated sewer relief valve. Construction of vacuum sewer systems usually causes less disturbance to developed land than gravity systems, as pipes can be installed at a shallower grade than gravity pipes, but construction is more disruptive than for low

[4] Source: Airvac - Septic to Sewer Swap by Steve Gibbs (Water and Wastes Digest, Ap. 2017)
https://www.airvac.com/fileadmin/user_upload/Case_Studies/Charlotte_Cty.2017.WWD.pdf

pressure sewers. The 4-inch air intake on each property however is installed several feet above grade and can be aesthetically unpleasing and a potential source of odor.

Figure 7-5: Valve Pit O&M

In addition to less disruptive construction, advantageous features of vacuum sewer systems include their high level of reliability during power outages and minimal inflow and infiltration and leakage. Because the system is operated under vacuum, there is minimal leakage in the case of a line break and no electrical components are needed at the vacuum pits or properties. The power requirements are concentrated at the vacuum pumping station which can be equipped with standby power.

While highly reliable, vacuum systems require more maintenance than a gravity collection system as the pneumatic valve pits need to be routinely inspected and maintained as seen in **Figure 7-5**[5].

An important factor to consider with vacuum sewers is that the key components for vacuum sewers, i.e. vacuum pits and valves, are proprietary and currently only manufactured by Airvac (in the US) and by Flovac, Inc. (based in the Netherlands). Therefore, the decision to utilize vacuum sewer technology requires a commitment to and reliance on a specific manufacturer.

7.1.5 Distributed Wastewater Treatment Systems

An emerging concept that takes advantage of network technology is distributed wastewater treatment. In this concept, advanced on-site treatment units are collectively monitored remotely using a “Micro-Scada” Platform (MSP) and controlled by a licensed wastewater operator for the managing utility. The system uses a combination of on-site treatment, which can vary from primary settling to some degree of biological treatment, and final treatment at a wastewater facility, with the on-site treatment. Effluent from the on-site treatment system is pumped into a low-pressure collection system and transported to a wastewater treatment facility for final treatment.

The partial treatment that occurs on-site brings about potential advantages including enabling the use of smaller pressure collection pipes which reduces construction cost and reducing the organic load on the existing receiving wastewater facility.

Conceptually, the distributed on-site units can be permitted collectively by the FDEP as a distributed wastewater treatment system rather than as individual on-site systems. However, this is not currently addressed in FDEP regulations for wastewater treatment Chapter 62-620 FAC as the concept is still relatively new. Without employing the concept of remote monitoring and a collective single FDEP permit, the components of a distributed wastewater treatment systems are similar to those of a STEP system. The difference is that in a distributed wastewater treatment system, a specialized storage and treatment tank replaces the simpler septic tank which can be removed or abandoned in place. The property owner may choose to retain the drainfield as a means of back-up treatment during power outages.

Figure 7-6: OnSyte Distributed Wastewater Treatment Unit

Some suppliers of distributed systems include OnSyte Performance™ Suwanee, Georgia and Orenco Systems® Sutherlin, Oregon. An example of an OnSyte residential three-chambered distributed wastewater treatment unit is illustrated in **Figure 7-6**[6].

[5] Source: Kimley Horn Presentation: Gravity and Beyond – A Discussion of Sewage Collection Technologies and Costs
[6] Source: http://www.onsyte.com/technology

7.2 ONSITE SEWAGE TREATMENT AND DISPOSAL (OSTDS)

7.2.1 Conventional OSTDS

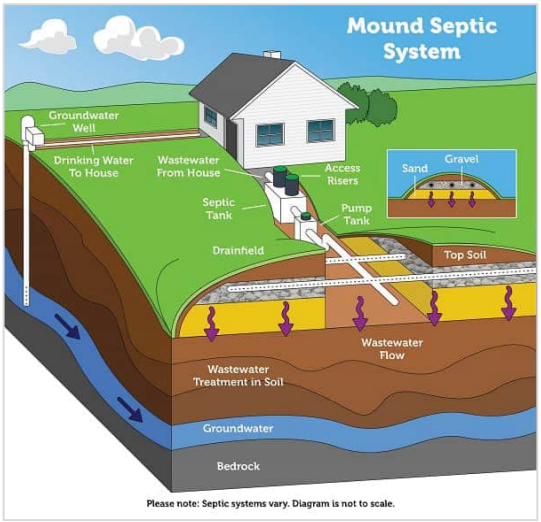
Conventional OSTDS have commonly been used as a means of wastewater disposal when utility services are not available. In a conventional OSTDS, wastewater flows from the property via a gravity pipe to a septic tank for solids settling and some anaerobic treatment. The septic tank effluent then flows to a porous drainfield where further treatment takes places among the soil layers and the effluent is disposed. **Figure 7-7**[7] illustrates a conventional septic system.

Figure 7-7: Conventional Septic System Layout

While properly maintained and functioning conventional septic systems provide effective removal of human pathogens, there is still concern over nutrient loading and pollution that finds its way into area ground and surface waters. In Florida, where there is a high seasonal groundwater table, the separation distance of 24 inches from the bottom of the drainfield to the seasonal high groundwater is required. Most of the conventional OSTDS constructed prior to 1983 do not meet the separation criteria, which does not allow the proper treatment in the soil layers to take place. Therefore, while there is removal of TSS and BOD to primary treatment levels, there is no reliable mechanism for the reduction of nutrients in the effluent before it discharges to groundwater and ultimately migrates to surface water.

FDEP regulations for conventional OSTDS include regular inspections and permitting renewals on 5-year intervals. In the case of OSTDS, the property owner has the sole responsibility of operation and maintenance of the system. Furthermore, high groundwater levels in Florida often necessitate installation of mounded drainfields (as seen in **Figure 7-8**[8]) in order to achieve the required separation distance to the seasonal high groundwater.

Figure 7-8: Mound Septic System Layout



[7] Source: US Environmental Protection Agency Website, Types of Septic Systems https://www.epa.gov/septic/types-septic-systems
[8] Source: US Environmental Protection Agency Website, Types of Septic Systems https://www.epa.gov/septic/types-septic-systems

7.2.2 Advanced OSTDS

Advanced OSTDS (including performance based systems) are on-site systems that provide a higher level of treatment than a conventional septic system. Effluent is still disposed of by drainfield, but all systems are designed to introduce both aerobic and anaerobic conditions to the wastewater for nitrification and de-nitrification, resulting in a higher quality effluent and reducing nutrient levels. Advanced or performance based OSTDS are used most commonly in communities where the construction of centralized collection system is impractical, due to a low density or a remote location, and there is high concern for nutrient pollution of ground and surface water. However, these systems require more maintenance than conventional OSTDS to preserve their effectiveness.

Advanced OSTDS require operating permits, maintenance contracts, and are subject to annual inspection. The FDEP FAC 62-6 defines four levels of performance for Advanced OSTDS.

Advanced Treatment Unit (ATU)

Aerobic Treatment Units are similar to conventional septic systems but achieve better nutrient removal. In ATUs, air is introduced to the sewage to promote aerobic biological stabilization, which reduces BOD in the effluent and achieves some nitrification of ammonia. Effluent from ATUs is required to meet quality standards of secondary treatment as defined in the FAC 62-6 which are more stringent that what is assumed can be achieved for unregulated conventional septic systems. Use of an ATU allows for a 25% reduction in the drainfield size, which is advantageous for the property owner.

Performance Based Treatment Systems (PBTS)

Performance based OSTDS have more requirements and restrictions than conventional systems or ATUs, further regulating the effluent quality and eliminating pollution to groundwater. The rules are established in FAC 62-6 Part IV. They must be designed by a Professional Engineer and act as small individual wastewater treatment plants. The FAC rules allow the use of PBTS for larger homes and have reduced size requirements for effluent drainfields. The three levels of PBTS are: (1) Secondary Treatment, (2) Advanced Secondary Treatment, and (3) Advanced Wastewater Treatment (AWT) which is Advanced Secondary plus Nutrient Removal.

Secondary PBTS systems consist of multi-stage treatment tanks that typically include mechanical aeration, solids separation, and pumping units. Advanced secondary PBTS systems are similar but additionally have equalization, recycle stream pumping units, and special filter media for nutrient removal. On the other hand, advanced wastewater treatment PBTS consist of advanced secondary treatment with additional nutrient removal and technology that uses special clay aggregate absorption media for phosphorous removal.

7.2.2.1 Advanced OSTDS Regulatory Requirements

Due to the advanced effluent quality limits required with permitted ATUs and PBTS OSTDS, the current requirements in Chapter 62-6 of the FAC place additional responsibilities on the property owner over those required for conventional septic systems:

- The homeowner must maintain a current operating permit for the life of the system. In Lee County, the operating permit must be renewed every two years and costs $100.00 payable to the DOH. The operating permit is non-transferrable.
- The homeowner must maintain a valid maintenance contract with an approved maintenance entity for the life of the system. The maintenance contract on new construction will initially be good for two years. Subsequent renewals must be good for at least a one-year term for the life of the system. Prices vary depending on the maintenance entity selected and type of system.
- The maintenance contractor is required to inspect and service the Advanced OSTDS at least twice per year. Inspection reports must be submitted to the DOH in Lee County.
- FDEP must inspect the maintenance and performance of the Advanced OSTDS at least once per year.
- Additional requirements for a PBTS unit used for treating domestic or commercial sewage flows in excess of 1500 gallons per day include: (1) a contract with a maintenance entity which has at least one Class D state certified wastewater treatment plant operator; (2) submit effluent water quality analysis for $CBOD_5$ (BOD), total suspended solids (TSS) and fecal coliform collected at least semi-annually with the samples analyzed by an approved environmental laboratory.

The current regulations regarding the levels of treatment for the different types of OSTDS defined in Chapter 62-6 of the FAC are summarized in **Table 7-1** below.

Table 7-1: Summary Chart for OSTDS Levels of Treatment Defined by FDOH

Regulated Permit Limits in mg/L	Conventional Septic Systems	Aerobic Treatment Units	Secondary PBTS	Advanced Secondary PBTS	Advanced Wastewater Treatment PBTS
TSS	Not regulated (50 mg/L assumed)	20 mg/L[A]	20 mg/L	10 mg/L	5 mg/L
BOD	Not regulated (50 mg/L assumed)	20 mg/L[B]	20 mg/L	10 mg/L	5 mg/L
Total TN	No removal	Not Regulated (50 mg/L assumed)	Not Regulated (25 mg/L assumed)	20 mg/L	3 mg/L
Total TP	No removal	Not Regulated (no removal assumed)	Not Regulated (no removal assumed)	10 mg/L	1 mg/L

*Limits in mg/L reflect the maximum concentration allowed for the arithmetic mean of the parameter value for the effluent samples collected (whether grab or composite technique is used) during an annual period.

7.3 COMPARISON OF ALTERNATIVE SYSTEMS

Based on the discussion of the alternatives in the subsections above, a matrix was developed to compare the wastewater collection system alternatives and is presented in **Table 7-2**. The following list provides the comparison criteria and the basis of scores assigned for each criterion:

- Construction Disruption: The level of disruption to public ROW that will occur due to construction.

  A 'high' level reflects a system that will cause significant disruption to public ROW and require significant road restoration efforts, such as gravity sewer systems. A 'low' level reflects a system that can be installed without causing disruption to public ROW and restoration efforts through installation at shallow grades or installation outside of the public ROW, such as low-pressure sewer systems.

- O&M Needs: The level of O&M needed to maintain system viability (regardless of the responsible party).

  A 'high' level encompasses a system with several components/moving parts that require periodic maintenance or third-party operational control, such as STEP and distributed wastewater systems. A 'low' level encompasses a system that does not require regular maintenance and for which most components do not require any intervention for operation, such as gravity systems.

- Vulnerability: The vulnerability of the system against power outages and flooding.

  A 'high' level of vulnerability indicates that the functionality of the system is significantly impacted by power outages and/or flooding. For example, all systems that are heavily reliant on power and not easily equipped with standby power, such as STEP and distributed wastewater systems, are considered highly vulnerable. High wet season water tables and storms impact the viability of conventional OSTDS, as the systems can get backed up during flooding. Alternatively, a 'low' level of vulnerability includes systems that can continue to be utilized during power outages because the system inherently has storage capacity or is easy to equip with standby power, such as gravity systems.

- Nutrient Pollution: The level of nutrient pollution that is associated with the system.

  A 'high' nutrient pollution level reflects a system that is not effective at reducing or removing nutrients and therefore contributes to nutrient pollution, such as conventional OSTDS. A 'low' nutrient pollution level encompasses the centralized systems that transport wastewater flows to an advanced WWTF where the most significant nutrient reduction takes place.

- Permitting Requirements: The level of difficulty or complexity of the permitting required.

  A 'high' level for permitting requirements indicates that the permitting process for the system is complex, untried, or is associated with many regulatory requirements. For example, ATUs or PBTS OSTDS have strict effluent limitations, and distributed wastewater systems are still considered a relatively new concept for which the permitting requirements are still not specifically regulated. Comparatively, a 'low' level includes systems that have straightforward permitting processes that do not need renewals, such as gravity, low-pressure, and vacuum sewers. Otherwise, systems such as conventional OSTDS have clear permitting requirements but are subject to 5-year inspections and permit renewals, therefore they are assigned a 'medium' level.

- Homeowner Responsibility: The level of responsibility placed on the homeowner/customer.

  A 'high' level of homeowner responsibility is assigned for systems where the homeowner is responsible for more than one of the following: supplying power, operating/maintaining a component of the system, placing a component on property, and/or obtaining permit renewals. A 'medium' level is assigned if the homeowner has *one* of the previous responsibilities for the system. A 'low' level of homeowner responsibility is when the homeowner has none of the previous responsibilities which indicates that the managing utility is responsible for all aspects of the system, such as gravity systems.

- Supplier Limitations: The limitations or constraints of suppliers for this type of system.

  A 'high' level of supplier limitations is associated with systems that use proprietary technology and/or require a commitment to a certain manufacturer/supplier, such as vacuum sewer systems. A 'low' level of supplier limitations is assigned for systems that have abundant options for suppliers, like gravity sewer systems and conventional OSTDS, while a 'medium' level is assigned to systems that are not proprietary but not commonly used, and therefore have less supplier options.

Table 7-2: Comparison of Wastewater Collection System Alternatives

Wastewater System Alternative	Construction Disruption	O&M Needs	Vulnerability	Nutrient Pollution	Permitting Requirements	Homeowner Responsibility	Supplier Limitations
Centralized Wastewater Systems							
Gravity Sewer	High	Low	Low	Low	Low	Low	Low
Low-Pressure	Low	Medium	Medium	Low	Low	High	Medium
Vacuum Sewer	Medium	High	Low	Low	Low	Medium	High
STEP System	Medium	High	High	Medium	Medium	High	Medium
Distributed Wastewater Systems	Medium	High	High	Medium	High	Medium	High
On-Site Treatment and Disposal Systems							
Conventional	Low	Medium	Medium	High	Medium	Medium	Low
Advanced (ATUs or PBTS)	Low	High	High	Medium	High	High	Medium

Based on the comparison in **Table 7-2** above, a few of the wastewater alternatives were eliminated from the consideration for septic conversion. For the centralized wastewater systems, gravity and low-pressure sewer systems score better overall than STEP, vacuum sewer, and distributed wastewater systems. More specifically, the STEP and distributed wastewater systems both require more O&M than other alternatives, are not reliable during power outages, and contribute more to nutrient pollution than other centralized wastewater systems. Vacuum sewers were also eliminated from consideration due to having high O&M needs and the most significant limitations on suppliers as it will require a commitment to a certain manufacturer/supplier. As for OSTDS, conventional OSTDS were eliminated primarily due to their ineffectiveness at removing nutrients.

Therefore, the wastewater collection alternatives to be considered for septic conversion were narrowed down to (1) gravity sewers, (2) low-pressure sewers, and (3) advanced OSTDS, including PBTS. Planning level costs were developed for all three alternatives in Chapter 9. However, FDEP prefers gravity sewer construction over advanced OSTDS since connection to centralized sewer eliminates concerns about nitrogen loading to groundwater and the County prefers it over low pressure sewer as the majority of LCU's wastewater collection system is comprised of gravity sewers.

8. ALTERNATIVES EVALUATION AND HYDRAULIC MODELING ANALYSIS

8.1 INTRODUCTION

The alternative wastewater collection systems – gravity sewers, low-pressure sewers, and advanced OSTDS – were considered and conceptually laid out for each of the septic conversion areas in the ten priority groupings identified in Chapter 4 using LCU design criteria and best design practices. While this chapter presents the design basis and assumptions for each of the alternatives, it focuses on the centralized collection system alternatives and their tie-in points to the existing system for hydraulic modeling purposes. This chapter also details the hydraulic modeling scenarios considered and the needed system improvements based on the results of that analysis. In addition, building on Chapter 6 conclusions, layouts developed for the planned treatment plants and existing plant expansions are presented in this chapter.

This section discusses the following:

- Design basis for the alternative wastewater collection systems for the priority septic conversion areas
- Tie-in points for the priority grouping areas to the existing infrastructure
- Hydraulic modeling analysis
- Summary of pumping and piping improvements based on hydraulic modeling results
- Preliminary layouts for planned new treatment plants and treatment plant expansions

8.2 DEVELOPMENT OF ALTERNATIVE COLLECTION SYSTEM LAYOUTS

As previously mentioned, different types of collection and disposal systems were considered for each septic conversion area. This subsection focuses on the design criteria and assumptions for the centralized collection systems - gravity sewers and low-pressure sewers. Given that advanced OSTDS are not associated with a network system and do not tie into the existing infrastructure, only cost estimates were developed for this alternative which is presented in Chapter 9.

8.2.1 Design Basis and Assumptions

For the design of the gravity and low-pressure sewer layouts, the available design guidelines used included:

- For gravity sewer layouts: LCU Design Manual, Section 3: Sanitary Sewer, Revised 2015
- For low-pressure sewer layouts: Environment One (EOne) Low Pressure Design Guide

For information not available in the above design guidelines and missing information regarding the existing infrastructure, design assumptions were made based on common engineering practices and input from LCU staff. The design assumptions used for gravity and low-pressure sewer layouts are presented in **Tables 8-1** and **8-2,** respectively**.**

Table 8-1: Gravity Sewer Layout Design Criteria and Assumptions

Design Criteria	Design Guideline/Assumptions
Force Mains are sized based on a minimum scour velocity of 2 ft per second (fps).	LCU Design Manual
Manholes are located every 300 to 500 linear feet and at changes in direction.	
Plug valves are located at the end of a force main run or at 1,000 LF intervals as per LCU Design Criteria.	
Air release valves are located at each end of a horizontal directional drill (HDD).	
Casing and carrier pipes are needed for HDDs under roadways.	
Minimum gravity sewer diameter is 8-in and minimum force main diameter is 4-in.	

Design Criteria	Design Guideline/Assumptions
Flow conveyance routes are to covey the flow to the nearest point of connection to the centralized system.	Assumption
Proposed lift stations are located on empty parcels due to insufficient area within the Right-of-Way (ROW), unless otherwise stated in the layouts.	
Existing force mains and lift stations can accommodate additional flow. Hydraulic modeling was completed to confirm or identify needed infrastructure improvements.	
Septic conversion areas with a shared tie-in point to the existing infrastructure can share a forcemain up to that connection point.	
Maximum length of gravity sewers is 2,500 LF (based on a slope of 0.4% for 8" gravity sewer and a minimum of 4 ft of cover) to avoid sewer depths below 14 ft.	

Table 8-2: Low-Pressure Sewer Layout Design Criteria and Assumptions

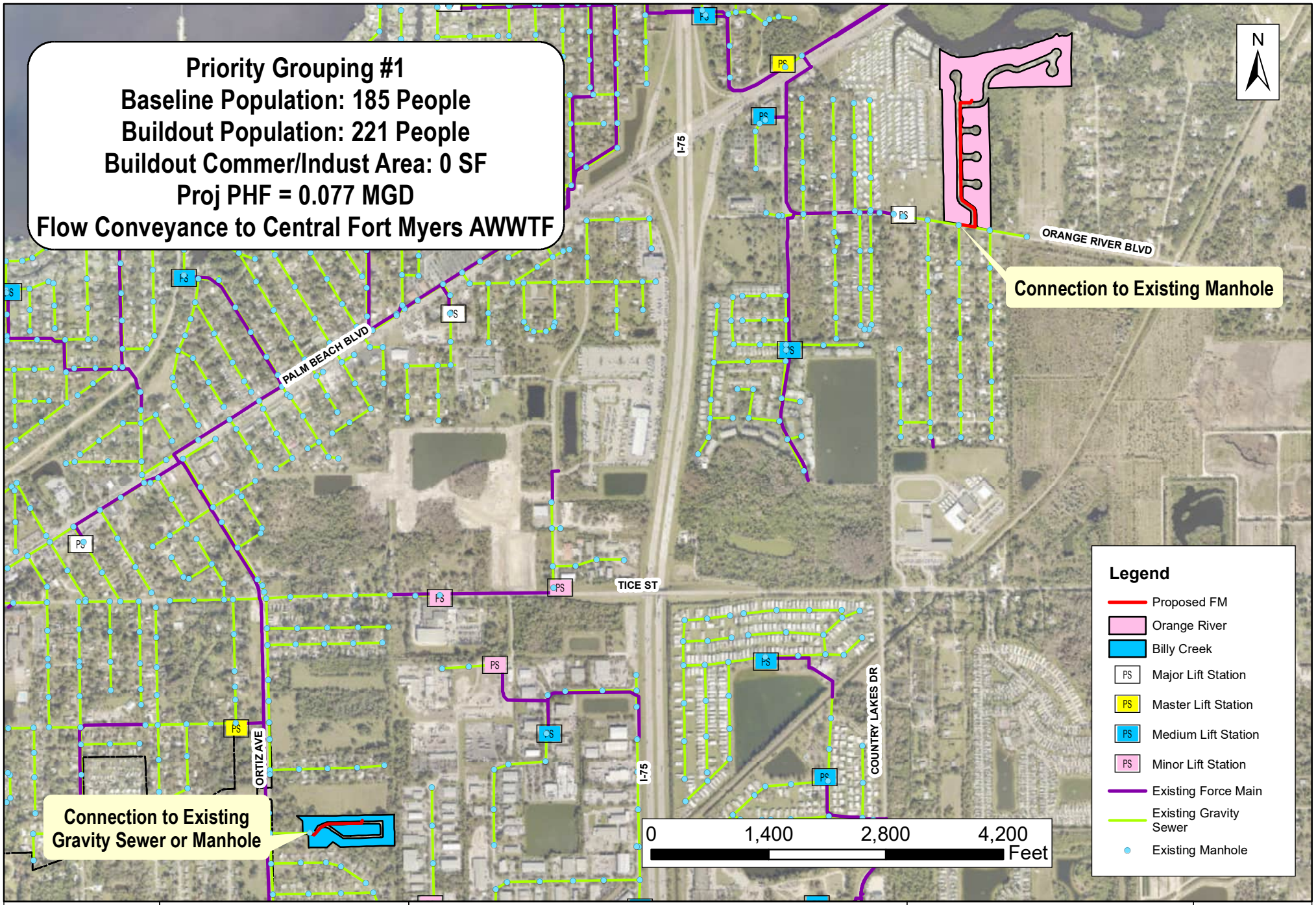
Design Criteria	Design Guideline/Assumptions
1.25" force main is used for all service laterals.	EOne Design Guide
2" force mains will have no more than 9 total upstream service lateral connections.	
3" force mains will have no more than 30 total upstream service lateral connections (21 additional).	
4" force mains will have no more than 230 total upstream service lateral connections (200 additional).	
6" force mains are used after 230 total upstream connections is reached.	
Grinder pump stations are located within 50 LF of each house/building.	
Flow conveyance routes are to covey the flow to the nearest point of connection to the centralized system.	Assumption
Existing force mains and lift stations can accommodate additional flow. Hydraulic modeling was completed to confirm or identify needed infrastructure improvements.	
Septic conversion areas with a shared tie-in point to the existing infrastructure can share a force main up to that connection point.	
All flows will be conveyed by the grinder pump stations and no new centralized lift stations will be required.	

As previously mentioned, there are no design assumptions for the advanced OSTDS as there are no layouts associated with it. The general assumption is that any additional design element related to the installation of the advanced OSTDS, such as mounds for example, will be considered by the septic contractor.

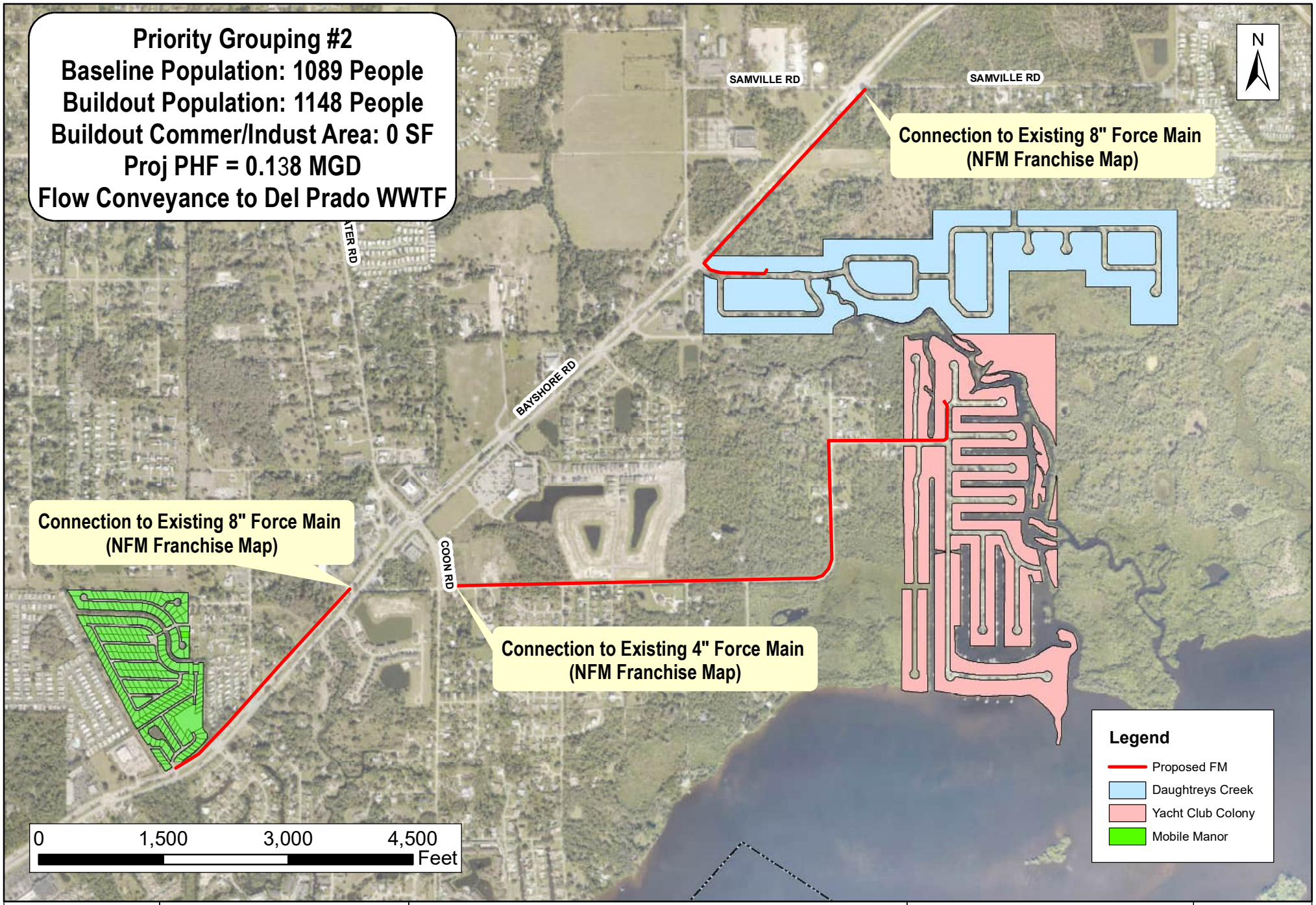
Tables 8-1 and **8-2** show that gravity and low-pressure sewer layouts share some design assumptions. For both, a major design assumption when laying out the sewers was that the existing force mains and lift stations can accommodate the additional flow received from the conversion of the priority septic area. Subsections 8.3 and 8.4 discuss the hydraulic modeling and the results of that analysis highlight whether the existing infrastructure has adequate capacity or needs upsizing. Moreover, when septic conversion areas were in proximity to each other and had the same nearest connection point to existing infrastructure, a shared force main was proposed for those areas up to the tie-in point. The cost distribution for this shared force main, which is discussed in Chapter 9, was calculated based on percentage of flow contributed from each septic conversion area.

8.2.2 Priority Septic Conversion Groupings and Tie-Ins to the Existing System

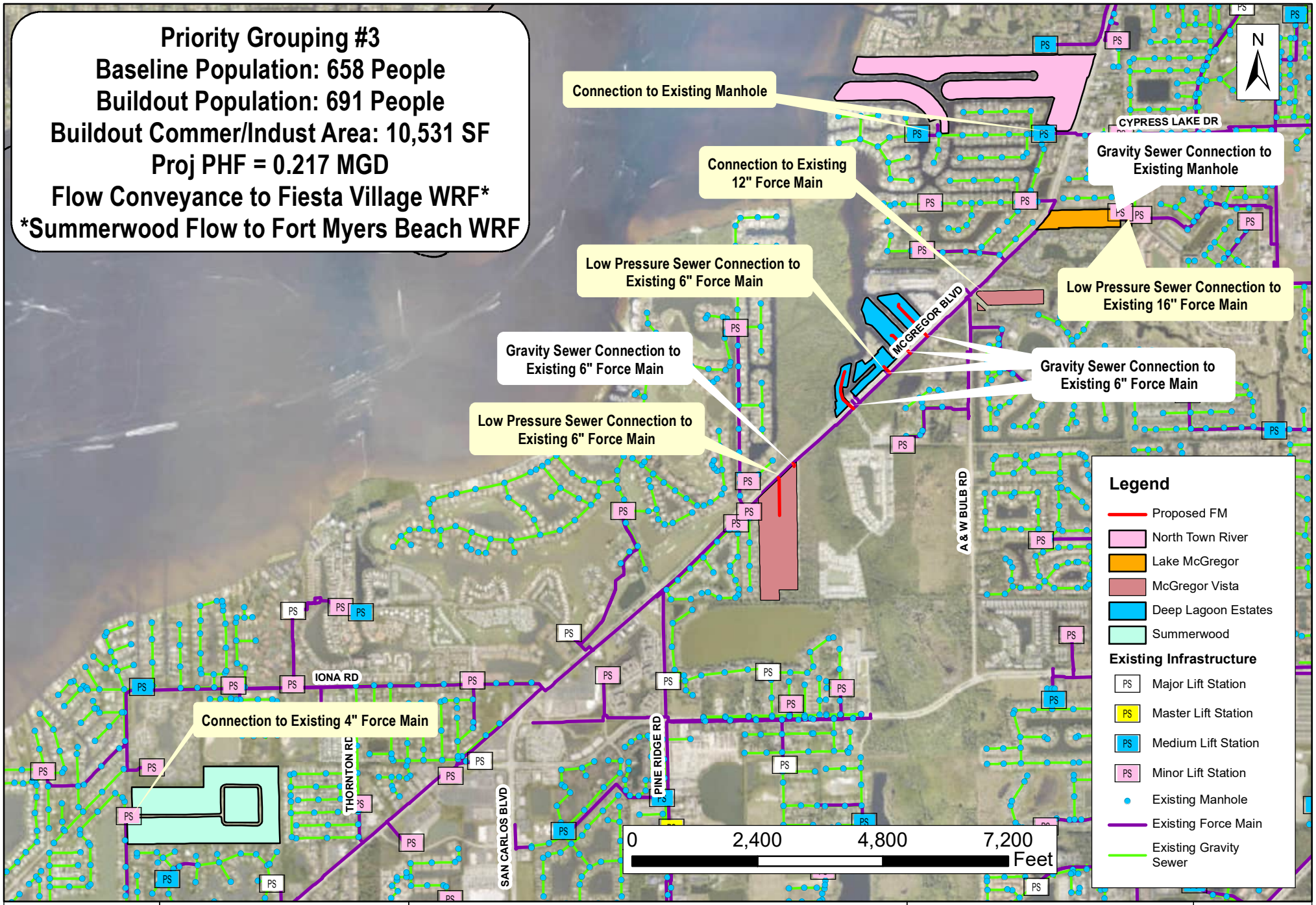
The design criteria presented in **Tables 8-1** and **8-2** were used to develop the conceptual layout for the gravity and low-pressure sewer networks which are presented in Chapter 9 with their cost estimates. However, for the hydraulic modeling analysis, only the projected wastewater flows from each septic conversion area and the connection point at which they are conveyed to the existing system are discussed. **Figures 8-1** to **8-10** present overview maps of the septic conversion areas and their tie-in points to the existing system for each priority grouping.



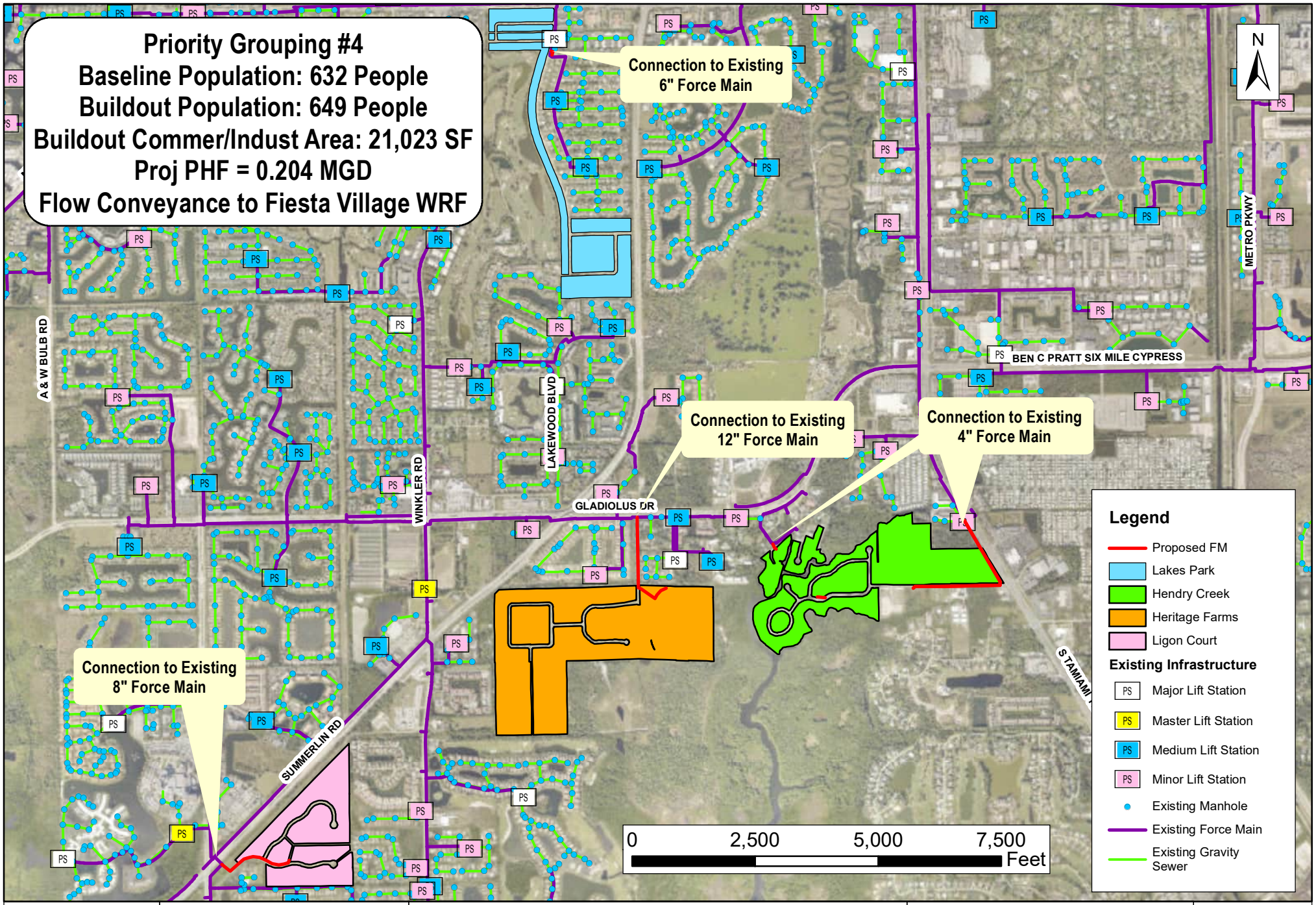
Date Created: July 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Priority Grouping #1** **Overview of Septic Conversion Areas**	AECOM	**Figure** **8-1**



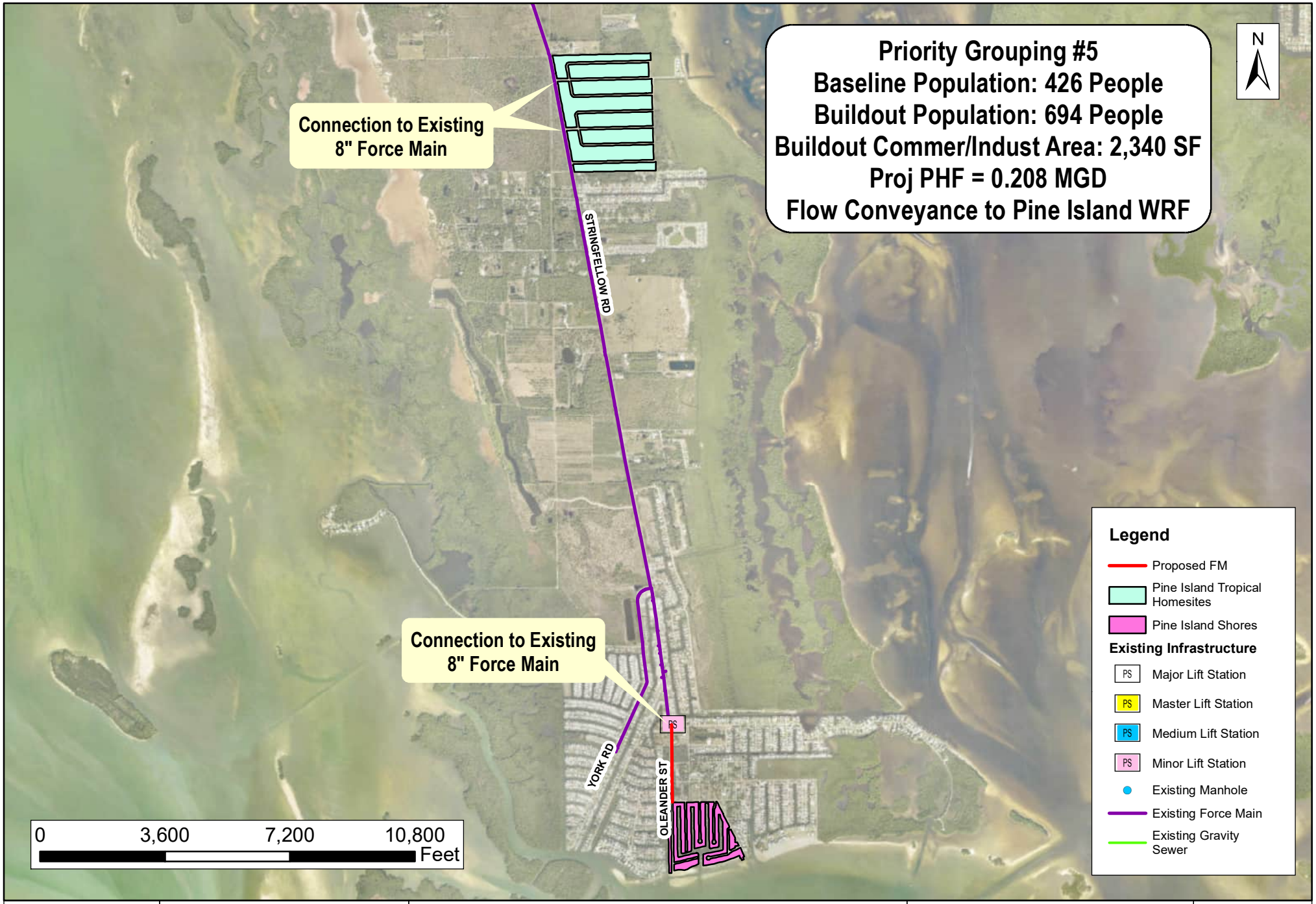
Date Created: July 2022	LEE COUNTY SOUTHWEST FLORIDA	Countywide Wastewater Management Plan Priority Grouping #2 Overview of Septic Conversion Areas	AECOM	Figure 8-2



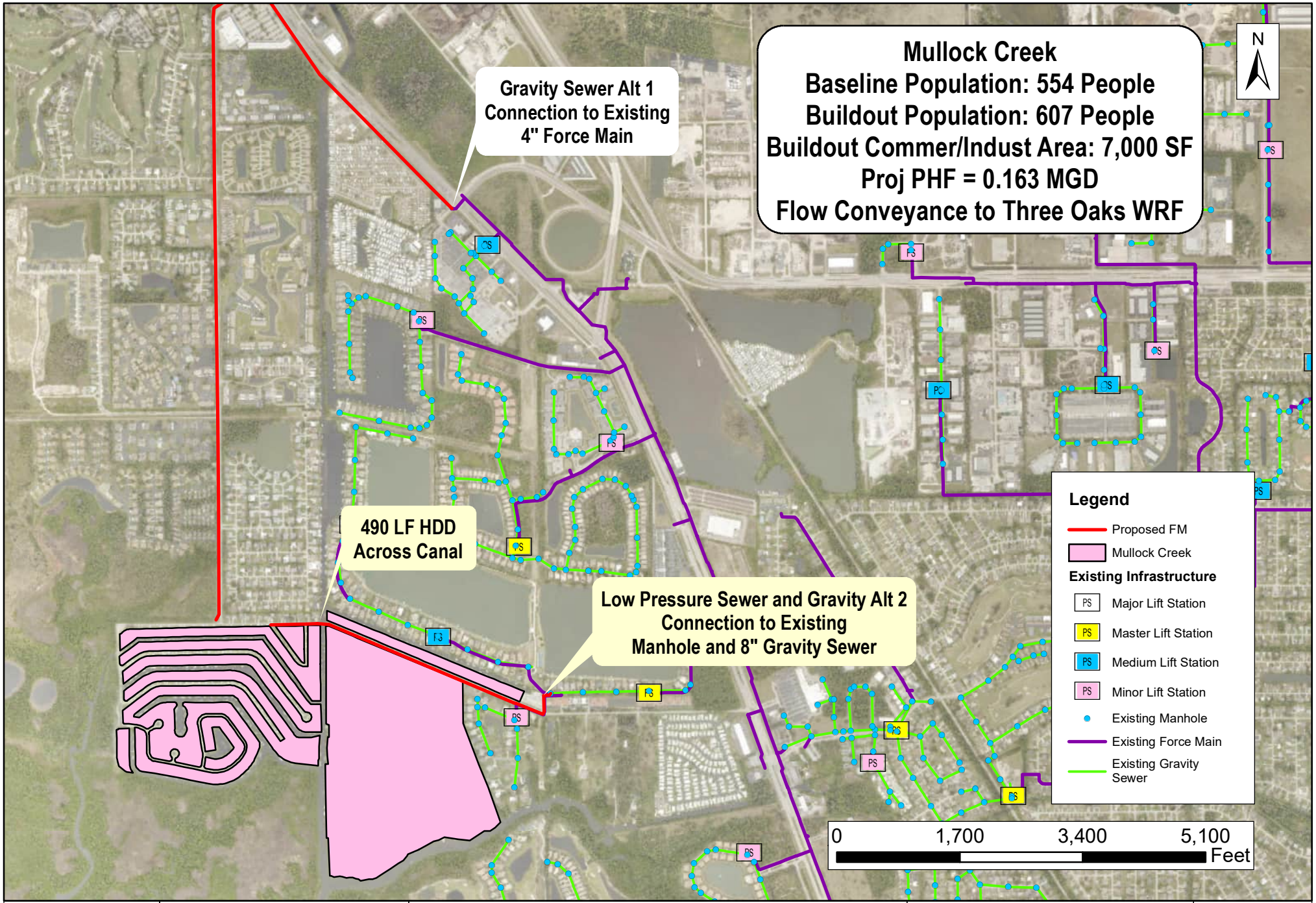
Date Created: July 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Priority Grouping #3** **Overview of Septic Conversion Areas**	AECOM	**Figure** **8-3**



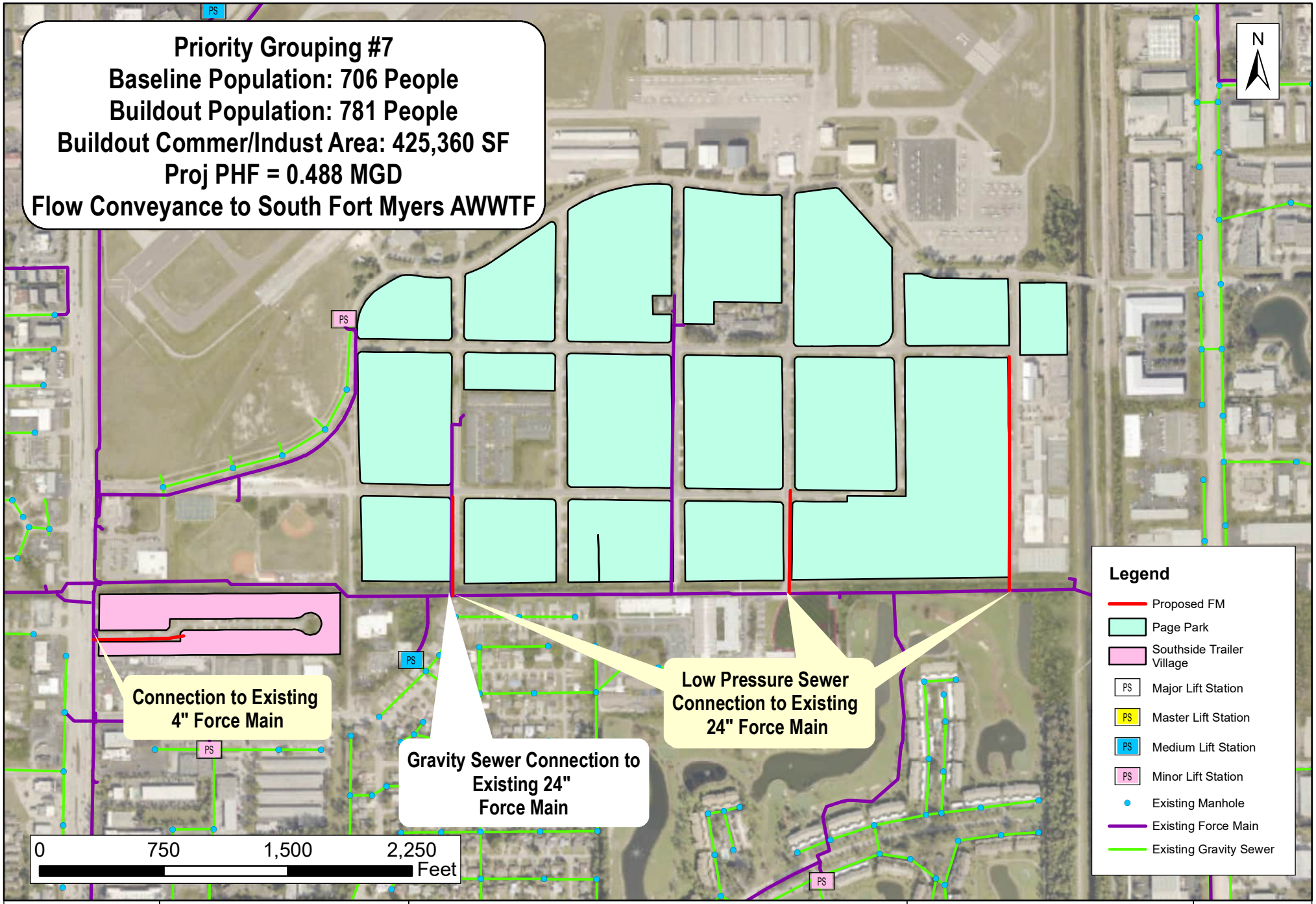
Date Created: July 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Priority Grouping #4** **Overview of Septic Conversion Areas**	AECOM	**Figure** **8-4**



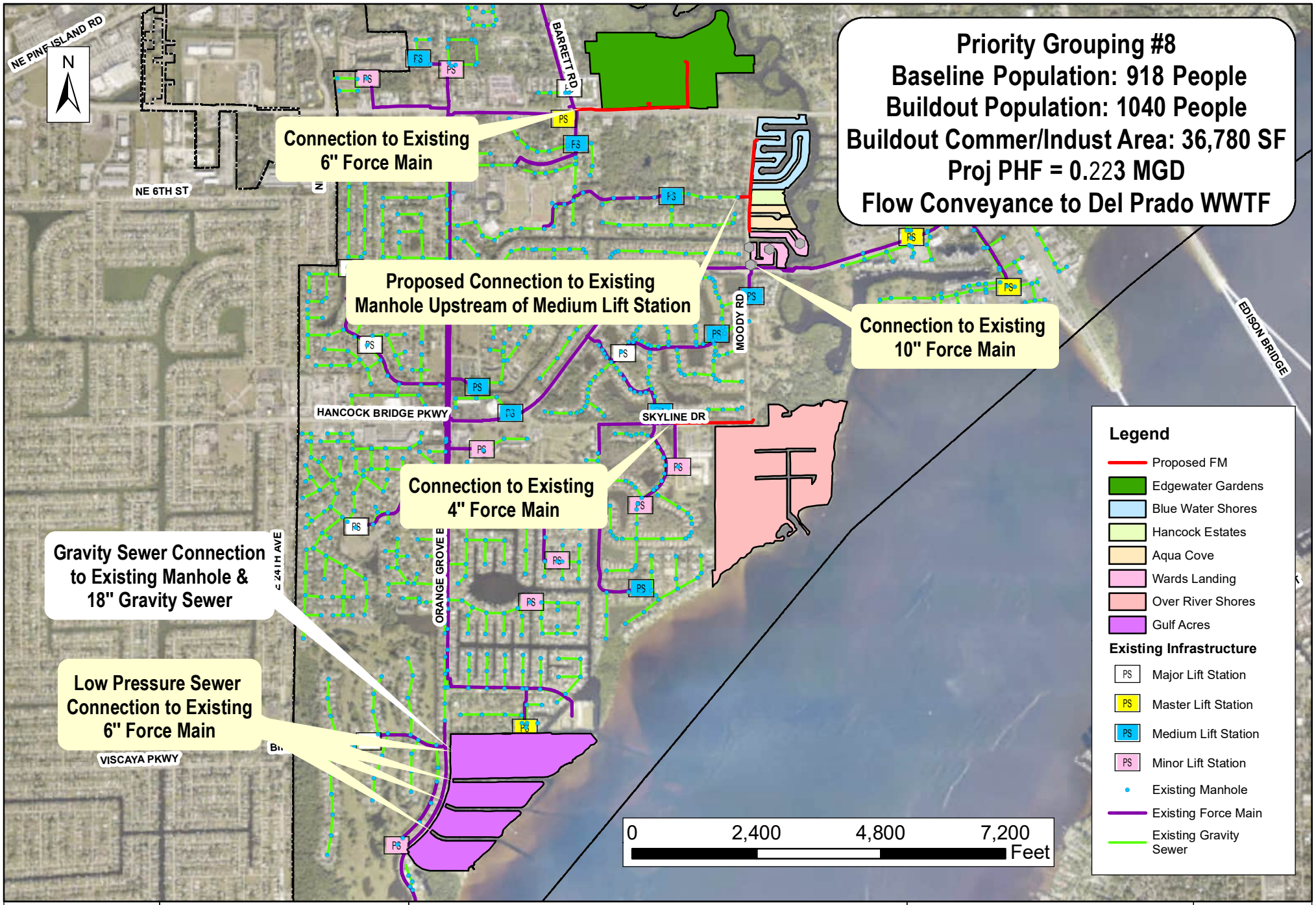
Date Created: July 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan**	AECOM	**Figure**
		Priority Grouping #5 Overview of Septic Conversion Areas		**8-5**



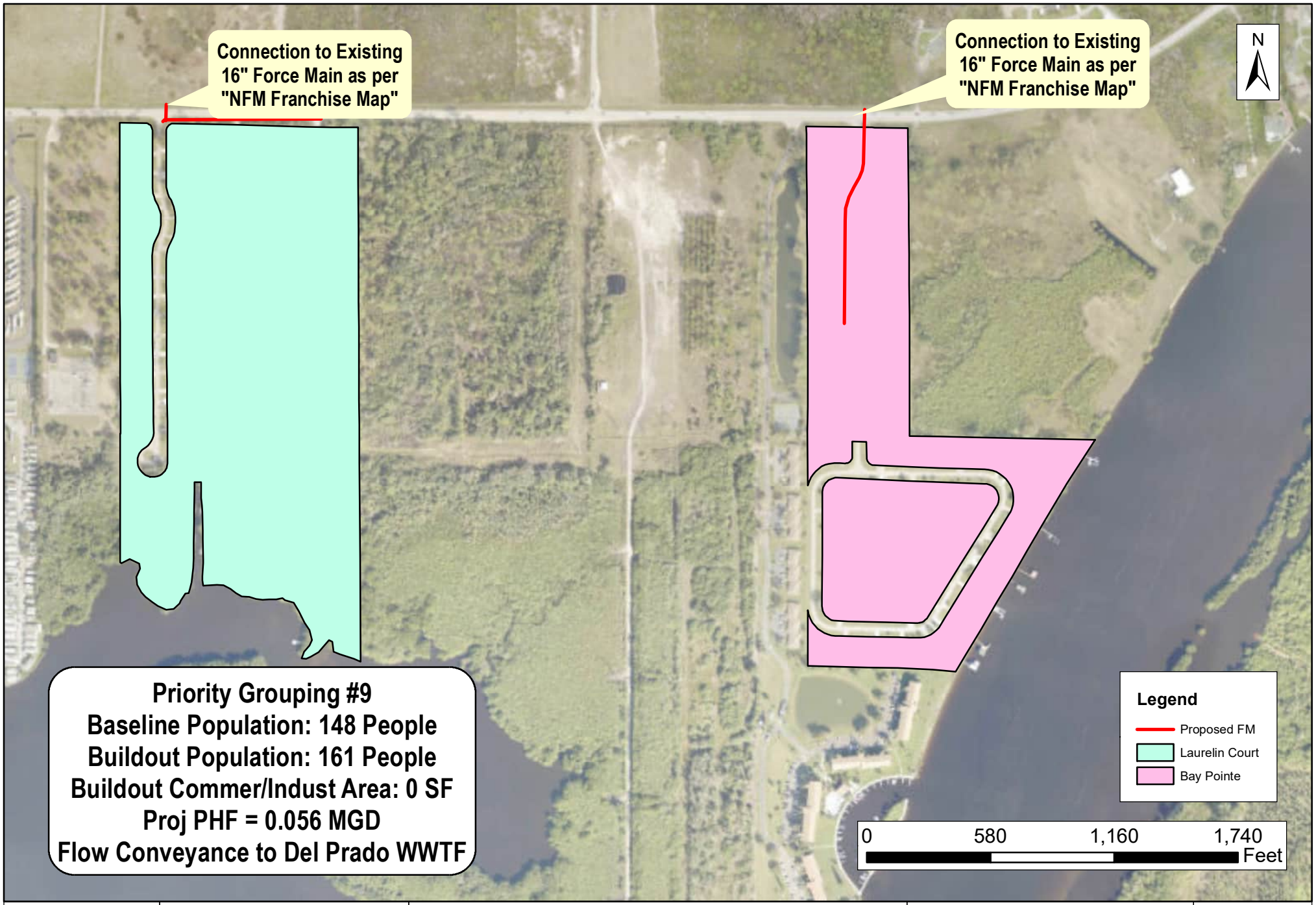
Date Created: July 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Priority Grouping #6** **Overview of Septic Conversion Area**	AECOM	**Figure** **8-6**



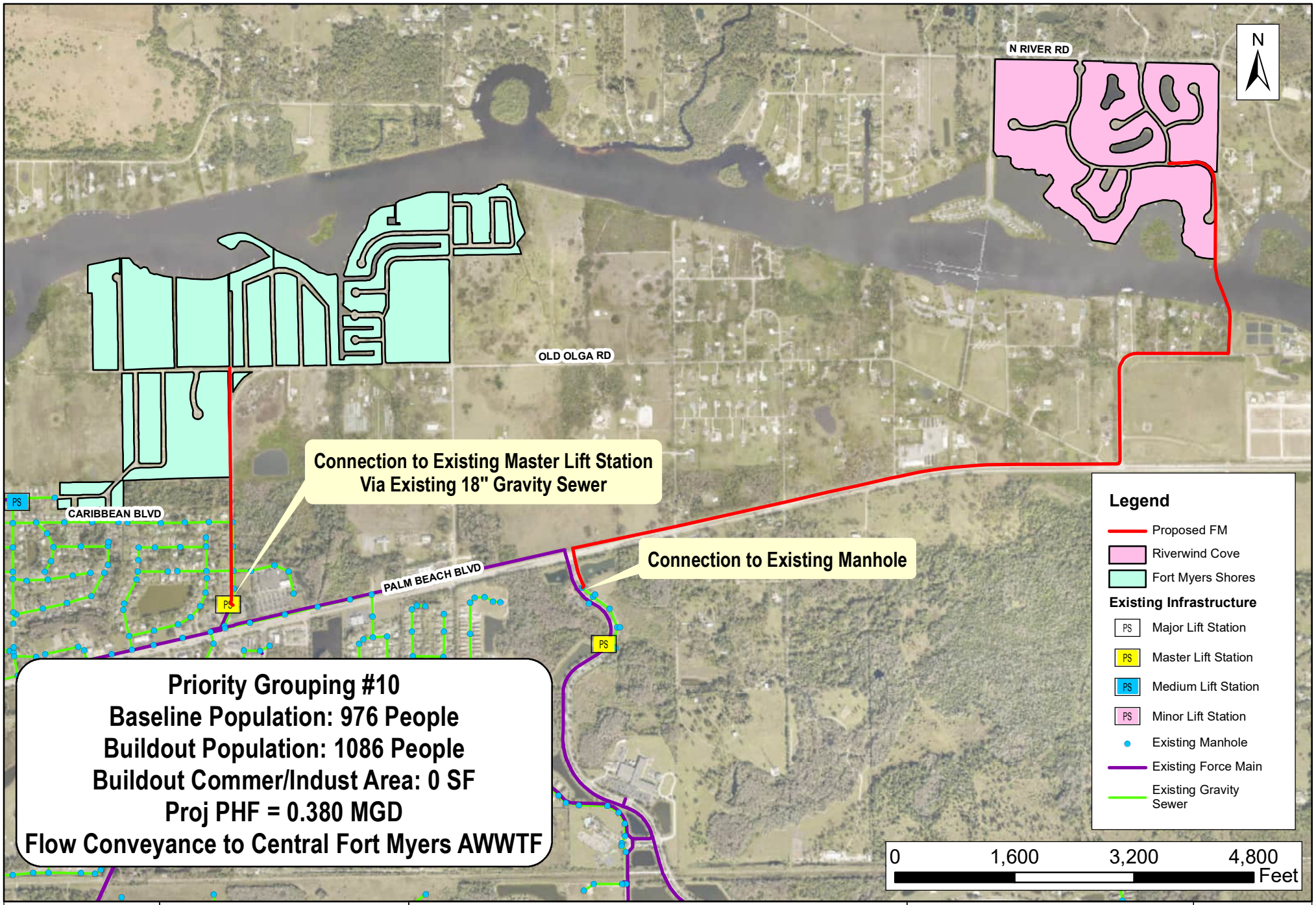
Date Created: July 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Priority Grouping #7** **Overview of Septic Conversion Areas**	AECOM	**Figure** **8-7**



Date Created: July 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Priority Grouping #8** **Overview of Septic Conversion Areas**	AECOM	**Figure** **8-8**



Date Created: July 2022	LEE COUNTY SOUTHWEST FLORIDA	Countywide Wastewater Management Plan Priority Grouping #9 Overview of Septic Conversion Areas	AECOM	Figure 8-9



Date Created: July 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Priority Grouping #10** **Overview of Septic Conversion Areas**	AECOM	**Figure** **8-10**

Figures 8-1 through **8-10** highlight the connection points of each of the septic conversion areas in a priority grouping to the existing system. The figures represent an overview of each priority grouping, the projected peak hour flows from the septic conversion areas in that grouping, and the treatment plant that will receive those flows. In the hydraulic modeling analysis, the projected buildout flows from each septic conversion area were input into the model at the location of the tie-in point with the existing system. The evaluation of the system capacity for accommodating these additional flows is discussed further in the following subsections.

8.3 HYDRAULIC MODELING ANALYSIS

8.3.1 Objective

The objective of the hydraulic modeling analysis was to assess the impact of the proposed septic to sewer conversions for each of the priority areas on the existing wastewater conveyance system. The proposed gravity sewer and low-pressure system conceptual designs and point of connection to the existing wastewater conveyance system are presented in Section 8.2. The hydraulic analysis identifies additional system improvements that would be needed to accommodate the additional flows from the septic conversion areas.

To complete these analyses, existing wastewater force main system hydraulic models for the affected conveyance systems in Lee County were updated to include the new septic to sewer conversion projects. Force main hydraulic models were provided by the County for the WRFs at Fiesta Village, Pine Island, Three Oaks, South Fort Myers/Gateway and Fort Myers Beach service areas. Each of these models were developed by others using Innovyze's InfoWater pressure main hydraulic modeling software, and include the primary force main and pump stations (PS) in each area. For the septic conversion areas discharging to Del Prado and Central Fort Myers, models were not available so alternate methods for assessing the impact of the septic conversions were used.

8.3.2 Modeling Scenarios & Development of Updated Models

Model Scenarios

The general approach for identifying the impact of the septic conversions was to update the existing 2020 and 2025 demands in the existing models to include buildout peak hour flows (PHF) from the septic conversion areas. The model results for the buildout flows and the existing system flows were compared to the model results of the existing system without the septic conversion areas. Based upon this methodology, each available model was run for two modeling scenarios:

- Existing system with 2020 flows
- Existing system + buildout flows from the septic conversion areas

Modeling Flows from Septic Conversion Areas

The septic conversion areas were grouped into three categories depending on whether an existing model was available and how the flows were modeled. The categories are summarized in **Table 8-3** below.

Table 8-3: Description of Model Categories

Category No.	Model/Service Area in Category	Description
I	Fiesta Village Three Oaks South Fort Myers/Gateway Fort Myers Beach	Systems all have existing InfoWater models that conduct extended period simulations with demands represented by diurnal patterns.
II	Pine Island	System model only conducts steady state simulations for peak hour flows.
III	Del Prado Central Fort Myers	Systems for which models were not available. For these systems, additional infrastructure to accommodate the flows from the septic conversion projects were simulated without any tie-ins to the existing infrastructure.

The approach to modeling flows from the septic conversion areas for each category as described in **Table 8-3** is as follows:

- **For Category I:**

The septic conversion area flows were modeled using the same methodology applied for existing flows in the InfoWater models. The peak hour flows were divided into base sanitary flow (BSF) and groundwater infiltration

(GWI). The existing models use hourly patterns for the BSF to represent sanitary flow fluctuations during the day based on hourly flow data from Supervisory Controls and Data Acquisition (SCADA) while the GWI has a fixed pattern. The peak hourly flow factors identified in each of the models range from 1.30 to 1.64. whereas the peak hourly flow factor used to develop the projected flows was 3.50. **Table 8-4** below shows the peak hourly flow factor for the BSF in each of the models.

Table 8-4: Peak Hourly Flow Factor from the Diurnal Pattern for the BSF

Model	Peak Hourly Demand Factor in BSF Pattern
Fiesta Village	1.52
Pine Island	N/A
Three Oaks	1.39
South CFM/Gateway	1.30
Fort Myers Beach	1.64

The modeled flows (GWI and BSF), which are presented in **Table 8-5**, were calculated by subtracting the GWI from the buildout PHF and dividing that number by the peak hourly factor corresponding to the appropriate model as shown in **Table 8-4.**

Table 8-5: Modeled Flows for the Septic Conversion Areas in Category I

Area Name	WRF	GWI (gpm)	BSF (gpm)
Deep Lagoon Estates	Fiesta Village	6.78	11.07
Lake McGregor		3.89	6.34
McGregor Vista		8.31	13.55
McGregor Vista North		2.16	3.52
McGregor Vista South		6.15	10.03
North Town River		19.83	32.35
Hendry Creek		12.52	20.43
Heritage Farms		12.48	20.37
Lakes Park		11.87	19.36
Ligon Court		3.84	6.27
Pine Island Shores	Pine Island	N/A	N/A
Pine Island Tropical Homesites		N/A	N/A
Mullock Creek - Alternative 2	Three Oaks	25.72	62.98
Mullock Creek East - Alternative 1		6.69	16.38
Mullock Creek West - Alternative 1		19.04	46.61
Page Park	South CFM/Gateway	132.56	143.60
Southside Trailer Village		8.30	8.99
Summerwood	Fort Myers Beach	3.69	7.50

For septic conversion areas in any of the models in Category I, the model was updated differently depending on whether the septic conversion area was proposed to connect to an existing force main or an existing gravity sewer. For the areas connecting to an existing force main, the model was updated so that the proposed pump station prior to the tie-in with the existing system can deliver the PHF with the highest pressures in the system. If there is more than one proposed pump station, the PHF was split depending on the percent area contributing flow to that pump station. The BSF and GWI wastewater flows were added to upstream of the proposed the pump station. If the area was connecting to a gravity sewer, wastewater flow added as BSF and GWI, was added to the existing pump station immediately downstream of that gravity sewer.

