

**JOINT MEETING
CITY OF FORT PIERCE - ST. LUCIE COUNTY - FORT PIERCE UTILITIES AUTHORITY**

Joint Meeting - Thursday, January 7, 2021 - 2:00 p.m.
Havert L. Fenn Center, 2000 Virginia Avenue, Fort Pierce, Florida

- a. See agenda and backup materials attached.

Joint Meeting - Fort Pierce/SLC/FPUA 2:00 pm

Meeting Date: 01/07/2021

Re:

Information

SUBJECT:

See agenda and backup materials attached.

Attachments

Agenda

Presentation

Conservative Analysis

Maximum Concept

Conceptual Cost

Impact Analysis

Form Review

Form Started By: Linda Cox

Started On: 01/05/2021 02:34 PM

Final Approval Date: 01/05/2021



BOARD OF COUNTY COMMISSIONERS AGENDA

ST LUCIE COUNTY

Joint Workshop

Thursday, January 7, 2021

2:00 PM

Havert L. Fenn Center
2000 Virginia Avenue
Fort Pierce, FL 34982

FPUA BOARD MEMBERS

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GLYNDA CAVALCANTI

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District No. 2

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Mission Statement

To provide service, infrastructure and leadership necessary to advance a safe and sustainable community, maintain a high quality of life, and protect the natural environment for all our citizens

1. CALL TO ORDER

2. DISCUSSION ITEMS

- A. Concepts of a Joint Wastewater Treatment Plant

3. ADJOURNMENT

NOTICE: All Proceedings before this Board are electronically recorded. Any person who decides to appeal any action taken by the Board at these meetings will need a record of the proceedings and for such purpose may need to ensure that a verbatim record of the proceedings is made. Upon the request of any party to the proceedings, individuals testifying during a hearing will be sworn in. Any party to the proceedings will be granted the opportunity to cross-examine any individual testifying during a hearing upon request. Anyone with a disability requiring accommodation to attend this meeting should contact the St. Lucie County Human Resources Department at (772) 462-1546, HumanResources@stlucieco.org or TDD (772) 462-1428 at least forty-eight (48) hours prior to the meeting.



ISLAND WATER RECLAMATION FACILITY RELOCATION





Welcome & Introductions



Time Is Now

- Environmental
 - Storms Are Getting Worse & More Frequent
 - Discharges
 - Sea Level Rise
- Solid Partnership Plan
 - District Needs Capacity for Growth
 - District is Ready to Invest in Mainland Plant
 - FPUA Needs a Financial Partner
 - Eliminate Duplication of Services
 - Best Service at Lowest Cost
 - Grants Favor Cooperative Projects
- Solid Financial Plan w/ Clear Benefits
 - Construction Is Not Getting Any Less Expensive
 - Causeway Redevelopment Hinges on Relocation



Evolution

- Original Interlocal (City of Fort Pierce, St. Lucie County “District” & FPUA) executed in February 2004.
- Interlocal Amended in April 2019
 - WRF Relocation Analysis by an Independent Financial & Engineering Firm
- Best Inter-Jurisdictional Coordination
- Momentum



Goals

Educate & Update

1. Timing
2. Economic Opportunity from Reutilization of the Causeway
3. Cost
4. Funding
5. Entity Creation & Governance

Achieve Consensus

Schedule Future Workshops On Each Specific Milestone

Opportunity

Conservative Impact Analysis

- GAI Consultants & Comm Solutions
- Similar to Harbor Isles
- Net Cost-Benefit 4:1 or \$556M
- Direct & Indirect Jobs – 593

Maximum Reutilization

- Redtail Design Group
- Residential, Retail, Restaurants, Hotel, Amphitheatre, Event Center

Department of Economic Opportunity Grant Potential

Environmental Stewardship



FORT PIERCE CAUSEWAY
WATERFRONT PLAN



Proposal by Redtail DG



Costs & Offsets

- 2021 Dollars \$131.5M
- 2027 Dollars & Capitalized Interest \$156M

- Initial Capital Cost Share 70%/30% (Worst Case – No Grants)
 - FPUA: 5.6 MGD @ \$109M
 - SLC: 2.4 MGD @ \$47M

- Cost Offsets
 - Reuse/Cooling Water to Florida Municipal Power Association, Est \$1.1M
 - Reliable Leachate Disposal, Est. \$600K
 - Strong Waste Charges & Industrial Permits, \$80K
 - Septage Hauling Revenues, \$40K
 - Reduce Combined Treatment Cost From \$1750 to \$1412 MGD/Day



Debt Service Strategy

➤ 6 Year Plan

- 2021: Entity Creation, Interlocal Agreements
- 2022-2023: Design, Permitting, Easement Acquisition
- 2024-2027: Construction

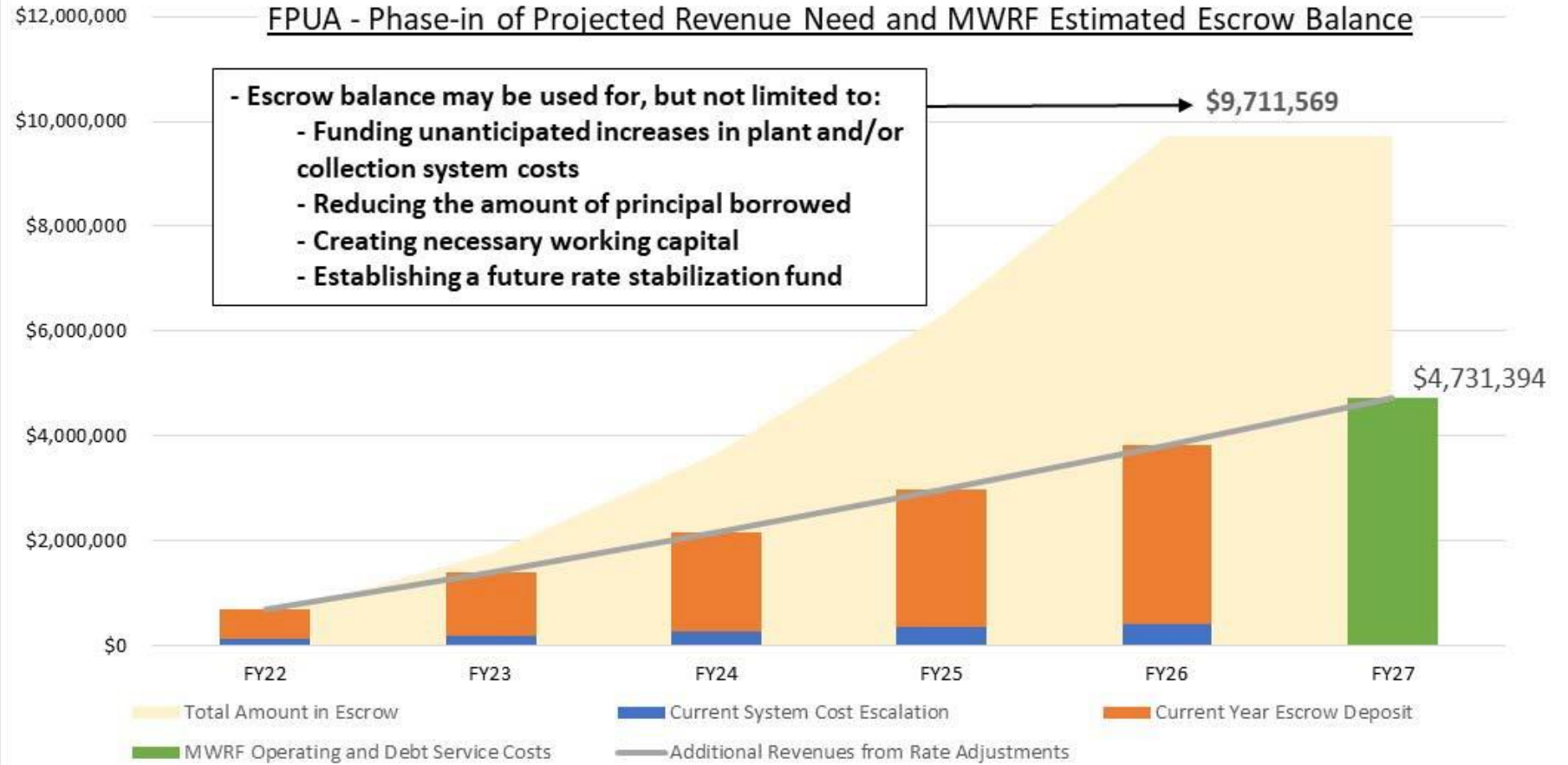
➤ Landranomics

- Ramp Up Realistic Utility Rate Increases from 2022-2027
- Structure WIFIA and SRF Loans to Defer Debt Service Until 2027
- Create Escrow Accounts from 2022-2027 w/ Funds Prior to Payments
 - Offset Capital Expenditures
 - Offset Rate Increases
 - Provide Working Capital to Joint Operational Board

Wastewater Plant Relocation Conceptual Analysis

FPUA - Phase-in of Projected Revenue Need and MWRf Estimated Escrow Balance

FPUA Debt Service



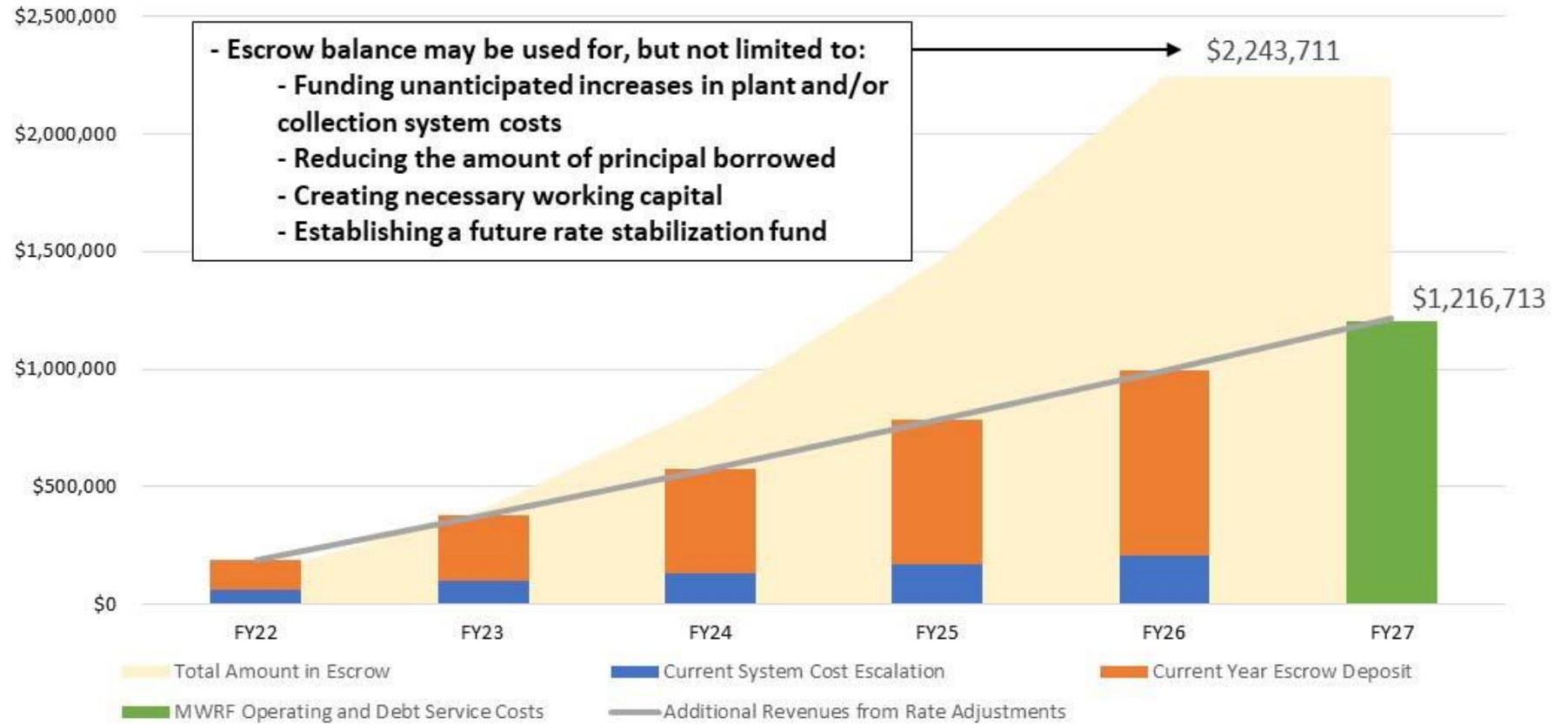
- Additional revenues from rate adjustments are based on two cost recovery approaches that achieve an incremental revenue need of approximately \$4.7 million per year by FY27 to recover only the incremental increase in the MWRf operating and debt service costs:

(1) Applied Wastewater Revenues Only: 5.5% per year for a combined increase of \$16.93 for the existing residential customer (based on 5,000 monthly gallons) or an average monthly increase of \$2.82 per month per year.

(2) Applied Water and Wastewater Revenues: 2.5% per year for a combined increase of \$12.76 for the existing residential customer (based on 5,000 monthly gallons) or an average monthly increase of \$2.13 per month per year.

[] For identification of major study assumptions and disclosures, please refer to Raftelis' presentation dated December 16, 2020.*

Wastewater Plant Relocation Conceptual Analysis
SLCU - Phase-in of Projected Revenue Need and MWRP Estimated Escrow Balance



District Debt Service

- Additional revenues from rate adjustments are based on two cost recovery approaches that achieve an incremental revenue need of approximately \$1.2 million per year by FY27 to recover only the incremental increase in the MWRP operating and debt service costs:

(1) Applied Wastewater Revenues Only: 3.5% per year for a combined increase of \$14.60 for the existing residential customer (based on 5,000 monthly gallons) or an average monthly increase of \$2.43 per month per year.

(2) Applied Water and Wastewater Revenues: 2.1% per year for a combined increase of \$14.52 for the existing residential customer (based on 5,000 monthly gallons) or an average monthly increase of \$2.42 per month per year.

[*] For identification of major study assumptions and disclosures, please refer to Raftelis' presentation dated December 16, 2020.



Governance

Joint Operational Board

- MWRf as Independent Entity
- 5 Member Board of Technical Experts
- Secure Funding
- Control Construction
- Propose Budgets for Approval by SLC, CFP & FPUA
- Utilities Maintain Their Own Customer Base

Modeled After Successful Partnerships

- East Central Regional WW Treatment Board
- Seacoast Utility Authority
- Peace River Water Management District

Models Provided by Philip Gildan Esq.



Path Forward

- Commit to the Concept and Commit to Overcoming Obstacles
- Establish Joint Operational Board by Interlocal Agreement
- Focused Joint Workshops & Discussions
- Marketing
- Empower Your Staff's to Succeed



Everybody Wins

- City of Fort Pierce
 - Control of Valuable Property
 - Increased Tax Base
- Saint Lucie County
 - More Wastewater Capacity with Partnership
 - More Cost-Effective Wastewater Treatment
- Fort Pierce Utilities Authority
 - Mitigate for Eminent Environmental Issues
- Citizens
 - Jobs
 - Reduced Overall Wastewater Treatment Costs
 - Funding For Infrastructure Improvements – Roads
 - Expanded Public Use



Public Comment & Discussion



ISLAND WATER RECLAMATION FACILITY IMPACT ANALYSIS

October 2020



IWRF IMPACT ANALYSIS

ST. LUCIE COUNTY, FLORIDA

OCTOBER 2020

ACKNOWLEDGMENTS

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SECTION ONE: FINDINGS

Total Regional and Community Impacts and Findings

- From an economic cost-benefit perspective, decommissioning and relocating the existing Island Water Reclamation Facility (IWRF) reasonably creates or preserves \$570 million to \$700 million in annual economic benefits to the community, reflecting \$4 to \$5 of benefit for every \$1 of cost
- As a catalyst for residential and commercial growth on the island, direct redevelopment of the IWRF and indirect redevelopment of other adjacent properties would conservatively create nearly \$290 million in development value, driving significant one-time economic impacts for the region
- After build-out of direct and indirect redevelopment in the area, the annual recurring economic impact could conservatively measure more than \$60 million each year, representing an economic payback of relocation costs of less than 3 years

IWRF Site-Specific Impacts and Findings

- The IWRF site is currently zoned “open space”, but has a Future Land Use (FLU) designation that would allow 8 development units per acre (~150 du) and a 1.0 Floor Area Ratio of commercial (~815,000 sq. ft.). No direct provision is assumed for converting commercial land use rights to residential units
- With a rezoning to the limits of the FLU, residential for-sale condominium is considered the most likely use for the redeveloped site at the existing 8 dwelling units per acre, approximately 150 units. No additional residential entitlements were assumed*
- We do not believe the market supports the full FAR amount of commercial/non-residential. However, we believe the addition of some market supportable commercial (retail, restaurant) would produce a more valuable utilization of the site within the current FLU. We have assumed 55,000 gross square feet of supportable commercial based on review of market demand factors
- Within this type of scenario, the scale of redevelopment on the IWRF site should reflect a 1- to 3-year absorption at most (residential sales or commercial leasing activity after construction)
- Land value for the Island Water Reclamation Facility (“IWRF”) site is estimated between \$6.7 million to \$11.3 million, reflecting a potential sale price of \$360,000 to \$600,000 per acre
- The property would need rezoning approval, at minimum. A potential developer would most likely pursue a Planned Unit Development (PUD)

Notes: 1. This study does not assume increases to density / intensity above the current FLU. We note that the Harbour Isles site is ~8.0 du/acre calculated against total site area, but when calculated against developable uplands, the effective density is greater.



SECTION TWO: BACKGROUND AND HISTORY

About the Fort Pierce Utilities Authority's Island Water Reclamation Facility

In 1972, the City of Fort Pierce ("City") created a governmental utilities authority to be known and designated as Fort Pierce Utilities Authority ("FPUA"), which is responsible for the development, production, purchase and distribution of all electricity, gas, water, sanitary sewer collection and disposal, and other utility services as designated by the City Commission. Fort Pierce is one of more than 2,000 communities in the United States served by a community-owned electric utility. FPUA is unique as it is among the few providers of water, wastewater, natural gas, and Internet services.

The FPUA owns and operates a wastewater collection and transmission system that consists of 110 lift stations and 7 master lift stations. The gravity collection system consists of 158 miles of piping ranging in size from 4 to 42 inches. Most of the collection system is vitrified clay pipe ("VCP"). The gravity collection system has 3,344 manholes located throughout FPUA's service area. The transmission system consists of 98 miles of force mains ranging in size from 1.5 inches up to 30 inches. The force mains are predominantly PVC.

FPUA owns and operates the Island Water Reclamation Facility ("IWRf") which has a permitted capacity of 10.0 Million Gallons per Day ("MGD") Average Annual Daily Flow ("AADF"), Three-Month Average Daily Flow ("TMADF") of 11.5 MGD, Peak Hour Flow ("PHF") of 14.92 MGD for deep well injection, and PHF of 18.6 MGD for surface water discharge. The facility, located

on South Hutchinson Island and built in 1959, has one Class 1 Deep Injection Well. The current Capacity Analysis Reports ("CAR") indicates that the facility is operating well below its design capacity. Based on these data there is no need to expand the facility. The facility has seen high peak hour flows that occurred during tropical storm events and did not exceed the facility's current permitted capacity. The flows entering the facility come from residential (homes), commercial (restaurants and other businesses), and industry (manufacturing, juicing, car washes, etc.). The facility receives industrial waste from five customers. These customers follow FPUA's industrial pretreatment program, and there have been no reported violations nor adverse impacts on the IWRf.

Even with proper operating and maintenance activity and capital renewal and replacement, the IWRf is vulnerable to natural disasters, mainly tropical storms and hurricanes. For Florida, the 2017 hurricane season was one of the most active and destructive on record. In 2017, there were 17 named storms, and significant damage was registered across the Caribbean and southeastern United States.

In particular, Hurricane Irma (September 10, 2017) moved over the Florida Keys and made landfall near Naples before moving up the center of the state. In total, Irma caused at least \$6 billion in property damage and another \$2.5 billion in agriculture losses, with the entire peninsula suffering damage.

As a result of power outages and damage to power distribution systems that continued for several weeks after Irma, the IWRF reported several discharges into the Indian River Lagoon. Consequently, in 2017 the Florida Department of Environmental Protection (“DEP”) fined FPUA \$10,500 for these spills totaling about 10.5 million gallons of treated and untreated sewage at the plant and at several lift stations throughout the City. These spills included the following:

- About 1.25 million gallons between 3 a.m and 6:45 a.m. Oct. 2, 2017
- About 6 million gallons between 10 p.m. Sept. 10, 2017 and 1 p.m. Sept. 11, 2017
- About 3 million gallons between 3:49 a.m. and 9:30 a.m. Sept. 12, 2017

The DEP fine for the discharges was minimized by proactive efforts of the FPUA to recognize and implement an action plan as a result of the 2017 spills. The FPUA has invested more than \$3 million installing a backup electric generation system to minimize the potential for a similar event in the future.

The FPUA Board has considered moving the 59-year-old plant off the island in recent years, which would help eliminate the threat of future spills in the Indian River Lagoon. In light of the 2017 events, continued risk from natural disasters, and more focused environmental regulation efforts, FPUA would like to decommission the IWRF and build a mainland water reclamation facility. St. Lucie County (“County”) has five wastewater treatment facilities, one each on North and South Hutchinson Island, and three smaller package plants on the mainland. St. Lucie County would like to decommission the three mainland package plants and redirect corresponding wastewater flow to a mainland location. FPUA is working collaboratively with St. Lucie County to locate a new mainland water reclamation facility where both utilities could utilize the new facility.

Based on the draft relocation analysis conducted by Raftelis Financial Consultants, Inc. in May 2020, the total conceptual capital costs to relocate the IWRF to a mainland location was calculated to cost roughly \$131 million to \$150 million, depending on the mainland location site.



SECTION THREE:

ST. LUCIE SOCIO-ECONOMICS

In 2019, the population of St. Lucie County totaled slightly more than 328,000 residents occupying nearly 113,000 households out of roughly 140,000 housing units. The average home value reflected in the County was about \$234,654 in 2019. In 2019, the median age within the County was 44.6, with an average household size of 2.6. Approximately 88% within the County's population has obtained their high school diploma; 47% of the high school graduates within the County have obtained an advanced degree. In the County, the per capita income was \$28,458, the average disposable income was \$60,380, and the median household income was \$54,202 in 2019.

From this base of consumer demand, the St. Lucie economy is estimated at a Gross Regional Product ("GRP") of nearly \$8.6 billion dollars (see Table 3.1). This regional contribution of final product is generated from about \$16.6 billion in economic activity (output) generating approximately \$4.9 billion in wages and salaries.

Table 3.1. St. Lucie County Gross Regional Product

Component	GRP (\$, millions)
Household Demand	\$12,084
State/Local Government Demand	1,661
Federal Government Demand	186
Capital	2,232
Exports	3,977
Imports	(11,161)
Institutional Sales	(399)
Total Final Demand	8,580

Based on industry, the St. Lucie economy is dominated by Services and Government activities, accounting for 45% and 49% of total jobs and GRP, respectively (see Table 3.2).

Table 3.2. Industry Share of Gross Regional Product

Industry	Share of Employment	Share of GRP
Services	34%	36%
Government	11%	13%
Wholesale and Retail Trade	12%	11%
Medical	12%	10%
Utility	1%	10%
Construction	7%	6%
Manufacturing	4%	4%
Total	81%	90%

Medical industries including physicians, dentists, outpatient care centers, medical and diagnostic laboratories, home health care services, hospitals, and nursing and community care facilities play a relatively significant role in the local economy as well, generally driven by demographics. While not significant in the share of jobs, utilities also play a significant role in the local economy as a result of the Florida Power facility located on Hutchison Island, as well as the Florida Power and Light solar power plant located between Interstate 95 and Florida's Turnpike.

Tourism in Florida is a major industry that also plays a significant role in St. Lucie, although its full impact is generally included within other industry classifications (e.g., retail, restaurants, services). There are several directly related industries, but

a portion of the impact of visitation requires estimating visitor spending.

The logical base for estimating the impact of visitation is the inventory of hotel and other lodging in the County. This analysis estimates that the County has a supply of roughly 4,000 accommodations among traditional hotel and motel rooms and other transient accommodations (e.g., AirBnB). In 2019, these accommodations generated approximately \$116M in room-revenues from an estimated

550,000 overnight visitors to the County. Accounting for potential day-visitation using industry standards, the total number of annual visitors to St. Lucie is estimated to be between 1.0M to 1.3M, generating more than \$225M in spending in addition to room-revenues.

Together with specific tourist-related industries, this analysis estimates that visitation to St. Lucie supports more than \$550M in economic output and nearly 5,000 jobs (see Table 3.3).

Table 3.3. Economic Output Supported by Visitation

Sub-industry	Jobs	Output
Visitor Spending (Excluding Lodging)	2,030	\$225,000,000
Hotels and Motels, including Casino Hotels	710	74,200,000
Other Amusement and Recreation Industries	690	38,500,000
Scenic and Sightseeing Transportation and Support Activities for Transportation	520	73,600,000
Other Accommodations	350	41,800,000
Travel Arrangement and Reservation Services	290	51,900,000
Gambling Industries (Except Casino Hotels)	180	24,900,000
Boat Building (Less Resident Demand)	75	19,100,000
Amusement Parks and Arcades	35	2,200,000
Museums, Historical Sites, Zoos, and Parks	15	2,000,000
Total	4,890	\$553,100,000

Based on this analysis, tourist-related activity in St. Lucie is estimated to account for 6.5% of GRP. There is a likelihood of some double counting between estimates of visitor spending and reported industries identified above; however, it is our opinion that any double counting is

mitigated by excluding other tourism-related spending or industries. As a result, calculating a range of possible tourist-related impacts would be expected to average to 6.5% of GRP.

SECTION FOUR: DEVELOPMENT POTENTIAL

One objective of this analysis is to provide an estimate of the economic value or market value of the property underlying the IWRF, assuming the facility would be decommissioned and relocated. This analysis starts at the point where the 19-acre site is made available for development or is otherwise in a “greenfield” state. The full costs of decommissioning, relocation, and site remediation (if any) are considered outside of this analysis and not included in determining either development opportunities or the market value of the site.

Potential development opportunity for the site is considered in terms of highest-and-best-use (“HBU”) reflecting the reasonably probable and legal use of vacant land that is physically possible, appropriately supported, financially feasible, and that results in the highest value. However, this analysis does not include a full site analysis or market analysis to identify either physical or market constraints. This analysis relies on observed physical and market characteristics of surrounding properties as reasonable validation of development scenarios. The potential market for uses on this site is limited to residential, either for-sale or for-rent, and commercial in the form of lodging or retail and restaurant.

What Is Residual Land Value?

The economic value or market value of land as used in this analysis includes the following assumptions:

1. A hypothetical buyer and seller are both willing, and thus interested in the transaction, and are able to enter into a transaction, implying a hypothetical buyer has sufficient

funds, and the seller has sufficient rights to enter into a transaction;

2. A hypothetical buyer is prudent, implying a rational buyer, and is considered to be a “financial” and not a “strategic” buyer;
3. Even though a willing buyer and willing seller are hypothetical, they are presumed to be dedicated to achieving their individual maximum economic advantage, but absent any compulsion to buy or sell;
4. Both parties are assumed to understand the industry and other economic conditions and their effects on the asset to be sold;
5. A hypothetical buyer is assumed to represent an independent third party; and
6. A hypothetical sale will be for cash.

In economic theory, the most ideal indication of the market value of land would be an observed market transaction for a specific piece of land or an alternative that is identical in every aspect. However, even with observed market transactions, it is improbable these transactions meet the standards described above, particularly with land and real estate. With a high level of risk in terms of development costs and returns, land is generally viewed as a means of adding flexibility to development cost in order to control profitability. This tends to lead to land speculation and generally creates asymmetry in information, favoring the buyer or developer. As a result, this analysis will utilize a Residual Land Value approach for estimating market value for the subject site that would be created from various development options.

Residual Land Value is a method for calculating the value of land by subtracting from an

estimated total market value all costs associated with the development, including profit but excluding the cost of the land. The amount left over is the residual land value—i.e., the amount someone is able to pay for the land, given the assumed value of the development, the assumed project costs, and an acceptable market profit.

Total Market Value

Total market value can be expressed as a capitalization of net income from a stabilized year. Calculating market value using this approach for a project with a constant growth rate would generate the same value as a Discounted Cash Flow (“DCF”) method, because the discount factor using income capitalization is equal to the discount factor in a DCF approach minus the growth rate. At this level of research, a DCF is not necessary to express the potential total market value from various development scenarios. In addition, a capitalized income method allows a comparison of development products whether they are for-sale or for-lease because it expresses total market value as if full projected revenue has been achieved or a sale is completed. After a determination of the potential development opportunities, the total market value is estimated from a detailed sales analysis or local and regional data on commercial and residential rental rates.

Development Costs

Building costs form the largest risk to the cost side of residual valuation—representing about 80% to 90% of total direct project costs. Building cost information is published by multiple organizations, giving details of historical cost information for a wide range of building types

(residential and commercial). This information is based on a national average of tender prices. There are regional adjustments to be made, depending on location. Site improvements, soft costs, developer marketing, overhead, sales costs, and interest costs are estimated using industry standards and are generally a function of the scale of building costs.

Residual Land Value

Residual land value is the difference between the estimated total market value and estimated development cost, considering a provision for federal taxes and normal profit is left for the purchase of land. Conceptually, this method provides the most unbiased measure of the market price for land, consistent with the concept of market value.



Development Opportunities

The IWRF is located on the north end of Hutchinson Island, along the North Causeway between the mainland and barrier island. The decommissioning and relocation of the IWRF will create specific redevelopment opportunities for the 19-acre site, but is also expected to generate market conditions that are favorable for additional development or redevelopment of other properties along the causeway. This type of redevelopment generally follows a strategic and channeled process of developing vacant parcels and repurposing existing under-used parcels. Most often, this process is not simply the unsystematic development of individual lots but is driven by a unique opportunity or catalyst that influences a broader area. The redevelopment of the IWRF site is a clear market catalyst to create opportunities to foster new economic growth and maintain the existing character of the area.

The sites most likely to be influenced by redevelopment of the IWRF site, all of which have connected accessibility, include the County property to the north and the marina immediately adjacent to the east (see Table 4.1)

Table 4.1. IWRF Redevelopment Site Acreage

Property	Acres
North County Site	12.6
FPUA IWRF ¹	18.7
Causeway Cove Marina	42.8
Total	74.1

Note: (1) There is a sub-station that occupies 1 acre of the FPUA IWRF site which will not be relocated and redeveloped; however, development rights would be calculated for the entire property and would not have an effect on the direct impacts.

The IWRF site (Parcel ID: 2402-323-0003-000-3) measures 18.7 acres, all of which would be assumed to be developable for an alternative use. Nearly 2,500 linear feet of the property fronts the Indian River Lagoon, as illustrated in the map below (see Figure 4.1).

Figure 4.1. Site Map



The Causeway Cove Marina is developed with an active, functional use; however, it could be considered under-utilized from an economic perspective. It would be reasonable to speculate that one factor influencing its current use is the location of the IWRF. The presence of the treatment facility should have very limited or no influence on the commercial marina uses, but is generally not ideal for residential development or other types of commercial uses such as retail and restaurant. Redeveloping the IWRF to an alternative use would be expected to remove negative market perceptions, if any, and promote the development of the property that may not have been considered optimal in the past.

The County property on the north side of the causeway currently provides a variety of public uses through the St. Lucie County Regional History Center, St. Lucie County Aquarium, Museum Pointe Park, and other boating and recreational facilities. While there are no apparent deficiencies or gaps in these public uses, the market conditions created by the redevelopment of the IWRF could provide opportunities to

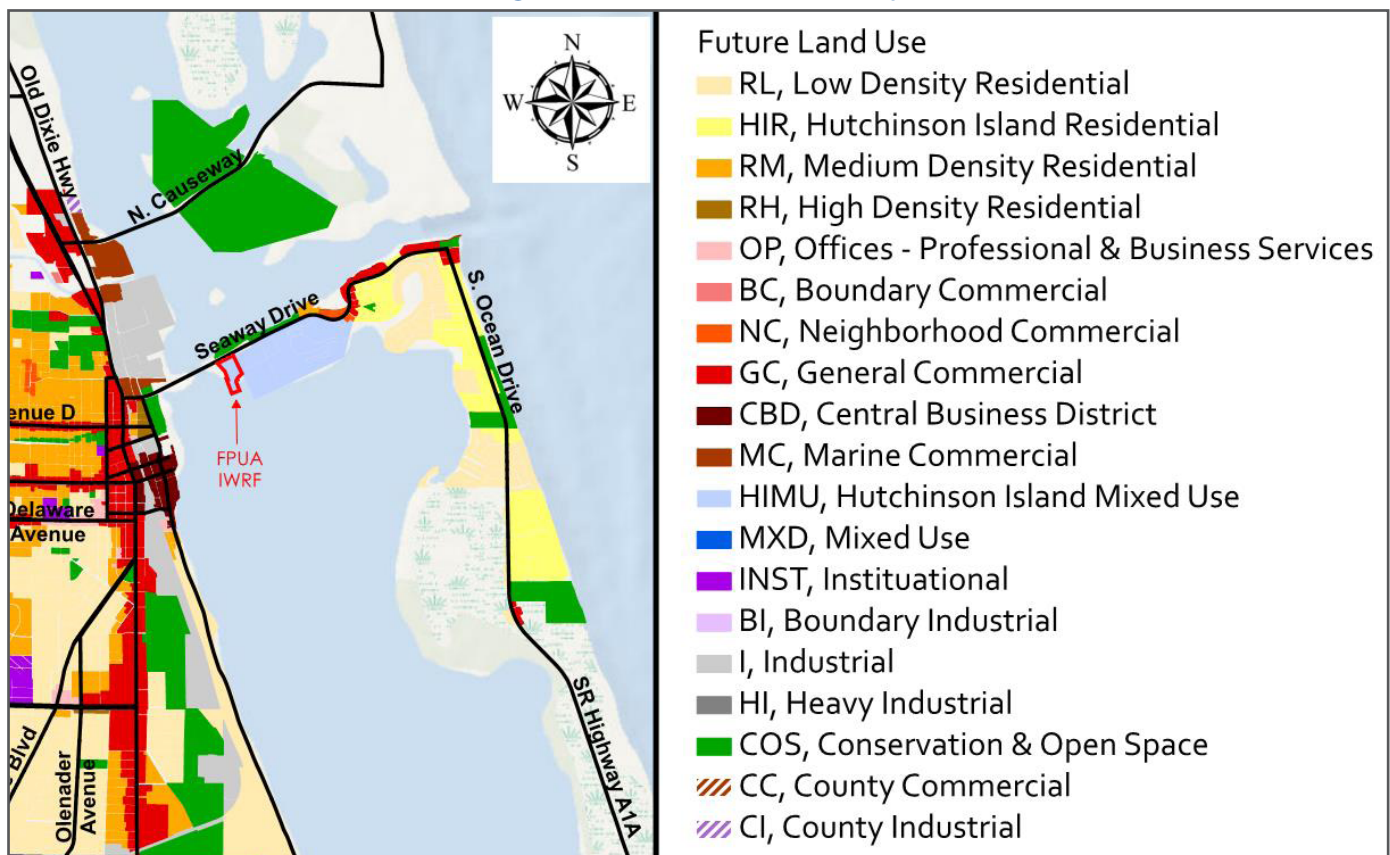
significantly enhance these uses. For example, the County might consider the addition of civic or public event space that would be efficiently located adjacent to allowable commercial uses on the IWRF site or redeveloped within the Causeway Cove Marina.

Overall, the analysis of legally permissible development on the site and other adjacent sites included a review of the City of Ft. Pierce’s existing Future Land Use (“FLU”) and Zoning regulations, as represented in the following pages.

Future Land Use

The IWRF and Causeway Cove Marina sites are located within a special FLU designation called Hutchinson Island Mixed Use (“HIMU”), which also encompasses several adjacent properties, including Harbour Isles and the Smithsonian Marine Station. The County site to the north is within a FLU designation of Conservation and Open Space (“COS”), which limits its future development potential to public uses (see Figure 4.2).

Figure 4.2. Future Land Use Map



The HIMU designation is intended to provide for mixed-use, residential, and tourism-related uses, but at lower densities to protect the existing character of the island. Based on the FLU designation of HIMU (see Table 4.2), the development potential for the IWRF and Causeway Cove sites is 8 dwelling units (“du”) per acre plus a 1.0 non-residential Floor Area Ratio (“FAR”).

Table 4.2. Maximum Development Potential

Land Use	Rate	IWRF Site	Causeway Cove
Residential	8 du/acre	150 du	342 du
Commercial	1.0 FAR	814,572 sq. ft.	1,864,368 sq. ft.

However, the HIMU designation as a whole is limited to 20% non-residential floor area of all developed uses. This overall limitation of non-residential development indicates that the HIMU is envisioned as predominately a residential area. Currently, non-residential development within the HIMU amounts to only 2% of all developed uses, which would not appear to further constrain non-residential development on the IWRF or Causeway Cove site based on maximum allowable.

While the FLU and existing commercial development may not constrain allowable maximum commercial square footage, the current market is not expected to support development anywhere near the allowable maximums for either site.