- **For Category II:**

The Pine Island model does not include wastewater flows applied to junctions, and therefore, the BSF and GWI patterns are not applicable. New pump stations were added to the model with upstream reservoirs with fixed wet well levels. The design pump flow and head were adjusted to meet the PHF for the septic conversion projects.

- **For Category I & II:**

For both categories, the general characteristics of the new model elements are listed in **Table 8-6**. Pump controls set on wet well levels were generally set between 2 and 6 ft above the wet well invert elevation. This range was reduced between 2 and 4 ft when needed due to the values of the incoming wastewater flows.

Table 8-6: Physical Characteristics for Elements Added to the Models

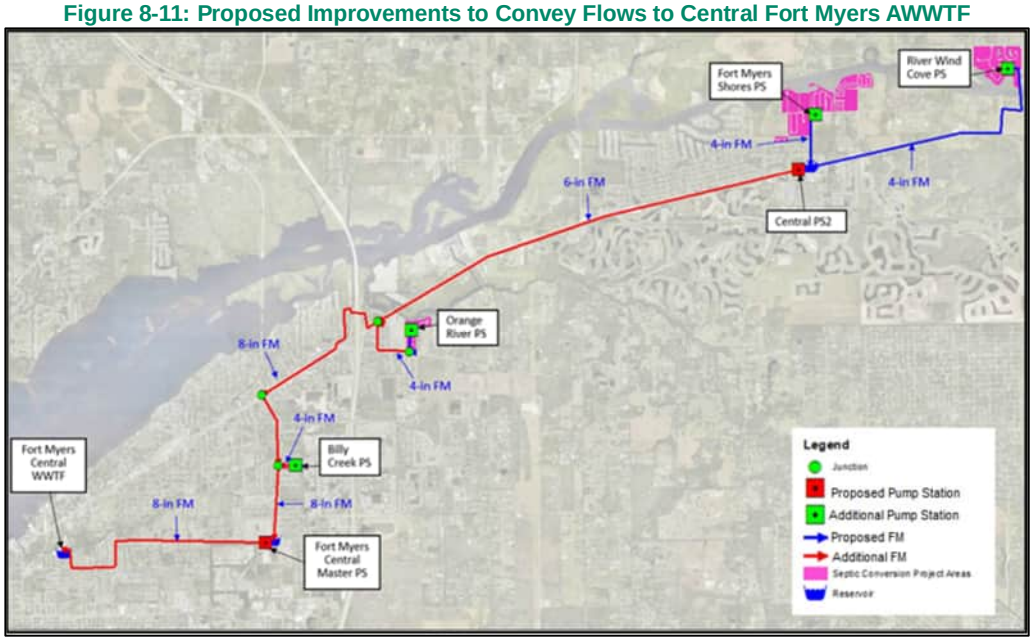
Septic Conversion Flows Added to New Wet Wells	
Junction (Source Flows)	
Elevation (ft)	6 ft over the invert of the WW
Demand 1	BSF flow (gpm)
Pattern 1	BSF
Demand 2	GWI flow (gpm)
Pattern 2	GWI
Junction Elevation (ft)	+6 ft above the invert level of the Wet Well
Tank (Wet Well)	
Type	Cylindrical
Elevation (ft)	-10 ft under Google Earth Elevation
Minimum Level (ft)	0.01
Maximum Level (ft)	10
Initial Level (ft)	2
Diameter(ft)	8
Pipes	
Length (ft)	Scaled from maps (PDF or AutoCAD)
Diameter (in)	4
Roughness	120
Minor Loss	InfoWater Tool
Pipes connecting PS with WW or Source	
Length (ft)	0.01
Diameter (in)	99
Roughness	199
Minor Loss	0
Pump	
Type	1: Design Point Curve
Elevation (ft)	Same as Wet well invert elevation
Diameter (in)	4
Design Head (ft)	Largest head gain needed to deliver PHF into existing infrastructure. Included the force main head losses and the elevation of the water in the wet well.
Design Flow (gpm)	PHF (gpm)
Septic Conversion Flows Added to Existing Wet Wells	
Demand Added to Existing Junction	
Demand 5	BSF flow (gpm)
Pattern 5	BSF
Demand 6	GWI flow (gpm)
Pattern 6	GWI

- **For Category III:**

In the absence of model information for the wastewater collection system for the Del Prado wastewater service area (both LCU and FGUA infrastructure) and Central Fort Myers, infrastructure improvements were developed to convey the flows from these septic conversion areas directly to the respective WWTFs without any connections to the existing infrastructure in those service areas. The infrastructure laid out for the septic conversion areas is referred to as 'proposed', while the additional improvements needed to convey the flows to the plants directly are referred to as 'additional'. A description of the conceptual improvements proposed is as follows:

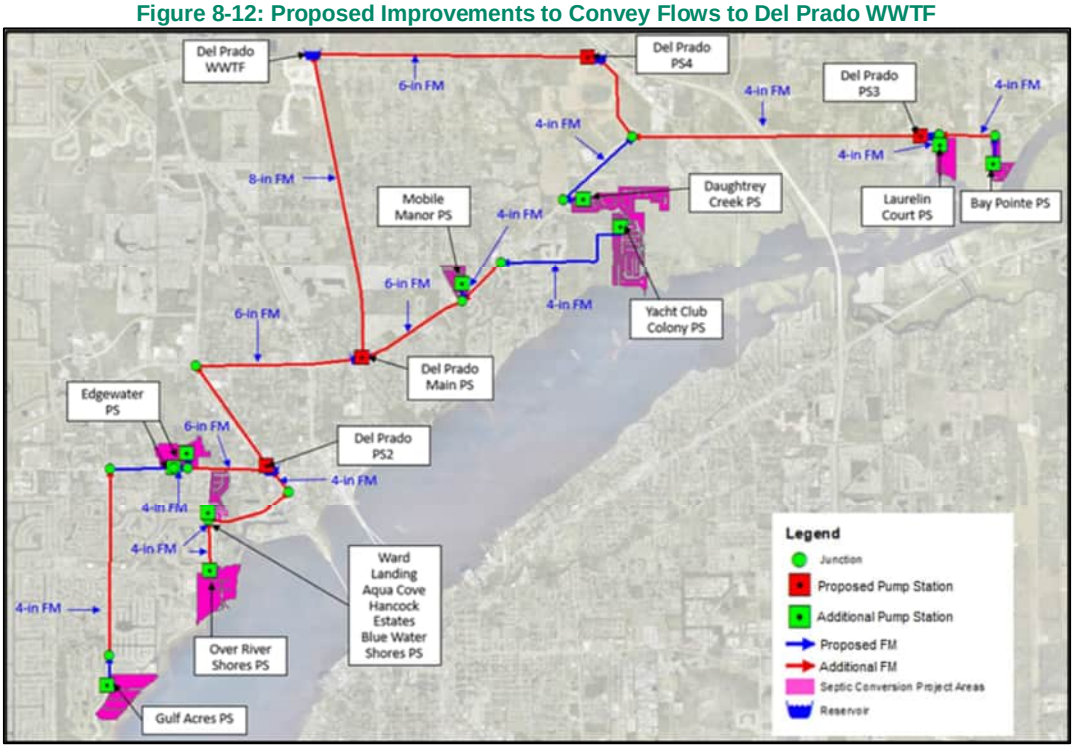
Central Fort Myers AWWTF: The Riverwind Cove and Fort Myers Shores proposed force mains will discharge into the wet well of an additional pump station (Central PS2) located near the intersection of Buckingham Road and Palm Beach Boulevard. The additional force main from this station would run along Palm Beach Boulevard while connecting with the additional force mains from the Orange River and Billy Creek pump stations. The combined flow from these septic conversion areas would be pumped again to the Central Fort Myers WWTF from an additional pump station (Fort Myers Central Master PS) located near Ballard Boulevard and Ortiz Avenue. These improvements are shown in **Figure 8-11**.

Figure 8-11: Proposed Improvements to Convey Flows to Central Fort Myers AWWTF



Del Prado WWTF: There would be two subsystems pumping to the Del Prado WWTF: the Eastside and the Westside. The Eastside subsystem would include an additional pump station (Del Prado PS3) conveying flows from the Laurelin Court and Bay Pointe septic conversion areas. The additional force main from this station would combine with the proposed force main from the Daughtreys Creek area. Another additional pump station (Del Prado PS4) would be located on the west side of I-75 opposite of the intersection of Leetana Road and Panther Trail Lane. The additional force main from this pump station would discharge to the Del Prado WWTF. The Westside system would entail combining the additional force mains from the Gulf Acres, Over River Shores, Edgewater, and Ward Landing/Aqua Cove/Hancock Estates/Blue Water Shores proposed pump stations and convey these flows to an additional pump station (Del Prado PS2) located near Pondella Road and North Tamiami Trail. This pump station's force main would run to another additional pump station located near Bayshore Road and Old Bridge Road. The Del Prado Main pump station would also receive flows from the Mobile Manor and Yacht Club Colony areas. The combined flows would then be conveyed to the Del Prado WWTF. These improvements are shown in **Figure 8-12**.

Figure 8-12: Proposed Improvements to Convey Flows to Del Prado WWTF



Force main diameters were proposed to meet performance criteria as described in **Table 8-7** with a roughness of 120 following the general characteristics of the new model elements listed in **Table 8-6**. Wet well levels at the headworks facilities for the Del Prado WWTP and FM Central WWTP were set to 38 ft and 18 ft, respectively, based on the Del Prado Wastewater Treatment Facility 10-Year Planning Analysis and grade elevations extracted from Google Earth. Pump stations included in the conversion projects concept design were sized by applying a negative demand, i.e., the design flow, to junctions representing the discharge side of the lift stations. The design head of the lift stations was calculated as the difference between the hydraulic grade line and elevation of the junction representing the discharge side of the pump station. Additional pump stations were proposed in order to maintain a pressure below 150 psi (346.5 ft) to meet the performance criteria. The additional pump stations were sized following the same methodology as the proposed pump stations.

Performance Criteria

The modeling results for each modeled system were evaluated against the performance criteria presented in **Table 8-7**. This performance criteria was established in the 2020 Black&Veatch Wastewater Master Plan for Lee County and was based on several references such as FDEP regulations.

Table 8-7: Performance Criteria

Criteria	Maximum	Minimum
Pipeline Criteria		
Velocity	7 fps	2 fps
Pressure	150 psi	10 psi
Pump Criteria		
Starts per Hour	6 Starts/hr	2 Starts/hr
Wet Well and Surcharging Criteria		
Wet Well Level	<5 ft Freeboard	NA

In addition to the abovementioned criteria, the model results in InfoWater provide a report with warnings indicating when elements are working out of their range, such as pumps attempting to run against excessive head. The analysis of these reports allows for the identification of the pump stations that have reached their capacity limits with the new conditions.

Pumping and piping improvements needed based on the results of the hydraulic modeling analysis against the performance criteria are discussed and summarized in section 8.4.

8.4 SUMMARY OF PUMPING AND PIPE IMPROVEMENTS NEEDED

The results of the existing system scenario analysis and existing system with buildout flows from the septic conversion areas analysis were compared to determine whether the additional flows from the septic conversion areas caused any new hydraulic issues in the system. Generally, the same exceedances of performance criteria were recorded for both modeling scenarios, indicating that the addition of flows from the septic conversion areas, in most instances, would not create any new hydraulic issues.

8.4.1 Pumping Improvements

For the South Fort Myers/Gateway, Pine Island, and Fort Myers Beach hydraulic models, the additional flows from the septic conversion areas increased the number of pump starts per hour in general, but did not cause any new exceedances to the operating ranges of the pumps in the existing system scenario. Therefore, there are no recommended improvements resulting from the connection of the septic conversion areas to the existing system. However, pumping improvements are recommended at PS029 located in the Fiesta Village service area and at PS-7729 located in the Three Oaks service area. These improvements, along with the additional pumping improvements to convey flows from the relevant septic conversion areas directly to Del Prado and Central Fort Myers are summarized in **Table 8-8**.

Table 8-8: Summary of Pumping Improvements Needed by Hydraulic Model

Pump Station	Recommendation/Improvement	
	Design Flow (gpm)	Design Head (ft)
For septic conversion area flows to Fiesta Village WRF		
PS-029	Upsize the wet well (unless a review of the controls governing the operation of the pump station indicates a larger wet well operating range could be accommodated).	
For septic conversion area flows to Three Oaks WRF		
PS-7729 (under Mullock Creek Alt 2)	148	123
For septic conversion area flows directly to Del Prado WWTP		
Del Prado Main PS	827	276
Del Prado PS2	392	222
Del Prado PS3	157	331
Del Prado PS4	245	129
For septic conversion area flows directly to Central Fort Myers WWTF		
Fort Myers Central Master PS	453	86
Central PS2	296	308

8.4.2 Piping Improvements

The piping improvements discussed in this subsection only pertain to existing force mains (i.e. does not pertain to planned force mains to convey wastewater from the septic conversion areas) that did not meet maximum velocity criteria due to the additional flows from the septic conversion areas. Also, pipes that are connections between elements within a pump station were not considered in the recommended improvements.

The comparison between the results of the existing system model analysis and the existing system with the buildout flows from the septic conversion areas indicates that none of the velocity or pressure exceedances in the pipelines were caused by the additional flows from the septic conversion areas. Therefore, no pipe improvements are recommended. In the South Fort Myers/Gateway model, the septic conversion area PHFs resulted in a 0.03 ft/sec maximum velocity exceedance over a total length of approximately 280 ft. Due to the negligible value of velocity exceedance, no improvements are recommended.

As discussed above, the additional piping improvements to convey flows from the relevant septic conversion areas directly to Del Prado and Central Fort Myers are summarized in **Table 8-9**.

Table 8-9: Summary of Piping Improvements Needed to Convey Flows from Septic Conversion Areas Directly to the Del Prado and Central Fort Myers Plants

Force Main Diameter (in)	Length of Force Main (ft)
For septic conversion area flows to Del Prado WRF	
4	33,700
6	44,200
8	16,000
For septic conversion area flows to Central Fort Myers WWTF	
4	4,800
6	25,400
8	32,700

8.5 NEW TREATMENT PLANTS AND TREATMENT PLANT EXPANSION LAYOUTS

Preliminary layouts were developed for the planned new Southeast WRF and expansions at Gateway and Three Oaks WRF based on available information regarding the planned treatment capacities. Plant components needing rehabilitation or replacement regardless of the treatment capacity expansions will be evaluated later on following a workshop with LCU operations staff.

As mentioned in previous chapters, the Three Oaks WRF expansion is meant to increase the treatment capacity of the plant from 6 MGD to 8 MGD with consideration for rerating to 9 MGD. For the planning purposes of this CWMP, the expanded treatment capacity is assumed to be 9 MGD as the process components needed to achieve 8 or 9 MGD are similarly sized. In order to accommodate a planned capacity of 9 MGD, the following additional components are needed based on information in the Final Basis of Design Report for the Three Oaks Wastewater Treatment Plant prepared by CDM Smith in 2013:

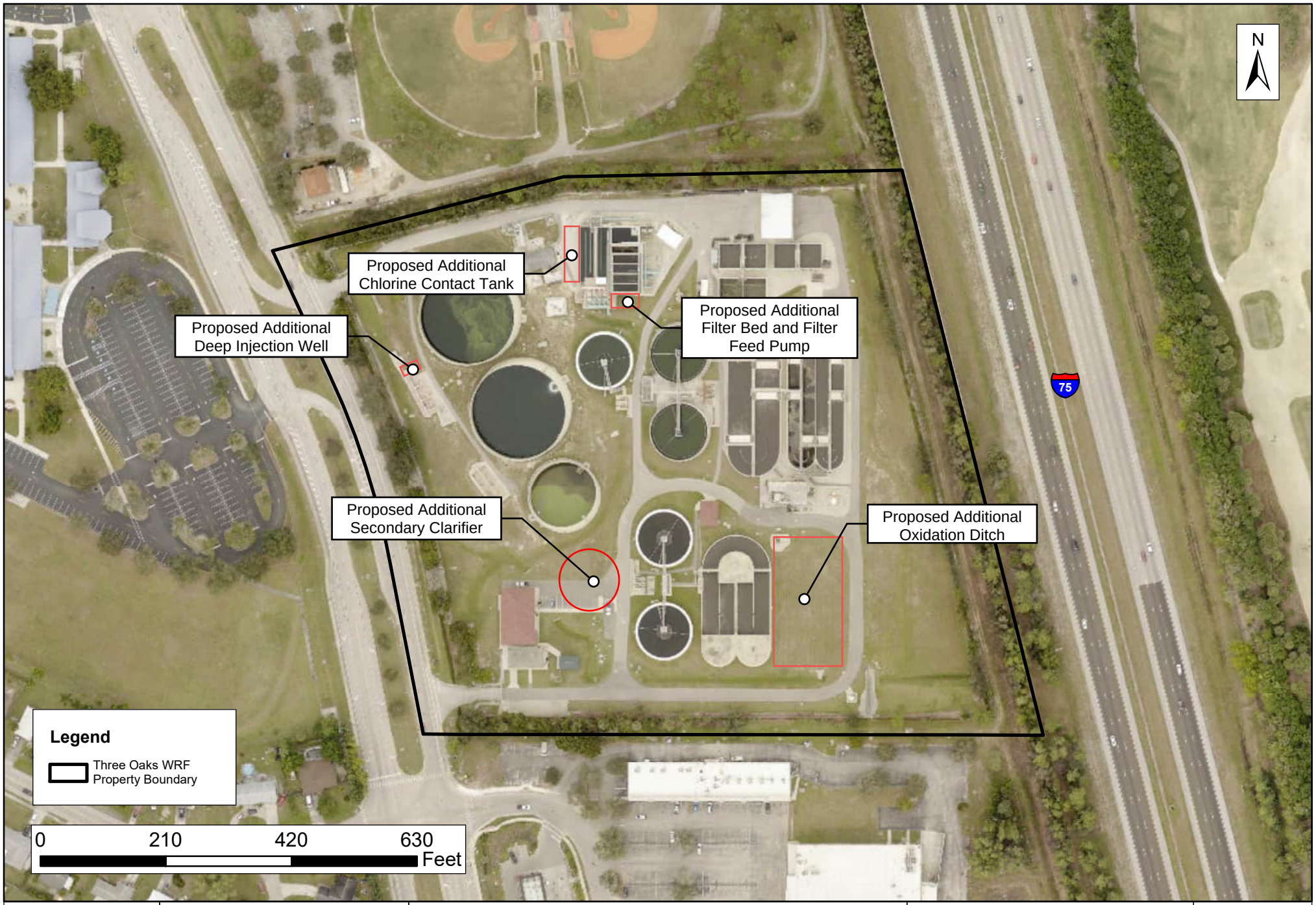
- An oxidation ditch, making a total of five oxidation ditches.
- A secondary clarifier, making a total of six secondary clarifiers.
- A deep filter bed and an additional filter feed pump.
- A chlorine contact tank, potentially deeper than the existing two tanks due to space constraints at the site.
- A deep injection well, to be determined whether necessary based on results of evaluating the existing reclaimed/reject storage system.

A sketch showing a preliminary site plan for the 9 MGD expansion at Three Oaks is presented in **Figure 8-13**.

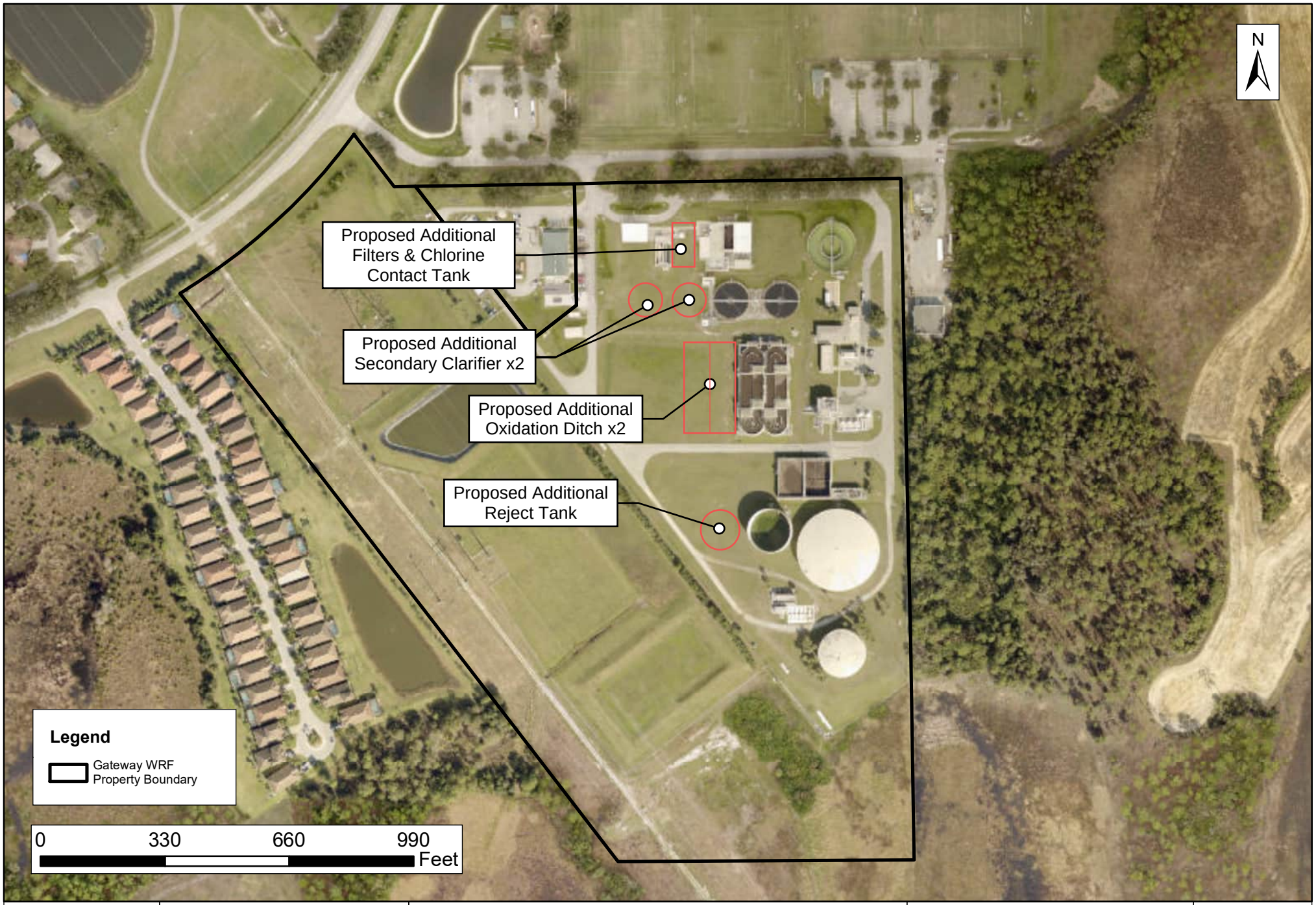
In addition, the County has a planned expansion for Gateway WRF from 3 to 6 MGD included in their 10-year Capital Improvement Plan (CIP). When developing the layout for a concept site plan for this expansion, the proposed additional process equipment and tanks were included based on the components of other treatment plants with similar capacity. An assessment of the capacity of the headworks should be conducted to determine whether improvements are needed. Generally, the concept plan indicates that the existing property has adequate space to accommodate additional process equipment and tanks. However, further site evaluation is needed and design and sizing for process equipment is required. A map showing a concept site plan for the 3 MGD expansion at Gateway is presented in **Figure 8-14**.

As for the planned SE WRF, the conceptual schematic for the proposed SE WRF is based on the proposed 6 MGD treatment capacity as communicated by LCU staff. The treatment plant components in the schematic are based on the current Three Oaks site plan but rearranged to accommodate the shape of the parcel the SE WRF will be located on. Generally, the concept plan indicates that the existing property has adequate space to accommodate the proposed process equipment and tanks. However, further site evaluation is needed and design and sizing for process equipment is required. A map showing a concept schematic for the proposed 6 MGD SE WRF is presented in **Figure 8-15**.

Further evaluation to determine the needed capacity of the SE WRF is recommended as previously discussed in Chapter 6 and the concept schematic should be updated accordingly. Planning level costs for the recommended wastewater improvements noted herein are evaluated and summarized in the following chapter.

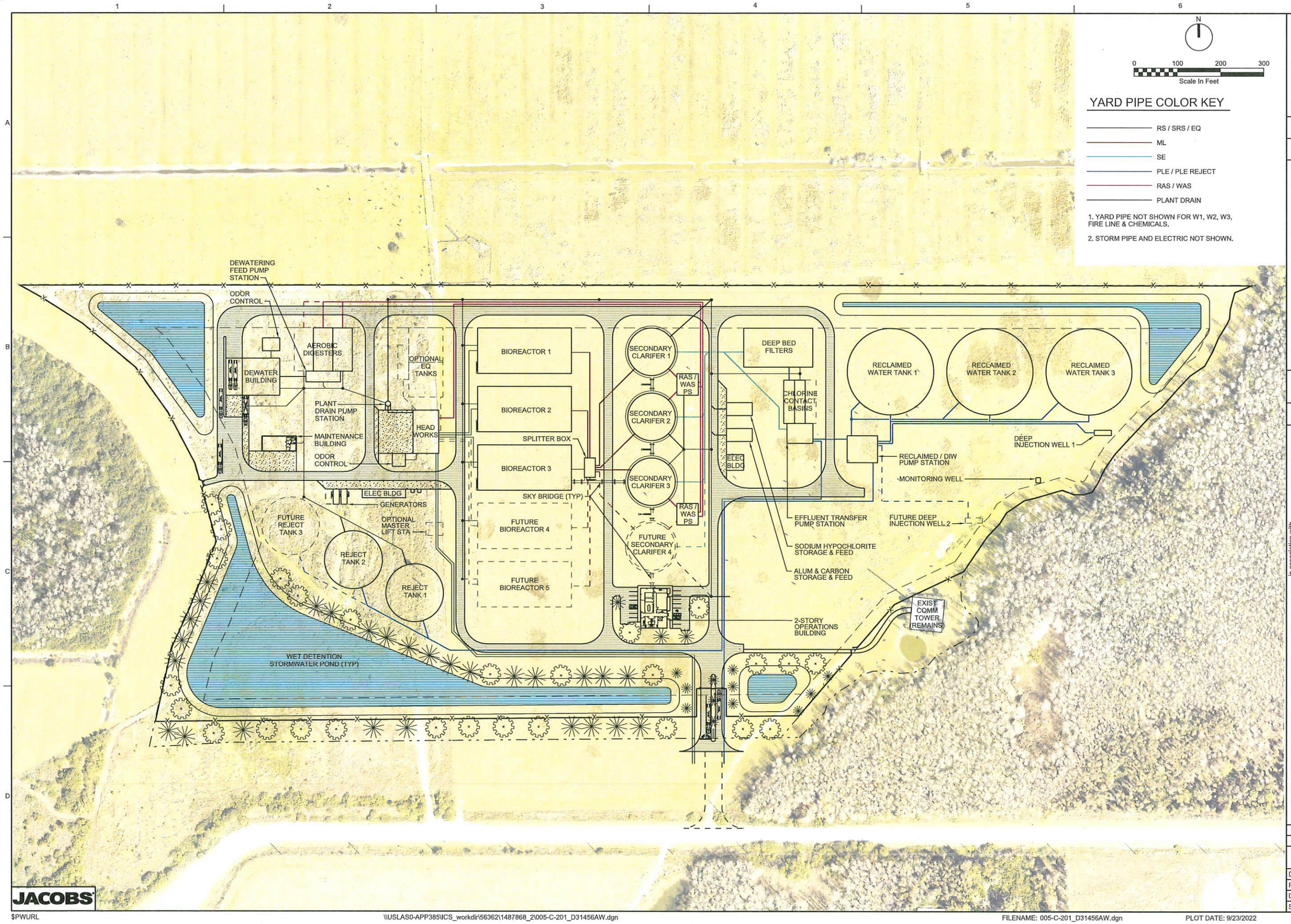


Date Created: July 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Preliminary Schematic for the Three Oaks WRF Expansion to 9 MGD**	AECOM	**Figure** **8-13**



Date Created: July 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan**	AECOM	**Figure**
		Conceptual Site Plan for the Gateway WRF Expansion to 6 MGD		**8-14**

Figure 8-15: Concept Schematic for the Proposed 6 MGD Southeast WRF



$PWURL \\USLAS0-APP385\ICS_workdir\56362\1487868_2\005-C-201_D31456AW.dgn FILENAME: 005-C-201_D31456AW.dgn PLOT DATE: 9/23/2022 PLOT TIME: 10:03:35 AM

9. PLANNING LEVEL COSTS

9.1 INTRODUCTION

Planning level cost estimates were prepared based upon preliminary layouts for the alternative wastewater collection system alternatives presented in Chapter 7. Planning level costs were also developed for recommended improvements to the wastewater treatment and conveyance systems.

Planning level costs will be used to determine the cost per ERU (or per parcel) to connect the septic conversion areas to the centralized sewer system or to upgrade septic conversion areas with advanced OSTDS. In addition, the planning level costs associated with wastewater capacity improvements needed to expand centralized sewer to the septic conversion areas will be used to determine utility impact costs.

This section of the report identifies:

- The approach used for developing planning level cost estimates
- Planning level cost estimates for system capital costs per parcel and Operations and Maintenance (O&M) costs per parcel associated with proposed layouts for alternative wastewater collection systems
- Utility impact costs for gravity and low pressure sewers
- Planning level cost estimates for recommended pumping and piping capacity improvements resulting from the hydraulic modeling analysis
- Planning level cost estimates for recommended treatment plant upgrades
- An overall summary of planning level costs associated with recommended improvements for developing a Capital Improvement Plan (CIP)

9.2 PLANNING LEVEL COSTS APPROACH

Cost estimates were prepared for connecting the priority septic conversion areas to centralized sewer or upgrading the areas with Advanced OSTDS. Cost estimates were also developed for needed treatment and transmission capacity improvements. The following paragraphs identify the cost estimate classifications, how unit costs were developed, and what markups were utilized.

9.2.1 Definition and Accuracy

When preparing cost estimates, AECOM references the Association for the Advancement of Cost Engineering (AACE) cost estimate classification system which is a recommended practice that gives guidelines for applying the general principles of estimates classification to project cost estimates. The cost estimate classification system matrix is shown in **Table 9-1.**

Table 9-1: Cost Estimate Classification System

ESTIMATE CLASS	*Primary Characteristic*	*Secondary Characteristic*			
	LEVEL OF PROJECT DEFINITION Expressed as % of complete definition	**END USAGE** Typical purpose of estimate	**METHODOLOGY** Typical estimating method	**EXPECTED ACCURACY RANGE** Typical variation in low and high ranges [a]	**PREPARATION EFFORT** Typical degree of effort relative to least cost index of 1 [b]
Class 5	0% to 2%	Concept Screening	Capacity Factored, Parametric Models, Judgment, or Analogy	L: -20% to -50% H: +30% to +100%	1
Class 4	1% to 15%	Study or Feasibility	Equipment Factored or Parametric Models	L: -15% to -30% H: +20% to +50%	2 to 4
Class 3	10% to 40%	Budget, Authorization, or Control	Semi-Detailed Unit Costs with Assembly Level Line Items	L: -10% to -20% H: +10% to +30%	3 to 10
Class 2	30% to 70%	Control or Bid/ Tender	Detailed Unit Cost with Forced Detailed Take-Off	L: -5% to -15% H: +5% to +20%	4 to 20
Class 1	50% to 100%	Check Estimate or Bid/Tender	Detailed Unit Cost with Detailed Take-Off	L: -3% to -10% H: +3% to +15%	5 to 100

As shown in the table, the ACCE presents five classes of estimates that are characterized primarily by % level of project definition as well as end usage, methodology, expected accuracy range, and preparation effort. Consideration of these characteristics and comparison with the project details is used to determine the appropriate estimate class applied to each project as well as appropriate contingencies.

As indicated in Chapter 8, the concept basis for alternative collection system layouts follows LCU design criteria and best design practices as well as several assumptions. Following these criteria, planning level layouts of both gravity collection systems and low-pressure collection systems were created for each of the septic priority areas. These layouts are considered as planning level due to the level of detail that went into creating each layout. This is also the case for recommended improvements for wastewater treatment as well as conveyance which are based on the results of the gap analysis and hydraulic modeling. Therefore, the estimate class considered applicable to this project closely aligns with a Class 3 or Class 4 estimate and expected accuracy ranges for all cost estimates should be considered as shown in the table.

9.2.2 Unit Cost Development

To develop planning level cost estimates, unit costs were established using contractor pay applications and other cost estimates for similar projects AECOM has carried out in the Florida southwestern region alongside input from contractors and manufacturers of various low pressure and advanced on-site systems. These unit costs are used to estimate the capital cost for each system and other recommended improvements. Unit costs were inflated to 2021 dollars based on Engineering News-Record historical construction costs indices.

Planning level cost estimates and contractor pay applications for force main and pump station projects within Collier County, Marco Island, Sarasota, and Cape Coral were compiled and compared to determine the unit costs for the gravity collection system components. The dates of these sources were documented, and unit costs were inflated to 2021 dollars. Lee County Utilities provided their standard service connection fee which was included in the estimates for gravity and low pressure systems.

The most updated unit cost information for construction of Environment One Low-Pressure Systems was obtained from Environment One (E/One) representatives to develop the unit costs for the low pressure collection system components.

AECOM reached out to several manufacturers of advanced OSTDS systems that comply with systems listed under Rule 62-6 of the F.A.C. The unit costs used for estimating the capital cost of the advanced OSTDSs are based on a FujiClean USA LLC CEN5 System and were provided during conversations with FujiClean sales representatives.

For all three collection system alternatives, a unit cost estimate was applied for existing septic tank abandonment permitting and demolition. This unit cost was developed from discussions with local companies that perform septic tank abandonment. No factor for economy of scale was applied.

9.2.3 Cost Estimating Mark Ups

Several mark ups are applied to the capital cost estimates developed in this report. These mark ups are compounded with the capital cost estimates for all recommended projects.

They include:

- 5% for Mobilization and Demobilization
- 15% for Contingency
- 10% for Engineering, Construction, and Design Services

9.3 SEPTIC CONVERSION PRIOIRITY AREA PLANNING LEVEL COST ESTIMATES

For each of the septic conversion areas in Groupings 1 through 10, costs estimates were developed for each of the three wastewater collection system alternatives. The cost estimates for gravity and low-pressure sewer alternatives were based on the layouts developed for each area. These layouts and associated detailed cost estimates are shown in Appendix C. The costs for advanced OSTDS were based on the number of existing parcels for each of the areas (assuming each parcel would require an advanced OSTDS unit).

9.3.1 Planning Level Cost Estimates for Gravity Sewer Systems

Capital Cost Estimate

As previously stated, the capital cost estimates for the proposed gravity sewer collection systems are based on the layouts shown in Appendix C. The gravity sewer collection system components considered in the capital cost estimate include 8" PVC gravity sewer, PVC force mains ranging from 4" to 6", plug valves ranging from 4" to 6", above ground air release valves, 4 ft diameter manholes, service connections, connections to the existing conveyance system, new duplex lift stations, and associated road restoration. For some project groupings, the proposed infrastructure is shared by several priority areas in which case the cost of shared infrastructure was divided up based on percentage of flow contribution. It should be noted that the cost estimates do not include any land acquisition costs that might be associated with the proposed duplex lift stations. **Table 9-2** shows the estimates for gravity sewer collection system capital costs for each of the septic priority areas.

Table 9-2: Summary of Gravity Sewer System Capital Cost Estimates

Area Name	Area Grouping	Constructed Parcel Count	Gravity Sewer System	
			Total Cost (Mil $)	Cost per Parcel ($/Parcel)
Billy Creek	1	24	$1.42 M	$59,167
Orange River	1	61	$2.90 M	$47,541
Daughtreys Creek	2	158	$7.62 M	$48,228
Mobile Manor	2	254	$7.45 M	$29,331
Yacht Club Colony	2	192	$9.40 M	$48,958
Deep Lagoon Estates	3	53	$5.46 M	$103,019
Lake McGregor	3	30	$0.86 M	$28,667
McGregor Vista (North)	3	26	$2.00 M	$76,923
McGregor Vista (South)	3	68	$4.39 M	$64,559
North Town River	3	179	$7.63 M	$42,626
Summerwood	3	42	$2.88 M	$68,571
Hendry Creek	4	128	$8.74 M	$68,281
Heritage Farms	4	126	$8.34 M	$66,190
Lakes Park	4	125	$6.80 M	$54,400
Ligon Court	4	35	$2.71 M	$77,429
Pine Island Shores	5	174	$7.10 M	$40,805
Pine Island Tropical Homesites	5	184	$12.37 M	$67,228
Mullock Creek Alt 1	6	318	$16.71 M	$52,547
Mullock Creek Alt 2	6	318	$15.39 M	$48,396

Area Name	Area Grouping	Constructed Parcel Count	Gravity Sewer System	
			Total Cost (Mil $)	Cost per Parcel ($/Parcel)
Page Park	7	301	$12.83 M	$42,625
Southside Trailer Village	7	27	$1.36 M	$50,370
Aqua Cove	8	12	$0.77 M	$64,167
Blue Water Shores	8	61	$2.89 M	$47,377
Edgewater Gardens	8	156	$7.02 M	$45,000
Gulf Acres	8	111	$4.91 M	$44,234
Hancock Estates	8	8	$0.60 M	$75,000
Over River Shores	8	87	$5.29 M	$60,805
Wards Landing	8	24	$2.09 M	$87,083
Bay Pointe	9	41	$2.77 M	$67,561
Laurelin Court	9	82	$3.54 M	$43,171
Fort Myers Shores	10	446	$17.94 M	$40,224
River Wind Cove	10	58	$6.15 M	$106,034
		Total Cost	**$198.33 M**	
		Average Cost per Parcel	**$50,737**	

It is estimated that gravity sewer collection system capital costs will range between $28,667 and $106,034 with an average cost per parcel of $50,737. The cost per parcel estimates for areas such as Deep Lagoon Estates and River Wind Cove are higher than the average because of directional drilling required to make connections to the existing system. Also, areas with large average parcel sizes tend to show higher average costs due to the lower housing density. The cost per parcel estimates for areas such as Mobile Manor are lower than the average due to very high density of homes.

Customer O&M Cost Estimate

For gravity sewer systems, O&M costs typically include inspection and cleaning of pipelines, replacement and rehabilitation (R&R) costs, and power usage associated with lift stations. For the purposes of this study, the focus is on capital and O&M costs that the Customer must pay. The only O&M costs that a County customer is responsible for is the annual sewer charges. These were calculated based on the sewer fees on the LCU website (https://www.leegov.com/utilities/customer-resource-center/rates-fees).

The buildout AADF, which includes both residential and commercial flows, for each septic conversion area was multiplied by the sewer fees of $5.85 per 1000 gallons to obtain sewer user charges by day. These were then multiplied by 365 days to develop an annualized cost. The total annual sewer charges for each septic conversion area were then divided by the number of existing housing units to develop an annual O&M cost per connection. **Table 9-3** presents the annual user charges, or O&M costs, for each septic conversion area.

Table 9-3: Annual Customer O&M Costs for Gravity Sewer Systems for Priority Septic Conversion Areas

Area Name	Existing Parcels	Annual User Charges ($)	Annual User Charges ($/parcel)
Billy Creek	24	$21,780	$907
Orange River	61	$25,409	$417
Daughtreys Creek	158	$77,296	$489
Mobile Manor	254	$72,599	$286
Yacht Club Colony	192	$95,232	$496
Deep Lagoon Estates	53	$20,509	$387
Lake McGregor	30	$11,834	$394
McGregor Vista	94	$25,479	$271
North Town River	179	$60,620	$339
Summerwood	42	$13,997	$333
Hendry Creek	128	$38,277	$299
Heritage Farms	126	$38,114	$302

Area Name	Existing Parcels	Annual User Charges ($)	Annual User Charges ($/parcel)
Lakes Park	125	$36,336	$291
Ligon Court	35	$11,797	$337
Pine Island Shores	174	$36,782	$211
Pine Island Tropical Homesites	184	$75,107	$408
Mullock Creek	318	$99,449	$313
Page Park	301	$327,109	$1,087
Southside Trailer Village	27	$17,582	$651
Aqua Cove	12	$4,911	$409
Blue Water Shores	61	$28,826	$473
Edgewater Gardens	156	$90,571	$581
Gulf Acres	111	$52,100	$469
Hancock Estates	8	$3,843	$480
Over River Shores	87	$41,424	$476
Wards Landing	24	$12,171	$507
Bay Pointe	41	$12,812	$312
Laurelin Court	82	$21,566	$263
Fort Myers Shores	446	$191,105	$428
River Wind Cove	58	$40,783	$703
		Average Cost per Parcel	**$447**

Table 9-3 shows that the estimated annual O&M costs per parcel for the septic conversion areas range from $211 for Pine Island Shores to $1,087 for Page Park with an average O&M cost per parcel of $447. The annual O&M costs per parcel are indicative of the wastewater flows projected for each area. For example, flow projections are high for Page Park due to a large commercial presence and has a relatively lower number of connections giving a higher O&M cost estimate per parcel.

9.3.2 Planning Level Cost Estimates for Low Pressure Sewer Systems

Capital Cost Estimate

As previously stated, the capital cost estimates for the proposed low pressure sewer collection systems are based on the layouts shown in Appendix C. The low-pressure system capital cost estimates include PE SDR 11 force mains ranging from 1.25” to 6”, service connections, associated road restoration, E/One Simplex Lift Stations, E/One Sentry Advisors, terminal flushing connections, and isolation valves. Similar to the gravity system capital cost estimates, the proposed infrastructure is shared by several priority areas in which case the cost of shared infrastructure was divided up based on percentage of flow contribution. Cost estimate mark-ups were made to match what was determined for the gravity sewer estimates. **Table 9-4** shows the estimates for low pressure sewer collection system capital costs for each of the septic priority areas.

Table 9-4: Summary of Low Pressure Sewer System Capital Cost Estimates

Area Name	Area Grouping	Constructed Parcel Count	Low Pressure System	
			Total Cost (Mil $)	Cost per Parcel ($/Parcel)
Billy Creek	1	24	$0.92 M	$38,333
Orange River	1	61	$2.29 M	$37,541
Daughtreys Creek	2	158	$6.24 M	$39,494
Mobile Manor	2	254	$7.33 M	$28,858
Yacht Club Colony	2	192	$7.46 M	$38,854
Deep Lagoon Estates	3	53	$2.92 M	$55,094
Lake McGregor	3	30	$0.91 M	$30,333
McGregor Vista (North)	3	26	$1.25 M	$48,077
McGregor Vista (South)	3	68	$2.99 M	$43,971
North Town River	3	179	$6.22 M	$34,749

Area Name	Area Grouping	Constructed Parcel Count	Low Pressure System	
			Total Cost (Mil $)	Cost per Parcel ($/Parcel)
Summerwood	3	42	$2.06 M	$49,048
Hendry Creek	4	128	$6.12 M	$47,813
Heritage Farms	4	126	$6.15 M	$48,810
Lakes Park	4	125	$5.15 M	$41,200
Ligon Court	4	35	$1.80 M	$51,429
Pine Island Shores	5	174	$6.05 M	$34,770
Pine Island Tropical Homesites	5	184	$8.87 M	$48,207
Mullock Creek Alt 1	6	318	NA	NA
Mullock Creek Alt 2	6	318	$12.45 M	$39,151
Page Park	7	301	$10.08 M	$33,488
Southside Trailer Village	7	27	$0.95 M	$35,185
Aqua Cove	8	12	$0.50 M	$41,667
Blue Water Shores	8	61	$2.27 M	$37,213
Edgewater Gardens	8	156	$5.72 M	$36,667
Gulf Acres	8	111	$4.12 M	$37,117
Hancock Estates	8	8	$0.36 M	$45,000
Over River Shores	8	87	$4.09 M	$47,011
Wards Landing	8	24	$1.19 M	$49,583
Bay Pointe	9	41	$1.87 M	$45,610
Laurelin Court	9	82	$2.97 M	$36,220
Fort Myers Shores	10	446	$15.79 M	$35,404
River Wind Cove	10	58	$4.65 M	$80,172
	Total Cost		**$141.74 M**	
	Average Cost per Parcel		**$39,471**	

It is estimated that low pressure sewer collection system capital costs will range between $28,858 and $80,172 with an average cost per parcel of $39,471. The cost per parcel estimates for areas such as River Wind Cove are much higher than the average because of directional drilling required to make connections to the existing system. Also, areas with large average parcel sizes tend to show higher average costs due to the housing density although this is less so than with gravity sewer systems.

Customer O&M Cost Estimate

For low pressure sewers, O&M borne by the customer includes annual user charges as well as other O&M costs for low pressure sewers that are the responsibility of the homeowner, namely the O&M costs for the grinder pump on the homeowner's property and the service lateral. These O&M costs include the power usage and maintenance or replacement for the grinder pump. This cost was estimated at $50/year/customer by E/One and occur at the end of the five-year warrantee covered by E/One for the grinder pumps. This cost was multiplied by the number of existing housing units for each septic conversion area to develop a total annual O&M cost on the homeowner. **Table 9-5** presents the annual O&M costs for maintenance of the low pressure sewer system downstream of the grinder pump station and the on-lot annual O&M costs to the homeowner for each septic conversion area.

Table 9-5: Annual Customer O&M Costs for Low Pressure Sewer Systems for Septic Conversion Areas

Area Name	Existing Parcels	Annual User Charges ($)	Annual Customer O&M for Low Pressure Sewer System ($)	Total Annual O&M for Low Pressure Systems ($)	Total Annual O&M for Low Pressure Systems ($/Parcel)
Billy Creek	24	$21,780	$1,200	$22,980	$957
Orange River	61	$25,409	$3,050	$28,459	$467
Daughtreys Creek	158	$77,296	$7,900	$85,196	$539
Mobile Manor	254	$72,599	$12,700	$85,299	$336
Yacht Club Colony	192	$95,232	$9,600	$104,832	$546
Deep Lagoon Estates	53	$20,509	$2,650	$23,159	$437

Area Name	Existing Parcels	Annual User Charges ($)	Annual Customer O&M for Low Pressure Sewer System ($)	Total Annual O&M for Low Pressure Systems ($)	Total Annual O&M for Low Pressure Systems ($/Parcel)
Lake McGregor	30	$11,834	$1,500	$13,334	$444
McGregor Vista	94	$25,479	$4,700	$30,179	$321
North Town River	179	$60,620	$8,950	$69,570	$389
Summerwood	42	$13,997	$2,100	$16,097	$383
Hendry Creek	128	$38,277	$6,400	$44,677	$349
Heritage Farms	126	$38,114	$6,300	$44,414	$352
Lakes Park	125	$36,336	$6,250	$42,586	$341
Ligon Court	35	$11,797	$1,750	$13,547	$387
Pine Island Shores	174	$36,782	$8,700	$45,482	$261
Pine Island Tropical Homesites	184	$75,107	$9,200	$84,307	$458
Mullock Creek	318	$99,449	$15,900	$115,349	$363
Page Park	301	$327,109	$15,050	$342,159	$1,137
Southside Trailer Village	27	$17,582	$1,350	$18,932	$701
Aqua Cove	12	$4,911	$600	$5,511	$459
Blue Water Shores	61	$28,826	$3,050	$31,876	$523
Edgewater Gardens	156	$90,571	$7,800	$98,371	$631
Gulf Acres	111	$52,100	$5,550	$57,650	$519
Hancock Estates	8	$3,843	$400	$4,243	$530
Over River Shores	87	$41,424	$4,350	$45,774	$526
Wards Landing	24	$12,171	$1,200	$13,371	$557
Bay Pointe	41	$12,812	$2,050	$14,862	$362
Laurelin Court	82	$21,566	$4,100	$25,666	$313
Fort Myers Shores	446	$191,105	$22,300	$213,405	$478
River Wind Cove	58	$40,783	$2,900	$43,683	$753
				Average Cost per	**$497**

Table 9-5 shows that the estimated total annual O&M costs per parcel range from $261 for Pine Island Shores to $1,137 for Page Park, with an average O&M cost per parcel of $497. The customer O&M costs required for power and pump maintenance the annual O&M cost per parcel slightly higher than those for gravity sewer systems.

9.3.3 Planning Level Cost Estimates for Advanced OSTDS

Capital Cost Estimate

The Advanced OSTDS capital cost estimates were developed on a per home basis which was applied for all the septic priority areas. The unit costs include cost and installation of the fiberglass tank as well as abandonment permitting and demolition of the existing septic system. Other improvements that may be required but are not included in the estimates include drain field installation/modification, additional fill materials, or electrical modifications. No factor for economy of scale was applied although this may certainly be applicable for many of the priority areas. **Table 9-6** shows the capital cost estimate for a single advanced OSTDS unit used in this project.

Table 9-6: Capital Cost Estimate for a Single Advanced OSTDS Unit

Item	Units	Unit Cost
Fiberglass Tank Cost and Install	EA	$ 27,600
Design and Permitting	LS	$ 5,750
Septic Tank Abandonment Permit and Demo	LS	$ 4,000
Subtotal		$ 37,350
Contingency (15%)		$ 5,603
Total		$ 42,953
Rounded Total		**$ 43,000**

The advanced OSTDS system capital costs for each of the septic priority areas are shown in **Table 9-7**.

Table 9-7: Summary of Advanced OSTDS Capital Cost Estimates

Area Name	Area Grouping	Constructed Parcel Count	Advanced OSTDS	
			Total Cost (Mil $)	Cost per Parcel ($/Parcel)
Billy Creek	1	24	$1.03 M	$43,000
Orange River	1	61	$2.62 M	$43,000
Daughtreys Creek	2	158	$6.79 M	$43,000
Mobile Manor	2	254	$10.92 M	$43,000
Yacht Club Colony	2	192	$8.26 M	$43,000
Deep Lagoon Estates	3	53	$2.28 M	$43,000
Lake McGregor	3	30	$1.29 M	$43,000
McGregor Vista (North)	3	26	$1.12 M	$43,000
McGregor Vista (South)	3	68	$2.92 M	$43,000
North Town River	3	179	$7.70 M	$43,000
Summerwood	3	42	$1.81 M	$43,000
Hendry Creek	4	128	$5.50 M	$43,000
Heritage Farms	4	126	$5.42 M	$43,000
Lakes Park	4	125	$5.38 M	$43,000
Ligon Court	4	35	$1.51 M	$43,000
Pine Island Shores	5	174	$7.48 M	$43,000
Pine Island Tropical Homesites	5	184	$7.91 M	$43,000
Mullock Creek Alt 1	6	318	$13.67 M	$43,000
Mullock Creek Alt 2	6	318	$13.67 M	$43,000
Page Park	7	301	$12.94 M	$43,000
Southside Trailer Village	7	27	$1.16 M	$43,000
Aqua Cove	8	12	$0.52 M	$43,000
Blue Water Shores	8	61	$2.62 M	$43,000
Edgewater Gardens	8	156	$6.71 M	$43,000
Gulf Acres	8	111	$4.77 M	$43,000
Hancock Estates	8	8	$0.34 M	$43,000
Over River Shores	8	87	$3.74 M	$43,000
Wards Landing	8	24	$1.03 M	$43,000
Bay Pointe	9	41	$1.76 M	$43,000
Laurelin Court	9	82	$3.53 M	$43,000
Fort Myers Shores	10	446	$19.18 M	$43,000
River Wind Cove	10	58	$2.49 M	$43,000
		Total Cost	**$168.09 M**	
		Average Cost per Parcel	**$43,000**	

O&M Cost Estimate

As previously mentioned in Chapter 7, advanced OSTDS have significant O&M needs and homeowner responsibility. The O&M costs for advanced OSTDS were developed for each unit and include the cost of a maintenance contract with a licensed and approved maintenance entity by the FDEP, power usage to operate the system, as well as required permits for the operation of the system by the FDEP. Research regarding average costs for annual maintenance cost revealed an average contract cost of $1,500. The annual power usage to operate the system was estimated assuming a daily 1.2 kWh/day draw at $0.15 per kWH, resulting in an annual cost of approximately $65.70 per year. The applicable O&M related permits as presented in the 62-6 of the F.A.C. include a biennial operating permit of $100 and an annual tank manufacturer's inspection permit of $100. The biennial operating permit cost was distributed as $50 for each year.

Based on the above O&M costs, the total annual O&M cost per advanced OSTDS is estimated at $1,715.70. The total annual O&M costs per septic conversion area, as shown in **Table 9-8**, were calculated by multiplying this annual cost per system by the number of existing housing units.

Table 9-8: Annual O&M Costs for Advanced OSTDS for Septic Conversion Areas

Area Name	Existing Parcels	Total O&M for Adv OSTDS ($)
Billy Creek	24	41,177
Orange River	61	104,658
Daughtreys Creek	158	271,081
Mobile Manor	254	435,788
Yacht Club Colony	192	329,414
Deep Lagoon Estates	53	90,932
Lake McGregor	30	51,471
McGregor Vista	94	161,276
North Town River	179	307,110
Summerwood	42	72,059
Hendry Creek	128	219,610
Heritage Farms	126	216,178
Lakes Park	125	214,463
Ligon Court	35	60,050
Pine Island Shores	174	298,532
Pine Island Tropical Homesites	184	315,689
Mullock Creek	318	545,593
Page Park	301	516,426
Southside Trailer Village	27	46,324
Aqua Cove	12	20,588
Blue Water Shores	61	104,658
Edgewater Gardens	156	267,649
Gulf Acres	111	190,443
Hancock Estates	8	13,726
Over River Shores	87	149,266
Wards Landing	24	41,177
Bay Pointe	41	70,344
Laurelin Court	82	140,687
Fort Myers Shores	446	765,202
River Wind Cove	58	99,511
	Average Cost per Parcel	**$1,716**

Table 9-8 shows that the estimated annual O&M costs for the septic conversion areas range from $13,726 for Hancock Estates to $765,202 for Fort Myers Shores. As previously stated, the annual average O&M cost per parcel for the advanced OSTDS is approximately $1,716.

9.3.4 UTILITY IMPACT COST ESTIMATES

In addition to the capital and O&M costs for the gravity and low pressure sewer alternatives, there is a cost associated with the impact of the additional wastewater flows from the septic conversion areas on the treatment facilities. Based on discussions with LCU, $35 per gallon was determined to be appropriate to use as an estimated operational cost per gallon of wastewater. This cost was used in conjunction with the baseline AADF generated from each septic conversion area to determine the "utility impact". The utility impact is not applicable to the advanced OSTDS alternative as no wastewater flows will be conveyed to the treatment facilities.

Table 9-9 below presents the baseline AADF and corresponding utility impact cost for each septic conversion area.

Table 9-9: Utility Impact of Septic Conversion Areas

Area Name	Baseline AADF* (MGD)	Utility Impact (Expansion Cost in $M)
Billy Creek	0.008	$0.277
Orange River	0.011	$0.371
Daughtreys Creek	0.019	$0.666
Mobile Manor	0.019	$0.657
Yacht Club Colony	0.023	$0.811
Deep Lagoon Estates	0.008	$0.292
Lake McGregor	0.006	$0.194
McGregor Vista	0.011	$0.376
North Town River	0.028	$0.982
Summerwood	0.007	$0.229
Hendry Creek	0.017	$0.604
Heritage Farms	0.017	$0.610
Lakes Park	0.017	$0.590
Ligon Court	0.005	$0.187
Pine Island Shores	0.017	$0.583
Pine Island Tropical Homesites	0.020	$0.696
Mullock Creek	0.042	$1.454
Page Park	0.132	$4.630
Southside Trailer Village	0.008	$0.271
Aqua Cove	0.001	$0.045
Blue Water Shores	0.007	$0.233
Edgewater Gardens	0.022	$0.776
Gulf Acres	0.012	$0.417
Hancock Estates	0.001	$0.031
Over River Shores	0.009	$0.331
Wards Landing	0.003	$0.092
Bay Pointe	0.003	$0.096
Laurelin Court	0.006	$0.194
Fort Myers Shores	0.083	$2.919
River Wind Cove	0.014	$0.497
	Total Utility Impact ($M)	**$20.11**

*Baseline AADF was calculated based on the baseline population projections for the septic conversion areas and the service area per capita values presented in Chapter 5.

Table 9-9 shows that the total utility impact from all the septic conversion areas is $20.11 M. It should be noted that the utility impact is considered in the total septic conversion cost for each grouping in the CIP.

9.4 PUMPING AND PIPING UPGRADE PLANNING LEVEL COST ESTIMATES

Recommendations for pumping and piping upgrades for the County's existing infrastructure were presented in Chapter 8. This section presents the planning level cost estimates developed for these recommendations.

The hydraulic modeling analysis determined that upgrades would be required for a few of the County's lift stations to accommodate the additional flows from the septic conversion areas. One of these recommended upgrades was to upsize the existing wet well at PS-029 in the Fiesta Village service area. The cost estimate provided for upsizing the wet well is based on the cost estimate for a wet well in a new master pump station AECOM completed design on for Cape Coral. The cost estimate for this upgrade is shown in **Table 9-10.**

Table 9-10: PS-029 Wet Well Replacement Planning Level Cost Estimate (Fiesta Village Service Area)

Item Desc. (Units)	Quantity	Unit Cost	Total
Wet Well Replacement	$315,000	$315,000	$315,000
Subtotal			$315,000
Mobilization and Demobilization (5%)			$15,750
Contingency (15%)			$49,613
Construction and Design Services (10%)			$38,036
Total			$418,399
Rounded Total			$420,000

As shown by the table, it is estimated the cost to upgrade the PS-029 wet well is $420,000.

It was also determined that to accommodate flows from Mullock Creek (as shown in Mullock Creek Alternative 2 in Appendix C) that PS-7729 in the Three Oaks service area would require replacement and upsizing of the existing pumps. The cost for this improvement was determined using the Pump Replacement Unit Costs chart shown as Figure 6-3 in the 2019 Lee County Master Plan and a projected flowrate 147 gpm (as per the results of hydraulic modeling). This places the target flowrate outside the lowest limit of Figure 6-3 which is approximately 250 gpm. Therefore, the lowest charted value was used which gives a unit cost for the pump replacement of approximately $45,000 and the resulting planning level cost estimate is shown in **Table 9-11**.

Table 9-11: PS-7729 Pump Replacement Planning Level Cost Estimate (Three Oaks Service Area)

Item Desc. (Units)	Quantity	Unit Cost	Total
Pump Replacement	2	$22,500	$45,000
Subtotal			$45,000
Contingency (15%)			$6,750
Total			$51,750
Rounded Total			**$60,000**

As shown by the table, it is estimated the cost to upgrade the PS-7729 pumps is $60,000.

It was recommended that force main improvements be made in the Del Prado service area and four new duplex lift stations be constructed to convey flows to the Del Prado WRF. The planning cost estimate shown in **Table 9-12** was developed using the same assumptions and unit costs as were used for the gravity sewer layouts and cost estimates.

Table 9-12: Del Prado Service Area Recommended Improvements Planning Level Cost Estimate

Item Desc. (Units)	Quantity	Unit Cost	Total
4" Force Main (LF)	33,700	$70	$2,359,000
4" Plug Valve (EA)	34	$3,000	$102,000
6" Force Main (LF)	44,200	$95	$4,199,000
6" Plug Valve (EA)	45	$3,450	$155,250
8" Force Main (LF)	16,000	$110	$1,760,000
8" Plug Valve (EA)	16	$4,025	$64,400
Road Restoration (LF @ 20' Width)	93,900	$160	$15,024,000
Duplex Lift Station (EA)	4	$460,000	$1,840,000
Subtotal			$25,503,650
Mobilization and Demobilization (5%)			$1,275,183
Contingency (15%)			$4,016,825
Construction and Design Services (10%)			$3,079,566
Total			$33,875,223
Rounded Total			**$33,880,000**

As shown in the table, it is estimated that the recommended Del Prado service area improvements would total $33,880,000. It is not intended that these improvements be made all at once but are presented as a single project for simplicity.

In Chapter 8 it was also recommended that force main improvements be made in the LCU portion of the Central Fort Myers service area and two new duplex lift stations be constructed to convey flows to the Central Fort Myers AWWTF. The planning cost estimate shown in **Table 9-13** was developed using the same assumptions and unit costs as were used for the gravity sewer layouts and cost estimates.

Table 9-13: Central Fort Myers Service Area Recommended Improvements Planning Level Cost Estimate

Item Desc. (Units)	Quantity	Unit Cost	Total
4" Force Main (LF)	4,800	$70	$336,000
4" Plug Valve (EA)	5	$3,000	$15,000
6" Force Main (LF)	25,400	$95	$2,413,000
6" Plug Valve (EA)	26	$3,450	$89,700
8" Force Main (LF)	32,700	$110	$3,597,000
8" Plug Valve (EA)	33	$4,025	$132,825
Road Restoration (LF @ 20' Width)	62,900	$160	$10,064,000
Duplex Lift Station (EA)	2	$460,000	$920,000
Subtotal			$17,567,525
Mobilization and Demobilization (5%)			$878,376
Contingency (15%)			$2,766,885
Construction and Design Services (10%)			$2,121,279
Total			$23,334,065
Rounded Total			**$23,340,000**

As shown in the table, it is estimated that the recommended Central Fort Myers service area improvements would total $23,340,000. It is not intended that these improvements be made all at once but are presented as a single project for simplicity.

9.5 TREATMENT FACILITY UPGRADE PLANNING LEVEL COST ESTIMATES

Recommendations for capacity upgrades for the County's WRFs were presented at the end of the gap analysis in Chapter 6. This section presents the planning level cost estimates developed for these recommendations.

Planning level costs for WRF capacity expansions were developed based on the estimates utilized in the most recent version of the County CIP. The County has plans to expand the Three Oaks WRF by 3 MGD which has an estimated cost of $30,900,000. Without mark ups, it was estimated that the cost for WRF expansion is $7,755,000 per MGD of expansion. This rate was used to develop planning level cost estimates for recommended capacity expansions at the Pine Island WRF. The County's CIP also includes a $25,000,000 budget for the 3 MGD expansion to 6 MGD at Gateway WRF. as **Table 9-14** shows the planning level cost estimate developed for the recommended capacity expansion at the Pine Island WRF.

Table 9-14: Pine Island WRF Capacity Expansion Planning Level Cost Estimate

Pine Island WRF 0.892 MGD Expansion			
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
Facility Capacity Expansion ($/MGD)	0.892	$7,755,000	$6,917,460
Subtotal			$6,917,460
Mobilization and Demobilization (5%)			$345,873
Contingency (15%)			$1,089,500
Construction and Design Services (10%)			$835,283
Total			$9,188,116
Rounded Total			**$9,190,000**

As shown in **Table 9-14**, the planning level cost estimate to expand the Pine Island WRF by 0.892 MGD is $9,190,000.

9.6 SUMMARY OF PLANNING LEVEL COSTS

This section summarizes the planning level costs for the alternative wastewater systems and the needed transmission and treatment capacity improvements.

9.6.1 Comparison of Costs for Septic Priority Area Wastewater System Alternatives

To compare the cost for each of the alternative wastewater collection and disposal systems, the average cost per parcel for each alternative was calculated. In addition, a comparison of the 40-year net present worth of each of the septic groups/areas was carried out for each of the alternatives. The average capital, O&M, and 40-year net present worth costs per parcel for each of the alternatives are summarized and are presented in **Table 9-15**.

Table 9-15: Summary of Wastewater System Alternative Average Costs

Cost Comparison Summary per Parcel

Wastewater Collection System Type	Avg. On-Lot Costs	Avg. Collection System Costs	Avg. Total Capital Cost	Annual O&M	40-Year Net Present Worth*
Gravity	$8,853	$41,884	$50,737	$447	$56,773
Low Pressure	$23,017	$16,454	$39,471	$497	$46,182
Advanced OSTDS	$43,000	$0	$43,000	$1,716	$66,173

*Note that the interest rate used in calculating the 40-year net present worth is 6.89% as determined by the January 2023 US Treasury bond interest rate

The results of the net present worth analysis show that the net cost of the low pressure system is the lowest at $46,182. The costs for the advanced OSTDS and gravity systems were greater, with the cost of advanced OSTDS being almost $20,000 per parcel over that for low pressure. Although the capital costs are higher for gravity systems, they are the preferred alternative for converting areas near to the existing system because the majority of the existing collection system in the County is gravity sewer and annual O&M costs are typically lower, as shown in **Table 9-15**.

9.6.2 Summary of Planning Level Costs for Recommended Transmission and Treatment System Capacity Improvements

Table 9-16 summarizes the planning level cost estimates for the recommended piping, pumping, and treatment improvement projects.

Table 9-16: Summary of Recommended Improvement Planning Level Cost Estimates

Description	Planning Level Cost Estimate
PS-029 Wet Well Replacement (Fiesta Village Service Area)	$420,000
PS-7729 Pump Replacement (Three Oaks Service Area)	$60,000
Del Prado Service Area Piping and Pumping Improvements	$33,880,000
Central Fort Myers Service Area Piping and Pumping Improvements	$23,340,000
Pine Island WRF 0.892 MGD Expansion	$9,190,000
Total	**$66,890,000**

As shown by the table, the total cost for the recommended improvements is $66,890,000. The total cost for these improvements excludes the improvements already accounted for in the County's CIP such as the Three Oaks and Gateway WRF expansions and the new SE WRF. A recommended Capital Improvement Plan which identifies the implementation schedule along with funding requirements are summarized in Chapter 10 and detailed in Appendix D.

10. RECOMMENDED IMPROVEMENTS AND CAPITAL IMPROVEMENT PLAN

10.1 INTRODUCTION

The previous chapters presented the results of the initial screening and prioritization, hydraulic modeling, wastewater treatment gap analysis, planning analysis, and septic conversion alternative cost comparison. Combined, these results were used to identify the recommended improvements to implement the septic conversions for the priority groupings and expand the wastewater system as needed. This chapter discusses the approach used to develop a tiered system for septic conversion priorities, lists the recommended wastewater improvements identified through the planning effort, and develops a Capital Improvement Plan for LCU through the 2040 planning horizon.

10.2 FINAL TIERED RANKING OF PRIORITY GROUPINGS

Following the initial screening in Chapter 4, ten (10) priority groupings were established for septic to sewer conversion. The groupings, along with the results of the gap analysis and the consistency of the septic conversions with LCU's master plan, were discussed with LCU to develop a three-tier system that establishes an order of priority for implementing the septic conversions.

A tiered system was developed to prioritize the septic to sewer conversion areas for construction. A description of the tier methodology used for prioritization is summarized below. The groupings included in each tier are listed in **Table 10-1**.

Tier 1

Priority is given to groupings that convey wastewater flow to LCU's water reclamation facilities that have available wastewater treatment capacity. This limits flow to treatment facilities that are nearing permitted capacity such as the Del Prado WWTF. Grouping #1 is included in Tier 1 even though wastewater from this grouping is conveyed to Fort Myers Central AWWTF because based upon the initial screening criteria it is the highest ranked grouping and will have minimal impact to wastewater treatment capacity since the septic conversion area only includes 77 residential parcels.

Tier 2

Priority is given to groupings in FGUA's service area in North Fort Myers. The groupings located in the FGUA service area in North Fort Myers are considered the next priority to be consistent with LCU's master planning efforts. Since treatment capacity at the Del Prado WWTF is a concern, additional time is needed for the Board of County Commissioners (BoCC) to coordinate wastewater infrastructure needs, including treatment capacity with FGUA.

Within this tier, Group 8 was split into two subgroups: 8A and 8B. The split was determined in a manner to balance flows that are conveyed to Del Prado from the areas within each subgroup.

Tier 3

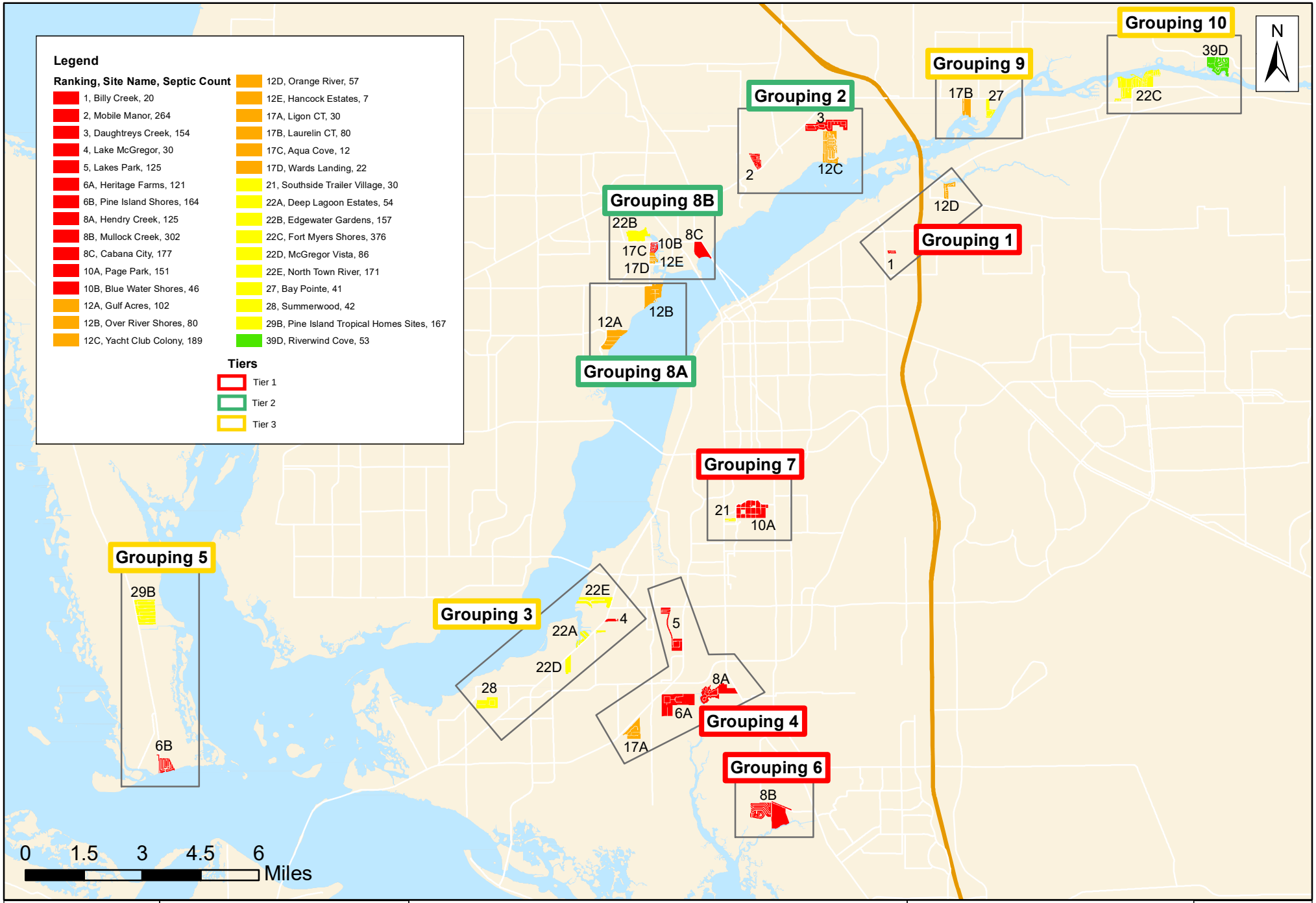
Remainder of groupings which would require major upgrades to LCU's WRFs or the implementation of pressure systems and/or advanced OSTDS along the eastern portion of the Caloosahatchee.

Table 10-1: Tiered System and Corresponding Septic Conversion Groupings

Tier	Septic Conversion Grouping
Tier 1	1, 4, 6, and 7
Tier 2	2, 8A, and 8B
Tier 3	3, 5, 9, and 10

The tiered system and corresponding septic conversion groupings are presented in **Figure 10-1**. It should be noted that the tiered system only provides an order of priority for the septic conversion of the priority groupings and not a detailed schedule. It is recommended that LCU develop an implementation schedule based on the tiered system, available plant capacity and capacity expansions, other County priority projects and availability of funding.

Two additional methods of prioritization of septic conversion areas based on the Lee County Board of County Commissioners Work Session are presented in **Appendix E.**



Source:
FDOH and ESRI
Date April 2021
County: Lee

Lee County Southwest Florida

Countywide Wastewater Management Plan

Tiered System and Corresponding Septic Conversion Groupings Map

AECOM

Figure

10-1

10.3 LIST OF RECOMMENDED IMPROVEMENTS

The recommended improvements for the wastewater system were identified as a result of hydraulic modeling efforts, gap analysis, and collection system upgrades for each of the septic conversion areas in the priority groupings. The collection system upgrades presented later in the section are based on gravity sewer layouts as it is the preferred alternative by FDEP and LCU because the connection to centralized sewer eliminates concerns of nitrogen loading to groundwater and the majority of LCU's wastewater collection system is comprised of gravity sewers. However, it is recommended that more consideration is given to advanced OSTDS for Grouping 10 areas in Tier 3 considering these areas are significantly far from centralized sewer. This subsection presents the recommended improvements for the gravity sewer layouts for septic conversion areas, the system improvements identified in the hydraulic modeling, and treatment plant capacity expansions.

10.3.1 Septic Conversion Area Improvements

The septic conversion area improvements summarized here are based on the detailed gravity sewer layouts for each septic conversion area in the priority groupings presented in Appendix C Part I. The septic conversion improvements are presented in **Table 10-2** and include 8" PVC gravity pipes, gravity manholes, 4" and 6" force mains, and duplex lift stations.

Table 10-2: Septic Conversion Area Improvements

Tier	Grouping	Pipe Diameter (in)	Pipe Length (LF)	Manholes (EA)	Duplex Stations (EA)
1	1	4 (FM)	2,340	29	2
		8 (Gravity)	4,840		
	4	4 (FM)	9,545	218	8
		8 (Gravity)	40,450		
	6	4 (FM)	18,920	86	6
		8 (Gravity)	19,420		
	7	4 (FM)	490	73	3
		6 (FM)	3,260		
		8 (Gravity)	19,870		
2	2	4 (FM)	17,115	165	7
		8 (Gravity)	31,345		
	8A	4 (FM)	2,770	80	2
		8 (Gravity)	16,850		
	8B	4 (FM)	4,370	86	4
		8 (Gravity)	17,700		
3	3	4 (FM)	8,465	139	11
		8 (Gravity)	25,785		
	5	4 (FM)	3,600	142	5
		8 (Gravity)	30,870		
	9	4 (FM)	1,610	50	2
		8 (Gravity)	8,970		
	10	4 (FM)	19,000	163	4
		8 (Gravity)	35,600		

For this CWMP, it is proposed that the septic conversion improvements for Tier 1 be implemented within the next ten years, the improvements for Tier 2 be implemented by 2040, and the improvements for Tier 3 be implemented some time outside the 20-year planning horizon. This schedule is preliminary and should be re-evaluated based on available funding and consistency with LCU's other planning efforts.

10.3.2 Improvements Identified through Hydraulic Modeling

As discussed in Chapter 8, the improvements identified through the hydraulic modeling only pertain to those triggered by the additional flows from the septic conversion areas. The modeling results showed that the

wastewater system improvements due to the septic conversion area flows are limited to two pump stations as shown in **Table 10-3**.

Table 10-3: Summary of Pumping Improvements Identified by Hydraulic Modeling

Pump Station	Recommendation/Improvement	
For septic conversion area flows to Three Oaks WRF		
PS-7729 (under Mullock Creek Alt 2)	**Design Flow (gpm)**	**Design Head (ft)**
	148	123
For septic conversion area flows to Fiesta Village WRF		
PS-029	Upsize the wet well (unless a review of the controls governing the operation of the pump station indicates a larger wet well operating range could be accommodated).	

Additionally, pumping and piping improvements were proposed for conveying flows from the septic conversion areas in the Del Prado and Central Fort Myers service areas directly to the treatment facilities. This was a very conservative approach used due to limited GIS information pertaining to the wastewater infrastructure and the the absence of a calibrated hydraulic model for the service areas. These improvements were proposed with the assumption that flows need to be conveyed to the treatment facilities without utilizing the existing infrastructure. Accordingly, the pumping and piping improvements will be needed to convey septic conversion flows to the Del Prado and Central Fort Myers WWTFs:

- To Del Prado WWTF
  - Four pump stations: 3 pump stations with design flows ranging from 150 to 400 gpm and 1 main pump station with an approximate design flow of 830 gpm.
  - 93,900 LF of force main ranging from 4 to 8-inches in diameter.
- To Central Fort Myers AWWTF
  - Two pump stations: 1 master pump station with an approximate design flow of 450 gpm and 1 pump station with a design flow of 300 gpm.
  - 62,900 LF of force main ranging from 4 to 8-inches in diameter.

It is recommended that further engineering evaluation is carried out to confirm the need for these improvements, which are detailed in Chapter 8, prior to the implementation of the septic conversion of the groupings within those two service areas.

10.3.3 Treatment Capacity Improvements/Expansions

The treatment capacity improvements/expansions identified herein include both planned WWTF expansions and new treatment facilities and expansions identified as part of the gap analysis effort. It should be noted that all the improvements identified in the gap analysis are based on the service area modifications and flow diversions planned and communicated by LCU. Recommendations for alternative capacities and expansions are detailed in Chapter 6.

Planned Improvements

Planned treatment capacity expansions that are accounted for in the County's 10-year CIP include the following:

- Gateway WRF expansion from 3 MGD to 6 MGD. Based on the gap analysis carried out in Chapter 6 and the proposed flow diversion from the South Fort Myers AAWTF in 2025, the permitted 3 MGD capacity of the WRF will be exceeded in 2035. The 3 MGD expansion is presented in the CIP as was originally planned, however, the flow diversion to Gateway and the 3 MGD expansion might be delayed from the original schedule.
- Three Oaks WRF expansion from 6 MGD to 9 MGD. This expansion is currently planned to be online at the end of 2024.
- New 6 MGD Southeast WRF, expandable to 10 MGD, to be online in 2028.

Improvements Identified in the Gap Analysis

The gap analysis identified the following treatment capacities expansions needed:

- Pine Island WRF expansion of 0.892 MGD for a total permitted capacity of 1.275 MGD by buildout. The expansion is recommended to come online some time outside of the planning horizon.

For both Gateway and the Southeast WRF, the gap analysis identified that expansions might be needed to accommodate buildout flows. Further analysis of the Gateway WRF treatment capacity is recommended to incorporate any changes to the planned service area modifications. The Southeast WRF is planned to be design in a manner that allows it to be expanded to 10 MGD.

The County should consider including these projects in their overall capital improvement plan. The timing for including these improvements is subject to change based on availability of funding and consistency with overall regional master planning. More details regarding a recommended CIP is provided in Appendix D, including LCU's 10-year CIP.

11.FUNDING STRATEGY

11.1 INTRODUCTION

Angie Brewer and Associates, LC (ABA) has been engaged by AECOM in support of the Lee County Utilities (LCU) Wastewater Management Plan, to provide a preliminary analysis of potential funding opportunities for septic-to-sewer improvements. As part of this effort, ABA has reviewed the proposed improvements, conducted funding research, and prepared recommendations to fund wastewater improvements.

The funding strategy includes a detailed breakdown of the potential funding sources for the projects proposed as part of the Countywide Wastewater Management Plan. This strategy includes information such as funding cycles, match requirements, administrative burden, and special considerations.

It is important to note that this document is a snapshot in time at its completion. The current economic climate is under constant change. Pressure from the top levels of the federal and state governments to reduce budgets and eliminate programs is a constant concern. The COVID-19 pandemic has caused many of the governmental funding agencies to switch gears, close programs, create new funding opportunities and revise funding policies. There have been many causal effects on the standards of awarding public funds as well as on funding eligibility factors. With increasingly higher demand for infrastructure improvements, there may be new funding opportunities and initiatives coming to light.

This chapter discusses the following items:

- Leveraging funds and viability versus costs. ABA utilizes these techniques to ensure that our clients pursue the best opportunities while delivering the project at the lowest total cost of delivery.
- Exploration of the various funding sources and how LCU can take full advantage of them to reduce costs. Key details about the funding sources and an identification of which projects appear to be good candidates is included as well.
- Conclusions that were arrived at based on the evaluation of funding opportunities.

11.2 LEVERAGING AND VIABILITY VERSUS COSTS

This subsection contains general information on important aspects of project funding. They are leveraging, project consolidation, and viability versus costs. Having an understanding of these concepts will support the decision-making process when pursuing funding sources for critical projects.

11.2.1 Leveraging

Leveraging is simply using funds from one source, internal or external, as match for another funding source thereby increasing the available funding for a project. Our view on leveraging is based on the belief that evaluation of all aspects of a program, without restriction to a project level approach, greatly improves chances of success. If everything is viewed from only a project level approach, this will create gaps and the LCU may miss out on an opportunity to leverage funds from one source by matching another. ABA maintains a focus at a program level first to define the overall needs. Then it is possible to assist LCU in identifying the specific project elements that align with specific funding sources. With that perspective in mind, ABA seeks funding sources that will accept another source as its match rather than using the LCU funds as the only source of match. When external match is not available or insufficient internal LCU funds should be identified, budgeted or “earmarked” to plan for fulfilling match requirements.

11.2.2 Viability versus Costs

There are many programs available to fund a multitude of projects and project elements and while it would seem appropriate to apply for all opportunities that are identified, this is not always the case. There are times when the cost of an application and the required funding administration, either by a consultant or LCU staff, is too onerous for the amount of money that is being awarded. This does not mean that smaller funding opportunities should be ignored, but that an evaluation of the application process and the administration requirements should be performed before moving forward. The Funding Strategy has an evaluation of these factors included in the recommendations. This will help to ensure that the associated costs of applying and administering the funding do not outweigh the financial benefit.

Other considerations relating to viability versus cost include review of internal policies, procedures and requirements. It is critical to ensure LCU's procurement, legal, financial, and operating requirements are evaluated for alignment with Federal, State and specific funding program requirements. It is also important to evaluate and assess whether there would be any anticipated impact on current and future debt obligations, rates/revenue and any other institutional requirements.

11.3 FUNDING STRATEGY

This subsection contains recommendations and information on the State Revolving Fund (SRF) loan program and other potential funding sources that the LCU could utilize to fund the projects that are ultimately identified for the Countywide Wastewater Management improvements.

11.3.1 Recommended Strategy

Based on the proposed improvements, the primary recommended sources of funding for this collection of wastewater projects are the State of Florida Department of Environmental Protection Clean Water State Revolving Fund (SRF) Loan Program, Protecting Florida Together – Wastewater Grant Program and State Water-Quality Assistance Grant (SWAG)/319 Grant Program. Secondary sources recommended for consideration are the State of Florida Local Funding Initiative Request (Legislative Process). Tertiary sources are included for informational purposes but are not recommended for pursuit unless additional information becomes available. A funding resource summary for each program that provides expanded information has been included in this section.

The Community Development Block Grant – Mitigation General Infrastructure Program was initially included for consideration. However, we were recently informed that this program is no longer open as the governmental entity that managed this funding opportunity has been transitioned to administering current awarded grants. In addition, remaining funds in this funding opportunity are being transitioned to serve other public purposes. Based on this, this program is no longer recommended for consideration or pursuit.

11.3.2 Funding Source Discussion

There are many benefits associated with the use of the SRF programs. The first, and quite likely the most important, is reduced interest rates compared to the bond market. Interest rates in the SRF programs range from 20-50% less than what a community can obtain on their own. The savings from these reduced interest rates adds up very quickly on even an average size project and can equal tens of millions of dollars on a larger project. Additional benefits include no pre-payment penalty, no arbitrage, no payments until after construction completion and others. Administrative and other considerations include a loan service fee, fiscal sustainability plan, capitalized interest, Davis-Bacon compliance, MBE/WBE compliance and American Iron and Steel (AIS)/Buy American Build American (BABA) compliance.

The LCU Wastewater Management Plan provides a solid foundation of information needed for the SRF Facilities Plan which is the first step in securing SRF funding.

The State of Florida SRF Clean Water (Wastewater) program has five phases associated with the use of this funding mechanism. These phases include planning, design, pre-construction, construction and close out. The following general tasks are included to explain the phases.

Planning

- Project Identification
- Request for Inclusion
- Studies/Evaluations in Support of Facilities Plan
- Facilities Plan
- Environmental Clearance (FFONSI/CEN)

Design

- Request for Inclusion
- Design
- Biddable Plans and Specifications
- Permits
- Site Certification
- Readiness to Proceed
- Update RFI for Construction Funding

Pre-Construction

- Pre-Award Compliance
- Bidding Process
- Authority to Award Approval Process
- Pre-Construction Meeting

Construction

- Payment Processes
- Change Orders/Eligibility Determinations
- Reimbursement Processes
- Compliance with Davis Bacon and American Iron & Steel

Close Out

- Final Pay Estimate, Change Order and Disbursement Request
- Final Contract Close Out Documentation
- FDEP Close Out Inspection
- Single Project and Annual Audit

Table 11-1 is a legend showing an example of the **Key Facts** section included for each funding source identified in the strategy. In the second column is an explanation of the potential values in each cell.

Table 11-1: Key Facts Example Legend

Key Facts	
Grant and/or Loan:	Identifies the funding source as a grant and/or a loan.
Terms:	N/A for a grant. If a loan, this will include an estimate of the interest rate and the maximum length of the loan repayment.
Maximum Funding per Cycle:	Identifies the maximum funding available per funding cycle.
Match Requirement:	Identifies the required match percentage and any special match conditions or exclusions.
Application Burden:	Low – Can be completed in-house or with minimal outside support Moderate – Typically completed by an in-house trained grant writer or outside consultant. High – Typically completed by a consultant and may include special technical reports or studies and planning documents.
Special Application Considerations:	Identifies important factors related to schedule and effort such as partnerships, public involvement, and special timetables.
Administrative Burden:	Low – Can be completed in-house or with minimal outside support Moderate – Typically completed by an in-house trained grant administrator or outside consultant. High – Typically completed by a consultant and may include special reports or compliance requirements such as Davis Bacon and Equal Employment Opportunity (EEO).
Special Administrative Considerations:	Identifies important factors related to schedule and effort such as Davis Bacon, EEO monitoring, and others.

11.3.2.1 Primary Funding Sources

State Revolving Fund Loan Program (SRF) – Clean Water

Florida Department of Environmental Protection

The aim of the Clean Water State Revolving Fund (SRF) Loan Program is to provide low-interest loans to eligible entities for planning, designing, and constructing public wastewater, reclaimed water and storm water facilities.

Funding Cycle

Cycle Frequency: Quarterly

Begin Application Planning: Ongoing

Funding Cycle Open: Ongoing

Applications Due: 45 Days Prior to Quarterly Public Hearings

Key Facts

Grant and/or Loan:	Loan
Terms:	20 years / Low interest, Loan Fee and Capitalized Interest, Payments begin after Construction Completion
Maximum Funding per Cycle:	Subject to Annual Segment Cap
Match Requirement:	None
Application Burden:	Moderate
Special Application Considerations:	Planning/Environmental Documents
Administrative Burden:	Moderate
Special Administrative Considerations:	Davis Bacon and American Iron and Steel

Protecting Florida Together – Wastewater Grants

Florida Department of Environmental Protection

The aim of the Wastewater Grants Program is to provide grant to eligible governmental entities for constructing wastewater projects that reduce excess nutrient pollution within a Basin Management Action Plan (BMAP), alternative resolution plan or rural area of opportunity. Septic to Sewer projects are eligible under this program.

Funding Cycle

Cycle Frequency: Annually

Begin Application Planning: Ongoing

Funding Cycle Open: Expected in Summer

Applications Due: Expected in Summer

Key Facts

Grant and/or Loan:	Grant
Terms:	N/A
Maximum Funding per Cycle:	No definitive maximum
Match Requirement:	No minimum required
Application Burden:	Moderate
Special Application Considerations:	Project identification in BMAP
Administrative Burden:	Moderate
Special Administrative Considerations:	Reporting and Financial Oversight

State Water-Quality Assistance Grant (SWAG)/Section 319 Grant Program

Florida Department of Environmental Protection

These grant funds can be used to implement projects or programs that will help to reduce nonpoint sources of pollution. Projects or programs must be conducted within the state's NPS priority watersheds, which are the state's SWIM watersheds and National Estuary Program waters.

Examples of fundable projects include: demonstration and evaluation of Best Management Practices (BMPs), nonpoint pollution reduction in priority watersheds, Green Infrastructure/Low Impact Development for stormwater, ground water protection from nonpoint sources, public education programs on nonpoint source management, and septic to sewer projects.

Funding Cycle

Cycle Frequency:	Bi-annually
Begin Application Planning:	Ongoing
Funding Cycle Open:	Ongoing
Applications Due:	Spring/Fall

Key Facts

Grant and/or Loan:	Grant
Terms:	N/A
Maximum Funding per Cycle:	Varies - Typically around $1,000,000/project
Match Requirement:	None for SWAG/40% Non-Federal for Section 319
Application Burden:	High
Special Application Considerations:	Technical Data Requirements
Administrative Burden:	High
Special Administrative Considerations:	Technical Data Requirements

11.3.2.2 Other Funding Sources

This section focuses on funding programs other than the Primary Sources listed above and provides available details for each funding source. The funding source summaries are listed in alphabetical order.

In addition to the potential funding sources outlined below, the Infrastructure Investment and Jobs Act (IIJA) provides funding in support of project of this type. The overall list of funding categories in the IIJA are included below:

- roads, bridges, and major projects;
- passenger and freight rail;
- highway and pedestrian safety;
- public transit;
- broadband;
- ports and waterways;
- airports;
- water infrastructure;
- power and grid reliability and resiliency;
- resiliency, including funding for coastal resiliency, ecosystem restoration, and weatherization;
- clean school buses and ferries;
- electric vehicle charging;
- addressing legacy pollution by cleaning up Brownfield and Superfund sites and reclaiming abandoned mines; and
- Western Water Infrastructure.

As it pertains to the proposed septic-to-sewer improvements, the IIJA effectively adds additional funding to the existing “financial infrastructure” of the SRF Programs over the next 5 years, beginning late 2022 to early 2023. This additional funding is essential to increasing the annual SRF cap by community. The significance of this development is that it will take fewer years for large projects to be fully funded and ease cash flow impacts.

Community Development Block Grant – Mitigation General Infrastructure Program (CDBG-MIT)

Florida Department of Economic Opportunity

This program was developed in response presidentially declared disasters in 2016 and 2017 and encompasses mitigation for communities affected by the major storm events of that time period. Eligible projects include the upgrading of water, sewer, solid waste, communications, energy, transportation, health and medical, and other public infrastructure projects that will reduce hazard risks in the Most Impacted and Distressed Areas (MIDs) designated areas focusing on resiliency to implement the goal of providing adequate protection from future disasters.

Funding Cycle

Cycle Frequency: TBD

Begin Application Planning: TBD

Funding Cycle Open: TBD

Applications Due: TBD

Key Facts

Grant and/or Loan:	Grant
Terms:	N/A
Maximum Funding per Cycle:	No definitive maximum
Match Requirement:	None
Application Burden:	Moderate
Special Application Considerations:	Public Meetings/Citizen Advisory Task Force
Administrative Burden:	Moderate
Special Administrative Considerations:	None

State of Florida Local Funding Initiative Request

State Legislature (Senate and House)

The State of Florida Senate and House accept Local Funding Initiative Requests through a process that begins with the Legislative Delegation. This opportunity provides funding for projects that enhance, preserve or improve environmental or fish and wildlife quality as well as improve wastewater management, stormwater management, groundwater quality, drinking water quality and surface water quality. Other activities can be funded through this mechanism however, they relate to other types of community projects.

It is imperative that Legislative support be garnered throughout this process. There are multiple steps in the process culminating in the project being listed in the State Budget. Other factors are considered during evaluation such as Local Public Involvement efforts, other funding sought, financially disadvantaged status and local match.

Funding Cycle

Cycle Frequency: Annually

Begin Application Planning: Late Summer 2022 - TBD

Funding Cycle Open: Fall 2022 - TBD

Applications Due: TBD

Key Facts

Grant and/or Loan:	Grant
Terms:	N/A
Maximum Funding per Cycle:	No definitive maximum
Match Requirement:	No minimum required
Application Burden:	Low
Special Application Considerations:	Legislator Support Required
Administrative Burden:	Moderate
Special Administrative Considerations:	Quarterly and ROI Reporting

Florida Job Growth Grant Fund – Public Infrastructure

Florida Department of Economic Opportunity

This program is centered around economic development and is focused on meeting the demand for infrastructure needs in the community. Infrastructure initiatives are based on attracting businesses, creating jobs, and promoting economic growth.

Funding Cycle

Cycle Frequency: Ongoing

Begin Application Planning: Ongoing

Funding Cycle Open: Summer 2022

Applications Due: TBD

Key Facts

Grant and/or Loan:	Grant
Terms:	N/A
Maximum Funding per Cycle:	None
Match Requirement:	None
Application Burden:	Moderate
Special Application Considerations:	None
Administrative Burden:	Moderate
Special Administrative Considerations:	None

Florida Rural Water Association Loan Programs

Florida Rural Water Association

The objective of this program is to assist communities in acquiring interim financing for construction projects. The program allows communities to have access to competitive fixed rate loan funds at a low cost of borrowing. The salient requirement for this program is that the recipient community must have received either a permanent loan commitment from the US Department of Agriculture-Rural Development (USDA-RD) or from the Department of Environmental Protection-State Revolving Fund (DEP-SRF) for construction funding. The loans are used during the construction period and are paid off with the USDA-RD/DEP-SRF funds once the project is complete. An additional consideration is that it may require close coordination with FRWA depending on the timing of projects and the ability of FRWA to assemble the Governing Board of this program.

Funding Cycle

Cycle Frequency: Ongoing

Begin Application Planning: Ongoing

Funding Cycle Open: Ongoing

Applications Due: Ongoing

Key Facts

Grant and/or Loan:	Loan
Terms:	Up to 5 years / Anticipated interest rate 2-5%
Maximum Funding per Cycle:	Varies depending on market conditions
Match Requirement:	None
Application Burden:	Moderate
Special Application Considerations:	Letter of Commitment from FDEP or USDA-RD
Administrative Burden:	Low
Special Administrative Considerations:	None

Water Infrastructure Finance and Innovation Act (WIFIA)

Environmental Protection Agency

The Water Infrastructure Finance and Innovation Act program was established in 2014 and annually provides federal credit for eligible water and wastewater infrastructure projects. The eligible projects may include development phase activities, construction, acquisition of real property and equipment, capitalized interest, and other related development and implementation activities. A dedicated source of revenue is required and the project must be creditworthy. This program is aimed towards larger construction projects as the minimum funding per project is $20 million for communities with populations of more than 25,000 and has a substantial non-refundable $100,000 application fee.

Funding Cycle

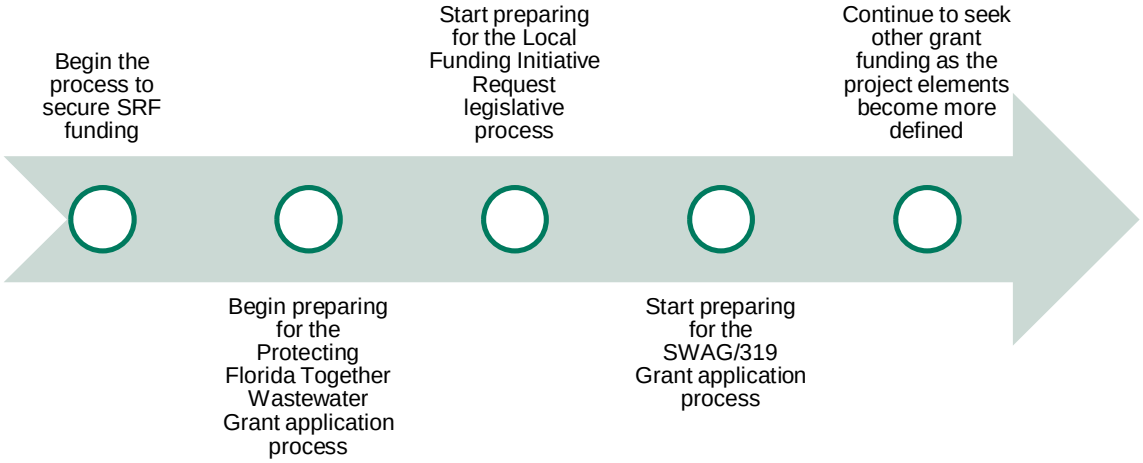
Cycle Frequency:	Annual
Begin Application Planning:	Ongoing
Funding Cycle Open:	TBD - May 2020 (2019 issued in March)
Letter of Interest Due:	TBD 2020 (2019 due in July)
Applications Due:	Within 365 days of the invitation to apply

Key Facts

Grant and/or Loan:	Loan
Terms:	35 years – US Treasury rates or greater
Maximum Funding per Cycle:	Minimum of $20 million per project
Match Requirement:	51%
Application Burden:	High
Special Application Considerations:	Non-refundable application fee of $100,000
Administrative Burden:	High
Special Administrative Considerations:	NEPA, Davis-Bacon, American Iron and Steel, other federal cross-cutter provisions.

11.4 CONCLUSIONS

LCU has an opportunity to bring grant and low-cost funding dollars back into the community. The funding sources presented offer LCU potential savings versus conventional project funding sources such as traditional bond financing. The following list of actions are the recommended path forward to provide valuable resources/services to the community at the lowest possible capital costs.



With SRF planned as the “umbrella funding mechanism” for the project, any grants that are received serve to reduce the amount to be repaid through the loan. Essentially, this reduces the cost to LCU and ultimately to the users of the system.

In addition to limiting the ultimate costs to the County through grant and low-interest financing, the strategic evaluation, implementation and collection of user fees and exploring the utilization of assessments and other internal revenue generation options will provide excellent match for grant funding opportunities. Also, with such a large program, creative combinations of fee and rate structures will be necessary to support debt service for financing such as SRF Loans. Opportunities that are recommended for consideration to reduce costs or improve the long-term financial viability of the program include public-private partnerships, Tax Increment Financing, Municipal Service Benefit Units (MSBU), etc. The successful integration of the County's internal funding mechanisms united with the potential funding sources identified will be vital to ensuring the cost-effectiveness and long-term viability of the projects.

11.4.1 Hurricane Ian Impacts to Overall Wastewater Management Plan

The CWMP was initiated using 2021 existing conditions as the baseline for the wastewater management plan. In September of 2022, Hurricane Ian (a Category 4 hurricane) significantly impacted Lee County and caused severe damage to coastal communities. The impact of Hurricane Ian is still unfolding and therefore was difficult to capture in this CWMP. It is anticipated that the hurricane will impact reconstruction efforts and thus potentially affect population densities. Building codes, including materials of construction and locations of buildings, will also likely change to better account for hurricane impacts.

Continuous monitoring and evaluation of the impact of Hurricane Ian on the reconstruction effort should be carried out to determine how it will impact population forecasts, wastewater infrastructure needs, and implementation schedules of recommended improvements.

In addition - although it is early in the process - there will likely be changes to the long-term funding strategy resulting from Disaster Declarations for Hurricane Ian and Tropical Storm Nicole. Based on previously authorized funding for disaster mitigation, it will be critical to monitor ongoing funding developments related to the recent storms. It is anticipated that these funding opportunities may take 2-3 years to be available to Lee County for mitigation type activities.

There may also be increased funding allocations for resilience and coastal zone management projects. This may come in the form of new funding programs or increased dollars for existing programs. It is recommended to continually evaluate the funding environment as it relates to the County's selected projects. This will help to ensure that the maximum grant dollars are garnered, and out-of-pocket costs are offset by outside funding to the greatest extent possible.

APPENDIX A EXAMPLE INITIAL SCREENING CRITERIA SCORING

This appendix provides example calculations for each criterion using Billy Creek as a sample area.

1. OSTDS Density

No. of Parcels in Billy Creek 20

Total area (acres) of Billy Creek 3.8

$$OSTDS\ Density = {}^{no.\ of\ parcels}/_{total\ area}$$

$$OSTDS\ Density = {}^{20}/_{3.8}$$

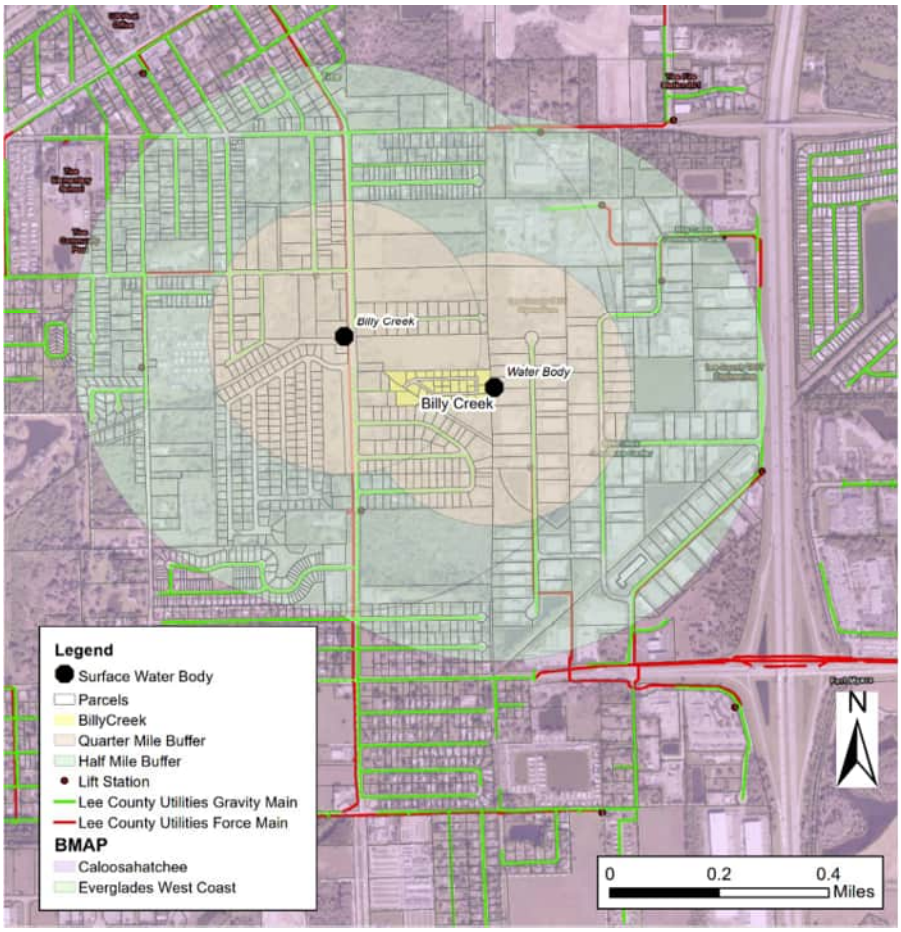
$$OSTDS\ Density\ for\ Billy\ Creek = 5.3$$

Since an OSTDS density of 5.3 falls in the scoring density range of 3 to 5.5, **a score of 3 is assigned**.

2. Proximity to Surface Waters/Impaired Waters

Buffers were created with a center on the nearest surface water or impaired water body as seen in the image below.

It can be seen that more than 50% of the Billy Creek area falls within the quarter mile buffer (whether from the surface water body or impaired Billy Creek). Therefore, **a score of 5 is assigned** to it.



3. Age of Septic

Billy Creek has a total of 20 parcels. The age of the structure for each parcel was obtained from the GIS attributes for each of the parcels and was designated into the age groups established in section 4.1 as follows:

Age Group	Score for Age Group	No. of Parcels within Age Group
0-15 years	1	0
15-25 years	2	0
25-30 years	3	0
30-35 years	4	0
>35 years	5	20

A weighted age is then calculated based on the scoring assigned to the age groups. While the calculation is not necessary in the case of Billy Creek as all the parcels fall within the same age group, it is as follows:

$$Weighted\ Age = \frac{\sum_{0-15}^{>35} no.\ of\ parcels\ in\ age\ group\ \times score\ for\ age\ group}{total\ number\ of\ parcels}$$

$$Weighted\ Age = \frac{(0 \times 1)_{0-15} + (0 \times 2)_{15-25} + (0 \times 3)_{25-30} + (0 \times 4)_{30-35} + (20 \times 5)_{>35}}{20}$$

$$\boldsymbol{Weighted\ Age = 5}$$

A weighted age of 5 falls within the first weighted age scoring range (>4.5), and therefore **a score of 5 is assigned**.

4. Groundwater Elevation (Seasonal High Groundwater)

The natural ground level for the general area of Billy Creek was estimated from GIS contours and the wet season high groundwater elevation was estimated from the County's PDF contour map. For Billy Creek, these elevations are as follows:

Natural Ground Level (NGVD 29)	14.00 ft
Seasonal High Groundwater (NAVD 88)	14.50 ft
NGVD 29 to NAVD 88 Conversion Factor for Lee County (FEMA-recommended)	-1.18 ft
Natural Ground Level (NAVD 88)	12.28 ft

The separation distance between the natural ground level and the seasonal high groundwater is then calculated as follows:

$$Separation\ Distance\ (in) = (NGL\ NAVD88 - Seasonal\ High\ Groundwater\ NAVD88) \times 12$$

$$Separation\ Distance\ (in) = (12.28 - 14.5) \times 12$$

$$\boldsymbol{Separation\ Distance\ (in) = -20.16}$$

Since the separation distance is less than 0 inches, meaning that during the wet season the groundwater table is above the natural ground level and thus floods, **a score of 5 is assigned**.

5. Known Water Quality Issues

As mentioned in section 4.1 of the report, the scoring for this criterion is established based on two sources as follows:

- If the area is one of the sites included in the MST study, it is **always** assigned a score of 3 to 5 based on its score in the MST study (image to the right) as follows:

5	MST Score ≥ 21.6
4	19.7 ≥ MST Score ≥ 14.9
3	14.9 > MST Score

- If an area is not included in the MST study, the score for this criterion is assigned based on whether the area is located near an impaired water body according to the FDEP impaired waters list as follows:

3	Area is close to an impaired water body listed in FDEP's 303(d) List.
1	Area is not close to an impaired water body listed in FDEP's 303(d) List.

Site #	Site Name	Score
18	Summerwood Drive	27
7	Heritage Farms	24.5
11	Mobile Manor	24.3
14	Overlook Drive	24.1
1	Billy Creek	23.7
10	Ligon Court	22.6
15	Page Park	21.6
17	San Carlos Park	19.7
20	Tidewater Island 02	18.6
21	Waterway Estates 01	17.7
6	Hendry Creek	16.5
13	Orange River	16.5
5	Fort Myers Shores	16.4
8	Lake McGregor	15.2
3	Daughtry Creek	14.9
22	Waterway Estates 02	14.9
9	Laurelin Court	12.3
19	Tidewater Island 01	11.3
16B	Pine Island 02	9.8
2	Briarcliff	8.6
4	Deep Lagoon	8.6
12	North Town	8.6
24	Reference	8.6
16	Pine Island	8.6
23	Yacht Club	8.5

In the case of the Billy Creek site, it was one of the areas included in the MST study. The area received a score of 23.7, which assigns it a score of 5. In addition, Billy Creek is on the FDEP's Impaired Waters List – which would assign it a score of 3 if it was not included in the MST study. In general, if an area is included in the MST study, then the scoring is always assigned based on its result in the MST study (from 3 to 5) rather than presence or absence of the water body its nearest to in the FDEP's Impaired Waters List.

Therefore, Billy Creek **is assigned a score of 5** for this criterion.

APPENDIX B REFERENCES

Black and Veatch (2020, May 22). *Lee County Utilities Wastewater Master Plan Report.* Prepared by Black and Veatch.

CDM Smith, Inc. (2020, April 30). *City of Fort Myers South Advanced Wastewater Treatment Facility Capacity Analysis Report Update*. Prepared by CDM Smith, Inc.

CDM Smith, Inc. (2021, April 29). *City of Fort Myers Central Advanced Wastewater Treatment Facility Capacity Analysis Report Update*. Prepared by CDM Smith, Inc.

CDM Smith, Inc. (2021, December). *Three Oaks Water Reclamation Facility Substantial Modification and Operating Permit Renewal Applications*. Prepared by CDM Smith, Inc.

Fiesta Village Water Reclamation Facility White Paper (n.d.). Prepared by Lee County Utilities.

Florida Department of Environmental Protection (2015, December 17). *Highpoint Wastewater Treatment Plant Notice of Permit Issuance*. Prepared by Florida Department of Environmental Protection.

Florida Department of Environmental Protection (2017a, June 12). *Fort Myers Central Advanced Wastewater Treatment Facility Notice of Permit*. Prepared by Florida Department of Environmental Protection.

Florida Department of Environmental Protection (2017b, June 12). *Fort Myers South Advanced Wastewater Treatment Facility Notice of Permit.* Prepared by Florida Department of Environmental Protection.

Florida Department of Environmental Protection (2018, March 13). *Fort Myers Central Advanced Wastewater Treatment Plant Notice of Permit Revision.* Prepared by Florida Department of Environmental Protection.

Florida Department of Environmental Protection (2019a, February 19). *Fiesta Village Wastewater Treatment Facility Permit Renewal*. Prepared by Florida Department of Environmental Protection.

Florida Department of Environmental Protection (2019b, June 10). *Fort Myers Beach Water Reclamation Facility Notice of Permit Issuance*. Prepared by Florida Department of Environmental Protection.

Florida Department of Environmental Protection (2019c, April 12). *Pine Island Water Reclamation Facility Notice of Permit Issuance*. Prepared by Florida Department of Environmental Protection.

Florida Department of Environmental Protection (2019d, June 25). *Fort Myers South Advanced Wastewater Treatment Facility Notice of Permit Revision*. Prepared by Florida Department of Environmental Protection.

Florida Department of Environmental Protection (2021, July 16). *Gateway Water Reclamation Facility Notice of Permit Revision.* Prepared by Florida Department of Environmental Protection.

Fort Myers Beach Water Reclamation Facility White Paper (n.d.). Prepared by Lee County Utilities.

Gateway Water Reclamation Facility White Paper (n.d.). Prepared by Lee County Utilities.

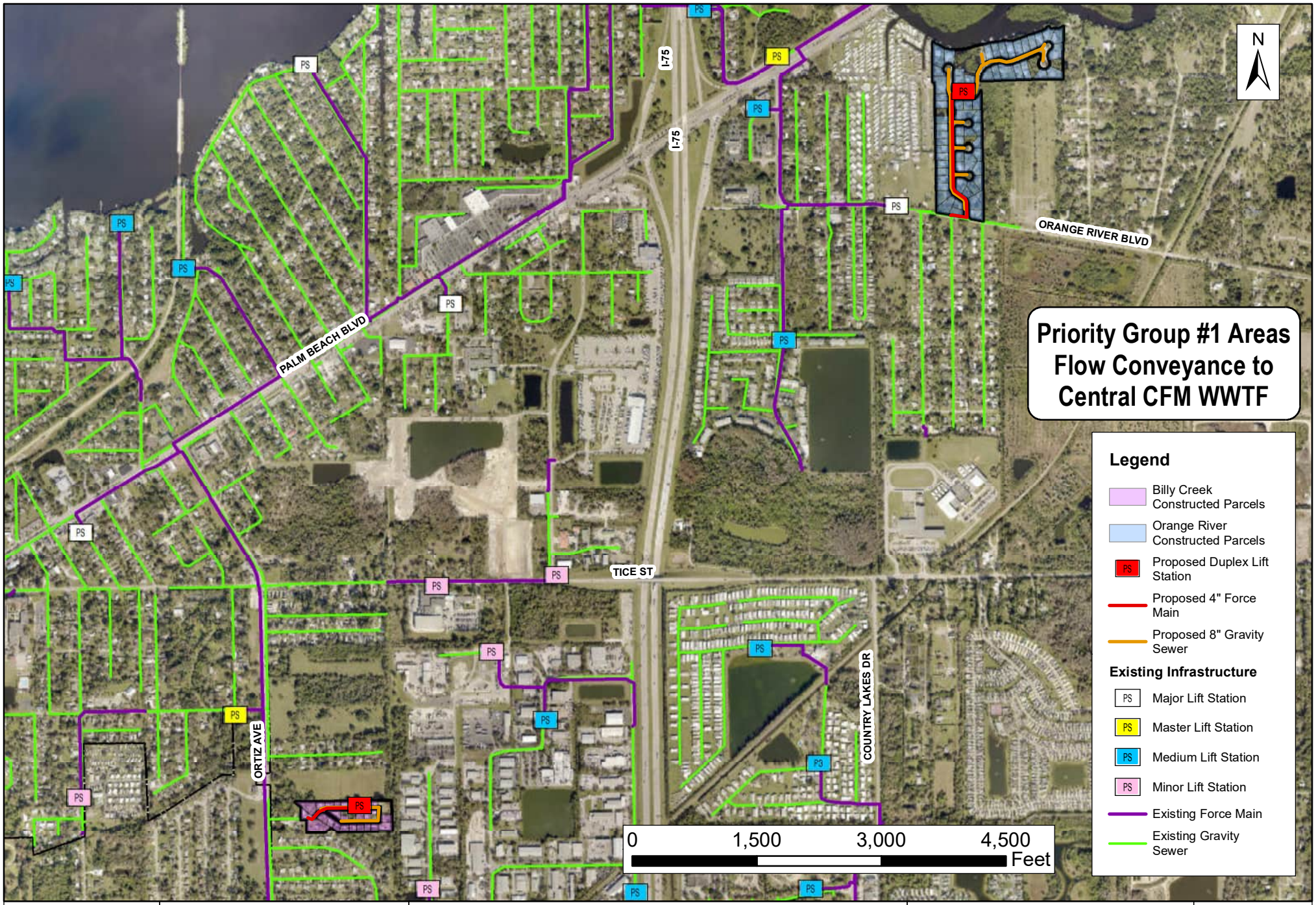
High Point Water Reclamation Facility White Paper (n.d.). Prepared by Lee County Utilities.

Malcolm Pirnie, Inc. (2005, December). *City of Fort Myers Sanitary Sewer Master Plan Final Report.* Prepared by Malcom Pirnie, Inc.

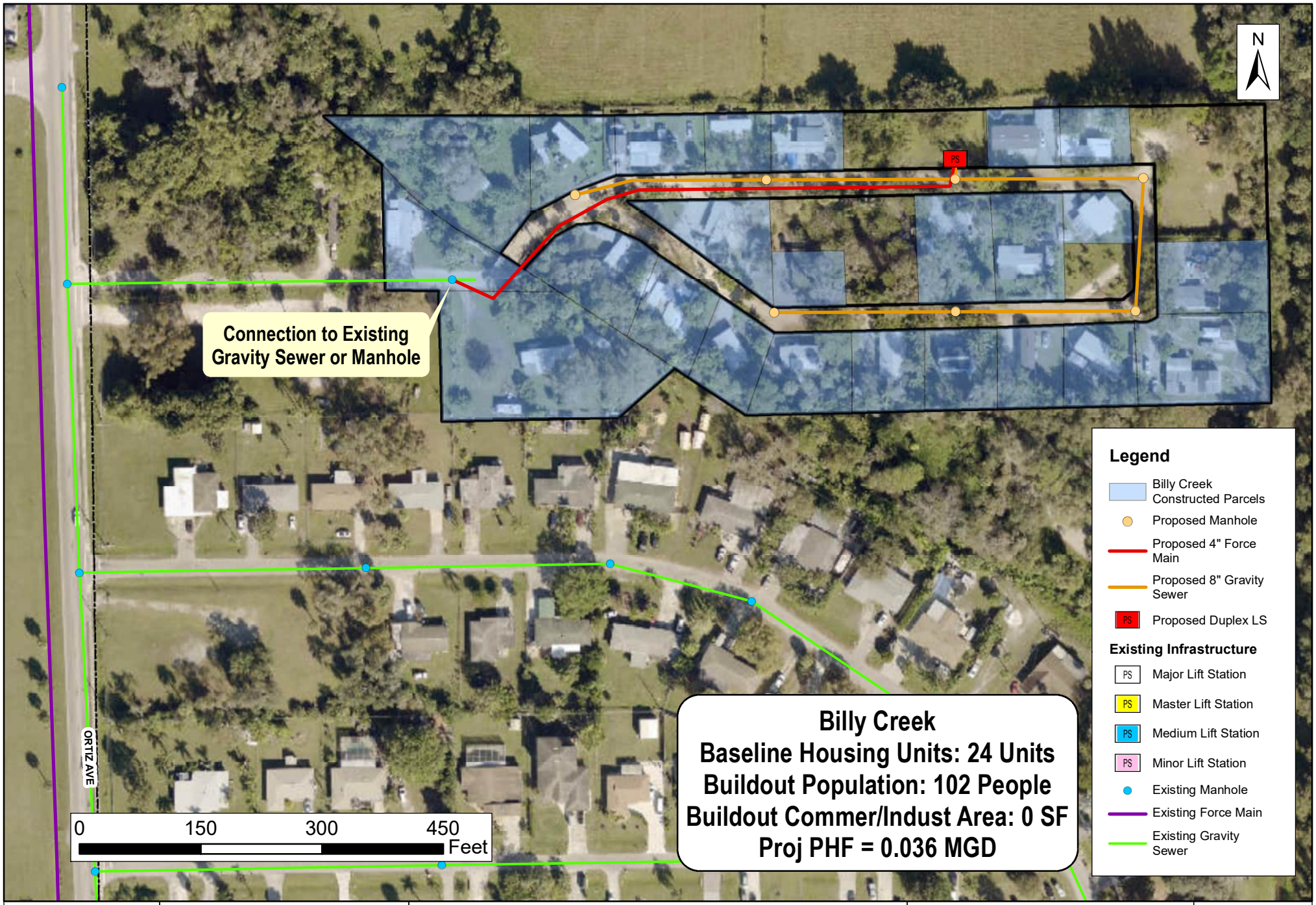
Pine Island Water Reclamation Facility White Paper (n.d.). Prepared by Lee County Utilities.

White Paper for Three Oaks Water Reclamation Facility (2019, August). Prepared by Lee County Utilities.

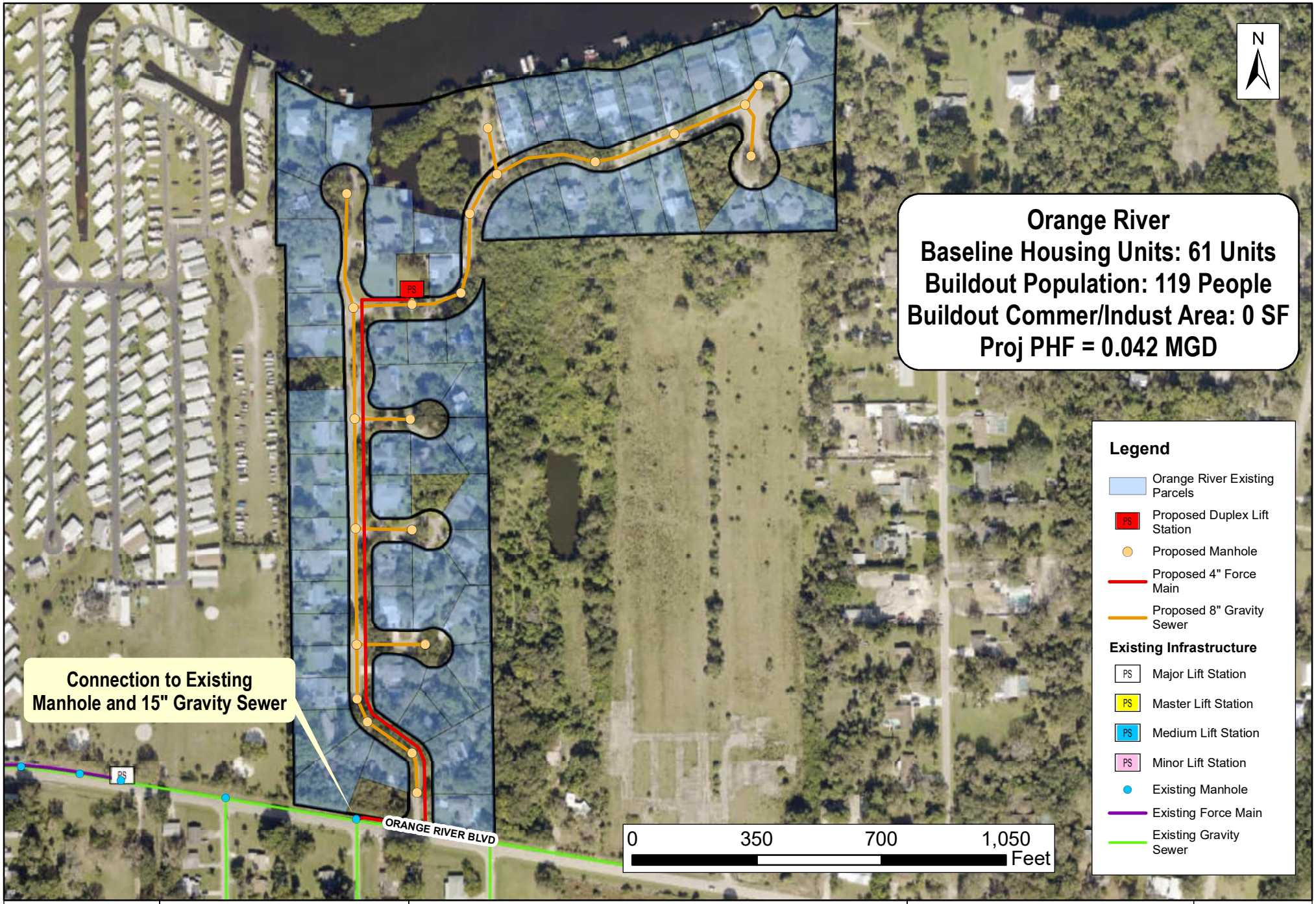
APPENDIX C GRAVITY AND LOW PRESSURE SEWER LAYOUTS AND DETAILED COST ESTIMATES (Part I)



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Priority Grouping #1 Areas Overview Map** **Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



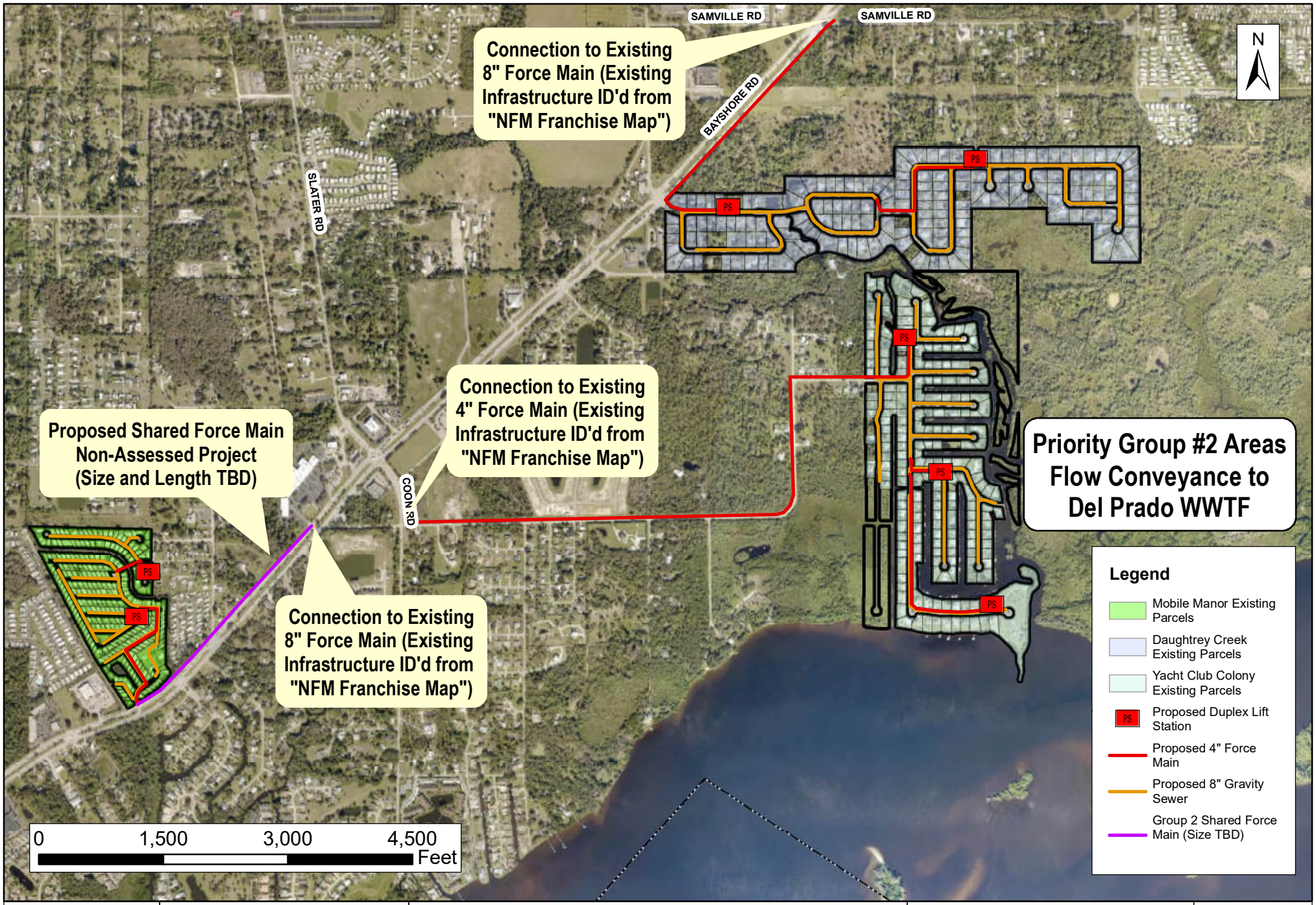
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Billy Creek - Priority Grouping #1 Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



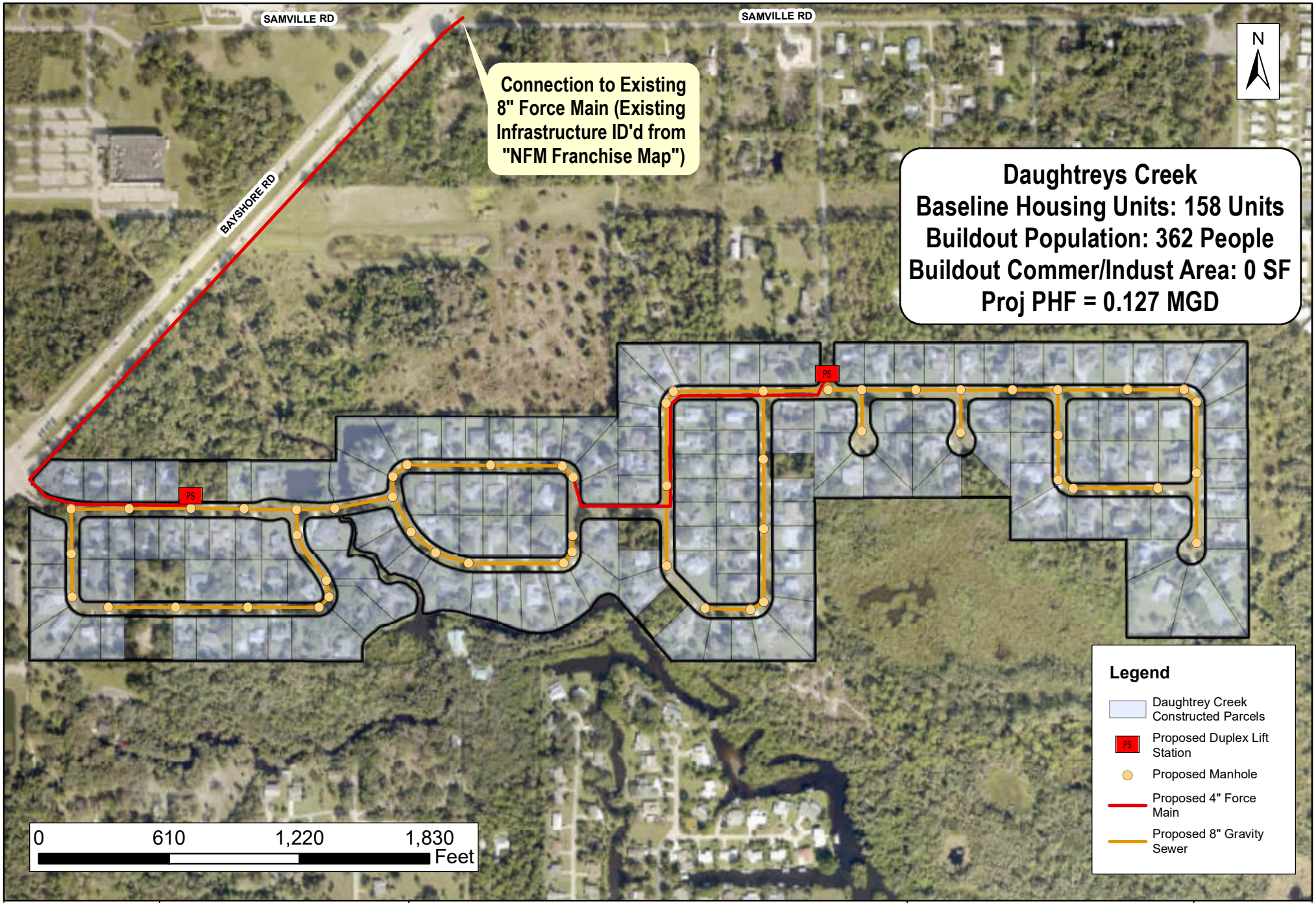
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Orange River - Priority Grouping #1** **Gravity Collection System Concept Plan**	AECOM	**Figure** **X**

Site Name, Group #	Billy Creek, Group 1		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	1,200	$95	$114,000
4" Force Main (LF)	630	$70	$44,100
4" Plug Valve (EA)	2	$3,000	$6,000
4' Manhole (EA)	7	$11,500	$80,500
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	24	$2,660	$63,840
Septic Tank Abandonment Permit and Demo (EA)	24	$4,000	$96,000
Duplex Lift Station (EA)	1	$460,000	$460,000
Road Restoration (LF @ 20' Width)	1,200	$160	$192,000
Subtotal			$1,063,340
Mobilization and Demobilization (5%)			$53,167
Contingency (15%)			$167,476
Construction and Design Services (10%)			$128,398
Total			$1,412,381
Rounded Total			**$1,420,000**