The Harbour Isle condominium development just east of the site, also within the HIMU designation, encompasses a net land area of approximately 95 acres today (110 acres at the time of development) and comprises 905 units, along with some common features and

accessory buildings. Therefore, residential density at Harbour Isle today is nearly 10 du per acre on a net land basis for the entire development, which includes vacant commercial acreage as well as common area acreage. In fact, by following the land lines for Harbour Isle West and Harbour Isle East, which total a net land area of 81 acres, the intensity of the 905 condominium units reflects more than 11 units per acre.

Regardless of the comments above, the development of Harbour Isle appears to exceed 8 du per acre on a gross acre basis. Construction of the Harbour Isle development began in 2003, possibly before the HIMU designation existed. The Comprehensive Plan does reference a presently non-existent Medium Density Residential Hutchinson Island/General Commercial (“RMHI/GC”) category. That may explain how Harbour Isle exceeds the current maximum of 8 du per acre.

The IWRF, Causeway Cove Marina, and County sites are also within the Coastal Planning Area (not the High Hazard Area), which has a somewhat higher threshold applied to proposed land use and zoning changes.

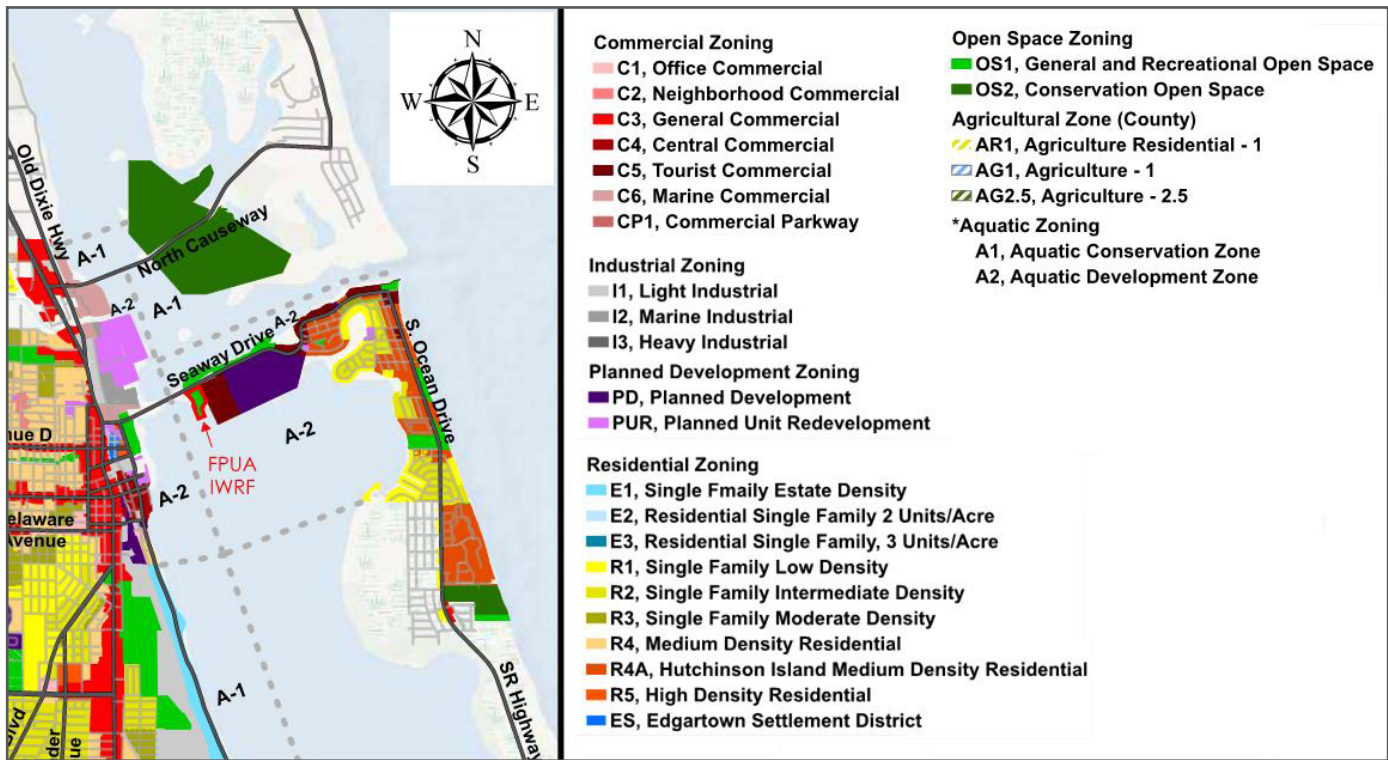


Zoning

The IWRF and County sites are currently zoned General and Recreational Open Space (“OS-1”) with South Beach Overlay (Sec. 125-157 (1)), as

illustrated in Figure 4.3 below. The Causeway Cove Marina site is zoned General Commercial (“C4”).

Figure 4.3. Zoning Map



The OS-1 zone does not allow residential or commercial type developments, so any proposal would require a rezoning to a different designation. The overlay lists specific standards for the underlying zoning categories, including C-3, C-5, OS-1, R-1, R-2, R-3 and R-4A; however, it does not specify that others are not allowed, that’s just what exists there today. The City’s zoning map also shows that there are PUDs and PURs currently within the overlay, which would be the most likely choice for a redevelopment of the property, depending on what is proposed. For the purpose of this analysis, future development potential will be assumed to be governed by the current FLU designations. Any required

adjustments to existing zoning will be assumed to be accomplished through some future PUD process, as needed.

The South Beach Overlay automatically limits the residential density on the island to a maximum of 8 du per acre, so no rezoning would be able to exceed that. At the same time, the overlay limits the height of buildings according to their underlying zones. The highest of all the underlying districts is 45 feet or 4 stories; however, there is no specific limit stated for PUD/PUR zones. It is unclear whether a rezoning to PUD or PUR could allow the City to approve heights greater than 45 feet/4 stories.

Direct Development Opportunities

Given the nature of existing development within the HIMU, the initial consideration for development of the site was residential, specifically for-sale condominium units. Over the past 12 months, there have been more than 970 qualified sales of condominium units in St. Lucie County, with an average unit price of approximately \$235,000, reflecting a sales price per square foot of \$177 (including non-waterfront units). The pool of sales is dominated by small, older condominium units, which has a significant impact on market value relative to future market opportunity.

Approximately 78% of the units sold in 2019 had a finished area or less than 1,500 square feet, predominately a result of the average age of these units being nearly 31 years. There is strong indication that the market is demanding larger units, either a result of consumer demand or profit requirements driven by land prices, which is expected to continue in the future. Just among the pool of condominium sales in 2019, units built before 1990 averaged 1,150 square feet, compared with 1,600 square feet from 1990 and later, a 40% increase. Based on these trends and our modeling, products offered in the near-term are expected to average 2,500 square feet in living area.

In addition to unit size, the realized price per square foot is significantly impacted by the age of existing units. Using a model to adjust sale prices for size of unit, age of building, date of sale, and location (non-water, river-front, ocean-front), this analysis estimates a \$9,000 to \$15,000 premium on current sales prices for each year since construction. (Alternatively, this can also be considered a penalty on the current sales price for each year before 2020 that units are constructed.)

Adjusting recent sales to account for future market opportunity, this analysis is based on an average sales price of \$230 per square foot applied to 2,500 square feet of finished area (see Table 4.2)

Table 4.2. Adjustment to Recent Sales

Living Area	2,500 sq. ft.
Price per square foot	\$230
Market Price	\$575,000

It is also assumed that the different development scenarios reflect no more than a 1- to 3- year absorption period (unit sales or commercial leasing activity after construction), given the volume of sales in 2019 and the proposed programs.

This initial consideration was modeled based on allowable maximums, for the development of 150 units with a finished living area of 2,500 square feet, constructed in either a 2-story or 4-story product (see Table 4.3).

Table 4.3. Initial Consideration for Development

Land Area	2-Story	4-Story
Residential Buildings	196,900	98,450
Parking (surface)	150,000	150,000
Front set-back	28,350	28,350
Other (roads, stormwater, amenities, open space)	439,322	537,772
Total	814,572	814,572
Other % of Total	53.9%	66.0%
Dwelling Units	150	150

While this analysis understands the HIMU's intent to provide an incentive for mixed-use development while at the same time maintaining a character of development (intensity and height) that reflects the desire of the community, the HIMU FLU designation is relatively inefficient from an economic perspective. The portion of the site (excluding roads and stormwater retention) that is either used for amenities or open space is significant. Depending on the contribution of this space to the market prices of the condominium units, it is reasonable to identify this constraint as an economic or market underutilization of the property.

In addition, as a stand-alone site, the potential underutilization of land when applying gross density limits can more easily be addressed when the property size is much larger than the IWRF site (which emphasizes the potential synergies should the site be combined with other adjacent property for redevelopment). The development of Harbour Isle is an example of the advantage of developing more land with the same gross density limits. Developing roughly 110 acres allowed Harbour Isle to utilize 15 acres to construct a commercial marina and transfer development rights—and effectively more land value—to the remaining 95 acres. While the marina did not contribute to the market value of individual units, it created income for the developer/owner. So while the same gross density limitation is applied, it has a significantly different impact on economic utilization.

One consideration for the more efficient development of the subject site, even with the obstacles of both FLU and zoning, would be to consider allowing more density on this 18.7-acre site but remain consistent with the character of existing, similar developments (see Table 4.4).

Table 4.4. New Consideration for Development

Land Area	8 du/ac	13.5 du/ac
Residential Buildings	98,450	165,375
Parking (surface)	150,000	252,000
Front set-back	28,350	28,350
Other (roads, storm-water, amenities, open space)	537,772	368,847
Total	814,572	814,572
Other % of Total	66.0%	45.2%
Dwelling Units	150	252

Note: (1) There is a sub-station that occupies 1 acre of the FPUA IWRF site which will not be relocated and redeveloped; however, development rights would be calculated for the entire property and would not have an effect on the direct impacts.

It seems reasonable to assume that developing the subject site at higher gross density, even up to 13.5 dwelling unit per acre (“du/ac”), would be virtually indistinguishable from the spacing and connectivity of Harbour Isle, which was developed at more than 5-times the scale at more than 11 du per net acre.

A second consideration for development would be the addition of non-residential uses as allowed by the HIMU designation. However, it is important to distinguish between mixed-use and multi-use development.

It is generally accepted that for mixed-use development the physically integrated combination of residential, commercial, cultural, or transportation functions within a structure, consolidates activity within an area, and is intended to promote some level of self-sustaining interdependence. The success of mixed-use development is not exclusively about high-density development. However, there are products and markets, both reflecting a much higher intensity than allowed in this case, that are more conducive to a mixed-use development. Multi-use development is simply a program of multiple uses that may or may not promote some level of self-sustaining interdependence. Commercial development (retail, restaurant) included on the site will most likely be developed as stand-alone and may or may not be integrated with the condominium product.



Base Development Pro Forma

A financial pro forma for developing 150 condominium units on the site is provided in the following table (see Table 4.5). Financial modeling for this analysis assumes the IWRP would be

provided as “greenfield”. No costs for decommissioning, relocating, or reclamation (if any) have been included in this pro forma.

Table 4.5. Financial Pro Forma (\$, 000s)

Component	Value (\$,000s)	Notes
Total Market Value	\$86,250	150 units at \$575,000
Land	\$6,728	\$8.26/sq. ft.
Site	\$492	\$1.25/sq. ft.
Building	\$60,555	\$154/sq. ft.
Soft	\$1,221	2% of hard costs
Total Direct Costs	\$68,996	
Developer Overhead, Marketing, Sales	\$7,631	12.5% of hard costs
Interest	\$1,916	2.5% of total cost
Provision for Federal Taxes	\$3,083	40% of net margin
Net Income	\$4,624	
Profit (%)	5.4%	

Assuming the market supports the \$575,000 sales price for these units, along with the various assumptions on projects costs, the base development program would create a land value of approximately \$6,700,000 or \$45,000 per unit. Using the residual land value approach, we

estimate that the addition of 55,000 square feet of commercial use, along with the development of for-sale residential condominiums, would generate the equivalent land value of the alternative residential development at 13.4 du/ac (see Table 4.6).

Table 4.6. Alternative Residential Development – Residual Land Value Approach

	8 du/ac		13.5 du/ac
	No Commercial	With Commercial	
Total Market Value	\$86,250	\$104,580	\$144,900
Direct Costs	68,996	83,669	115,921
Net Income	4,624	5,850	7,765
Profit (%)	5.40%	5.60%	5.40%
Residual Land Value	\$6,732	\$11,435	\$11,314
Dwelling Units	150	150	252
Commercial Sq. Ft.	-	55,000	-

Indirect Development Opportunities

The County site on the north side of the causeway is assumed to remain in public use for the purpose of this analysis; however, redevelopment of the IWRP property, along with the potential redevelopment opportunities created for the Causeway Cove Marina, could promote additional development or redevelopment of public uses on this site. While any consideration of new or redeveloped public uses on this site would create significant community and social value, they would not directly contribute to economic market value. But the additional development or the redevelopment of public uses on the County site could create demand supporting non-residential uses developed on both the IWRP and Causeway Cove Marina sites. For example, civic or public event or meeting space, whether developed as a stand-alone or incorporated into existing facilities would provide significant support for new commercial uses such as retail, restaurant, and lodging.

Therefore, potential additional redevelopment as a result of the catalyst of relocating the IWRP is currently limited to the Causeway Cove Marina property. This in-direct redevelopment opportunity was modeled based on allowable maximums, for the development of 343 units

with a finished living area of 2,500 square feet. The marina uses would remain as currently developed (see Table 4.7).

Table 4.7. Potential Additional Development

Land Area	Sq. Ft.	Dist. (%)
Residential Buildings	225,185	12.1%
Parking (surface)	343,000	18.4%
Front set-back	46,575	2.5%
Marina (submerged)	1,105,988	59.3%
Other (roads, storm-water, amenities, open space)	144,491	7.7%
Total	1,865,239	100.0%
Dwelling Units	343	

A financial pro forma for developing 343 condominium units on the site is provided in the following table (see Table 4.8).

Assuming the market supports the \$575,000 sales price for these units, along with the various assumptions on projects costs, the base development program for in-direct development opportunities would create a land value of approximately \$15,400,000 or \$45,000 per unit.

Table 4.8. Additional Financial Pro Forma for 343 Condominium Units

Component	Value (\$,000's)	Notes
Total Market Value	\$197,225	343 units at \$575,000
Land	\$15,382	\$5.74/sq. ft.
Site	\$1,126	\$1.25/sq. ft.
Building	\$138,480	\$154/sq. ft.
Soft	<u>\$2,792</u>	2% of hard costs
Total Direct Costs	\$157,780	
Developer Overhead, Marketing, Sales	\$17,451	12.5% of hard costs
Interest	\$4,381	2.5% of total costs
Provision for Federal Taxes	\$7,045	40% of net margin
Net Income	\$10,568	
Profit (%)	5.4%	

SECTION FIVE: IMPACT ANALYSES

Cost-benefit and economic impact analyses assist in the study of the economic contributions of the use of public resources, or to help evaluate the consequences of public policy decisions affecting resources. These analyses are commonly applied to the issue of public funding as it relates to the following (among other issues):

- Resource allocation (public services)
- Land use regulations and restrictions
- Economic development
- Environmental protection
- Social and economic assistance

Cost-benefit and Economic Impact assessments may be *ex ante*, estimating the likely impacts of proposed or hypothetical public projects or policy; or *ex post*, measuring impacts associated with an historical public project of policy. Evaluating a public project or policy after it has happened or is implemented only seems to have value if it can be corrected (assuming desired outcomes are not being achieved) or may appear to only provide a validation of an action that has arguable benefit. However, a review of the impacts *ex post* is likely to be more accurate because the desired changes (at least measurable changes) can be observed and compared with actual costs. An *ex ante* analysis is faced with the challenge of making assumptions about how certain economic parameters will change, or how individuals or groups will react. Thus, the outcome of a cost-benefit or economic impact analyses is contingent on the validity of the assumptions being used to describe probable changes in economic activity and benefit. This analysis is obviously an *ex ante* assessment of the

potential impact of redevelopment of the IWRP, assuming it is decommissioned and relocated; as such, it is subject to variation from actual changes in economic activity.

A critical difference between cost-benefit and economic impact analyses is how they each deal with costs. In calculating economic impacts, more costs or spending generates more jobs and income. Thus the more costs associated with a public project or policy, the larger the estimated economic impact to the region. In contrast, in a cost-benefit analysis, the cost of a public project or policy is subtracted from calculated benefits, thereby reducing the value of a project or policy the higher the cost. This seemingly conflicting dynamic of the effect of the cost of a public project or policy is typically not recognized; the goal of policy research is generally focused on one or the other method of analysis depending on the goal of the inquiry. It is not common for research to address both public policy efficiency and the magnitude of economic impact.

Cost-Benefit Analysis

A cost-benefit analysis calculates the costs (implicit or explicit) and benefits (also implicit or explicit) of a specific public project or policy and how different individuals or groups are affected. The benefits of a public project or policy can include market benefits: those that can be quantified from market transactions; as well as non-market benefits: those that are received by an individual or group without having to pay for them. Measured in like terms (i.e., economic output, income, employment), the calculated costs can be subtracted from benefits to reveal either a positive or negative net impact in total

and between individuals or groups. This method allows for the comparison of different projects or policies to determine which are relatively more efficient and how the impacts differ at the level of individuals or groups.

The goal of cost-benefit analysis is to understand the efficiency of public projects or policy. This implies that, at most, specific projects or policies should only be undertaken if the net impact for the whole is positive (benefits exceed costs) and generates more net benefit than alternative projects or policies that accomplish similar ends. Cost-benefit analysis, however, also provides for the evaluation of the distributional implications of projects or policies. In the end, a properly constructed cost-benefit analysis should provide sufficient information to allow policy makers to choose the most efficient public project or policy—providing both aggregate positive net impacts and minimal negative distributional impact among individuals or groups.

The most significant complication with cost-benefit analysis as it relates to public projects and policy is the notion of implicit “benefit” or “cost”, market and non-market benefits, and the ability to calculate values of public or social themes. For example, it is intuitively beneficial to provide a safe, clean potable water supply for which costs are clearly quantifiable. However, it is not entirely clear how one would calculate the value of the health, safety, and welfare conferred to the public. It is common to attempt to calculate costs avoidance as a surrogate to benefits, such as reduced medical cost by avoiding illness or the loss of economic efficiency from having to allocate time and resources to constantly search for sufficiently safe, clean water. However, these

costs most certainly miss the value of ethereal benefits that are sometimes more important than cost avoidance.

Decommissioning and Relocation Cost

The cost impact of decommissioning and relocating the IWRF are identifiable based on existing studies. These explicit costs also appear to reflect the complete set of cost implications because the program will be funded with new, incremental revenues. Thus, there is no apparent opportunity cost by allocating public resources to meet the requirements for decommissioning and relocating the IWRF and, therefore, little implicit costs. Based on operational and planning estimates, the full annual program operations and maintenance costs are estimated between \$131M and \$150M.

Economic Values of Benefits

The value of the benefit of relocating the IWRF to a more appropriate location is not as easily identifiable, or at least measurable. The community has the choice of not relocating the facility, but this would continue the risk of spills and discharges of wastewater into the Indian River Lagoon. The risk would largely be recognized in the future if other natural disasters occur that have an impact on the IWRF, in addition to increased efforts and pressure from state legislation and regulation. Environmental legislation, regulations, and penalties are not expected to simply go away and will most likely escalate in the future.

In addition, the property would remain underutilized, and the community would not realize the benefits of incremental jobs, income, and taxes that could be generated from a more appropriate use. At a minimum, the benefit of relocating the IWRF could be attributed to the avoidance of further fines. However, this type of “cost avoidance” estimate is woefully inadequate to capture the full value or benefit from protecting the natural resources of the region. Cumulative spills of more than 10 million gallons of wastewater in 2017 as a result of power outages from Hurricane Irma carried a fine of only \$10,500. The FPUA would clearly not be making the decision of relocating the IWRF to avoid fines of this amount from future spills and discharges. The greater significance of the environmental impact over time and downstream is about preserving the natural assets that contribute to a significant tourism industry in the county and region.

The significance of tourism in the region provides reasonable evidence of the economic value of the area’s natural resources. Common practices in research attempting to calculate the economic value of environmental or natural resources include: 1) industry valuation; 2) travel cost and expenditures; and 3) contingent valuation. The objective of each method is to relate a market value for a good or service that is not entirely transacted in market terms. The more appropriate measure of benefit of relocating the IWRF is the preservation of the tourism industry directly impacting St. Lucie County and the region.

What happens if natural resources are destroyed? A study found that wastewater discharged into the waters in the Caribbean is killing coral reefs at alarming rates. At a specific site impacted by wastewater discharge, 30% of the coral were infected with two coral diseases (black-band and white plague), which can destroy a coral colony rapidly. At other locations where no wastewater was discharged, no more than 4% of coral were infected.

The northern extension of the Florida coral reef tract runs parallel to the Atlantic coastline of southeast Florida, from the northern border of Biscayne National Park in Miami Dade County to the St. Lucie Inlet. The reefs and hard-bottom habitats in the northern third of the Florida reef tract support diverse biological communities, which provide habitat to important fisheries. Marine and estuarine fisheries habitats observed in southeast Florida consist of a varying mosaic of contiguous coral reefs, marine and estuarine soft substrate habitats (e.g., tidal sand flats and mud flats), sea-grass, oyster reefs, mangroves, offshore hard-bottom and nearshore hard-bottom, including worm reef.

A number of stressors affect coral reefs and other fisheries habitats in southeast Florida. The degradation of habitat and loss of ecosystem functions, such as primary production, trophic linkages, and habitat complexity can result from synergistic and cumulative effects of natural and human stressors on a system. The discharge of wastewater, stormwater from urban development, and agriculture—along with the increase of populations in critical areas—have contributed to the degradation of the water quality and fisheries habitats of the southeast Florida ecosystem. These discharges carry excess nutrients, suspended and dissolved organic matter, and other pollutants to the estuaries, which in turn affect the water quality, flora, and fauna in the estuaries and adjacent coastal waters.

Recreation and tourism are two of Florida’s most important industries. Much of Florida’s recreation and tourism is associated with reef-related activities such as fishing, diving, and boating, as well as industries supporting these activities. Results from two studies of economic activity associated with natural and artificial reefs in Florida indicated that reef-related recreation and tourism supported more than 36,000 jobs, and that a total of \$2.3 billion in sales and \$1.1 billion in income were generated annually from reef-related expenditures. These findings clearly demonstrate that conservation and sustainable

use of coral reef and fisheries resources are very important to Florida's economy.

Benefits of managing wastewater could therefore be attributed to the total value of the tourism industry or the value of travel costs and expenditures. Environmental damage has a cumulative impact and ultimately reduces the attraction of a destination based on natural resources. Some level of tourism could continue after major damage, and impacts have become obvious; however, it is reasonable to predict significant reduction in the overall industry without proper environmental management practices.

The direct economic value of the tourism industry in the region is clearly a function of its natural resources; whereas a travel cost and expenditure model in theory reflects how users value a destination based on what they spend to get there and personal expenditures while they are there. The non-market contingent valuation method has been used to elicit a response to what someone might be willing to pay in order to preserve something, particularly environmental resources. Studies of water rights and non-commercial fish have resulted in household values in the range of \$160-\$200 to protect natural resources. In other words, households responded that they would be willing to pay \$160-\$200 to protect the identified natural resource (see Table 5.1).



Table 5.1. Economics Costs and Benefits

Economic Costs	Low (\$, mil)	High (\$, mil)
IWRF Relocation	\$130	\$150
Economic Benefits		
Industry Loss	\$190	240
Travel Cost and Expenditures	300	371
Household Contingent Value ¹	18	23
Economic Impact of Redevelopment	<u>60</u>	<u>72</u>
Total	\$568	\$706
Net Cost-Benefit	\$438	\$556
Benefit to Cost Ratio	4:1	5:1

Note: (1) Conservatively applied to only the number of households in St. Lucie County. Because the Indian River Lagoon impacts the quality of a region-wide tourism industry, this measure could reasonably be applied to a regional household count.

Economic Impacts

Economic impact analysis attempts to calculate how a particular event affects the economy or economic growth of a specific geography. This type of analysis commonly measures positive and negative impacts in terms of output, employment, and income. For example, a project might add to a region or country's level of output, creating new employment and household income. As the new, incremental household income is spent in the region or country, additional demand is created for goods and services, generating further increases in output, employment, and income. This dynamic continues for several cycles, diminishing each time until no further indirect impact can be measured. The initial change is, therefore, the direct impact and the sum of changes resulting from the cycles of re-spending representing the indirect impacts.

The goal of economic impact analysis is to estimate the relative significance of changes in economic activity caused by a specific project or event. Generally, large positive economic impacts are often considered “good”, particularly for regions in need of jobs and income. A common error with economic impact analysis is confusing estimated impacts (positive or negative) with benefits to individuals or groups. Economic impact analyses determine the likely stock and flow of economic activity in a region or country; thus economic impact analysis measures benefits to the economy, not the benefits to individuals and groups.

Economic benefits are typically defined as the value of a new business’ or development’s economic output, expressed in terms of sales or production capacity, value added or other like economic or commercial activity, and total employment generated. The common measures of benefit are simply economic output (final sales), jobs, and wages. The measures of economic benefit from an economic analysis are generally the basis for the creation of new public tax revenues and fees.

Economic benefits can be classified as direct, indirect, or induced:

- Direct benefits relate to revenues generated or expenditures made in the local economy during the years of construction and operation of a proposed project. For example, from an economic context, direct construction expenditures relate to the spending required to complete the development of a project. After development is complete, sales generated by one or many companies occupying the commercial space reflect direct permanent, on-going economic benefits from operations.
- Indirect and induced benefits are those stimulated by subsequent or secondary rounds of expenditures, such as employees

and/or other businesses that have some link to the operations or other partners, and any parties subsequently involved as users, tenants, or owners. For example, the largest impact of these secondary effects includes employment and output that is created when employees of the primary activity spend annual wages as household consumption expenditures.

The economic benefits derived in this report have been prepared using commercially available software, Impact Analysis for Planning (“IMPLAN”). IMPLAN is a common input-output model often used to track the impacts of major capital spending and business-operating activities. These kinds of generalized models incorporate multipliers adapted from extensive archives of national economic accounts specific to a state, region, or county. Consequently, the output is explained in terms of both direct and total economic impact of these activities. Calculating economic benefits utilizing this type of input-output model is generally accepted as the industry standard, and results will be consistent among different input-output models or between different professionals.

Total Recurring Operation Impacts

The redevelopment of the IWRf site, at final build-out, is expected to produce demand for nearly 593 total annual, permanent jobs within the region from on-going operations. Roughly 220 of these jobs will be directly associated with the activities on the site, supporting the operation and maintenance of the residential units, along with retail and restaurant spending generated in the commercial uses. The other 373 jobs result from indirect and induced effects from direct operations and household disposable income.

The table on the following page (Table 5.2) presents the estimated recurring (on-going) economic impact within the region.

Table 5.2. Economic Impact Summary (2020 Dollars) – On-going Impacts

Economic Measures	Direct	Indirect-Induced	Total Impact
Employment	220	373	593
Earnings (000s)	\$6,097	\$13,243	\$19,340
Output (000s)	\$14,911	\$49,345	\$64,256
Wages / Employee	\$27,714	\$35,552	\$32,641
GDP to Wage Ratio	2.4	3.7	3.3

Source: IMPLAN; GAI Consultants

These kinds of recurring annual economic impacts are essential to achieving other local tax revenues. The levels of annual economic output (e.g., sales, business revenues) and annual wages directly support the predominate forms of tax revenues used to fund City services.

The total job count from on-going operations is associated with more than \$64 million in annual economic output and \$32 million in total annual earnings. Direct job impacts associated with the redevelopment total nearly \$15 million in annual economic output and \$28 million in annual earnings.

Direct, Indirect, and Induced Operating Job Impacts

The subsequent rounds of spending that create indirect and induced employment impacts are those most likely to benefit the neighboring areas adjacent to the site. While these employment impacts can occur anywhere within the region, the direct activity stimulated by the redevelopment is likely a main attraction for these support and affiliated jobs. The Indirect and Induced employment impacts created from the direct development of the redevelopment represents a mix of professional and service-related jobs, clearly providing adjacent neighboring area with more and enhanced employment opportunity than would otherwise exist. The table on the following page (Table 5.3) estimates the top employment sectors created at build-out of the Project resulting from the direct effects of on-going operations.



Table 5.3. Employment Sector Impacts

Industry Sector	Jobs
509 - Full-service restaurants	138.1
411 - Retail - General merchandise stores	94.2
476 - Services to buildings	28.8
447 - Other real estate	21.0
510 - Limited-service restaurants	18.2
483 - Office of physicians	14.0
490 - Hospitals	13.8
488 - Home health care services	12.2
406 - Retail - Food and beverage stores	11.6
422 - Warehousing and storage	8.7
442 - Other financial investment activities	8.5
512 - Automotive repair and maintenance, except car washes	7.0
517 - Personal care services	6.4
494 - Child day care services	6.4
491 - Nursing and community care facilities	6.3
417 - Truck transportation	5.7
485 - Offices of other health practitioners	5.6
511 - All other food and drinking places	5.4
472 - Employment services	5.4
493 - Individual and family services	5.3

Total Construction Impacts

During all construction phases over a 2- or 4-year period, an estimated 4,000 total jobs are expected to be created within the region, with 2,932 of these directly associated with the redevelopment of the IWRF and Causeway Cove sites. The total job count for new development of the entire site is associated with almost \$430 million in total output, with more than \$168 million in earnings connected to the redevelopment.

The following table (Table 5.4) illustrates the estimated nonrecurring (one-time) economic impact captured within the region from the proposed construction activities.

Table 5.4. Economic Impact Summary (2020 Dollars) – One-Time Impacts

Economic Measures	Direct	Indirect-Induced	Total Impact
Employment	2,932	1,066	3,998
Earnings (000s)	\$129,544	\$38,517	\$168,061
Output (000s)	\$292,000	\$138,210	\$430,210
Wages / Employee	\$44,176	\$36,139	\$42,036
GDP to Wage Ratio	2.3	3.6	2.6

Source: IMPLAN; GAI Consultants

While these impacts occur only during the construction and development of the Project, they are nonetheless critical to maintaining a flow of demand for construction-related employment within the region and establishing a base of skilled labor that provides for future opportunities.

Direct, Indirect, and Induced One-Time Impacts

Construction spending will also provide a catalyst for Indirect and Induced employment impacts in the form of a mix of professional and service-related jobs. The following table (see Table 5.5) estimates the top employment sectors created at build-out of the Project from the Direct effects of one-time construction.

Table 5.5. Top 20 Employment Sector Impacts

Industry Sector	Jobs
58 - Construction of new multifamily residential structures	2,285.0
457 - Architectural, engineering, and related services	364.0
55 - Construction of new commercial structures, including farm structures	299.9
405 - Retail - Building material and garden equipment and supplies stores	94.1
447 - Other real estate	67.5
509 - Full-service restaurants	43.1
472 - Employment services	41.2
417 - Truck transportation	34.4
510 - Limited-service restaurants	33.3
476 - Services to buildings	25.9
490 - Hospitals	23.6
411 - Retail - General merchandise stores	23.1
456 - Accounting, tax preparation, bookkeeping, and payroll services	22.4
483 - Offices of physicians	22.2
468 - Marketing research and all other miscellaneous professional, scientific, and technical services	21.1
462 - Management consulting services	20.2
406 - Retail - Food and beverage stores	19.4
477 - Landscape and horticultural services	19.3
488 - Home health care services	18.6
442 - Other financial investment activities	15.8

Similar to on-going economic impacts, the Indirect and Induced employment impacts created from the construction of the Project represents a mix of professional and service-related jobs, clearly providing adjacent neighboring area with more and enhanced employment opportunity than would otherwise exist.

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FORT PIERCE CAUSEWAY WATERFRONT PLAN



Proposal by Redtail DG

FORT PIERCE CAUSEWAY WATERFRONT PLAN

EXISTING STATE AND SCOPE OF WORK

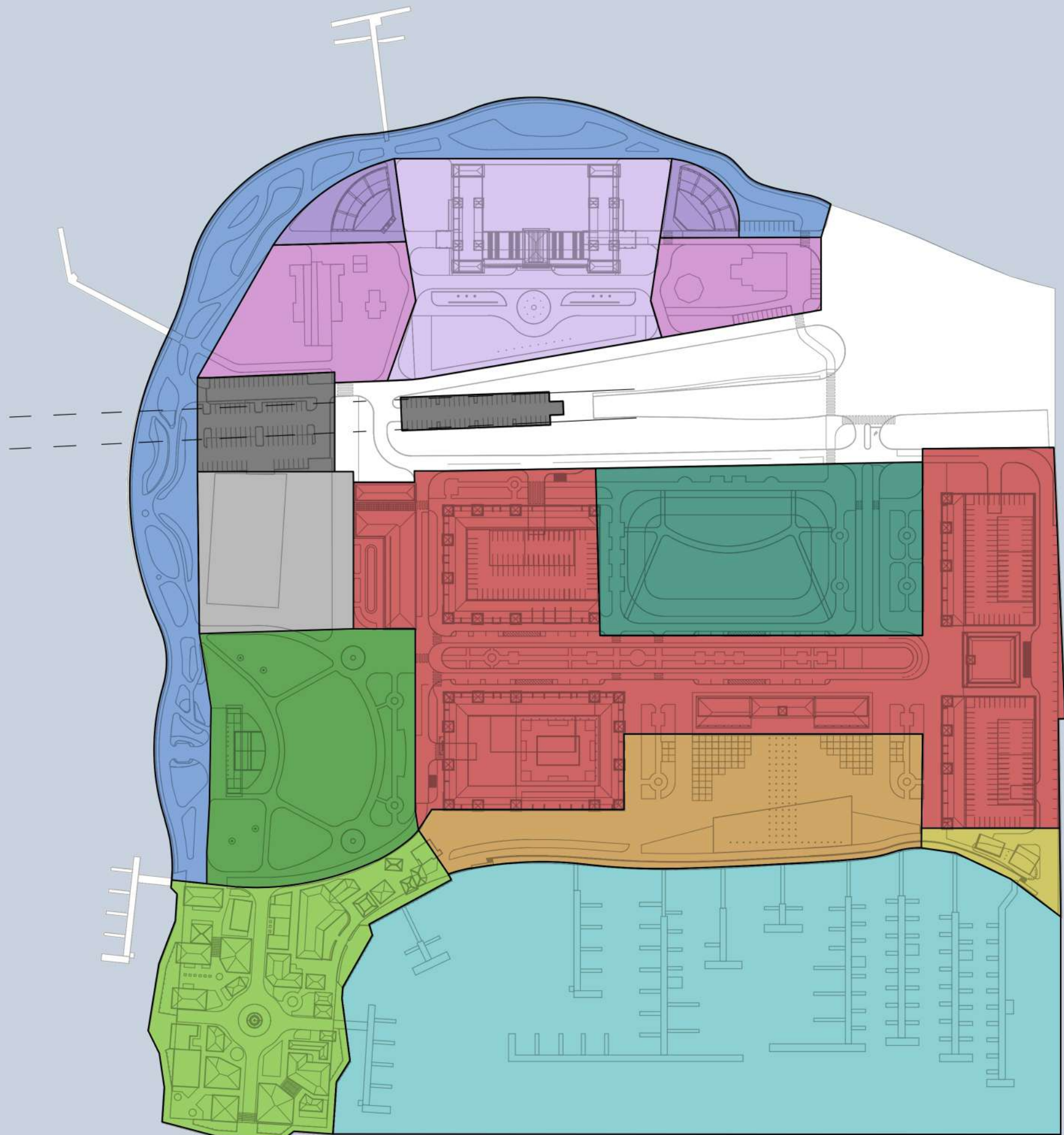
Project site area currently consists of a total of three lots owned by St. Lucie County, Fort Pierce Utility Authority and a private land owner. Seaway Drive separates the existing museum row (5) from the Causeway Cove Marina (former mobile home park) and FPUA's existing wastewater treatment plant and electrical substation. Seaway Drive's bridge is a significant physical barrier between the County property and the the other 2 parcels.

The scope of work includes redesigning the three parcels to create a mixed use development including festive retail, office and residential space, along with outdoor public spaces including waterfront boardwalks, an amphitheater, an open plaza with flush mounted boardwalk uprights and a zero depth reflection pool. The designs include incorporating elements of the City's history with a working fishing village and tying in landscape areas emblematic of A.E. Bachus' paintings.

Areas that shall remain intact include FPUA's electrical substation, the newly rebuilt marina and the County's museums.