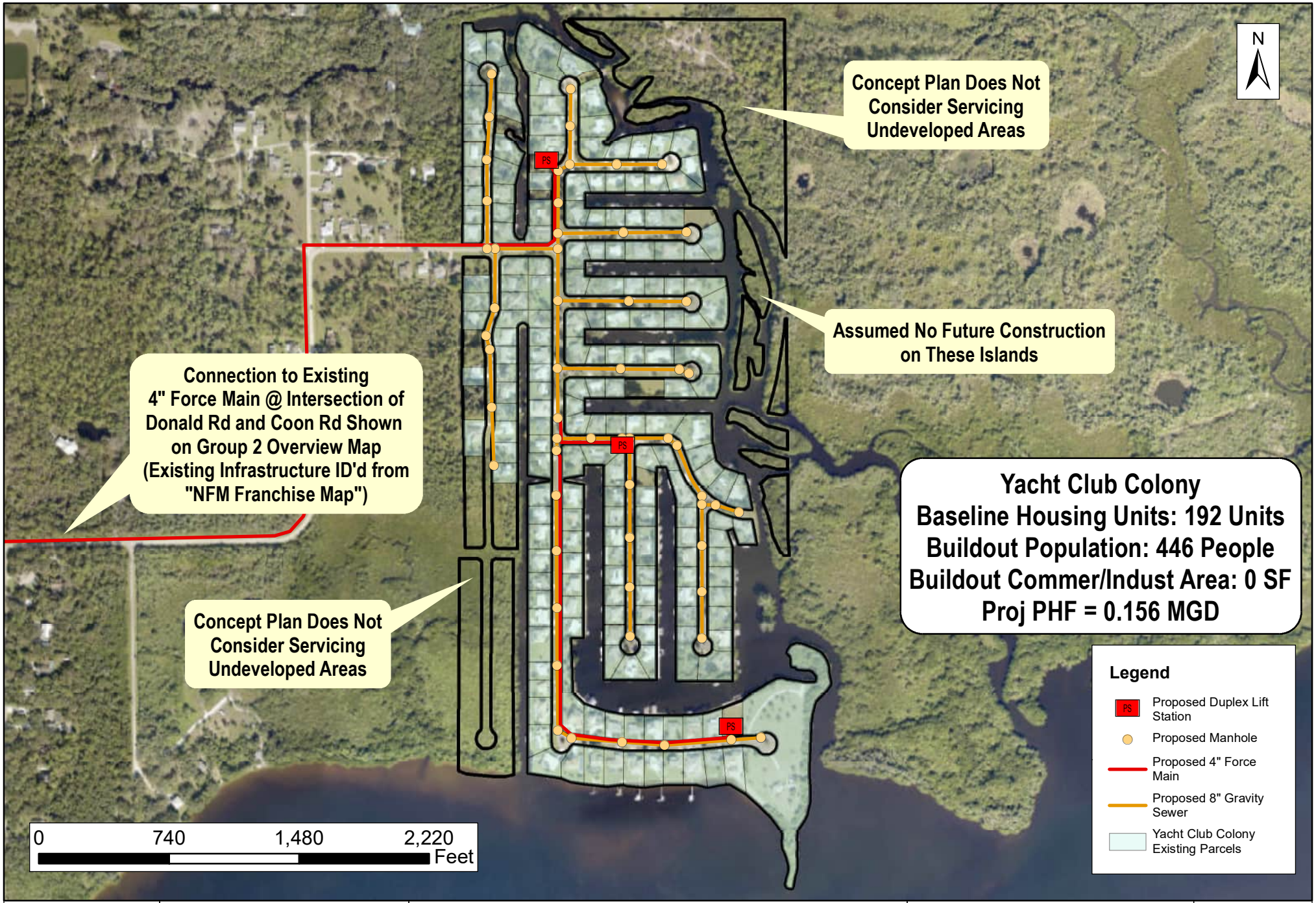
Site Name, Group #	Orange River, Group 1		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	3,640	$95	$345,800
4" Force Main (LF)	1,710	$70	$119,700
4" Plug Valve (EA)	3	$3,000	$9,000
4' Manhole (EA)	22	$11,500	$253,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	61	$2,660	$162,260
Septic Tank Abandonment Permit and Demo (EA)	61	$4,000	$244,000
Duplex Lift Station (EA)	1	$460,000	$460,000
Road Restoration (LF @ 20' Width)	3,640	$160	$582,400
Subtotal			$2,183,060
Mobilization and Demobilization (5%)			$109,153
Contingency (15%)			$343,832
Construction and Design Services (10%)			$263,604
Total			$2,899,649
Rounded Total			**$2,900,000**



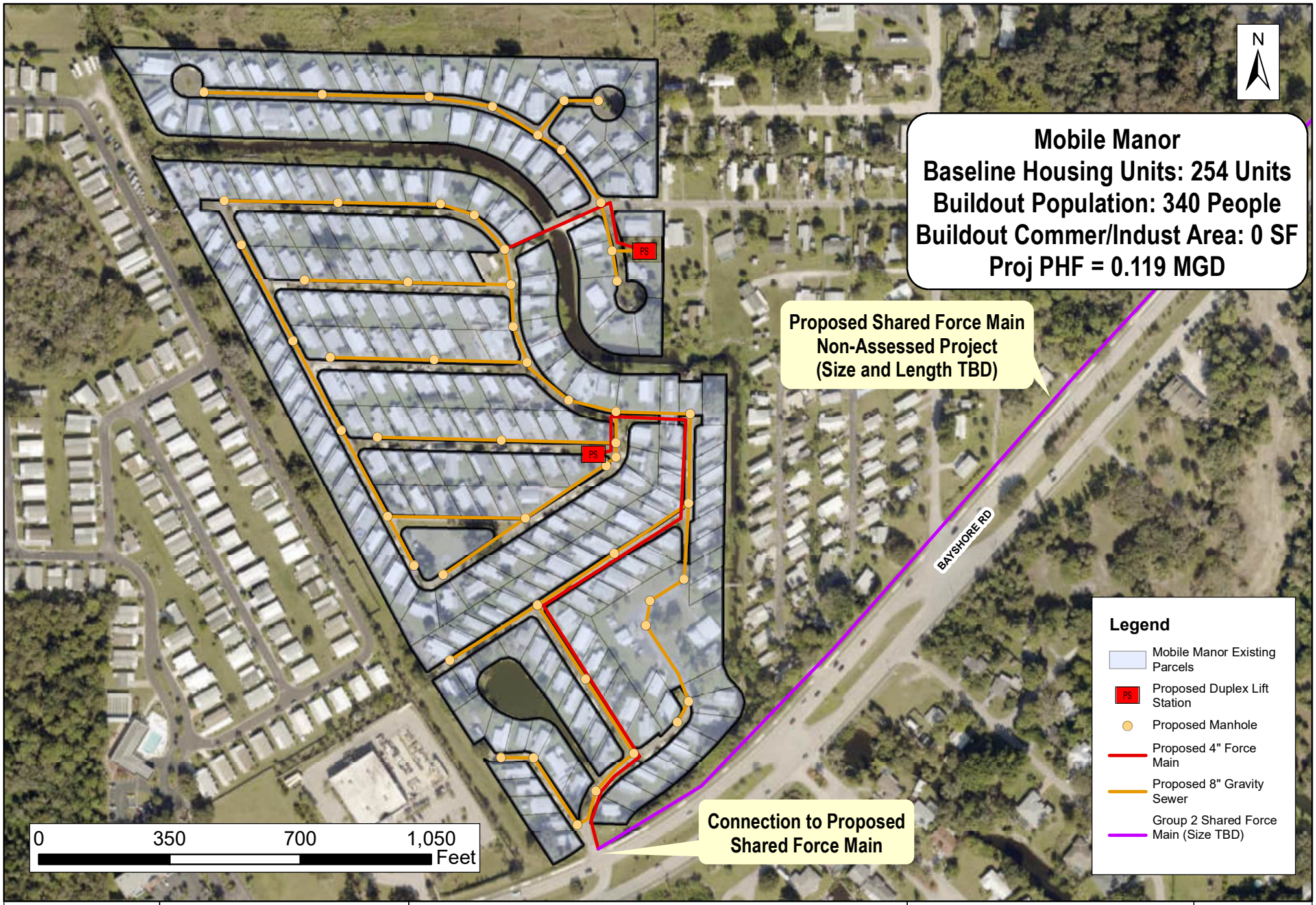
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	Countywide Wastewater Management Plan Priority Grouping #2 Areas Overview Map Gravity Collection System Concept Plan	AECOM	Figure X



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Daughtrey Creek - Priority Grouping #2 Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	Countywide Wastewater Management Plan Yacht Club Colony - Priority Grouping #2 Gravity Collection System Concept Plan	AECOM	Figure X

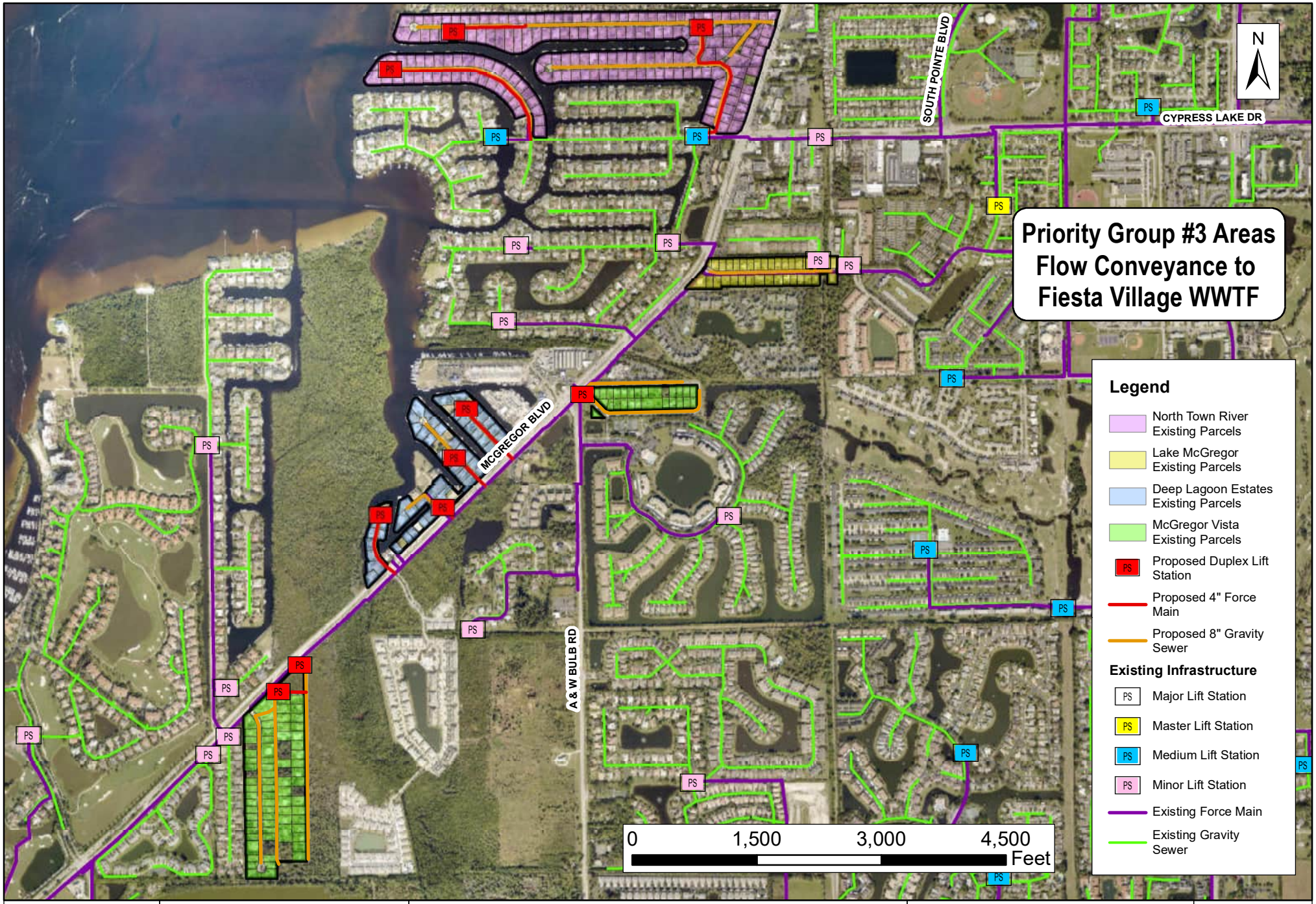


Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Mobile Manor - Priority Grouping #2** **Gravity Collection System Concept Plan**	AECOM	**Figure** **X**

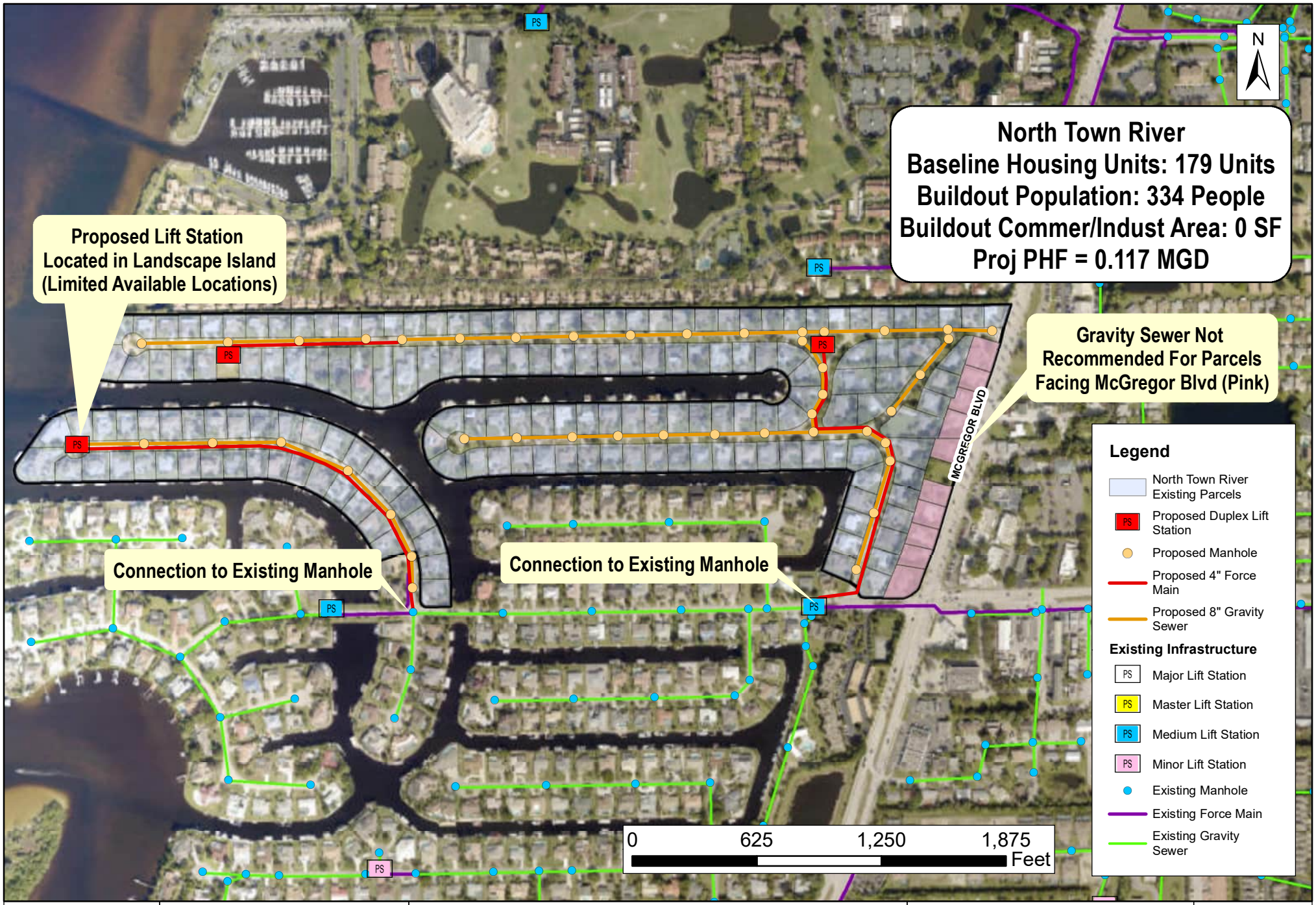
Site Name, Group #	Daughtreys Creek, Group 2		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	10,835	$95	$1,029,325
4" Force Main (LF)	5,025	$70	$351,750
4" Plug Valve (EA)	5	$3,000	$15,000
4' Manhole (EA)	54	$11,500	$621,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	158	$2,660	$420,280
Septic Tank Abandonment Permit and Demo (EA)	158	$4,000	$632,000
Duplex Lift Station (EA)	2	$460,000	$920,000
Road Restoration (LF @ 20' Width)	10,835	$160	$1,733,600
Subtotal			$5,729,855
Mobilization and Demobilization (5%)			$286,493
Contingency (15%)			$902,452
Construction and Design Services (10%)			$691,880
Total			$7,610,680
Rounded Total			**$7,620,000**

Site Name, Group #	Yacht Club Colony, Group 2		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	11,800	$95	$1,121,000
4" Force Main (LF)	10,030	$70	$702,100
4" Plug Valve (EA)	9	$3,000	$27,000
4' Manhole (EA)	58	$11,500	$667,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	192	$2,660	$510,720
Septic Tank Abandonment Permit and Demo (EA)	192	$4,000	$768,000
Duplex Lift Station (EA)	3	$460,000	$1,380,000
Road Restoration (LF @ 20' Width)	11,800	$160	$1,888,000
Subtotal			$7,070,720
Mobilization and Demobilization (5%)			$353,536
Contingency (15%)			$1,113,638
Construction and Design Services (10%)			$853,789
Total			$9,391,684
Rounded Total			**$9,400,000**

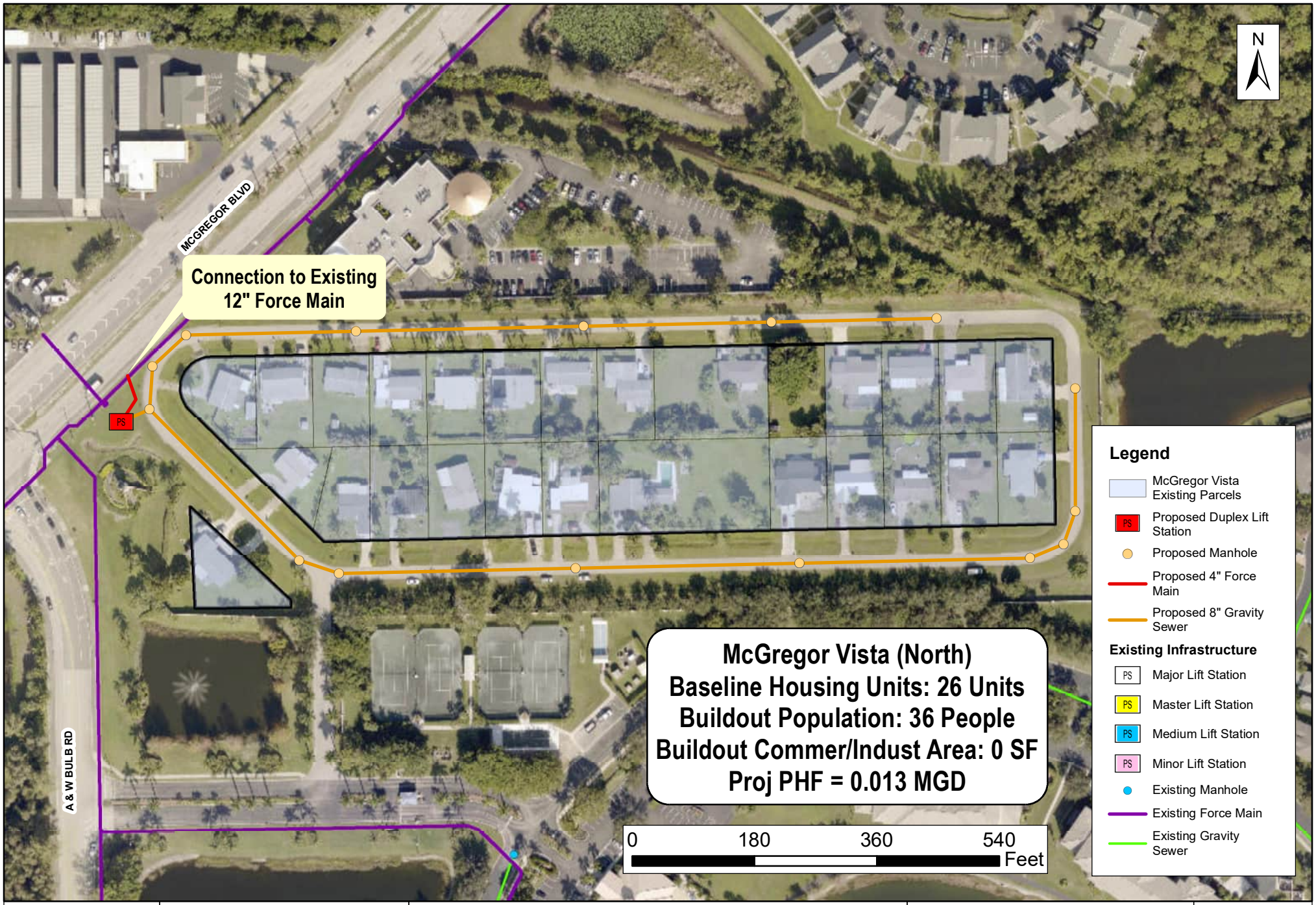
Site Name, Group #	Mobile Manor, Group 2		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	8,710	$95	$827,450
4" Force Main (LF)	2,060	$70	$144,200
4" Plug Valve (EA)	3	$3,000	$9,000
4' Manhole (EA)	53	$11,500	$609,500
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	254	$2,660	$675,640
Septic Tank Abandonment Permit and Demo (EA)	254	$4,000	$1,016,000
Duplex Lift Station (EA)	2	$460,000	$920,000
Road Restoration (LF @ 20' Width)	8,710	$160	$1,393,600
Subtotal			$5,602,290
Mobilization and Demobilization (5%)			$280,115
Contingency (15%)			$882,361
Construction and Design Services (10%)			$676,477
Total			$7,441,242
Rounded Total			**$7,450,000**



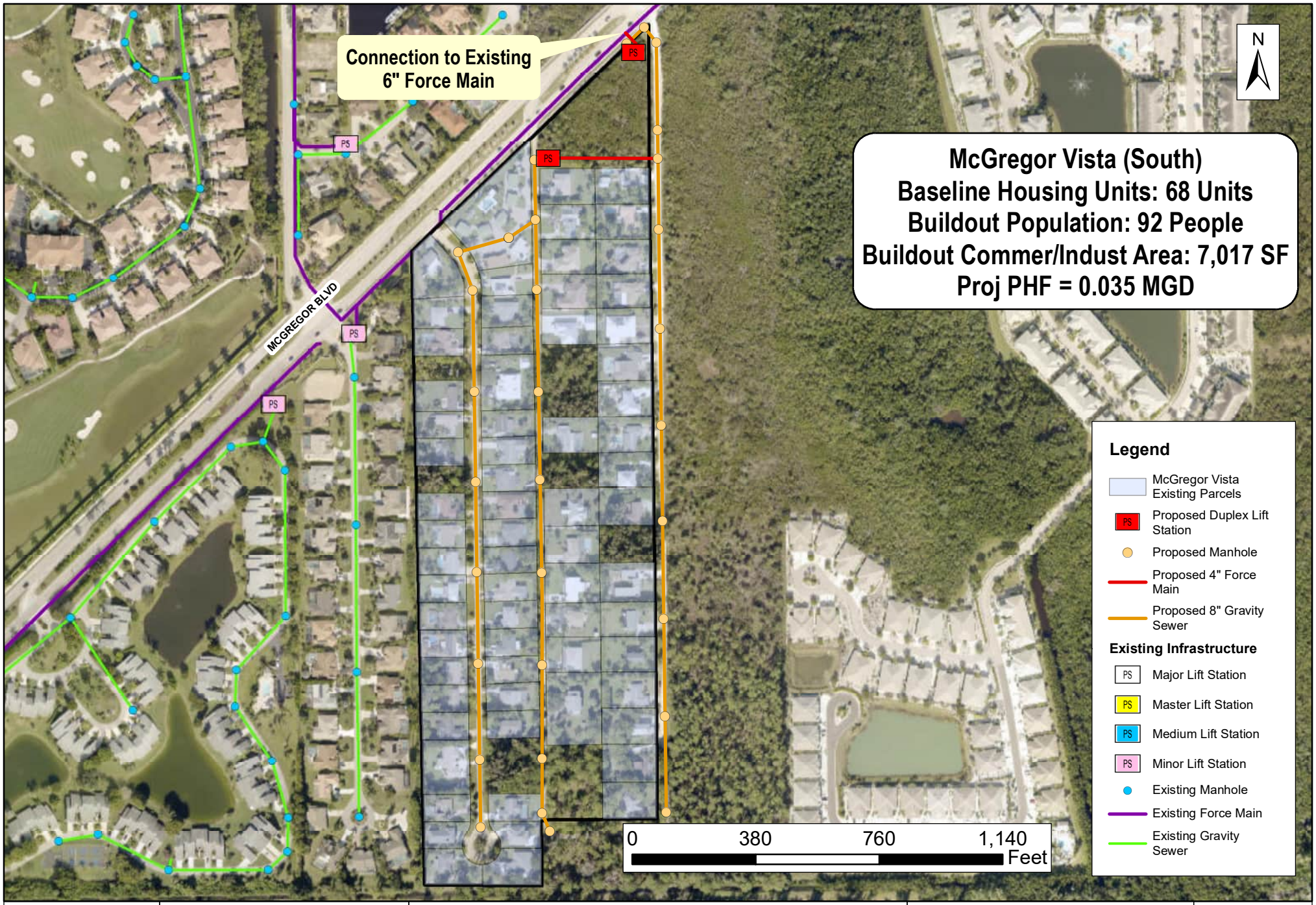
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Priority Grouping #3 Areas Overview Map** **Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



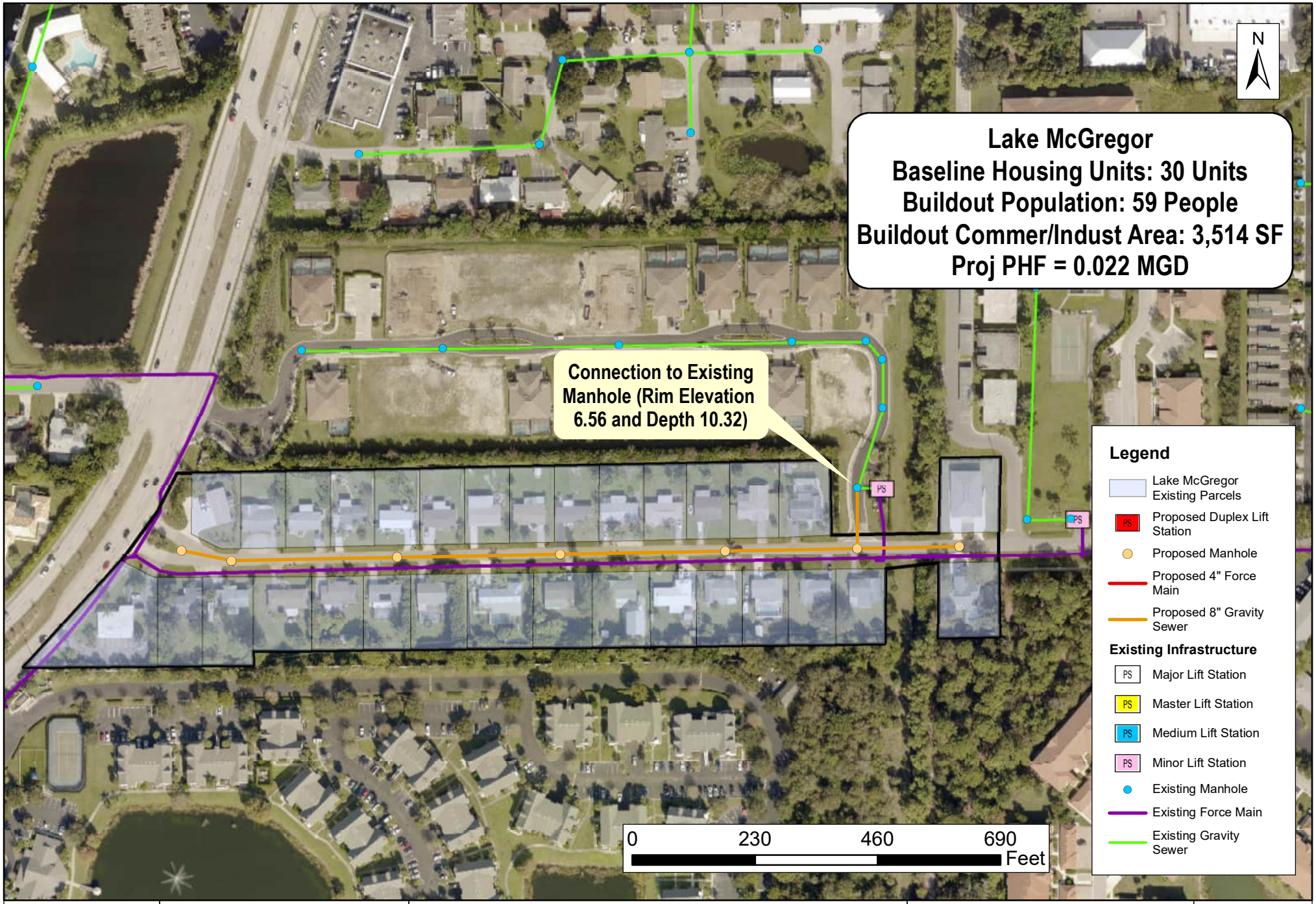
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **North Town River - Priority Grouping #3** **Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



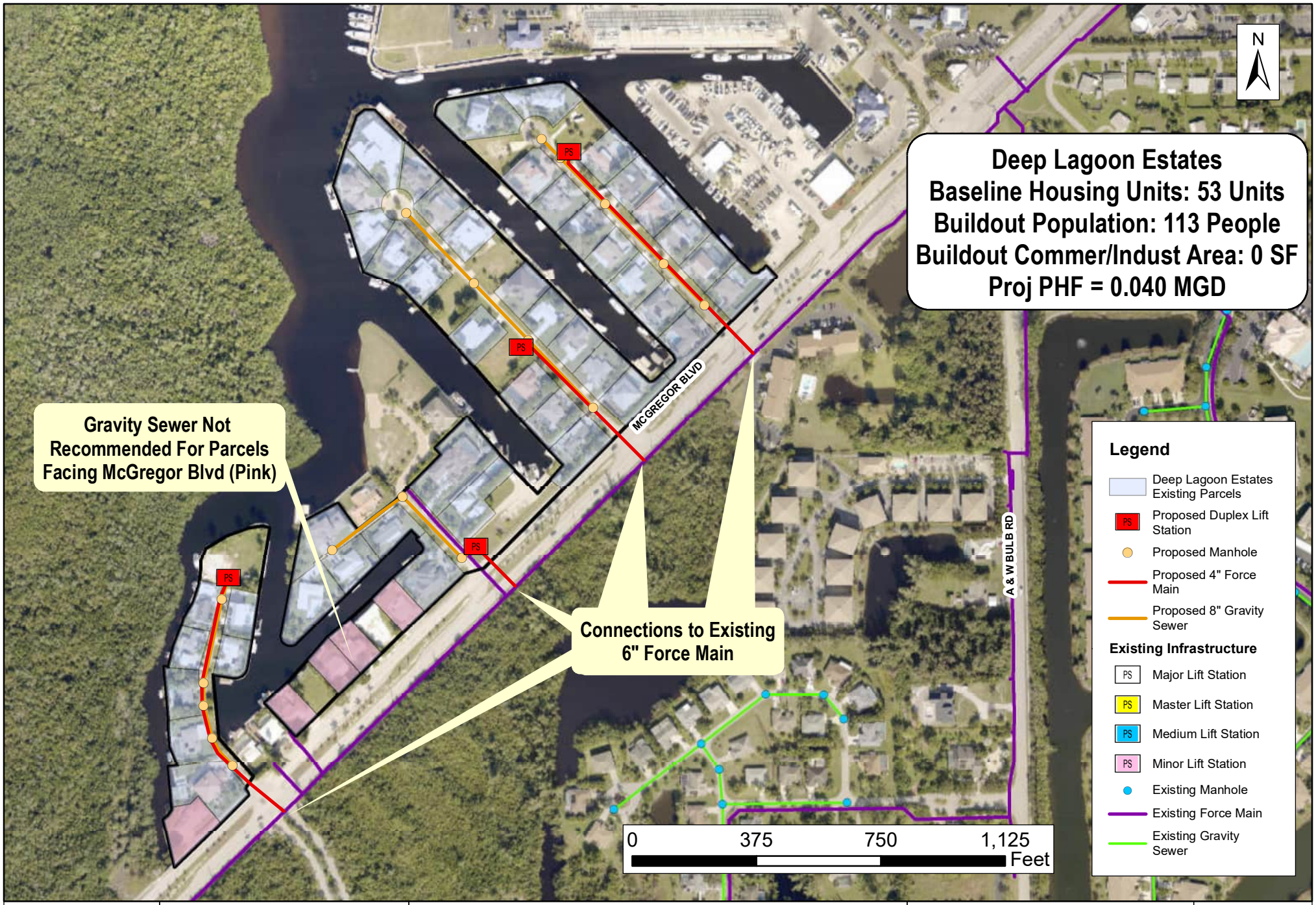
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **McGregor Vista (North) - Priority Grouping #3 Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



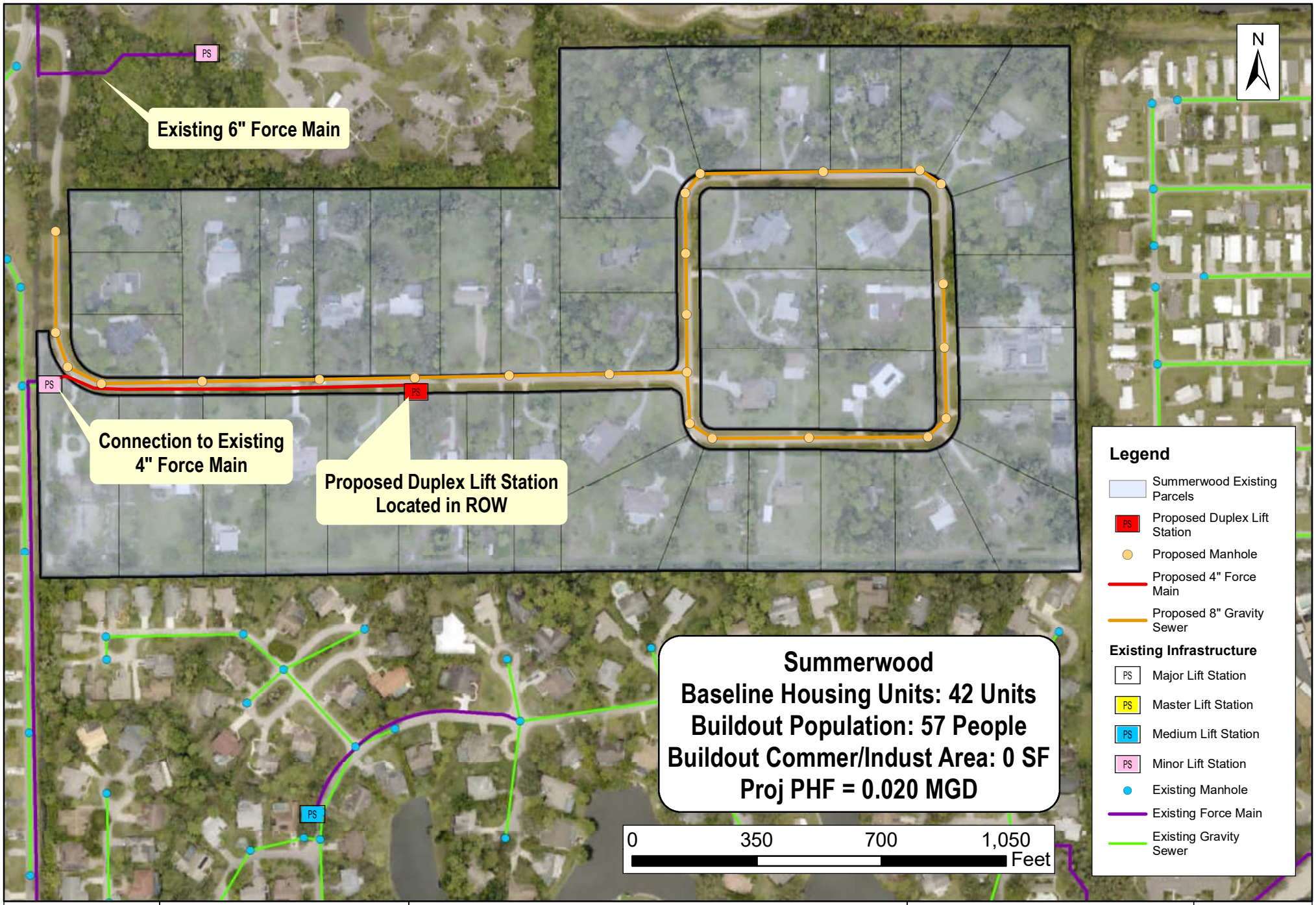
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **McGregor Vista (South) - Priority Grouping #3 Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Lake McGregor - Priority Grouping #3 Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Deep Lagoon Estates - Priority Grouping #3 Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Summerwood - Priority Grouping #3 Gravity Collection System Concept Plan**	AECOM	**Figure** **X**

Site Name, Group #	Deep Lagoon Estates, Group 3		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	2,465	$95	$234,175
4" Force Main (LF)	2,075	$70	$145,250
4x10" Forcemain w Casing - HDD under Road (LF)	600	$1,380	$828,000
4' Manhole (EA)	17	$11,500	$195,500
Above Ground Air Release Valve Assembly (EA)	8	$11,500	$92,000
Connection to Existing Infrastructure (LS)	4	$6,900	$27,600
Service Connections (EA)	53	$2,660	$140,980
Septic Tank Abandonment Permit and Demo (EA)	53	$4,000	$212,000
Duplex Lift Station (EA)	4	$460,000	$1,840,000
Road Restoration (LF @ 20' Width)	2,465	$160	$394,400
Subtotal			$4,109,905
Mobilization and Demobilization (5%)			$205,495
Contingency (15%)			$647,310
Construction and Design Services (10%)			$496,271
Total			$5,458,981
Rounded Total			**$5,460,000**

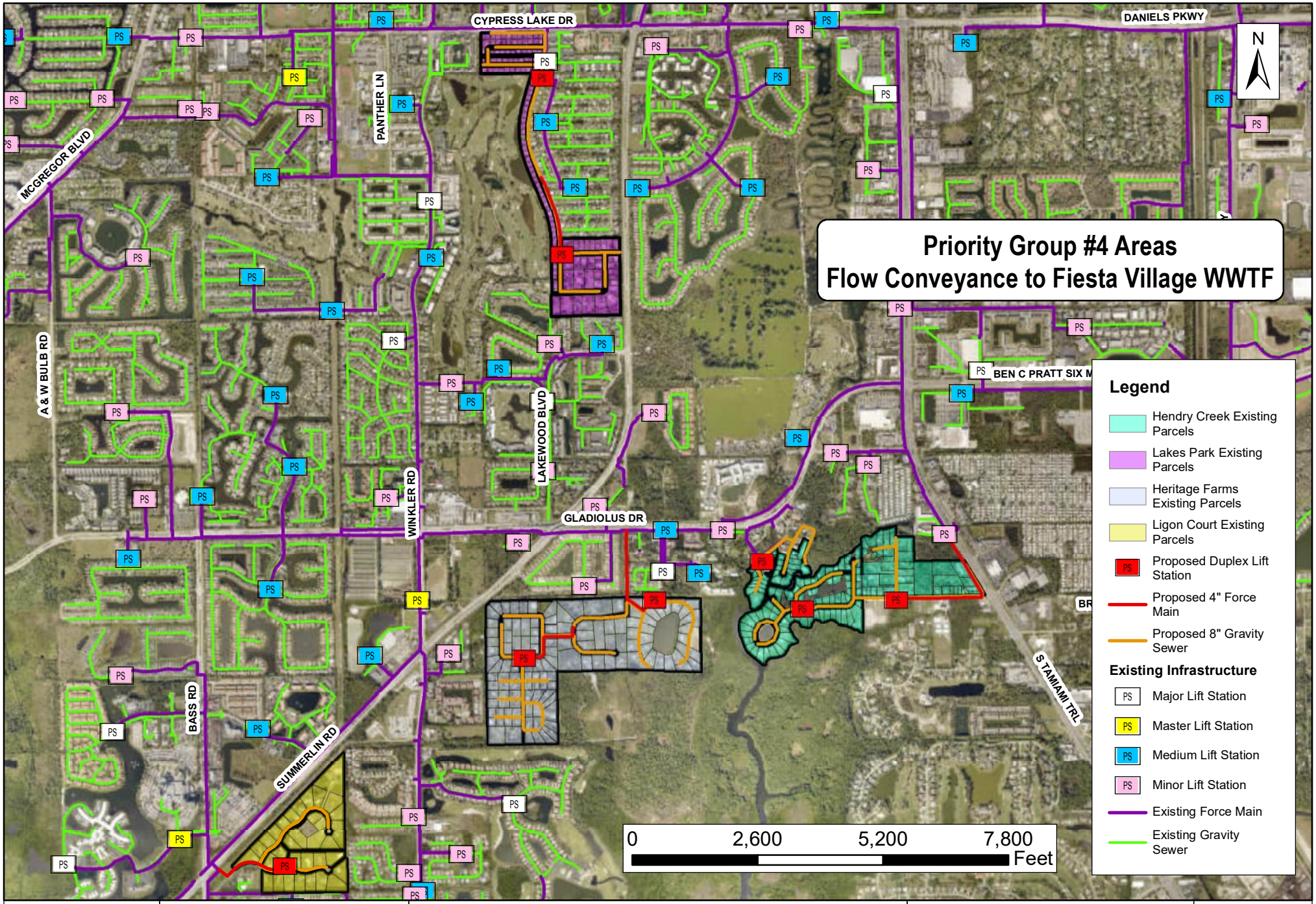
Site Name, Group #	Lake McGregor, Group 3		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	1,410	$95	$133,950
4' Manhole (EA)	7	$11,500	$80,500
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	30	$2,660	$79,800
Septic Tank Abandonment Permit and Demo (EA)	30	$4,000	$120,000
Road Restoration (LF @ 20' Width)	1,410	$160	$225,600
Subtotal			$646,750
Mobilization and Demobilization (5%)			$32,338
Contingency (15%)			$101,863
Construction and Design Services (10%)			$78,095
Total			$859,046
Rounded Total			**$860,000**

Site Name, Group #	McGregor Vista (North), Group 3		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	2,650	$95	$251,750
4" Force Main (LF)	70	$70	$4,900
4" Plug Valve (EA)	2	$3,000	$6,000
4' Manhole (EA)	15	$11,500	$172,500
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	26	$2,660	$69,160
Septic Tank Abandonment Permit and Demo (EA)	26	$4,000	$104,000
Duplex Lift Station (EA)	1	$460,000	$460,000
Road Restoration (LF @ 20' Width)	2,650	$160	$424,000
Subtotal			$1,499,210
Mobilization and Demobilization (5%)			$74,961
Contingency (15%)			$236,126
Construction and Design Services (10%)			$181,030
Total			$1,991,326
Rounded Total			**$2,000,000**

Site Name, Group #	McGregor Vista (South), Group 3		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	5,960	$95	$566,200
4" Force Main (LF)	370	$70	$25,900
4" Plug Valve (EA)	2	$3,000	$6,000
4' Manhole (EA)	32	$11,500	$368,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	68	$2,660	$180,880
Septic Tank Abandonment Permit and Demo (EA)	68	$4,000	$272,000
Duplex Lift Station (EA)	2	$460,000	$920,000
Road Restoration (LF @ 20' Width)	5,960	$160	$953,600
Subtotal			$3,299,480
Mobilization and Demobilization (5%)			$164,974
Contingency (15%)			$519,668
Construction and Design Services (10%)			$398,412
Total			$4,382,534
Rounded Total			**$4,390,000**

Site Name, Group #	North Town River, Group 3		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	9,090	$95	$863,550
4" Force Main (LF)	4,415	$70	$309,050
4" Plug Valve (EA)	6	$3,000	$18,000
4' Manhole (EA)	44	$11,500	$506,000
Connection to Existing Infrastructure (LS)	2	$6,900	$13,800
Service Connections (EA)	179	$2,660	$476,140
Septic Tank Abandonment Permit and Demo (EA)	179	$4,000	$716,000
Duplex Lift Station (EA)	3	$460,000	$1,380,000
Road Restoration (LF @ 20' Width)	9,090	$160	$1,454,400
Subtotal			$5,736,940
Mobilization and Demobilization (5%)			$286,847
Contingency (15%)			$903,568
Construction and Design Services (10%)			$692,736
Total			$7,620,091
Rounded Total			**$7,630,000**

Site Name, Group #	Summerwood, Group 3		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	4,210	$95	$399,950
4" Force Main (LF)	935	$70	$65,450
4" Plug Valve (EA)	2	$3,000	$6,000
4' Manhole (EA)	24	$11,500	$276,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	42	$2,660	$111,720
Septic Tank Abandonment Permit and Demo (EA)	42	$4,000	$168,000
Duplex Lift Station (EA)	1	$460,000	$460,000
Road Restoration (LF @ 20' Width)	4,210	$160	$673,600
Subtotal			$2,167,620
Mobilization and Demobilization (5%)			$108,381
Contingency (15%)			$341,400
Construction and Design Services (10%)			$261,740
Total			$2,879,141
Rounded Total			**$2,880,000**



Date Created:
June 2022

LEE COUNTY
SOUTHWEST FLORIDA

Countywide Wastewater Management Plan

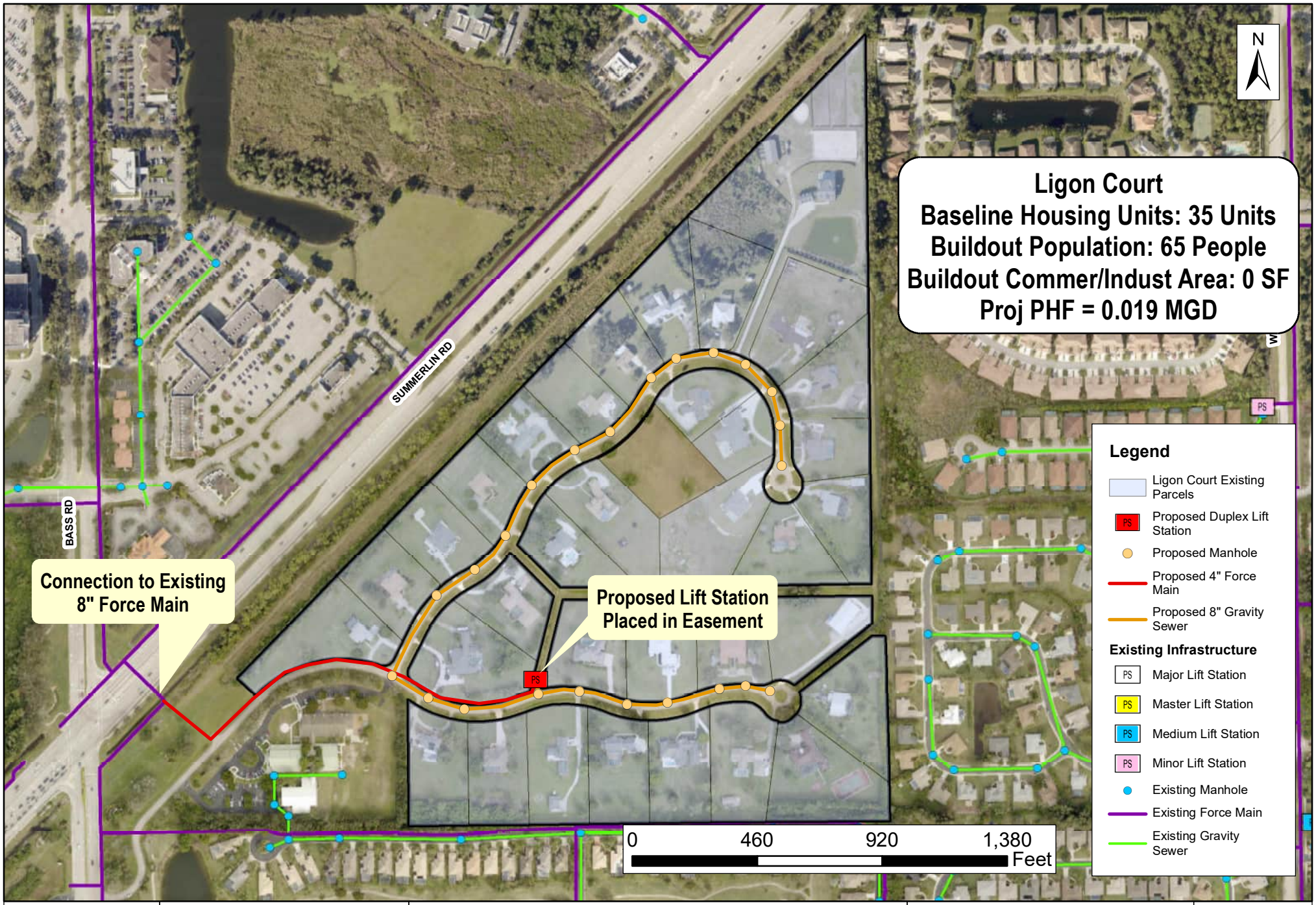
Priority Grouping #4 Area Overview Map
Gravity Collection System Concept Plan

AECOM

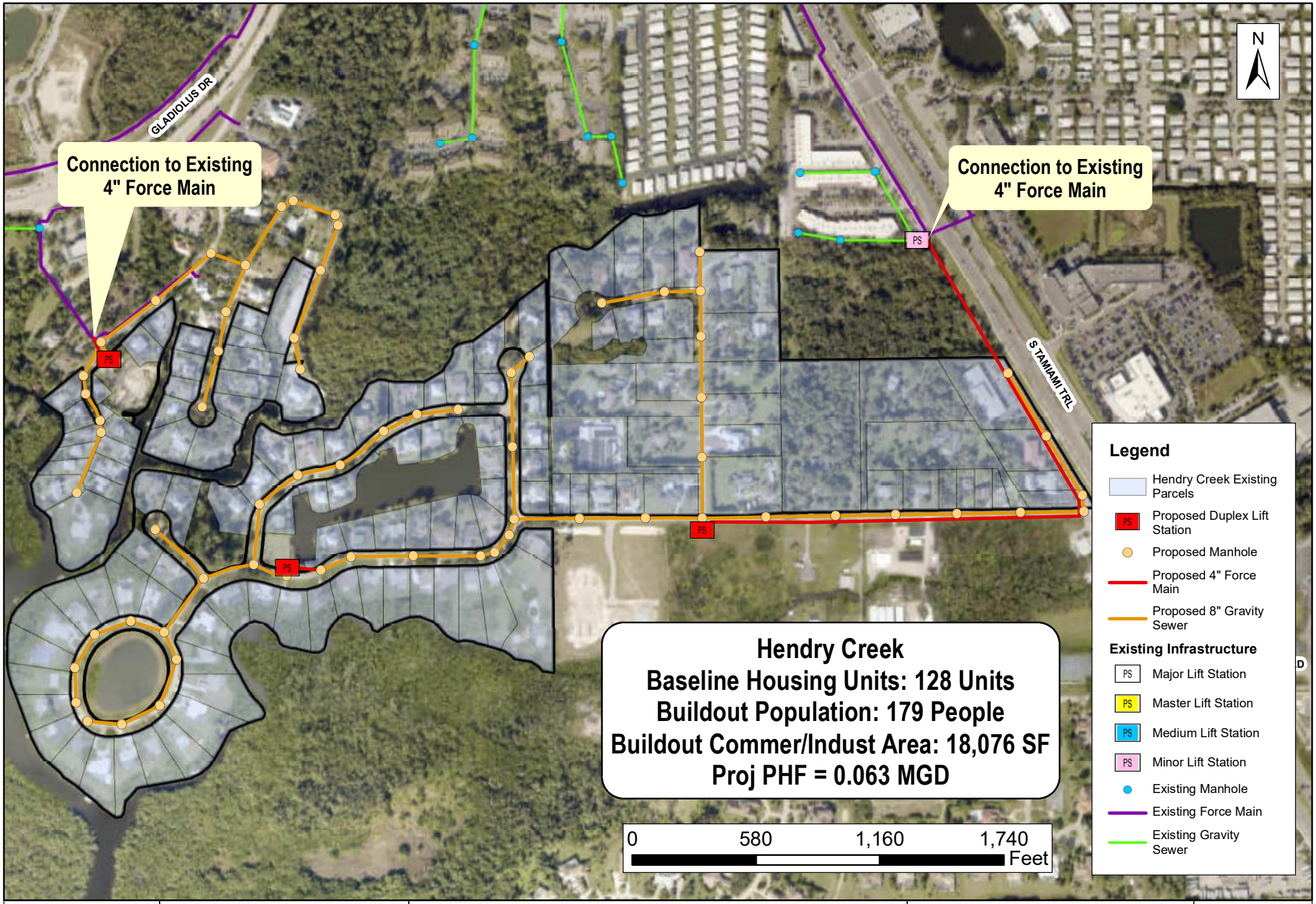
Figure

X

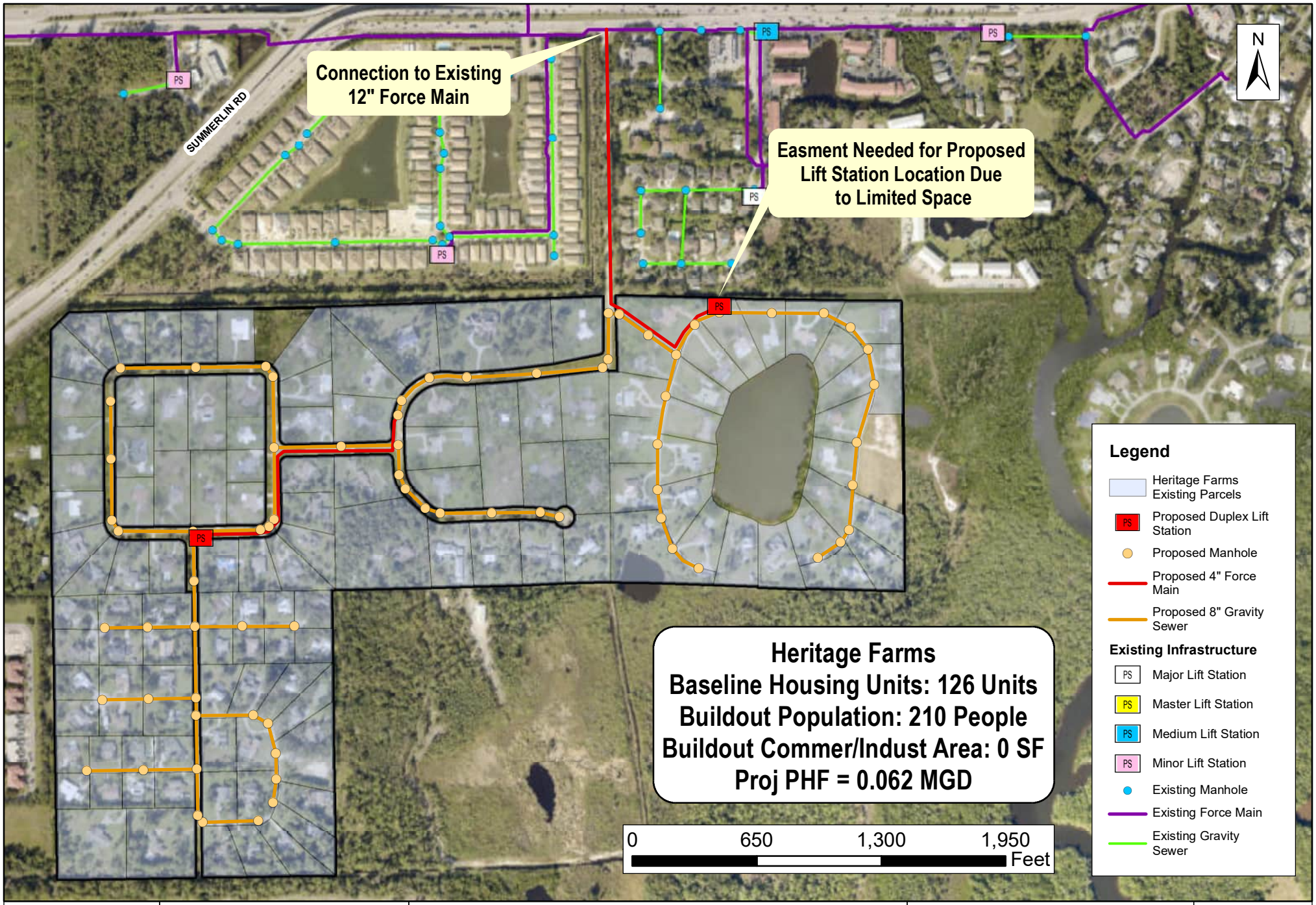
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Lakes Park - Priority Grouping #4** **Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Ligon Court - Priority Grouping #4** **Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Hendry Creek - Priority Grouping #4 Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created:
June 2022

LEE COUNTY
SOUTHWEST FLORIDA

Countywide Wastewater Management Plan

Heritage Farms - Priority Grouping #4
Gravity Collection System Concept Plan

AECOM

Figure

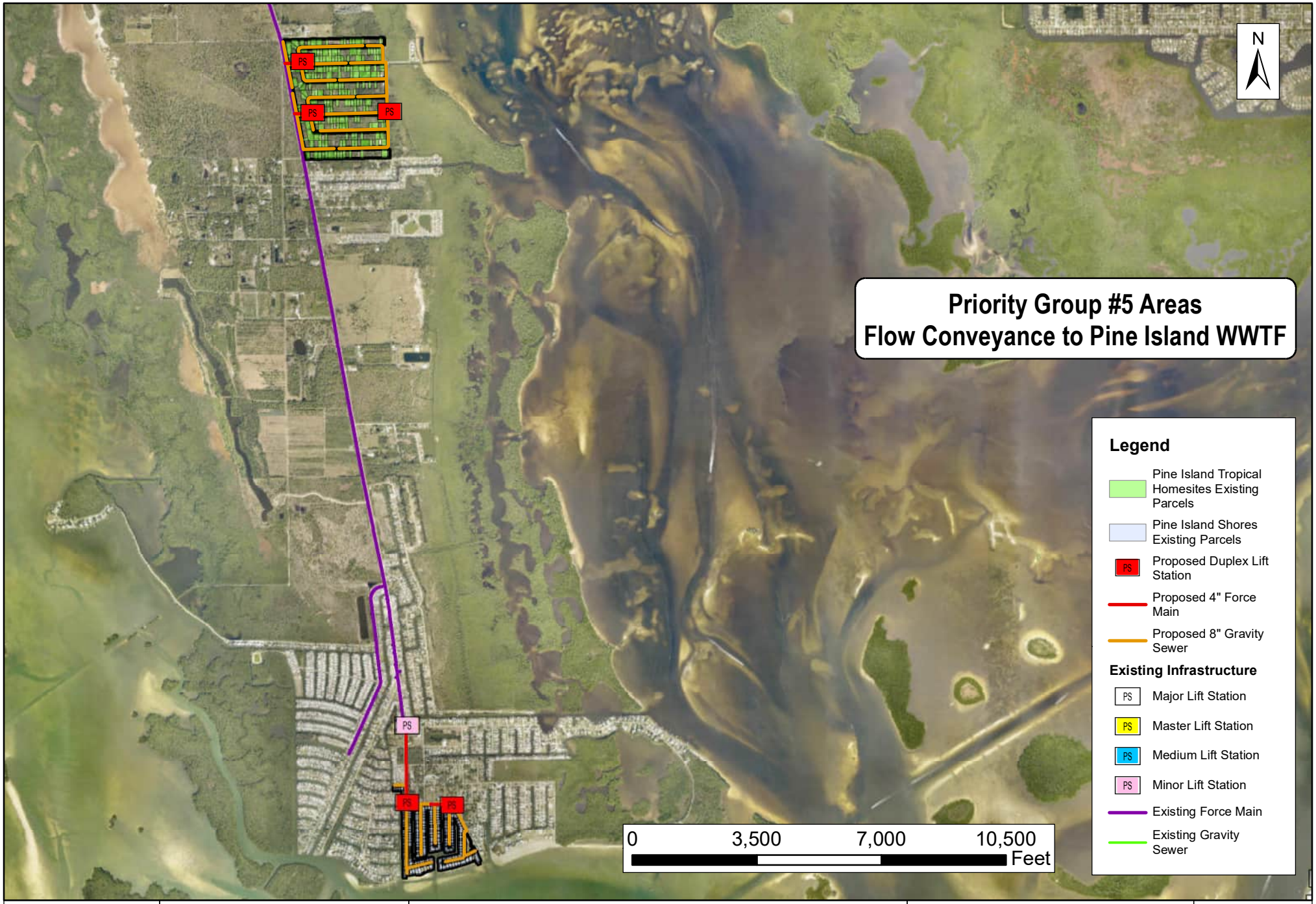
X

Site Name, Group #	Hendry Creek, Group 4		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	13,010	$95	$1,235,950
4" Force Main (LF)	3,200	$70	$224,000
4" Plug Valve (EA)	5	$3,000	$15,000
4' Manhole (EA)	67	$11,500	$770,500
Connection to Existing Infrastructure (LS)	2	$6,900	$13,800
Service Connections (EA)	128	$2,660	$340,480
Septic Tank Abandonment Permit and Demo (EA)	128	$4,000	$512,000
Duplex Lift Station (EA)	3	$460,000	$1,380,000
Road Restoration (LF @ 20' Width)	13,010	$160	$2,081,600
Subtotal			$6,573,330
Mobilization and Demobilization (5%)			$328,667
Contingency (15%)			$1,035,299
Construction and Design Services (10%)			$793,730
Total			$8,731,026
Rounded Total			**$8,740,000**

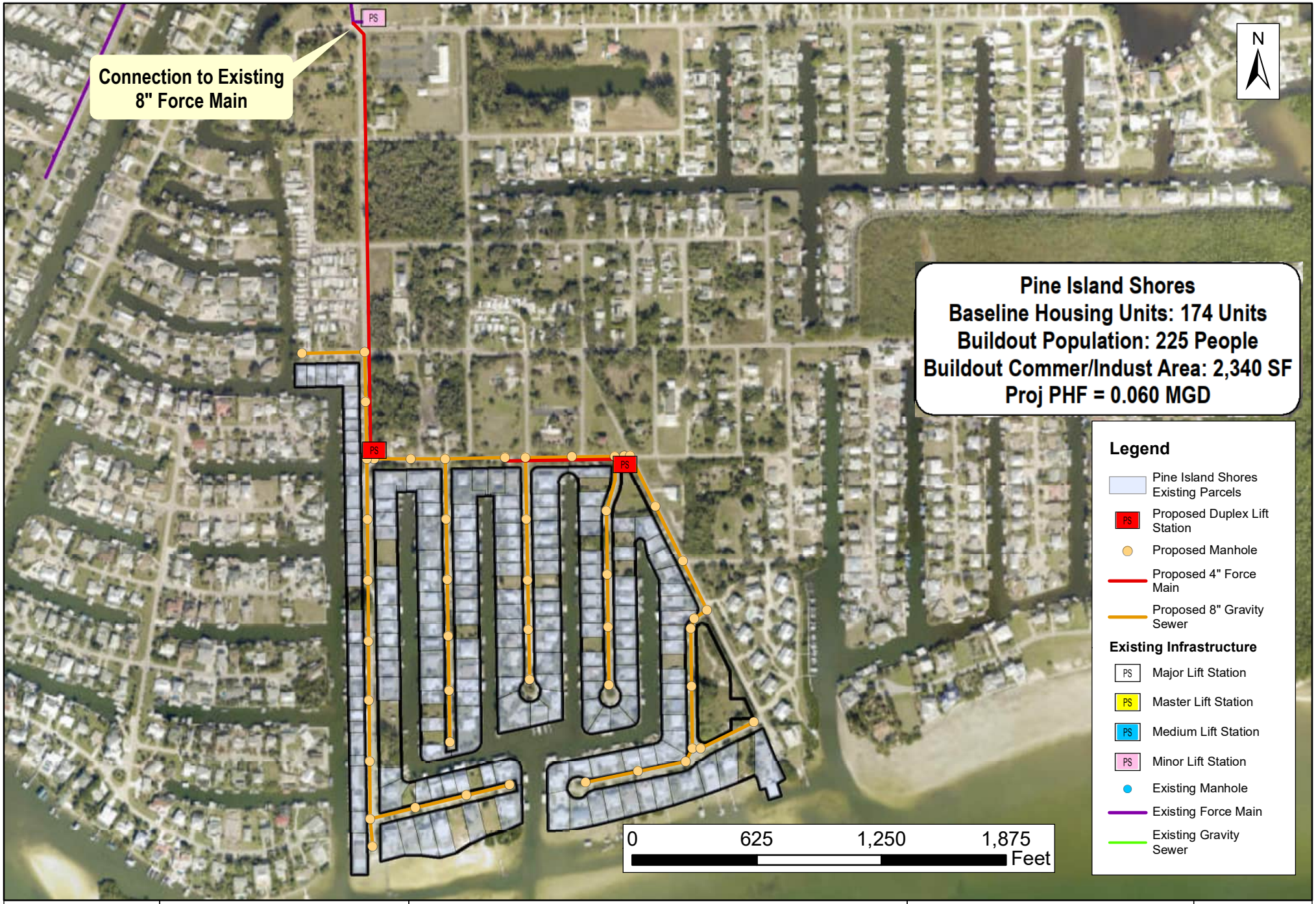
Site Name, Group #	Heritage Farms, Group 4		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	13,440	$95	$1,276,800
4" Force Main (LF)	3,330	$70	$233,100
4" Plug Valve (EA)	4	$3,000	$12,000
4' Manhole (EA)	73	$11,500	$839,500
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	126	$2,660	$335,160
Septic Tank Abandonment Permit and Demo (EA)	126	$4,000	$504,000
Duplex Lift Station (EA)	2	$460,000	$920,000
Road Restoration (LF @ 20' Width)	13,440	$160	$2,150,400
Subtotal			$6,277,860
Mobilization and Demobilization (5%)			$313,893
Contingency (15%)			$988,763
Construction and Design Services (10%)			$758,052
Total			$8,338,568
Rounded Total			**$8,340,000**

Site Name, Group #	Lakes Park, Group 4		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	10,610	$95	$1,007,950
4" Force Main (LF)	1,585	$70	$110,950
4" Plug Valve (EA)	4	$3,000	$12,000
4' Manhole (EA)	46	$11,500	$529,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	125	$2,660	$332,500
Septic Tank Abandonment Permit and Demo (EA)	125	$4,000	$500,000
Duplex Lift Station (EA)	2	$460,000	$920,000
Road Restoration (LF @ 20' Width)	10,610	$160	$1,697,600
Subtotal			$5,116,900
Mobilization and Demobilization (5%)			$255,845
Contingency (15%)			$805,912
Construction and Design Services (10%)			$617,866
Total			$6,796,522
Rounded Total			**$6,800,000**

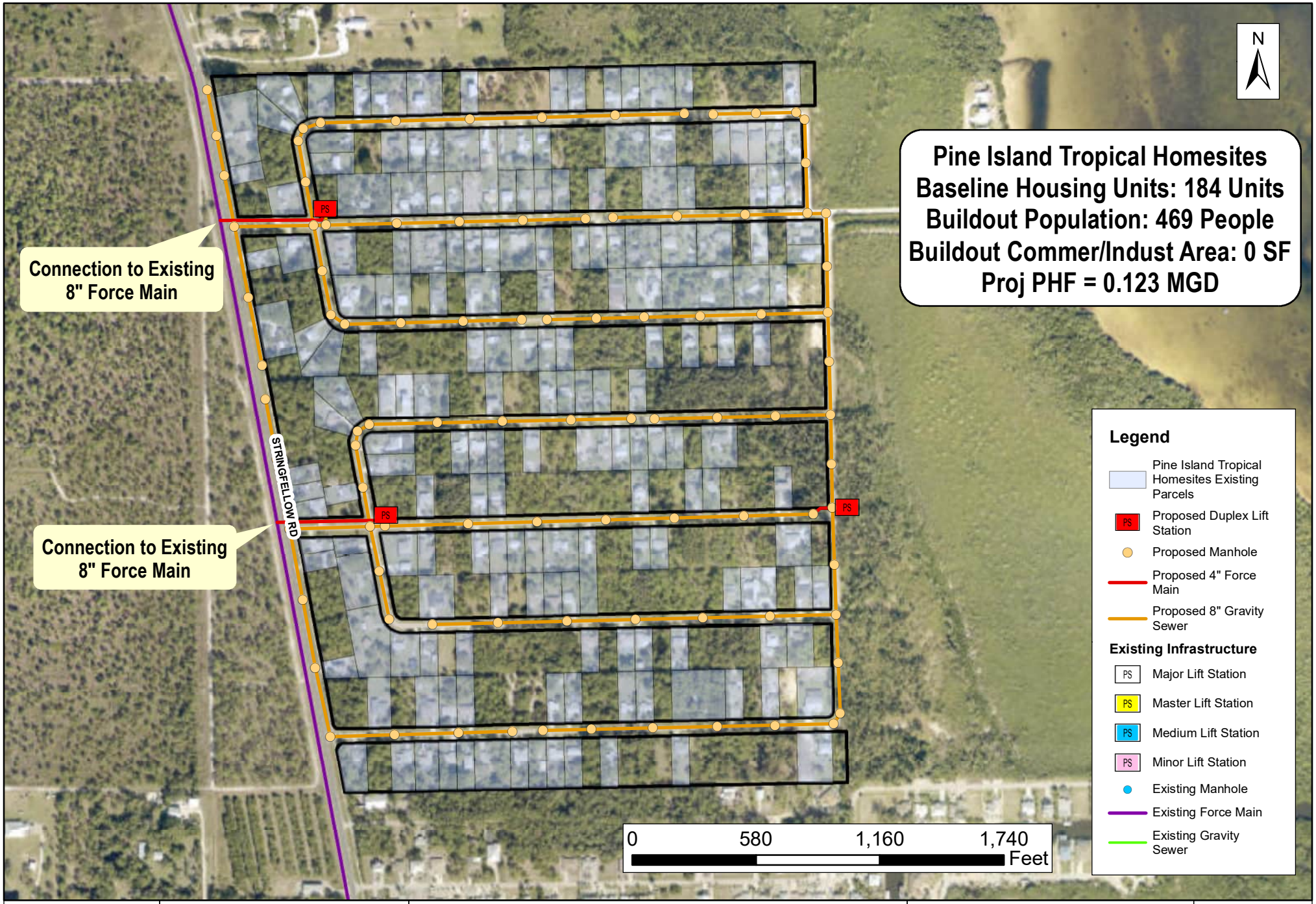
Site Name, Group #	Ligon Court, Group 4		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	3,390	$95	$322,050
4" Force Main (LF)	1,430	$70	$100,100
4" Plug Valve (EA)	2	$3,000	$6,000
4' Manhole (EA)	32	$11,500	$368,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	35	$2,660	$93,100
Septic Tank Abandonment Permit and Demo (EA)	35	$4,000	$140,000
Duplex Lift Station (EA)	1	$460,000	$460,000
Road Restoration (LF @ 20' Width)	3,390	$160	$542,400
Subtotal			$2,038,550
Mobilization and Demobilization (5%)			$101,928
Contingency (15%)			$321,072
Construction and Design Services (10%)			$246,155
Total			$2,707,704
Rounded Total			**$2,710,000**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Priority Grouping #5 Areas Overview Map** **Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



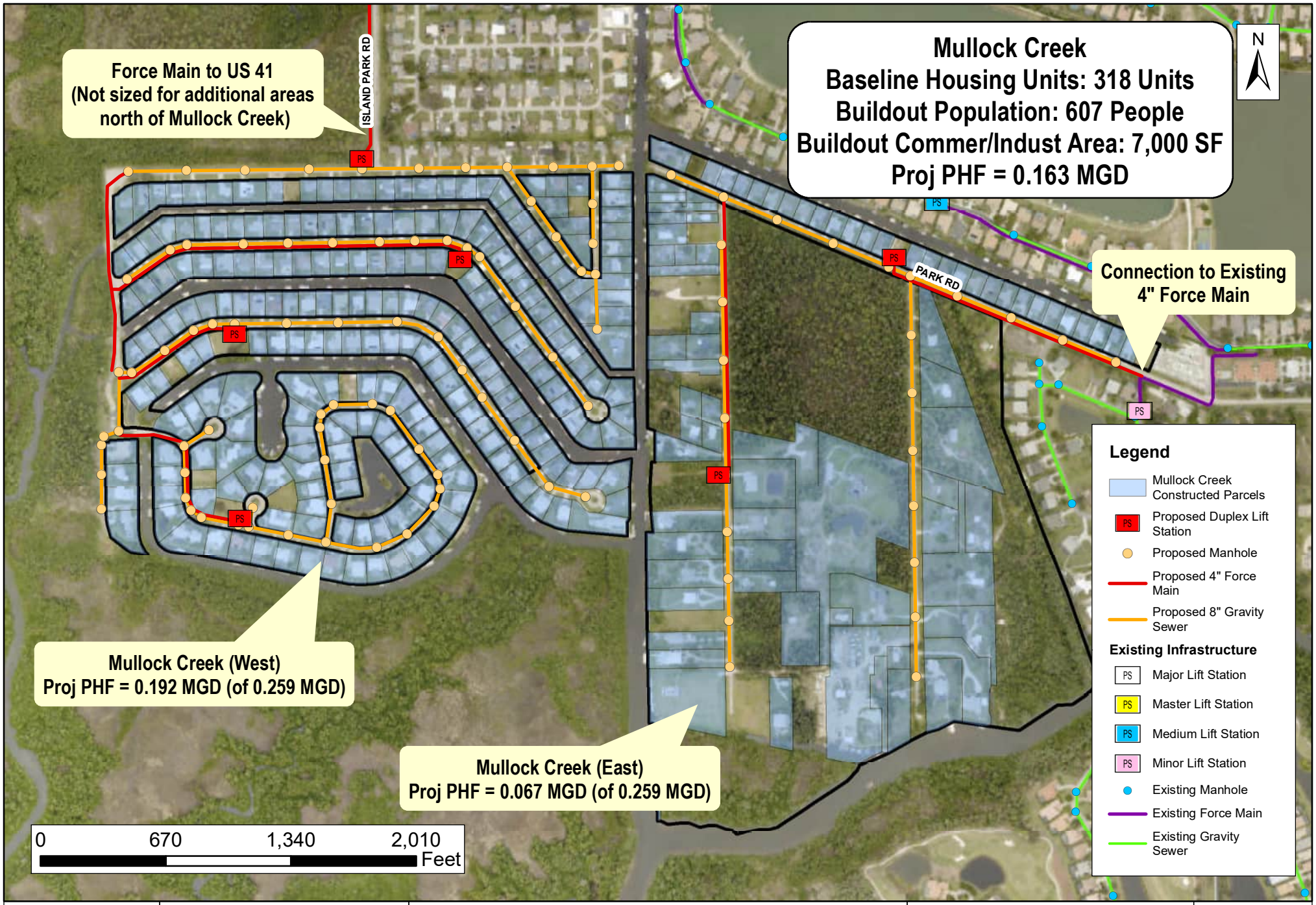
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Pine Island Shores - Priority Grouping #5 Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Pine Island Tropical Homesites - Priority Grouping #5 Gravity Collection System Concept Plan**	AECOM	**Figure** **X**

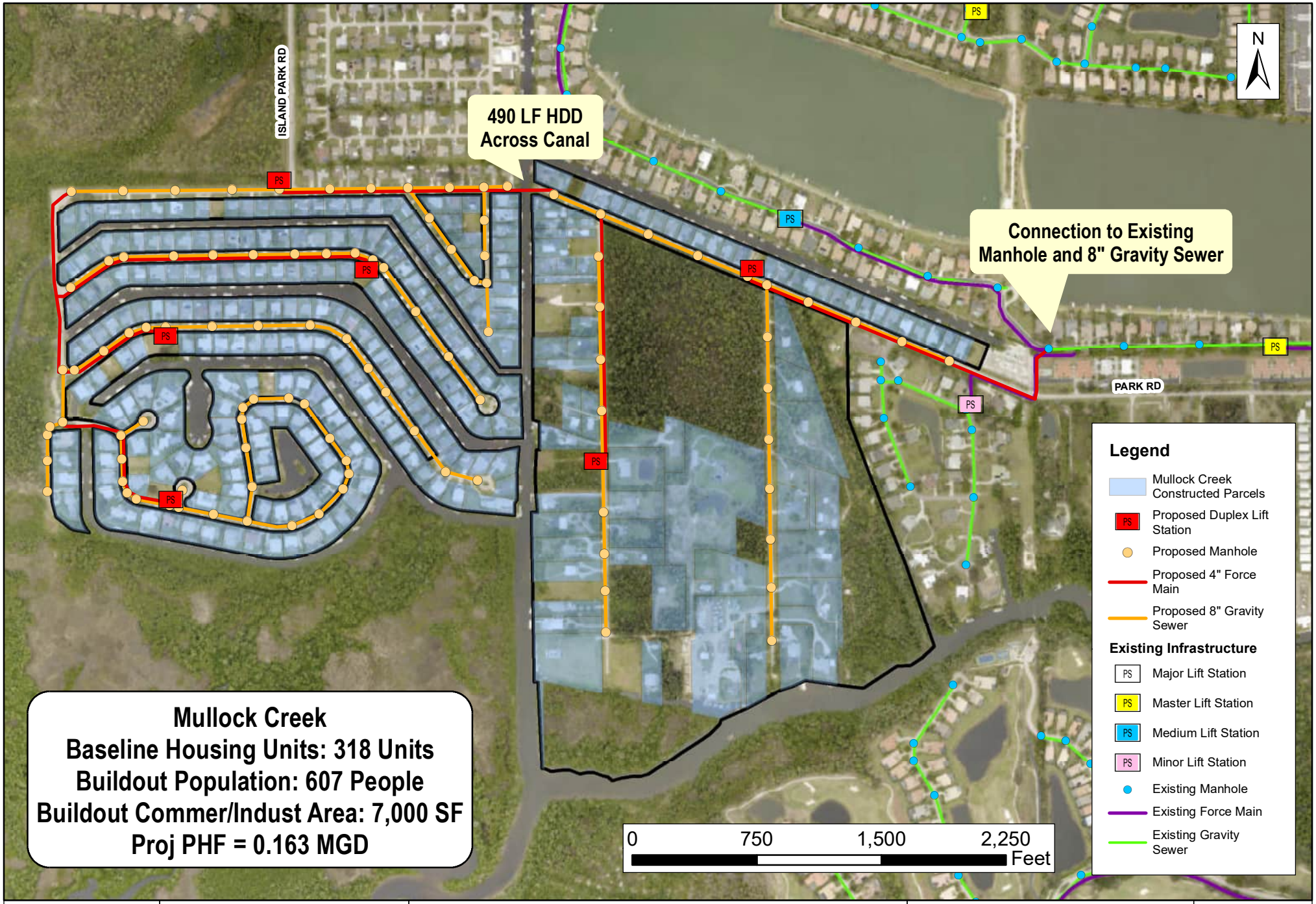
Site Name, Group #	Pine Island Tropical Homesites, Group 5		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	21,020	$95	$1,996,900
4" Force Main (LF)	1,100	$70	$77,000
4" Plug Valve (EA)	6	$3,000	$18,000
4' Manhole (EA)	94	$11,500	$1,081,000
Connection to Existing Infrastructure (LS)	2	$6,900	$13,800
Service Connections (EA)	184	$2,660	$489,440
Septic Tank Abandonment Permit and Demo (EA)	184	$4,000	$736,000
Duplex Lift Station (EA)	3	$460,000	$1,380,000
Road Restoration (LF @ 20' Width)	22,000	$160	$3,520,000
Subtotal			$9,312,140
Mobilization and Demobilization (5%)			$465,607
Contingency (15%)			$1,466,662
Construction and Design Services (10%)			$1,124,441
Total			$12,368,850
Rounded Total			**$12,370,000**

Site Name, Group #	Pine Island Shores, Group 5		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	9,850	$95	$935,750
4" Force Main (LF)	2,500	$70	$175,000
4" Plug Valve (EA)	5	$3,000	$15,000
4' Manhole (EA)	48	$11,500	$552,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	174	$2,660	$462,840
Septic Tank Abandonment Permit and Demo (EA)	174	$4,000	$696,000
Duplex Lift Station (EA)	2	$460,000	$920,000
Road Restoration (LF @ 20' Width)	9,850	$160	$1,576,000
Subtotal			$5,339,490
Mobilization and Demobilization (5%)			$266,975
Contingency (15%)			$840,970
Construction and Design Services (10%)			$644,743
Total			$7,092,178
Rounded Total			**$7,100,000**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Mullock Creek Alt 1 - Priority Grouping #6 Gravity Collection System Concept Plan**	AECOM	**Figure** **X**

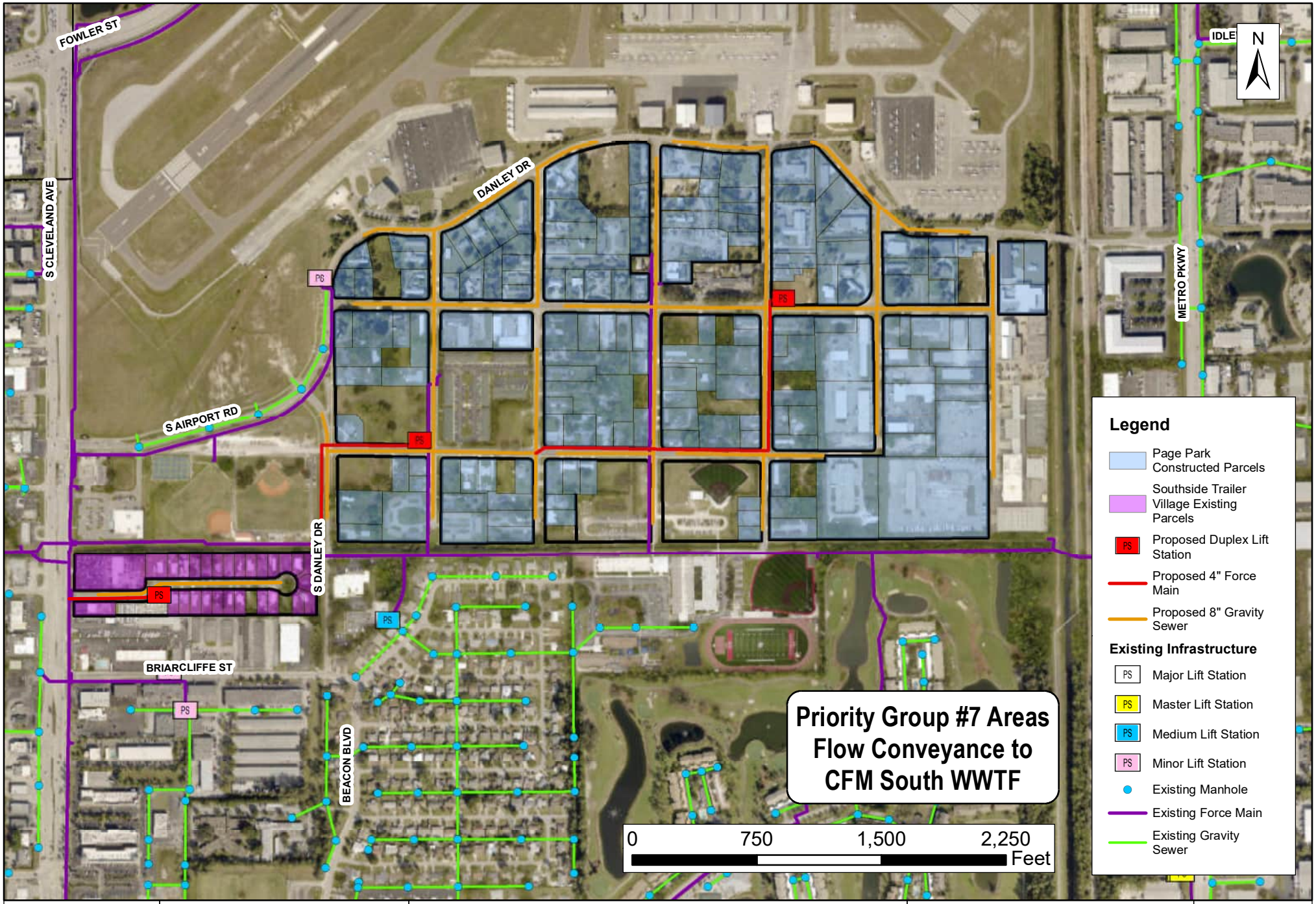
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Mullock Creek Alt 1 - Priority Grouping #6 Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



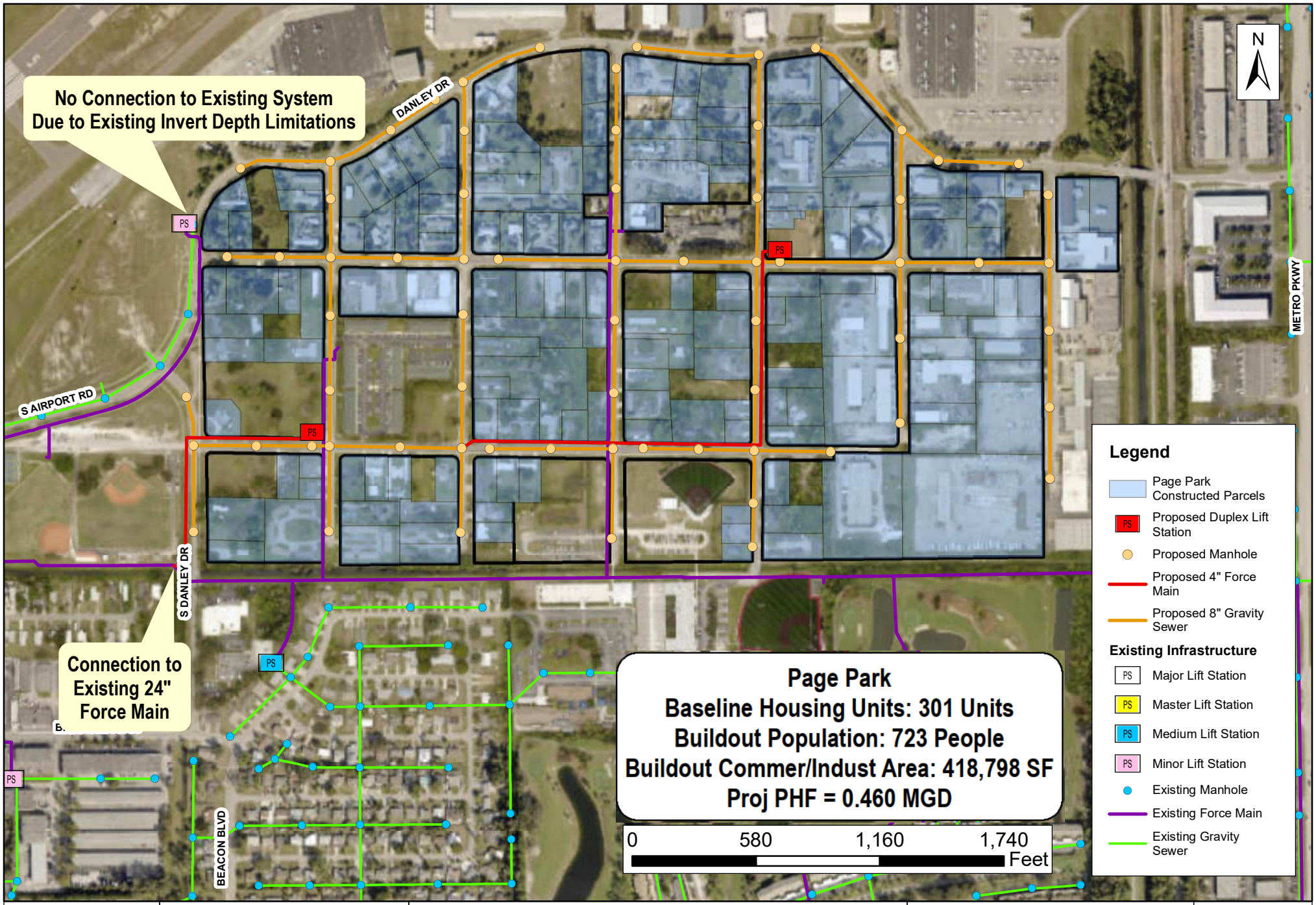
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Mullock Creek Alt 2 - Priority Grouping #6 Gravity Collection System Concept Plan**	AECOM	**Figure** **X**

Site Name, Group #	Mullock Creek Alternative 1, Group 6		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	19,420	$95	$1,844,900
4" Force Main (LF)	15,570	$70	$1,089,900
4" Forcemain - HDD Along US41 and Across Canal	3,350	$175	$586,250
4" Plug Valve (EA)	18	$3,000	$54,000
4' Manhole (EA)	86	$11,500	$989,000
Above Ground Air Release Valve Assembly (EA)	2	$11,500	$23,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	318	$2,660	$845,880
Septic Tank Abandonment Permit and Demo (EA)	318	$4,000	$1,272,000
Duplex Lift Station (EA)	6	$460,000	$2,760,000
Road Restoration (LF @ 20' Width)	19,420	$160	$3,107,200
Subtotal			$12,579,030
Mobilization and Demobilization (5%)			$628,952
Contingency (15%)			$1,981,197
Construction and Design Services (10%)			$1,518,918
Total			$16,708,097
Rounded Total			**$16,710,000**

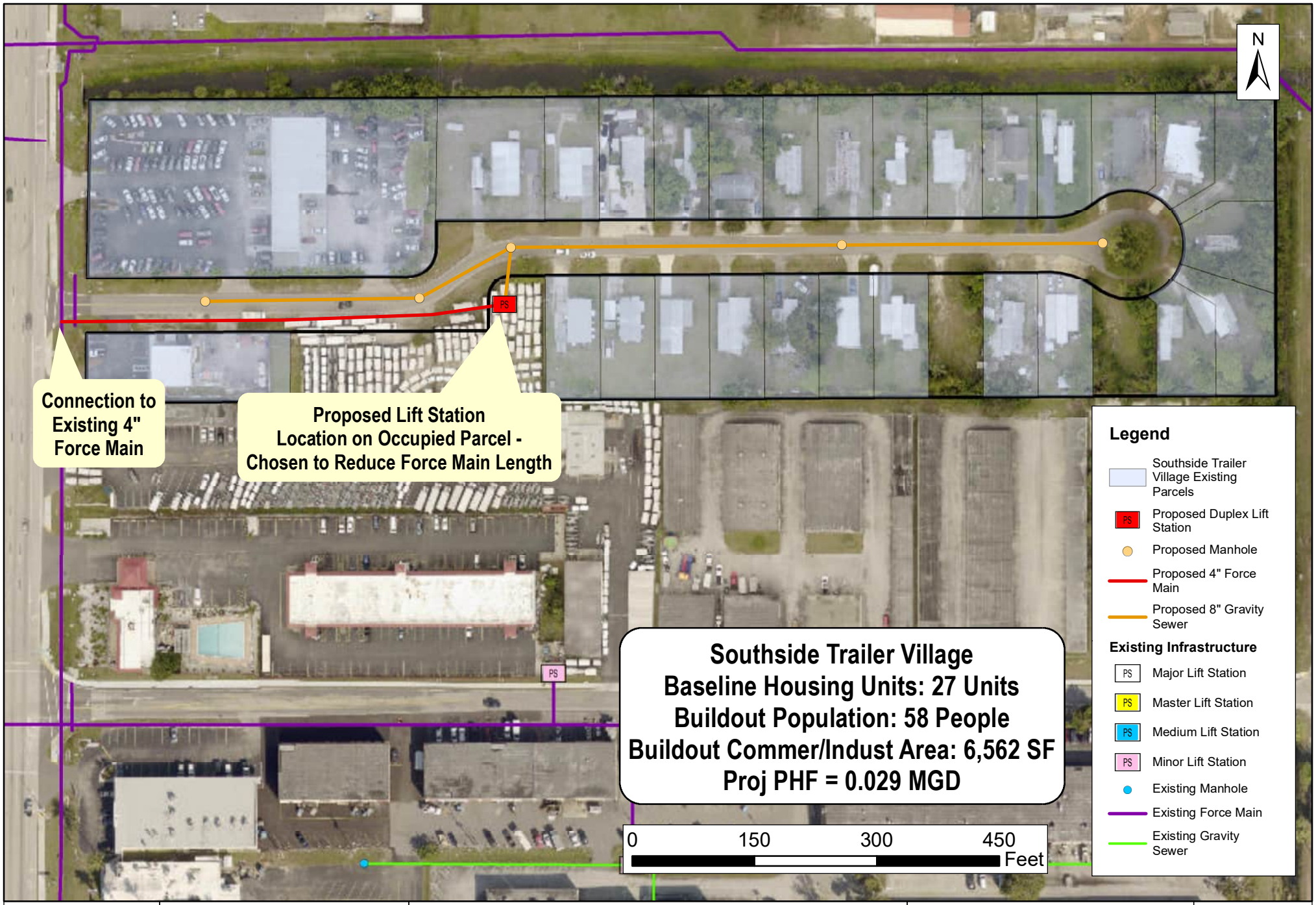
Site Name, Group #	Mullock Creek Alternative 2, Group 6		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	19,420	$95	$1,844,900
4" Force Main (LF)	8,770	$70	$613,900
4" Forcemain - HDD Across Canal	490	$175	$85,750
4" Plug Valve (EA)	12	$3,000	$36,000
4' Manhole (EA)	86	$11,500	$989,000
Above Ground Air Release Valve Assembly (EA)	2	$11,500	$23,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	318	$2,660	$845,880
Septic Tank Abandonment Permit and Demo (EA)	318	$4,000	$1,272,000
Duplex Lift Station (EA)	6	$460,000	$2,760,000
Road Restoration (LF @ 20' Width)	19,420	$160	$3,107,200
Subtotal			$11,584,530
Mobilization and Demobilization (5%)			$579,227
Contingency (15%)			$1,824,563
Construction and Design Services (10%)			$1,398,832
Total			$15,387,152
Rounded Total			**$15,390,000**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Priority Grouping #7 Areas Overview Map** **Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Page Park - Priority Grouping #7** **Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



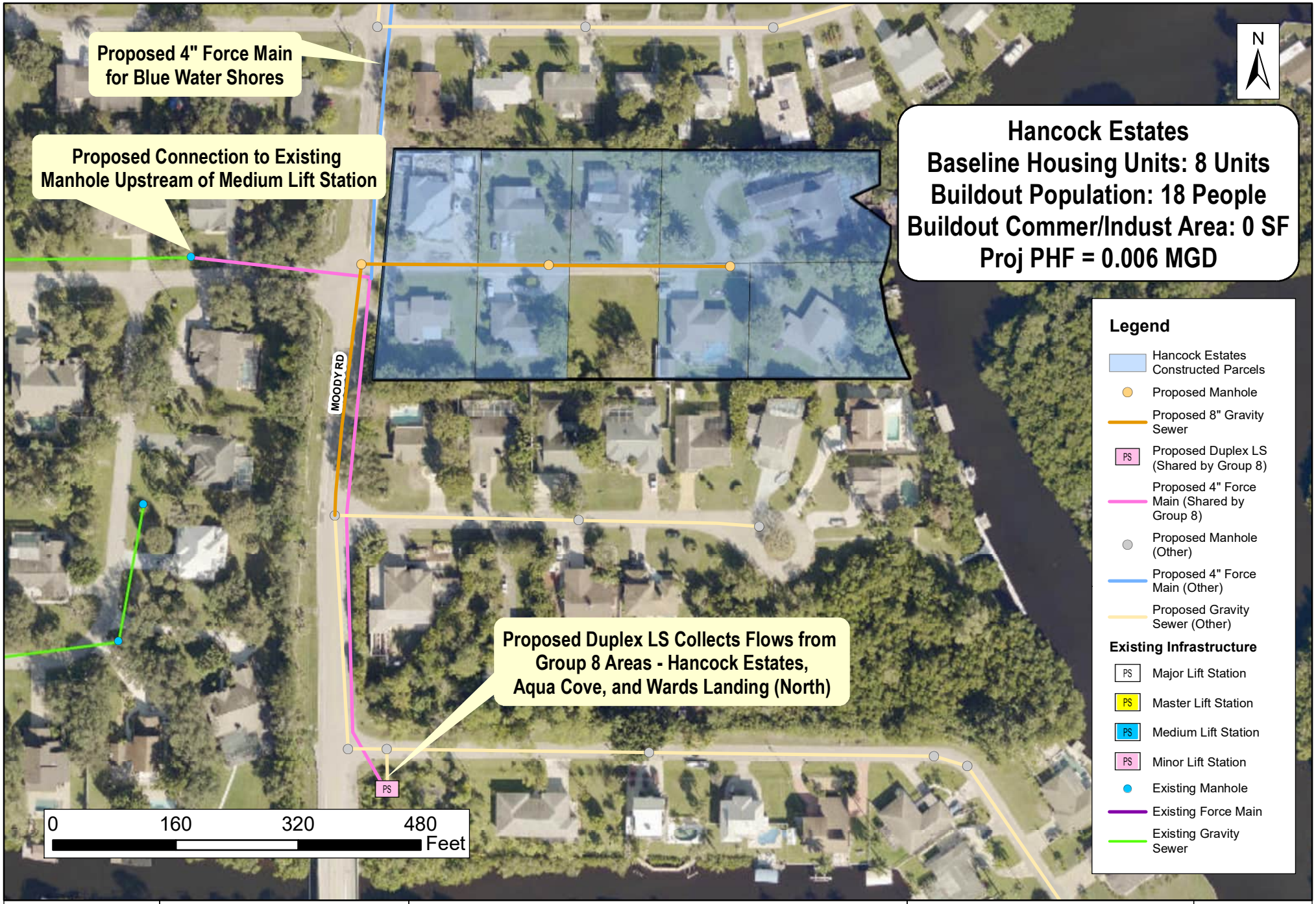
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Southside Trailer Village - Priority Grouping #7 Gravity Collection System Concept Plan**	AECOM	**Figure** **X**

Site Name, Group #	Page Park, Group 7		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	18,800	$95	$1,786,000
6" Force Main (LF)	3,260	$80	$260,800
6" Plug Valve (EA)	4	$3,450	$13,800
4' Manhole (EA)	68	$11,500	$782,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	301	$2,660	$800,660
Septic Tank Abandonment Permit and Demo (EA)	301	$4,000	$1,204,000
Duplex Lift Station (EA)	2	$460,000	$920,000
Road Restoration (LF @ 20' Width)	9,100	$160	$1,456,000
Road Restoration (LF @ 40' Width)	9,700	$250	$2,425,000
Subtotal			$9,655,160
Mobilization and Demobilization (5%)			$482,758
Contingency (15%)			$1,520,688
Construction and Design Services (10%)			$1,165,861
Total			$12,824,466
Rounded Total			**$12,830,000**

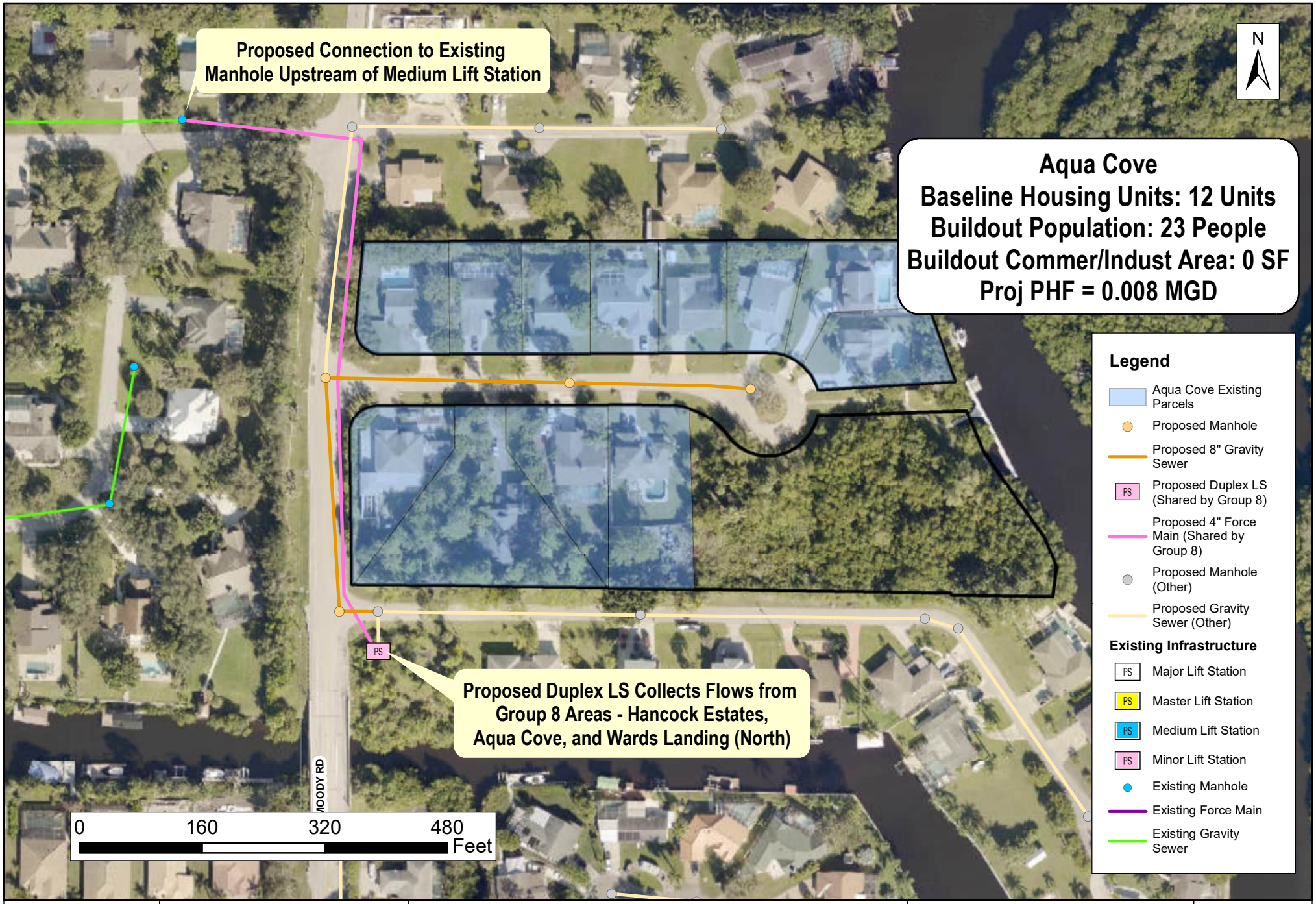
Site Name, Group #	Southside Trailer Village, Group 7		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	1,070	$95	$101,650
4" Force Main (LF)	490	$70	$34,300
4" Plug Valve (EA)	2	$3,000	$6,000
4' Manhole (EA)	5	$11,500	$57,500
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	27	$2,660	$71,820
Septic Tank Abandonment Permit and Demo (EA)	27	$4,000	$108,000
Duplex Lift Station (EA)	1	$460,000	$460,000
Road Restoration (LF @ 20' Width)	1,070	$160	$171,200
Subtotal			$1,017,370
Mobilization and Demobilization (5%)			$50,869
Contingency (15%)			$160,236
Construction and Design Services (10%)			$122,847
Total			$1,351,322
Rounded Total			**$1,360,000**

Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Group 8 Areas on Moody Road Gravity Collection System Concept Plan**	AECOM	**Figure** **X**

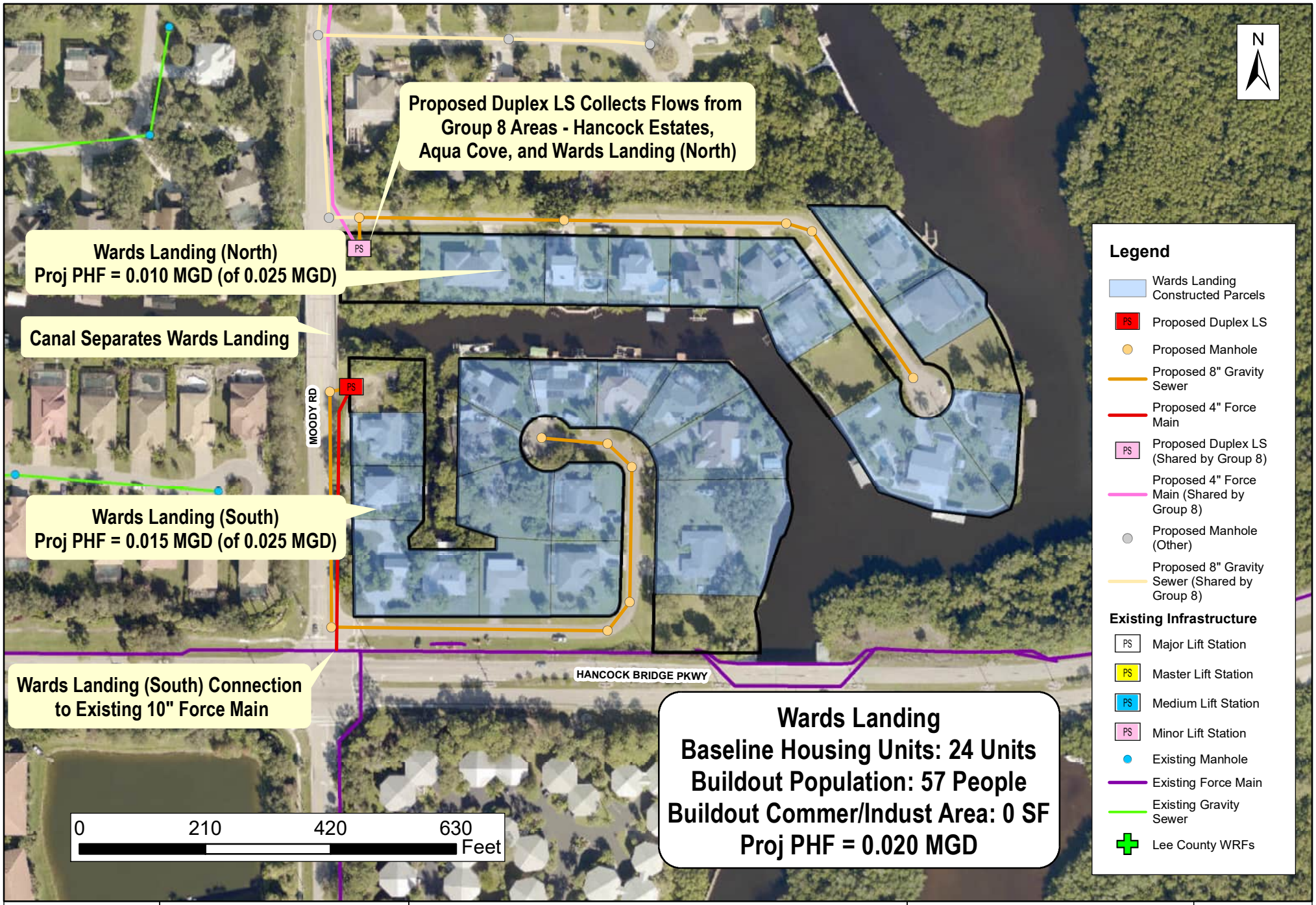
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Blue Water Shores - Priority Grouping #8 Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



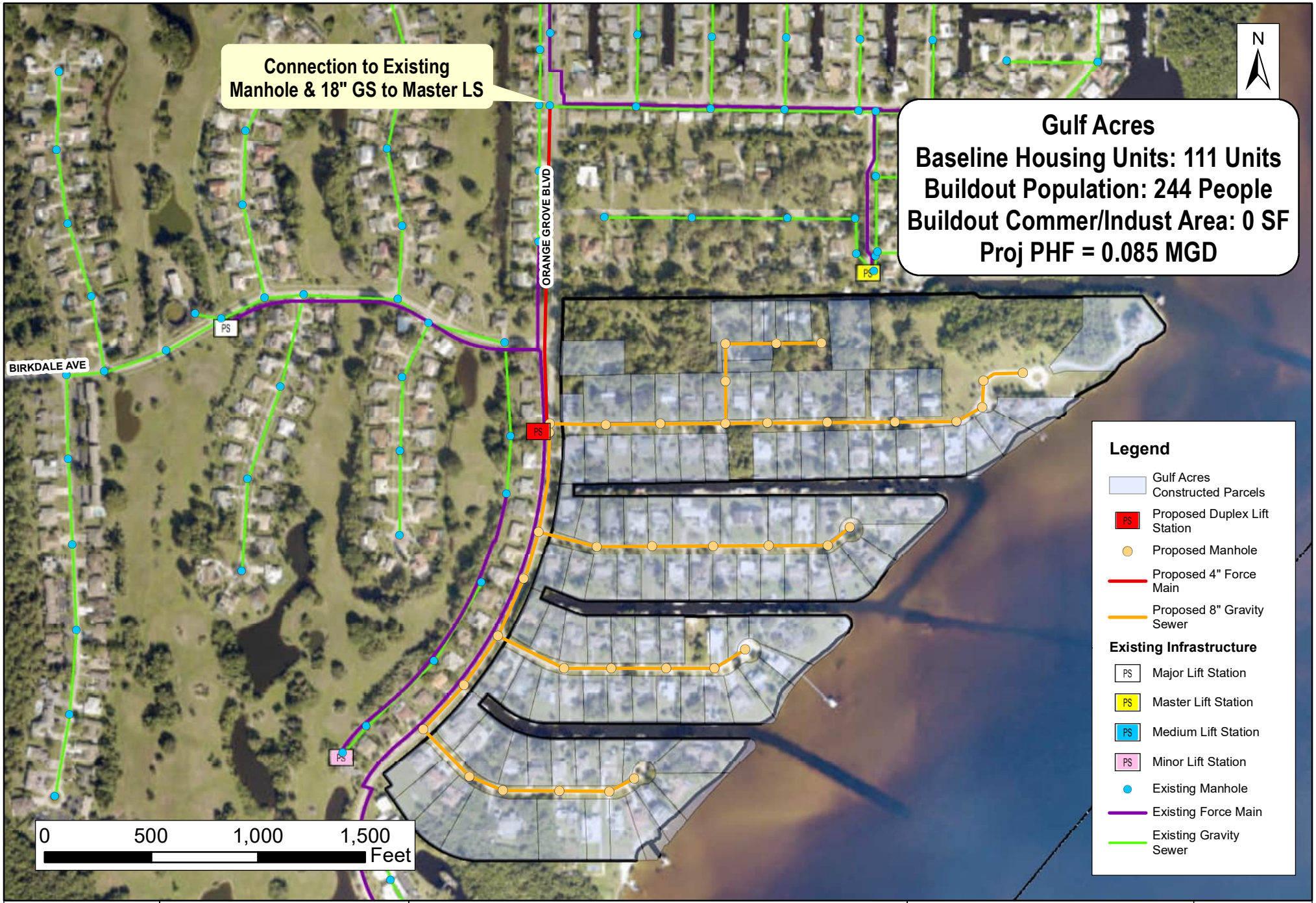
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Hancock Estates - Priority Grouping #8 Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



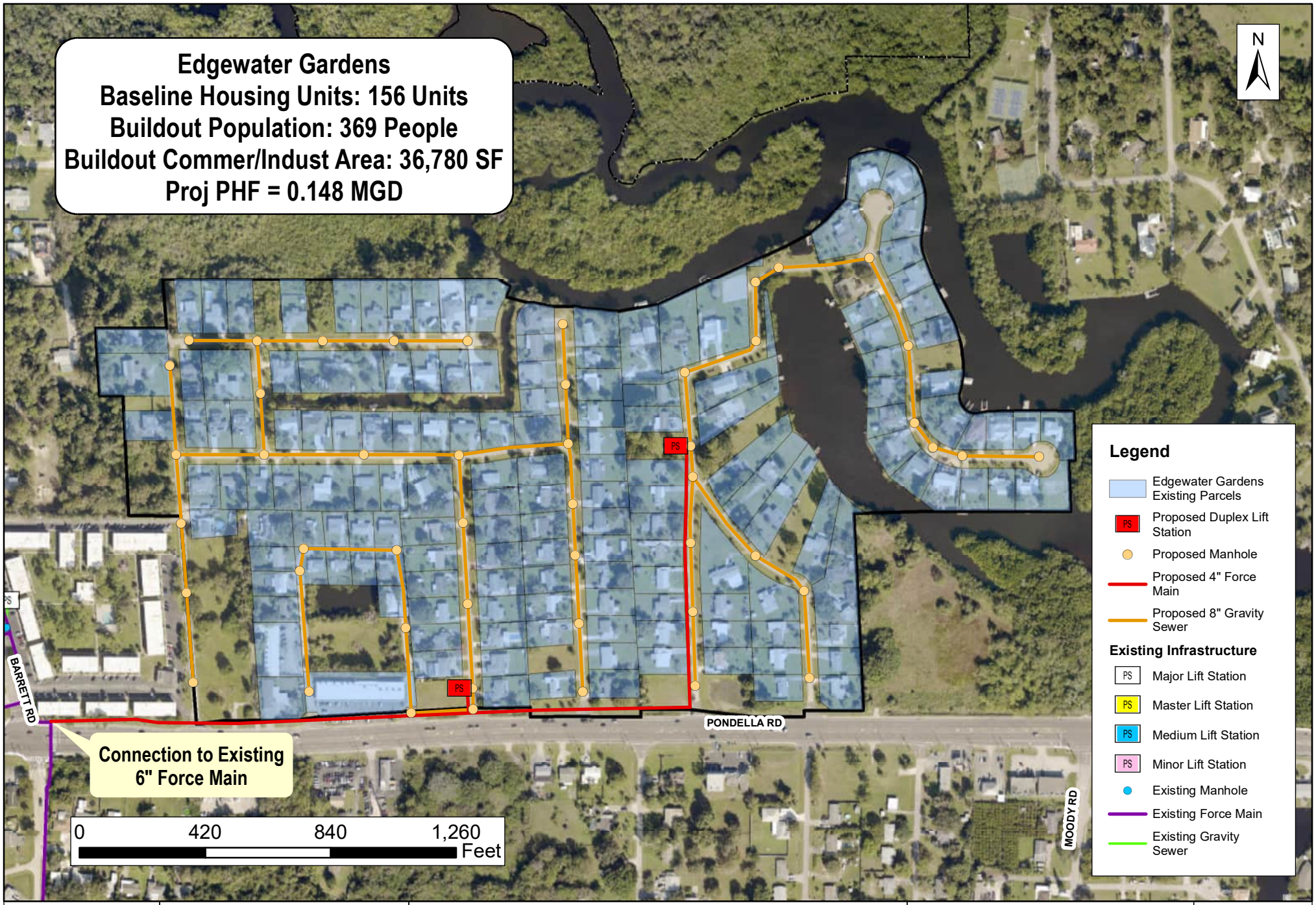
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Aqua Cove - Priority Grouping #8** **Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



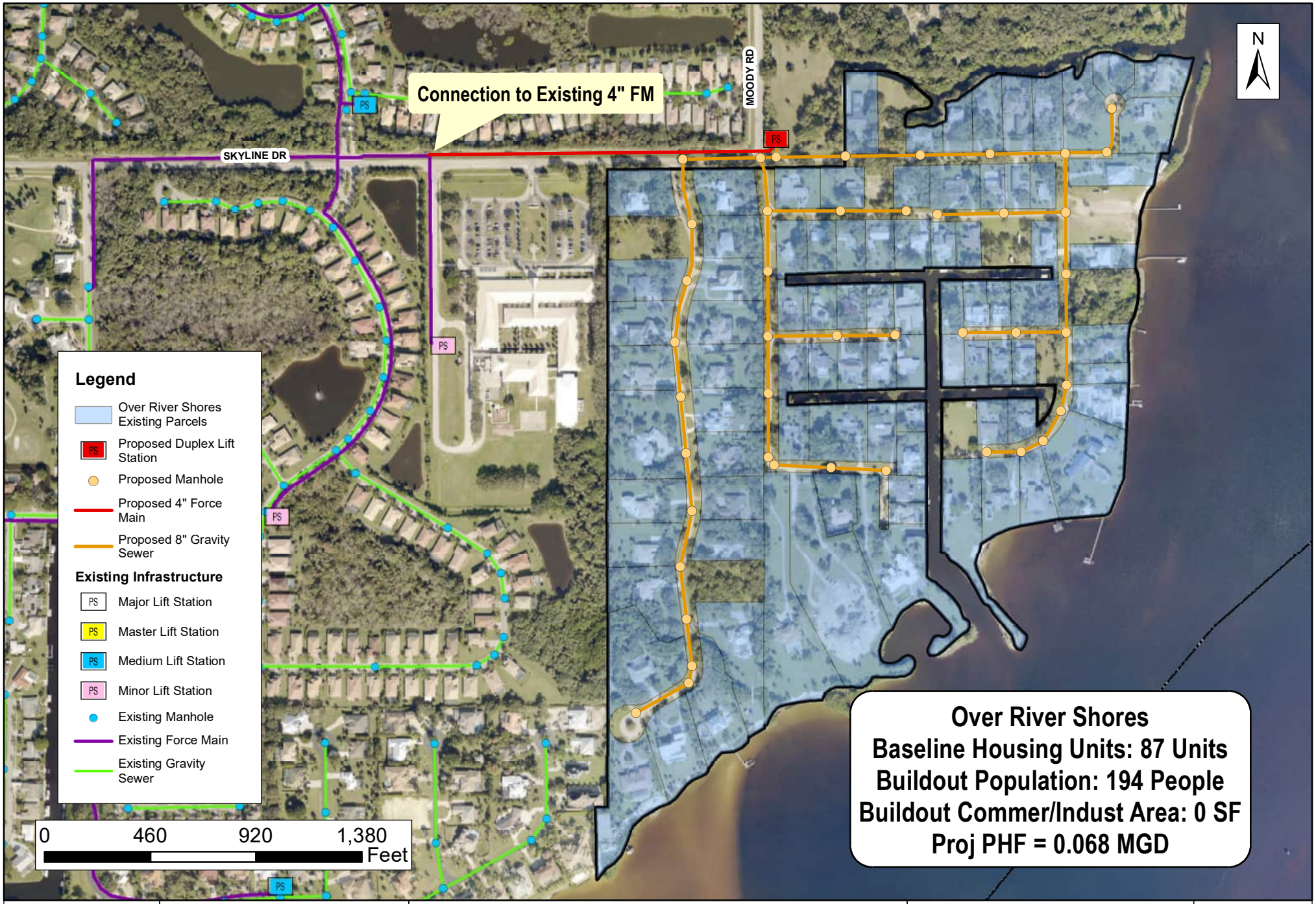
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Wards Landing - Priority Grouping #8** **Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Gulf Acres - Priority Grouping #8** **Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Edgewater Gardens - Priority Grouping #8 Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Over River Shores - Priority Grouping #8 Gravity Collection System Concept Plan**	AECOM	**Figure** **X**

Site Name, Group #	Blue Water Shores, Group 8		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	4,010	$95	$380,950
4" Force Main (LF)	1,030	$70	$72,100
4" Plug Valve (EA)	2	$3,000	$6,000
4' Manhole (EA)	18	$11,500	$207,000
Service Connections (EA)	61	$2,660	$162,260
Septic Tank Abandonment Permit and Demo (EA)	61	$4,000	$244,000
Duplex Lift Station (EA)	1	$460,000	$460,000
Road Restoration (LF @ 20' Width)	4,010	$160	$641,600
Subtotal			$2,173,910
Mobilization and Demobilization (5%)			$108,696
Contingency (15%)			$342,391
Construction and Design Services (10%)			$262,500
Total			$2,887,496
Rounded Total			**$2,890,000**

Site Name, Group #	Hancock Estates, Group 8		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	730	$95	$69,350
4' Manhole (EA)	3	$11,500	$34,500
Service Connections (EA)	8	$2,660	$21,280
Septic Tank Abandonment Permit and Demo (EA)	8	$4,000	$32,000
Road Restoration (LF @ 20' Width)	400	$160	$64,000
Road Restoration (LF @ 40' Width)	330	$250	$82,500
27% of Group 8 Shared Cost for Duplex Lift Station (EA)	1	$460,000	$124,200
27% of Group 8 Shared Cost for 4" Force Main (LF)	820	$70	$15,498
27% of Group 8 Shared Cost for 4" Plug Valve (EA)	1	$3,000	$810
27% of Group 8 Shared Cost for Connection to Existing System	1	$6,900	$1,863
Subtotal			$446,001
Mobilization and Demobilization (5%)			$22,300
Contingency (15%)			$70,245
Construction and Design Services (10%)			$53,855
Total			$592,401
Rounded Total			**$600,000**

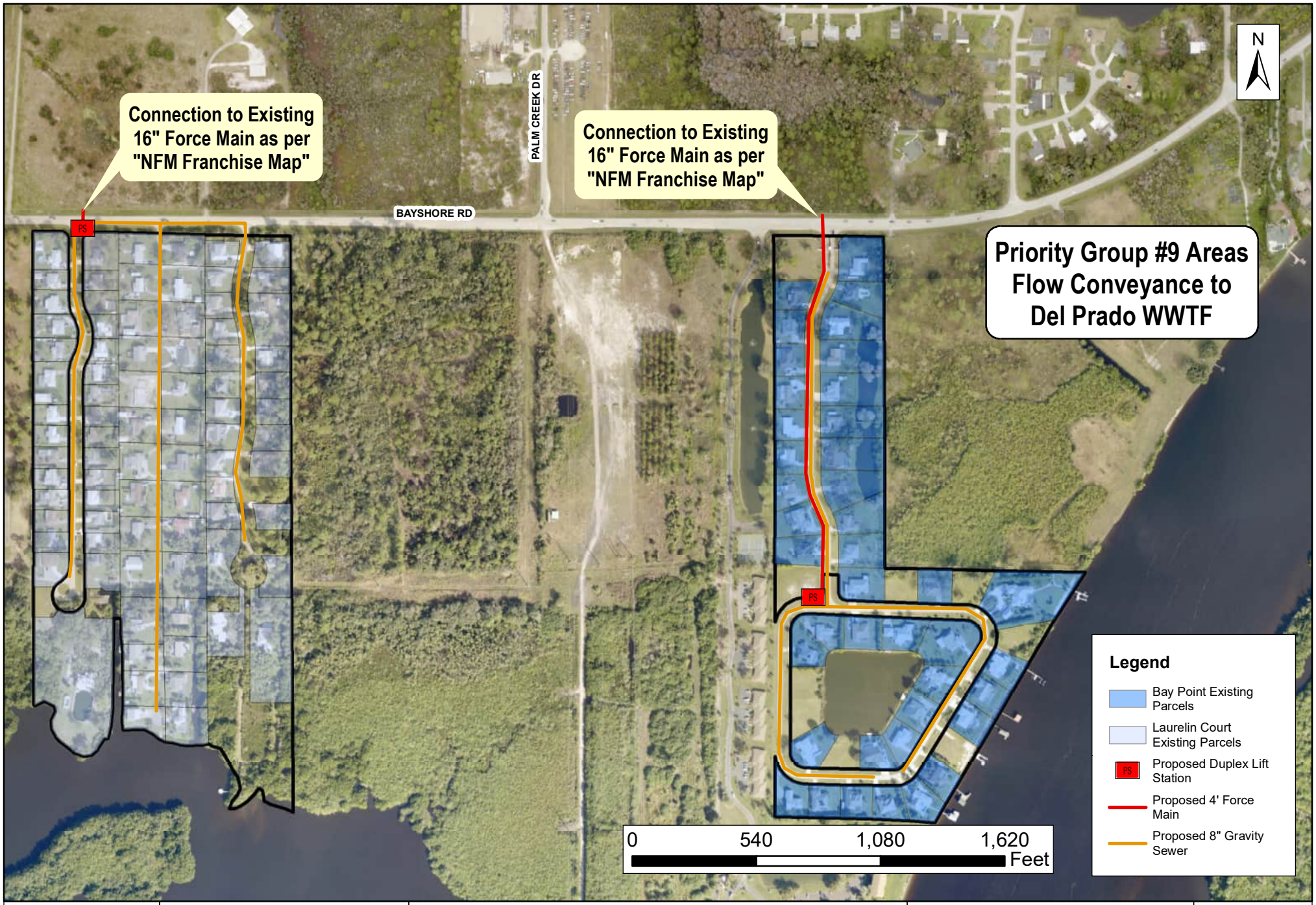
Site Name, Group #	Aqua Cove, Group 8		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	820	$95	$77,900
4' Manhole (EA)	4	$11,500	$46,000
Service Connections (EA)	12	$2,660	$31,920
Septic Tank Abandonment Permit and Demo (EA)	12	$4,000	$48,000
Road Restoration (LF @ 20' Width)	515	$160	$82,400
Road Restoration (LF @ 40' Width)	305	$250	$76,250
40% of Group 8 Shared Cost for Duplex Lift Station (EA)	1	$460,000	$184,000
40% of Group 8 Shared Cost for 4" Force Main (LF)	820	$70	$22,960
40% of Group 8 Shared Cost for 4" Plug Valve (EA)	1	$3,000	$1,200
40% of Group 8 Shared Cost for Connection to Existing System	1	$6,900	$2,760
Subtotal			$573,390
Mobilization and Demobilization (5%)			$28,670
Contingency (15%)			$90,309
Construction and Design Services (10%)			$69,237
Total			$761,605
Rounded Total			**$770,000**

Site Name, Group #	Wards Landing, Group 8		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	2,200	$95	$209,000
4" Force Main (LF)	400	$70	$28,000
4" Plug Valve (EA)	2	$3,000	$6,000
4' Manhole (EA)	12	$11,500	$138,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	24	$2,660	$63,840
Septic Tank Abandonment Permit and Demo (EA)	24	$4,000	$96,000
Duplex Lift Station (EA)	1	$460,000	$460,000
Road Restoration (LF @ 20' Width)	1,800	$160	$288,000
Road Restoration (LF @ 40' Width)	400	$250	$100,000
33% of Group 8 Shared Cost for Duplex Lift Station (EA)	1	$460,000	$151,800
33% of Group 8 Shared Cost for 4" Force Main (LF)	820	$70	$18,942
33% of Group 8 Shared Cost for 4" Plug Valve (EA)	1	$3,000	$990
33% of Group 8 Shared Cost for Connection to Existing System	1	$6,900	$2,277
Subtotal			$1,569,749
Mobilization and Demobilization (5%)			$78,487
Contingency (15%)			$247,235
Construction and Design Services (10%)			$189,547
Total			$2,085,019
Rounded Total			**$2,090,000**

Site Name, Group #	Edgewater Gardens, Group 8		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	9,940	$95	$944,300
4" Force Main (LF)	2,940	$70	$205,800
4" Plug Valve (EA)	4	$3,000	$12,000
4' Manhole (EA)	49	$11,500	$563,500
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	156	$2,660	$414,960
Septic Tank Abandonment Permit and Demo (EA)	156	$4,000	$624,000
Duplex Lift Station (EA)	2	$460,000	$920,000
Road Restoration (LF @ 20' Width)	9,940	$160	$1,590,400
Subtotal			$5,281,860
Mobilization and Demobilization (5%)			$264,093
Contingency (15%)			$831,893
Construction and Design Services (10%)			$637,785
Total			$7,015,631
Rounded Total			**$7,020,000**

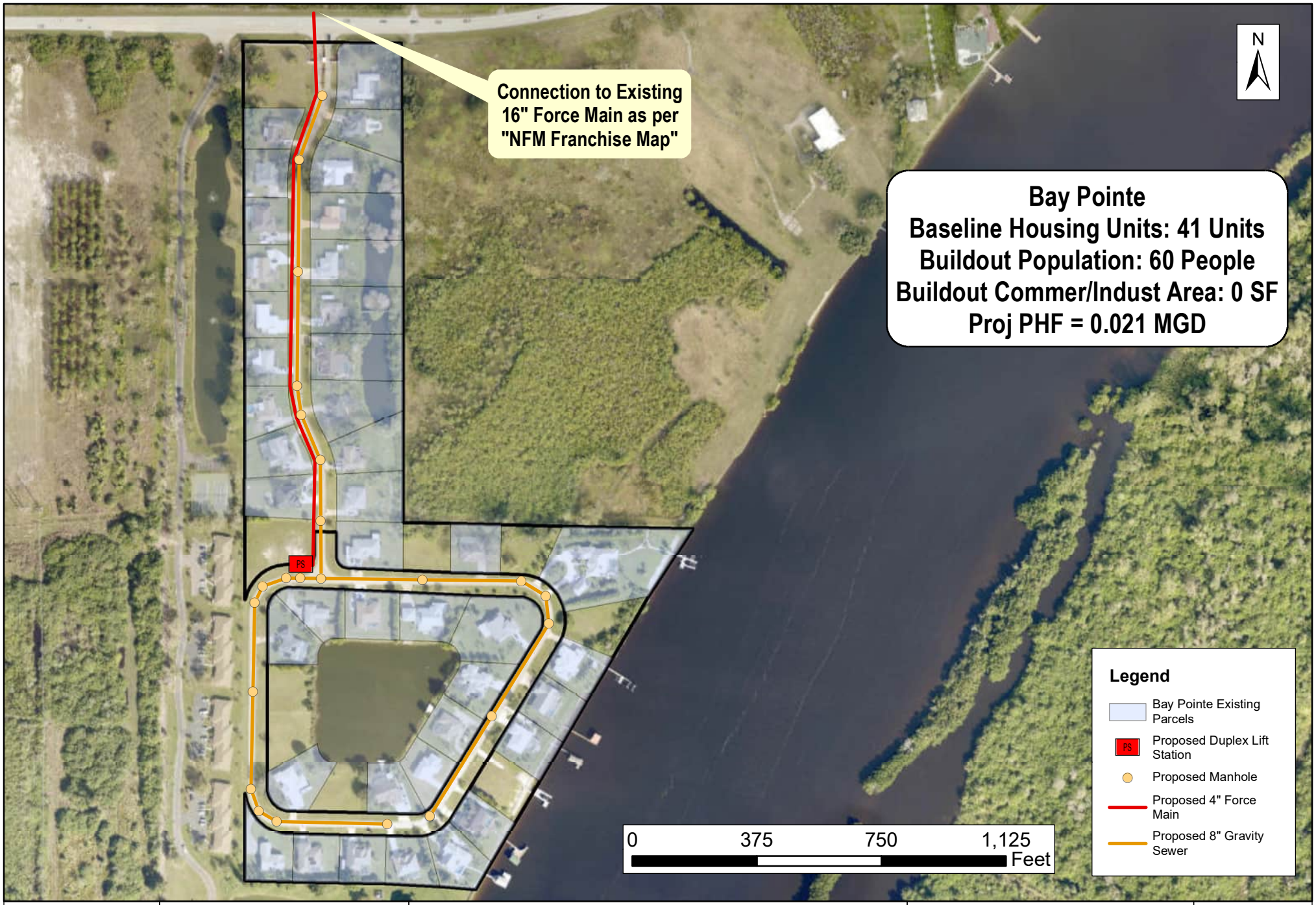
Site Name, Group #	Gulf Acres, Group 8		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	7,730	$95	$734,350
4" Force Main (LF)	1,390	$70	$97,300
4" Plug Valve (EA)	2	$3,000	$6,000
4' Manhole (EA)	36	$11,500	$414,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	111	$2,660	$295,260
Septic Tank Abandonment Permit and Demo (EA)	111	$4,000	$444,000
Duplex Lift Station (EA)	1	$460,000	$460,000
Road Restoration (LF @ 20' Width)	7,730	$160	$1,236,800
Subtotal			$3,694,610
Mobilization and Demobilization (5%)			$184,731
Contingency (15%)			$581,901
Construction and Design Services (10%)			$446,124
Total			$4,907,366
Rounded Total			**$4,910,000**

Site Name, Group #	Over River Shores, Group 8		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	9,120	$95	$866,400
4" Force Main (LF)	1,380	$70	$96,600
4" Plug Valve (EA)	2	$3,000	$6,000
4' Manhole (EA)	44	$11,500	$506,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	87	$2,660	$231,420
Septic Tank Abandonment Permit and Demo (EA)	87	$4,000	$348,000
Duplex Lift Station (EA)	1	$460,000	$460,000
Road Restoration (LF @ 20' Width)	9,120	$160	$1,459,200
Subtotal			$3,980,520
Mobilization and Demobilization (5%)			$199,026
Contingency (15%)			$626,932
Construction and Design Services (10%)			$480,648
Total			$5,287,126
Rounded Total			**$5,290,000**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Priority Grouping #9 Areas Overview Map** **Gravity Collection System Concept Plan**	AECOM	**Figure** **X**