FORT PIERCE CAUSEWAY WATERFRONT PLAN

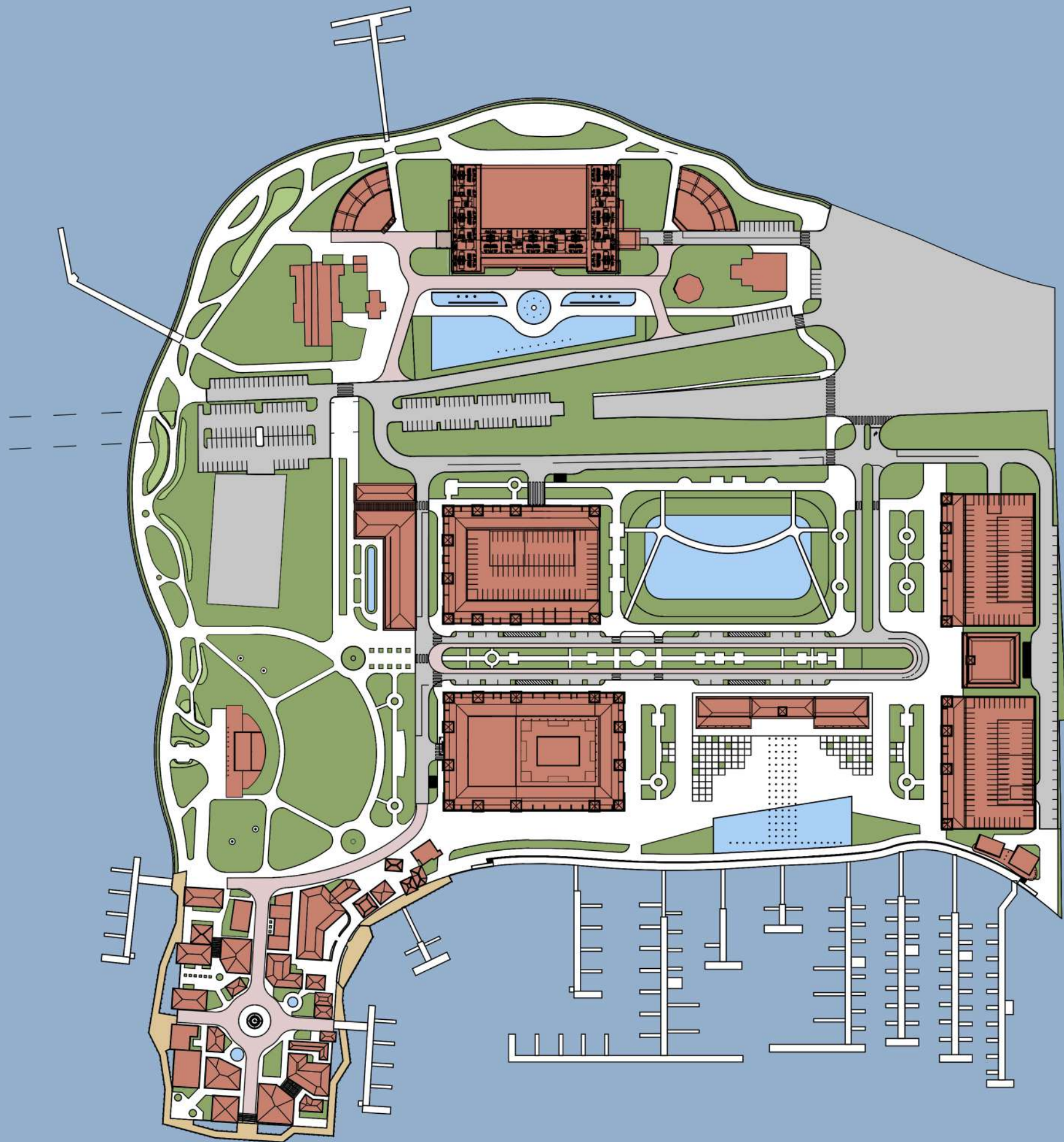
PROPOSED LAND USE



- RETAIL AND RESIDENTIAL - 536.000 sq. ft.
- WATERFRONT OPEN SPACE - 168.000 sq. ft.
- MARINA - OFFICES - 21.000 sq. ft.
- FISHING VILLAGE - 168.000 sq. ft.
- AMPHITHEATER - 172.000 sq. ft.
- RETENTION BASIN - 176.000 sq. ft.
- BOARDWALK - 215.000 sq. ft.
- RESTAURANTS- 40.000 sq. ft.
- MUSEUMS - 126.000 sq. ft.
- HOTEL - 176.000 sq. ft.
- SUBSTATION - 84.000 sq. ft.
- PARKING - 62.000 sq. ft.
- MARINA - DOCKS

FORT PIERCE CAUSEWAY WATERFRONT PLAN

PROPOSED SITE PLAN



-  ROADWAY
-  MIXED USE - Reduced traffic
-  PAVEMENT
-  BOARDWALK adjacent to village area
-  LANDSCAPING
-  WATER FEATURES
-  OBJECTS

FORT PIERCE CAUSEWAY WATERFRONT PLAN RETAIL AND RESIDENTIAL

Core retail area consists of 6 buildings that provide balanced and historic views connected with elegant boulevards and wide pedestrian walkways.

1 - (G+1) Terminal office building that includes key architectural style in a 17,000 sq. ft. office space. Facade has arcades and includes a clock tower. Strong visual focus looking towards a specimen Royal Poinciana tree in honor of A.E. Backus.

2a and 2b - (G+2) Mixed use building with retail on the ground level and residential space on the upper floors. Also includes parking lots. Each building has 270 parking spaces, 20,000 sq. ft. of residential space and 7,000 sq. ft. of retail space. Facade has arcade and architecture similar to the Renaissance building.

3 - (G) Low rise public use building that has public bathrooms, a cafe, an art gallery and small retail shops or restaurants in an area of 10,500 sq. ft. The open plaza area will allow for outdoor seating and open air events. This is a strong public use area tying in scenic views of the marina.

4 - (G+4) Mixed use building with 120,000 sq.ft. of residential space, 30,000 sq. ft. of retail space, internal parking with 270 parking spaces, a pool area and 6,000 sq. ft. gym. This will be the tallest building in the grouping with higher floors on the west side.

5 - (G+2) Mixed use building with 60,000 sq. ft. of residential space, 24,000 sq. ft. of retail space and 270 parking spaces.

6 - (G) Retail building with 15 000 sq. ft. of retail space, with water feature, arcade and trellis between the objects.

7- Greenway that offers relaxation and rest, with rows of palm and other trees, gazebos, small water features and benches. It is visually enclosed on each end by specimen Royal Poinciana trees.



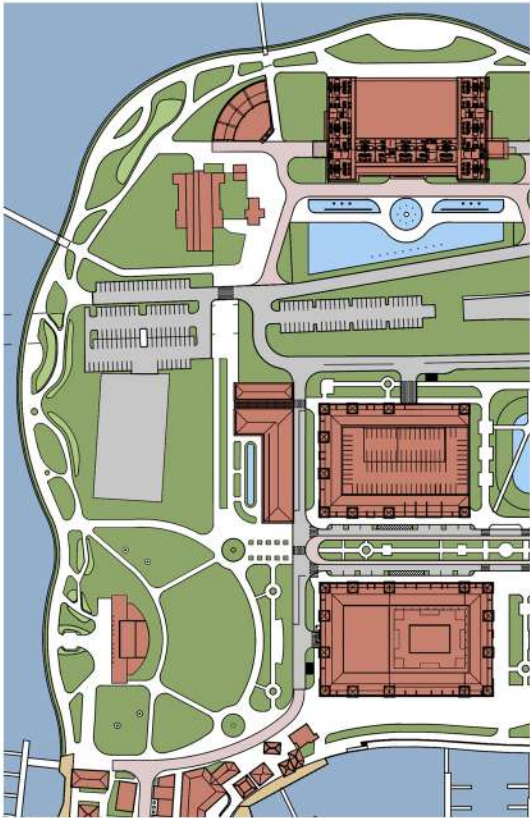
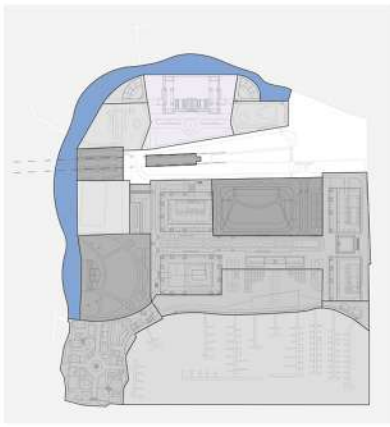
MOOD BOARD - INSPIRATION



Mixed use buildings

Greenway

Terminal office building



site plan



FORT PIERCE CAUSEWAY WATERFRONT PLAN

BOARDWALK

Water and water views are an important part of Fort Pierce. The Boardwalk wraps the wateredge of the entire Causeway development. The boardwalk includes many "pullout" areas for viewing, sitting, relaxing, biking and other passive activities.

The Boardwalk includes a 3 ft. wide raised sea wall next to the water's edge, similar to what has been developed near the inlet or downtown Fort Pierce. The use of decorative palm trees along the 20 ft. wide Boardwalk creates a coastal rhythm that adds to this being a desired destination.

Since the electric substation needs to remain (2), the use of thick vegetation and landscaping will help hide the utility, without disrupting its purpose. The Boardwalk includes narrow connecting pathways around areas like the substation, with benches, resting or exercise areas and some important shade.

Open usable space under the bridge is ideal for open surface lot parking. The Boardwalk connects people from the parking lot and other areas to the existing museum row. There is also a children's playground just off the Boardwalk adjacent to the History museum (3).

MOOD BOARD - INSPIRATION



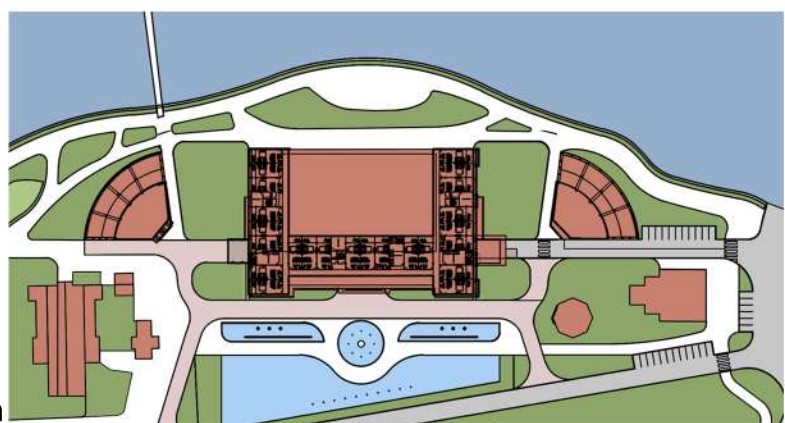
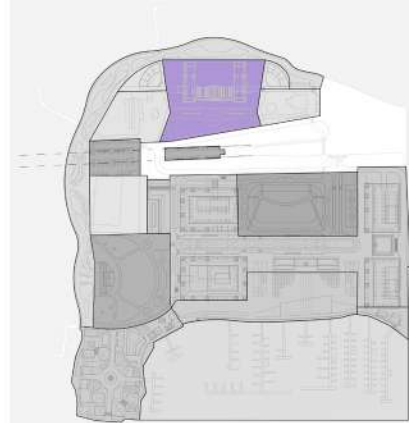
Benches and shading



Planters



Boardwalk



FORT PIERCE CAUSEWAY WATERFRONT PLAN HOTEL

The Hotel is positioned on the North side of Muesum Pointe Park, where some of the best views are located. It sits on the inlet and allows for Boardwalk connectivity to the adjacent Fort Pierce Beach, the museums, the Fishing Village, Marina and other Causeway elements.

The destination hotel includes an infinity pool (1) overlooking the inlet waterway and the hotel includes an internal parking garage with 250 parking spaces, offices, meeting rooms and 114 rooms for guests. Almost all of the Hotel rooms should include a waterfront view.

The front of the hotel faces south where hotel guests begin their experience with check-in and valet parking (2) off of a brick paver roadway that includes access to two destination style waterfront restaurants (6 and 7). The paver roadway allows for valet style restaurant drop offs and includes limited parking. The roadway also allows for service delivery trucks. The hotel parking garage is accessed on the east side (3) and the exit is on the west side.

In front of the hotel there is a large reflection pool (2) with synchronized fountains and flag poles (4) and a stormwater retention basins (5 and 9). The Museums remain with one gazebo (8), The limited adjacent parking should be for disabled visitors, with the majority of the parking found in the hotel or under the Causeway bridge surface lots.



MOOD BOARD - INSPIRATION



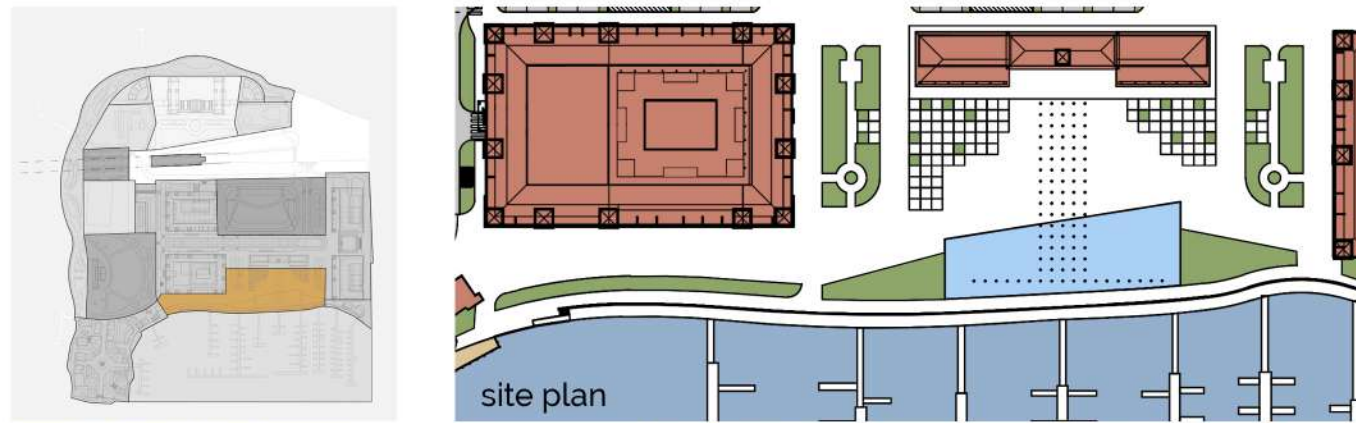
Hotel pool

Facade

Pathway along retention basin



FORT PIERCE CAUSEWAY WATERFRONT PLAN WATERFRONT - OPEN SPACE



Open space waterfront plaza connects festive retail area and marina, and is intended to be a place where visitors and residents can relax and enjoy the view of the waterfront and marina.

There are cafe's, galleries, restaurants, shops and a large outdoor table seating areas (1) that lead into two symmetrical landscape area (2a and 2b) that have seating translucent cubes lit from below and placed onto a square grid shaping the central area.

In the middle, there is a row of flush mount led lights built into the walk surface (3) that lead into a zero depth shallow pool that also includes underwater uplights that ends with a row of fountains, landscaping and flags (USA, FL and Fort Pierce) (4)

Waterfront boardwalk (5) connects to the dock master's building on the east and the fishing village on the west.

MOOD BOARD - INSPIRATION



Waterfront Plaza

Marina

Fountain underwater uplights

WATERFRONT FORT PIERCE

FISHERMAN'S VILLAGE

Fisherman's village is an area where visitors can experience the atmosphere of old Florida port villages, with low rise buildings that include more festive retail areas with handcrafted items, paintings, souvenirs and other similar items. Total retail space is 60,000 sq ft.

In the center of the village there is a lighthouse (1) that serves as a focal point and also provides a potential for a panoramic view of the area and marina.

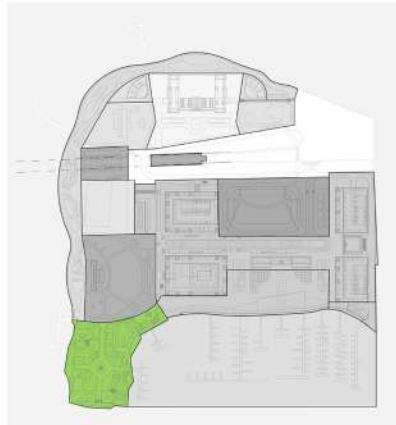
The area is setup to allow for a few larger significant restaurants including a large seafood restaurant (2) that has 9,000 sq ft. of space, not including outdoor seating areas.

There is also a working fishing component with a commercial fresh fish market (3) that is connected to a dock for commercial boat dockage.

Along the perimeter of the village there is a wooden dock that connects visitors to the water (4). The internal walkway areas are designed for fire truck access and for delivery truck during non pedestrian hours

On the edge of the village, there is an opportunity for a connecting Sea Taxi (5) that uses one smaller dock and connects this area with the Fort Pierce area.

Architecture is to be simple, a mix of colorful and artistic objects, with narrow and wide spaces, trellises and mix of metal and thatched roofs. The tiki component is stressed in this area. Also could host an overhead gateway feeling arch and a photo station next to a historic replica of sport fish or Fort Pierce historic photographed Goliath Grouper.



site plan

MOOD BOARD - INSPIRATION



Docking around the village



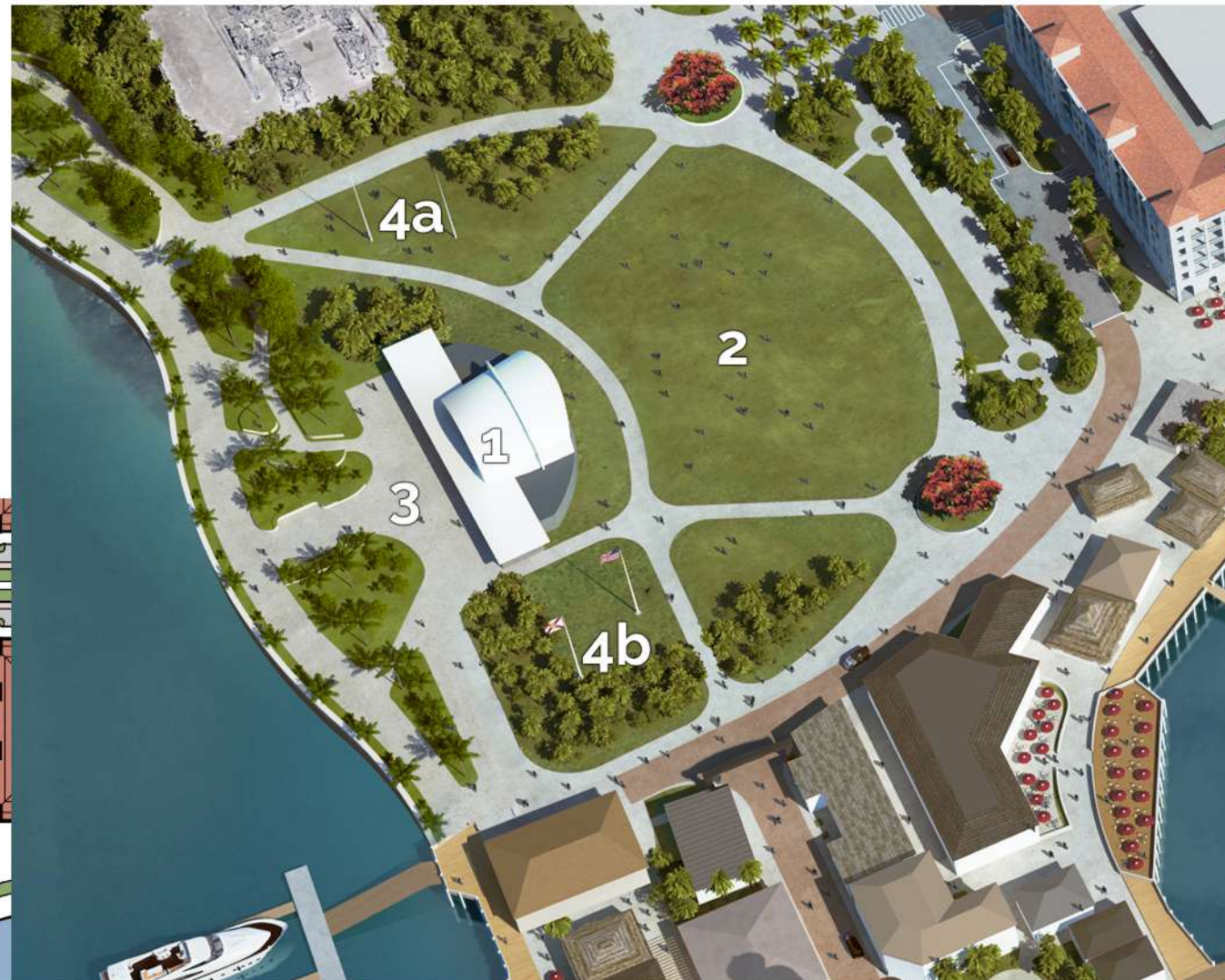
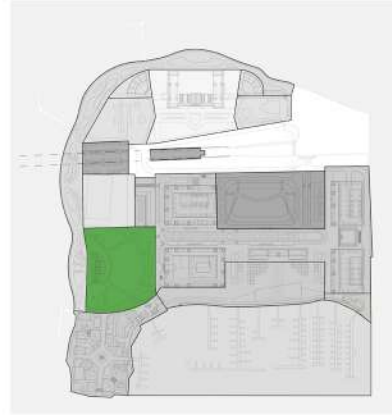
Thatched roofs



Sequence of wide and narrow spaces

FORT PIERCE CAUSEWAY WATERFRONT PLAN

AMPHITHEATER



The Amphitheater site is envisioned as an entertainment and open air gathering point for the development. The area in front is an open grassy level area meant to be used in a multipurpose manner (2).

The waterfront side is also meant to be architecturally appealing and includes an Entry area (3) designed with a multipurpose pedestrian/access road able to accommodate venue vehicles.

The access road is meant for the delivery of amphitheater equipment, supplies, maintenance, etc. and should not interfere with pedestrian traffic. The design includes turning radius' for the larger vehicles and fire department vehicles.

The waterfront side of the venue includes storage space and importantly a public restroom destination. It also could host offices and it displays a 7,500 sq. ft stage area.

Since FPUA's two large utility poles on the south side of the substation need to remain in place (4a), the amphitheater design includes two symmetrical non functioning utility poles on the opposite end of the amphitheater (4b), allowing for the placement of large flags.

The Amphitheater's positioning allows for a sunset view framed with an elegant landscaping area.

The Royal Poinciana trees on the outside edges of the Amphitheater lawn pay tribute to the City's rich tradition in art and the importance of the environment. Area artists such as A.E. Backus, many of the 20+ core Highwaymen artists such as Al Black, James Gibson, Harold Newton and local mosaic artist Anita Prentice, and others have used the environment and Royal Poinciana trees in their work.



site plan

MOOD BOARD - INSPIRATION



Daytime concerts



Night time concerts

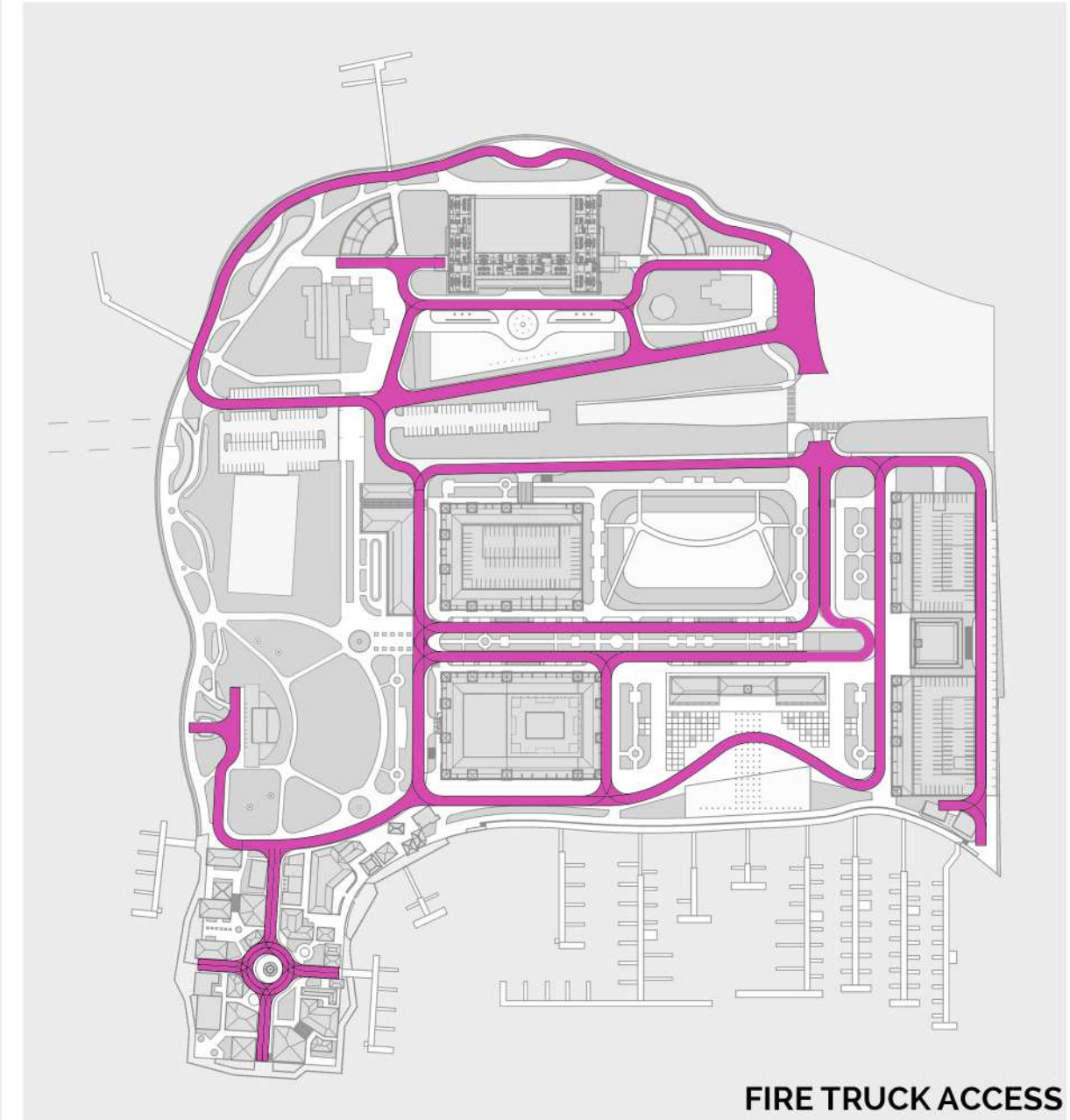
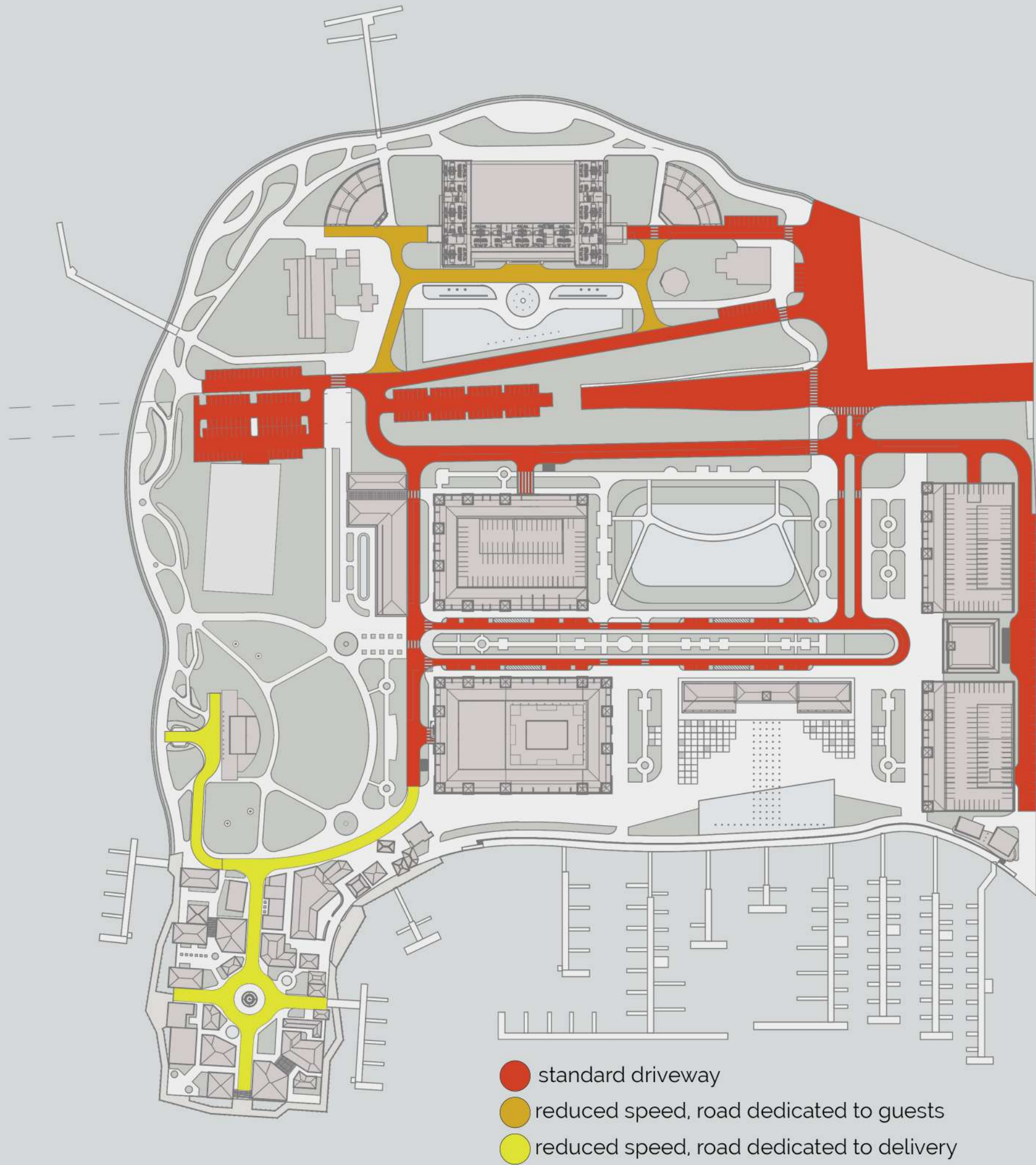


Royal Poinciana



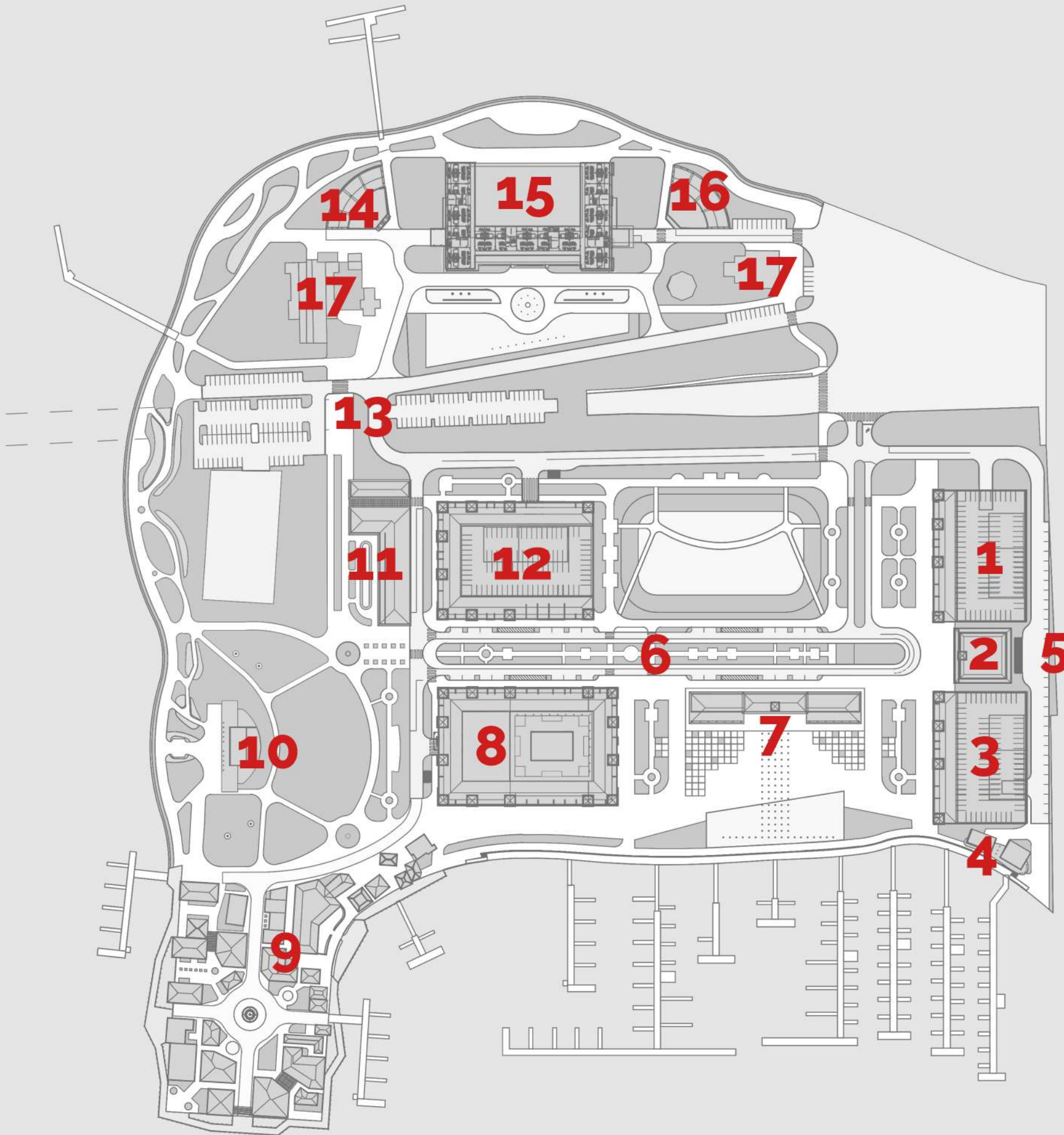
View of Fishing Village and Amphitheater area

FORT PIERCE CAUSEWAY WATERFRONT PLAN VEHICULAR TRAFFIC



FORT PIERCE CAUSEWAY WATERFRONT PLAN

PROPOSED SITE PLAN AREAS AND PARKING SPACES



	NAME	residential sq.ft.	office sq.ft.	retail sq.ft.	parking spaces
1	Mixed use building #1	20,000		7,000	270
2	Townhouse office building		17,000		
3	Mixed use building #2	20,000		7,000	270
4	Dockmaster building		3,000		
5	Service road				31
6	Greenway				26
7	Waterfront building				
8	Mixed use building #3	120,000		36,000	270
9	Fishing Village			60,000	
10	Amphitheater		7,500		
11	Retail building			15,000	
12	Mixed use building #4	60,000		24,000	270
13	Parking under bridge				149
14	Destination Restaurant			4,000	
15	Destination Hotel			3,000	250
16	Beach Restaurant			4,000	
17	Museum				29
	TOTALS	220,000	27,500	160,000	1,565

Fort Pierce Utilities Authority and St. Lucie County



Wastewater Plant Relocation Conceptual Analysis

Draft Report

May 2020



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Hazen and Sawyer
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Boca Raton, FL 33431 • 561.997.8070

May 18, 2020

Mr. Bo Hutchinson, P.E.
Director Water/Wastewater Systems
Fort Pierce Utilities Authority
206 South 6th Street
Fort Pierce, FL 34950

Mr. George Landry
Interim Director of Public Utilities
St. Lucie County
2300 Virginia Avenue
Fort Pierce, FL 34982

Subject: Wastewater Plant Relocation Conceptual Analysis (Draft)

Dear Mr. Hutchinson and Mr. Landry:

The Fort Pierce Utilities Authority (“FPUA”) and St. Lucie County (“County”) requested that Raftelis and its sub-consultant, Hazen and Sawyer (“Hazen”) (the “Project Team”), provide professional services to prepare a Wastewater Plant Relocation Conceptual Analysis to construct a Mainland Water Reclamation Facility (“MWRF”) and remove from service the FPUA Island Water Reclamation Facility (“IWRF”) and affected County plants for joint use by FPUA and the County (the “Parties”). It is our understanding that the main objectives for the effective relocation of the IWRF to the mainland is to: i) regionalize wastewater treatment and disposal service on behalf of the Parties and its customers; ii) essentially provide an upgrade to the wastewater facilities since many components of the facilities are in need of replacement or expansion for growth; iii) promote economies of scale in the cost of providing service; and iv) provide capacity for economic growth in the region. The analysis as discussed in the report is considered as a conceptual or desktop review based on available information and meetings with the Parties and does not reflect a Master Planning level analysis which will be necessary based on the needs and directives of the Parties.

The Project Team has reviewed existing reports and condition assessments of existing facilities, geographic information systems (GIS), existing facility permits (including deep injection wells), Capacity Analysis Reports and Monthly Operating Reports as submitted to the Florida Department of Environmental Protection (FDEP), and other information available from the Parties. Technical review meetings were held with the Parties to discuss the Project Team’s understanding of the project requirements. Specifically, the meetings included discussions about the following tasks:

- Discuss approach to the availability and use of existing wastewater collection lines and lift stations, and the possible rerouting of the lines to the potential MWRF locations.

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- Discuss condition of existing facilities for each party.
- Discuss approach to identifying existing and the determination of future flow projections and wastewater capacity characteristics.
- Review current regulations and future/pending regulations.
- Discuss Design Criteria for each potential site.

During the technical review meetings, the Parties agreed on certain planning criteria, including but not limited to, transmission routes within the existing systems, methods of estimating future wastewater plant flows and customer demands, plant design options related to the facility costs and efficiencies, and the overall planning horizon to estimate the plant capacity at construction (through 2035).

Preliminary results of the conceptual analysis were provided to the Parties on March 9, 2020 with an emphasis on the proposed plant capacity and conceptual capital costs by location, including the costs to reroute the Parties' collection system based on each prospective plant site. Based on a review of the design criteria and updated construction costs, the proposed amounts have been updated. In addition, an analysis has been performed to estimate the additional decommissioning costs of existing facilities that will not remain in service after construction of the MWRF and to develop an initial projection of the annual operating expenses of the proposed MWRF. Please see the attached engineering report prepared by Hazen.

In preparing the conceptual analysis, the Parties agreed to certain basic assumptions regarding the proposed study. The following is a list of the major assumptions used to develop the scope of services:

- The Parties wish to evaluate options to relocate the wastewater treatment function by removing the IWRf from service and constructing a mainland wastewater treatment facility.
 - The Project Team was not tasked with evaluating the financial feasibility of maintaining the IWRf and/or the County's existing mainland wastewater treatment facilities.
 - The Project Team was also not tasked with evaluating the estimated utility rate impacts, if any, to each individual party based on the operating and/or capital costs of any option.
- The Project Team evaluated two (2) locations for the MWRf.
- The governance and administrative costs of the proposed regional system was assumed to be the same under any wastewater plant location option and have not been included in the evaluation.
- Effluent disposal is assumed to be by deep injection well and any reclaimed water conveyance costs in addition to the plant site options were assumed to be the responsibility of and funded by each respective Party for their own specific water resource benefit; no potential reclaimed water costs or associated revenues were assumed in the conceptual analysis.

- Future population projections and wastewater flows were based on available reports and documentation provided by the Parties.
- Condition assessments based on existing reports provided by the Parties and were limited to those facilities that will be impacted by the construction of the MWRP. Facilities that will not contribute wastewater flow to the MWRP or not have flow redirected to it was not included in the condition assessment.
- Other than the decommissioning costs of the IWRP, no other analysis of the IWRP site was conducted. Specifically, this study did not include an evaluation of the property rights, the property value, or whether proceeds from the potential sale of the property would be available to off-set any potential costs of moving the IWRP.

The following section provides a summary discussion of the projected costs of the proposed MWRP including initial capital costs of new facilities, decommissioning costs of existing facilities, and projected annual operating expenses under combined operations.

Summary of MWRP Conceptual Costs

Summary of Projected Capital Costs of New Facilities (Millions) ^[1]		
Description	North County (Taylor Dairy Road)	South County / FPUA (Treasure Coast Energy Center)
MWRP Construction Costs ^[2]	\$119.440	\$104.620
Collection System / Routing	<u>26.510</u>	<u>22.746</u>
Sub-total Capital Costs of Proposed New Facilities	\$145.950	\$127.366
Decommission IWRP Site	\$2.382	\$2.382
Decommission 3 SLC Plants	<u>1.733</u>	<u>1.733</u>
Sub-total Decommission Costs	\$4.115	\$4.115
Total Capital Costs of Proposed New Facilities	\$150.065	\$131.481
<p>[1] Amounts reflect estimated costs (in today's dollars) as derived from Tables 7-1 and 7-2 of the Hazen report, which is attached for your consideration. The amounts are based on information provided by the Parties and the assumptions as documented in the report, which should be read in its entirety.</p> <p>[2] The MWRP facility design and costs are identical for both locations except that the North County site requires an additional deep injection well for redundancy whereas the South County site already has an existing deep injection well that is available for effluent disposal from the MWRP.</p>		

As discussed in Hazen's report, future population forecasts were used to estimate the wastewater demands to size the amount of capacity to be constructed at the MWRP. When evaluating the future development data and reports made available by the Parties, no specific service area within either Party's service territory was identified for specific development. As such, the future rate of growth is assumed to be service area-wide for both Parties.

As shown on the previous page, utilizing the FPUA location at the Treasure Coast Energy Center is projected to have a total capital cost of \$131.481 million or approximately \$18.5 million less when compared to the Taylor Dairy Road location. The lower cost is primarily attributed to: i) the availability of having existing deep injection wells at the FPUA site for effluent disposal that would have to be duplicated if the County site is chosen, and ii) overall lower rerouting costs of the collection systems. Based on information provided by Hazen, several key assertions and assumptions were made to develop the capital cost estimates:

- The initial plant sizing was estimated to support annual average flows of 8.0 MGD and peak hourly flows of 20.0 MGD based on projected flows and loadings in Year 2035.
- It is assumed that the build-out capacity of the MWRf will be for an annual average flow 10.0 MGD; future facilities are shown on the conceptual facility site plan.
- The development of the conceptual costs were based on: i) applying historical cost of similar facilities available to Hazen, including regional bid tabulations and estimated additional ancillary cost from RS Means Cost Works, and ii) the design and sizing criteria of the MWRf. The proposed MWRf costs are identical except for the savings realized by existing deep injection well infrastructure at the FPUA Energy Center site.
- Amounts shown above are based on FPUA's existing South Hutchinson Island flows being redirected to the MWRf regardless of the site chosen.

To provide the Parties additional information regarding the operation of the proposed MWRf, an operating cost analysis was prepared as shown in Section 8 of the Hazen report. The analysis began with identifying recent actual operating expenses for the combined IWRf and SLC facilities, which totaled approximately \$2.86 million for Fiscal Year 2018. Hazen developed a projection of the direct facility operating expenses through Fiscal Year 2025 based on the projected wastewater treatment flows in order to provide a comparison to the projected MWRf expenses. Fiscal Year 2025 was selected since it is the first full year the proposed MWRf is assumed to be in service and operational. The following table provides a comparison of the existing and projected operating expenses of the current and proposed facilities based on projected wastewater demands for Fiscal Year 2025:

-Remainder of this page intentionally left blank-

Comparison of Projected Operating Expenses – FY 2025 [1]		
Description	Combined IWRF & SLC Facilities	Proposed WRF
Labor	\$1,454,650	\$1,247,688
Power	641,294	612,105
Chemicals	121,179	235,653
Sludge	622,791	592,648
Repairs & Maintenance	183,803	90,754
Administrative / Other	123,223	101,422
Total Annual Cost	\$3,146,940	\$2,880,271
MGD - AADF	5.59	5.59
Projected Flows MGY	2,040	2,040
Cost, \$ / MG Treated	\$1,542	\$1,412

[1] Amounts reflect estimated costs (in today's dollars) to treat future estimated 2025 wastewater flows of 5.59 MGD (AADF) as derived from Table 8-3 of the Hazen report, which should be read in its entirety.

MG – Million Gallons
 MGD - Million Gallons per Day
 MGY - Million Gallons per Year
 AADF - Annual Average Daily Flow

As shown above, the proposed MWRF is projected to have a lower annual cost of \$2.88 million when compared to the projected operating expenses of the combined existing facilities, or approximately 8% less. Section 8 of the attached report provides a detail discussion about the development of the estimated operating expenses, which are summarized in today's dollars and were not adjusted for inflation. The amounts shown above are based on the projected treatment demands by Fiscal Year 2025, which are estimated to be approximately 2,040 million gallons per year, or 5.59 MGD (AADF). Fiscal Year 2025 was selected for the analysis since it represents the first full year the MWRF is proposed to be in service. For the purposes of estimating labor costs, existing staffing levels at the IWRF were assumed to be adequate to operate the proposed facility.

To provide the Parties additional information related to operating expenses, Hazen developed a comparison of operating costs for similarly sized facilities. Please refer to Section 8 of the report for a detailed review of the cost analysis. The following summarizes Hazen's observations based on a comparison of the projected unit costs to the survey results:

- IWRF power costs (\$/MG treated) are within the range of unit power costs.
- IWRF labor costs are at the high end of unit labor costs.
- IWRF repairs and maintenance expenses and facility renewal and replacement costs are at the low end of the unit costs. Benchmarking data from the American Water Works Association (AWWA) indicates that the average utility investment in capital renewal and replacement is approximately 1.5% per year of the gross asset value of the plant. Based on discussions with the Parties, only critical repairs and

maintenance are being conducted at the existing facilities since the future operation of the plants is unknown.

- IWRf chemical costs are significantly lower than unit chemical costs for the surveyed utilities; this may be attributed to the fact that IWRf disposes effluent to deep injection wells that require lower chlorine dosages than for facilities treating to high-level disinfection standards for reclaimed water distribution.
- IWRf unit costs for administration, sludge disposal and other categories are within the range of costs when compared to the surveyed utilities.

The projected costs recognized the observations and the estimated operating expenses considered the results of the cost comparison survey. The study results associated with the proposed construction of the MWRf (relocation of the IWRf) were based on discussions with and information provided by the Parties, as well as certain assumptions and analyses made by the consulting engineers. This report includes a summary of estimates and opinions regarding the flow and capacity demands, the proposed wastewater transmission, treatment and effluent disposal facilities to be constructed, and the estimated direct cost of operation of the wastewater treatment plant regarding the proposed project, and the report should be read in its entirety.

Additional Study Tasks

The project scope of services negotiated between the Parties envisioned the need to develop a financial forecast of the projected expenditure requirements over the life of the new assets (not to exceed forty years). Specifically, this task provided for the evaluation of the estimated direct lifecycle operating and capital costs for the conceptual MWRf sites. Based on the best planning information available, Raftelis recommends developing a financial evaluation of one or both of the two planning scenarios that includes the relocation construction costs of the IWRf to the mainland and any operating cost increases or reductions as a result of the relocation of facilities. While a portion of capital costs may be funded from future capital improvement charges or impact fees and revenue bonds, a financial forecast could also consider other funding sources as may identified by the Parties. As of the date of this report, certain key assumptions about the proposed operation of the facilities and projected new development are not known, and long-term projections of the existing facilities' needs for comparison purposes are not available. Raftelis will meet with the Parties to discuss and develop study parameters that may allow for the reasonable estimation of operating results over time that is consistent with current phase of planning. When completed at the convenience of the Parties, this task will be submitted as a separate report.


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The scope of services for this study were limited to a desktop review and development of a conceptual analysis based on the available planning data from the Parties, and did not include Master Planning level analysis, such as, hydraulic modeling, examination of property and/or right of way acquisition, or the physical assessment of any existing infrastructure or assets. As such, the Parties should consider a more detailed Master Planning study if future phases of the proposed project are approved.

We appreciate the support and effort provided by the Parties in completion of this study.

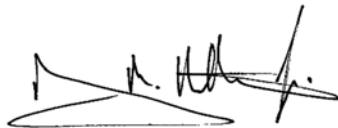
Sincerely,

RAFTELIS FINANCIAL CONSULTANTS, INC.



Robert J. Ori

Executive Vice President



Murray M. Hamilton, Jr.

Senior Manager

Attachments

Wastewater Plant Relocation Conceptual Analysis – Draft May 2020

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Fort Pierce Utilities Authority and St. Lucie County

Wastewater Plant Relocation Conceptual Analysis

Draft Report
May 2020

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1. Introduction

The scope of this study is to perform a conceptual analysis to determine the feasibility of building a Mainland Water Reclamation Facility (MWRF) that could be a joint use facility between the project participants. The scope of the analysis is a desktop review based on available data provided by the project participants and does not include Master Planning level analysis such as hydraulic modeling, property and/or rights of ways acquisition, age of existing infrastructure, criticality of existing infrastructure or any physical assessment any existing infrastructure.

1.1 Project Background

The Fort Pierce Utilities Authority (FPUA) would like to decommission their Island Water Reclamation Facility (IWRF), located on South Hutchinson Island, and build a mainland WRF. St Lucie County (SLC) has five WWTFs, one each on North and South Hutchinson Island (that will remain in service), and three smaller package plants on the mainland. SLC would like to decommission the three mainland package plants and redirect corresponding wastewater flow to the proposed MWRF. FPUA is working jointly with St. Lucie County to locate a MWRF where both utilities could utilize the new facility.

1.2 Project Participants

SLC and the FPUA executed Amendment 1 to the Bulk Service Agreement with FPUA in April 2019. This Amendment created an agreement between the entities to share the cost in conducting a conceptual analysis to determine if it would be feasible to relocate the FPUA IWRF to a mainland location that could be shared between FPUA and SLC.

1.3 Data Collection and Review

The scope of this conceptual analysis is to look at locating the MWRF at either the SLC North County Site or the FPUA Treasure Coast Energy Center. The conceptual analysis also included a possible third location for the MWRF that was not previously considered by the project participants. The third location would be based on planned future growth that would create a densely populated area which could be identified as a reasonable location to build a MRWF. Based on the review of data made available for this analysis a third location meeting the defined criteria was not found.

The following data was requested to conduct the conceptual analysis:

- GIS layers of all existing SLC and FPUA infrastructure and delineation of service areas
- Existing WRF Operating Permits including the Deep Injection wells
- Most current Capacity Analysis Reports for each facility
- Most current Operation and Maintenance Performance Reports for each facility
- Most current Wastewater Master Plans including data on all lift stations

- FPUA and St Lucie County Design Standards
- Future Land Use Plans, including population and flow projections
- Five years of WRF Monthly Operating Reports (MOR's) for the (5) county WWTFs and FPUA's MOR data for the IWRf
- Operations and CIP budgets for the FPUA and County relative to the wastewater service (including collection, transmission, treatment, and disposal)

A project kickoff meeting was conducted with the project participants to discuss data collection and to discuss the project understanding from the perspective of both participants. A subsequent technical review meeting was held to review collected data, any outstanding data collection needs, and how to proceed if the participants were unable to provide these data. The technical review meeting was also used to present preliminary findings from the provided data analysis, discuss the planned approach to the analysis, and to obtain buy-in from both participants.

1.4 Project Objectives

The objective of this project is to provide FPUA and SLC with a conceptual analysis of a MWRF that would serve the needs of both participants. This conceptual analysis provides the layout of the MWRF and associated costs of two potential sites to assist the two participants in their determination of the feasibility of relocating the IWRf to a Mainland location.

2. Existing Service Areas, Existing and Proposed Facilities

2.1 Introduction

FPUA's and SLC's GIS data was reviewed and used to develop service area maps. Service areas and existing infrastructure were then reviewed to determine how they overlap with each other and how they relate to the overall County Urban Service Area. For the purpose of this study, focus was placed on looking at growth within the County's Urban Service Area. The review included existing utility infrastructure to determine possible routing of new force mains and the re-routing of existing lift stations to direct wastewater flows to the two possible MWRF locations.

The scope of the study includes determining how to re-route existing wastewater flows from the FPUA's IWRf located on South Hutchinson Island and the three mainland St. Lucie County WRF's located in the northern county service area to the two proposed mainland facility locations. The three St. Lucie County facilities are: The Fairwinds Golf Course WRF, Holiday Pines WRF and Lakewood Park WRF. The two proposed mainland facility locations are the County's North County Site located just south of Indrio Rd along Taylor Dairy Rd, and the FPUA site located at the Treasure Coast Energy Center just east of the Florida Turnpike off Glades Cut-off Rd.

Based on a review of the existing FPUA and St. Lucie County infrastructure and coordination meetings with the Project Team, three scenarios were developed to direct wastewater from the FPUA IWRf and the three SLC mainland facilities to each of the proposed MWRF locations.

To make the scenario maps less cluttered, the FPUA lift stations that have a capacity of less than 300 gpm are not shown. Similarly, all force mains for both St Lucie County and FPUA that are 4-inches and less are not shown on the scenario maps. FPUA's existing wastewater collection system is routed to Master Lift Station "A". Flow from Master Lift Station "A" is then pumped across the intercostal waterway to the IWRf. Scenarios were developed such that repumping all FPUA's flow to the west, to the proposed north/south force main, would not be required. Selected lift stations were re-routed to eliminate and/or minimize some of the repumping that would occur if all the flow from the FPUA system was collected and sent to Master Lift Station "A". The re-routing of selected lift stations is consistent between the two mainland scenarios to eliminate or minimize cost bias in the site selection process. The selected lift stations that are shown to be re-routed to either the St Lucie County North County Site or the FPUA Treasure Coast Energy Center, would redirect approximately seven (7) MGD of pumping capacity. This repumping capacity would be eliminated from the FPUA Master Lift Station "A".

Scenario 1 is based on locating the MWRf at the St. Lucie County North County Site. Scenario 2 is based on locating the MWRf at the FPUA Treasure Coast Energy Center. Scenario 3 is based on re-routing all FPUA's South Hutchinson Island service area wastewater flow to the St. Lucie County SHI WRF. Under Scenarios 1 and 2, all the FPUA South Hutchinson Island wastewater flow is re-routed to Master Lift Station "A" and then westward to a north-south transmission main. Based on existing infrastructure and Project Team discussions, it was agreed the re-routed flow from the IWRf would flow to the west to a proposed 24-inch north/south transmission main along Jenkins Rd for which some of the 24-inch force main already exist.

To eliminate sending all FPUA mainland collection/transmission system flow to Master Lift Station "A" and then re-routing it back to the west, ten of the existing FPUA lift stations would be redirected to the north/south transmission main. Five St. Lucie County lift stations around the Treasure Coast International Airport and Business Park and the three master lift stations located at the County's three mainland facilities would also be redirected under Scenarios 1 and 2 to the MWRF.

2.2 Force Main Flow Velocity Assessment Criteria

The velocity of wastewater flowing through a force main is a key factor in assessing force main capacity. The diameter of the force main should be sized such that the velocity during pumping will be neither too low (less than two feet per second) such that deposits build-up (potentially clogging the pipeline) nor too high (greater than eight feet per second) resulting in excessive energy consumption. The force main is considered the piping outside of the lift station; piping internal to the lift station is not considered force main. **Table 2-1** presents the criteria utilized to size the conceptual force mains relative to flow velocity.

Table 2-1: Force Main Flow Velocity Assessment Criteria

Flow Velocity (fps)	Assessment
less than 2	Not Acceptable
2 to 8	Acceptable
greater than 8	Not Acceptable

For this study standard hydraulics tables were utilized for force main piping conceptual sizing. Lift stations were sized based on projected future flows utilizing the FPUA standard peaking factors. Computer modeling of the collection/transmission system is not part of this scope. Detailed hydraulic modeling of the FPUA and SLC collection/transmission systems should be done to determine if the assumptions made for redirecting flows from existing lift stations and conceptual force main sizing are adequate.

2.3 Redirected Flow Scenarios

The following explains the assumptions that were utilized in the development of the three scenarios.

Scenario 1 – Redirect Flow to SCL North County Site (see attached Scenario 1 Figure and Table 2-4, found at the end of this section)

Assumptions:

1. Install a 24-inch FM from the intersection of Jenkins Rd and Orange Ave running north to Keen Rd, west along St. Lucie Blvd to Taylor Dairy Rd and north to the SCL North County Site.
2. Install a 12-inch FM between Edwards and existing 24-inch FM at Okeechobee Rd.
3. Install a 16-inch Reuse main between both facilities following the routing of the 24-inch FM.

4. Install a 1,000 gpm master lift station at the IWRF to re-direct flow from the SHI FPUA service area to Master Lift Station "A".
5. Master Lift Station "A" will be re-routed to pump to the west to the 24-inch FM located at the intersection of Jenkins Rd and Orange Ave.
6. Ten of the existing FPUA lift stations will be re-routed to send flow to the 24-inch FM.
7. Five existing St. Lucie County lift stations (around the Treasure Coast International Airport and Business Park) will be re-routed to the 24-inch FM.
8. The master lift station at Fairwinds Golf Course WWTF will be re-routed to the MWRF located at the North County Site.
9. The master lift stations at Holiday Pines and Lakewood Park WWTF's will be re-routed to the existing 16-FM from Portofino Shores.
10. Holiday Pines, Lakewood park and Fairwinds WWTP's would all be decommissioned under this scenario.
11. A 4-inch FM will be installed from the Lakewood Park WWTF master lift station along Green Dr to the 16-inch FM from Portofino Shores to redirect flow.
12. A 4-inch FM will be installed from the Holiday Pines WWTF master lift station and connect to the existing 16-inch FM for Portofino Shores to redirect flow.
13. Road Crossings will be open cut, except for Okeechobee Rd and Glades Cutoff Rd.
14. Canal 1, Belcher Canal, Ten Mile Creek and Okeechobee Rd will be crossed via Horizontal Directional Drilling.

Scenario 2 – Redirect to Treasure Coast Energy Center MWRF (see attached Scenario 2 Figure and Table 2-5, found at the end of this section)

Assumptions

1. Install a 24-inch FM from the intersection of Jenkins Rd and Okeechobee Rd running south along Jenkins Rd to the FPUA Treasure Coast Energy Center site.
2. Install a 12-inch FM running south between West Angle Rd and the existing 24-inch FM at Orange Ave.
3. Install a 16-inch Reuse main between both facilities following the routing of the 24-inch FM.
4. Install a 1,000 gpm master lift station at the IWRF to re-direct flow from the SHI FPUA service area to Master Lift Station "A".
5. Master Lift Station "A" will be re-routed to pump to the west to the 24-inch FM located at the intersection of Jenkins Rd and Orange Ave.

6. Ten of the existing FPUA lift stations will be re-routed to send flow to the 24-inch FM.
7. Five existing St. Lucie County lift stations (around the Treasure Coast International Airport and Business Park) will be re-routed to Master Lift Station “A”.
8. The master lift station at Fairwinds Golf Course WWTF will be re-routed to Master Lift Station “A”.
9. The master lift stations at Holiday Pines and Lakewood Park WWTF’s will be re-routed to the existing 16-FM from Portofino Shores.
10. Holiday Pines, Lakewood Park and Fairwinds WWTP’s would all be decommissioned under this scenario.
11. A 4-inch FM will be installed from the Lakewood Park WWTF master lift station along Green Dr to the 16-inch FM from Portofino Shores to redirect flow.
12. A 4-inch FM will be installed from the Holiday Pines WWTF
13. Road Crossings will be open cut, except for Okeechobee Rd and Glades Cutoff Rd.
14. Canal 1, Belcher Canal, Ten Mile Creek and Okeechobee Rd will be crossed via Horizontal Directional Drilling.

Scenario 3 – Redirect FPUA Flow to SLC WRF (see attached Scenario 3 Figure and Table 2-6, found at the end of this section)

Assumptions

1. This is a standalone scenario that does not impact Scenarios 1 and 2.
2. Install an 8-inch FM from the south end of the FPUA South Hutchinson Island service area south to the SLC South Hutchinson Island WRF.
3. Install a 1,000 gpm master lift station at the south end of the FPUA South Hutchinson Island service area to re-direct flow from the FPUA SHI service area to the SLC SHIWRF.
4. At minor creek crossings the FM can be routed alongside the bridge.
5. Horizontal directional drilling will be utilized to cross the FPL power plant intake and outflow canals.

2.4 Conceptual Flow Routing and Re-routing Costs

The estimated total construction and ancillary costs for redirecting flows and installing new force mains were calculated on a per foot basis using information obtained from regional bid tabulations and estimated additional ancillary costs from RS Means CostWorks. It was assumed that PVC DR-18 pressure pipe would be installed up to 24-inches in diameter. **Tables 2-2** and **2-3** provide the unit costs utilized to estimate the conceptual level opinion of probable cost for these scenarios.

Table 2-2: Unit Cost Summary Table for Pressure Pipe

Diameter	Construction Unit Cost (\$/ft)	Total Cost (\$/ft)
PVC DR-18		
4	\$40	\$76
6	\$60	\$114
8	\$80	\$152
10	\$90	\$171
12	\$100	\$190
16	\$110	\$209
18	\$120	\$228
21	\$130	\$247
24	\$150	\$285

Table 2-3: Additional Cost Summary Table for Pressure Pipe

Final Add-On Percentages	Additional Cost Categories
10%	Project Team Internal Costs
5%	Fittings and Appurtenances (valves, Fittings etc.)
10%	Pavement and Restoration
15%	Permitting and MOT
25%	Contingency
15%	Engineering = 10% Survey = 5%; Total 15% for Engineering and Survey
10%	Construction Management and Inspection
90%	Total Extra Add-on Cost as a Percent of Construction Costs

The estimated total capital cost for Scenarios 1, 2 and 3 are \$26,510,000, \$22,746,000, and \$8,940,000, respectively. The proposed improvements are shown on **Figures 2-1, 2-2 and 2-3**, respectively. The conceptual costs are shown in the attached tables (**Tables 2-4, 2-5 and 2-6**) labeled as Scenarios 1, 2 and 3, respectively. These are conceptual Class 5 cost opinions and are consistent with Class 5 Estimate in accordance with the American Association of Cost Engineering (AACE) Recommended Practice No. 18R-97.

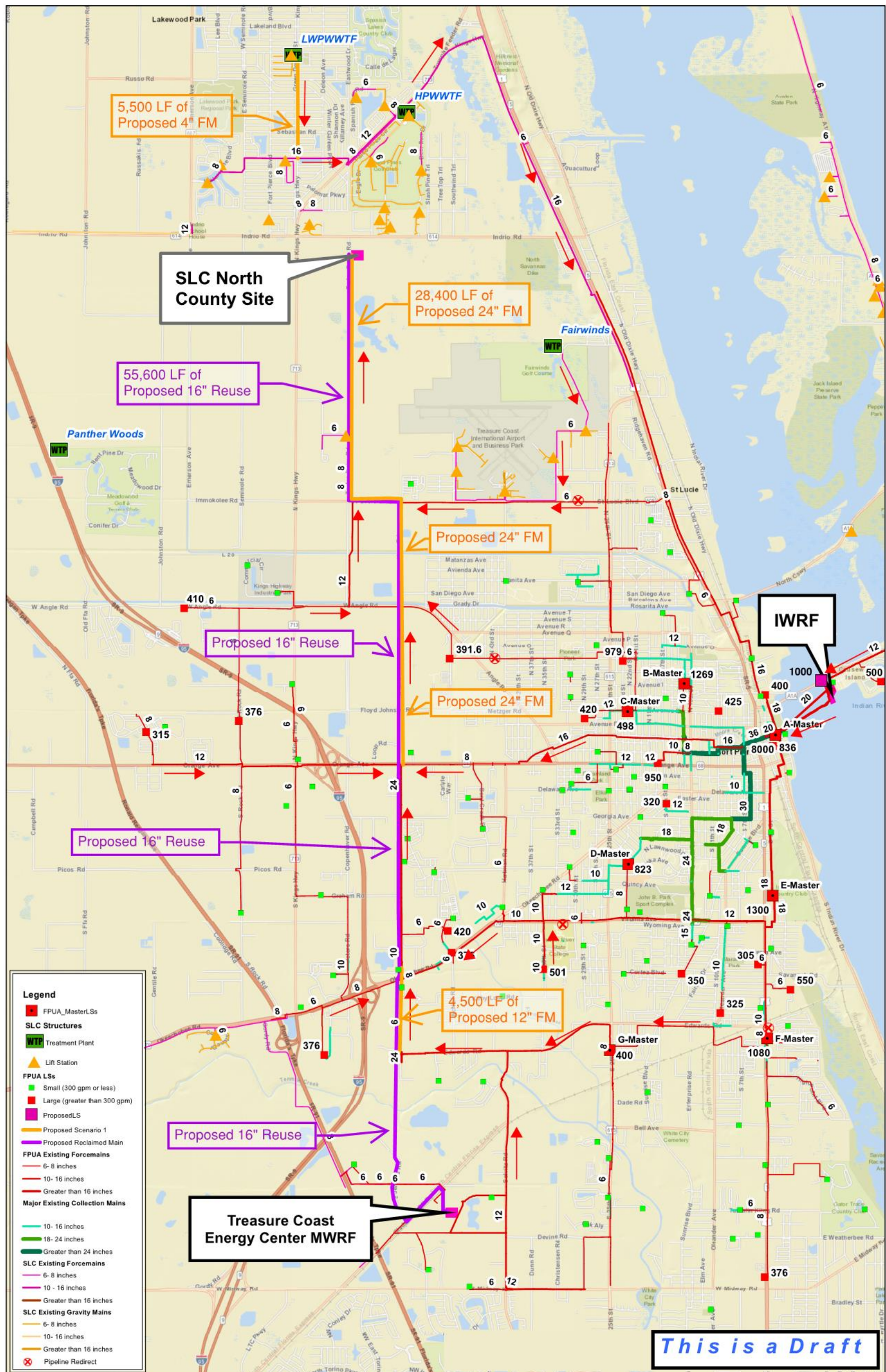


Figure 2-1: Redirect Flow to SCL North County Site

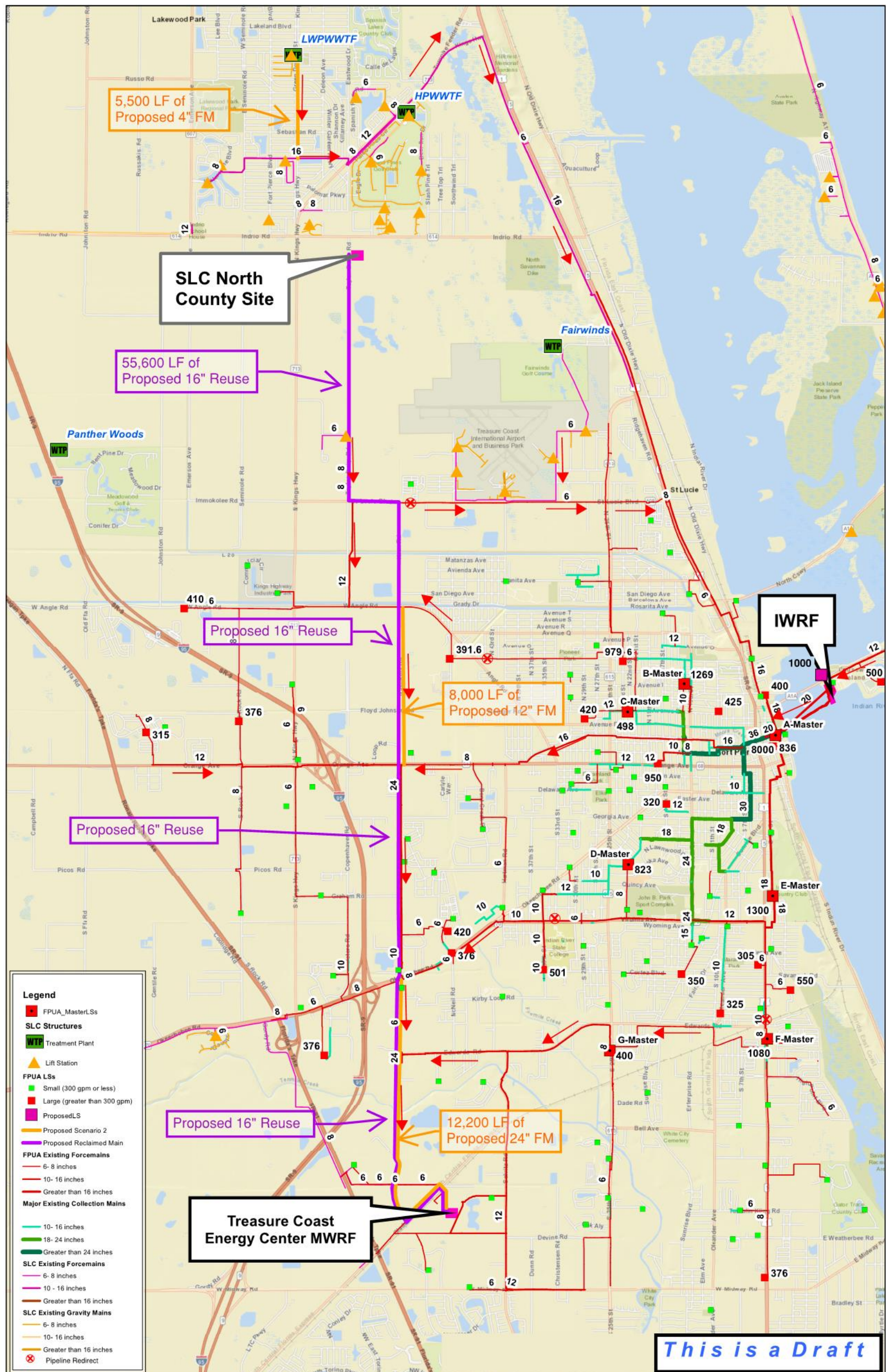


Figure 2-2: Redirect Flow to Treasure Coast Energy Center

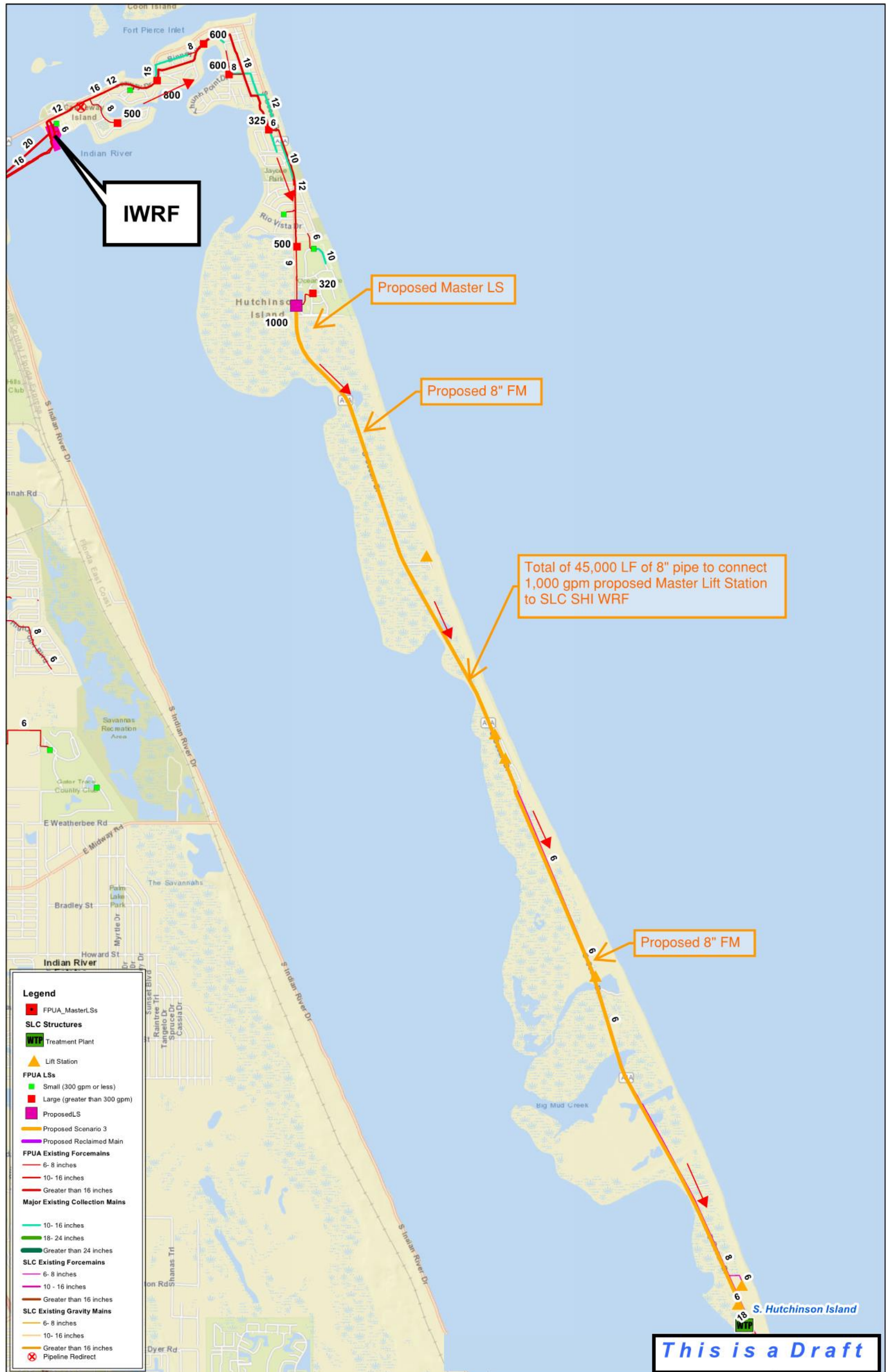


Figure 2-3: Redirect FPUA SHI Flow to SLC SHI WRF

Table 2-4: Scenario 1 Probable Cost – MWRf Located at the SCL North County Site

Item No.	Description	Quantity	Unit	Unit Price	Total
Item 2 - Site Construction					
Redirect Lift Stations:					
	FPUA and SLC LS	15	LS	\$75,000	\$1,125,000
	Master LS at Fairwinds, HPWRF and LPWRF	3	LS	\$150,000	\$450,000
	Master LS A	1	LS	\$500,000	\$500,000
New Lift Stations:					
	Master LS at LWRF	1	LS	\$1,500,000	\$1,500,000
Force Main Horizontal Directional Drill:					
	Canal 1 Crossing				
	16-inch	350	LF	\$425	\$148,750
	24-inch	350	LF	\$625	\$218,750
	Belcher Canal Crossing				
	16-inch	450	LF	\$425	\$191,250
	24-inch	450	LF	\$625	\$281,250
	Okeechobee Road				
	16-inch	650	LF	\$425	\$276,250
	24-inch	650	LF	\$625	\$406,250
	Ten Mile Creek				
	16-inch	350	LF	\$425	\$148,750
	Glades & FEC RR				
	16-inch	650	LF	\$425	\$276,250
Force Main:					
	4-inch	5,500	LF	\$76	\$418,000
	12-inch	4,500	LF	\$190	\$855,000
	16-inch	55,600	LF	\$209	\$11,620,400
	24-inch	28,400	LF	\$285	\$8,094,000
	Total				\$26,510,000

Table 2-5: Scenario 2 Probable Cost – MWRP Located at the FPUA Treasure Coast Energy Center

Item No.	Description	Quantity	Unit	Unit Price	Total
Item 2 - Site Construction					
Redirect Lift Stations:					
	FPUA and SLC LS	15	LS	\$75,000	\$1,125,000
	Master LS at Fairwinds, HPWRF and LPWRF	3	LS	\$150,000	\$450,000
	Master LS A	1	LS	\$500,000	\$500,000
New Lift Stations:					
	Master LS at LWRF	1	LS	\$1,500,000	\$1,500,000
Force Main Horizontal Directional Drill:					
	Canal 1 Crossing				
	16-inch	350	LF	\$425	\$148,750
	24-inch	0	LF	\$625	\$0
	Belcher Canal Crossing				
	16-inch	450	LF	\$425	\$191,250
	24-inch	0	LF	\$625	\$0
	Okeechobee Road				
	16-inch	650	LF	\$425	\$276,250
	24-inch	650	LF	\$625	\$406,250
	Ten Mile Creek				
	16-inch	350	LF	\$425	\$148,750
	24-inch	450	LF	\$625	\$281,250
	Glades & FEC RR				
	16-inch	650	LF	\$425	\$276,250
	24-inch	650	LF	\$625	\$406,250
Force Main:					
	4-inch	5,500	LF	\$76	\$418,000
	12-inch	8,000	LF	\$190	\$1,520,000
	16-inch	55,600	LF	\$209	\$11,620,400
	24-inch	12,200	LF	\$285	\$3,477,000
	Total				\$22,746,000

Table 2-6: Scenario 3 Probable Cost – Redirect FPUA SHI Flows to St. Lucie County’s SHI WRF

Item No.	Description	Quantity	Unit	Unit Price	Total
Item 2 - Site Construction					
Redirect Lift Stations:					
	FPUA and SLC LS	0	LS	\$75,000	\$0
	Master LS at Fairwinds, HPWRF and LPWRF	0	LS	\$150,000	\$0
	Master LS A	0	LS	\$500,000	\$0
New Lift Stations:					
	Master LS at LWRF	1	LS	\$1,500,000	\$1,500,000
Force Main Horizontal Directional Drill:					
	FPL Canal Crossing				
	8-inch	2,000	LF	\$300	\$600,000
Force Main:					
	4-inch	0	LF	\$76	\$0
	12-inch	45,000	LF	\$152	\$6,840,000
	16-inch	0	LF	\$190	\$0
	24-inch	0	LF	\$209.00	\$0
	Total				\$8,940,000

3. Facilities Condition Assessment

This chapter provides a general overview of the St Lucie County and Fort Pierce Utility's facilities that are part of this conceptual analysis.