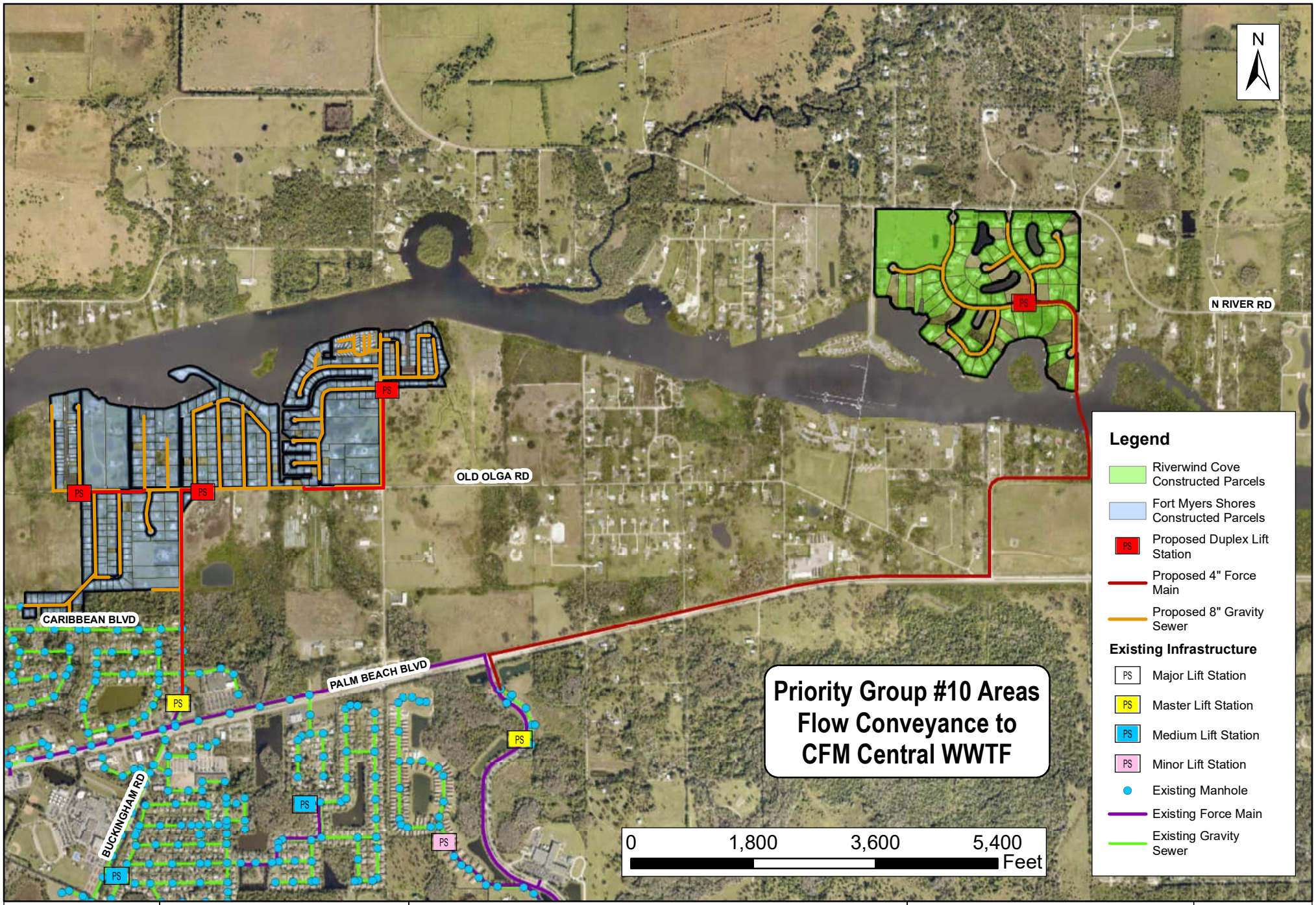
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Laurelin Court - Priority Grouping #9** **Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Bay Pointe - Priority Grouping #9** **Gravity Collection System Concept Plan**	AECOM	**Figure** **X**

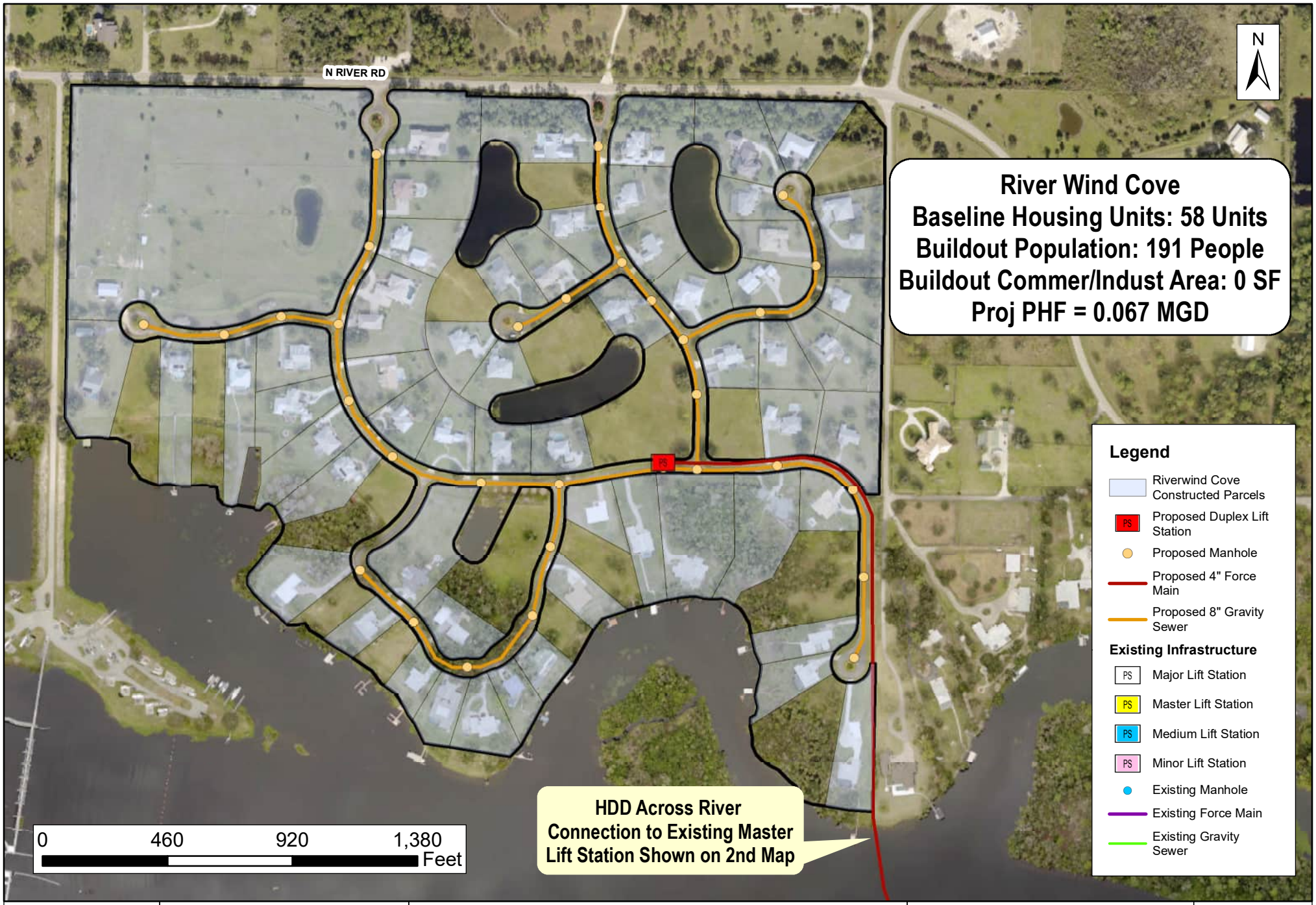
Site Name, Group #	Bay Pointe, Group 9		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	3,780	$95	$359,100
4" Force Main (LF)	1,540	$70	$107,800
4" Plug Valve (EA)	2	$3,000	$6,000
4' Manhole (EA)	23	$11,500	$264,500
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	41	$2,660	$109,060
Septic Tank Abandonment Permit and Demo (EA)	41	$4,000	$164,000
Duplex Lift Station (EA)	1	$460,000	$460,000
Road Restoration (LF @ 20' Width)	3,780	$160	$604,800
Subtotal			$2,082,160
Mobilization and Demobilization (5%)			$104,108
Contingency (15%)			$327,940
Construction and Design Services (10%)			$251,421
Total			$2,765,629
Rounded Total			**$2,770,000**

Site Name, Group #	Laurelin Court, Group 9		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	5,190	$95	$493,050
4" Force Main (LF)	70	$70	$4,900
4" Plug Valve (EA)	2	$3,000	$6,000
4' Manhole (EA)	27	$11,500	$310,500
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	82	$2,660	$218,120
Septic Tank Abandonment Permit and Demo (EA)	82	$4,000	$328,000
Duplex Lift Station (EA)	1	$460,000	$460,000
Road Restoration (LF @ 20' Width)	5,190	$160	$830,400
Subtotal			$2,657,870
Mobilization and Demobilization (5%)			$132,894
Contingency (15%)			$418,615
Construction and Design Services (10%)			$320,938
Total			$3,530,316
Rounded Total			**$3,540,000**

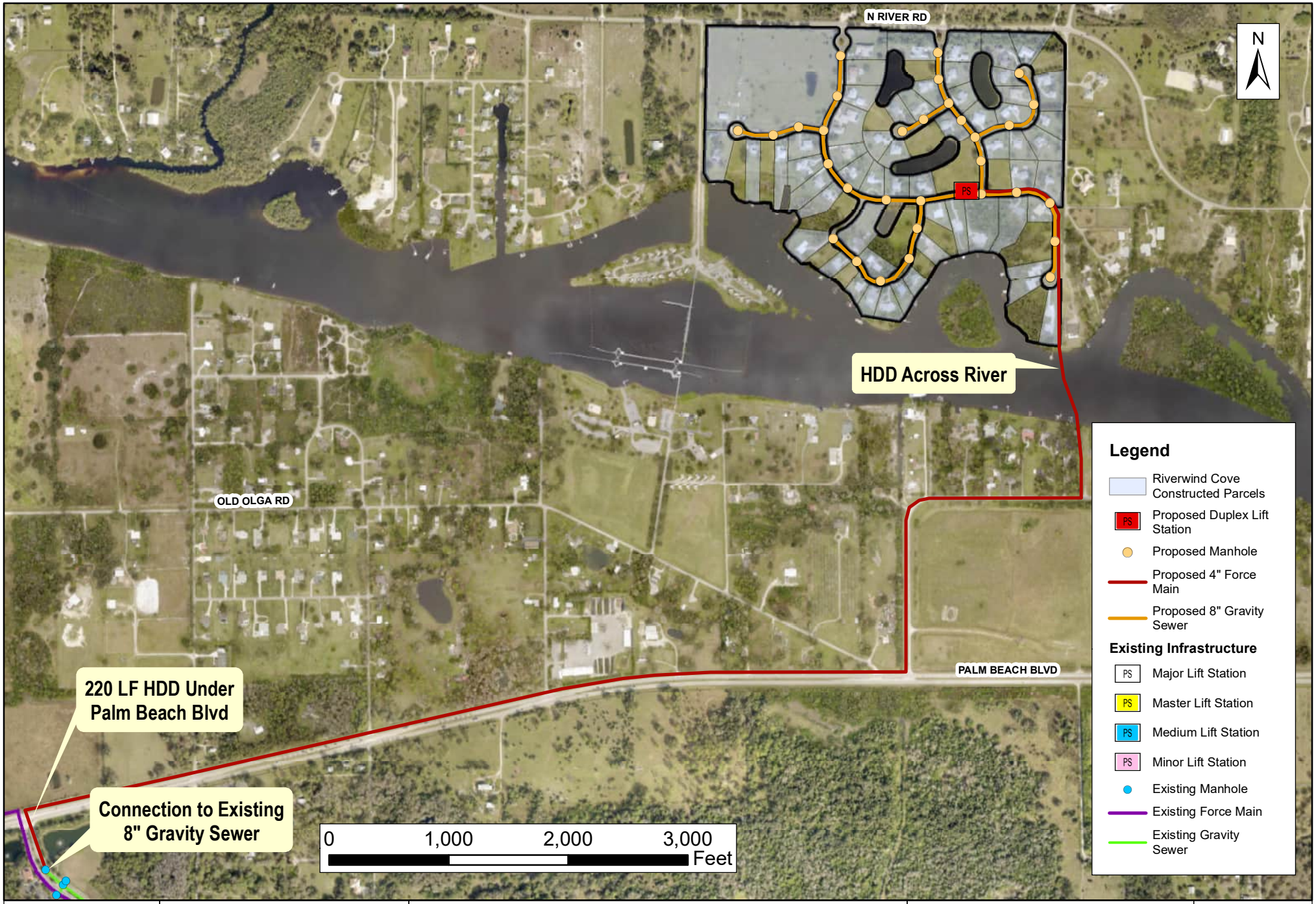


Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Priority Grouping #10 Areas Overview Map** **Gravity Collection System Concept Plan**	AECOM	**Figure** **X**

Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Fort Myers Shores - Priority Grouping #10 Gravity Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **River Wind Cove - Priority Grouping #10** **Gravity Collection System Concept Plan**	AECOM	**Figure** **X**

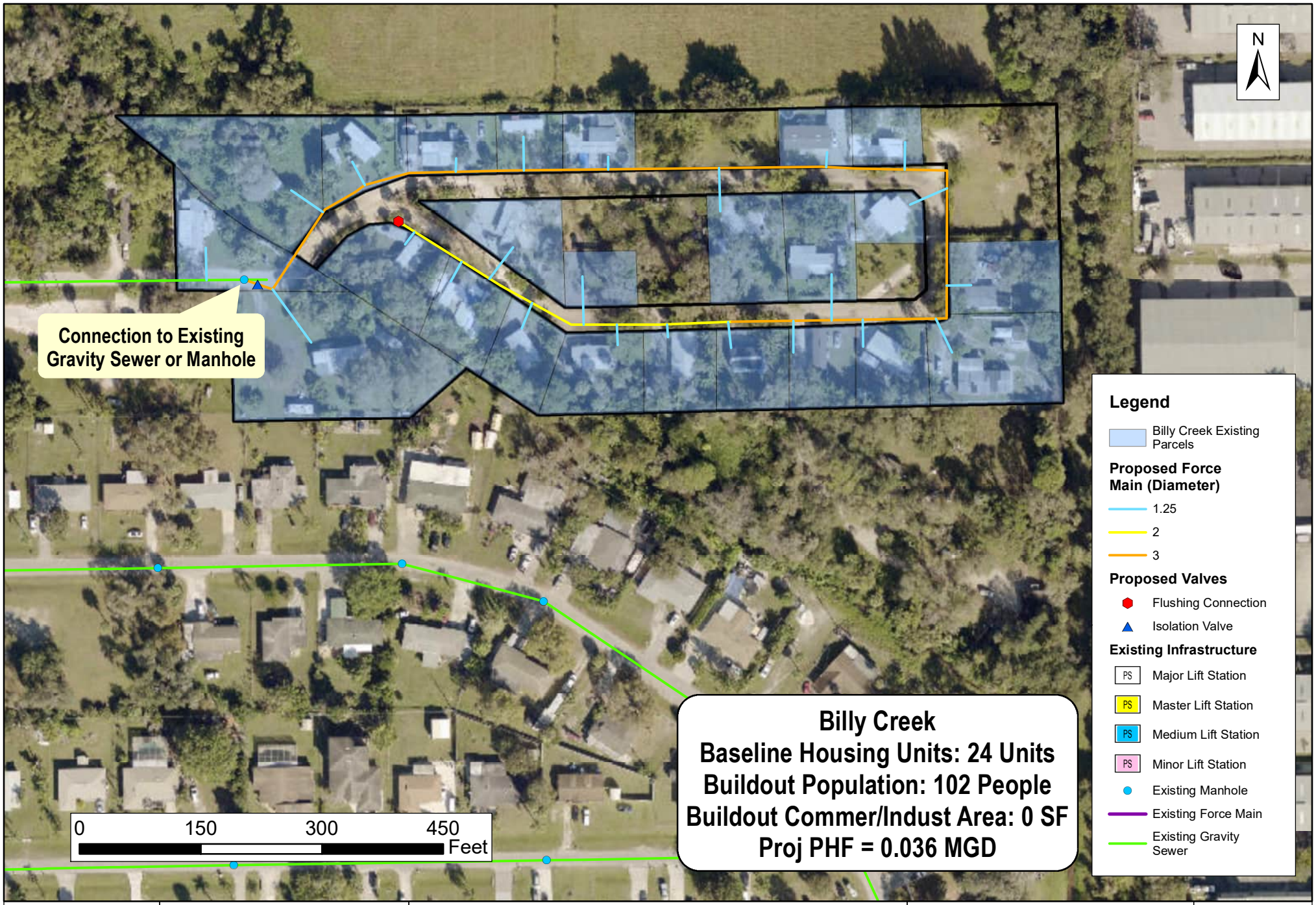


Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Riverwind Cove - Priority Grouping #10** **Gravity Collection System Concept Plan**	AECOM	**Figure** **X**

Site Name, Group #	Fort Myers Shores, Group 10		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	28,100	$95	$2,669,500
4" Force Main (LF)	6,400	$70	$448,000
4" Plug Valve (EA)	8	$3,000	$24,000
4' Manhole (EA)	131	$11,500	$1,506,500
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	446	$2,660	$1,186,360
Septic Tank Abandonment Permit and Demo (EA)	446	$4,000	$1,784,000
Duplex Lift Station (EA)	3	$460,000	$1,380,000
Road Restoration (LF @ 20' Width)	28,100	$160	$4,496,000
Subtotal			$13,501,260
Mobilization and Demobilization (5%)			$675,063
Contingency (15%)			$2,126,448
Construction and Design Services (10%)			$1,630,277
Total			$17,933,049
Rounded Total			**$17,940,000**

Site Name, Group #	Riverwind Cove, Group 10		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
8" PVC Gravity Sewer (LF)	7,500	$95	$712,500
4" Force Main (LF)	9,980	$70	$698,600
4" Forcemain - HDD Across River	2,400	$175	$420,000
4x10" Forcemain w Casing - HDD under Road (LF)	220	$1,380	$303,600
4" Plug Valve (EA)	9	$3,000	$27,000
4' Manhole (EA)	32	$11,500	$368,000
Above Ground Air Release Valve Assembly (EA)	4	$11,500	$46,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections	58	$2,660	$154,280
Septic Tank Abandonment Permit and Demo (EA)	58	$4,000	$232,000
Duplex Lift Station (EA)	1	$460,000	$460,000
Road Restoration (LF @ 20' Width)	7,500	$160	$1,200,000
Subtotal			$4,628,880
Mobilization and Demobilization (5%)			$231,444
Contingency (15%)			$729,049
Construction and Design Services (10%)			$558,937
Total			$6,148,310
Rounded Total			**$6,150,000**

APPENDIX C GRAVITY AND LOW PRESSURE SEWER LAYOUTS AND DETAILED COST ESTIMATES (Part II)



Date Created:
June 2022

LEE COUNTY
SOUTHWEST FLORIDA

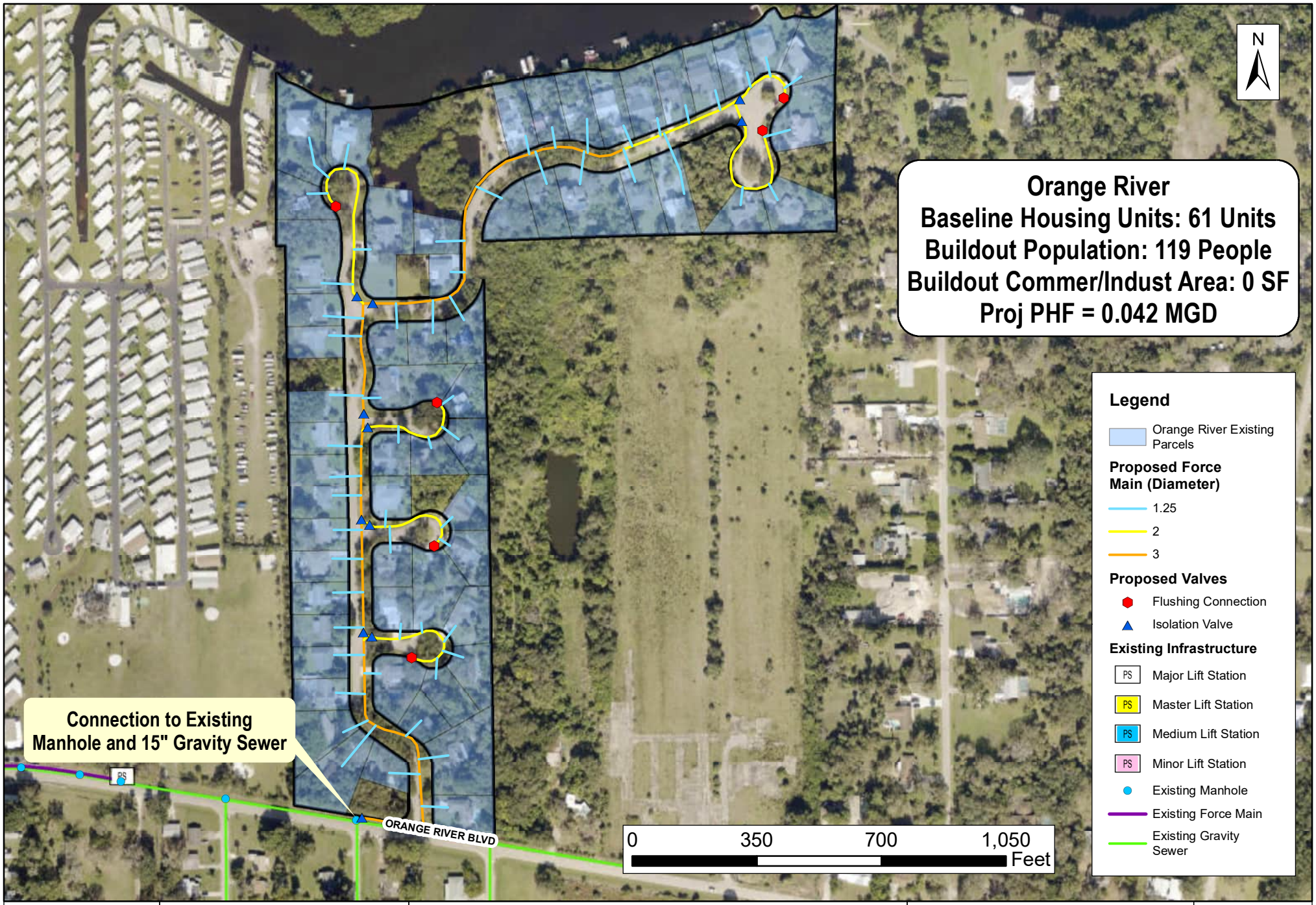
Countywide Wastewater Management Plan

Billy Creek - Priority Grouping #1
Low Pressure Collection System Concept Plan

AECOM

Figure

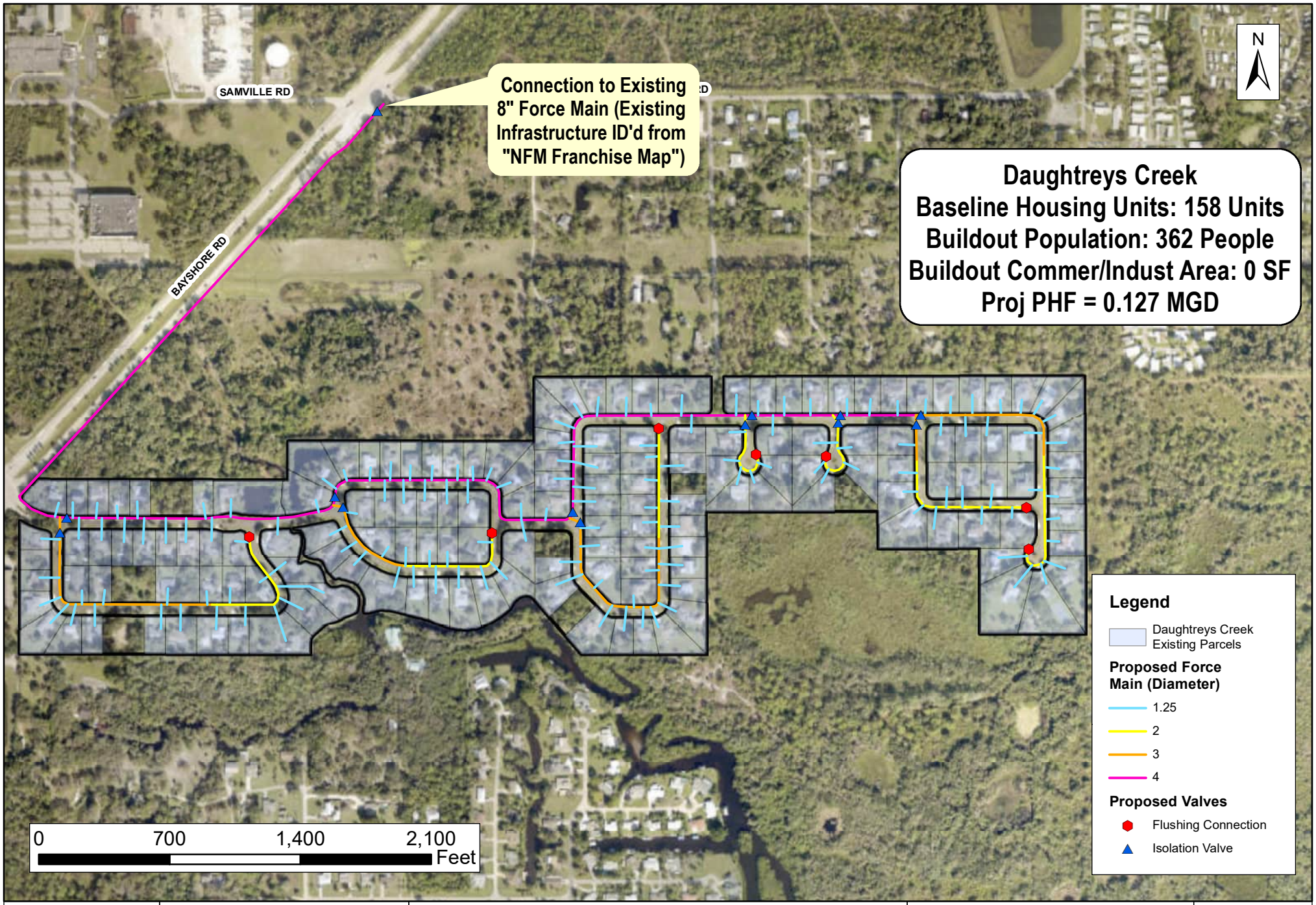
X



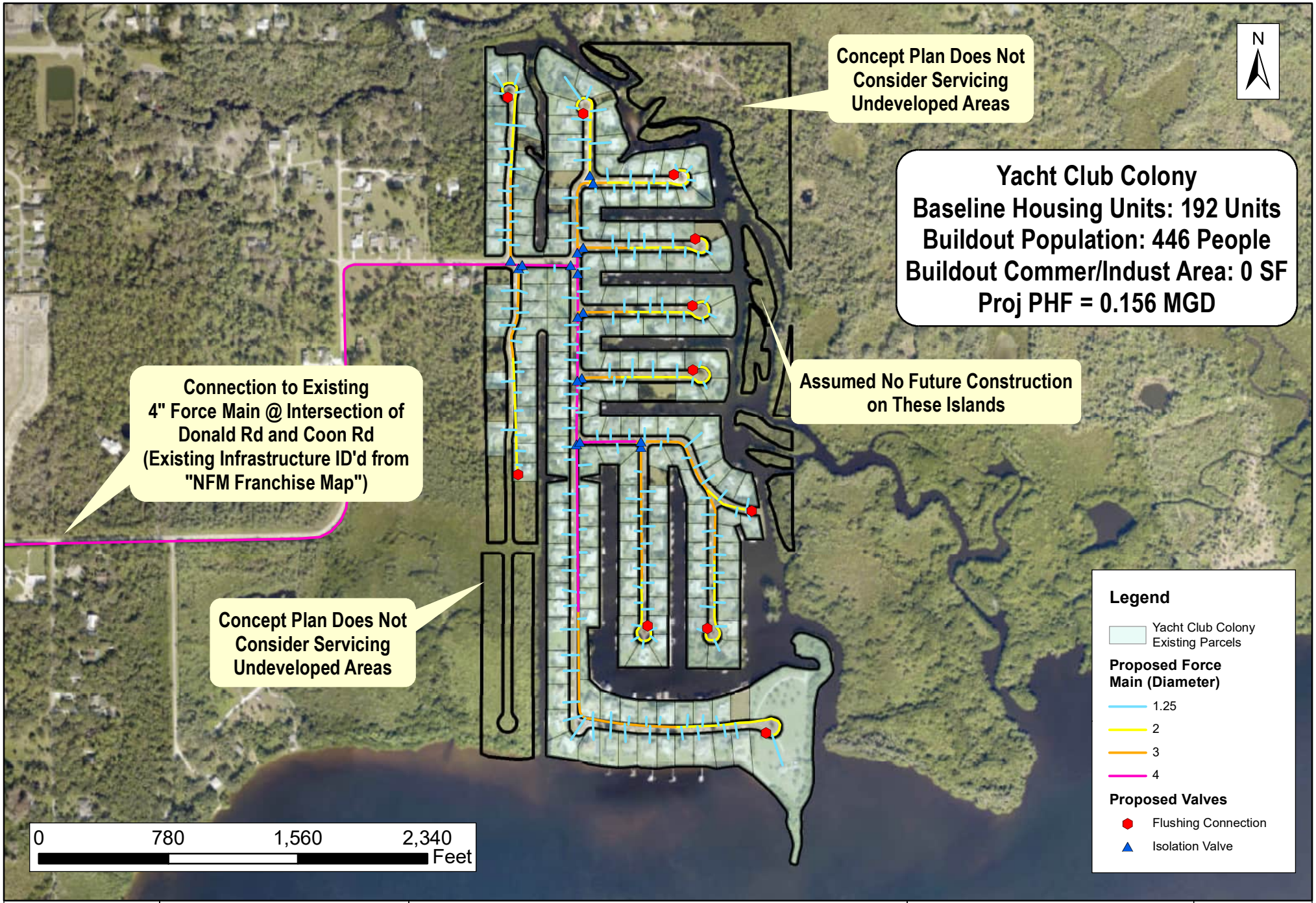
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Orange River - Priority Grouping #1** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**

Site Name, Group #	Billy Creek, Group 1		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	910	$25	$22,750
2" PE SDR 11 Pipe (LF)	400	$30	$12,000
3" PE SDR 11 Pipe (LF)	1,240	$40	$49,600
Simplex Lift Station (EA)	24	$8,500	$204,000
Sentry Advisor (Optional) (EA)	24	$500	$12,000
Terminal Flushing Connection (EA)	1	$2,500	$2,500
Isolation Valve (EA)	1	$3,000	$3,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	24	$2,660	$63,840
Road Restoration (LF @ 20' Width)	600	$160	$96,000
Septic System Abandonment (EA)	24	$4,000	$96,000
Subtotal			$568,590
Mobilization and Demobilization (Same as Gravity)			$53,167
Contingency (Same as Gravity)			$167,476
Construction and Design Services (Same as Gravity)			$128,398
Total			$917,631
Rounded Total			**$920,000**

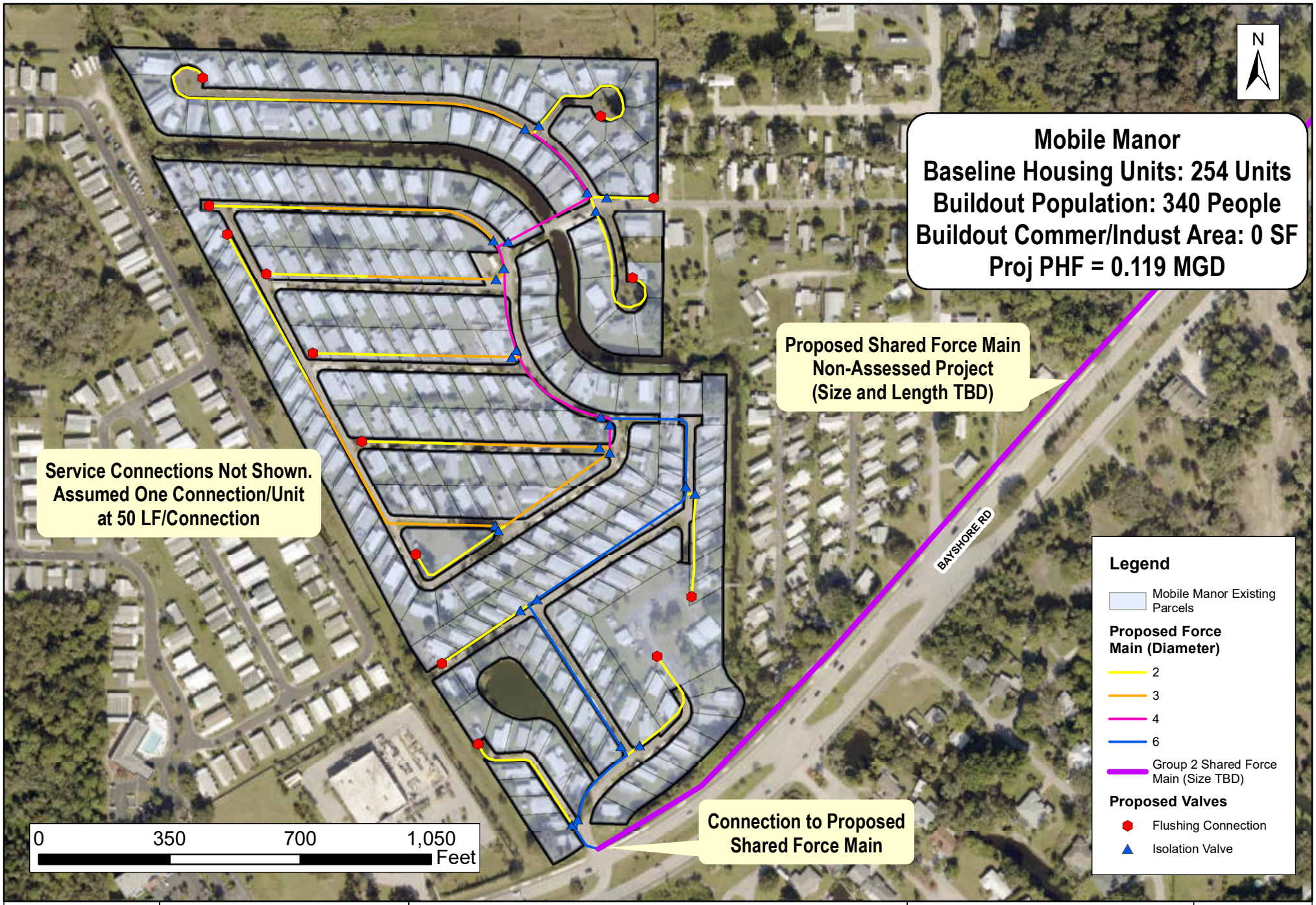
Site Name, Group #	Orange River, Group 1		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	3,860	$25	$96,500
2" PE SDR 11 Pipe (LF)	2,345	$30	$70,350
3" PE SDR 11 Pipe (LF)	2,490	$40	$99,600
Simplex Lift Station (EA)	61	$8,500	$518,500
Sentry Advisor (Optional) (EA)	61	$500	$30,500
Terminal Flushing Connection (EA)	6	$2,500	$15,000
Isolation Valve (EA)	11	$3,000	$33,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	61	$2,660	$162,260
Road Restoration (LF @ 20' Width)	1,820	$160	$291,200
Septic System Abandonment (EA)	61	$4,000	$244,000
Subtotal			$1,567,810
Mobilization and Demobilization (Same as Gravity)			$109,153
Contingency (Same as Gravity)			$343,832
Construction and Design Services (Same as Gravity)			$263,604
Total			$2,284,399
Rounded Total			**$2,290,000**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Daughtreys Creek - Priority Grouping #2** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Yacht Club Colony - Priority Grouping #2** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**

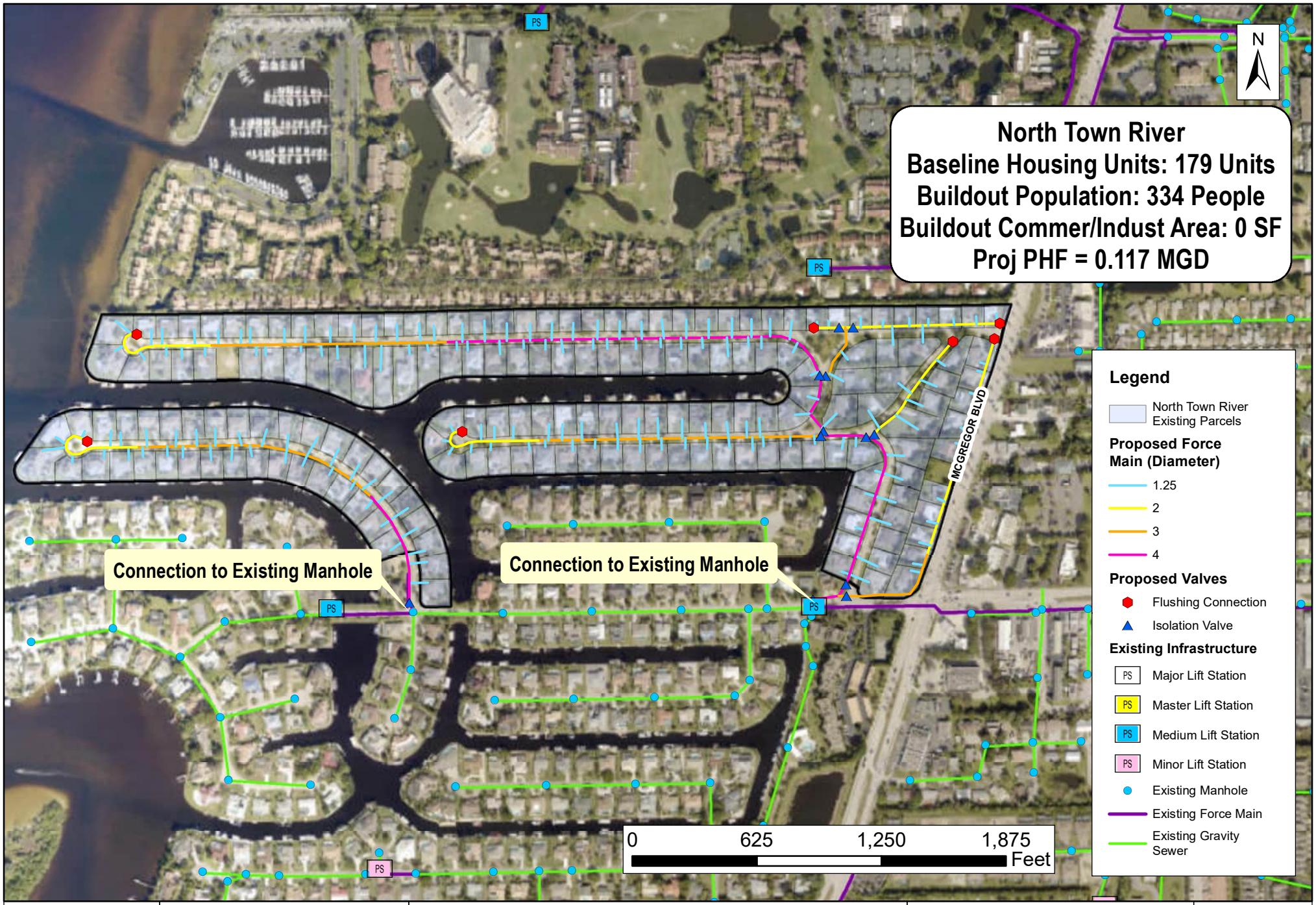


Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Mobile Manor - Priority Grouping #2** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**

Site Name, Group #	Daughtreys Creek, Group 2		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	13,900	$25	$347,500
2" PE SDR 11 Pipe (LF)	3,945	$30	$118,350
3" PE SDR 11 Pipe (LF)	3,630	$40	$145,200
4" PE SDR 11 Pipe (LF)	7,560	$45	$340,200
Simplex Lift Station (EA)	158	$8,500	$1,343,000
Sentry Advisor (Optional) (EA)	158	$500	$79,000
Terminal Flushing Connection (EA)	7	$2,500	$17,500
Isolation Valve (EA)	13	$3,000	$39,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	158	$2,660	$420,280
Road Restoration (LF @ 20' Width)	5,418	$160	$866,800
Septic System Abandonment (EA)	158	$4,000	$632,000
Subtotal			$4,355,730
Mobilization and Demobilization (Same as Gravity)			$286,493
Contingency (Same as Gravity)			$902,452
Construction and Design Services (Same as Gravity)			$691,880
Total			$6,236,555
Rounded Total			**$6,240,000**

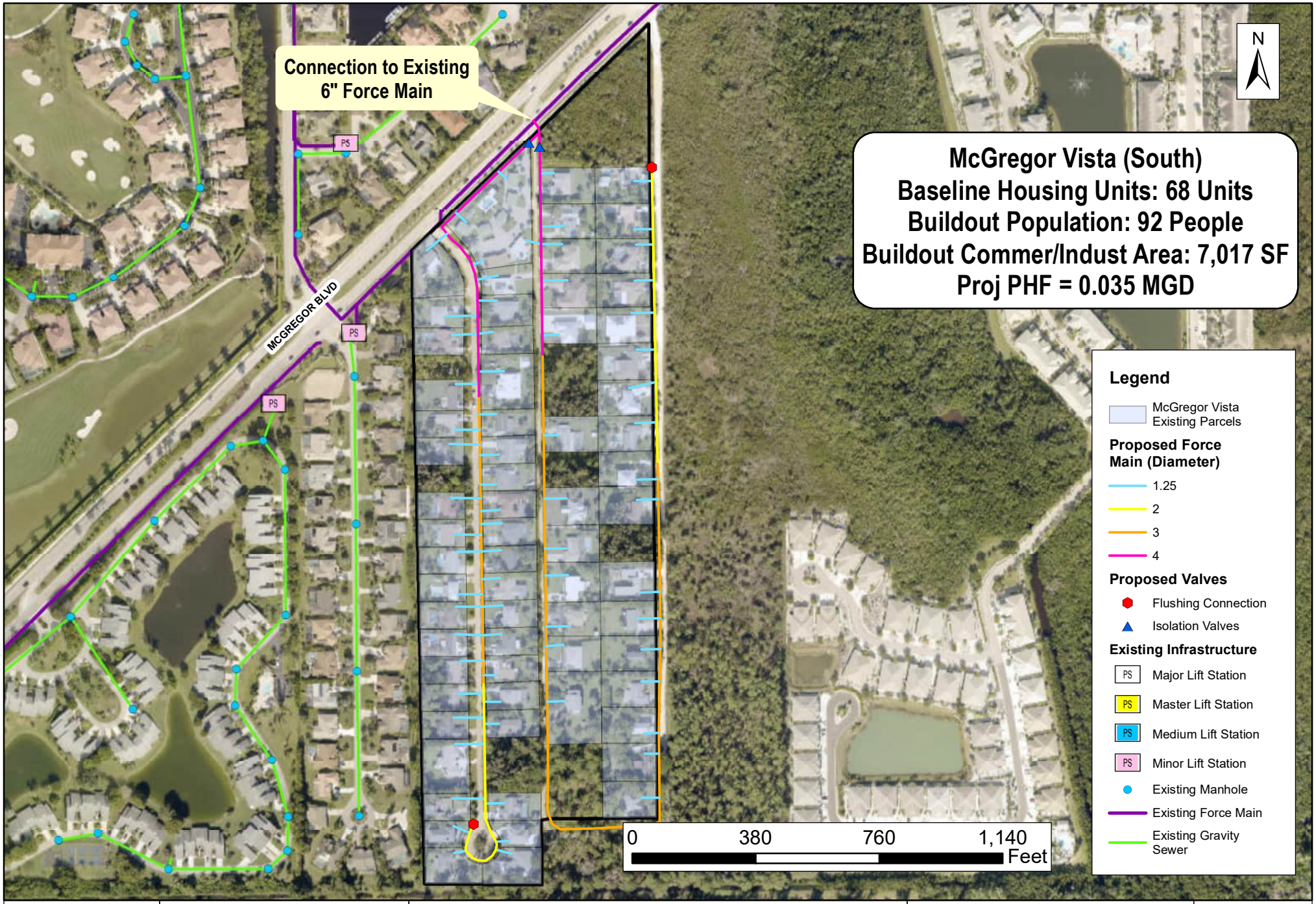
Site Name, Group #	Yacht Club Colony, Group 2		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	12,125	$25	$303,125
2" PE SDR 11 Pipe (LF)	6,210	$30	$186,300
3" PE SDR 11 Pipe (LF)	4,965	$40	$198,600
4" PE SDR 11 Pipe (LF)	9,095	$45	$409,275
Simplex Lift Station (EA)	192	$8,500	$1,632,000
Sentry Advisor (Optional) (EA)	192	$500	$96,000
Terminal Flushing Connection (EA)	11	$2,500	$27,500
Isolation Valve (EA)	17	$3,000	$51,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	192	$2,660	$510,720
Road Restoration (LF @ 20' Width)	5,900	$160	$944,000
Septic System Abandonment (EA)	192	$4,000	$768,000
Subtotal			$5,133,420
Mobilization and Demobilization (Same as Gravity)			$353,536
Contingency (Same as Gravity)			$1,113,638
Construction and Design Services (Same as Gravity)			$853,789
Total			$7,454,384
Rounded Total			**$7,460,000**

Site Name, Group #	Mobile Manor, Group 2		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	12,700	$25	$317,500
2" PE SDR 11 Pipe (LF)	4,120	$30	$123,600
3" PE SDR 11 Pipe (LF)	3,025	$40	$121,000
4" PE SDR 11 Pipe (LF)	1,070	$45	$48,150
6" PE SDR 11 Pipe (LF)	1,545	$55	$84,975
Simplex Lift Station (EA)	254	$8,500	$2,159,000
Sentry Advisor (Optional) (EA)	254	$500	$127,000
Terminal Flushing Connection (EA)	14	$2,500	$35,000
Isolation Valve (EA)	25	$3,000	$75,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	254	$2,660	$675,640
Road Restoration (LF @ 20' Width)	4,355	$160	$696,800
Septic System Abandonment (EA)	254	$4,000	$1,016,000
Subtotal			$5,486,565
Mobilization and Demobilization (Same as Gravity)			$280,115
Contingency (Same as Gravity)			$882,361
Construction and Design Services (Same as Gravity)			$676,477
Total			$7,325,517
Rounded Total			**$7,330,000**

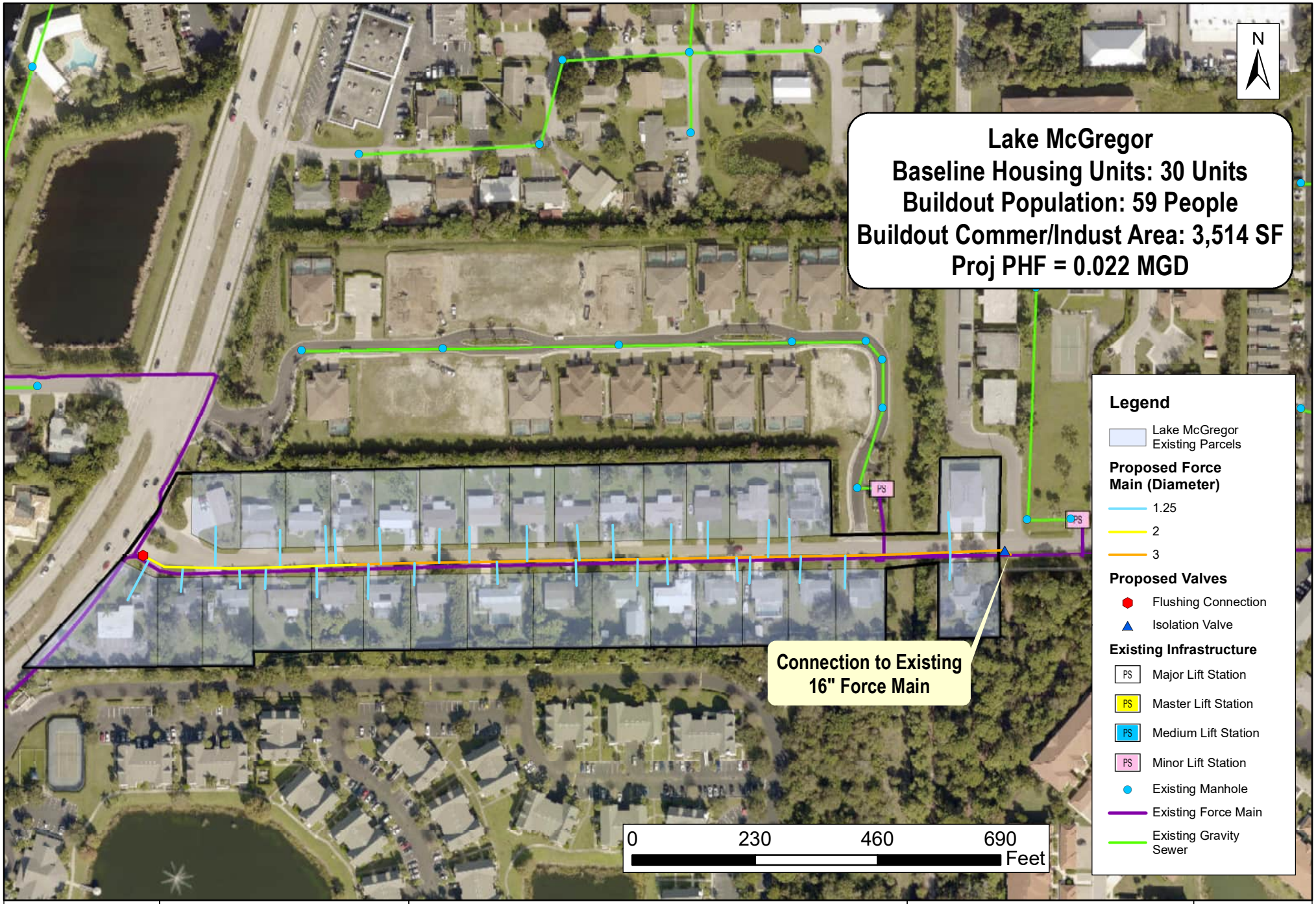


Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **North Town River - Priority Grouping #3** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**

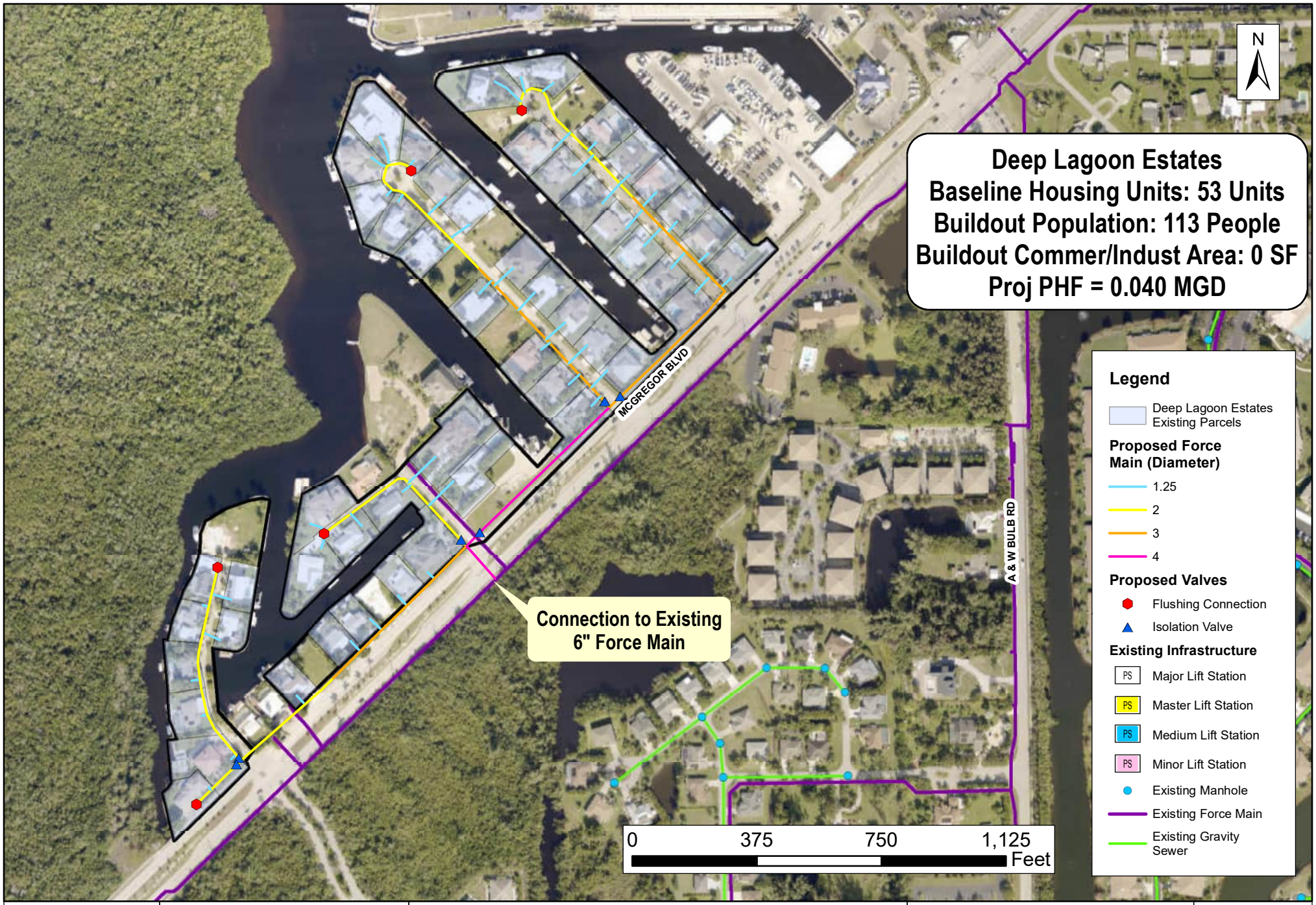
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **McGregor Vista (North) - Priority Grouping #3** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**



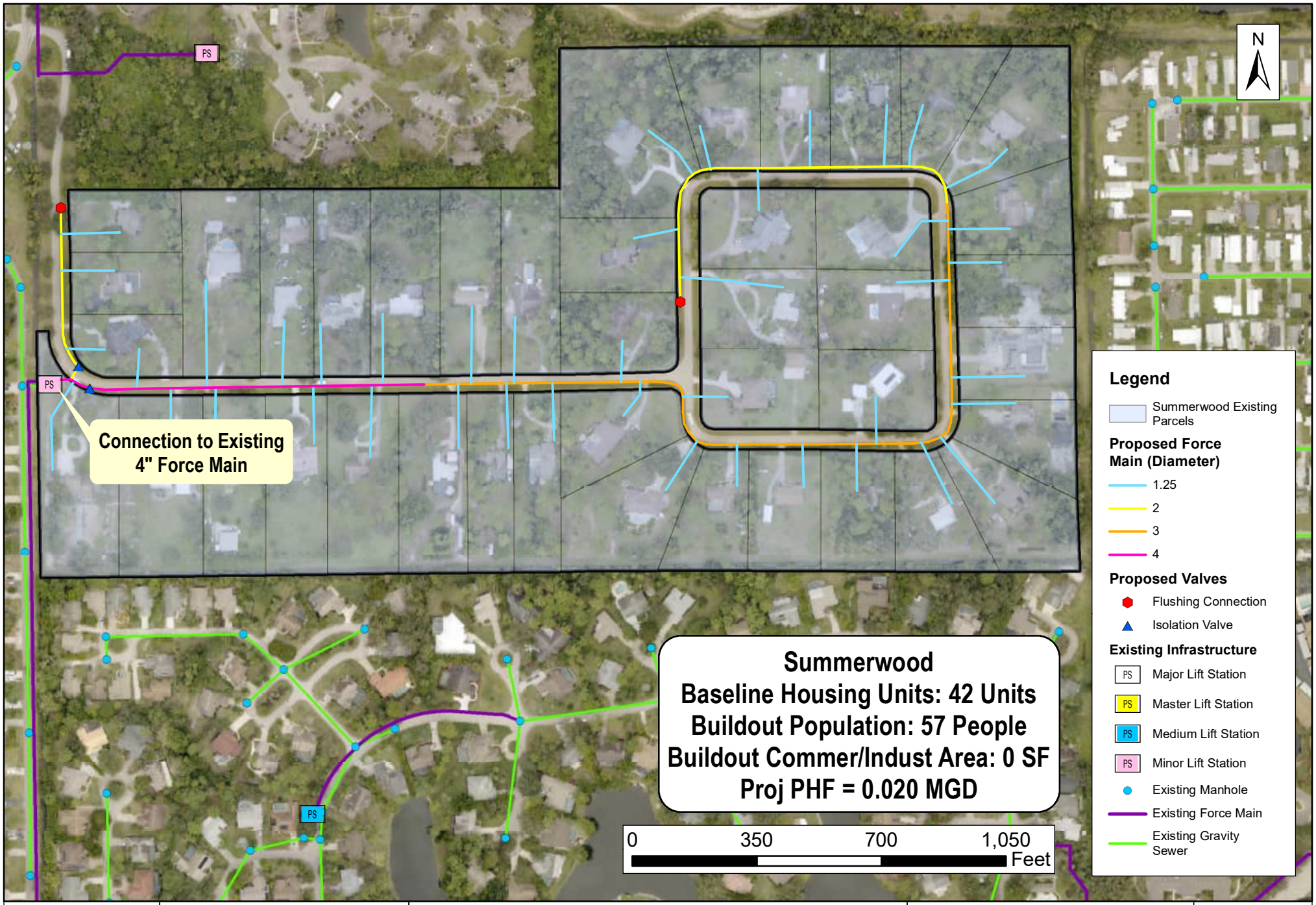
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **McGregor Vista (South) - Priority Grouping #3** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Lake McGregor - Priority Grouping #3** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Deep Lagoon Estates - Priority Grouping #3** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Summerwood - Priority Grouping #3** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**

Site Name, Group #	Deep Lagoon Estates, Group 3		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	2,450	$25	$61,250
2" PE SDR 11 Pipe (LF)	2,515	$30	$75,450
3" PE SDR 11 Pipe (LF)	1,815	$40	$72,600
4" PE SDR 11 Pipe (LF)	455	$45	$20,475
4x10" Force main w Casing - HDD under Road (LF)	200	$1,380	$276,000
Simplex Lift Station (EA)	53	$8,500	$450,500
Sentry Advisor (Optional) (EA)	53	$500	$26,500
Terminal Flushing Connection (EA)	5	$2,500	$12,500
Isolation Valve (EA)	6	$3,000	$18,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	53	$2,660	$140,980
Road Restoration (LF @ 20' Width)	1,233	$160	$197,200
Septic System Abandonment (EA)	53	$4,000	$212,000
Subtotal			$1,570,355
Mobilization and Demobilization (Same as Gravity)			$205,495
Contingency (Same as Gravity)			$647,310
Construction and Design Services (Same as Gravity)			$496,271
Total			$2,919,431
Rounded Total			**$2,920,000**

Site Name, Group #	Lake McGregor, Group 3		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	1,640	$25	$41,000
2" PE SDR 11 Pipe (LF)	365	$30	$10,950
3" PE SDR 11 Pipe (LF)	1,100	$40	$44,000
Simplex Lift Station (EA)	30	$8,500	$255,000
Sentry Advisor (Optional) (EA)	30	$500	$15,000
Terminal Flushing Connection (EA)	1	$2,500	$2,500
Isolation Valve (EA)	1	$3,000	$3,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	30	$2,660	$79,800
Road Restoration (LF @ 20' Width)	705	$160	$112,800
Septic System Abandonment (EA)	30	$4,000	$120,000
Subtotal			$690,950
Mobilization and Demobilization (Same as Gravity)			$32,338
Contingency (Same as Gravity)			$101,863
Construction and Design Services (Same as Gravity)			$78,095
Total			$903,246
Rounded Total			**$910,000**

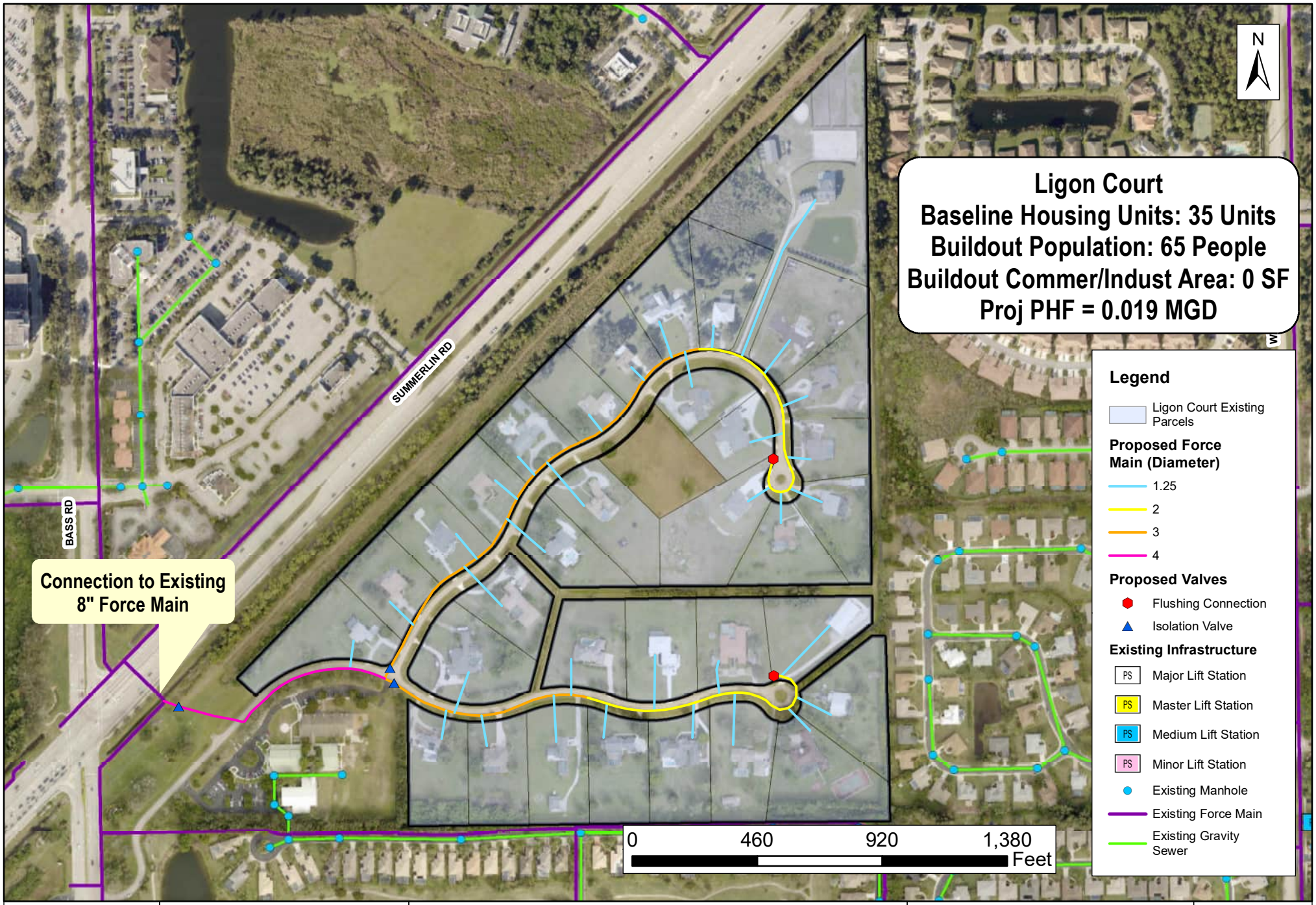
Site Name, Group #	McGregor Vista (North), Group 3		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	1,360	$25	$34,000
2" PE SDR 11 Pipe (LF)	1,580	$30	$47,400
3" PE SDR 11 Pipe (LF)	915	$40	$36,600
Simplex Lift Station (EA)	26	$8,500	$221,000
Sentry Advisor (Optional) (EA)	26	$500	$13,000
Terminal Flushing Connection (EA)	2	$2,500	$5,000
Isolation Valve (EA)	2	$3,000	$6,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	26	$2,660	$69,160
Road Restoration (LF @ 20' Width)	1,325	$160	$212,000
Septic System Abandonment (EA)	26	$4,000	$104,000
Subtotal			$755,060
Mobilization and Demobilization (Same as Gravity)			$74,961
Contingency (Same as Gravity)			$236,126
Construction and Design Services (Same as Gravity)			$181,030
Total			$1,247,176
Rounded Total			**$1,250,000**

Site Name, Group #	McGregor Vista (South), Group 3		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	4,020	$25	$100,500
2" PE SDR 11 Pipe (LF)	1,455	$30	$43,650
3" PE SDR 11 Pipe (LF)	3,370	$40	$134,800
4" PE SDR 11 Pipe (LF)	1,515	$45	$68,175
Simplex Lift Station (EA)	68	$8,500	$578,000
Sentry Advisor (Optional) (EA)	68	$500	$34,000
Terminal Flushing Connection (EA)	2	$2,500	$5,000
Isolation Valve (EA)	2	$3,000	$6,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	68	$2,660	$180,880
Road Restoration (LF @ 20' Width)	2,980	$160	$476,800
Septic System Abandonment (EA)	68	$4,000	$272,000
Subtotal			$1,906,705
Mobilization and Demobilization (Same as Gravity)			$164,974
Contingency (Same as Gravity)			$519,668
Construction and Design Services (Same as Gravity)			$398,412
Total			$2,989,759
Rounded Total			**$2,990,000**