3.1 Introduction

Condition assessments were based on a review of the most current WRF's Permits, Capacity Analysis Reports (CAR) and Operation and Maintenance Performance Reports (O&MPR) for each participant's facilities. The focus of the review was on the facilities that could be impacted by the construction of a MWRF. Facilities that would not contribute wastewater flow to the MWRF or not have flow redirected to them were not included in the condition assessment.

3.2 St Lucie County

The St Lucie County wastewater collection system is made up of over 22 miles of gravity sewer lines which collect flow and direct it to one of the County's 69 lift stations. These lift stations then pump the wastewater through approximately 35 miles of force mains conveying wastewater to five WWTF's within the County's service area. The combined permitted treatment capacity of the County's five WWTF's is 2.82 million gallons per day (MGD). All the County's WWTF's have public reuse or restricted public access reuse systems. A condition assessment of the County's collection/transmission system is not part of this scope. At the time of this study there were no reported issues with the operation of the County's collection and transmission systems.

The North Hutchinson Island WRF is not considered in this study as flows are not planned to be re-directed from there to the MWRF. The three mainland WWTF's that are consider in this study are Fairwinds Golf Course WWTF, Holiday Pines WWTF, and Lakewood Park WWTF. These three facilities would all be decommissioned, and their flows would be redirected to the MWRF. The South Hutchinson Island WRF is also included in this study as an option to redirect FPUA's South Hutchinson Island service area flows to the County's South Hutchinson Island WRF.

3.2.1 Fairwinds Golf Course WWTF

The Fairwinds Golf Course WWTF (Permit FLA013945, Expiration date of November 15, 2022) has a permitted capacity of 0.05 MGD (TMADF). This facility has recently gone through an expansion from 0.04 MGD to 0.05 MGD. There is no planned expansion beyond the current capacity of 0.05 MGD. The CAR for this facility did not indicate that there were any maintenance issues with the treatment facility.

The was no O&MPR made available at the time of this study so no detailed maintenance information was made available for this study.

3.2.2 Holiday Pines WWTF

The Holiday Pines WWTF (Permit FLA013969, Expiration date of December 21, 2021) has a permitted capacity of 0.3 MGD (AADF). The CAR for this facility did not indicate that there were any maintenance

issues with the treatment facility. The CAR did indicate that the facility is operating well under its design capacity and there is no need to expand the facility. The service area for the facility is essentially built-out with only a few vacant lots that could be developed and contribute flow to the existing WWTF.

There was no O&MPR for this facility made available at the time of this study so no detailed maintenance information was made available for this study.

3.2.3 Lakewood Park WWTF

The Lakewood Park WWTF (Permit FLA03586, Expiration date of January 7, 2019) has a permitted capacity of 0.02 MGD (AADF). The CAR for this facility indicated that the facility is operating well under its design capacity and there is no need to expand the facility. The service area for the facility is essentially built-out with no plan for expansion.

The O&MPR for this facility made available at the time of this study indicated that the facility is operating properly with no major maintenance issues to be addressed. There was a minor issue with the facility's master lift station existing access, but the access hatch was in the process of being replaced. The collection system for the facility's service area has been lined and so have the lift stations. In addition, rain guards have been installed to minimize stormwater runoff into the collection system. These improvements have enhanced the operation and performance of the facility.

3.2.4 South Hutchinson Island WRF

The South Hutchinson Island WRF (Permit FL0139475, Expiration date of August 23, 2022) has a permitted capacity of 1.60 MGD (MMADF). The CAR for this facility indicated that the facility is operating well under its design capacity and there is no need to expand the facility. The service area for the facility has some vacant land for development. However, with development of these areas the facility is expected to reach 42 percent of its permitted capacity. Therefore, there is no plan for expansion of this facility.

The O&MPR for this facility made available at the time of this study indicated that the facility is operating properly with no major maintenance issues to be addressed. The O&MPR noted that the facility's headworks bars screens should be addressed due to the age of the equipment (20 plus year of service).

3.3 Fort Pierce Utilities Authority

The FPUA owns and operates a wastewater collection and transmission system that consists of 110 lift stations and seven master lift stations. The gravity collection system consists of 158 miles of piping ranging in size from 4 to 42 inches. Most of the collection system is vitrified clay pipe (VCP). The gravity collection system has 3,344 manholes located throughout FPUA's service area. The transmission system consists of 98 miles of force mains ranging in size from one and a half inches up to 30 inches. The force mains are predominantly PVC. At the time of this study, FPUA's lift stations, gravity collection system and transmission mains were reported to be in good working order. The FPUA is actively working to identify collection system issues and line those pipelines to help reduce Inflow and Infiltration (I&I) problems within the system. Currently no major I&I issues have been reported in the system.

3.3.1 Island Water Reclamation Facility

The FPUA owns and operates the IWRF (Permit FL0027278, Expiration date of December 10, 2022), which has a permitted capacity of 10.0 MGD (AADF), 11.5 MGD (TMADF), 14.92 MGD (PHF) for deep well injection and 18.6 MGD (PHF) for surface water discharge. The facility has one Class 1 Deep Injection Well (Permit 0180484-006-UO/1M, Expiration date of May 7, 2022). The current CAR indicates that the facility is operating well below its design capacity. Based on these data there is no need to expand the facility. The facility has seen high peak hour flows but those have occurred during tropical storm events and did not exceed the facility's current permitted capacity. The facility receives industrial waste from five customers. These customers follow FPUA's industrial pretreatment program and there have been no reported violations and no adverse impacts on the IWRF.

The O&MPR for this facility describes the condition of the IWRF's treatment processes. The primary components of the facility are influent screening, aerated grit removal, secondary wastewater treatment, chlorine disinfection, and deep well injection. The facility does have a permitted surface water discharge that is to be used during mechanical integrity testing of the deep injection well or an emergency basis only such as a tropical storm event. The facility utilizes their digesters as sludge holding tanks and has a sludge management contract with an operations company to process and dispose of their sludge. Currently FPUA does not accept any septage or Fats, Oils and Grease (FOG) at the IWRF.

The influent screening system is reported to be in good condition. Some of the existing influent screening equipment is at or beyond its useful life expectancy and should be replaced. There were not reported issues with the aerated grit system or the aeration system. These facilities were reported to be in good working condition. The clarifiers are reported to be in poor condition as the internal clarifier mechanisms are at or beyond their useful life and in need of replacement. The chlorine contact tanks, sludge holding tanks and the deep injection well are all reported to be in good condition. The electrical system is also reported to be in good condition.

The mechanical bar screen at the influent screening facility is scheduled to be replaced in 2021. Based on the anticipated schedule to build a mainland WRF, if the project does proceed, the FPUA would most likely have to replace the mechanical bar screen.

The Facility's clarifiers are scheduled for full internal mechanism replacement in 2022 due to age and general condition. If the MWRF is constructed, the FPUA may be able to maintain adequate clarification without the cost of replacing the clarifier mechanisms. This is because the facility has four clarifiers and only needs to utilize two clarifiers at a time due to the current volume of flow received at the facility. Plant staff now rotates operations of their clarifiers so that while two clarifiers are online maintenance staff can inspect the two that are offline and make adjustments or minor repairs as needed to keep them operating properly. This could result in a savings of several million dollars for FPUA if the clarifier mechanisms do not need to be replaced.

3.3.2 Treasure Coast Energy Center

The Treasure Coast Energy Center is equipped with two Class 1 injection wells, IW-1, and IW-2 (Permit 0259734-006-007-UO/1I, Expiration date of August 4, 2020). IW-1 has a permitted capacity of 2.7 MGD. IW-1 receives cooling tower blowdown water and wastewater from floor drains at the Treasure Coast

Energy Center. IW-1 also receives leachate from the St Lucie County bailing and recycling. Currently there are no reported issues with the operation of this injection well.

Injection Well IW-2 was constructed as a municipal injection well. However, this well has not been completed and has not been placed into service. IW-2 is a 24-inches in diameter and should have a capacity of approximately 18.6 MGD at an injection velocity of 10 fps. This well could be utilized for effluent disposal from the MWRF if the facility were constructed at the Treasure Coast Energy Center. The capacity of this well would need to be determined based on injection velocity and pressure. A backup injection well would need to be constructed if the MWRF were located at the Treasure Coast Energy Center.

4. Existing and Future Wastewater Flow Projections

4.1 Introduction

FPUA and St. Lucie County data was reviewed to determine the future population and wastewater projections and water quality characteristics. Provided data included Capacity Analysis Reports, Operation and Maintenance Performance Reports and Monthly Operating Reports. Additional data regarding County wide population projections was obtained from the St. Lucie County Comprehensive Plan.

Flow from FPUA IWRF, Fairwinds WWTF, Holiday Pines WWTF, and Lakewood WWTF would be redirected to the new MWRF. Flows from South Hutchison Island would either be redirected to the new MWRF or to SLC’s SHI WRF. Projected flows to the MWRF were calculated by using Monthly Operating Reports and Capacity Analysis Report data for the various facilities in conjunction with County-wide population projection data.

4.2 Population and Flow Projections

The total historical average wastewater flows for Fairwinds, Holiday Pines, and Lakewood facilities is shown in **Table 4-1**. These facilities service fully developed areas and minimal growth is expected within their respective service areas. Flow projections for the three County owned facilities that would be redirected to the MWRF total approximately 0.16 MGD. These three facilities have a permitted capacity of 0.36 MGD. However, the Fairwinds WWTF is in the process of expanding to 0.05 MGD to facilitate increased growth around the St. Lucie County Airport Industrial Park area. Based on meetings with the Project Team, the County has requested the MWRF have 1 MGD of initial capacity reserved for these facilities. **Table 4.2** summarizes the historical average wastewater flows for IWRF for the last 10 years. These numbers were sourced from the Monthly Operating Reports.

Table 4-1: Historical Flow Data in MGD for SLC WWTFs

Year	Fairwinds	Holiday Pines	Lakewood
2017	0.020	0.113	0.018
2018	0.025	0.112	0.019
2019	0.026	0.115	0.012

Table 4-2: Historical Flow Data in MGD for FPUA IWRF

Year	2009	2011	2012	2013	2014	2015	2016	2017	2018	2019
AADF	4.47	3.95	4.29	4.90	3.88	4.32	6.3	4.84	4.31	4.14

Table 4-3 summarizes the St. Lucie County population projections. Two sources were analyzed: the St. Lucie County Comprehensive Plan amended in 2018, and the Bureau of Economic and Business Research (BEBR) Florida Population Studies, released in January 2020. The Comprehensive Plan projections are between the Medium and High projections from BEBR, but closer to Medium. Because these numbers are reasonably conservative, and have the benefit of being approved by SLC, the Comprehensive Plan Projections were selected.

Table 4-3: St. Lucie County Population Projections

Year	St. Lucie County 2018 Comp Plan Population Projection	BEBR 2020 Population Projection (Low)	BEBR 2020 Population Projection (Medium)	BEBR 2020 Population Projection (High)
2020	318,600	302,300	315,200	327,500
2025	349,901	319,300	342,900	364,600
2030	377,998	333,800	367,500	401,700
2035	404,100	344,300	387,400	434,100
2040	428,198	352,000	404,400	464,300

St Lucie County developed a Comprehensive Plan with a Future Land Use Element that was updated in June of 2018. Future Land Use designations indicate compatible zoning districts and can be used to predict expected population densities based on the assigned zoning. The majority of unincorporated SLC is zoned agricultural. Future Land Use indicates that approximately 15% of unincorporated land may be used for residential and Towns, Villages, and Countryside (TCV). The Urban Service Boundary delineates the area to which the county will provide services, as shown by the bold outline in **Figure 4-1**. The new MWRF will serve the citizens of Fort Pierce and may absorb future flows from developments within the Urban Service Area that are outside of the Port St Lucie service area.

To encapsulate the expected county wide growth within the FPUA Service Area and the St. Lucie County Service area, the county wide population growth rates were applied to FPUA IWRf’s Equivalent Resident Connections (ERCs) as determined in the 2017 FPUA IWRf Capacity Analysis Report (CAR). Percent growth was determined from the SLC Comprehensive Plan projections.

The AADF from 2018 was used as the initial flow value (4.31 MGD). To derive a projected flow rate, 190 gpd/ ERC was applied to the new growth. The CAR proposed that new development should apply 190 gpd/ ERC. This value was determined based on historical data. **Table 4-4** summarizes the conceptual population growth and projected wastewater flows for the MWRF through year 2040.

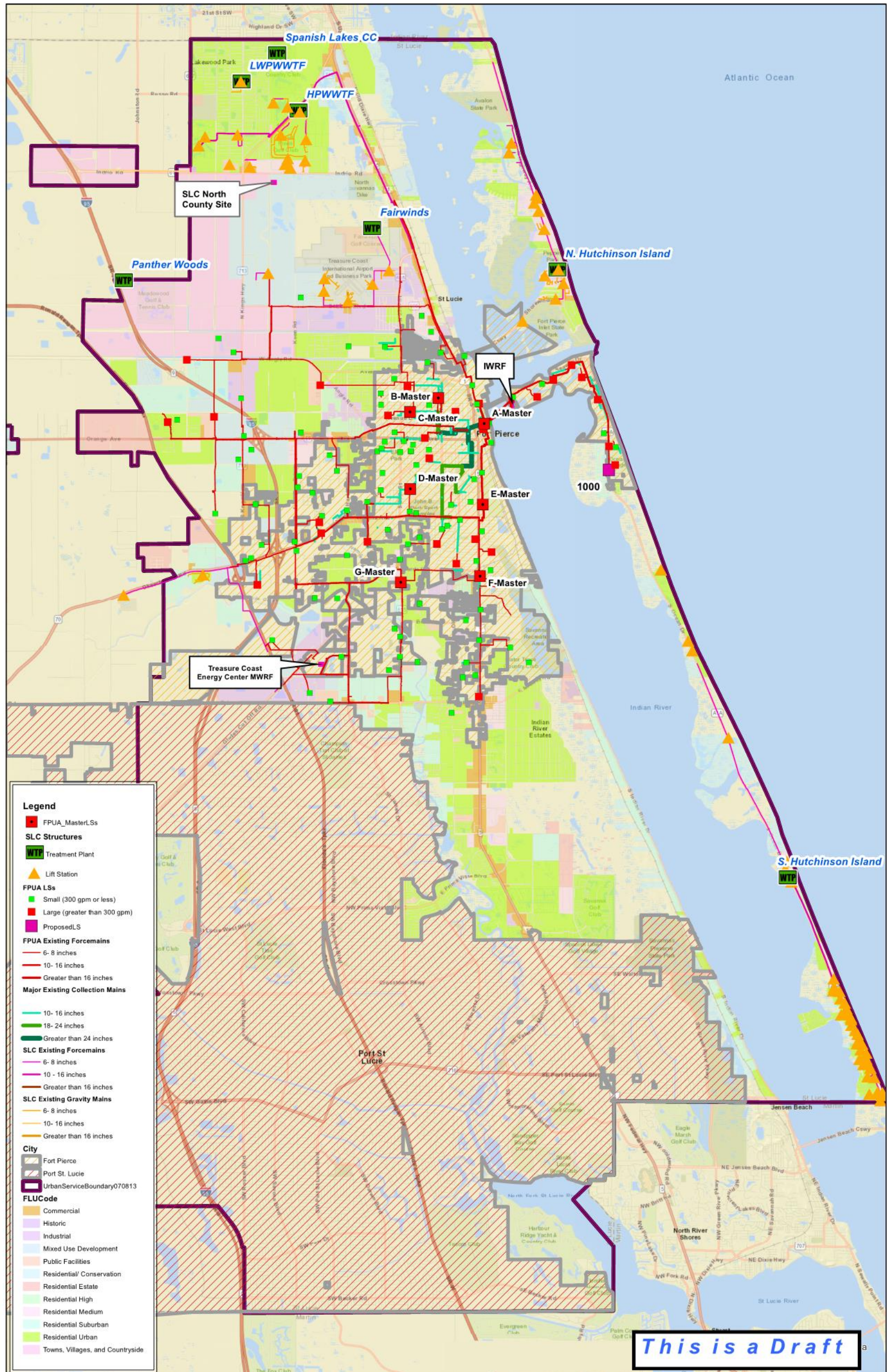


Figure 4-1: SLC Future Land Use Map

Table 4-4: MWRf Flow Projections

	2018	2020	2025	2030	2035	2040
SLC Comp Plan Population Projection	304,623	318,600	349,901	377,998	404,100	428,198
SLC Population Growth %		4.59%	9.82%	8.00%	6.90%	6.00%
FPUA ERC Projection @ SLC Growth Rate	31,742	33,198	36,460	39,377	42,094	44,619
Flow Rate (MGD) @ 190 gpd per additional ERC	4.31	4.59	5.21	5.76	6.28	6.76
Flow Rate (MGD) plus 1 MGD for SLC	5.31	5.59	6.21	6.76	7.28	7.76

Figure 4-2 depicts the historical flows for IWRf and the three combined SLC plants, as well as the projected flows for the future MWRf. Note that the graph shows the project flows with and without the 1 MGD SLC capacity included.

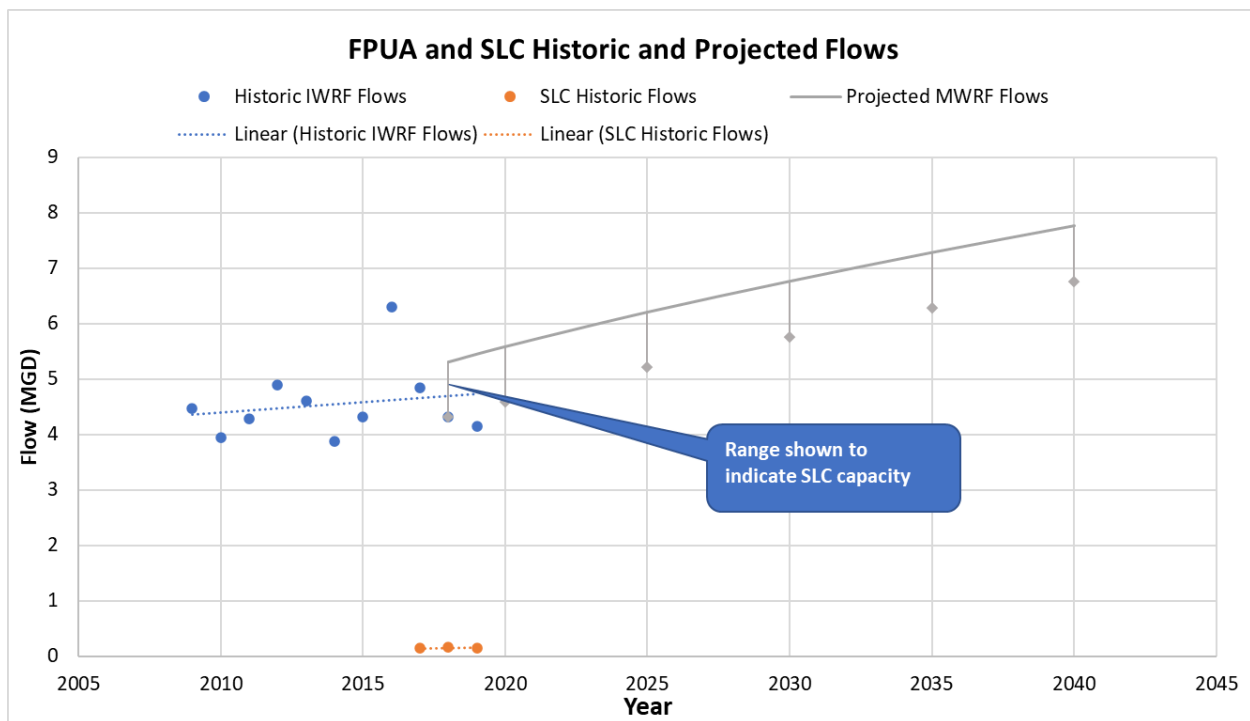


Figure 4-2: FPUA and SLC Historic and Project Flows

A similar method was employed to predict future flows from South Hutchinson Island. The FPUA provided historical customer billing data for 2019 for the accounts on the island. This data was used to determine the number of accounts and the average flow per account, which was 272 gpd per account. **Table 4-5** shows the results of applying the SLC population growth rate to the number of FPUA SHI Service Area accounts.

Table 4-5: FPUA South Hutchinson Island Flow Projections

	2019	2020	2025	2030	2035	2040
SLC Population Growth %		2.19%	9.82%	8.00%	6.90%	6.00%
Number of Wastewater Accounts	1,453	1,485	1,631	1,761	1,883	1,996
Flow Rate (MGD) @ 272 gpd/Account	0.39	0.40	0.44	0.48	0.51	0.54

5. Regulatory Requirements

The purpose of this chapter is to summarize current permitting requirements and identify future permitting requirements as they pertain to the proposed Mainland WRF.

5.1 Existing and Proposed Permit Requirements

The existing IWRF operates under FDEP Permit No. FL0027278. The IWRF has a permitted annual average daily flow (AADF) of 10.0 million gallons per day (mgd) and a permitted 3-month average daily flow (3MADF) of 11.5 mgd. Influent wastewater is treated to secondary effluent standards and disposed to a Class I underground injection well system. The deep injection well system has a permitted capacity of 14.92 mgd (based on 8 feet per second velocity) during normal operation and a permitted capacity of 18.65 mgd (based on 10 feet per second velocity) during emergency operation. During mechanical integrity testing of the deep injection well, secondary effluent can be discharged to surface waters (Indian River Lagoon) for a maximum of 6 days every 5 years. Residuals from the IWRF treatment process are dewatered and transported by a contract operator to an offsite biosolids processing facility that reportedly produces a Class E/EQ product that is then land applied.

In addition to the secondary treatment provided at IWRF, the proposed Mainland WRF would provide tertiary treatment through a high-level disinfection process. Tertiary treatment would be required for the proposed distribution of reclaimed water for cooling water supply to the Treasure Coast Energy Center, as well as restricted Part III reclaimed water distribution to irrigation customers. It is assumed that residuals from the proposed MWRf would continue to be dewatered and transported by a contract operator to the same offsite biosolids processing facility.

Table 5-1 presents a side-by-side comparison of currently permitted effluent limits (left) and proposed effluent limits (right) based on FDEP reclaimed water requirements and additional limits anticipated to meet cooling water quality requirements.

Table 5-1: Existing and Proposed Effluent Water Quality Requirements

Parameter	Current IWRF	Proposed MWRf
Flow (MGD)		
CBOD ₅ (mg/L), Annual	20.0	20.0
CBOD ₅ (mg/L), Monthly	30.0	30.0
CBOD ₅ (mg/L), Weekly	45.0	60.0
CBOD ₅ (mg/L), Single Sample	60.0	80.0
TSS (mg/L), Annual	20.0	N/A ¹
TSS (mg/L), Monthly	30.0	N/A ¹
TSS (mg/L), Weekly	45.0	N/A ¹

Parameter	Current IWRP	Proposed MWRP
TSS (mg/L), Single Sample	60.0	5.0 ²
TP (mg/L), Single Sample	N/A	1.5 ³
NH ₃ (mg/L), Single Sample	N/A	1.0 ³
pH (mg/L)	6.0 to 8.5	6.0 to 8.5
Fecal Coliform, #/100ml, Annual	200	N/A ⁴
Fecal Coliform, #/100ml, Monthly	400	N/A ⁴
Fecal Coliform, #/100ml, 90% Percentile	600	N/A ⁴
Fecal Coliform, #/100ml, Single Sample	800	N/A ⁴

Notes:

1. Not applicable based on single sample requirement for proposed high-level disinfection
2. To meet high-level disinfection requirements
3. Estimated limits to meet cooling water quality requirements for Treasure Coast Energy Center
4. Not applicable for MWRP, which will not have a surface water discharge available during deep injection well integrity testing

5.2 Future Regulatory Assessment

The following potential regulatory developments should be monitored and considered during conceptual planning of the Mainland WRF:

5.2.1 Proposed FDEP 62-640 Biosolids Rule Revisions

In 2018, FDEP created the Biosolids Technical Advisory Committee (TAC) to evaluate current biosolids management practices and explore opportunities to better protect Florida’s water resources. FDEP also created a separate Blue-Green Algae Task Force to focus on expediting water quality improvements, including expedited nutrient reductions in Lake Okeechobee and downstream estuaries. The Biosolids TAC convened four times between September 2018 and January 2019 to discuss the current options for biosolids management in the state, explore better ways to manage biosolids to improve the protection of the state’s ground and surface waters, and identify what research gaps exist and need to be examined and built upon to improve biosolids management.

The primary objectives of the FDEP Biosolids TAC were as follows:

- Mitigate release of nutrients from land applied biosolids to waters of the state.
- Increase FDEP inspection rates at biosolids land application sites.
- Enhance monitoring protocols for detecting nutrient migration from land-applied biosolids.

- Advance research on nutrient runoff from land-applied biosolids and promote innovative technology pilot projects.

As a result of the FDEP Biosolids TAC workshops, a Statement of Estimated Regulatory Costs (SERC) and subsequent input from stakeholders, FDEP proposed final revisions to Rule 62-640 on April 14, 2020. The proposed rule revisions also consider and implement biosolids provisions of this year's Combined Senate-House Bill 712.

Rule revisions relate primarily to the following aspects of land application management:

- Updated nitrogen and phosphorous application limits
- Analysis of crop nutrient demands
- Site-specific soil phosphorous storage capacity indices
- Analytical methods for determining water extractable phosphorous (nutrient migration)
- Requirements for annual soil fertility testing and continuous groundwater monitoring
- Requirements for each land application site's Nutrient Management Plan (NMP) to demonstrate compliance with the corresponding Basin Management Action Plan (BMAP)
- Restriction of land application of biosolids within 2 feet of saturated soils or on soils with high water table elevation within 15 centimeters of soil surface

Rule revisions could result in the following impacts to land application sites and the utilities that utilize land application sites:

- Reduction in allowable land application rates
- Need for additional land to address lower application rates
- Increased hauling distances and costs to reach new/additional land application sites

Proposed rule revisions impact land application of both Class B and Class A biosolids. Class AA biosolids that are marketed and distributed as fertilizer or compost products certified by the U.S. Compost Council are not impacted by the Biosolids Rule revisions. Although the basis of current (IWRf) and future (MWRf) biosolids management is third-party contract processing through a regional facility and Class A/EQ land application, it should be noted that the long-term feasibility of the contract processing operation may be impacted by these proposed rule revisions.

5.2.2 Report on Emerging Pollutants

On November 15, 2018, the EPA's Office of Inspector General (OIG) published a Report questioning the efficacy of the existing EPA Part 503 biosolids regulations to safeguard public health and the environment. The OIG Report identified 352 pollutants to be potential cause of concern. The OIG Report made the following conclusions:

- EPA's controls over land application of biosolids were incomplete or had weaknesses, and may not fully protect human health and the environment.
- The biosolids program is at risk of not achieving its goal to protect public health and the environment.
- EPA does not have the data to determine whether biosolids pollutants (beyond the currently regulated 9 heavy metals) with incomplete risk assessment are safe.
- EPA scientists working on biosolids stated that without completing risk assessments on all of the pollutants found in biosolids they cannot say whether biosolids are safe.
- Identified several gaps in the rule that needed to be addressed by research.

The EPA concluded that it cannot consider the 352 pollutants (including per- and polyfluoroalkyl substances, a.k.a. PFAS) at this time for further regulation due to either a lack of data or risk assessment tools. The EPA Office of Water has agreed to complete development of the probabilistic risk assessment tool and screening tool for biosolids land application scenarios by December 31, 2021 and develop and implement a plan to obtain additional data needed to complete risk assessments and finalize safety determinations on the 352 identified pollutants in biosolids by December 31, 2022. Federal regulations to regulate additional pollutants in biosolids (including PFAS) could likely be promulgated after completion of the risk assessment process. Although Federal regulations for PFAS in biosolids will likely not go into effect for the next 3 to 5 years, state level regulations could emerge. The state-level PFAS regulations for biosolids and wastewater could also likely accelerate due to adoption of drinking water and ambient groundwater quality standards.

It is unclear at this time whether or how this issue will impact biosolids land application programs beyond 2023. However, potential three outcomes can be considered:

- No risk from any of the 352 highlighted pollutants, resulting in business as usual.
- Risk from some pollutants, however, treatment technologies exist and at manageable cost.
- Risk from some pollutants and the treatment technologies do not exist or require high cost.

The City should monitor regulatory developments on this issue of emerging pollutants.

6. Design Criteria and Conceptual Site Plan

The purpose of this chapter is to develop the following conceptual design criteria for the proposed MWRF:

- Influent Flows, Concentrations, Loads and Peaking Factors
- Effluent Limits
- Unit Treatment Process Design Criteria
- Reliability Criteria

6.1 Influent Flows and Loadings

Influent flow projections developed in Chapter 4 are repeated below in **Table 6-1** for the reader's convenience.

Table 6-1: Mainland WRF Flow Projections

	2020	2025	2030	2035	2040
FPUA Flow Rate (MGD)	4.59	5.21	5.76	6.28	6.76
SLC Flow Rate (reserved) (MGD)	1.00	1.00	1.00	1.00	1.00
Total Mainland WRF Flow Rate (MGD)	5.59	6.21	6.76	7.28	7.76

It is assumed that the MWRF will be designed, constructed, and placed into initial operation by the Year 2025. The initial MWRF will be designed with an average annual daily flow (AADF) capacity of 8.0 MGD to meet projected flows in the Year 2035. The facility will be designed to accommodate a future build-out capacity of 10.0 MGD.

The past 5 years of MOR data from the IWRF were analyzed to determine historical minimum day, maximum 30-day, maximum 7-day and peak hour peaking factors for flows and loads. The results of that analysis are summarized in **Table 6-2**.

Table 6-2: Historical IWRF Flows, Loads and Peaking Factors (Years 2016 through 2019)

	Influent Flow		Influent CBOD				Influent TSS			
	Flow MGD	Peaking Factor	Actual Concentration (mg/L)	Load (ppd)	Load Peaking Factor	Calculated Concentration (mg/L)	Actual Concentration (mg/L)	Load (ppd)	Load Peaking Factor	Calculated Concentration (mg/L)
Minimum Day	3.83	0.68	29	1,708	0.25	56	23	1,070	0.10	34
Average Annual	5.89	1.00	152	7,219	1.00	147	218	10,225	1.00	208
Maximum Month	9.18	1.52	206	11,685	1.50	156	297	13,740	1.32	193
Max 30-Day	9.92	1.65	213	11,874	1.53	147	317	14,225	1.37	183
Max 7-Day	11.32	1.88	285	15,026	1.97	170	376	17,530	1.69	197
Maximum Day	12.94	2.15	489	24,660	3.31	261	516	30,232	2.91	288

Historical load concentrations and peaking factors from **Table 6-2** were then applied to projected annual average flows from **Table 6-1** to project minimum day, maximum 30-day, maximum 7-day flows and loads for the Year 2035, as summarized in **Table 6-3**.

Table 6-3: Projected MWRF Flows and Loads for Year 2035

Criteria	Flow MGD	CBOD mg/L	TSS mg/L	CBOD lb/day	TSS lb/day
Minimum Day	5.20	n/a	n/a	n/a	n/a
Average Annual	8.00	150	220	9,790	13,966
Maximum Month	12.16	225	290	14,671	18,679
Maximum 7-Day	15.04	296	372	19,033	23,159
Maximum Day	17.20	497	845	32,000	40,000
Peak Hour	20.00	n/a	n/a	n/a	n/a

6.2 Effluent Limits

Effluent limits presented in Chapter 5 (Regulatory Requirements) are repeated below in **Table 6-4** for the reader's convenience.

Table 6-4: Proposed MWRF Effluent Limits

Parameter	Proposed MWRF
CBOD ₅ (mg/L), Annual	20.0
CBOD ₅ (mg/L), Monthly	30.0
CBOD ₅ (mg/L), Weekly	60.0
CBOD ₅ (mg/L), Single Sample	80.0
TSS (mg/L), Single Sample	5.0
TP (mg/L), Single Sample	1.5
NH ₃ (mg/L), Single Sample	1.0
pH (mg/L)	6.0 to 8.5

6.3 Unit Treatment Process Design Criteria

The proposed MWRF will be designed with the following unit processes and supporting facilities:

- Preliminary Treatment, consisting of screening and grit removal facilities
- Secondary Treatment, consisting of aeration basins with fine-bubble membrane diffusers, multi-stage centrifugal blowers, secondary clarifiers and return activated sludge (RAS) and waste activated sludge (WAS) pumping
- Tertiary Treatment to meet high-level disinfection requirements, including deep-bed filters, chlorine contact basins and bulk sodium hypochlorite storage and dosing facilities
- Reclaimed Water Storage and Pumping
- Two (2) Deep Injection Wells and one (1) monitoring well; for the FPUA Energy Center Site, it is assumed that Injection Well #1 would remain in service to dispose of Energy Center waste streams, that Injection Well #2 (24" diameter, rated capacity of 18.6 MGD at 10 feet per second) would be used for MWRF effluent disposal, and that a new Injection Well #3 would be constructed to serve as a backup well to Injection Well #2
- Aerated WAS Storage Tanks to provide equalization between the secondary sludge wasting process and the sludge dewatering process
- Sludge Dewatering Building, including belt filter presses and truck loading facilities
- Operations (Administration Building)
- Maintenance Building
- Main Electrical Service Building

The purpose of the development of design criteria is to develop a feasible site plan and develop conceptual opinions of probable construction costs for the proposed MWRF. Opinions of probable construction costs for this conceptual evaluation are based on parametric estimating (e.g., \$ per MGD for certain treatment processes, \$ per gallon for tanks and basins, \$ per square foot for buildings). Therefore, detailed design criteria are developed below for the following unit processes to develop proposed dimensions for site planning and cost estimating:

- Aeration Basins
- Secondary Clarifiers
- Deep-Bed Filters
- Chlorine Contact Basins

For remaining unit processes, including Pretreatment, Reclaimed Water Storage and Pumping, WAS Storage, Sludge Dewatering, Operations and Maintenance Buildings and Electrical Service Buildings, site dimensions were established based on similar facilities at other South Florida treatment plants.

6.3.1 Aeration Basins

The main purpose of any activated sludge process is to remove soluble organics and suspended solids from the liquid wastewater stream. Dissolved oxygen in the wastewater stream is consumed as these materials are metabolized by microbes and converted or oxidized to settling microorganisms and waste gases. The oxygen consumed by wastewater over a 5-day period is defined as “biochemical oxygen demand”, or BOD₅; In aeration basins, microorganisms convert the organic substrate into new cell mass in the presence of sufficient concentrations of dissolved oxygen (DO) so the larger, heavier cell growth can be settled out downstream in secondary clarifiers. The addition of oxygen to the wastewater to satisfy and remove BOD is an important component of the activated sludge process. In addition to BOD removal, oxygen is also required for nitrification to transform ammonia to nitrate as required to meet ammonia limits associated with the use of effluent for cooling water at the Energy Center.

In a conceptual analysis, parameters for determining total aeration basin volume include hydraulic retention time (in hours) and BOD loading rate (in pounds per day of BOD loading per 1,000 cubic feet of basin volume). Basin depth is established to provide at least 15 feet of submergence over floor-mounted aeration diffusers. For this analysis, a side water depth of 18 feet has been assumed. An anaerobic selector is proposed at the beginning of each aeration basin to provide biological phosphorous removal as required to meet effluent phosphorous limits associated with the use of effluent for cooling water at the Energy Center.

Using these parameters, **Table 6-5** presents a summary of proposed aeration basin dimensions:

Table 6-5: Dimensions of Proposed Aeration Basins

Criteria	Units	Value
Number of aeration basins	#	4
Width per aeration basin	feet	40
Length of anaerobic selector zone, per basin	feet	35
Length of aerated zone, per basin	feet	170
Total length per basin	feet	205
Side Water Depth	feet	18
Total Anaerobic Volume, per basin	gallons	188,496
Total Aerobic Volume, per basin	gallons	915,552
Total Volume, per basin	gallons	1,104,048

Applying Year 2035 design flows and loadings (reference **Table 6-3**) to the proposed aeration basins dimensions (reference **Table 6-5**) results in the following aeration basins design criteria in **Table 6-6**:

Table 6-6: Aeration Basins Design Criteria

Design Criteria	Recommended Values	Proposed Values, All Basins in Service	Proposed Values, One Basin out of Service
Anaerobic hydraulic retention time, hours			
At Annual Average Daily Flow	1-2	2.26	1.70
At Maximum Month Average Daily Flow	1-2	1.49	1.12
Aerobic hydraulic retention time, hours			
At Annual Average Daily Flow	>5	10.99	8.24
At Maximum Month Average Daily Flow	>5	7.23	5.42
BOD Loading Rate, pounds/day/1,000 ft ³			
At Annual Average Daily Flow	<40	20.00	26.66
At Maximum Month Average Daily Flow	<40	29.97	39.95

6.3.2 Secondary Clarifiers

Solids separation is an important step in the production of a well-clarified, stable effluent low in BOD₅ and suspended solids. The process of liquid/solid separation is achieved in large circular basins referred to as secondary clarifiers. The secondary clarifiers have two basic functions:

- To clarify the secondary effluent through solids/liquid separation.
- To rapidly collect and thicken the settled solids for return to the aeration tanks or for wasting to the sludge processing facilities.

In a conceptual analysis, parameters for determining clarifier sizing include hydraulic surface overflow rate (in gallons per day per square foot of clarifier surface area), hydraulic weir loading rate (gallons per day per linear foot of effluent weir), and solids loading rate (in pounds per hour of mixed liquor suspended solids per square foot of clarifier surface area).

Using these parameters, **Table 6-7** presents a summary of proposed secondary clarifiers dimensions:

Table 6-7: Dimensions of Proposed Secondary Clarifiers

Criteria	Units	Value
Number of secondary clarifiers	#	3
Diameter of each clarifier	feet	120
Side Water Depth	feet	15

Applying Year 2035 design flows and loadings (reference Table 6-3) to the proposed secondary clarifiers dimensions (reference **Table 6-7**) results in the following secondary clarifiers design criteria in **Table 6-8**:

Table 6-8: Secondary Clarifiers Design Criteria

Design Criteria	Recommended Values	Proposed Values, All Basins in Service	Proposed Values, One Basin out of Service
Surface Overflow Rate, gpm/ft ²			
At Peak Hour Flow	900	589	884
Weir Loading Rate, gpm/ft			
At Peak Hour Flow	30,000	17,684	26,526
Solids Loading Rate, pounds/day/ft ²			
At Maximum Daily Flow	35	18.58	27.87

6.3.3 Tertiary Filters and Chlorine Contact Basins

High-level disinfection consisting of tertiary filtration and disinfection will be required at the MWRf to meet effluent quality requirements for cooling water supply to the Energy Center as well as for offsite restricted access landscape irrigation. Tertiary filtration removes most of the particulate matter and high-level disinfection incapacitates pathogenic organisms which may be in the treated wastewater. This conceptual evaluation assumes the use of deep-bed filters. Lower cost alternatives such as cloth-disk filters could be further evaluated during preliminary design.

Table 6-9 presents a summary of proposed dimensions for deep-bed filters and chlorine contact basins:

Table 6-9: Dimensions of Proposed Tertiary Filters and Chlorine Contact Basins

Criteria	Units	Value
Number of deep-bed filters	#	7
Width per filter	feet	9.5
Length per filter	feet	40
Area per filter	ft ²	380
Number of chlorine contact basins	#	3
Number of passes per contact basin	#	3
Width per pass	ft	8
Length per pass	ft	11
Side Water Depth	ft	8
Volume per contact basin	ft ³	143,616

Applying Year 2035 design flows and loadings (reference Table 6-3) to the proposed tertiary treatment dimensions (reference **Table 6-9**) results in the following tertiary treatment design criteria in **Table 6-10**:

Table 6-10: Tertiary Treatment Design Criteria

Design Criteria	Recommended Values	Proposed Values, All Basins in Service	Proposed Values, One Basin out of Service
Filter Loading Rate, gpm/ft ²			
At Annual Average Flow	3.0	2.09	2.44
At Peak Hour Flow	6.0	5.22	6.09
Chlorine Contact Time			
For CT of 40 at 2.0 mg/L chlorine residual	20	31	21

6.4 Conceptual Site Plan

Conceptual site plans for locating the proposed MWRf at SLC’s North County Site and FPUA’s Treasure Coast Energy Center are presented in **Figure 6-1** and **Figure 6-2**, respectively. The evaluation scope called for conceptual site plans at the SLC North County Site and the FPUA Treasure Coast Energy Center and a third site located strategically between the first and second sites. The third location would be considered if the data supported locating a facility where heavy growth would be anticipated. The analysis did not support a third location. The site plans are very similar in that all of the process equipment would be the same with different layouts for each facility. The main difference between the two layouts is that the SLC site will require the installation of two injection wells and a monitoring well. **Figure 6-1 SLC North County Proposed Site Plan** and **Figure 6-2 FPUA Treasure Coast Energy Center Proposed Site Plan** are on the following pages.

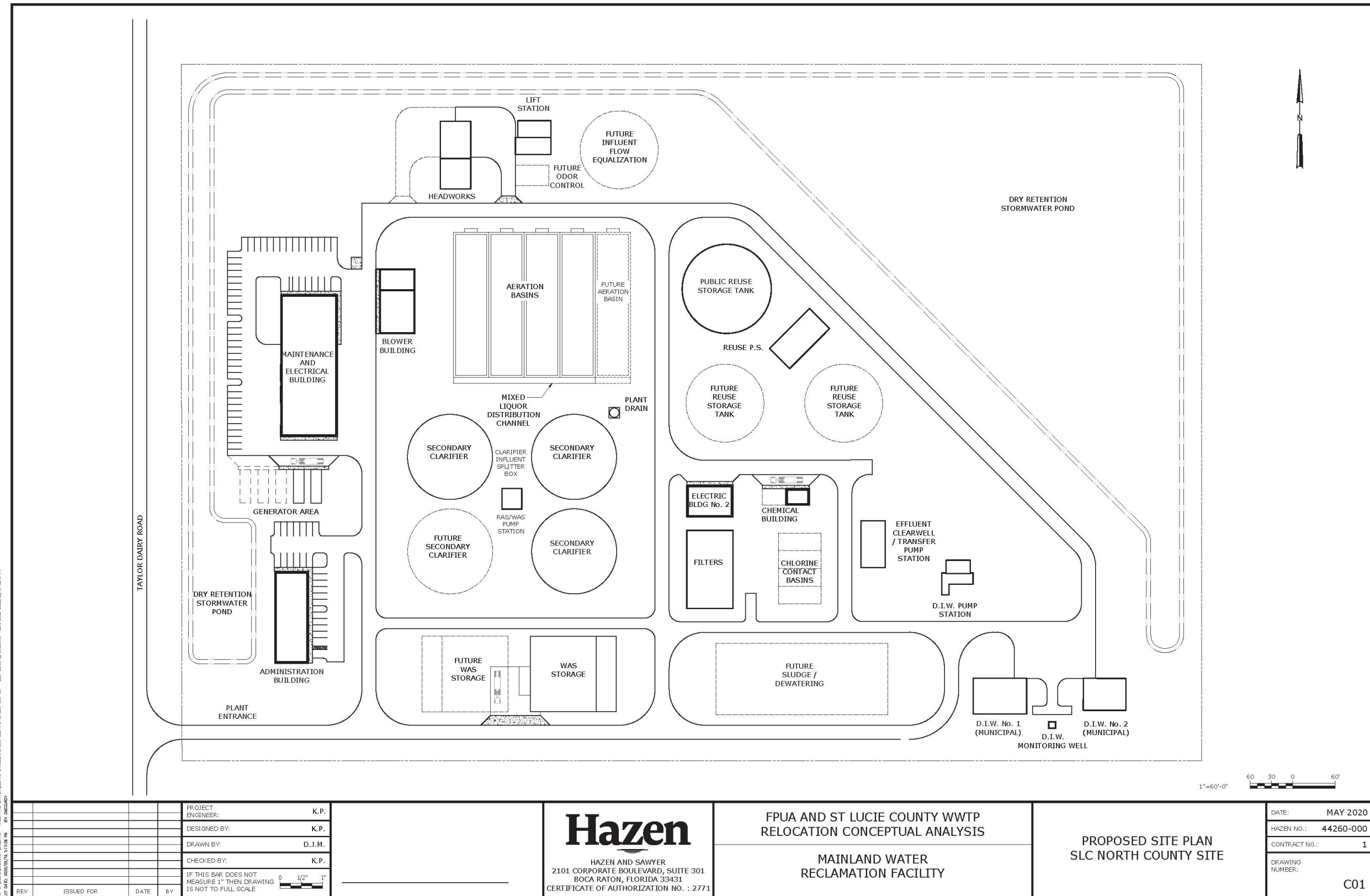


Figure 6-1: SLC North County Proposed Site Plan

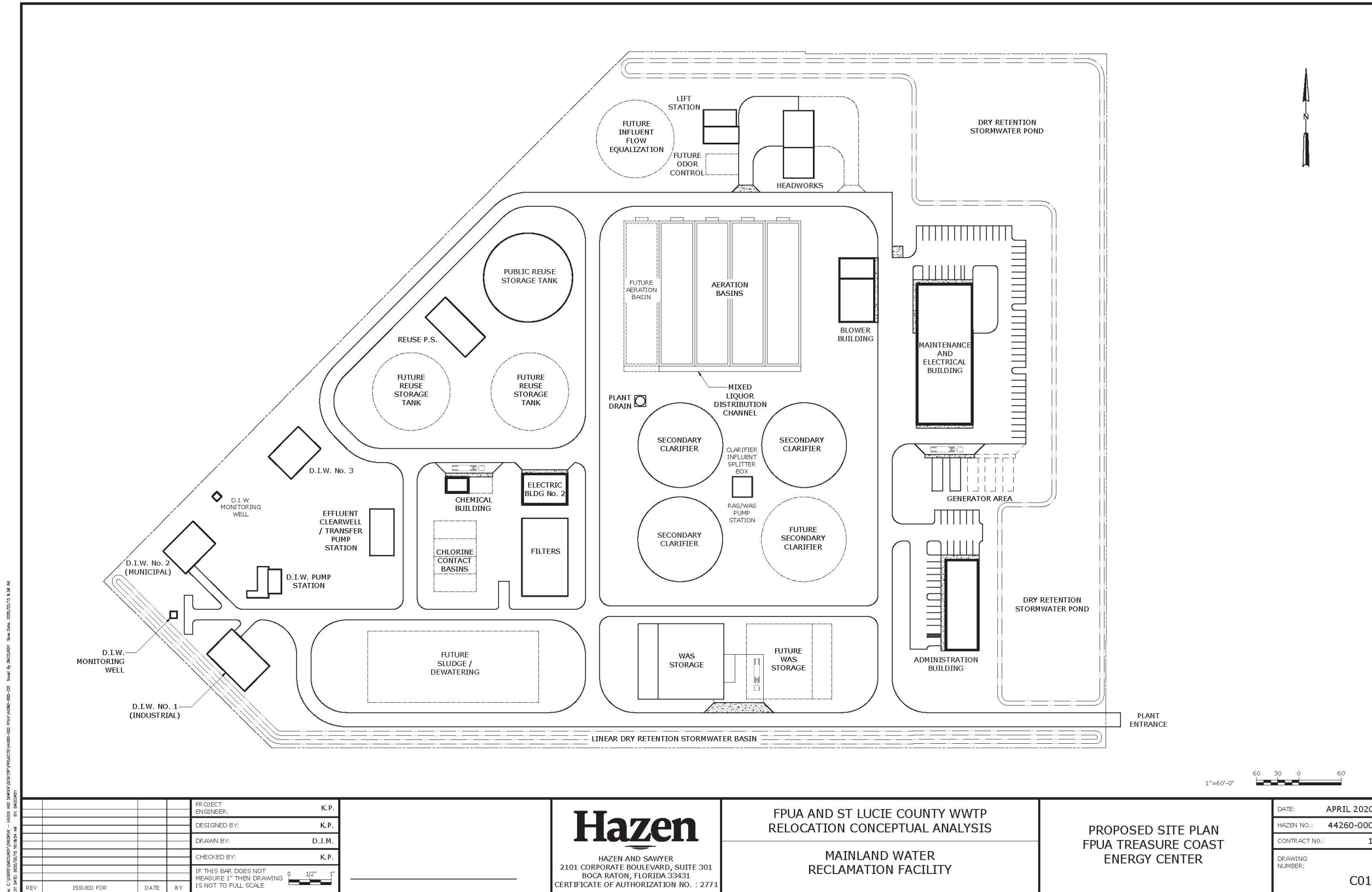


Figure 6-2: FPUA Treasure Coast Energy Center Proposed Site Plan

7. Conceptual Opinion of Probable Capital Costs

Costs for the MWRF were developed using parametric estimating methodology (e.g. \$/MGD, \$/square foot, \$/gallon). Conceptual construction costs for proposed MWRF facilities are based on applying historical costs of similar facilities to design and sizing criteria presented in Section 6. The estimated total construction and ancillary costs for redirecting flows, installing new force mains, lift stations and decommissioning costs were calculated on a per foot basis using information obtained from regional bid tabulations and estimated additional ancillary costs from RS Means CostWorks. The conceptual costs presented herein are consistent with Class 5 Estimates in accordance with the American Association of Cost Engineering (AACE) Recommended Practice No. 18R-97.

The conceptual capital costs for each of the MWRF locations along with their respective rerouting/redirecting scenario costs and associated decommissioning costs are summarized below. Conceptual opinions of probable capital costs for the proposed MWRF located at the SLC North County Site or the FPUA Treasure Coast Energy Center are summarized in **Tables 7-1** and **7-2**, respectively. Detailed cost tables for each of these are included in Section 7.3.

7.1 MWRF located at the SLC North County Site

Table 7-1 summarizes the conceptual capital costs associated with locating the MWRF at the SLC North County Site. This includes the estimated capital costs to construct the MWRF, the cost for proposed routing and redirecting force mains and lift stations, and decommissioning costs associated with the three existing SLC facilities and the IWRF that would be eliminated.

Table 7-1: Conceptual Costs Summary, MWRF Located at the SLC North County Site

Description	Capital Costs
SLC MWRF	\$119,440,000
Scenario 1	\$26,510,000
Decommissioning Lakewood Park WWTP	\$146,000
Decommissioning Holiday Pines WWTP	\$1,360,000
Decommissioning Fairwinds WWTP	\$227,000
Decommissioning IWRF	\$2,382,000
Total Costs	\$150,065,000

Note: see Section 7.3 for detailed cost tables.

7.2 MWRF located at the FPUA Treasure Coast Energy Center

Table 7-2 summarizes the conceptual capital costs associated with locating the MWRF at the FPUA Treasure Coast Energy Center. This includes the estimated capital costs to construct the MWRF, the cost for proposed routing and redirecting force mains and lift stations, and decommissioning costs associated with the three existing SLC facilities and the IWRF that would be eliminated.

Table 7-2: Conceptual Costs Summary, MWRF Located at the FPUA Treasure Coast Energy Center

Description	Capital Costs
FPUA MWRF	\$104,620,000
Scenario 2	\$22,746,000
Decommissioning Lakewood Park WWTP	\$146,000
Decommissioning Holiday Pines WWTP	\$1,360,000
Decommissioning Fairwinds WWTP	\$227,000
Decommissioning IWRF	\$2,382,000
Total Costs	\$131,481,000

7.3 Detailed Cost Tables

Listed below are detailed cost tables that are presented as backup for the summary of costs shown in **Tables 7-1 and 7-2** respectively. The scenarios conceptual costs for the piping and lift stations were discussed in Section 2. The conceptual costs for the mainland facilities were discussed in Section 6.

Table 7-3: MWRf Conceptual Opinion of Probable Construction Cost – SLC North County Site

Process	Unit Cost	Unit	MWRf Value	Cost	Rounded Cost
Influent Pump Station	\$0.25	\$/gal AA flow treated	8,000,000	\$2,000,000	\$2,000,000
Headworks	\$0.29	\$/gal treated	10,000,000	\$2,900,000	\$2,900,000
New Aeration Basins	\$2.59	\$/gal tankage	4,420,000	\$11,447,800	\$11,450,000
Blower Building	\$0.24	\$/gal AA flow treated	8,000,000	\$1,920,000	\$1,920,000
Secondary Clarifiers	\$180	\$/sf tankage	33,929	\$6,107,256	\$6,110,000
RAS Pump Station	\$0.21	\$/gal AA flow treated	8,000,000	\$1,680,000	\$1,680,000
Deep Bed Filters (will price cloth-disk for lower \$\$)	\$2,700	\$/sf tankage	2,660	\$7,182,000	\$7,190,000
Disinfection (Hypochlorite Storage/Feed)	\$0.05	\$/gal AA flow treated	8,000,000	\$400,000	\$400,000
Chlorine Contact Basins	\$1.86	\$/gal tankage	431,000	\$801,660	\$810,000
Reclaimed Water Storage Tank	\$0.50	\$/gal tankage	3,000,000	\$1,500,000	\$1,500,000
Reclaimed Water Pump Station (3 MGD)	\$500,000	lump sum	1	\$500,000	\$500,000
Deep Injection Wells	\$5,000,000	per well, equipped	2	\$10,000,000	\$10,000,000
Monitoring Well	\$1,750,000	per well, equipped	1	\$1,750,000	\$1,750,000
Deep Injection Well Pump Station	\$2,000,000	lump sum	1	\$2,000,000	\$2,000,000
WAS Holding Tank	\$1.86	\$/MG tankage	323,136	\$601,033	\$610,000
Ops/Admin Building	\$200	\$/sf building	6,000	\$1,200,000	\$1,200,000
Maintenance/Shop	\$150	\$/sf building	16,000	\$2,400,000	\$2,400,000
Subtotal				\$54,389,749	\$54,390,000
Sitework, Yard Piping	10%			\$5,438,975	\$5,440,000
Electrical	15%			\$8,158,462	\$8,160,000
Instrumentation & Control	3%			\$1,631,692	\$1,640,000
Contractors OH&P, Gen. Conditions	25%			\$13,597,437	\$13,600,000
Contingency	30%			\$16,316,925	\$16,320,000
Total Construction Costs				\$99,533,241	\$99,540,000
Legal, Engineering and Administration	20%			\$19,906,648	\$19,910,000
Total Capital Costs				\$119,439,889	\$119,440,000

**Table 7-4: Conceptual Costs for Flow Rerouting Scenario 1 Probable Cost –
 MWRf Located at the SCL North County Site**

Item No.	Description	Quantity	Unit	Unit Price	Total
Item 2 - Site Construction					
Redirect Lift Stations:					
	FPUA and SLC LS	15	LS	\$75,000	\$1,125,000
	Master LS at Fairwinds, HPWRF and LPWRF	3	LS	\$150,000	\$450,000
	Master LS A	1	LS	\$500,000	\$500,000
New Lift Stations:					
	Master LS at IWRF	1	LS	\$1,500,000	\$1,500,000
Force Main Horizontal Directional Drill:					
	Canal 1 Crossing				
	16-inch	350	LF	\$425	\$148,750
	24-inch	350	LF	\$625	\$218,750
	Belcher Canal Crossing				
	16-inch	450	LF	\$425	\$191,250
	24-inch	450	LF	\$625	\$281,250
	Okeechobee Road				
	16-inch	650	LF	\$425	\$276,250
	24-inch	650	LF	\$625	\$406,250
	Ten Mile Creek				
	16-inch	350	LF	\$425	\$148,750
	Glades & FEC RR				
	16-inch	650	LF	\$425	\$276,250
Force Main:					
	4-inch	5,500	LF	\$76	\$418,000
	12-inch	4,500	LF	\$190	\$855,000
	16-inch	55,600	LF	\$209	\$11,620,400
	24-inch	28,400	LF	\$285	\$8,094,000
	Total				\$26,510,000

Table 7-5: SLC Decommissioning Costs

Item No.	Description	Quantity	Unit	Unit Price	Total
Lakewood WWTF					
	Aeration Basins	4	EA	\$11,000	\$44,000
	Rectangular Clarifier	1	EA	\$12,000	\$12,000
	Chlorine Contact Chamber	1	EA	\$9,000	\$9,000
	Aerobic Digester	1	EA	\$12,000	\$12,000
	Percolation Pond				
	Dewatering	65400	GAL	\$0.03	\$1,962
	Filling and Compact	1300	CY	\$15	\$19,500
	Restoration	1500	SY	\$9	\$13,500
	30% Contingency				\$33,589
	Total				\$146,000
Holiday Pines WWTF					
	Aerated EQ Basin	1	EA	\$18,000	\$18,000
	Aeration Tanks	2	EA	\$22,000	\$44,000
	Secondary Clarifier (1 square 1 round)	2	EA	\$20,000	\$40,000
	Tertiary Disk Filter	2	EA	\$22,000	\$44,000
	Chlorine Contact Basin	2	EA	\$17,000	\$34,000
	Aerated Sludge Holding Tank	1	EA	\$20,000	\$20,000
	Percolation ponds				
	Dewatering	1080000	GAL	\$0.03	\$32,400
	Filling and Compact	42500	CY	\$15	\$637,500
	Restoration	19500	SY	\$9	\$175,500
	30% Contingency				\$313,620
	Total				\$1,360,000
Fairwinds WWTF					
	Aeration Tank	1	EA	\$8,500	\$8,500
	Sludge Holding Tank	6	EA	\$6,500	\$39,000
	Surge Tank	2	EA	\$10,000	\$20,000
	Settling Tank	2	EA	\$9,000	\$18,000
	Filters	2	EA	\$8,000	\$16,000
	Chlorine Contact Basin	2	EA	\$7,000	\$14,000
	Percolation ponds				
	Dewatering	70000	GAL	\$0.03	\$2,100
	Filling and Compact	3500	CY	\$15	\$52,500
	Restoration	450	SY	\$9	\$4,050
	30% Contingency				\$52,245
	Total				\$227,000

Table 7-6: MWRf Conceptual Opinion of Probable Construction Cost – FPUA Treasure Coast Energy Center Site

Process	Unit Cost	Unit	MWRf Value	Cost	Rounded Cost
Influent Pump Station	\$0.25	\$/gal AA flow treated	8,000,000	\$2,000,000	\$2,000,000
Headworks	\$0.29	\$/gal treated	10,000,000	\$2,900,000	\$2,900,000
New Aeration Basins	\$2.59	\$/gal tankage	4,420,000	\$11,447,800	\$11,450,000
Blower Building	\$0.24	\$/gal AA flow treated	8,000,000	\$1,920,000	\$1,920,000
Secondary Clarifiers	\$180	\$/sf tankage	33,929	\$6,107,256	\$6,110,000
RAS Pump Station	\$0.21	\$/gal AA flow treated	8,000,000	\$1,680,000	\$1,680,000
Deep Bed Filters (will price cloth-disk for lower \$\$)	\$2,700	\$/sf tankage	2,660	\$7,182,000	\$7,190,000
Disinfection (Hypochlorite Storage/Feed)	\$0.05	\$/gal AA flow treated	8,000,000	\$400,000	\$400,000
Chlorine Contact Basins	\$1.86	\$/gal tankage	431,000	\$801,660	\$810,000
Reclaimed Water Storage Tank	\$0.50	\$/gal tankage	3,000,000	\$1,500,000	\$1,500,000
Reclaimed Water Pump Station (3 MGD)	\$500,000	lump sum	1	\$500,000	\$500,000
Deep Injection Well #3	\$5,000,000	lump sum	1	\$5,000,000	\$5,000,000
Deep Injection Well Pump Station	\$2,000,000	lump sum	1	\$2,000,000	\$2,000,000
WAS Holding Tank	\$1.86	\$/MG tankage	323,136	\$601,033	\$610,000
Ops/Admin Building	\$200	\$/sf building	6,000	\$1,200,000	\$1,200,000
Maintenance/Shop	\$150	\$/sf building	16,000	\$2,400,000	\$2,400,000
Subtotal				\$47,639,749	\$47,640,000
Sitework, Yard Piping	10%			\$4,763,975	\$4,770,000
Electrical	15%			\$7,145,962	\$7,150,000
Instrumentation & Control	3%			\$1,429,192	\$1,430,000
Contractors OH&P, Gen. Conditions	25%			\$11,909,937	\$11,910,000
Contingency	30%			\$14,291,925	\$14,300,000
Total Construction Costs				\$87,180,740	\$87,190,000
Legal, Engineering and Administration	20%			\$17,436,148	\$17,440,000
Total Capital Costs				\$104,616,888	\$104,620,000

Table 7-7: Scenario 2 Probable Cost – MWRP Located at the FPUA Treasure Coast Energy Center

Item No.	Description	Quantity	Unit	Unit Price	Total
Item 2 - Site Construction					
Redirect Lift Stations:					
	FPUA and SLC LS	15	LS	\$75,000	\$1,125,000
	Master LS at Fairwinds, HPWRF and LPWRF	3	LS	\$150,000	\$450,000
	Master LS A	1	LS	\$500,000	\$500,000
New Lift Stations:					
	Master LS at IWRF	1	LS	\$1,500,000	\$1,500,000
Force Main Horizontal Directional Drill:					
	Canal 1 Crossing				
	16-inch	350	LF	\$425	\$148,750
	24-inch	0	LF	\$625	\$0
	Belcher Canal Crossing				
	16-inch	450	LF	\$425	\$191,250
	24-inch	0	LF	\$625	\$0
	Okeechobee Road				
	16-inch	650	LF	\$425	\$276,250
	24-inch	650	LF	\$625	\$406,250
	Ten Mile Creek				
	16-inch	350	LF	\$425	\$148,750
	24-inch	450	LF	\$625	\$281,250
	Glades & FEC RR				
	16-inch	650	LF	\$425	\$276,250
	24-inch	650	LF	\$625	\$406,250
Force Main:					
	4-inch	5,500	LF	\$76	\$418,000
	12-inch	8,000	LF	\$190	\$1,520,000
	16-inch	55,600	LF	\$209	\$11,620,400
	24-inch	12,200	LF	\$285	\$3,477,000
	Total				\$22,746,000

Table 7-8: FPUA Decommissioning Costs

Item No.	Description	Quantity	Unit	Unit Price	Total
IWRF					
	Headworks/ Screening Structure	1	EA	\$25,000	\$25,000
	Grit Removal Structure	1	EA	\$20,000	\$20,000
	Aeration Basin	3	EA	\$85,000	\$255,000
	Clarifier	4	EA	\$45,000	\$180,000
	Recycle Pump Station	1	LS	\$11,000	\$11,000
	Chlorine Contact Basin	1	EA	\$49,000	\$49,000
	Polymer and Chlorine Systems	1	LS	\$18,000	\$18,000
	Plug and Abandon Deep Injection Well	1	LS	\$500,000	\$500,000
	Aerobic Digesters	4	EA	\$25,000	\$100,000
	DAF Thickeners	2	EA	\$18,000	\$36,000
	Digested Sludge Pump Station	1	LS	\$6,000	\$6,000
	Effluent Pump Station	1	LS	\$7,000	\$7,000
	Surge Tank	1	LS	\$8,000	\$8,000
	Caustic Feed System	1	LS	\$10,000	\$10,000
	Electrical Building	1	LS	\$60,000	\$60,000
	Blower Building	1	LS	\$50,000	\$50,000
	Office/Warehouse	1	LS	\$60,000	\$60,000
	Admin Bldg	1	LS	\$30,000	\$30,000
	Electrical Demo	1	LS	\$70,000	\$70,000
	Yard Piping Demo	1	LS	\$40,000	\$40,000
	Site Restoration	33000	SY	\$9	\$297,000
	30% Contingency				\$549,600.00
	Total				\$2,382,000

7.4 Summary

The total conceptual capital costs to relocate the IWRf to a mainland location at the SLC North County Site or the FPUA Treasure Coast Energy Center is \$150,065,000 and \$131,481,000, respectively. The primary difference in costs (approximately \$18.5 million) between the two locations for the MWRf relate to deep well injection of treated effluent. The FPUA site includes two existing deep injection wells and a monitoring well. IW-1 is for industrial use and cannot receive Domestic Wastewater. IW-2 is existing but will required a backup well for redundancy. The SLC site is a “Green Field” site that will require two injection wells and a monitoring well to be installed. Therefore, costs for the SLC option reflect two new deep injection wells and a new monitoring well. The costs for the FPUA site are based on the installation of only one additional injection well. There is a slightly higher capital costs associated with the installation of new piping and redirection of flows to the SLC North County Site. This is approximately \$3.5 million and is primarily due to the installation of additional 24-inch force main to transmit flow to the SLC North County Site. However, these overall conceptual costs are very comparable for each location. A more detailed analysis is recommended to determine the best location for the MWRf.

8. Impacts on Operation and Maintenance Costs

Table 8-1 presents a summary of annual costs incurred by FPUA and SLC in 2018 for operation and maintenance of their respective wastewater treatment facilities.

Table 8-1: Current FPUA/SLC O&M Costs

	IWRF	Fairwinds Golf Course WWTF	Lakewood Park WWTF	Holiday Pines WWTF	Total
Power	\$512,737	See Note 1	See Note 1	See Note 1	\$512,737
Labor	\$1,247,688	\$21,136	\$15,811	\$170,015	\$1,454,650
Maintenance Parts Replacement Costs	\$113,443	\$5,760	\$8,800	\$55,800	\$183,803
Chemical	\$96,887	See Note 1	See Note 1	See Note 1	\$96,887
Administrative/ Legal Procurement	\$55,145	-	-	-	\$55,145
Sludge	\$456,943	\$1,000	\$5,000	\$35,000	\$497,943
Other	\$54,431	-	-	-	\$54,431
Total Annual Cost	\$2,537,274	\$27,896	\$29,611	\$260,815	\$2,855,596
Permitted Capacity, MGD	10.00	0.02	0.02	0.21	10.25
Treated Flow, MGD	4.31	0.03	0.02	0.12	4.47
Treated Flow, MGY	1,573	9	7	42	1,631
Cost, \$/ MG Treated	\$1,613	\$3,057	\$4,182	\$6,214	\$1,750

Note 1: Labor" cost for the three SLC plants are contract operating costs that include power and chemicals

Table 8-2 presents a comparison of annual O&M costs for the FPUA IWRF and three similarly sized Florida facilities, as well as a projection of O&M costs for the proposed MWRf. Costs are presented for major O&M categories in terms of total annual costs and unit costs per million gallons treated or unit costs per million gallons of treatment capacity, as applicable. The proposed MWRf is similar to the existing IWRF in terms of capacity, physical size and treatment facilities. The only fundamental components proposed for the MWRf that do not exist at the IWRF are deep-bed filters and reclaimed water storage/pumping. Those new facilities should not require additional operations staff, as they are an extension of the liquid stream process and are generally monitored by staff that monitors the overall facility. The far-right column in Table 8-2 provides the basis for MWRf cost projections for each of the main unit O&M cost categories. Due to the similarities between the existing IWRF and the proposed MWRf, current IWRF unit costs are used for projected MWRf unit costs for all categories except power and chemicals. It is assumed that the proposed MWRf will utilize more energy-efficient aeration, pumping and electrical power distribution equipment than what exist at IWRF, thus reducing power costs by at least 10%. It is also assumed that the addition of high-level disinfection at MWRf for reclaimed water distribution and supply of cooling water at the Energy Center will increase chemical costs. On balance, projected O&M unit costs for the proposed MWRf are slightly less than current O&M costs at the IWRF.

Table 8-2: Projected O&M Costs for Proposed MWRf

	FPUA IWRF (2018)	Plant City (2018)	Winter Haven (2018)	Boca Raton (2019)	Average of IWRF and References	MWRf Projections (2025)	Basis of MWRf Projections
Permitted Capacity							
MGD	10.00	10.00	7.50	17.50	11.25	8.00	Based on Chapter 6 design criteria
MGY	3,650	3,650	2,738	6,388	4,106	2,920	
Treated Flow							
MGD	4.31	4.80	4.50	12.30	6.48	5.59	Based on Chapter 4 flow projections for Year 2025
MGY	1,573	1,752	1,643	4,490	2,364	2,040	
Power							
Annual Cost	\$512,737	\$658,000	\$400,000	\$1,013,000	\$645,934	\$612,105	
Cost/MG (treated)	\$326	\$376	\$244	\$226	\$293	\$300	10% reduction from IWRF based on more efficient equipment
Labor							
Annual Cost	\$1,247,688	\$776,000	\$1,068,527	\$1,420,000	\$1,128,054	\$1,247,688	Current IWRF costs
Cost/MG (capacity)	\$342	\$213	\$390	\$222	\$292	\$427	
Maintenance Parts Replacement Costs							
Annual Cost	\$113,443	\$64,691	\$976,308	\$775,700	\$482,536	\$90,754	
Cost/MG (capacity)	\$31	\$18	\$357	\$121	\$132	\$31	Current IWRF costs
Chemical							
Annual Cost	\$96,887	\$202,350	\$350,000	\$947,340	\$399,144	\$235,653	
Cost/MG (treated)	\$62	\$115	\$213	\$211	\$150	\$115	Increased from IWRF costs to provide high-level disinfection
Administrative/ Legal Procurement							
Annual Cost	\$55,145	\$70,538	\$29,732	\$47,000	\$50,604	\$30,826	
Cost/MG (capacity)	\$15	\$19	\$11	\$7	\$13	\$15	Current IWRF costs
Sludge							
Annual Cost	\$456,943	\$500,000	\$300,000	\$1,172,220	\$607,291	\$592,648	
Cost/MG (treated)	\$290	\$285	\$183	\$261	\$255	\$290	Current IWRF costs
Other							
Annual Cost	\$54,431	\$171,887	\$198,150	\$0	\$106,117	\$70,596	
Cost/MG (treated)	\$35	\$98	\$121	\$0	\$63	\$35	Current IWRF costs
Total, \$							
Annual Cost	\$2,537,274	\$2,443,466	\$3,322,717	\$5,375,260	\$3,419,679	\$2,880,271	
Cost/MG (treated)	\$1,613	\$1,395	\$2,023	\$1,197	\$1,557	\$1,412	

The following observations are based on a comparison of unit O&M costs for IWRF and the reference facilities:

1. IWRF unit power costs (\$/MG treated) are within the range of unit power costs from reference facilities.
2. IWRF labor costs are at the high end of unit labor costs from reference facilities.
3. IWRF maintenance part replacement costs are at the low end of unit costs for reference facilities. AWWA benchmarking data indicates that the average utility investment in capital renewal and replacement is approximately 1.5%/year of total plant asset value.
4. IWRF chemical costs are significantly lower than unit chemical costs for reference facilities; this may be attributed to the fact that IWRF disposes effluent to deep injection wells that require lower chlorine dosages than for facilities treating to high-level disinfection standards for reclaimed water distribution.
5. IWRF unit costs for administration, sludge disposal and other categories are within the range of costs from reference facilities.

Table 8-3 presents a side-by-side comparison of total O&M costs at the FPUA IWRF and SLC facilities with projected O&M costs for the proposed MWRF. The first column presents O&M costs for existing FPUA/SLC facilities based on Year 2018 flows. The second cost column adjusts O&M costs for existing FPUA/SLC facilities to projected Year 2025 flows (to reflect flow conditions when the proposed MWRF would be placed into service). The third cost column presents projected O&M costs for the proposed MWRF at the same Year 2025 projected flows.