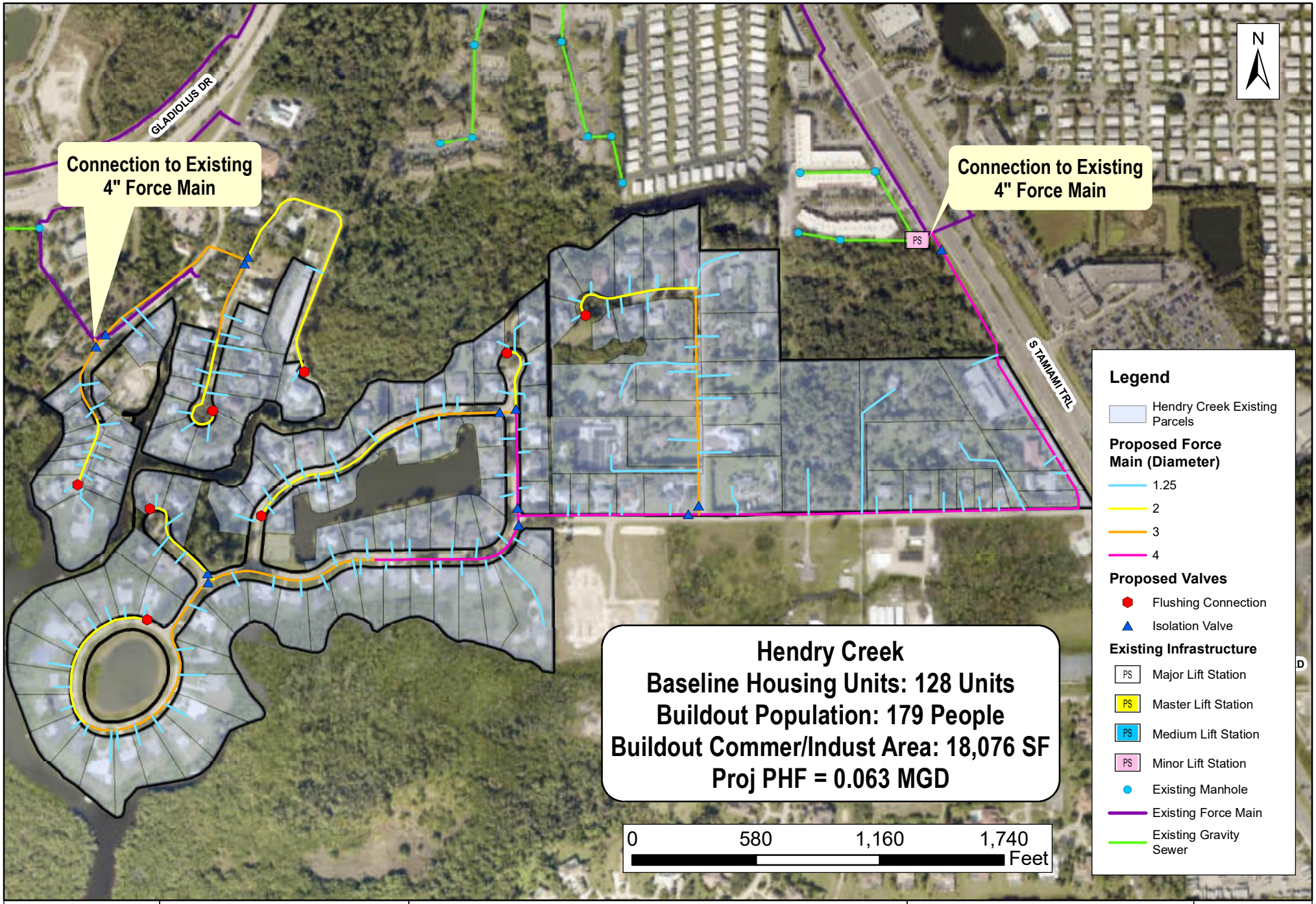
Site Name, Group #	North Town River, Group 3		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	11,000	$25	$275,000
2" PE SDR 11 Pipe (LF)	3,890	$30	$116,700
3" PE SDR 11 Pipe (LF)	4,245	$40	$169,800
4" PE SDR 11 Pipe (LF)	3,765	$45	$169,425
Simplex Lift Station (EA)	179	$8,500	$1,521,500
Sentry Advisor (Optional) (EA)	179	$500	$89,500
Terminal Flushing Connection (EA)	7	$2,500	$17,500
Isolation Valve (EA)	12	$3,000	$36,000
Connection to Existing Infrastructure (LS)	2	$6,900	$13,800
Service Connections (EA)	179	$2,660	$476,140
Road Restoration (LF @ 20' Width)	4,545	$160	$727,200
Septic System Abandonment (EA)	179	$4,000	$716,000
Subtotal			$4,328,565
Mobilization and Demobilization (Same as Gravity)			$286,847
Contingency (Same as Gravity)			$903,568
Construction and Design Services (Same as Gravity)			$692,736
Total			$6,211,716
Rounded Total			**$6,220,000**

Site Name, Group #	Summerwood, Group 3		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	6,610	$25	$165,250
2" PE SDR 11 Pipe (LF)	1,480	$30	$44,400
3" PE SDR 11 Pipe (LF)	2,010	$40	$80,400
4" PE SDR 11 Pipe (LF)	950	$45	$42,750
Simplex Lift Station (EA)	42	$8,500	$357,000
Sentry Advisor (Optional) (EA)	42	$500	$21,000
Terminal Flushing Connection (EA)	2	$2,500	$5,000
Isolation Valve (EA)	2	$3,000	$6,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	42	$2,660	$111,720
Road Restoration (LF @ 20' Width)	2,105	$160	$336,800
Septic System Abandonment (EA)	42	$4,000	$168,000
Subtotal			$1,345,220
Mobilization and Demobilization (Same as Gravity)			$108,381
Contingency (Same as Gravity)			$341,400
Construction and Design Services (Same as Gravity)			$261,740
Total			$2,056,741
Rounded Total			**$2,060,000**

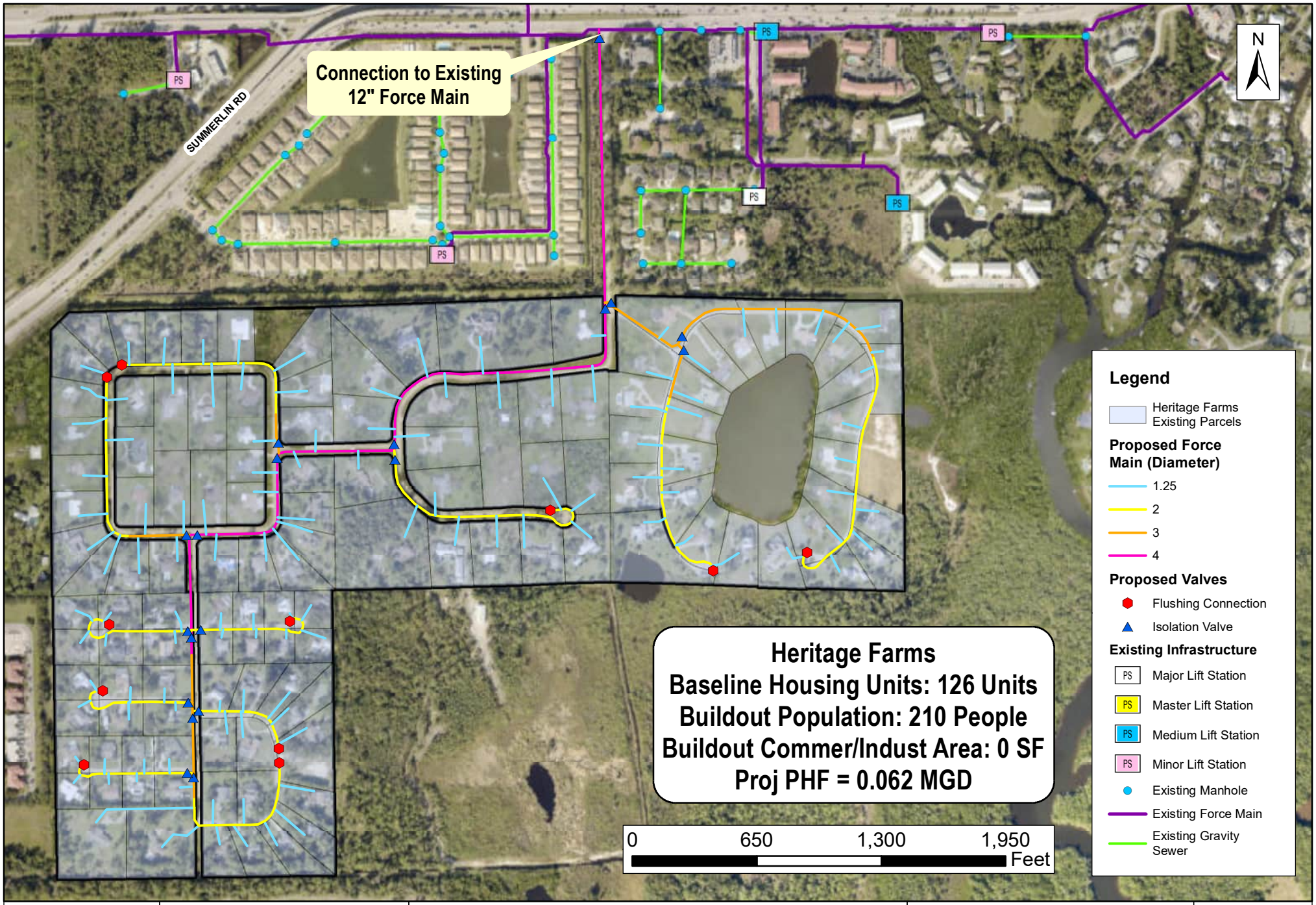
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Lakes Park - Priority Grouping #4** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Ligon Court - Priority Grouping #4** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Hendry Creek - Priority Grouping #4** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**



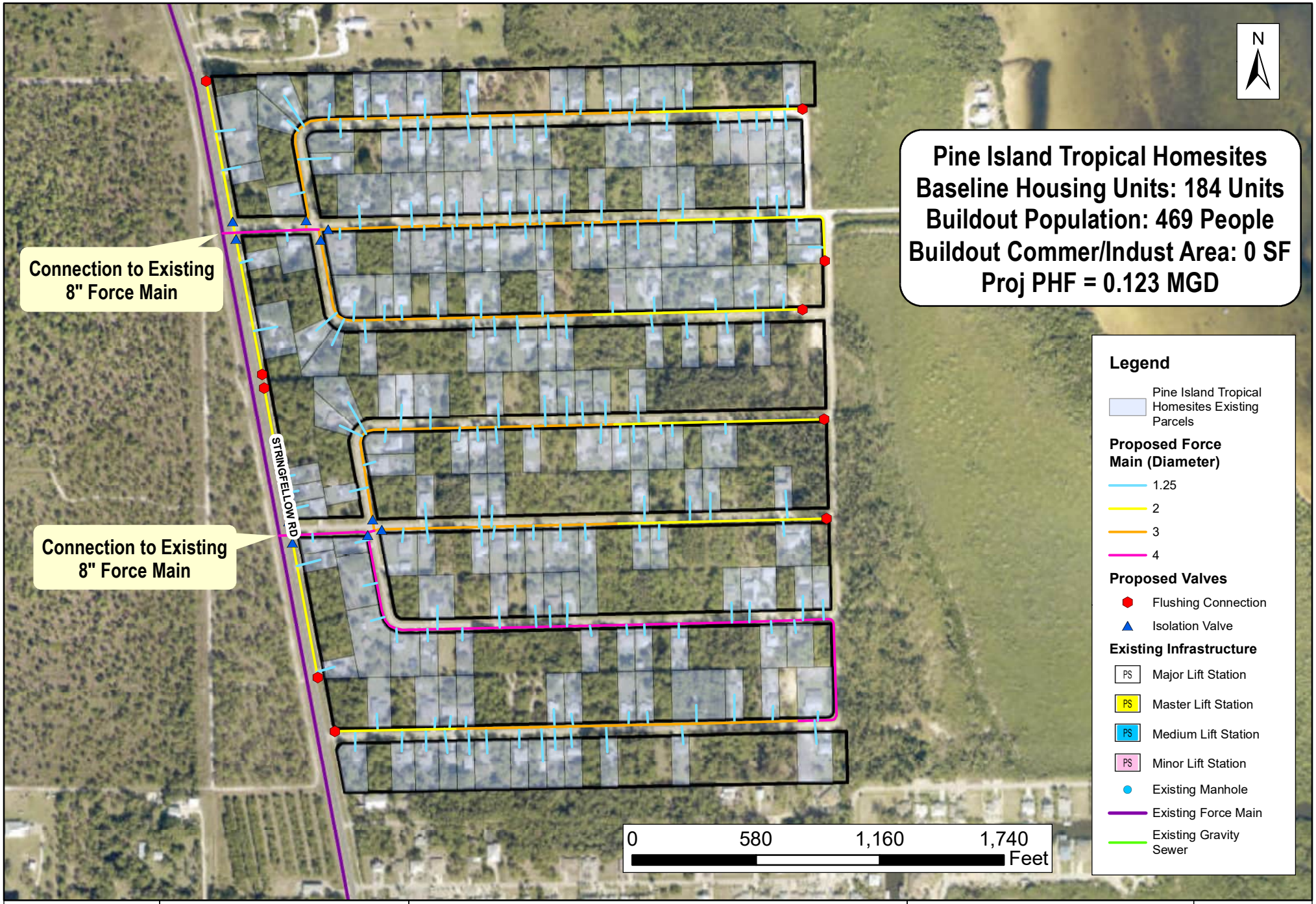
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Heritage Farms - Priority Grouping #4** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**

Site Name, Group #	Hendry Creek, Group 4		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	12,005	$25	$300,125
2" PE SDR 11 Pipe (LF)	4,675	$30	$140,250
3" PE SDR 11 Pipe (LF)	4,670	$40	$186,800
4" PE SDR 11 Pipe (LF)	4,810	$45	$216,450
Simplex Lift Station (EA)	128	$8,500	$1,088,000
Sentry Advisor (Optional) (EA)	128	$500	$64,000
Terminal Flushing Connection (EA)	8	$2,500	$20,000
Isolation Valve (EA)	13	$3,000	$39,000
Connection to Existing Infrastructure (LS)	2	$6,900	$13,800
Service Connections (EA)	128	$2,660	$340,480
Road Restoration (LF @ 20' Width)	6,505	$160	$1,040,800
Septic System Abandonment (EA)	128	$4,000	$512,000
Subtotal			$3,961,705
Mobilization and Demobilization (Same as Gravity)			$328,667
Contingency (Same as Gravity)			$1,035,299
Construction and Design Services (Same as Gravity)			$793,730
Total			$6,119,401
Rounded Total			**$6,120,000**

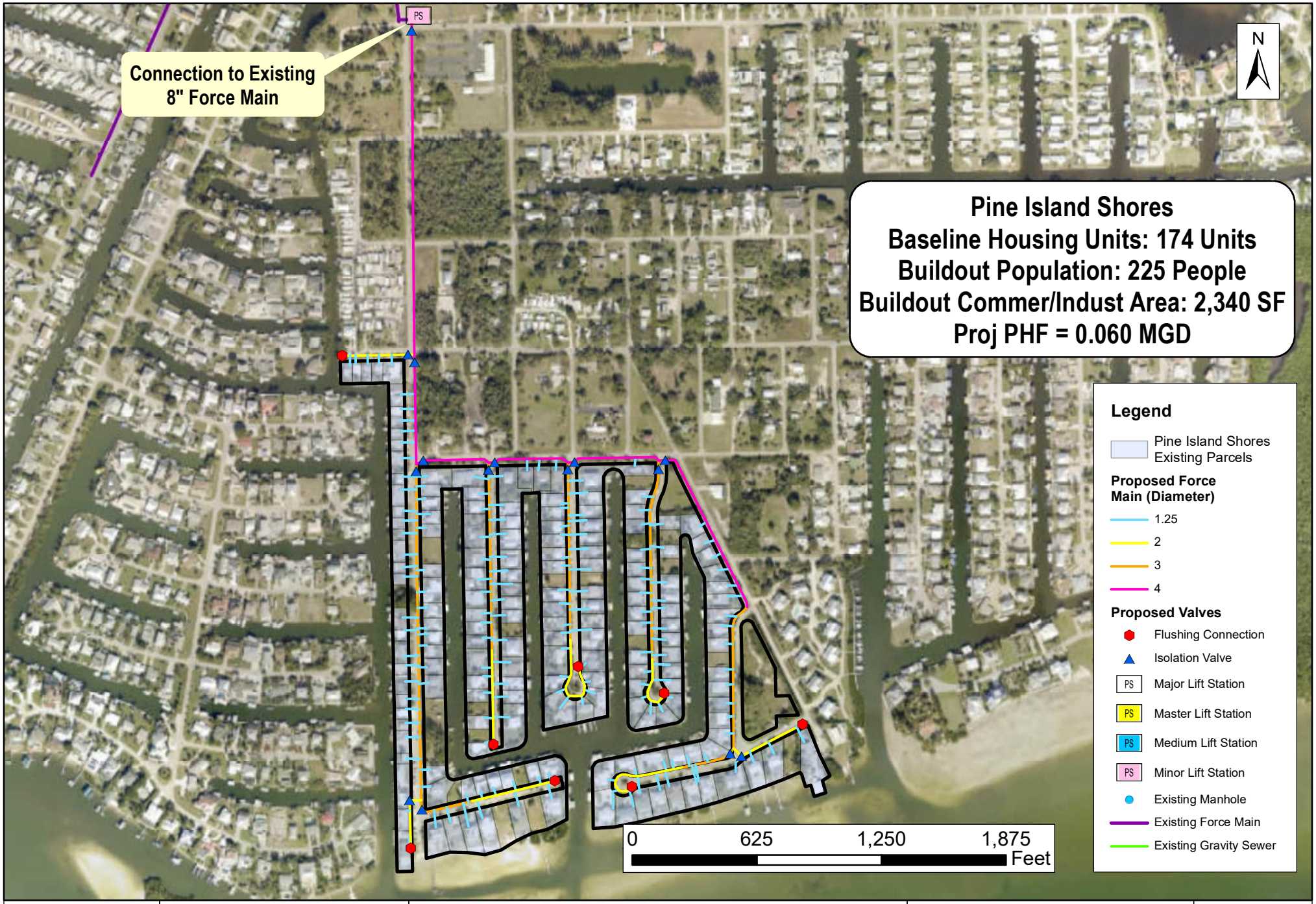
Site Name, Group #	Heritage Farms, Group 4		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	14,465	$25	$361,625
2" PE SDR 11 Pipe (LF)	8,770	$30	$263,100
3" PE SDR 11 Pipe (LF)	2,890	$40	$115,600
4" PE SDR 11 Pipe (LF)	4,640	$45	$208,800
Simplex Lift Station (EA)	126	$8,500	$1,071,000
Sentry Advisor (Optional) (EA)	126	$500	$63,000
Terminal Flushing Connection (EA)	11	$2,500	$27,500
Isolation Valve (EA)	19	$3,000	$57,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	126	$2,660	$335,160
Road Restoration (LF @ 20' Width)	6,720	$160	$1,075,200
Septic System Abandonment (EA)	126	$4,000	$504,000
Subtotal			$4,088,885
Mobilization and Demobilization (Same as Gravity)			$313,893
Contingency (Same as Gravity)			$988,763
Construction and Design Services (Same as Gravity)			$758,052
Total			$6,149,593
Rounded Total			**$6,150,000**

Site Name, Group #	Lakes Park, Group 4		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	7,970	$25	$199,250
2" PE SDR 11 Pipe (LF)	2,030	$30	$60,900
3" PE SDR 11 Pipe (LF)	3,210	$40	$128,400
4" PE SDR 11 Pipe (LF)	5,445	$45	$245,025
Simplex Lift Station (EA)	125	$8,500	$1,062,500
Sentry Advisor (Optional) (EA)	125	$500	$62,500
Terminal Flushing Connection (EA)	3	$2,500	$7,500
Isolation Valve (EA)	4	$3,000	$12,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	125	$2,660	$332,500
Road Restoration (LF @ 20' Width)	5,305	$160	$848,800
Septic System Abandonment (EA)	125	$4,000	$500,000
Subtotal			$3,466,275
Mobilization and Demobilization (Same as Gravity)			$255,845
Contingency (Same as Gravity)			$805,912
Construction and Design Services (Same as Gravity)			$617,866
Total			$5,145,897
Rounded Total			**$5,150,000**

Site Name, Group #	Ligon Court, Group 4		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	4,500	$25	$112,500
2" PE SDR 11 Pipe (LF)	1,660	$30	$49,800
3" PE SDR 11 Pipe (LF)	2,260	$40	$90,400
4" PE SDR 11 Pipe (LF)	805	$45	$36,225
Simplex Lift Station (EA)	35	$8,500	$297,500
Sentry Advisor (Optional) (EA)	35	$500	$17,500
Terminal Flushing Connection (EA)	2	$2,500	$5,000
Isolation Valve (EA)	3	$3,000	$9,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	35	$2,660	$93,100
Road Restoration (LF @ 20' Width)	1,695	$160	$271,200
Septic System Abandonment (EA)	35	$4,000	$140,000
Subtotal			$1,129,125
Mobilization and Demobilization (Same as Gravity)			$101,928
Contingency (Same as Gravity)			$321,072
Construction and Design Services (Same as Gravity)			$246,155
Total			$1,798,279
Rounded Total			**$1,800,000**



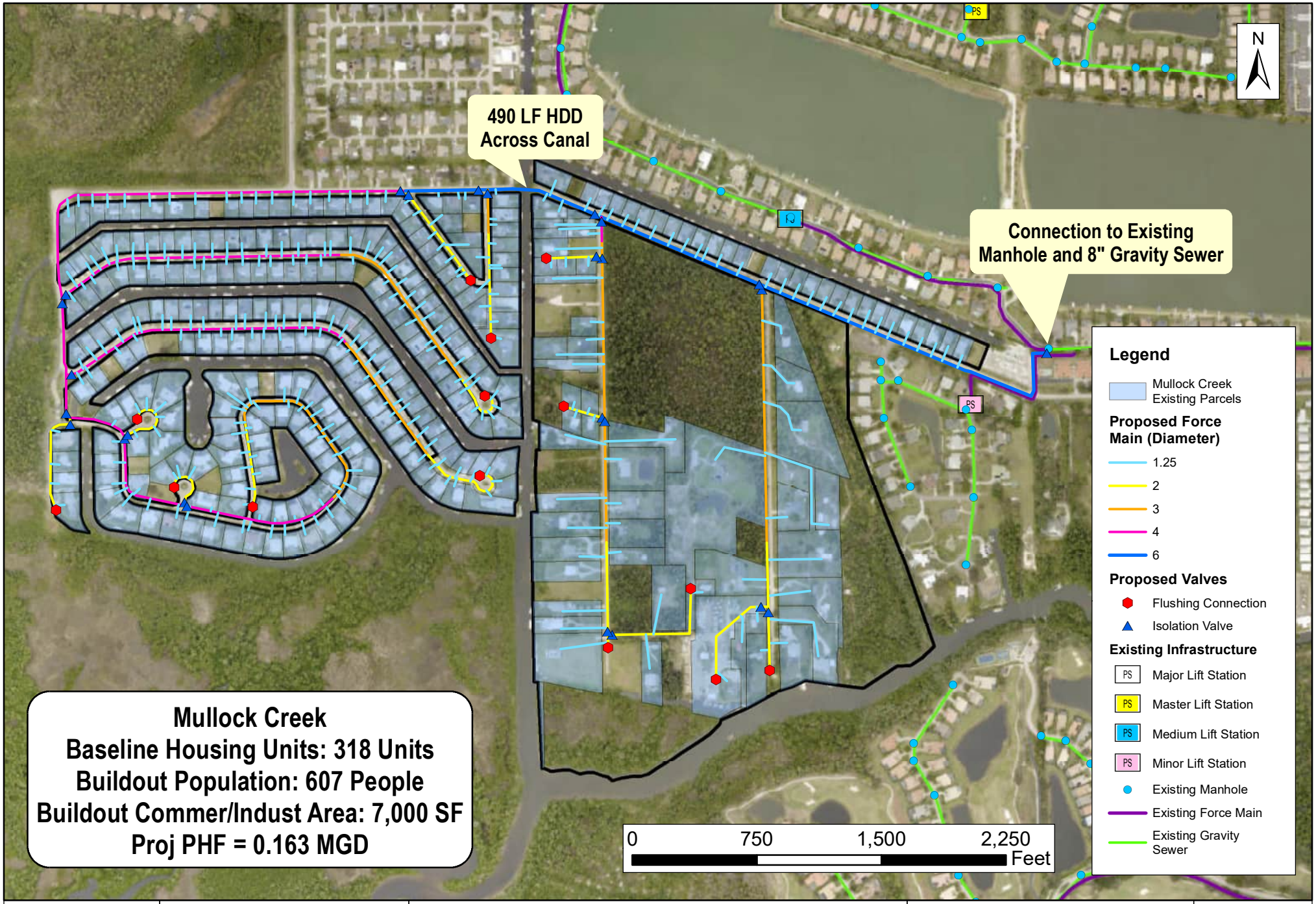
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Pine Island Tropical Homesites - Priority Grouping #5 Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Pine Island Shores - Priority Grouping #5** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**

Site Name, Group #	Pine Island Shores, Group 5		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	9,555	$25	$238,875
2" PE SDR 11 Pipe (LF)	2,915	$30	$87,450
3" PE SDR 11 Pipe (LF)	5,220	$40	$208,800
4" PE SDR 11 Pipe (LF)	3,920	$45	$176,400
Simplex Lift Station (EA)	174	$8,500	$1,479,000
Sentry Advisor (Optional) (EA)	174	$500	$87,000
Terminal Flushing Connection (EA)	8	$2,500	$20,000
Isolation Valve (EA)	15	$3,000	$45,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	174	$2,660	$462,840
Road Restoration (LF @ 20' Width)	4,925	$160	$788,000
Septic System Abandonment (EA)	174	$4,000	$696,000
Subtotal			$4,296,265
Mobilization and Demobilization (Same as Gravity)			$266,975
Contingency (Same as Gravity)			$840,970
Construction and Design Services (Same as Gravity)			$644,743
Total			$6,048,953
Rounded Total			**$6,050,000**

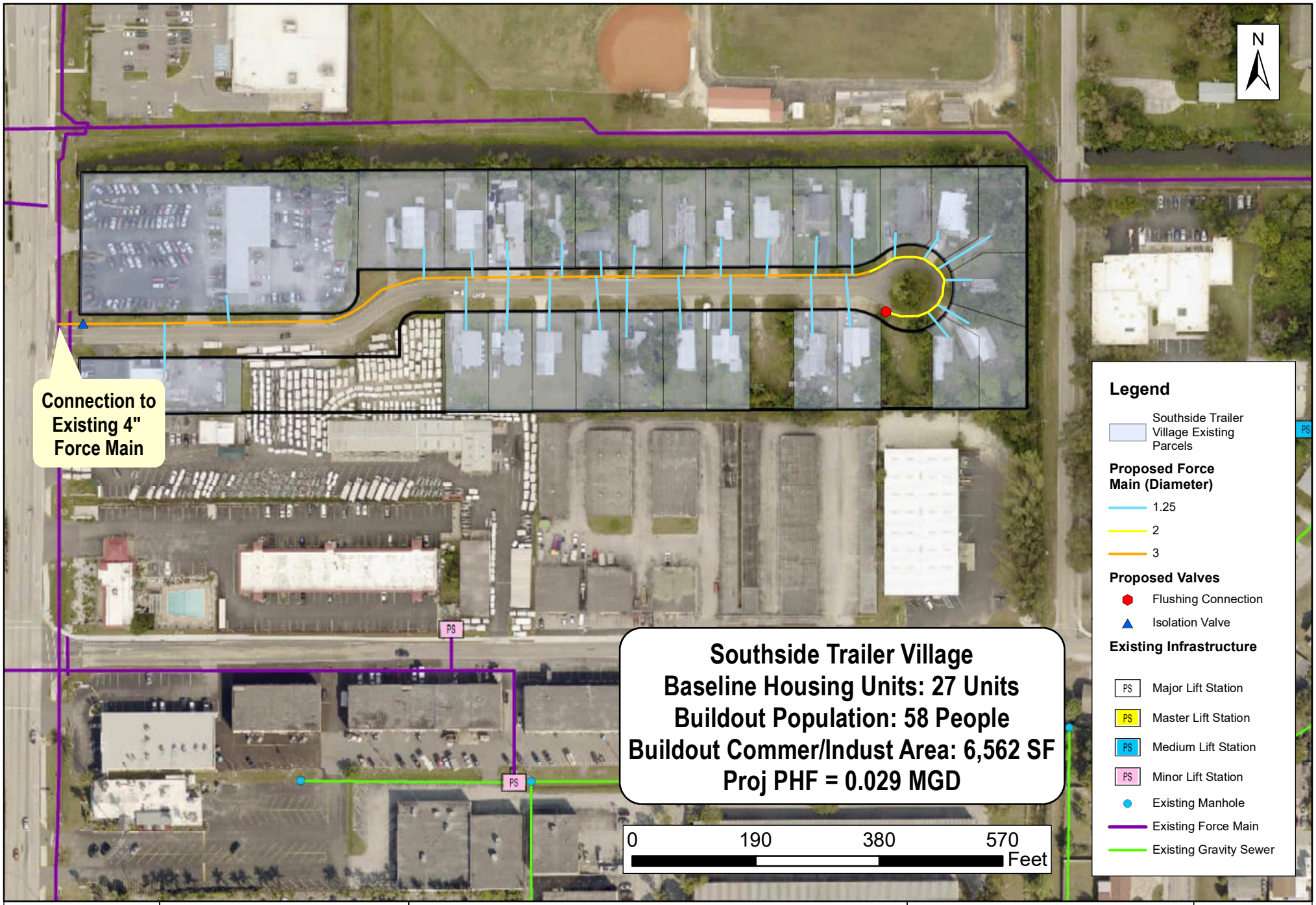
Site Name, Group #	Pine Island Tropical Homesites, Group 5		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	14,675	$25	$366,875
2" PE SDR 11 Pipe (LF)	7,080	$30	$212,400
3" PE SDR 11 Pipe (LF)	8,740	$40	$349,600
4" PE SDR 11 Pipe (LF)	3,645	$45	$164,025
Simplex Lift Station (EA)	184	$8,500	$1,564,000
Sentry Advisor (Optional) (EA)	184	$500	$92,000
Terminal Flushing Connection (EA)	10	$2,500	$25,000
Isolation Valve (EA)	11	$3,000	$33,000
Connection to Existing Infrastructure (LS)	2	$6,900	$13,800
Service Connections (EA)	184	$2,660	$489,440
Road Restoration (LF @ 20' Width)	11,000	$160	$1,760,000
Septic System Abandonment (EA)	184	$4,000	$736,000
Subtotal			$5,806,140
Mobilization and Demobilization (Same as Gravity)			$465,607
Contingency (Same as Gravity)			$1,466,662
Construction and Design Services (Same as Gravity)			$1,124,441
Total			$8,862,850
Rounded Total			**$8,870,000**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Mullock Creek - Priority Grouping #6** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**

Site Name, Group #	Mullock Creek, Group 6		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	24,165	$25	$604,125
2" PE SDR 11 Pipe (LF)	6,840	$30	$205,200
3" PE SDR 11 Pipe (LF)	5,920	$40	$236,800
4" PE SDR 11 Pipe (LF)	7,620	$45	$342,900
6" PE SDR 11 Pipe (LF)	3,440	$55	$189,200
4" HDD (Canal) (LF)	490	$175	$85,750
Simplex Lift Station (EA)	318	$8,500	$2,703,000
Sentry Advisor (Optional) (EA)	318	$500	$159,000
Terminal Flushing Connection (EA)	14	$2,500	$35,000
Isolation Valve (EA)	26	$3,000	$78,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	318	$2,660	$845,880
Road Restoration (LF @ 20' Width)	9,710	$160	$1,553,600
Septic System Abandonment (EA)	318	$4,000	$1,272,000
Subtotal			$8,317,355
Mobilization and Demobilization (Same as Gravity)			$628,952
Contingency (Same as Gravity)			$1,981,197
Construction and Design Services (Same as Gravity)			$1,518,918
Total			$12,446,422
Rounded Total			**$12,450,000**

Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Page Park - Priority Grouping #7** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created:
June 2022

LEE COUNTY
SOUTHWEST FLORIDA

Countywide Wastewater Management Plan

Southside Trailer Village - Priority Grouping #7
Low Pressure Collection System Concept Plan

AECOM

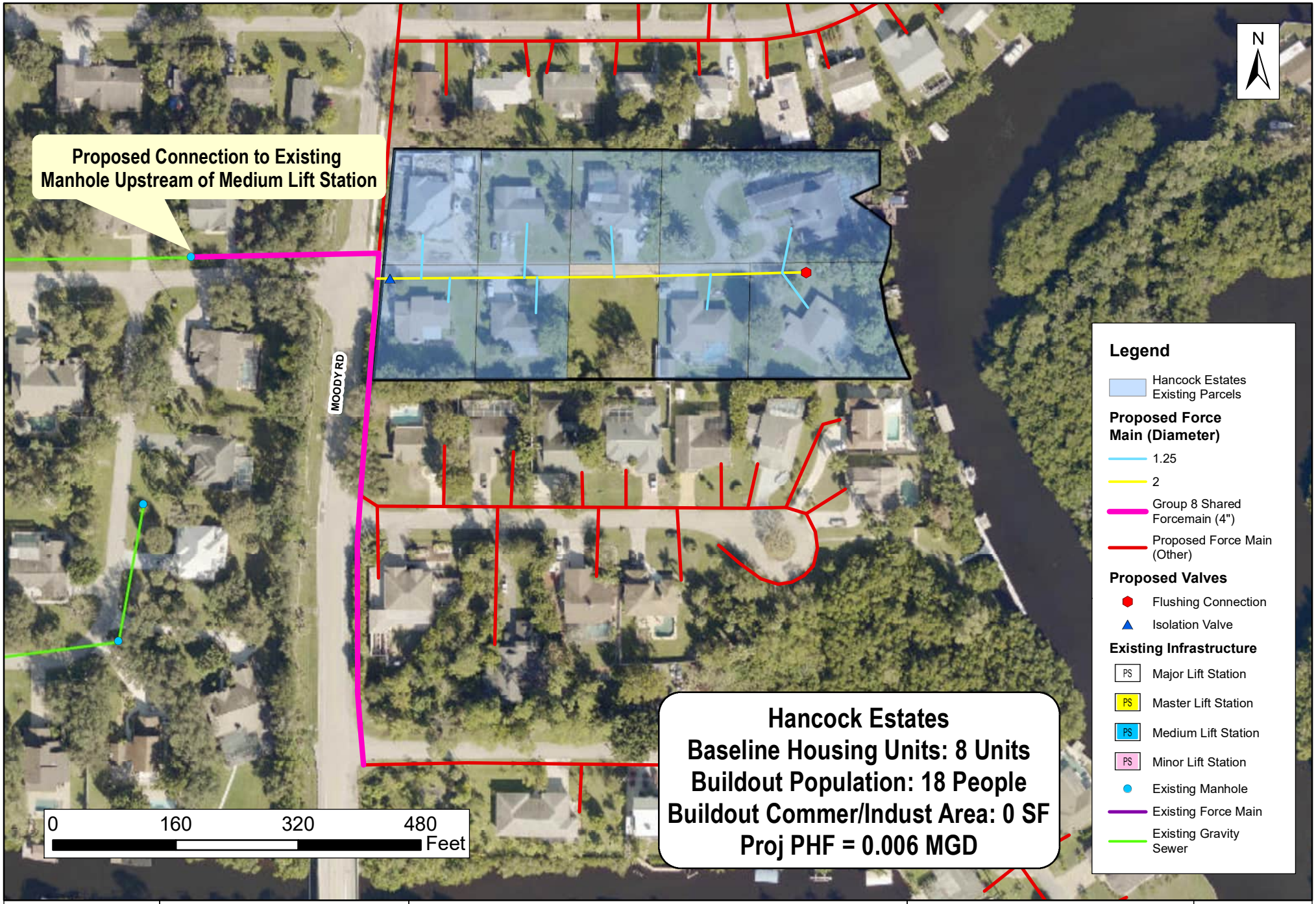
Figure

X

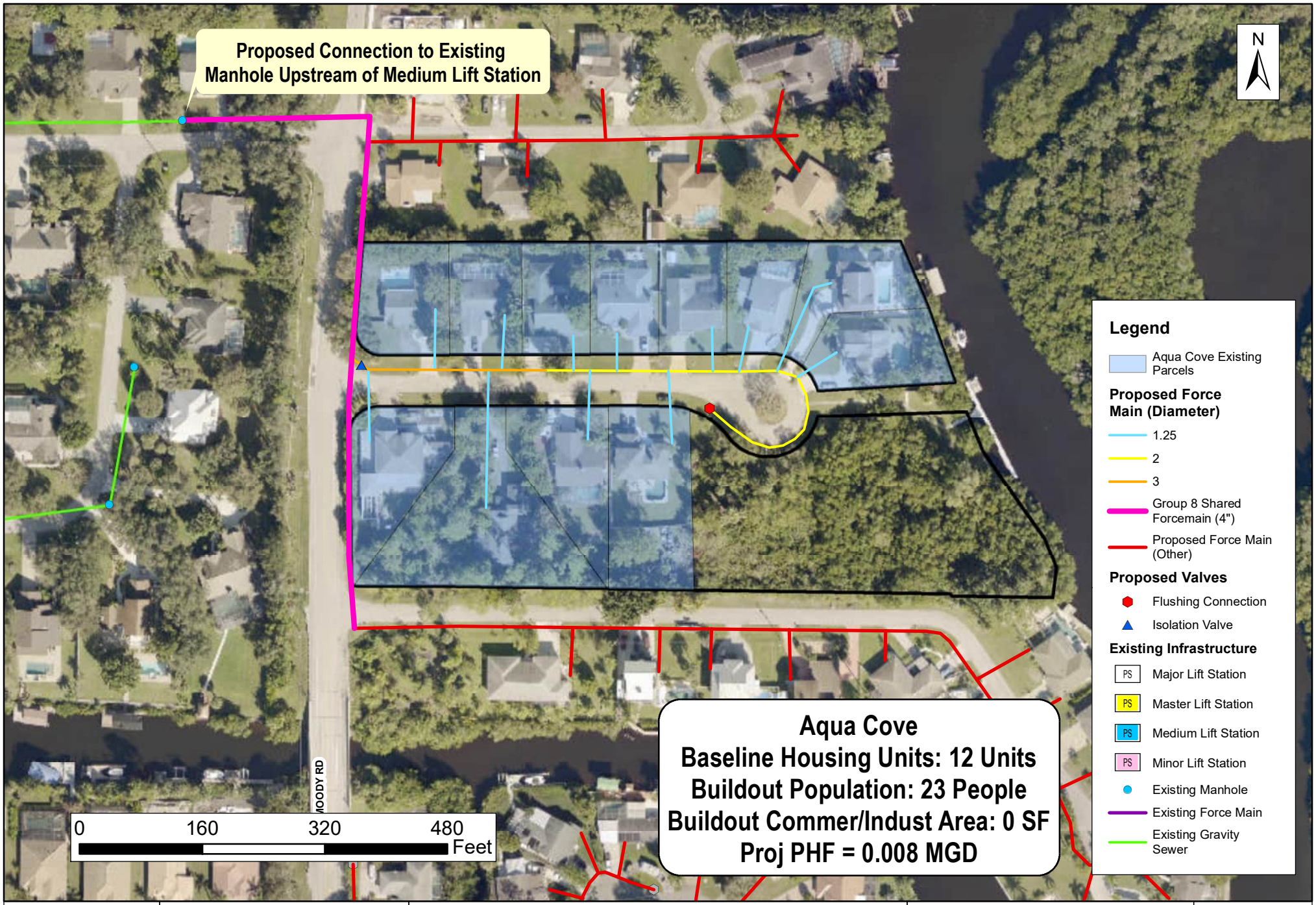
Site Name, Group #	Page Park, Group 7		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	22,575	$25	$564,375
2" PE SDR 11 Pipe (LF)	9,505	$30	$285,150
3" PE SDR 11 Pipe (LF)	4,575	$40	$183,000
4" PE SDR 11 Pipe (LF)	4,730	$45	$212,850
6" PE SDR 11 Pipe (LF)	1,130	$55	$62,150
Simplex Lift Station (EA)	301	$8,500	$2,558,500
Sentry Advisor (Optional) (EA)	301	$500	$150,500
Terminal Flushing Connection (EA)	19	$2,500	$47,500
Isolation Valve (EA)	30	$3,000	$90,000
Connection to Existing Infrastructure (LS)	3	$6,900	$20,700
Service Connections (EA)	301	$2,660	$800,660
Road Restoration (LF @ 20' Width)	4,550	$160	$728,000
Septic System Abandonment (EA)	301	$4,000	$1,204,000
Subtotal			$6,907,385
Mobilization and Demobilization (Same as Gravity)			$482,758
Contingency (Same as Gravity)			$1,520,688
Construction and Design Services (Same as Gravity)			$1,165,861
Total			$10,076,691
Rounded Total			**$10,080,000**

Site Name, Group #	Southside Trailer Village, Group 7		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	1,570	$25	$39,250
2" PE SDR 11 Pipe (LF)	235	$30	$7,050
3" PE SDR 11 Pipe (LF)	1,135	$40	$45,400
Simplex Lift Station (EA)	27	$8,500	$229,500
Sentry Advisor (Optional) (EA)	27	$500	$13,500
Terminal Flushing Connection (EA)	1	$2,500	$2,500
Isolation Valve (EA)	1	$3,000	$3,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	27	$2,660	$71,820
Road Restoration (LF @ 20' Width)	535	$160	$85,600
Septic System Abandonment (EA)	27	$4,000	$108,000
Subtotal			$612,520
Mobilization and Demobilization (Same as Gravity)			$50,869
Contingency (Same as Gravity)			$160,236
Construction and Design Services (Same as Gravity)			$122,847
Total			$946,472
Rounded Total			**$950,000**

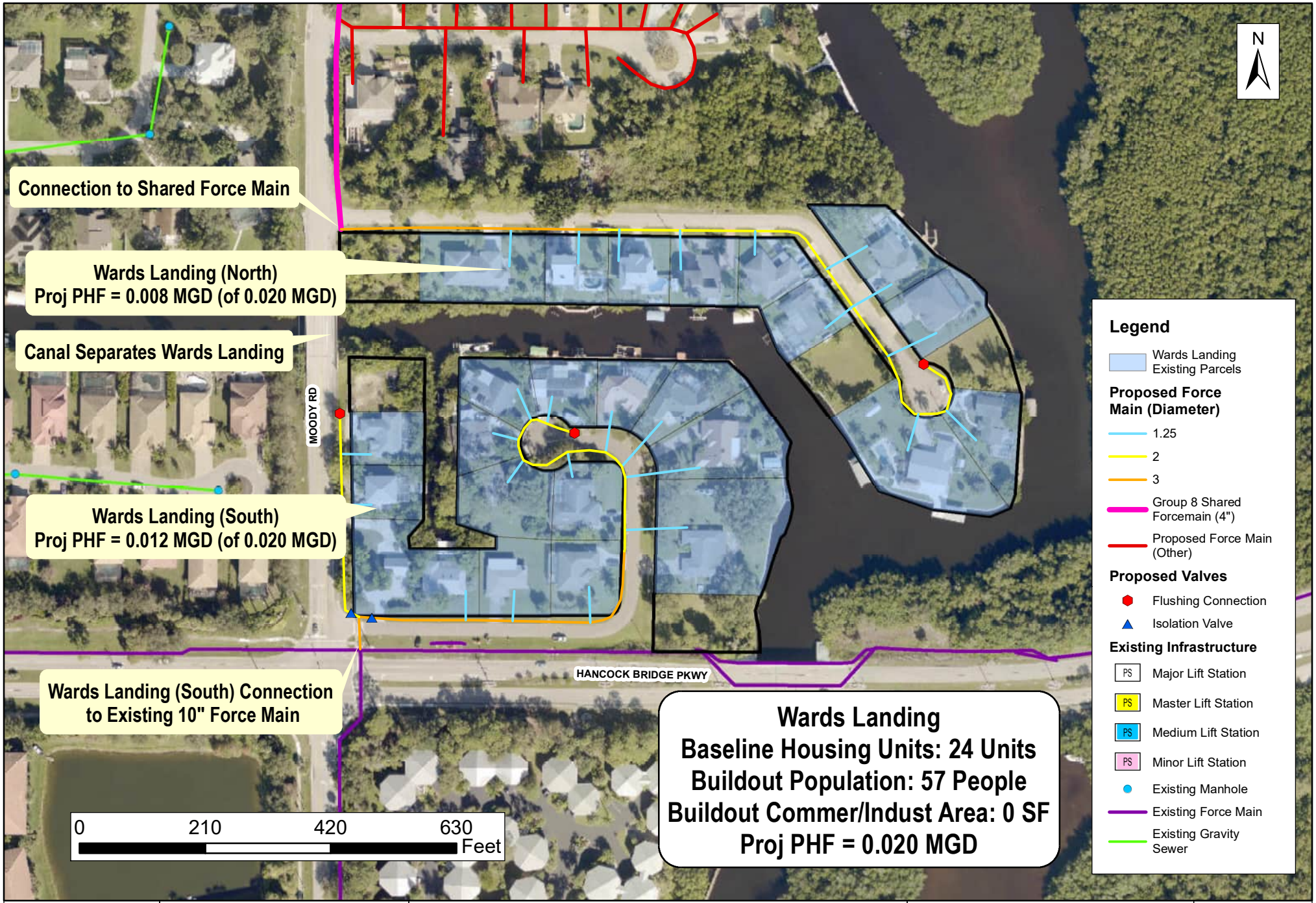
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	Countywide Wastewater Management Plan Blue Water Shores - Priority Grouping #8 Low Pressure Collection System Concept Plan	AECOM	Figure X



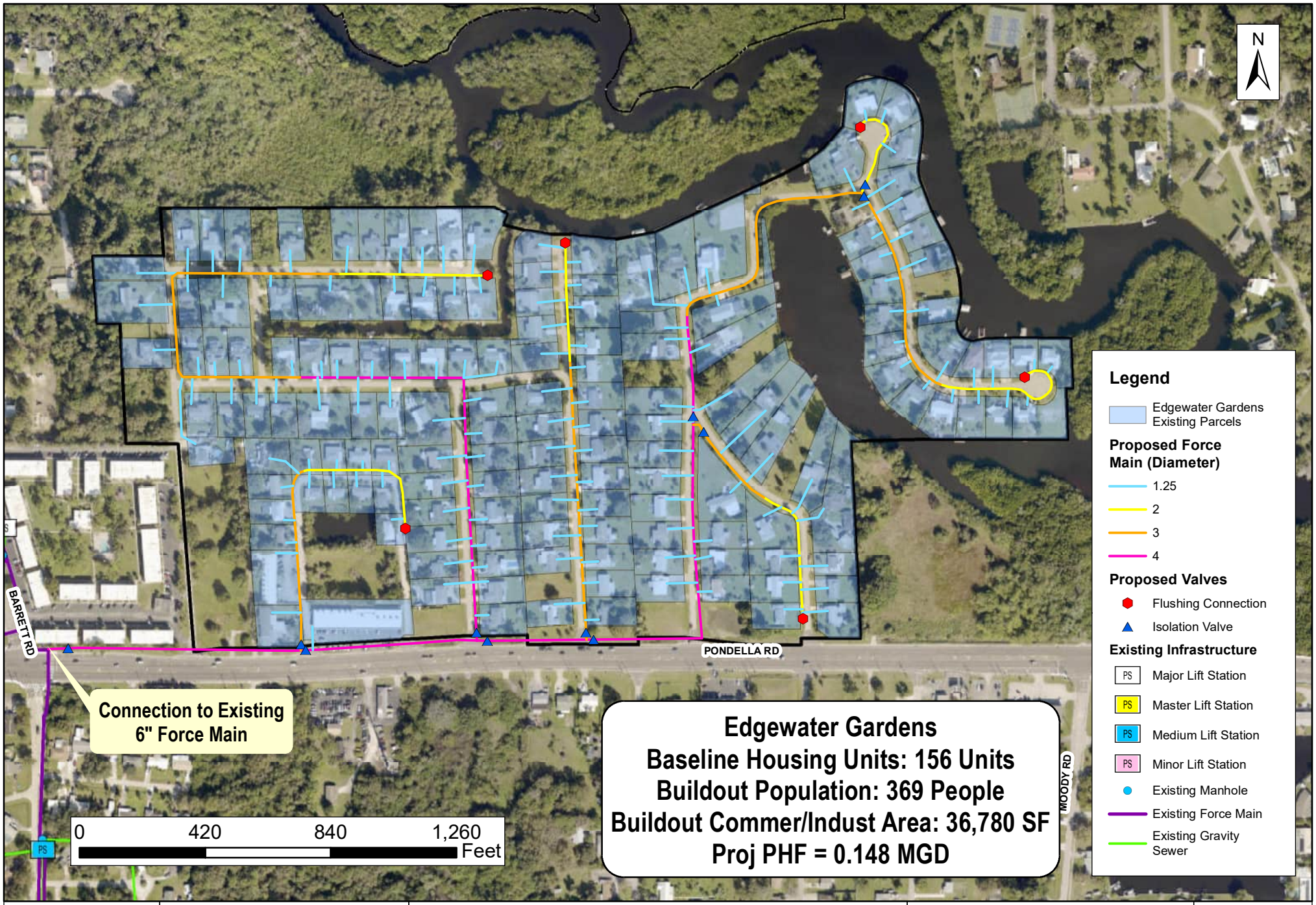
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Hancock Estates - Priority Grouping #8** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**



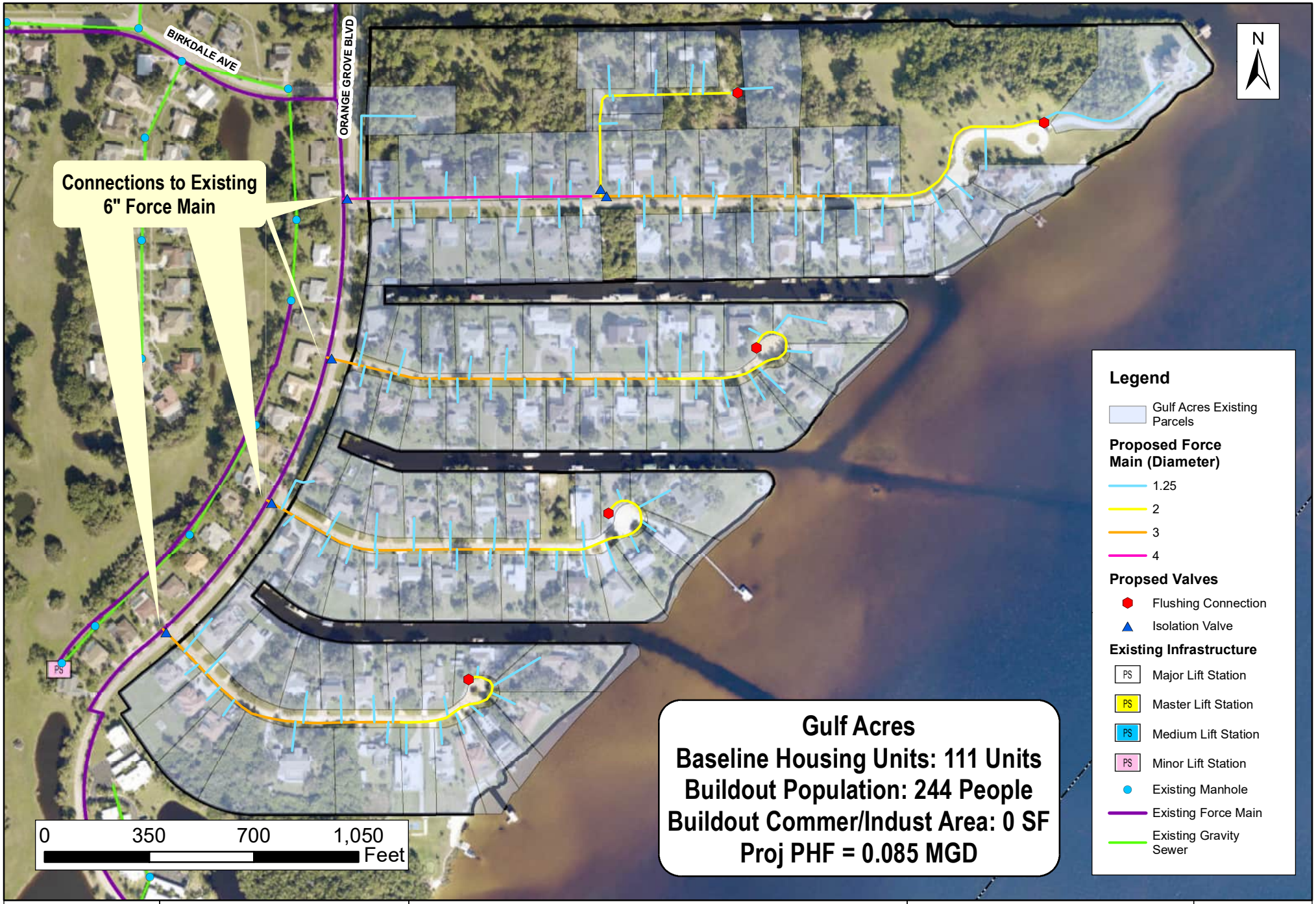
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Aqua Cove - Priority Grouping #8** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**



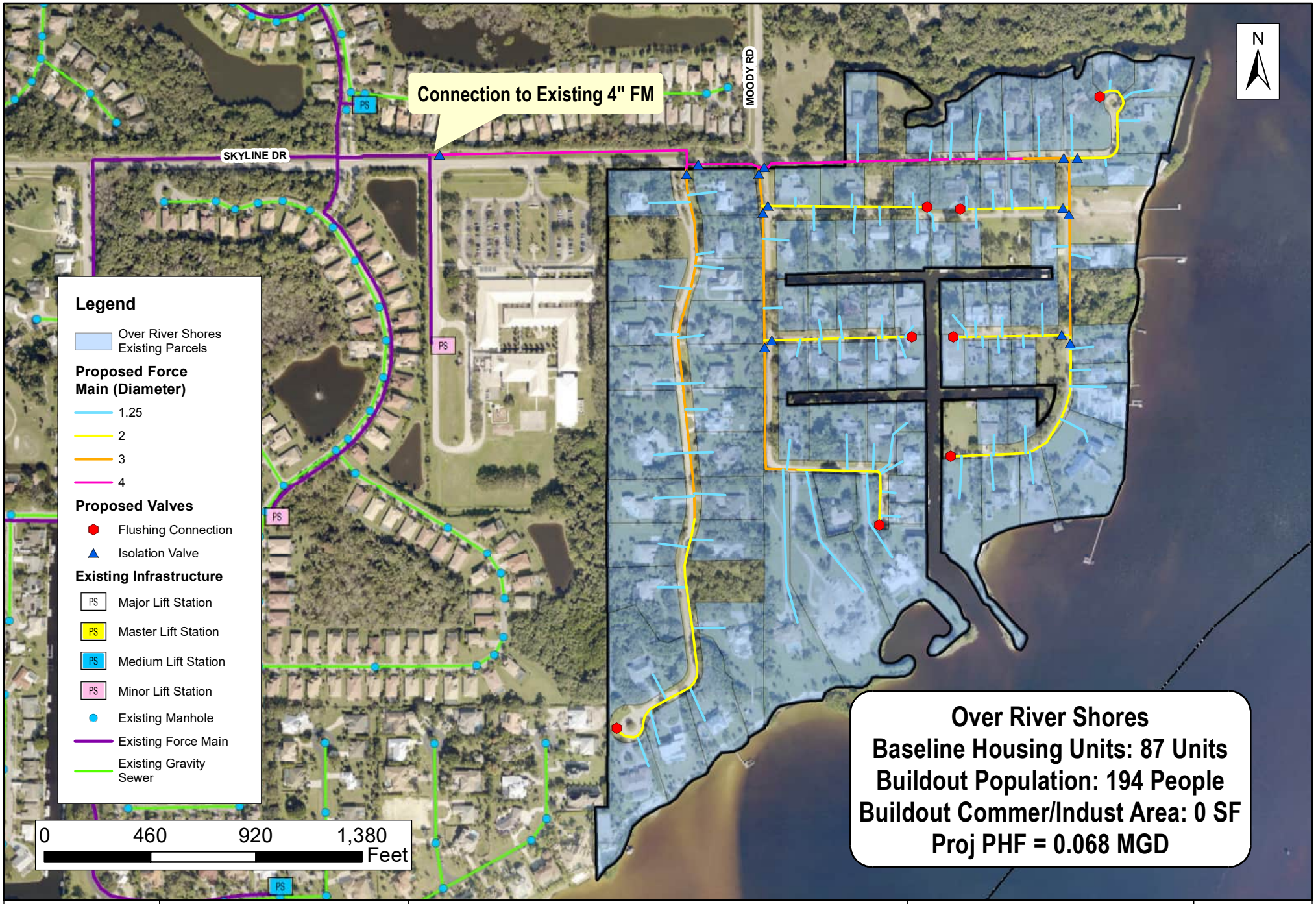
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Wards Landing - Priority Grouping #8** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Edgewater Gardens - Priority Grouping #8** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Gulf Acres - Priority Grouping #8** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	Countywide Wastewater Management Plan Over River Shores - Priority Grouping #8 Low Pressure Collection System Concept Plan	AECOM	Figure X

Site Name, Group #	Aqua Cove, Group 8		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	910	$25	$22,750
2" PE SDR 11 Pipe (LF)	495	$30	$14,850
3" PE SDR 11 Pipe (LF)	230	$40	$9,200
40% of Group 8 Shared Cost for 4" Force Main (LF)	815	$45	$14,670
Simplex Lift Station (EA)	12	$8,500	$102,000
Sentry Advisor (Optional) (EA)	12	$500	$6,000
Terminal Flushing Connection (EA)	1	$2,500	$2,500
Isolation Valve (EA)	1	$3,000	$3,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	12	$2,660	$31,920
Road Restoration (LF @ 20' Width)	258	$160	$41,200
Septic System Abandonment (EA)	12	$4,000	$48,000
Subtotal			$302,990
Mobilization and Demobilization (Same as Gravity)			$28,670
Contingency (Same as Gravity)			$90,309
Construction and Design Services (Same as Gravity)			$69,237
Total			$491,205
Rounded Total			**$500,000**

Site Name, Group #	Blue Water Shores, Group 8		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	3,095	$25	$77,375
2" PE SDR 11 Pipe (LF)	2,640	$30	$79,200
3" PE SDR 11 Pipe (LF)	1,665	$40	$66,600
4" PE SDR 11 Pipe (LF)	415	$45	$18,675
Simplex Lift Station (EA)	61	$8,500	$518,500
Sentry Advisor (Optional) (EA)	61	$500	$30,500
Terminal Flushing Connection (EA)	4	$2,500	$10,000
Isolation Valve (EA)	6	$3,000	$18,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	61	$2,660	$162,260
Road Restoration (LF @ 20' Width)	2,005	$160	$320,800
Septic System Abandonment (EA)	61	$4,000	$244,000
Subtotal			$1,552,810
Mobilization and Demobilization (Same as Gravity)			$108,696
Contingency (Same as Gravity)			$342,391
Construction and Design Services (Same as Gravity)			$262,500
Total			$2,266,396
Rounded Total			**$2,270,000**

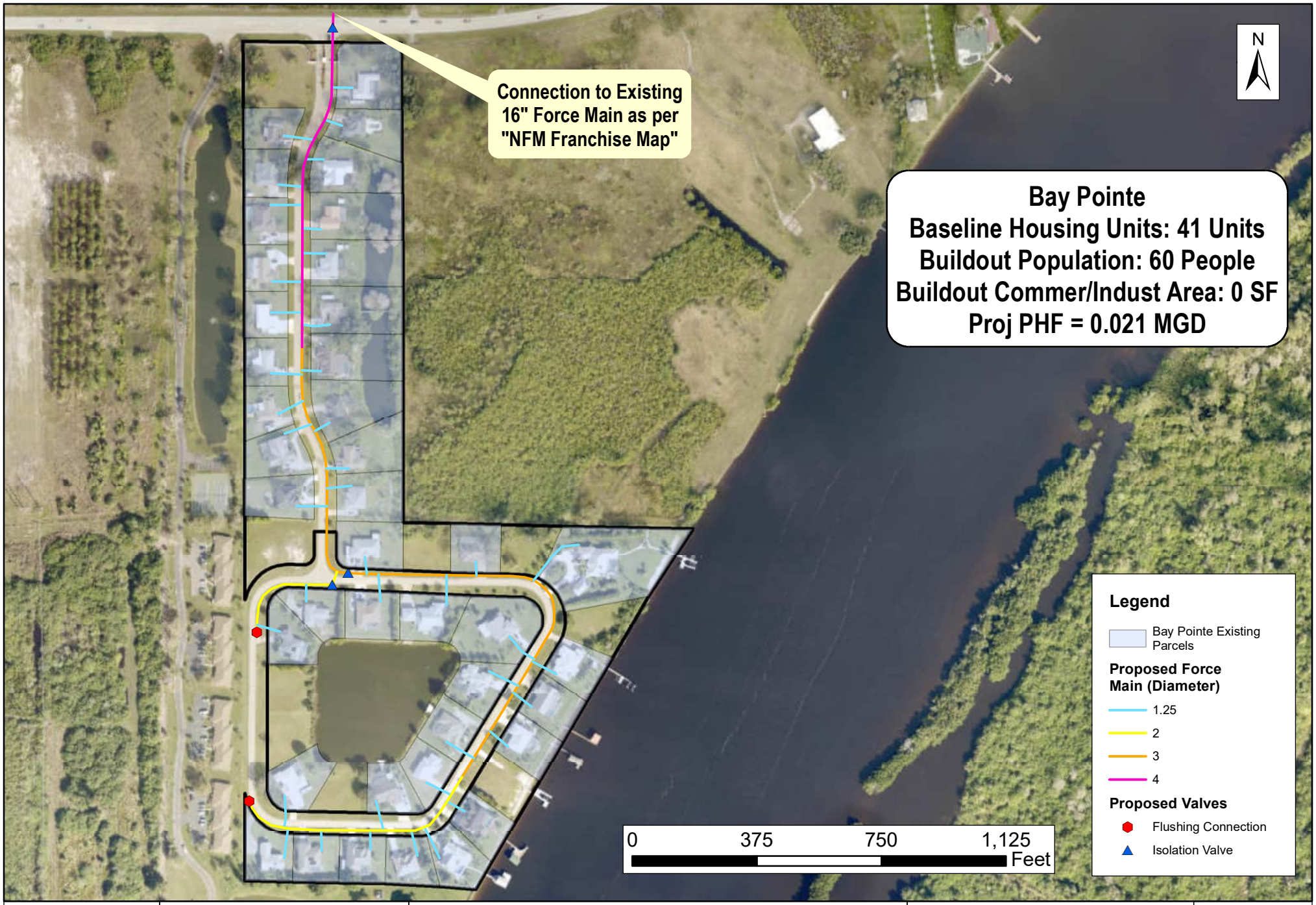
Site Name, Group #	Edgewater Gardens, Group 8		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	10,365	$25	$259,125
2" PE SDR 11 Pipe (LF)	2,450	$30	$73,500
3" PE SDR 11 Pipe (LF)	4,250	$40	$170,000
4" PE SDR 11 Pipe (LF)	4,195	$45	$188,775
Simplex Lift Station (EA)	156	$8,500	$1,326,000
Sentry Advisor (Optional) (EA)	156	$500	$78,000
Terminal Flushing Connection (EA)	6	$2,500	$15,000
Isolation Valve (EA)	11	$3,000	$33,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	156	$2,660	$414,960
Road Restoration (LF @ 20' Width)	4,970	$160	$795,200
Septic System Abandonment (EA)	156	$4,000	$624,000
Subtotal			$3,984,460
Mobilization and Demobilization (Same as Gravity)			$264,093
Contingency (Same as Gravity)			$831,893
Construction and Design Services (Same as Gravity)			$637,785
Total			$5,718,231
Rounded Total			**$5,720,000**

Site Name, Group #	Gulf Acres, Group 8		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	9,065	$25	$226,625
2" PE SDR 11 Pipe (LF)	2,835	$30	$85,050
3" PE SDR 11 Pipe (LF)	3,450	$40	$138,000
4" PE SDR 11 Pipe (LF)	755	$45	$33,975
Simplex Lift Station (EA)	111	$8,500	$943,500
Sentry Advisor (Optional) (EA)	111	$500	$55,500
Terminal Flushing Connection (EA)	5	$2,500	$12,500
Isolation Valve (EA)	6	$3,000	$18,000
Connection to Existing Infrastructure (LS)	4	$6,900	$27,600
Service Connections (EA)	111	$2,660	$295,260
Road Restoration (LF @ 20' Width)	3,865	$160	$618,400
Septic System Abandonment (EA)	111	$4,000	$444,000
Subtotal			$2,898,410
Mobilization and Demobilization (Same as Gravity)			$184,731
Contingency (Same as Gravity)			$581,901
Construction and Design Services (Same as Gravity)			$446,124
Total			$4,111,166
Rounded Total			**$4,120,000**