Table 8-3: Comparison of Current FPUA/SLC O&M Costs to Proposed MWRf O&M Cost

	Combined O&M Costs for I WRF and SLC Facilities (Year 2018 Flows)	Combined O&M Costs for IWRf and SLC Facilities (Year 2025 Flows)	Projected O&M Costs for Proposed MWRf (Year 2025 Flows)
Power	\$512,737	\$641,294	\$612,105
Labor	\$1,454,650	\$1,454,650	\$1,247,688
Maintenance parts replacement costs	\$183,803	\$183,803	\$90,754
Chemical	\$96,887	\$121,179	\$235,653
Administrative/ Legal Procurement	\$55,145	\$55,145	\$30,826
Sludge	\$497,943	\$622,791	\$592,648
Other	\$54,431	\$68,078	\$70,596
Total Annual Cost	\$2,855,596	\$3,146,940	\$2,880,271
Permitted Capacity, MGD	10.25	8.00	8.00
Treated Flow, MGD	4.47	5.59	5.59
Treated Flow, MGY	1,631	2,040	2,040
Cost, \$/ MG Treated	\$1,750	\$1,542	\$1,412

Based on the results presented in **Table 8-3**, the projected unit O&M costs (costs per million gallons treated) for the proposed MWRF would be approximately 10% lower than the combined O&M unit costs for the FPUA IWRF and the three SLC package plants, based on a comparison at projected Year 2025 flows. The projected reduction in unit O&M costs would be due to consolidation of operating labor to a single facility and increased energy efficiency inherent with a new facility using state-of-the-art process equipment, electrical power distribution equipment and automated controls.

Fort Pierce Utilities Authority and St. Lucie County Utilities

Wastewater Plant Relocation Conceptual Analysis

Evaluation of Preliminary Incremental Operating and Debt Service Costs

Draft 3 - Prepared on December 16, 2020



Study Tasks

- Identify the conceptual project schedule to design and construct the proposed 8.0 MGD Mainland Water Reclamation Facility (MWRF) at the Treasure Coast Energy Center (TCEC) location
- Estimate the preliminary capital costs over the project schedule, including an allowance for construction cost inflation
- Work with the County's Financial Advisor to develop a projection of future debt service payments
- Evaluate the existing operating and maintenance costs for FPUA and SLCU and estimate the preliminary operating expenses of the proposed MWRF



Study Tasks (cont.)

- Develop a preliminary allocation of projected operating expenses and debt service costs between FPUA and SLCU
- Develop a preliminary estimate of the revenue need during the first year of operation (FY2027 or the “Test Year”) to fund the estimated incremental expenditures



Agreed Upon Assumptions

- The analysis estimates the results of a cost-sharing arrangement to allocate the direct treatment-related expenditures
- The projected capital and associated debt service costs are assumed to be allocated based on a 70%/30% split or approximately 5.6 MGD for FPUA and 2.4 MGD for SLCU
- The analysis is limited to the estimated incremental increase in direct operating expenses of wastewater treatment needs plus the project-related debt service payments for the Test Year
 - > Excludes any analysis of operating expenses associated with operating and maintaining the collection system for each utility or any other non-wastewater treatment related expenditures
 - > Excludes any costs of governance and other administrative costs associated with any cost-sharing agreement



Agreed Upon Assumptions (cont.)

- Effluent disposal is assumed to be by deep injection well; no potential reclaimed water costs or any associated future revenues were considered
- Incremental revenue from future customer growth was not considered since timing and amount of new customers and the associated infrastructure needs are not known
- Analysis limited to estimating incremental change in proposed MWRf wastewater treatment-related operating and debt service costs when compared to Like-kind Costs recovered in existing retail wastewater revenues
- Analysis did not evaluate the adequacy of either utility's existing water and/or wastewater rates to meet the retail customer expenditure and funding requirements (i.e., non-wastewater treatment costs)



Summary of Estimated Capital Costs

Projected MWRP Capital Costs	
Description	Amount (Millions)
Total Project Costs – Current Dollars ^[1]	\$131.5
Conceptual Project Schedule ^[2]	
FY21 – Develop Interlocal Agreement	N/A
FY22 – Planning and Design (10%)	\$13.9
FY23 – Planning and Design (10%)	\$14.5
FY24 – Construction (30%)	\$44.5
FY25 – Construction (30%)	\$45.7
FY26 – Construction (20%)	<u>\$31.4</u>
Total Project Costs – Future Dollars ^[2]	\$150.0
<p>^[1] Amount reflects the estimated costs (in today's dollars) as provided in the May 2020 (Draft) Engineering Report prepared by Hazen and Sawyer, which includes the plant and collection system related capital costs of the MWRP and the additional costs to decommission the existing plants.</p> <p>^[2] Conceptual project schedule provided by FPUA and SLCU staff, and the project costs were allocated over the period and increased by a 3% annual allowance for construction inflation based on the historical annual average increase in the Engineering News Construction (ENR) Index.</p>	



Estimated Financing Assumptions

- The County's Financial Advisor, PFM Financial Advisors, LLC (PFM), developed a conceptual financing scenario
- Plan included combining low interest rate loans from the Florida State Revolving Fund (SRF) Loan Program and the Water Infrastructure Finance and Innovation Act (WIFIA) Program
 - > Projected loan payments are assumed begin FY2027 (the "Test Year") once construction completed
 - > Capitalized interest costs during the construction are estimated at \$6.0 million which increased the total principal amount of project to \$156 million
 - > The annual interest rate for the Financing was assumed to be 1.5% per year
 - The SRF Loan (51% of project) is assumed to be repaid over 20-years
 - The WIFIA Loan (49% of project) is assumed to be strategically negotiated to structure the principal and interest payments around the projected SRF Loan to provide level annual payments through Fiscal Year 2061 (over 35-years)

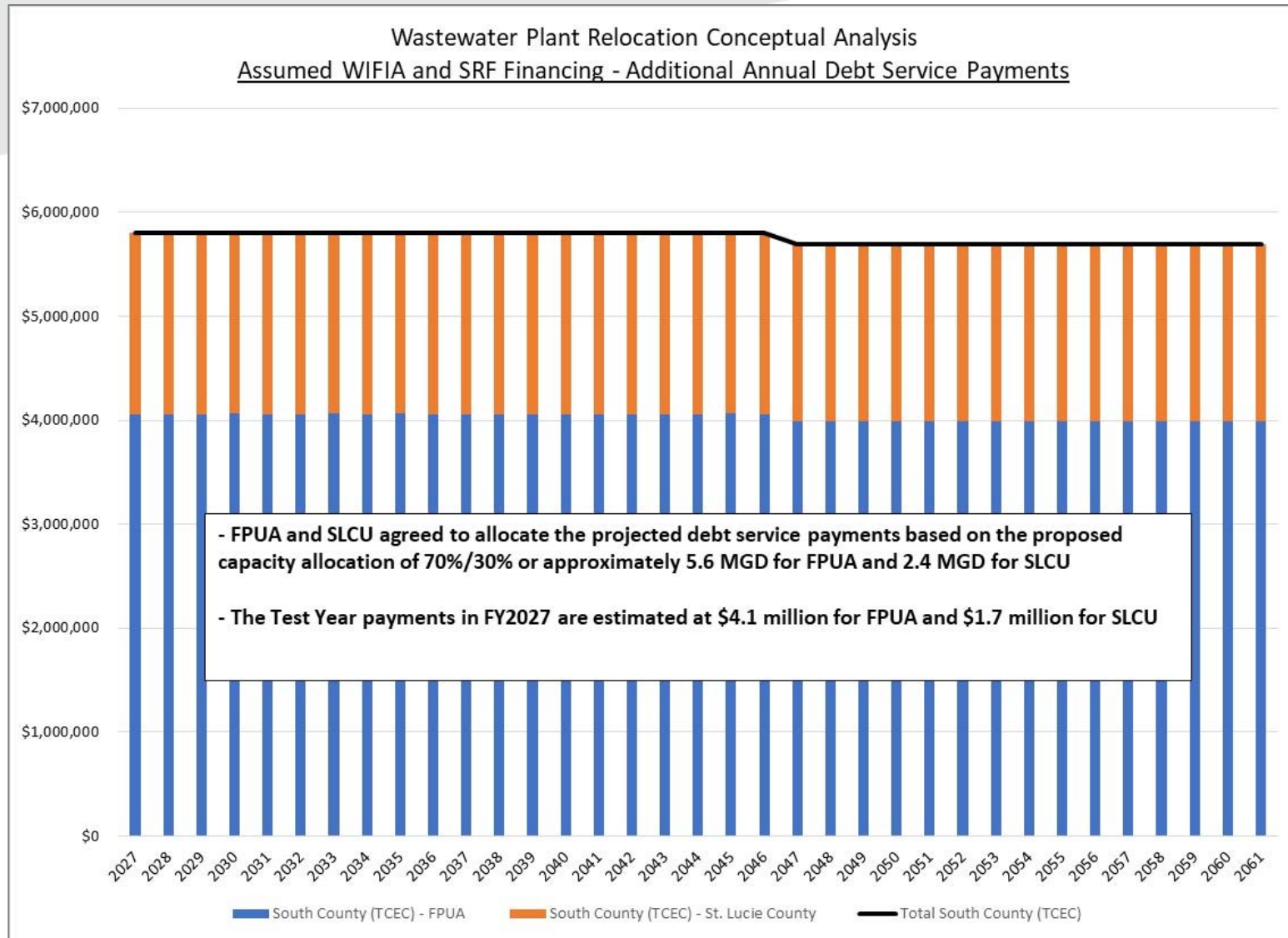


Estimated Financing Assumptions (cont.)

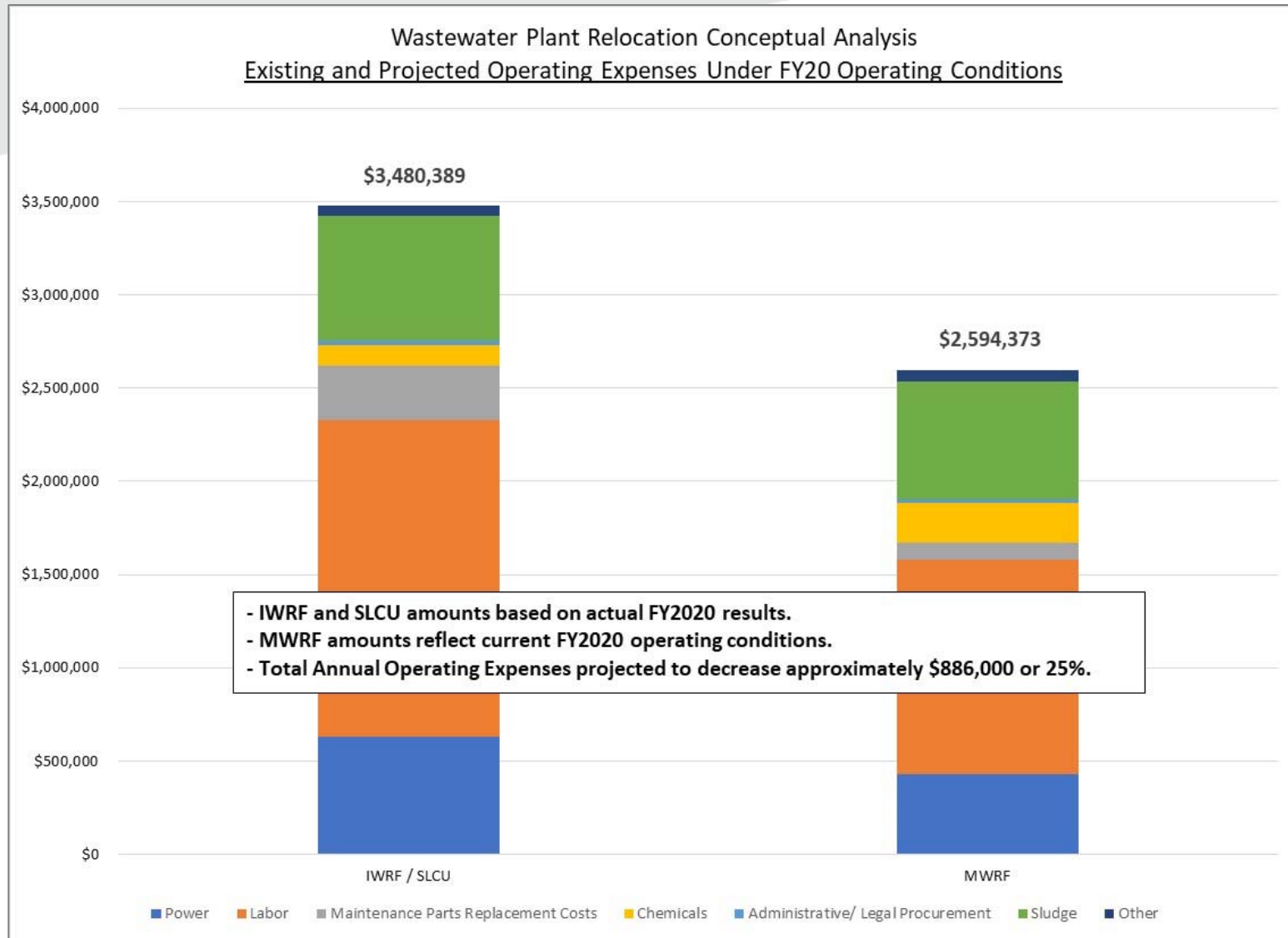
- PFM and Raftelis provide no assurances that the proposed project will be eligible for WIFIA/SRF funding or that the amount of funding will be available during the project schedule
 - > For comparative purposes, PFM also provided an additional financing scenario based on revenue bonds
 - > Resulted in increased debt service payments of 70% or approximately \$4.0 million more per year when compared to the WIFIA/SRF alternative



Projected Debt Service Payments



Existing and Projected Operating Expenses

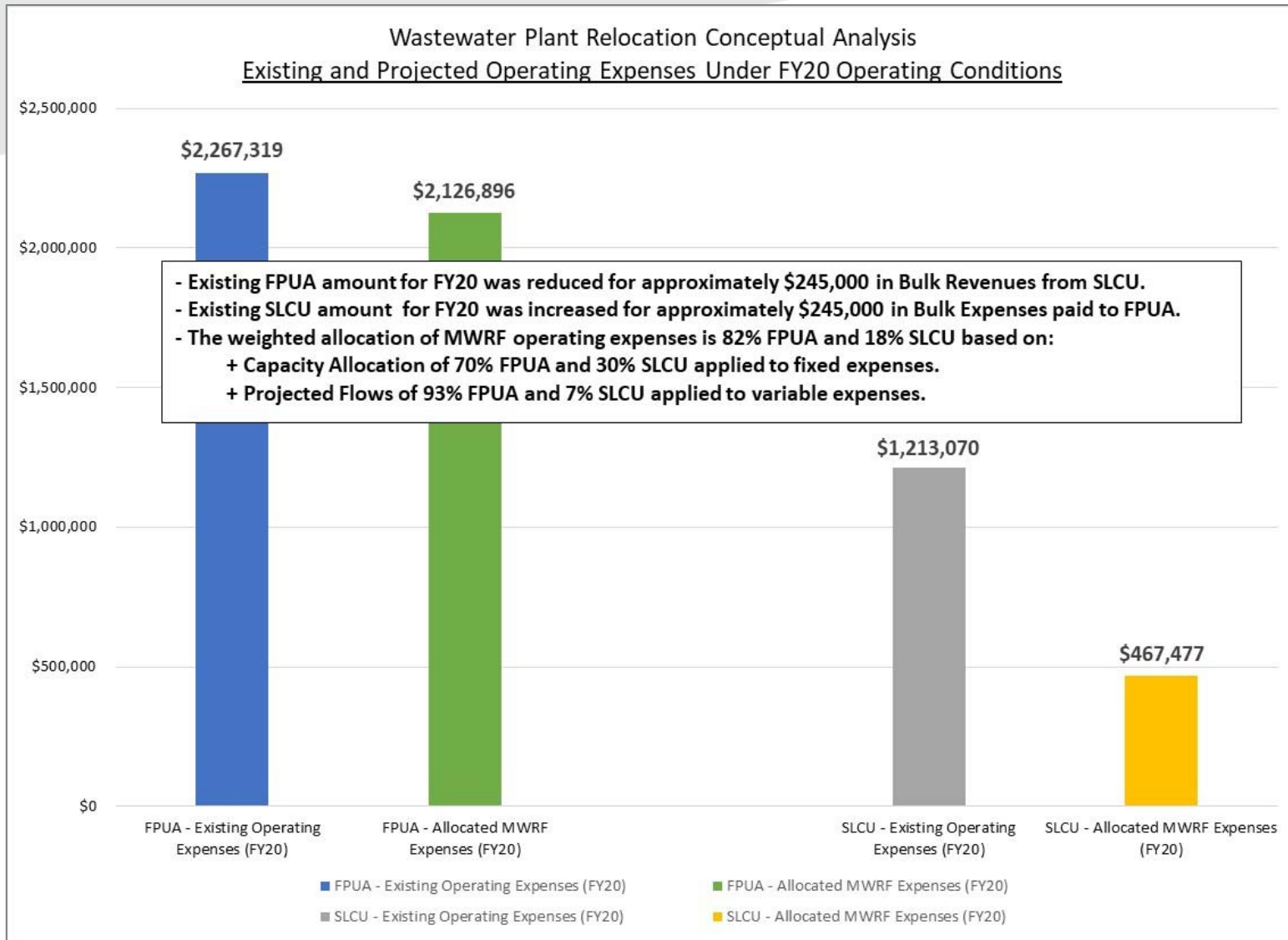


Allocation of Operating Expenses

- Based on a review of the direct wastewater treatment expenses under the proposed MWRf operation:
 - > The fixed operating expenses associated with labor & benefits and repairs & maintenance costs were apportioned based on the proposed capacity allocation or 70% FPUA and 30% SLCU
 - > The remaining variable expenses were apportioned based on the projected annual average wastewater flows contributed by each party or approximately 93% FPUA and 7% SLCU
 - Wastewater flows for each entity were adjusted to account for the SLCU bulk wastewater flows currently treated at the IWRF
 - Flow relationships will change based on new development, any inflow / infiltration reduction programs, conservation, and other factors
 - > The weighted average allocation of total operating expenses resulted in the following apportionment:
 - 82% FPUA / 18% SLCU



Allocation of Operating Expenses



Summary of Test Year Adjustments

- The first year of plant operation was assumed to be FY2027
- Operating expenses were projected from FY2020 levels to FY2027 based on each major treatment expense category, which resulted in an annual average increase of approximately 2.8% per year
- Based on the additional debt service payments allocated between the parties, a 35% debt service coverage allowance was added to the projected annual costs to meet minimum debt service coverage requirements, capital re-investment, and to provide working capital
- Adjustments were made to account for the elimination of the existing bulk wastewater service between FPUA and SLCU and to reapportion miscellaneous treatment plant income between the parties



Summary of Test Year Adjustments (cont.)

- Miscellaneous treatment plant income at the proposed MWRF was apportioned based on the proposed capacity allocation of 70% FPUA and 30% SLCU and was assumed to include:
 - > FMPA Cooling Tower Revenues - \$1.1 million (new)
 - > Leachate Revenues - \$600,000 (up from \$125,000)
 - > Strong Waste Charges & Industrial Permits - \$80,000 (existing)
 - > Septage Hauling Revenues - \$40,000 (existing)



Incremental Impact Statement - FPUA

Description	Projected Increase in Wastewater Treatment Costs		
	<u>Existing FY20</u>	<u>Proposed MWRF FY27</u>	<u>Net Increase (Decrease)</u>
FPUA Allocated Costs			
Existing IWRF Expenses	\$2,513,172	\$0	(\$2,513,172)
Proposed MWRF Expenses	0	2,570,402	2,570,402
Proposed MWRF Debt Service	0	4,060,000	4,060,000
Debt Service Coverage Allowance	0	1,421,000	1,421,000
Adjustment – Bulk Sales to SLCU	(245,853)	0	245,853
Adjustment – Treatment Plant Income	<u>(204,842)</u>	<u>(1,267,257)</u>	<u>(1,062,415)</u>
Total Annual Cost	\$2,062,477	\$6,784,145	\$4,721,668
Existing Wastewater Retail Revenues			\$12,489,070
Projected Cumulative Wastewater Revenue Need			37.8%
Projected Annual Wastewater Revenue Increase FY22-27			5.5%
Existing Water and Wastewater Retail Revenues			\$29,059,410
Projected Cumulative Water and Wastewater Revenue Need			16.2%
Projected Annual Water and Wastewater Revenue Increase FY22-27			2.5%
<small>[*] For identification of major study assumptions and disclosures, please refer to Rafielis' presentation dated December 16, 2020.</small>			



Incremental Impact Statement - SLCU

Description	Projected Increase in Wastewater Treatment Costs		
	<u>Existing FY20</u>	<u>Proposed MWRF FY27</u>	<u>Net Increase (Decrease)</u>
SLCU Allocated Costs			
Existing WWTP Expenses	\$967,217	\$0	(\$967,217)
Proposed MWRF Expenses	0	571,519	571,519
Proposed MWRF Debt Service	0	1,740,000	1,740,000
Debt Service Coverage Allowance	0	609,000	609,000
Adjustment – Bulk Expenses to FPUA	245,853	0	(245,853)
Adjustment – Treatment Plant Income	<u>(37,250)</u>	<u>(543,110)</u>	<u>(505,860)</u>
Total Annual Cost	\$1,175,820	\$2,377,409	\$1,201,589
Existing Wastewater Retail Revenues			\$5,307,240
Projected Cumulative Wastewater Revenue Need			22.6%
Projected Annual Wastewater Revenue Increase FY22-27			3.5%
Existing Water and Wastewater Retail Revenues			\$8,982,214
Projected Cumulative Water and Wastewater Revenue Need			13.4%
Projected Annual Water and Wastewater Revenue Increase FY22-27			2.1%
<p><small>[*] For identification of major study assumptions and disclosures, please refer to Rafelis' presentation dated December 16, 2020.</small></p>			



Conceptual Analysis
**Phase-in of Projected Revenue Needs and
Resulting Estimated MWRF Escrow Balance**



Summary of Major Assumptions / Amounts Available for Escrow

- The cost analysis is limited to the estimated incremental increase in direct operating expenses of wastewater treatment needs plus the project-related debt service payments for the Test Year
 - > Excludes any analysis of operating expenses associated with operating and maintaining the collection system for each utility or any other non-wastewater treatment related expenditures
 - > Excludes any costs of governance and other administrative costs associated with any cost-sharing agreement
- Analysis estimates a cumulative annual cost increase of \$4.7 million for FPUA and \$1.2 million for SLCU by FY2027 to only meet the estimated operating and debt service costs of the MWRF
 - > Projected cost increases may be phased in based on annual revenue adjustments applied to either the wastewater revenues or the combined water and wastewater revenues at the option of the parties



Summary of Major Assumptions / Amounts Available for Escrow (cont.)

- The projected revenue needs were assumed to be phased in from FY2022 to FY2027
 - > FPUA:
 - Applied Wastewater Revenues Only: 5.5% per year for a combined increase of \$16.93 for the existing residential customer (based on 5,000 monthly gallons) or an average monthly increase of \$2.82 per month per year
 - Applied Water and Wastewater Revenues: 2.5% per year for a combined increase of \$12.76 for the existing residential customer (based on 5,000 monthly gallons) or an average monthly increase of \$2.13 per month per year
 - > SLCU:
 - Applied Wastewater Revenues Only: 3.5% per year for a combined increase of \$14.60 for the existing residential customer (based on 5,000 monthly gallons) or an average monthly increase of \$2.43 per month per year
 - Applied Water and Wastewater Revenues: 2.1% per year for a combined increase of \$14.52 for the existing residential customer (based on 5,000 monthly gallons) or an average monthly increase of \$2.42 per month per year
 - > Either cost recovery approach achieves similar financial results, but customer bills will vary based on the utility services being received and each customer's actual water use billed

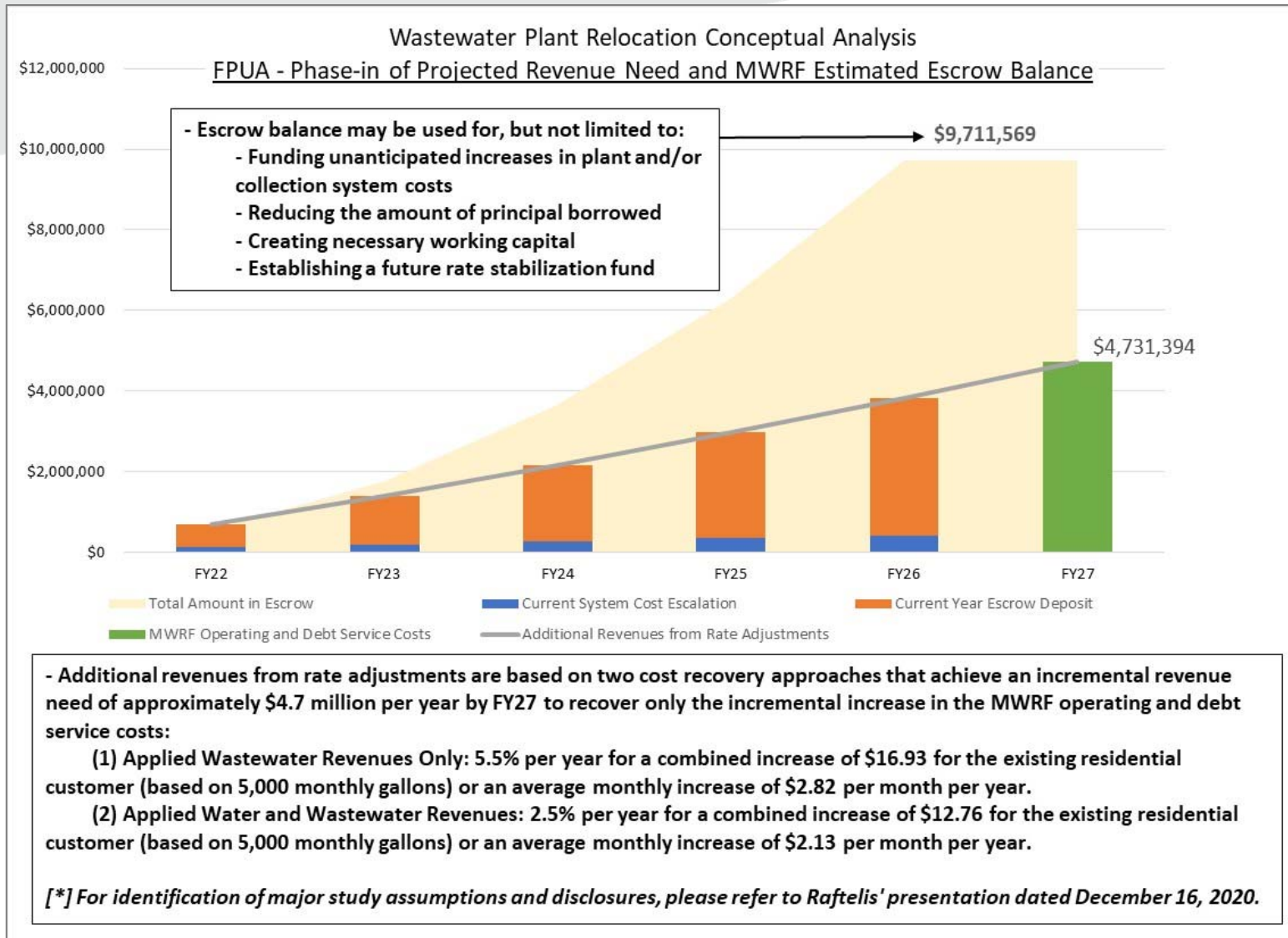


Summary of Major Assumptions / Amounts Available for Escrow (cont.)

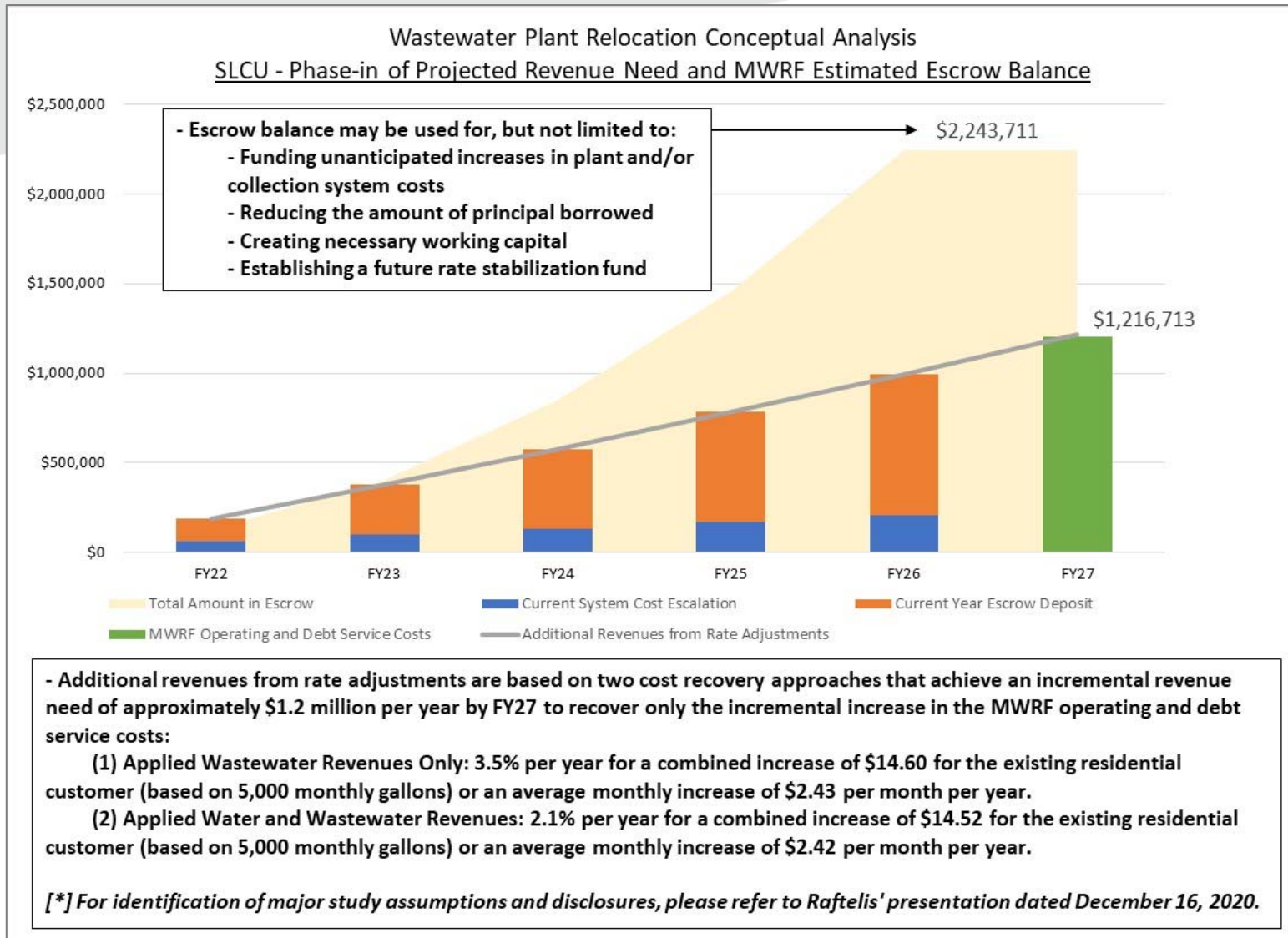
- The additional revenues derived from projected revenue adjustments were first allocated to projected increases in existing wastewater treatment-related operating expenses associated with FPUA's IWRP and SLCU's mainland wastewater plants
- The amount of additional revenues above the current system projected wastewater treatment operating expenses was assumed to be available for escrow
 - › The estimated escrow balances may be used for, but not limited to:
 - Funding unanticipated increases in plant and/or collection system capital costs
 - Reducing the amount of principal borrowed
 - Creating necessary working capital
 - Establishing a future rate stabilization fund
- FPUA and SLCU should consider initiating a comprehensive water and wastewater rate study to identify any additional utility rate adjustments that may be necessary to meet the needs of the wastewater collection system and any other non-wastewater treatment-related expenditure over the projection period (through FY2027)



Projected Phase-in of FPUA Revenue Needs



Projected Phase-in of SLCU Revenue Needs



Summary of Observations and Conclusions

- FPUA and SLCU propose designing and constructing an 8.0 MGD Mainland Water Reclamation Facility that will replace the existing IWRF and three mainland County plants
- The parties have developed an initial project schedule that places the proposed MWRF into operation in FY2027
- The conceptual project cost of \$131.5 million may require financing of up to \$156 million after providing an allowance for construction inflation and estimated capitalized interest costs over the construction period
 - › The project-related debt service costs and any other capacity-related operating expenses and/or revenues are proposed to be allocated 70% FPUA and 30% SLCU
- When considering the preliminary operating expenses of the MWRF, the weighted average allocation of operating expenses were 82% FPUA and 18% SLCU



Summary of Observations and Conclusions (cont.)

- The preliminary incremental increase in wastewater treatment-related operating expenses and debt service costs by FY2027 are approximately \$4.7 million (FPUA) and \$1.2 million (SLCU)
 - Each party has flexibility in addressing a cost recovery strategy that meets the needs of each system
 - FPUA’s projected revenue needs may be met by increasing water and wastewater revenues by approximately 2.5% per year from FY2022-2027 above any other system-wide revenue requirements
 - SLCU’s projected revenue needs may be met by increasing water and wastewater revenues by approximately 2.1% per year from FY2022-2027 above any other system-wide revenue requirements
- The projected MWRF operating expenses and debt service costs do not include any collection system operating expenses, or any costs of governance or administrative costs associated with any service agreement



Summary of Observations and Conclusions (cont.)