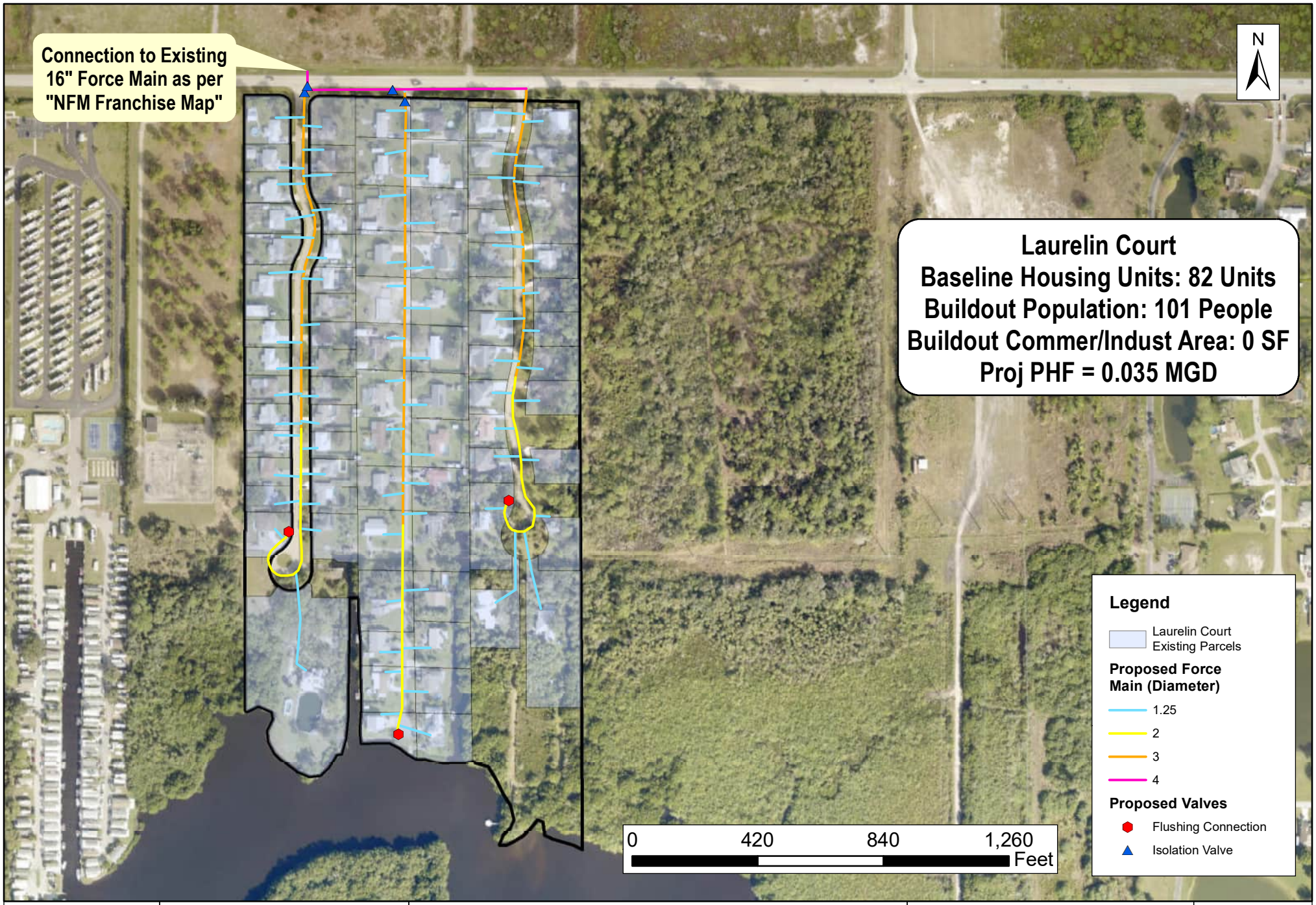
Site Name, Group #	Hancock Estates, Group 8		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	385	$25	$9,625
2" PE SDR 11 Pipe (LF)	505	$30	$15,150
27% of Group 8 Shared Cost for 4" Force Main (LF)	815	$45	$9,902
Simplex Lift Station (EA)	8	$8,500	$68,000
Sentry Advisor (Optional) (EA)	8	$500	$4,000
Terminal Flushing Connection (EA)	1	$2,500	$2,500
Isolation Valve (EA)	1	$3,000	$3,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	8	$2,660	$21,280
Road Restoration (LF @ 20' Width)	200	$160	$32,000
Septic System Abandonment (EA)	8	$4,000	$32,000
Subtotal			$204,357
Mobilization and Demobilization (Same as Gravity)			$22,300
Contingency (Same as Gravity)			$70,245
Construction and Design Services (Same as Gravity)			$53,855
Total			$350,757
Rounded Total			**$360,000**

Site Name, Group #	Over River Shores, Group 8		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	8,625	$25	$215,625
2" PE SDR 11 Pipe (LF)	5,015	$30	$150,450
3" PE SDR 11 Pipe (LF)	3,530	$40	$141,200
4" PE SDR 11 Pipe (LF)	2,390	$45	$107,550
Simplex Lift Station (EA)	87	$8,500	$739,500
Sentry Advisor (Optional) (EA)	87	$500	$43,500
Terminal Flushing Connection (EA)	8	$2,500	$20,000
Isolation Valve (EA)	15	$3,000	$45,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	87	$2,660	$231,420
Road Restoration (LF @ 20' Width)	4,560	$160	$729,600
Septic System Abandonment (EA)	87	$4,000	$348,000
Subtotal			$2,778,745
Mobilization and Demobilization (Same as Gravity)			$199,026
Contingency (Same as Gravity)			$626,932
Construction and Design Services (Same as Gravity)			$480,648
Total			$4,085,351
Rounded Total			**$4,090,000**

Site Name, Group #	Wards Landing, Group 8		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	1,430	$25	$35,750
2" PE SDR 11 Pipe (LF)	1,505	$30	$45,150
3" PE SDR 11 Pipe (LF)	915	$40	$36,600
33% of Group 8 Shared Cost for 4" Force Main (LF)	815	$45	$12,103
Simplex Lift Station (EA)	24	$8,500	$204,000
Sentry Advisor (Optional) (EA)	24	$500	$12,000
Terminal Flushing Connection (EA)	3	$2,500	$7,500
Isolation Valve (EA)	2	$3,000	$6,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	24	$2,660	$63,840
Road Restoration (LF @ 20' Width)	900	$160	$144,000
Septic System Abandonment (EA)	24	$4,000	$96,000
Subtotal			$669,843
Mobilization and Demobilization (Same as Gravity)			$78,487
Contingency (Same as Gravity)			$247,235
Construction and Design Services (Same as Gravity)			$189,547
Total			$1,185,113
Rounded Total			**$1,190,000**



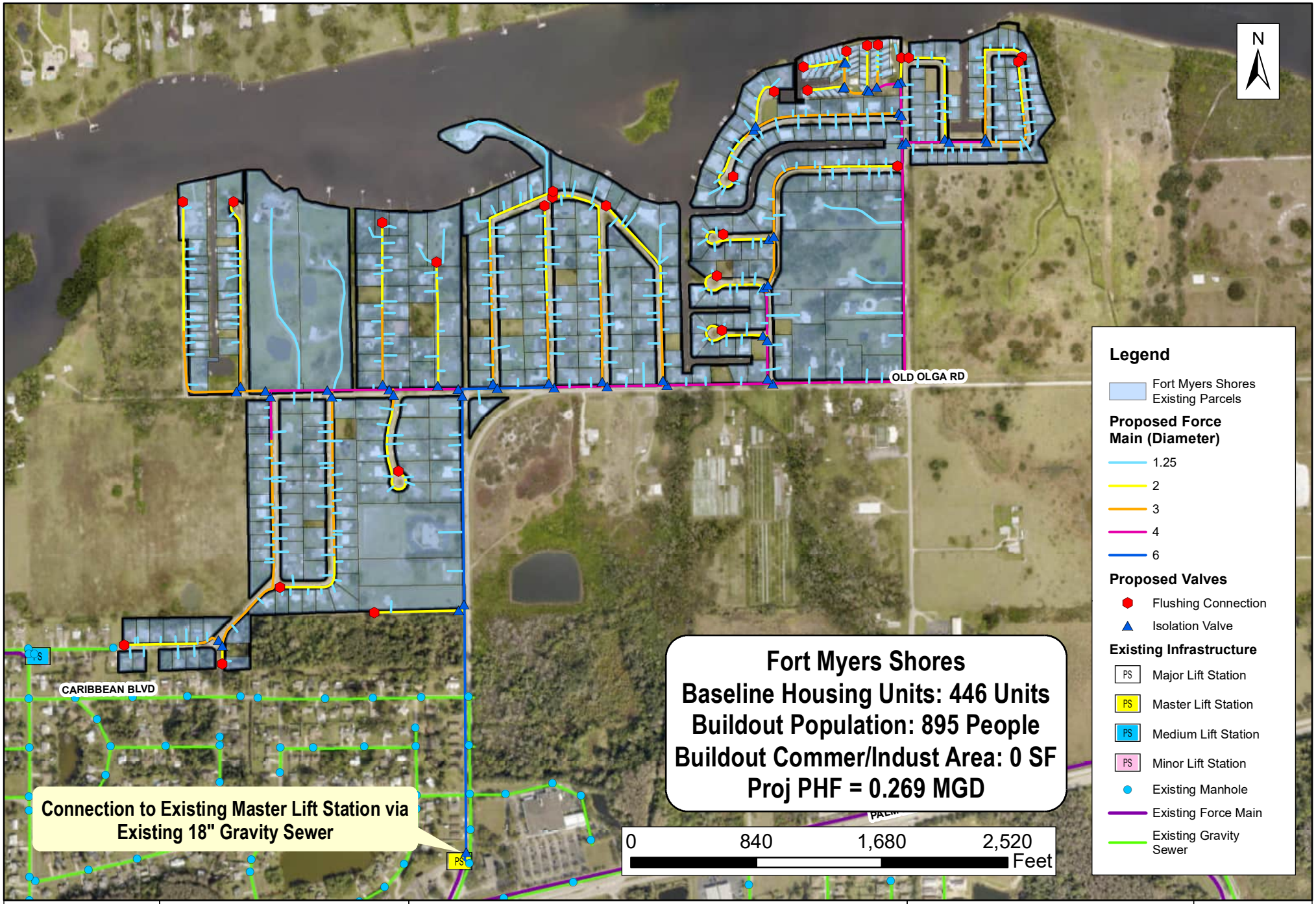
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Bay Pointe - Priority Grouping #9** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**



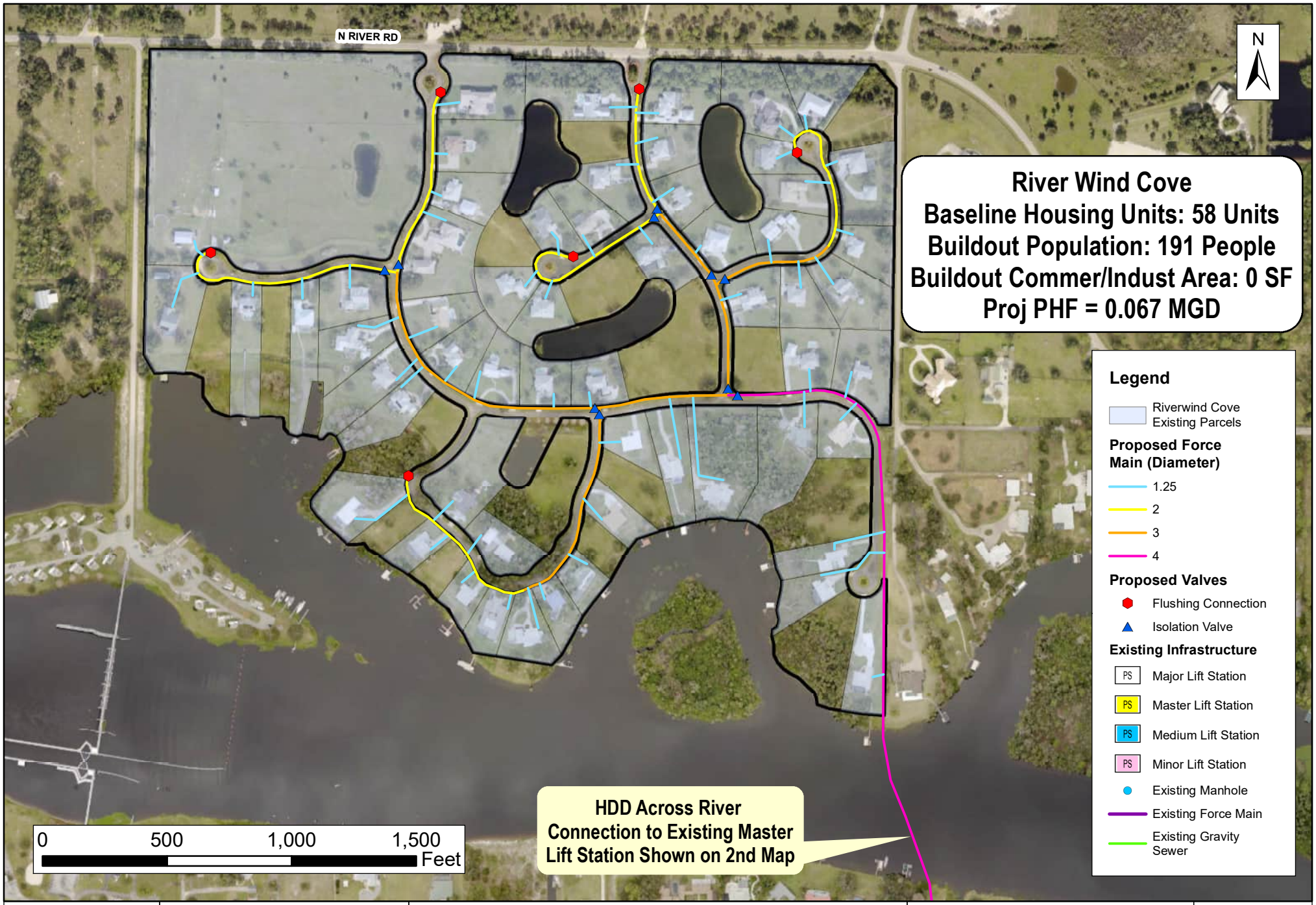
Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Laurelin Court - Priority Grouping #9** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**

Site Name, Group #	Bay Point, Group 9		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	2,895	$25	$72,375
2" PE SDR 11 Pipe (LF)	1,010	$30	$30,300
3" PE SDR 11 Pipe (LF)	1,775	$40	$71,000
4" PE SDR 11 Pipe (LF)	910	$45	$40,950
Simplex Lift Station (EA)	41	$8,500	$348,500
Sentry Advisor (Optional) (EA)	41	$500	$20,500
Terminal Flushing Connection (EA)	2	$2,500	$5,000
Isolation Valve (EA)	3	$3,000	$9,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	41	$2,660	$109,060
Road Restoration (LF @ 20' Width)	1,890	$160	$302,400
Septic System Abandonment (EA)	41	$4,000	$164,000
Subtotal			$1,179,985
Mobilization and Demobilization (Same as Gravity)			$104,108
Contingency (Same as Gravity)			$327,940
Construction and Design Services (Same as Gravity)			$251,421
Total			$1,863,454
Rounded Total			**$1,870,000**

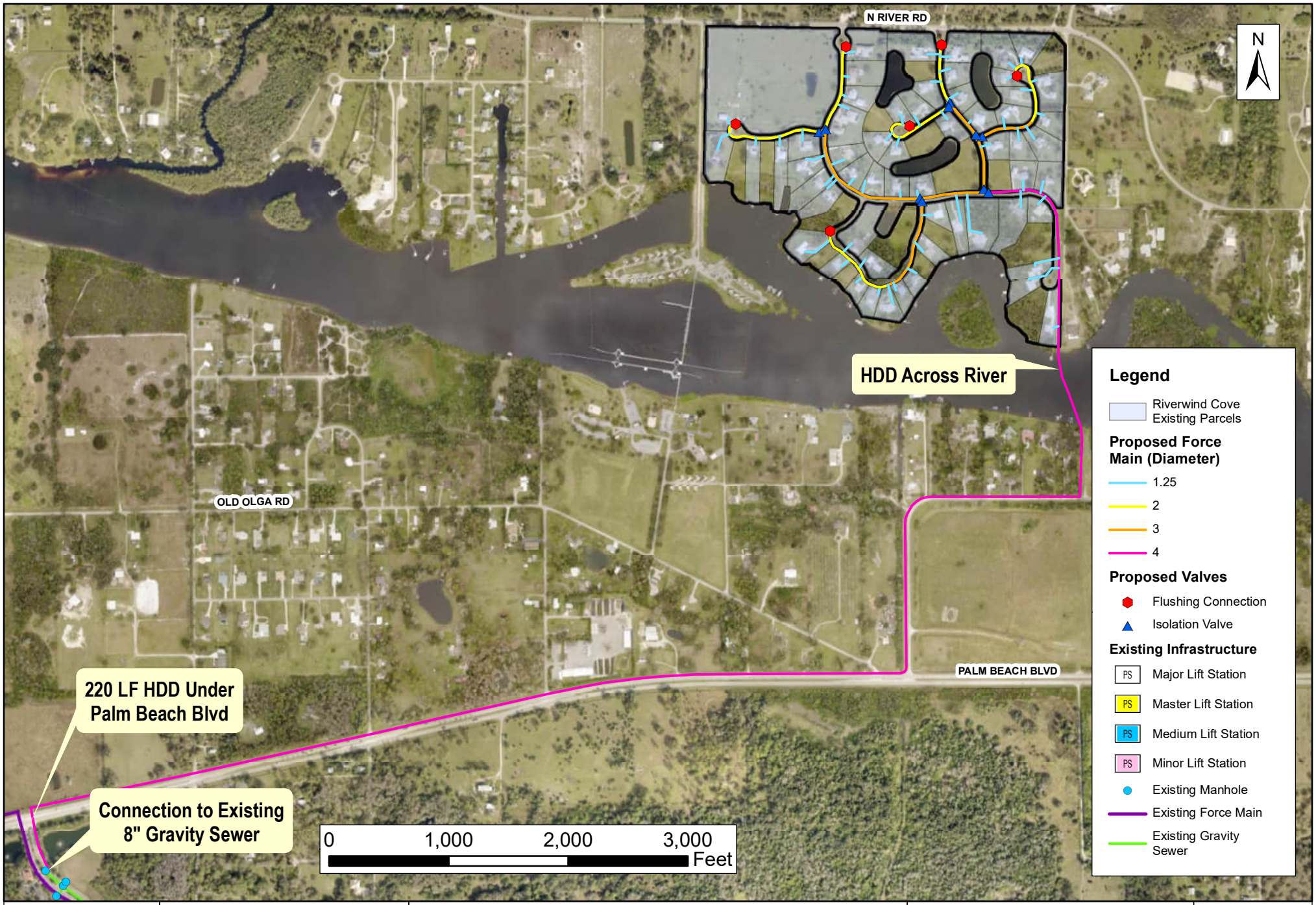
Site Name, Group #	Laurelin Court, Group 9		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	6,060	$25	$151,500
2" PE SDR 11 Pipe (LF)	1,895	$30	$56,850
3" PE SDR 11 Pipe (LF)	3,165	$40	$126,600
4" PE SDR 11 Pipe (LF)	720	$45	$32,400
Simplex Lift Station (EA)	82	$8,500	$697,000
Sentry Advisor (Optional) (EA)	82	$500	$41,000
Terminal Flushing Connection (EA)	3	$2,500	$7,500
Isolation Valve (EA)	4	$3,000	$12,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	82	$2,660	$218,120
Road Restoration (LF @ 20' Width)	2,595	$160	$415,200
Septic System Abandonment (EA)	82	$4,000	$328,000
Subtotal			$2,093,070
Mobilization and Demobilization (Same as Gravity)			$132,894
Contingency (Same as Gravity)			$418,615
Construction and Design Services (Same as Gravity)			$320,938
Total			$2,965,516
Rounded Total			**$2,970,000**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Fort Myers Shores - Priority Grouping #10** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **River Wind Cove - Priority Grouping #10** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**



Date Created: June 2022	LEE COUNTY SOUTHWEST FLORIDA	**Countywide Wastewater Management Plan** **Riverwind Cove - Priority Grouping #10** **Low Pressure Collection System Concept Plan**	AECOM	**Figure** **X**

Site Name, Group #	Fort Myers Shores, Group 10		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	25,685	$25	$642,125
2" PE SDR 11 Pipe (LF)	12,950	$30	$388,500
3" PE SDR 11 Pipe (LF)	10,015	$40	$400,600
4" PE SDR 11 Pipe (LF)	6,560	$45	$295,200
6" PE SDR 11 Pipe (LF)	3,355	$55	$184,525
Simplex Lift Station (EA)	446	$8,500	$3,791,000
Sentry Advisor (Optional) (EA)	446	$500	$223,000
Terminal Flushing Connection (EA)	19	$2,500	$47,500
Isolation Valve (EA)	51	$3,000	$153,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	446	$2,660	$1,186,360
Road Restoration (LF @ 20' Width)	14,050	$160	$2,248,000
Septic System Abandonment (EA)	446	$4,000	$1,784,000
Subtotal			$11,350,710
Mobilization and Demobilization (Same as Gravity)			$675,063
Contingency (Same as Gravity)			$2,126,448
Construction and Design Services (Same as Gravity)			$1,630,277
Total			$15,782,499
Rounded Total			**$15,790,000**

Site Name, Group #	River Wind Cove, Group 10		
Item Desc. (Units)	**Quantity**	**Unit Cost**	**Total**
1.25" PE SDR 11 Pipe (LF)	5,625	$25	$140,625
2" PE SDR 11 Pipe (LF)	3,890	$30	$116,700
3" PE SDR 11 Pipe (LF)	3,415	$40	$136,600
4" PE SDR 11 Pipe (LF)	9,795	$45	$440,775
4" HDD (River) (LF)	2,400	$175	$420,000
4" HDD (Road) (LF)	220	$1,380	$303,600
4" Plug Valve (EA)	2	$3,000	$6,000
Simplex Lift Station (EA)	58	$8,500	$493,000
Sentry Advisor (Optional) (EA)	58	$500	$29,000
Terminal Flushing Connection (EA)	6	$2,500	$15,000
Isolation Valve (EA)	10	$3,000	$30,000
Connection to Existing Infrastructure (LS)	1	$6,900	$6,900
Service Connections (EA)	58	$2,660	$154,280
Road Restoration (LF @ 20' Width)	3,750	$160	$600,000
Septic System Abandonment (EA)	58	$4,000	$232,000
Subtotal			$3,124,480
Mobilization and Demobilization (Same as Gravity)			$231,444
Contingency (Same as Gravity)			$729,049
Construction and Design Services (Same as Gravity)			$558,937
Total			$4,643,910
Rounded Total			**$4,650,000**

APPENDIX D RECOMMENDED CAPITAL IMPROVEMENT PLAN

RECOMMENDED CAPITAL IMPROVEMENT PLAN

Based on the recommended improvements discussed in Chapter 10, Section 10.3 and the cost estimates developed in Chapter 9, a recommended capital improvement plan was developed. The timing of recommended improvements proposed in this CIP is subject to modification by LCU based on consistency with other planning efforts and available budgets and funding sources.

Table D-1 below presents the proposed implementation schedule for the recommended improvements identified from the efforts of this CWMP within the planning horizon till 2040.

Table D-1: Proposed Implementation Schedule for Recommended and/or Planned Improvements within Planning Horizon

Year	Recommended Improvement
2022	-
2023	Start design and permitting for 6 MGD Southeast WRF
2024	Start design and permitting for Tier 1, Groupings 1 and 4 Septic Conversions
	3 MGD Three Oaks WRF Expansion to 9 MGD Online (Anticipated for End of Year 2024)
2025	Start assessments for Tier 1, Groupings 1 and 4 Septic Conversions
2026	Start design and permitting for Tier 1, Groupings 6 and 7 Septic Conversions
	Start construction of 6 MGD Southeast WRF
2027	PS-029 Wet Well Replacement (Fiesta Village Service Area)
	Start construction of Tier 1, Groupings 1 and 4 Septic Conversions
	Start assessments for Tier 1, Groupings 6 and 7 Septic Conversions
2028	6 MGD Southeast WRF Online
	Finish construction of Tier 1, Groupings 1 and 4 Septic Conversions
2029	Start construction for Tier 1, Groupings 6 and 7 Septic Conversions
2030	Finish construction of Tier 1, Groupings 6 and 7 Septic Conversions
	PS-7729 Pump Replacement (Three Oaks Service Area)
2031	-
2032	Start construction of 3 MGD Gateway WRF Expansion to 6 MGD
2033	Start design and permitting for Tier 2 Septic Conversions
2034	Start assessments for Tier 2 Septic Conversions
	3 MGD Gateway WRF Expansion to 6 MGD Online
2035	-
2036	Start construction for Tier 2 Septic Conversions
2037	Finish construction for Tier 2 Septic Conversions
2038	-
2039	-
2040	-

Note: It is assumed that the County has funding in place prior to key milestone dates for design and construction.

Table D-2 below presents the recommended CIP for the planning horizon through 2040 as well as LCU's CIP. It should be noted that the Gateway WRF expansion to 6 MGD, the Three Oaks WRF expansion to 9 MGD, and the new 6 MGD Southeast WRF are accounted for LCU's CIP.

Planning level costs (ACCE Class 4) in 2021 dollars were developed for AECOM recommended projects. Costs for design, permitting and construction of the septic conversion improvements were distributed over a period of 5 years from start of design till end of construction for each improvement as shown in **Table D-1**. A copy of LCU's 10-year CIP is included at the end of this appendix.

Table D-2: Recommended CIP for Planning Horizon and LCU's 10-Year CIP

Year	LCU CIP Budget	AECOM Recommended Improvements	Total Budget	Total Cumulative Budget
	($ M)			
2022	$78.75 M	$0.00 M	$78.75 M	$78.75 M
2023	$85.27 M	$0.00 M	$85.27 M	$164.02 M
2024	$51.49 M	$6.18 M	$57.67 M	$221.69 M
2025	$32.85 M	$6.18 M	$39.03 M	$260.73 M
2026	$25.94 M	$12.36 M	$38.30 M	$299.03 M
2027	$60.59 M	$12.78 M	$73.37 M	$372.40 M
2028	$0.00 M	$12.36 M	$12.36 M	$384.76 M
2029	$0.00 M	$6.18 M	$6.18 M	$390.94 M
2030	$0.00 M	$6.24 M	$6.24 M	$397.18 M
2031	$0.00 M	$0.00 M	$0.00 M	$397.18 M
2032	$0.00 M	$0.00 M	$0.00 M	$397.18 M
2033	$0.00 M	$9.61 M	$9.61 M	$406.79 M
2034	$0.00 M	$9.61 M	$9.61 M	$416.39 M
2035	$0.00 M	$9.61 M	$9.61 M	$426.00 M
2036	$0.00 M	$9.61 M	$9.61 M	$435.61 M
2037	$0.00 M	$9.61 M	$9.61 M	$445.22 M
2038	$0.00 M	$0.00 M	$0.00 M	$445.22 M
2039	$0.00 M	$0.00 M	$0.00 M	$445.22 M
2040	$0.00 M	$0.00 M	$0.00 M	$445.22 M
Total	$334.89 M	$110.33 M	$445.22 M	

As shown in **Table D-2**, the total budget in 2033 (approx. 10 years) will be $406.79 M. It is recommended that LCU revisits and reviews this CIP every 2-3 years to capture any impacts to the implementation schedules caused by funding availability, consistency with other planning efforts, etc.

The cumulative budget through 2040 is projected to be approximately $445 M. It is anticipated that LCU will pursue funding opportunities to cover some of the projects proposed in the recommended improvements. The funding sources and opportunities that are available for wastewater projects are discussed in Chapter 11.

LCU 10-Year CIP

Capital Improvement Program Detail Report Fiscal Years 2021/2022 through 2025/2026

Codes: A=Advalorem; CONS= Conservation 2020; D=Debt, E=Enterprise; G=Grant; GT=Gas Tax; I=Impact Fees; L= Library Advalorem; T=Tourist Development Tax; H=All Hazards; ST=Surplus Tolls; GIF=Growth Inc Funding; CONT = Contribution; BP=BP; EM=E-911 Operations; GF-CIP= General Fund Capital Improvements

Project Title	Project #	Fund	Code	Total Project FY 19/20	FY 20/21 Adopted Budget	FY 20/21 Amended Budget	FY21/22 Proposed Budget	FY 22/23 Proposed Budget	FY 23/24 Proposed Budget	FY 24/25 Proposed Budget	FY25/26 Proposed Budget	Five Year Project Total	Years 6-10	Total Project
Community Development														
Wild Turkey Strand	20500930700	30700	GT		2,502,315	2,502,315		200,864				200,864		2,703,179
	20500948730	48730	E		2,502,315	2,502,315		200,864				200,864		2,703,179
Total Community Development					**5,004,630**	**5,004,630**		**401,728**				**401,728**		**5,406,358**
County Lands														
Conservation 2020	20880030103	30103	Cons	328,485,904	25,000	13,922,155	25,000	25,000	25,000	25,000	25,000	125,000		342,533,059
Total County Lands				**328,485,904**	**25,000**	**13,922,155**	**25,000**	**25,000**	**25,000**	**25,000**	**25,000**	**125,000**		**342,533,059**
Natural Resources														
Brantley-Dover Canal Impr	**20073730100**	**30100**	**GF-CIP**				**150,000**	**212,000**				**362,000**		**362,000**
Kiker Preserve Berm	**20073830100**	**30100**	**GF-CIP,G**				**700,000**		**8,600,000**			**9,300,000**		**9,300,000**
GS-10 Stormwater Reservoir	**Not assigned**	**30100**	**G**					**2,000,000**	**6,300,000**	**2,000,000**		**10,300,000**		**10,300,000**
Six Mile Cypress Slough South	**20073930100**	**30100**	**GF-CIP**				**300,000**		**1,400,000**			**1,700,000**		**1,700,000**
Ten Mile Canal South	**20075530100**	**30100**	**GF-CIP**				**1,000,000**					**1,000,000**		**1,000,000**
			G					**2,293,266**	**2,102,000**	**2,341,500**	**9,462,790**	**16,199,556**	**20,267,336**	**36,466,892**
Bob Janes Restoration Project	20859930100	30100	GF-CIP	228,423		771,577	300,000					300,000		1,300,000
Deep Lagoon Hydro Presv Rest	20851730100	30100	GF-CIP	126,611		599,805	1,000,000	1,600,000				2,600,000		3,326,416
EMWCD-Infrastructure Rep Grant	21072730100	30100	G		5,339,470	5,339,470	1,779,823					1,779,823		7,119,293
Flood Remediation	20064830100	30100	GF-CIP	318,057		1,025,973	2,500,000					2,500,000		3,844,030
Lakes Park Phase III	20070930100	30100	GF-CIP	5,272		194,728		1,325,000				1,325,000		1,525,000
	22070930100	30100	G					475,000				475,000		475,000
Powell Creek/Old Bridge Park	20860130100	30100	GF-CIP	174,038	26,000	76,962	70,000					70,000		321,000
	22860130100	30100	G		774,000	774,000	30,000					30,000		804,000
Sunniland/9 Mile Run Drainage	20855730100	30100	CIP	91,373	100,000	208,627	700,000					700,000		1,000,000
	22855730100	30100	G				300,000					300,000		300,000
Total Natural Resources				**943,775**	**6,239,470**	**8,991,142**	**8,829,823**	**7,905,266**	**18,402,000**	**4,341,500**	**9,462,790**	**48,941,379**	**20,267,336**	**79,143,632**
Library														
Exterior Shade Structure	**20073634800**	**34800**	**L**				**884,500**	**100,000**	**57,500**			**1,042,000**		**1,042,000**
Library Admin Relocation	20071234800	34800	L		2,902,530	2,982,530	717,470					717,470		3,700,000
Riverdale Library Renovations	20070634800	34800	L		330,675	330,675	2,703,204					2,703,204		3,033,879
South Cty Regional Renovations	20070734800	34800	L				675,000	5,812,827				6,487,827		6,487,827
Total Library					**3,233,205**	**3,313,205**	**4,980,174**	**5,912,827**	**57,500**			**10,950,501**		**14,263,706**
Transit														
ADA & Passenger Amenities	20886430100	30100	GF-CIP	913,042		13,622								926,664
	20886448640	48640	E	1,597,347		43,183								1,640,530
	21886448640	48640	G	71,104		2,650,941								2,722,045
	22886448640	48640	G	211,604										211,604
Lehigh Acres Park & Ride	22072448640	48640	G		2,910,000	2,910,000								2,910,000
Rosa Pks Intermodel Expansion	22060448640	48640	G	1,957		2,300,000	1,700,000					1,700,000		4,001,957
South Park&Ride Trsf Stations	20889430100	30100	GF-CIP	29,375										29,375
	20889448640	48640	E	3,447	428,996	1,428,924								1,432,371
	21889448640	48640	G			3,000,000								3,000,000
	22889448640	48640	G			2,568,000								2,568,000
Total Transit				**2,827,876**	**3,338,996**	**14,914,670**	**1,700,000**					**1,700,000**		**19,442,546**

Project Title	Project #	Fund	Code	Total Project FY 19/20	FY 20/21 Adopted Budget	FY 20/21 Amended Budget	FY21/22 Proposed Budget	FY 22/23 Proposed Budget	FY 23/24 Proposed Budget	FY 24/25 Proposed Budget	FY25/26 Proposed Budget	Five Year Project Total	Years 6-10	Total Project
Parks and Recreation														
Shade Structures Parks & Playgrounds	**20076330100**	**30100**	**GF-CIP**				**1,827,150**	**1,827,150**	**1,827,150**			**5,481,450**		**5,481,450**
NFM Shuffleboard Shade	**20076430100**	**30100**	**GF-CIP**				**650,000**					**650,000**		**650,000**
Pine Island Dog Park	**not assigned**	**38651**	**I**										**520,000**	**520,000**
Playground&Splashpad Shade Enhancements	**200732**	**38651**	**I**				**45,000**					**45,000**		**45,000**
		38652	**I**				**90,000**					**90,000**		**90,000**
		38653	**I**				**45,000**					**45,000**		**45,000**
		38700	**I**				**180,000**					**180,000**		**180,000**
Rutenburg Park Improvements	**20073338653**	**38653**	**I**				**245,000**	**1,790,000**				**2,035,000**		**2,035,000**
Schandler Hall Skate Park	**20073438652**	**38652**	**I**				**275,000**					**275,000**		**275,000**
Trail System Expansion	**20073538700**	**38700**	**I**				**1,400,000**	**350,000**	**1,400,000**	**350,000**	**1,400,000**	**4,900,000**		**4,900,000**
Able Canal Pathway	20215438700	38700	I	9,753		490,247			1,500,000			1,500,000		2,000,000
	21215430100	30100	G			550,000			4,912,650			4,912,650		5,462,650
Boca Grande Dog Park	20071838651	38651	I		395,862	400,000	101,000					101,000		501,000
Boca Grande Storage Bldg	20065038651	38651	I							285,000		285,000		285,000
Larry Kiker Preserve	20071930105	30105	GF,I,T,G		500,000	500,000	6,000,000					6,000,000		6,500,000
Lehigh Community Park Expansion	20065138652	38652	I	1,603,718		3,948,813	1,929,694					1,929,694		7,482,225
	20065138700	38700	I				4,359,813					4,359,813		4,359,813
Six Mile Slough Preserve Impr	20072038700	38700	I		53,000	81,400	290,000					290,000		371,400
Telegraph Creek Kayak Launch	20067038700	38700	I	101,427			35,000	200,000				235,000		336,427
Total Parks and Recreation				**1,714,898**	**948,862**	**5,970,460**	**17,472,657**	**4,167,150**	**9,639,800**	**635,000**	**1,400,000**	**33,314,607**	**520,000**	**41,519,965**
Solid Waste														
Buckingham Resource Area	**20075140132**	**40132**	**E**						**570,000**			**570,000**		**570,000**
Lee County Compost Facility	**20075240132**	**40132**	**E**				**800,000**	**1,400,000**	**2,200,000**			**4,400,000**		**4,400,000**
Lee Hendry Landfill Connectivity	**20075340132**	**40132**	**E**				**476,000**					**476,000**		**476,000**
Material Recovery Facility	**20075440132**	**40132**	**E**				**1,500,000**	**2,400,000**	**7,000,000**	**12,500,000**	**8,500,000**	**31,900,000**		**31,900,000**
Hendry Cnty Transfer Station	20062440132	40132	E	5,688	435,000	554,312	2,040,000					2,040,000		2,600,000
Landfill Class I Update	20095640132	40132	E	105,233	1,260,000	2,558,940	2,500,000	6,000,000	4,230,000			12,730,000		15,394,173
Landfill Class III Update	20071540132	40132	E						400,000		3,400,000	3,800,000		3,800,000
Landfill Gas Collection System	20093640132	40132	E	5,479		100,000				700,000		700,000	7,000,000	7,805,479
Umbrella-Buckingham Upgrades	20068140132	40132	E		15,450	95,450	150,000					150,000		245,450
Umbrella-Equip for MRF Agrmt	20068240132	40132	E		104,000	104,000	577,000					577,000		681,000
Umbrella-Generators-mult sites	20068340132	40132	E		142,000	222,000	154,000					154,000		376,000
Umbrella-Mechanical Systems	20068440132	40132	E	45,047	154,500	194,453	58,300	30,000	30,000	30,000	30,000	178,300	111,600	529,400
Umbrella-Scales	20068540132	40132	E				122,000	198,000	201,000			521,000		521,000
Total Solid Waste				**161,447**	**2,110,950**	**3,829,155**	**8,377,300**	**10,028,000**	**14,631,000**	**13,230,000**	**11,930,000**	**58,196,300**	**7,111,600**	**69,298,502**
Public Safety														
Hurricane Mitigation	**20074018200**	**18200**	**H**				**500,000**					**500,000**		**500,000**
Next Generation E911	**20074115200**	**15200**	**EM**			**2,034,481**	**871,920**	**273,106**				**1,145,026**		**3,179,507**
PS/LCSO CAD Hardware	**20074330100**	**30100**	**GF-CIP**				**189,696**	**189,696**	**189,696**	**189,696**		**758,784**		**758,784**
PS/LCSO CAD System	20074230100	30100	GF-CIP			4,140,649								4,140,649
EOC Expansion	20066430100	30100	GF-CIP	408,219	8,500,000	16,426,525								16,834,744
	20066415200	15200	EM		2,000,000									
	20066418200	18200	H		1,000,000									
Total Public Safety				**408,219**	**11,500,000**	**22,601,655**	**1,561,616**	**462,802**	**189,696**	**189,696**		**2,403,810**		**25,413,684**

DOT														
Project Title	Project #	Fund	Code	Total Project FY 19/20	FY 20/21 Adopted Budget	FY 20/21 Amended Budget	FY21/22 Proposed Budget	FY 22/23 Proposed Budget	FY 23/24 Proposed Budget	FY 24/25 Proposed Budget	FY25/26 Proposed Budget	Five Year Project Total	Years 6-10	Total Project
Alico Road Connector	20924530700	30700	GT	2,800		8,397,200			6,000,000			6,000,000	113,940,155	128,340,155
	20924538825	38825	I	2,240,887		4,000,000			4,759,314			4,759,314		11,000,201
Bicycle/Pedestrain Facilities	20600238822	38822	I	352,130		1,568,897	1,123,368		1,335,683			2,459,051		4,380,078
	20600238823	38823	I	1,490,528	268,513	823,933	2,167,027		3,685,322		736,799	6,589,148		8,903,609
	20600238824	38824	I	1,420,661		188,303		138,793	135,801	1,578,915		1,853,509		3,462,473
	20600238825	38825	I	15,372	205,020	239,325	1,139,782		1,428,758			2,568,540		2,823,237
	20600230700	30700	GT	13,195,155		4,851,627	1,354,571	1,369,367	2,268,782	6,846,833	1,940,688	13,780,241		31,827,023
Big Carlos Pass Bridge Replace	20572430720	30720	ST	4,012,245		5,008,972	22,810,820					22,810,820		31,832,037
	20572430721	30721	ST				25,000,000					25,000,000		25,000,000
Cape Coral Bdg WP Span Repl	20924830721	30721	ST				13,148,702					13,148,702	111,808,571	124,957,273
Colonial Summerlin Flyover-MidPoint Bridge 6L	not assigned	30721	D/ST										137,000,000	137,000,000
Corkscrew Road	20066930700	30700	CONT					4,000,000				4,000,000		4,000,000
	20066930700	30700	D					7,068,116				7,068,116		7,068,116
	24066930700	30700	GIF							1,400,000		1,400,000		1,400,000
	20066938825	38825	I		3,000,000	3,000,000	1,000,000	5,000,000				6,000,000		9,000,000
Gateway/Griffin Roundabout	20067138823	38823	I				3,220,000					3,220,000		3,220,000
Hickory Bridge Replacement	20508330720	30720	ST					6,527,180				6,527,180	58,485,805	65,012,985
Lee Blvd Traffic Signals	20063730700	30700	GT	90,968	150,000	609,033	690,000					690,000		1,390,001
Ortiz 4L/Colonial - MLK	20061338823	38823	I	822,102		3,944,428	16,597,768					16,597,768		21,364,298
	24061330700	30700	GIF						519,000			519,000		519,000
Ortiz Ave MLK to Luckett	20407230700	30700	GT							21,474,599		21,474,599	544,000	22,018,599
	20407238823	38823	I	2,382,746		554,695		3,714,078		7,000,000		10,714,078		13,651,519
Signal System ATMS Upgrade	20675930700	30700	GT	6,016,774	750,000	1,624,559	750,000	750,000	750,000	750,000	750,000	3,750,000		11,391,333
Three Oaks Extension North	20405330700	30700	GT	8,833,085		20,543,345	6,776,619	3,820,000				10,596,619		39,973,049
	24405330700	30700	GIF	975,432		17,455,138	5,000,000	9,900,000		1,050,000		15,950,000		34,380,570
	20405338823	38823	I				1,000,000	13,000,000				14,000,000		14,000,000
	20405338824	38824	I	459,665			10,000,000	5,000,000				15,000,000		15,459,665
Toll Interoperability	20581842133	42133	ST	75,457	30,000	70,626	30,000	30,000	30,000	30,000	30,000	150,000		296,083
	20581842135	42135	ST	439,508	120,000	247,460	120,000	120,000	120,000	120,000	120,000	600,000		1,286,968
Toll System Replacement	20061542133	42133	ST		50,000	50,000		2,600,000				2,600,000		2,650,000
	20061542135	42135	ST		200,000	200,000		10,400,000				10,400,000		10,600,000
Veterans Parkway 6L Chiquita to Skyline	not assigned	30721	ST										8,500,000	8,500,000
Total DOT				**42,825,513**	**4,773,533**	**73,377,541**	**111,928,657**	**73,437,534**	**21,032,660**	**40,250,347**	**3,577,487**	**250,226,685**	**430,278,531**	**796,708,270**
Utilities														
Big Carlos Pass	**20074448730**	**48730**	**E**					**1,500,000**				**1,500,000**		**1,500,000**
CFM 30-24" FM Replacement	**20074548720**	**48720**	**E**					**800,000**		**5,770,000**	**5,770,000**	**12,340,000**		**12,340,000**
CFM Flow Diversion	**20074648713**	**48713**	**E**				**700,000**		**3,335,000**	**2,850,000**		**6,885,000**		**6,885,000**
Fiesta Village Digesters	**20074748720**	**48720**	**E**					**748,000**		**2,240,000**	**1,500,000**	**4,488,000**		**4,488,000**
FMB Filter Controls Upgrade	**20074848720**	**48720**	**E**					**580,000**				**580,000**		**580,000**
GM Floridian Wells 10F,11F,12F,13F	**20074948712**	**48712**	**E**					**800,000**		**2,000,000**	**2,420,000**	**5,220,000**		**5,220,000**
Ortiz Utility Relocation MLK-SR80	**20075048730**	**48730**	**E**				**500,000**				**2,000,000**	**2,500,000**	**3,800,000**	**6,300,000**
Sanibel Island Utilities Impr	**20076248730**	**47830**	**E**				**3,500,000**					**3,500,000**		**3,500,000**

Utilities Continued														
Project Title	Project #	Fund	Code	Total Project FY 19/20	FY 20/21 Adopted Budget	FY 20-21 Amended Budget	FY21/22 Proposed Budget	FY 22/23 Proposed Budget	FY 23/24 Proposed Budget	FY 24/25 Proposed Budget	FY25/26 Proposed Budget	Five Year Project Total	Years 6-10	Total Project
NLC WTP Expansion to 15 MGD	20063348712	48712	E		4,000,000	4,264,000	13,536,000	5,000,000				18,536,000		22,800,000
	20063348730	48730	E					14,000,000	4,000,000			18,000,000		18,000,000
NLC WTP Wellfield Expansion to	20761948712	48712	E	1,636,466	7,200,000	8,815,359	12,300,000	10,725,000	9,725,000			32,750,000		43,201,825
	20761948730	48730	E	977,082		5,439,269						0		6,416,351
	20761948735	48735	E	2,763	1,000,000	1,300,000	500,000					500,000		1,802,763
Ben Hill Griffin FM Improve S	20733448713	48713	E		650,000	650,000	300,000	3,136,440	312,000			3,748,440		4,398,440
Three Oaks WRF Expansion	20072348713	48713	E		5,000,000	5,000,000	10,200,000	11,700,000	4,000,000			25,900,000		30,900,000
North-South WM-SR 80	20062848730	48730	E			2,000,000	2,000,000		6,900,000	12,100,000	12,100,000	33,100,000	7,000,000	42,100,000
Flesta Village WWTP Deep Well	20925148730	48730	E	337,843	2,678,000	3,785,252	10,000,000	7,800,000				17,800,000		21,923,095
Fiesta Village WWTP Rm Upgrd	20061648730	48730	E	323,574	1,777,500	2,699,750	3,520,000	3,020,000	500,000			7,040,000		10,063,324
FMB Deep Injection Well #2	20061748730	48730	E	297,827	2,284,000	3,451,268	8,000,000	3,842,000				11,842,000		15,591,095
Corkscrew Road Widening	20067548730	48730	E	146,488	3,000,000	4,853,512	2,403,000	1,000,000	3,570,000	2,000,000		8,973,000		13,973,000
DOT Proj Utility Relocations	20741648730	48730	E	3,741,174	1,000,000	2,051,008	500,000	500,000	500,000	500,000	500,000	2,500,000	2,500,000	10,792,182
Electrical Equip Upgrd&Repl	20742948730	48730	E	5,415,740	895,000	1,169,381	735,000	210,000	210,000	210,000	235,000	1,600,000	1,025,000	9,210,121
FGCU Sewer	20730448730	48730	E	402,638	410,000	568,104			50,000	250,000		300,000		1,270,742
FGCU Water	20719748730	48730	E	1,316,632	290,000	368,766			50,000	255,000		305,000		1,990,398
Fiesta Village Swr Coll Sys Im	20729348713	48713	E	154,053		210,946	2,300,600					2,300,600		2,665,599
FMB Belt Press Replacement	20067648730	48730	E		370,000	370,000		3,000,000	1,500,000			4,500,000		4,870,000
FMB Main Switchgear Repl	20062648720	48720	E		400,000	400,000	25,000	2,500,000	4,025,000			6,550,000		6,950,000
Gateway WWTP Expansion 3 MG to 6MGD	20746048730	48730	E										25,000,000	25,000,000
Green Meadows 2nd Deep Inj	20746148730	48730	E						1,000,000			1,000,000	14,000,000	15,000,000
Lazy Days Water Main Replaceme	20065548720	48720	E	179,795	350,000	670,204	240,000	319,000				559,000		1,408,999
LCU Generator Replace/Improve	20744448730	48730	E	1,983,613	270,000	881,913	275,000	275,000	50,000	200,000	50,000	850,000	250,000	3,965,526
Master Pump Station 6600 Upgrd	20063848730	48730	E	81,051		463,949	0	1,800,000	500,000			2,300,000		2,845,000
Ortiz Av FM-SR 82 to Colonial	20065648720	48720	E	32,725	2,150,000	2,524,008			1,250,000			1,250,000		3,806,733
Remote Telemetry Replacement	20762348730	48730	E	1,801,588	5,500,000	5,809,926			1,000,000			1,000,000		8,611,514
RSW Trans Line-Ben Hill/Treeln	20719348712	48712	E	2,558,624	1,800,000	2,177,629		4,400,000	3,000,000			7,400,000		12,136,253
SEWRF-SE Water Reclaim Fac	20746748713	48713	E	1,998,281		1,500,000	200,000	1,000,000	2,500,000			3,700,000		7,198,281
Summerlin Rd 20" FM Replacemen	20065348730	48730	E	377,674	6,395,000	6,956,325	4,205,003	1,500,000				5,705,003		13,039,002
Tice Area WM Replacement	20063948730	48730	E	913,938	500,000	909,328	350,000	350,000				700,000		2,523,266
US 41 WM Replacements	20067848730	48730	E		525,000	525,000				2,615,000		2,615,000		3,140,000
Wastewater System Improvements	20722948730	48730	E	4,408,332	350,000	597,674	350,000	350,000	350,000	350,000	350,000	1,750,000	1,750,000	8,506,006
Wastewater Treatmnt Plt Improv	20713848730	48730	E	5,695,215	2,025,000	2,265,042	395,000	295,000	145,000	645,000	145,000	1,625,000	725,000	10,310,257
Water System Improvements	20709448730	48730	E	7,516,262	1,200,000	1,771,912	700,000	650,000	650,000	650,000	650,000	3,300,000	3,250,000	15,838,174
Water Treatment Plt Improv	20726848730	48730	E	6,567,899	325,500	680,726	587,500	87,500	87,500	87,500	87,500	937,500	637,500	8,823,625
Well Redevelop/Upgrd&Rebuild	20714948720	48720	E	4,354,307	130,000	130,000	130,000	130,000	130,000	130,000	130,000	650,000	650,000	5,784,307
Wells D25&S25 Relocation/Repla	20065248730	48730	E		600,000	600,000		1,250,000	1,150,000			2,400,000		3,000,000
Wtr/Swr Line Reloc-3 Oaks	20742648730	48730	E	18,705	500,000	782,977	300,000	2,000,000	1,000,000			3,300,000		4,101,682
Total Utilities				**53,240,288**	**53,575,000**	**76,643,228**	**78,752,103**	**85,267,940**	**51,489,500**	**32,852,500**	**25,937,500**	**274,299,543**	**60,587,500**	**464,770,559**

GRAND TOTAL							**233,627,330**	**187,608,247**	**115,467,156**	**91,524,043**	**52,332,777**	**680,559,553**	**518,764,967**	**1,858,500,282**

	Reconciliation					
	FY21/22 Proposed Budget	FY 22/23 Proposed Budget	FY 23/24 Proposed Budget	FY 24/25 Proposed Budget	FY25/26 Proposed Budget	Five Year Project Total
Grand Total	233,627,330	187,608,247	115,467,156	91,524,043	52,332,777	680,559,553
Grant *nis		4,293,266	13,314,650	4,341,500	9,462,790	31,412,206
Contribution *nis		4,000,000				4,000,000
Debt *nis		7,068,116				7,068,116
Transfer from TDT *nis	-6,000,000					-6,000,000
TDC CIP Projects see MM	632,371					632,371
Amended Total	228,259,701	172,246,865	102,152,506	87,182,543	42,869,987	632,711,602
Hubble 8/19/2021	228,259,701	172,246,865	102,152,506	87,182,543	42,869,987	632,711,602
	-	-	-	-	-	-

*nis= not in system

APPENDIX E LEE COUNTY BOARD OF COUNTY COMMISSIONERS WORK SESSION

This appendix provides additional information based on the County Commissioners Work Session conducted on February 21, 2023. The members of the Board requested two additional alternatives for prioritizing the project groupings based on those included in Low/Moderate Income boundaries, which have the highest probability of grant eligibility, and project groupings listed based on affordability or lowest to highest per property estimated costs.

Figure E-1 below depicts in purple areas within the County designated as Low/Moderate income. This was used to identify project groupings that are located within these areas and eligible for grant funding.

Table E-1 list project areas within the Low/Moderate areas as Tier 1 Low/Mod and the other project areas as Tier 2 Non-Low/Mod. Areas included within Tier 1 are Billy Creek (1), Edgewater Gardens (22B), Fort Myers Shores (22C), Summerwood (28), Page Park (10A), Mobile Manor (2), Southside Trailer Village (21), Pine Island Tropical Homes Sites (29B), and Cabana City (8C).

Table E-2 lists the project groupings in priority order based on affordability or estimated annual property cost converted to annual assessments. Both Table E-1 and E-2 indicate the estimated annual property assessments with the following assumptions:

1. A portion of the project cost is funded by FDEP and DEP grants. Grant funding is only available for construction costs and requires a 50% match.
2. The total property costs, excluding the grant funding, is covered by creating property assessments for 20-year payback with 2% annual interest.
3. Excludes any collection costs and the statutory discount recovery costs (4% prepayment).

Figure E-1: Final Study Groupings Within the Low/Mod Income Boundaries

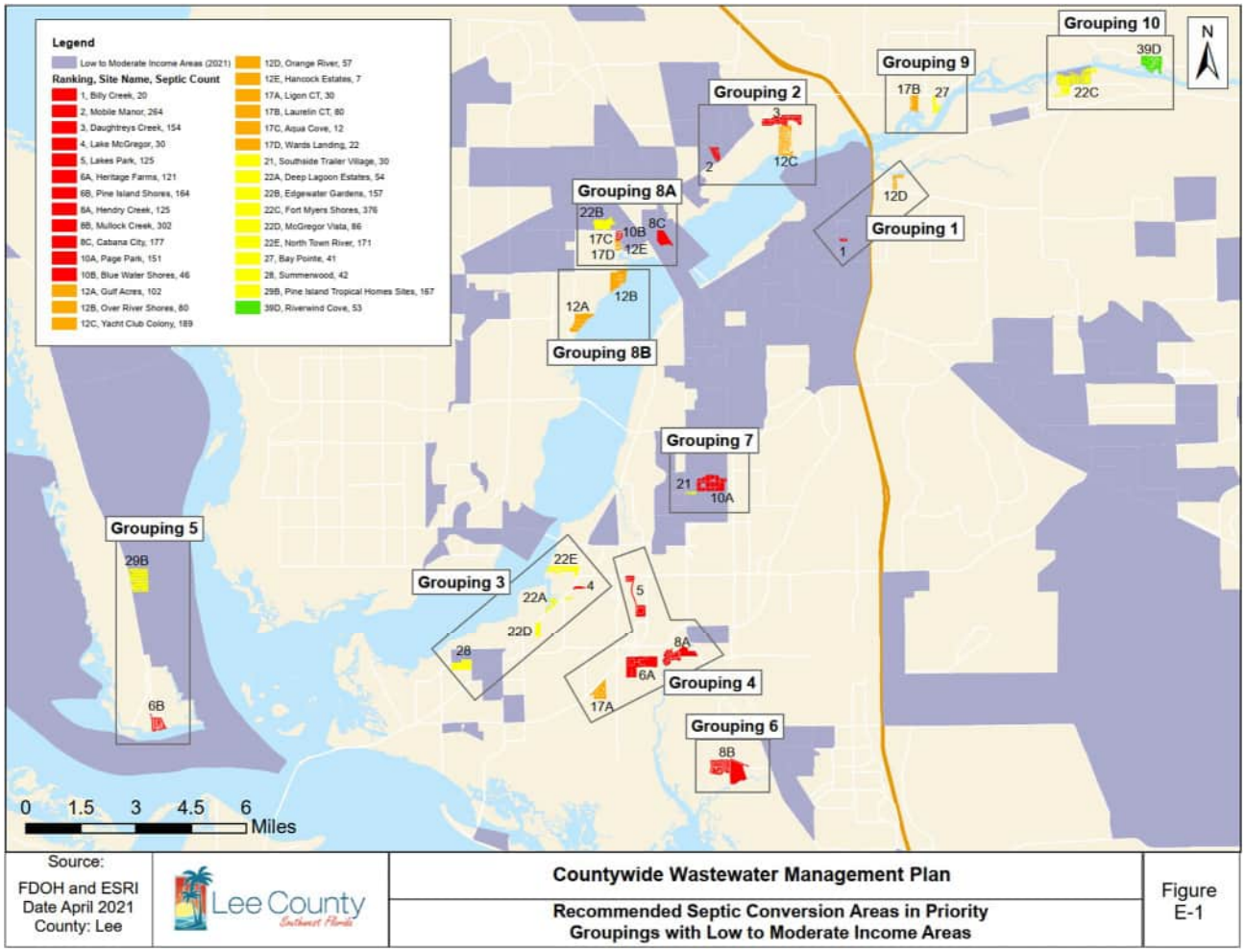


Table E-1: Priority Ranking by Low to Moderate Income Boundaries as Tier 1

Priority Tiers	WWTP Area/ Service Area	Area Name	Constructed Parcel Count	Total Impact (in Millions)	Total Cost per Property	Total Estimated Grant Award per Property	Total Cost Per Property with Assumed Maximum Grant Request Award	Total Annual Cost per Property with 20 Year Assessment with Assumed Maximum Grant Request Award at 2% Interest
1	FGUA - Del Prado WWTP	Mobile Manor	254	$ 8.11	$ 31,916	$ 11,968	$ 19,947	$ 1,224
1	CFM- Central WWTP	Billy Creek	24	$ 1.70	$ 70,688	$ 26,508	$ 44,180	$ 2,604
1	LCU - Pine Island WWTP	Pine Island Tropical Homesites	184	$ 13.07	$ 71,012	$ 26,629	$ 44,382	$ 2,736
1	CFM- South WWTP	Page Park	301	$ 17.46	$ 58,008	$ 21,753	$ 36,255	$ 1,848
1	CFM- South WWTP	Southside Trailer Village	27	$ 1.63	$ 60,407	$ 22,653	$ 37,755	$ 2,160
1	LCU - FMB WWTP	Summerwood	42	$ 3.11	$ 74,034	$ 27,763	$ 46,271	$ 2,832
1	FGUA - Del Prado WWTP	Cabana City	245	$ 9.03	$ 36,845	$ 13,817	$ 23,028	$ 2,028
1	CFM- South WWTP	Fort Myers Shores	446	$ 20.86	$ 46,769	$ 17,538	$ 29,231	$ 1,824
1	FGUA - Del Prado WWTP	Edgewater Gardens	156	$ 7.80	$ 49,976	$ 18,741	$ 31,235	$ 3,204
Subtotal			**1679**	**$ 82.75**	**$ 49,287**	**$ 18,483**	**$ 30,804**	**$ 20,460**
2	CFM- Central WWTP	Orange River	61	$ 3.27	$ 53,623	$ 20,109	$ 33,514	$ 2,040
2	LCU - Fiesta Village WWTP	Lakes Park	125	$ 7.39	$ 59,117	$ 22,169	$ 36,948	$ 2,256
2	LCU - Fiesta Village WWTP	Hendry Creek	128	$ 9.34	$ 72,997	$ 27,374	$ 45,623	$ 2,820
2	LCU - Fiesta Village WWTP	Lake McGregor	30	$ 1.05	$ 35,132	$ 13,175	$ 21,958	$ 1,308
2	LCU - Fiesta Village WWTP	McGregor Vista	94	$ 6.77	$ 71,979	$ 26,992	$ 44,987	$ 2,820
2	FGUA - Del Prado WWTP	Gulf Acres	111	$ 5.33	$ 47,995	$ 17,998	$ 29,997	$ 1,968
2	FGUA - Del Prado WWTP	Aqua Cove	12	$ 0.82	$ 67,923	$ 25,471	$ 42,452	$ 2,064
2	FGUA - Del Prado WWTP	Blue Water Shores	61	$ 3.12	$ 51,201	$ 19,200	$ 32,000	$ 2,592
2	FGUA - Del Prado WWTP	Hancock Estates	8	$ 0.63	$ 78,920	$ 29,595	$ 49,325	$ 2,688
2	FGUA - Del Prado WWTP	Wards Landing	24	$ 2.18	$ 90,922	$ 34,096	$ 56,826	$ 3,636
2	FGUA - Del Prado WWTP	Over River Shores	87	$ 5.62	$ 64,612	$ 24,229	$ 40,382	$ 1,980
2	LCU - Three Oaks WWTP	Mullock Creek	318	$ 18.16	$ 57,119	$ 21,420	$ 35,700	$ 2,184
2	LCU - Pine Island WWTP	Pine Island Shores	174	$ 7.68	$ 44,155	$ 16,558	$ 27,597	$ 1,740
2	LCU - Fiesta Village WWTP	Ligon Court	35	$ 2.90	$ 82,784	$ 31,044	$ 51,740	$ 3,132
2	FGUA - Del Prado WWTP	Daughtreys Creek	158	$ 8.29	$ 52,446	$ 19,667	$ 32,778	$ 2,064
2	FGUA - Del Prado WWTP	Yacht Club Colony	192	$ 10.21	$ 53,185	$ 19,944	$ 33,240	$ 2,088
2	FGUA - Del Prado WWTP	Bay Pointe	41	$ 2.87	$ 69,903	$ 26,214	$ 43,690	$ 1,908
2	FGUA - Del Prado WWTP	Laurelin Court	82	$ 3.73	$ 45,537	$ 17,076	$ 28,461	$ 2,856
2	CFM- South WWTP	River Wind Cove	58	$ 6.65	$ 114,603	$ 42,976	$ 71,627	$ 4,368
2	LCU - Fiesta Village WWTP	Deep Lagoon Estates	53	$ 5.75	$ 108,520	$ 40,695	$ 67,825	$ 4,152
2	LCU - Fiesta Village WWTP	North Town River	179	$ 8.61	$ 48,110	$ 18,041	$ 30,069	$ 1,812
2	LCU - Fiesta Village WWTP	Heritage Farms	126	$ 8.95	$ 71,031	$ 26,637	$ 44,394	$ 2,784
Subtotal			**2157**	**$ 129.33**	**$ 59,957**	**$ 22,484**	**$ 37,473**	**$ 55,260**

Table E-2: Ranking by Total Estimated Annual Cost per Property (Low to High)

WWTP Area/ Service Area	Area Name	Constructed Parcel Count	Total Impact (in Millions)	Total Cost per Property	Total Estimated Grant Award per Property	Total Cost Per Property with Assumed Maximum Grant Request Award	Total Annual Cost per Property with 20 Year Assessment with Assumed Maximum Grant Request Award at 2% Interest
FGUA - Del Prado WWTP	Mobile Manor	254	$ 8.11	$ 31,916	$ 11,968	$ 19,947	$ 1,224
LCU - Fiesta Village WWTP	Lake McGregor	30	$ 1.05	$ 35,132	$ 13,175	$ 21,958	$ 1,308
LCU - Pine Island WWTP	Pine Island Shores	174	$ 7.68	$ 44,155	$ 16,558	$ 27,597	$ 1,740
LCU - Fiesta Village WWTP	North Town River	179	$ 8.61	$ 48,110	$ 18,041	$ 30,069	$ 1,812
CFM- South WWTP	Fort Myers Shores	446	$ 20.86	$ 46,769	$ 17,538	$ 29,231	$ 1,824
CFM- South WWTP	Page Park	301	$ 17.46	$ 58,008	$ 21,753	$ 36,255	$ 1,848
FGUA - Del Prado WWTP	Bay Pointe	41	$ 2.87	$ 69,903	$ 26,214	$ 43,690	$ 1,908
FGUA - Del Prado WWTP	Gulf Acres	111	$ 5.33	$ 47,995	$ 17,998	$ 29,997	$ 1,968
FGUA - Del Prado WWTP	Over River Shores	87	$ 5.62	$ 64,612	$ 24,229	$ 40,382	$ 1,980
FGUA - Del Prado WWTP	Cabana City	245	$ 9.03	$ 36,845	$ 13,817	$ 23,028	$ 2,028
CFM- Central WWTP	Orange River	61	$ 3.27	$ 53,623	$ 20,109	$ 33,514	$ 2,040
FGUA - Del Prado WWTP	Daughtreys Creek	158	$ 8.29	$ 52,446	$ 19,667	$ 32,778	$ 2,064
FGUA - Del Prado WWTP	Aqua Cove	12	$ 0.82	$ 67,923	$ 25,471	$ 42,452	$ 2,064
FGUA - Del Prado WWTP	Yacht Club Colony	192	$ 10.21	$ 53,185	$ 19,944	$ 33,240	$ 2,088
CFM- South WWTP	Southside Trailer Village	27	$ 1.63	$ 60,407	$ 22,653	$ 37,755	$ 2,160
LCU - Three Oaks WWTP	Mullock Creek	318	$ 18.16	$ 57,119	$ 21,420	$ 35,700	$ 2,184
LCU - Fiesta Village WWTP	Lakes Park	125	$ 7.39	$ 59,117	$ 22,169	$ 36,948	$ 2,256
FGUA - Del Prado WWTP	Blue Water Shores	61	$ 3.12	$ 51,201	$ 19,200	$ 32,000	$ 2,592
CFM- Central WWTP	Billy Creek	24	$ 1.70	$ 70,688	$ 26,508	$ 44,180	$ 2,604
FGUA - Del Prado WWTP	Hancock Estates	8	$ 0.63	$ 78,920	$ 29,595	$ 49,325	$ 2,688
LCU - Pine Island WWTP	Pine Island Tropical Homesites	184	$ 13.07	$ 71,012	$ 26,629	$ 44,382	$ 2,736
LCU - Fiesta Village WWTP	Heritage Farms	126	$ 8.95	$ 71,031	$ 26,637	$ 44,394	$ 2,784
LCU - Fiesta Village WWTP	McGregor Vista	94	$ 6.77	$ 71,979	$ 26,992	$ 44,987	$ 2,820
LCU - Fiesta Village WWTP	Hendry Creek	128	$ 9.34	$ 72,997	$ 27,374	$ 45,623	$ 2,820
LCU - FMB WWTP	Summerwood	42	$ 3.11	$ 74,034	$ 27,763	$ 46,271	$ 2,832
FGUA - Del Prado WWTP	Laurelin Court	82	$ 3.73	$ 45,537	$ 17,076	$ 28,461	$ 2,856
LCU - Fiesta Village WWTP	Ligon Court	35	$ 2.90	$ 82,784	$ 31,044	$ 51,740	$ 3,132
FGUA - Del Prado WWTP	Edgewater Gardens	156	$ 7.80	$ 49,976	$ 18,741	$ 31,235	$ 3,204
FGUA - Del Prado WWTP	Wards Landing	24	$ 2.18	$ 90,922	$ 34,096	$ 56,826	$ 3,636
LCU - Fiesta Village WWTP	Deep Lagoon Estates	53	$ 5.75	$ 108,520	$ 40,695	$ 67,825	$ 4,152
CFM- South WWTP	River Wind Cove	58	$ 6.65	$ 114,603	$ 42,976	$ 71,627	$ 4,368
Total		**3836**	**$ 212.08**	**$ 55,287**	**$ 20,732**	**$ 34,554**	**$ 75,720**