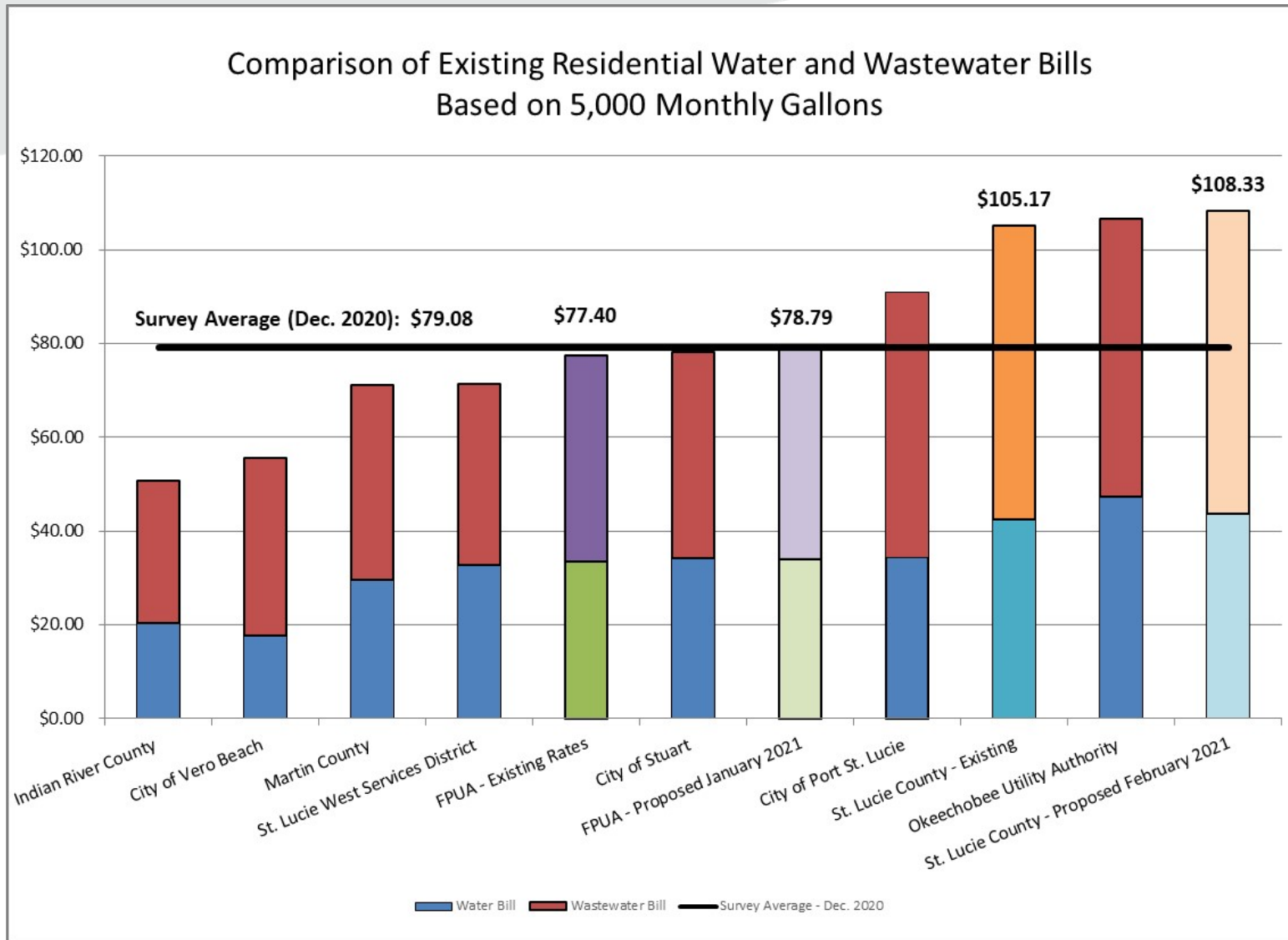
- The next steps in the planning process may include:
 - › Developing an interlocal agreement between the parties
 - › Initiating a comprehensive wastewater master planning project to update the conceptual project costs
 - This should include a hydraulic analysis of the combined collection systems and proposed transmission routes
 - › Preparing a comprehensive water and wastewater rate and impact fee study to evaluate the adequacy of rates and charges system-wide and to begin phasing in projected cost increases
 - Phasing in the projected rate adjustments over time may help to minimize cost increases to customers while providing the ability to escrow funds to:
 - Fund unanticipated increases in plant and/or collection system capital costs
 - Reduce the amount of principal borrowed
 - Create necessary working capital
 - Establish a future rate stabilization fund



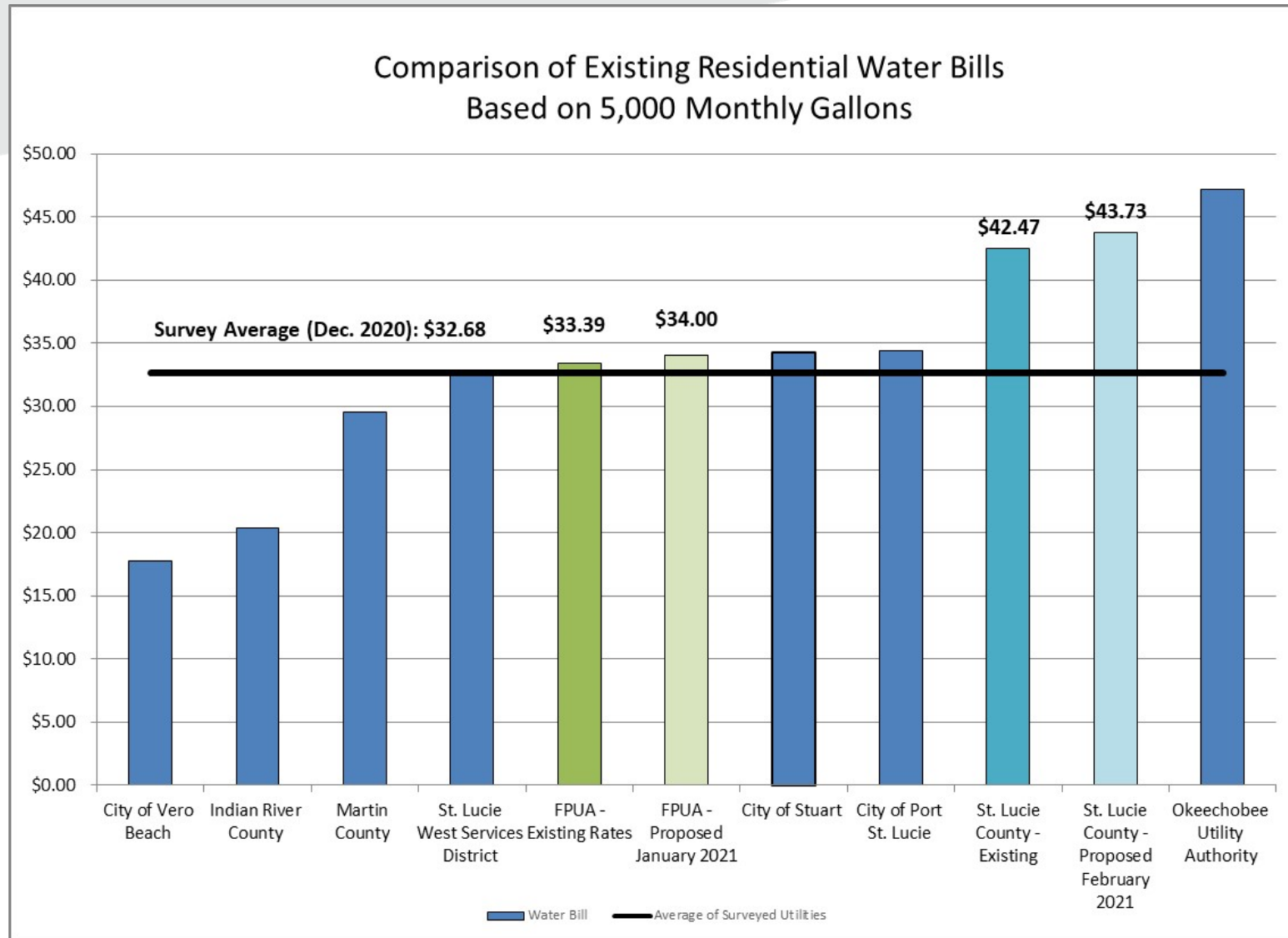
Supplemental Slides



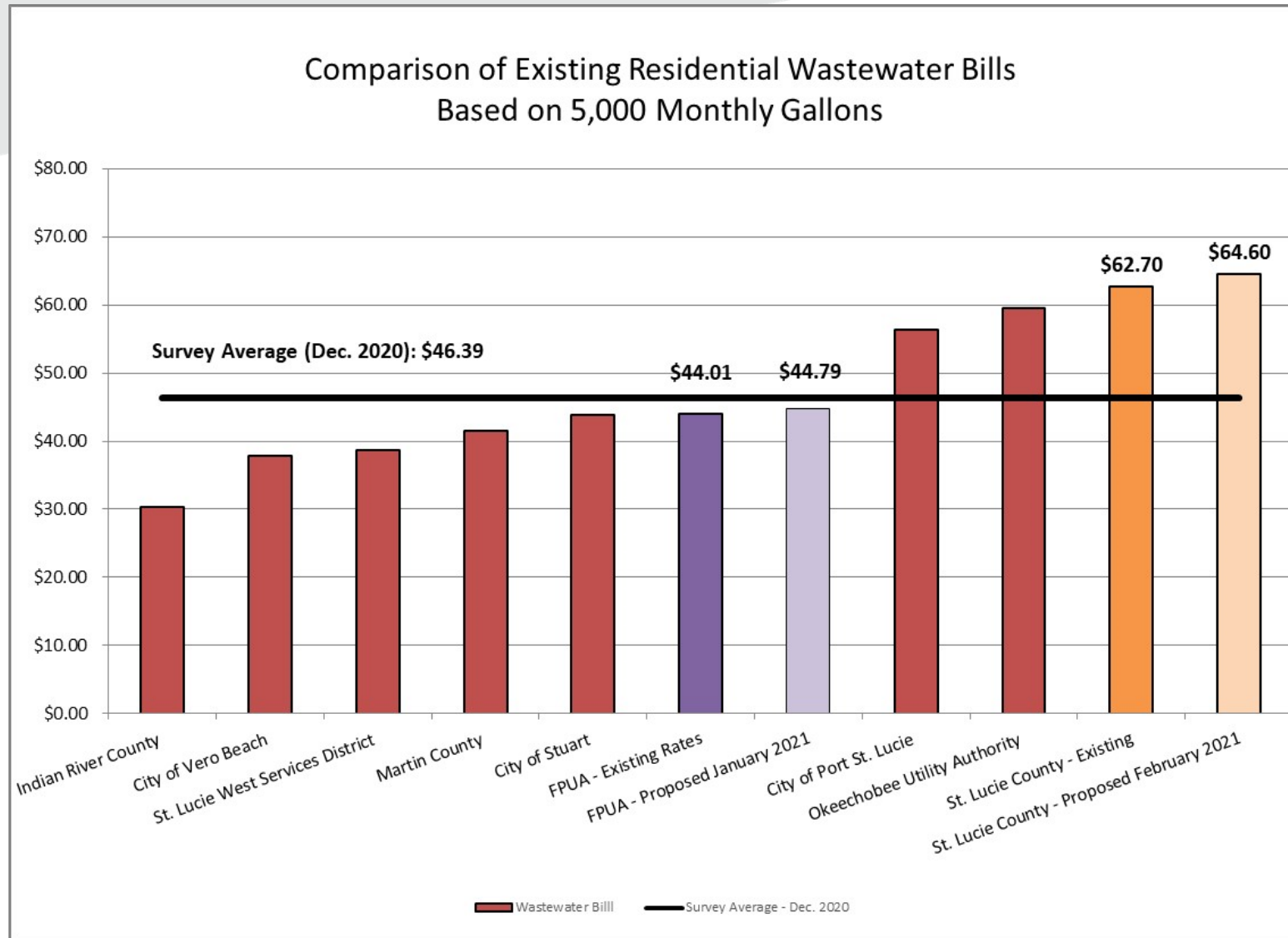
Comparison of Existing Water and Wastewater Bills



Comparison of Existing Water Bills



Comparison of Existing Wastewater Bills



Supporting Study Tables



Wastewater Plant Relocation Conceptual Analysis
Evaluation of Incremental Operating and Debt Service Costs

List of Tables and Charts

Table No.	Description
1	Summary of Capacity Costs - Current Values (FY20)
2	Summary of Estimated Project Schedule - Future Value of Capacity Costs
3	Summary of Estimated Debt Service Payments - Option 1 (Assumed Bond Financing)
4	Summary of Estimated Debt Service Payments - Option 2 (Assumed WIFIA / SRF Financing)
5	Summary of Financing Options - Allocated Debt Service Payments (Options #1 and #2)
6	Summary of Actual Wastewater Treatment Operating Expenses
7	Comparison of Existing and Projected Operating Expenses Under Current Operating Conditions
8	Summary of Projected Wastewater Treatment Operating Expenses
9	Summary of Projected Escalation Factors
10	Summary of Projected Test Year Analysis - Option #1 (Assumed Bond Financing)
11	Summary of Projected Test Year Analysis - Option #2 (Assumed WIFIA / SRF Financing)

Table 1
Wastewater Plant Relocation Conceptual Analysis
Summary of Capacity Costs - Current Values (FY20)

Line No.	Description	Basis	South County / FPUA (Treasure Coast Energy Center)
Summary of Project Costs [1]			
Cost of New Facilities			
1	MWRF Construction Costs		\$104,620,000
2	Collection System / Routing		22,746,000
3	Total Cost of New Facilities		\$127,366,000
Decommission Costs			
4	Decommission IWRP Site		\$2,382,000
5	Decommission 3 St. Lucie County Plants		1,733,000
6	Total Decommission Costs		\$4,115,000
7	Total Project Cost - Current Dollars		\$131,481,000
Less Grants and Other Funding Sources			
8	Grants (If any)		\$0
9	Other Funding Sources		0
10	Total Grants and Other Funding Sources		\$0
11	Total Project Costs to be Financed - Current Dollars		\$131,481,000
Summary of Capacity Allocation [2]			
12	FPUA - MGD	70.0%	5.600
13	SLCU - MGD	30.0%	2.400
14	Total	100.0%	8.000
Allocation of Project Costs			
FPUA			
15	Direct Assign - Decommission Costs [3]	Input	\$2,382,000
16	Direct Assign - Collection System Costs [4]	Input	0
17	Allocation of Sunk Costs [4]	Input	0
18	Capacity Allocation	70.0%	89,156,200
19	Total Allocated to FPUA - \$		\$91,538,200
20	Total Allocated to FPUA - %		70.0%
SLCU			
21	Direct Assign - Decommission Costs [3]	Input	\$1,733,000
22	Direct Assign - Collection System Costs [4]	Input	0
23	Allocation of Sunk Costs [4]	Input	0
24	Capacity Allocation	30.0%	38,209,800
25	Total Allocated to County - \$		\$39,942,800
26	Total Allocated to County - %		30.0%
27	Total Costs - %		\$131,481,000
28	Total Costs - \$		100.0%

Footnotes:

- [1] Amounts reflect estimated costs (in today's dollars) as provided in the draft study report prepared May 2020.
- [2] Capacity allocations based on discussions between FPUA and County staff.
- [3] Amount reflects directly assigned decommission costs to each party.
- [4] No adjustments were made for directly assignable collection system costs (if any) or existing "sunk" costs. Sunk costs could include the costs of existing assets and facilities that may serve the proposed joint project.

Table 2
Wastewater Plant Relocation Conceptual Analysis

Summary of Estimated Project Schedule - Future Value of Capacity Costs

Line No.	Description	Basis	South County / FPUA (Treasure Coast Energy Center)
Summary of Project Schedule			
1	Total Project Cost - Current Dollars [1]		\$131,481,000
2	FY21 - Develop Interlocal Agreement		
3	FY22 - Planning / Design	10%	\$13,148,100
4	FY23 - Planning / Design	10%	\$13,148,100
5	FY24 - Construction	30%	\$39,444,300
6	FY25 - Construction	30%	\$39,444,300
7	FY26 - Construction	20%	\$26,296,200
8	FY21	1.03	
9	FY22	1.03	\$13,948,819
10	FY23	1.03	\$14,367,284
11	FY24	1.03	\$44,394,907
12	FY25	1.03	\$45,726,754
13	FY26	1.03	\$31,399,038
14	Total Project Cost - Future Dollars		\$149,836,803
15	Total Project Cost - Future Dollars (Rounded)		\$150,000,000
16	Weighted Average Factor [2]		1.140

Footnotes:

[1] Amounts reflect estimated costs (in today's dollars) as provided in the draft study report prepared May 2020.

[2] Cumulative inflation adjustment estimated at 3% per year based on the historical annual average increase in the Engineering News Record (ENR) Index as follows:

5 - Year	2.70%
10 - Year	2.67%
20 - Year	3.12%

**Table 3
Wastewater Plant Relocation Conceptual Analysis**

Summary of Estimated Debt Service Payments - Option 1 (Assumed Bond Financing)

Traditional Public Bonds [1]

Amount 150,000,000
Assumed Rate 3.50%
Issuance Date 1/1/2021
Term 35 Years

Assumes Capitalized Interest for 5 Years [2]

Traditional Public Bonds				Estimated Allocation of Bond Payments			
Period Ending	Principal	Interest	Debt Service	Period Ending	FPUA	SLCU	Total Debt Service
1/1/2022	-	-	-		70%	30%	100%
1/1/2023	-	-	-				
1/1/2024	-	-	-				
1/1/2025	-	-	-				
1/1/2026	-	-	-				
1/1/2027	\$2,270,000	\$7,536,500	\$9,806,500	\$46,388	\$6,864,550	\$2,941,950	\$9,806,500
1/1/2028	2,385,000	7,423,000	9,808,000	1/1/2028	6,865,600	2,942,400	9,808,000
1/1/2029	2,500,000	7,303,750	9,803,750	1/1/2029	6,862,625	2,941,125	9,803,750
1/1/2030	2,625,000	7,178,750	9,803,750	1/1/2030	6,862,625	2,941,125	9,803,750
1/1/2031	2,760,000	7,047,500	9,807,500	1/1/2031	6,865,250	2,942,250	9,807,500
1/1/2032	2,895,000	6,909,500	9,804,500	1/1/2032	6,863,150	2,941,350	9,804,500
1/1/2033	3,040,000	6,764,750	9,804,750	1/1/2033	6,863,325	2,941,425	9,804,750
1/1/2034	3,195,000	6,612,750	9,807,750	1/1/2034	6,865,425	2,942,325	9,807,750
1/1/2035	3,350,000	6,453,000	9,803,000	1/1/2035	6,862,100	2,940,900	9,803,000
1/1/2036	3,520,000	6,285,500	9,805,500	1/1/2036	6,863,850	2,941,650	9,805,500
1/1/2037	3,695,000	6,109,500	9,804,500	1/1/2037	6,863,150	2,941,350	9,804,500
1/1/2038	3,880,000	5,924,750	9,804,750	1/1/2038	6,863,325	2,941,425	9,804,750
1/1/2039	4,075,000	5,730,750	9,805,750	1/1/2039	6,864,025	2,941,725	9,805,750
1/1/2040	4,280,000	5,527,000	9,807,000	1/1/2040	6,864,900	2,942,100	9,807,000
1/1/2041	4,490,000	5,313,000	9,803,000	1/1/2041	6,862,100	2,940,900	9,803,000
1/1/2042	4,715,000	5,088,500	9,803,500	1/1/2042	6,862,450	2,941,050	9,803,500
1/1/2043	4,950,000	4,852,750	9,802,750	1/1/2043	6,861,925	2,940,825	9,802,750
1/1/2044	5,200,000	4,605,250	9,805,250	1/1/2044	6,863,675	2,941,575	9,805,250
1/1/2045	5,460,000	4,345,250	9,805,250	1/1/2045	6,863,675	2,941,575	9,805,250
1/1/2046	5,735,000	4,072,250	9,807,250	1/1/2046	6,865,075	2,942,175	9,807,250
1/1/2047	6,020,000	3,785,500	9,805,500	1/1/2047	6,863,850	2,941,650	9,805,500
1/1/2048	6,320,000	3,484,500	9,804,500	1/1/2048	6,863,150	2,941,350	9,804,500
1/1/2049	6,635,000	3,168,500	9,803,500	1/1/2049	6,862,450	2,941,050	9,803,500
1/1/2050	6,970,000	2,836,750	9,806,750	1/1/2050	6,864,725	2,942,025	9,806,750
1/1/2051	7,315,000	2,488,250	9,803,250	1/1/2051	6,862,275	2,940,975	9,803,250
1/1/2052	7,680,000	2,122,500	9,802,500	1/1/2052	6,861,750	2,940,750	9,802,500
1/1/2053	8,065,000	1,738,500	9,803,500	1/1/2053	6,862,450	2,941,050	9,803,500
1/1/2054	8,470,000	1,335,250	9,805,250	1/1/2054	6,863,675	2,941,575	9,805,250
1/1/2055	8,895,000	911,750	9,806,750	1/1/2055	6,864,725	2,942,025	9,806,750
1/1/2056	9,340,000	467,000	9,807,000	1/1/2056	6,864,900	2,942,100	9,807,000
	<u>\$150,730,000</u>	<u>\$143,422,500</u>	<u>\$294,152,500</u>		<u>\$205,906,750</u>	<u>\$88,245,750</u>	<u>\$294,152,500</u>

Footnotes:

[1] Estimated amounts provided by PFM on November 6, 2020 as requested by Raftelis. Terms and conditions subject to change.

[2] Based on information provided by PFM, the assumed capitalized interest for five years adds approximately \$36 million to the bond sizing. Bond premium also assumed to be \$36 million, resulting in total principal of \$150.73 million..

\$114,730,000

**Table 4
Wastewater Plant Relocation Conceptual Analysis**

Summary of Estimated Debt Service Payments - Option 2 (Assumed WIFIA / SRF Financing)

WIFIA Loan [1] [2]		SRF Loan [1] [2]	
Amount	76,000,000 (Includes Capitalized Interest)	Amount	80,000,000 (Includes Capitalized Interest)
Assumed Rate	1.50%	Assumed Rate	1.50%
Issuance Date	1/1/2021	Issuance Date	1/1/2021
Term	35 Years	Term	20 Years
Assumes No Payment for 5 years and wrap around SRF Loan		Assumes No Payment for 5 years	

WIFIA Loan				SRF Loan				Aggregate Payments				Estimated Allocation of Bond Payments			
Period Ending	Principal	Interest	Debt Service	Period Ending	Principal	Interest	Debt Service	Period Ending	Principal	Interest	Debt Service	Period Ending	FPUA	SLCU	Total Debt Service
1/1/2022	-	-	-	1/1/2022	-	-	-	1/1/2022	-	-	-	1/1/2022	70%	30%	100%
1/1/2023	-	-	-	1/1/2023	-	-	-	1/1/2023	-	-	-	1/1/2023			
1/1/2024	-	-	-	1/1/2024	-	-	-	1/1/2024	-	-	-	1/1/2024			
1/1/2025	-	-	-	1/1/2025	-	-	-	1/1/2025	-	-	-	1/1/2025			
1/1/2026	-	-	-	1/1/2026	-	-	-	1/1/2026	-	-	-	1/1/2026			
1/1/2027	-	\$1,140,000	\$1,140,000	1/1/2027	\$3,460,000	\$1,200,000	\$4,660,000	1/1/2027	\$3,460,000	\$2,340,000	\$5,800,000	1/1/2027	\$4,060,000	\$1,740,000	\$5,800,000
1/1/2028	-	1,140,000	1,140,000	1/1/2028	3,510,000	1,148,100	4,658,100	1/1/2028	3,510,000	2,288,100	5,798,100	1/1/2028	4,058,670	1,739,430	5,798,100
1/1/2029	-	1,140,000	1,140,000	1/1/2029	3,565,000	1,095,450	4,660,450	1/1/2029	3,565,000	2,235,450	5,800,450	1/1/2029	4,060,315	1,740,135	5,800,450
1/1/2030	-	1,140,000	1,140,000	1/1/2030	3,620,000	1,041,975	4,661,975	1/1/2030	3,620,000	2,181,975	5,801,975	1/1/2030	4,061,383	1,740,592	5,801,975
1/1/2031	-	1,140,000	1,140,000	1/1/2031	3,670,000	987,675	4,657,675	1/1/2031	3,670,000	2,127,675	5,797,675	1/1/2031	4,058,373	1,739,302	5,797,675
1/1/2032	-	1,140,000	1,140,000	1/1/2032	3,725,000	932,625	4,657,625	1/1/2032	3,725,000	2,072,625	5,797,625	1/1/2032	4,058,338	1,739,287	5,797,625
1/1/2033	-	1,140,000	1,140,000	1/1/2033	3,785,000	876,750	4,661,750	1/1/2033	3,785,000	2,016,750	5,801,750	1/1/2033	4,061,225	1,740,525	5,801,750
1/1/2034	-	1,140,000	1,140,000	1/1/2034	3,840,000	819,975	4,659,975	1/1/2034	3,840,000	1,959,975	5,799,975	1/1/2034	4,059,983	1,739,992	5,799,975
1/1/2035	-	1,140,000	1,140,000	1/1/2035	3,900,000	762,375	4,662,375	1/1/2035	3,900,000	1,902,375	5,802,375	1/1/2035	4,061,663	1,740,712	5,802,375
1/1/2036	-	1,140,000	1,140,000	1/1/2036	3,955,000	703,875	4,658,875	1/1/2036	3,955,000	1,843,875	5,798,875	1/1/2036	4,059,213	1,739,662	5,798,875
1/1/2037	-	1,140,000	1,140,000	1/1/2037	4,015,000	644,550	4,659,550	1/1/2037	4,015,000	1,784,550	5,799,550	1/1/2037	4,059,685	1,739,865	5,799,550
1/1/2038	-	1,140,000	1,140,000	1/1/2038	4,075,000	584,325	4,659,325	1/1/2038	4,075,000	1,724,325	5,799,325	1/1/2038	4,059,528	1,739,797	5,799,325
1/1/2039	-	1,140,000	1,140,000	1/1/2039	4,135,000	523,200	4,658,200	1/1/2039	4,135,000	1,663,200	5,798,200	1/1/2039	4,058,740	1,739,460	5,798,200
1/1/2040	-	1,140,000	1,140,000	1/1/2040	4,200,000	461,175	4,661,175	1/1/2040	4,200,000	1,601,175	5,801,175	1/1/2040	4,060,823	1,740,352	5,801,175
1/1/2041	-	1,140,000	1,140,000	1/1/2041	4,260,000	398,175	4,658,175	1/1/2041	4,260,000	1,538,175	5,798,175	1/1/2041	4,058,723	1,739,452	5,798,175
1/1/2042	-	1,140,000	1,140,000	1/1/2042	4,325,000	334,275	4,659,275	1/1/2042	4,325,000	1,474,275	5,799,275	1/1/2042	4,059,493	1,739,782	5,799,275
1/1/2043	-	1,140,000	1,140,000	1/1/2043	4,390,000	269,400	4,659,400	1/1/2043	4,390,000	1,409,400	5,799,400	1/1/2043	4,059,580	1,739,820	5,799,400
1/1/2044	-	1,140,000	1,140,000	1/1/2044	4,455,000	203,550	4,658,550	1/1/2044	4,455,000	1,343,550	5,798,550	1/1/2044	4,058,985	1,739,565	5,798,550
1/1/2045	-	1,140,000	1,140,000	1/1/2045	4,525,000	136,725	4,661,725	1/1/2045	4,525,000	1,276,725	5,801,725	1/1/2045	4,061,208	1,740,517	5,801,725
1/1/2046	-	1,140,000	1,140,000	1/1/2046	4,590,000	68,850	4,658,850	1/1/2046	4,590,000	1,208,850	5,798,850	1/1/2046	4,059,195	1,739,655	5,798,850
1/1/2047	4,555,000	1,140,000	5,695,000	1/1/2047				1/1/2047	4,555,000	1,140,000	5,695,000	1/1/2047	3,986,500	1,708,500	5,695,000
1/1/2048	4,625,000	1,071,675	5,696,675	1/1/2048				1/1/2048	4,625,000	1,071,675	5,696,675	1/1/2048	3,987,673	1,709,002	5,696,675
1/1/2049	4,695,000	1,002,300	5,697,300	1/1/2049				1/1/2049	4,695,000	1,002,300	5,697,300	1/1/2049	3,988,110	1,709,190	5,697,300
1/1/2050	4,765,000	931,875	5,696,875	1/1/2050				1/1/2050	4,765,000	931,875	5,696,875	1/1/2050	3,987,813	1,709,062	5,696,875
1/1/2051	4,835,000	860,400	5,695,400	1/1/2051				1/1/2051	4,835,000	860,400	5,695,400	1/1/2051	3,986,780	1,708,620	5,695,400
1/1/2052	4,910,000	787,875	5,697,875	1/1/2052				1/1/2052	4,910,000	787,875	5,697,875	1/1/2052	3,988,513	1,709,362	5,697,875
1/1/2053	4,980,000	714,225	5,694,225	1/1/2053				1/1/2053	4,980,000	714,225	5,694,225	1/1/2053	3,985,958	1,708,267	5,694,225
1/1/2054	5,055,000	639,525	5,694,525	1/1/2054				1/1/2054	5,055,000	639,525	5,694,525	1/1/2054	3,986,168	1,708,357	5,694,525
1/1/2055	5,130,000	563,700	5,693,700	1/1/2055				1/1/2055	5,130,000	563,700	5,693,700	1/1/2055	3,985,590	1,708,110	5,693,700
1/1/2056	5,210,000	486,750	5,696,750	1/1/2056				1/1/2056	5,210,000	486,750	5,696,750	1/1/2056	3,987,725	1,709,025	5,696,750
1/1/2057	5,290,000	408,600	5,698,600	1/1/2057				1/1/2057	5,290,000	408,600	5,698,600	1/1/2057	3,989,020	1,709,580	5,698,600
1/1/2058	5,365,000	329,250	5,694,250	1/1/2058				1/1/2058	5,365,000	329,250	5,694,250	1/1/2058	3,985,975	1,708,275	5,694,250
1/1/2059	5,445,000	248,775	5,693,775	1/1/2059				1/1/2059	5,445,000	248,775	5,693,775	1/1/2059	3,985,643	1,708,132	5,693,775
1/1/2060	5,530,000	167,100	5,697,100	1/1/2060				1/1/2060	5,530,000	167,100	5,697,100	1/1/2060	3,987,970	1,709,130	5,697,100
1/1/2061	5,610,000	84,150	5,694,150	1/1/2061				1/1/2061	5,610,000	84,150	5,694,150	1/1/2061	3,985,905	1,708,245	5,694,150
	\$76,000,000	\$32,236,200	\$108,236,200		\$80,000,000	\$13,193,025	\$93,193,025		\$156,000,000	\$45,429,225	\$201,429,225		\$141,000,466	\$60,428,759	\$201,429,225

Footnotes:

[1] Estimated amounts provided by PFM on November 24, 2020 as requested by Raftelis. Principal amounts include \$6.0 million in estimated capitalized interest costs from FY22-26. Terms and conditions subject to change.

[2] Based on discussions with PFM, amounts prepared to demonstrate the benefit of a financing strategy that may combine WIFIA and SRF Funding. PFM and Raftelis provide no assurances that the proposed project will be eligible for funding or that any amount of funding will be available at the time the project is constructed.

Table 5
Wastewater Plant Relocation Conceptual Analysis

Summary of Financing Options - Allocated Debt Service Payments (Options #1 and #2)

Line No.	Description Allocation	Period	Option 1 (Assumed Bond Financing) [1]			Option 2 (Assumed WIFIA / SRF Financing) [1] [2]		
			FPUA	St. Lucie County	Total	FPUA	St. Lucie County	Total
			70.0%	30.0%	100.0%	70.0%	30.0%	100.0%
1	Yr.1	2027	\$6,864,550	\$2,941,950	\$9,806,500	\$4,060,000	\$1,740,000	\$5,800,000
2	Yr.2	2028	6,865,600	2,942,400	9,808,000	4,058,670	1,739,430	5,798,100
3	Yr.3	2029	6,862,625	2,941,125	9,803,750	4,060,315	1,740,135	5,800,450
4	Yr.4	2030	6,862,625	2,941,125	9,803,750	4,061,383	1,740,592	5,801,975
5	Yr.5	2031	6,865,250	2,942,250	9,807,500	4,058,373	1,739,302	5,797,675
6	Yr.6	2032	6,863,150	2,941,350	9,804,500	4,058,338	1,739,287	5,797,625
7	Yr.7	2033	6,863,325	2,941,425	9,804,750	4,061,225	1,740,525	5,801,750
8	Yr.8	2034	6,865,425	2,942,325	9,807,750	4,059,983	1,739,992	5,799,975
9	Yr.9	2035	6,862,100	2,940,900	9,803,000	4,061,663	1,740,712	5,802,375
10	Yr.10	2036	6,863,850	2,941,650	9,805,500	4,059,213	1,739,662	5,798,875
11	Yr.11	2037	6,863,150	2,941,350	9,804,500	4,059,685	1,739,865	5,799,550
12	Yr.12	2038	6,863,325	2,941,425	9,804,750	4,059,528	1,739,797	5,799,325
13	Yr.13	2039	6,864,025	2,941,725	9,805,750	4,058,740	1,739,460	5,798,200
14	Yr.14	2040	6,864,900	2,942,100	9,807,000	4,060,823	1,740,352	5,801,175
15	Yr.15	2041	6,862,100	2,940,900	9,803,000	4,058,723	1,739,452	5,798,175
16	Yr.16	2042	6,862,450	2,941,050	9,803,500	4,059,493	1,739,782	5,799,275
17	Yr.17	2043	6,861,925	2,940,825	9,802,750	4,059,580	1,739,820	5,799,400
18	Yr.18	2044	6,863,675	2,941,575	9,805,250	4,058,985	1,739,565	5,798,550
19	Yr.19	2045	6,863,675	2,941,575	9,805,250	4,061,208	1,740,517	5,801,725
20	Yr.20	2046	6,865,075	2,942,175	9,807,250	4,059,195	1,739,655	5,798,850
21	Yr.21	2047	6,863,850	2,941,650	9,805,500	3,986,500	1,708,500	5,695,000
22	Yr.22	2048	6,863,150	2,941,350	9,804,500	3,987,673	1,709,002	5,696,675
23	Yr.23	2049	6,862,450	2,941,050	9,803,500	3,988,110	1,709,190	5,697,300
24	Yr.24	2050	6,864,725	2,942,025	9,806,750	3,987,813	1,709,062	5,696,875
25	Yr.25	2051	6,862,275	2,940,975	9,803,250	3,986,780	1,708,620	5,695,400
26	Yr.26	2052	6,861,750	2,940,750	9,802,500	3,988,513	1,709,362	5,697,875
27	Yr.27	2053	6,862,450	2,941,050	9,803,500	3,985,958	1,708,267	5,694,225
28	Yr.28	2054	6,863,675	2,941,575	9,805,250	3,986,168	1,708,357	5,694,525
29	Yr.29	2055	6,864,725	2,942,025	9,806,750	3,985,590	1,708,110	5,693,700
30	Yr.30	2056	6,864,900	2,942,100	9,807,000	3,987,725	1,709,025	5,696,750
31	Yr.31	2057				3,989,020	1,709,580	5,698,600
32	Yr.32	2058				3,985,975	1,708,275	5,694,250
33	Yr.33	2059				3,985,643	1,708,132	5,693,775
34	Yr.34	2060				3,987,970	1,709,130	5,697,100
35	Yr.35	2061				3,985,905	1,708,245	5,694,150
36			\$205,906,750	\$88,245,750	\$294,152,500	\$141,000,466	\$60,428,759	\$201,429,225

Footnotes:

[1] Amounts derived from Tables 3 and 4 based on information provided by PFM. Terms and conditions subject to change.

[2] Based on discussions with PFM, amounts prepared to demonstrate the benefit of a financing strategy that may combine WIFIA and SRF Funding. PFM and Raftelis provide no assurances that the proposed project will be eligible for funding or that any amount of funding will be available at the time the project is constructed.

Table 6
Wastewater Plant Relocation Conceptual Analysis

Summary of Actual Wastewater Treatment Operating Expenses

Line No.	Description	Actual Operating Expenses - FY20 [1]				Total
		IWRF	Fairwinds Golf Course WWTF	Lakewood Park WWTF	Holiday Pines WWTF	
1	Power [2]	\$455,779	\$19,036	\$13,811	\$141,215	\$629,841
2	Labor [3]	1,155,316	37,182	57,310	450,671	1,700,480
3	Maintenance Parts Replacement Costs	109,279	19,218	9,534	154,423	292,453
4	Chemicals	106,009	-	-	-	106,009
5	Administrative/ Legal Procurement	23,605	-	-	-	23,605
6	Sludge	605,626	3,787	3,080	57,950	670,443
7	Other	57,557	-	-	-	57,557
8	Total Annual Cost	\$2,513,172	\$79,223	\$83,735	\$804,259	\$3,480,389
9	Permitted Capacity, MGD	10.00	0.02	0.02	0.21	10.25
10	Treated Flow, MGD	4.86	0.03	0.02	0.18	5.09
11	Treated Flow, MGY	1,774	11	7	66	1,858
12	Cost, \$/ MG Treated	\$1,417	\$7,235	\$11,471	\$12,241	\$1,873

Footnotes:

[1] Amounts provided by FPUA and SLCU staff.

[2] Power costs for the SLCU plants estimated based on the original budget.

[3] Labor costs for SLCU includes estimated contract operations provided by Severn Trent.

Table 7
Wastewater Plant Relocation Conceptual Analysis

Comparison of Existing and Projected Operating Expenses Under Current Operating Conditions

Line No.	Description	IWRF Only [1] Actual Costs - FY20	Combined [2] Actual Costs - FY20	MWRF [3] Projected Costs - FY20	Basis for MWRF Projections
	Permitted Capacity				
1	MGD	10.00	10.25	8.00	Based on Design Criteria (May 2020 Report)
2	MGY	3,650	3,742	2,920	
	Treated Flow				
3	MGD	4.86	5.09	5.09	Existing Operating Conditions
4	MGY	1,774	1,858	1,858	
	Power				
5	Annual Cost	\$455,779	\$629,841	\$427,306	Engineering 10% decrease of current IWRF based on more efficient equipment (May 2020 Report)
6	Cost/MG (treated)	\$257	\$339	\$230	
	Labor				
7	Annual Cost	\$1,155,316	\$1,700,480	\$1,155,316	Current IWRF costs
8	Cost/MG (capacity)	\$317	\$454	\$396	
	Maintenance Parts Replacement Costs				
9	Annual Cost	\$109,279	\$292,453	\$87,600	Current IWRF costs
10	Cost/MG (capacity)	\$30	\$78	\$30	
	Chemicals				
11	Annual Cost	\$106,009	\$106,009	\$213,653	Engineering estimate to provide high-level disinfection (May 2020 Report)
12	Cost/MG (treated)	\$60	\$57	\$115	
	Administrative/ Legal Procurement				
13	Annual Cost	\$23,605	\$23,605	\$17,520	Current IWRF costs
14	Cost/MG (capacity)	\$6	\$6	\$6	
	Sludge				
15	Annual Cost	\$605,626	\$670,443	\$633,527	Current IWRF costs
16	Cost/MG (treated)	\$341	\$361	\$341	
	Other				
17	Annual Cost	\$57,557	\$57,557	\$59,451	Current IWRF costs
18	Cost/MG (treated)	\$32	\$31	\$32	
	Total, \$				
19	Annual Cost	\$2,513,172	\$3,480,389	\$2,594,373	
20	Cost/MG (treated)	\$1,417	\$1,873	\$1,396	
21	Projected Increase (Decrease) Combined Costs - \$			<u><u>(\$886,016)</u></u>	
22	Projected Increase (Decrease) Combined Costs - %			<u><u>(25.5%)</u></u>	

Footnotes:

[1] Amounts derived from Table 6 and reflect the actual operating expenses for the IWRF only.

[2] Amounts derived from Table 6 and reflect the actual operating expenses for the IWRF and the County's three mainland plants.

[3] Amounts reflect the estimated MWRF operating expenses under the actual FY20 operating conditions.

Table 8
Wastewater Plant Relocation Conceptual Analysis

Summary of Projected Wastewater Treatment Operating Expenses

Line No.	Description	IWRP / SLCU Existing Costs - FY20 [1]	MWRP Projected Costs - FY20 [1]	Escalation Reference [2]	Projected Fiscal Year Ending September 30, [1]						
					2021	2022	2023	2024	2025	2026	2027
<u>Summary of Combined MWRP Operating Expenses</u>											
1	Power	\$629,841	\$427,306	Power	\$440,125	\$453,329	\$466,929	\$480,937	\$495,365	\$510,226	\$525,533
2	Labor	1,700,480	1,155,316	Labor	1,189,975	1,225,674	1,262,444	1,300,317	1,339,327	1,379,507	1,420,892
3	Maintenance Parts Replacement Costs	292,453	87,600	Repairs	90,228	92,935	95,723	98,595	101,553	104,600	107,738
4	Chemicals	106,009	213,653	Chemicals	218,994	224,469	230,081	235,833	241,729	247,772	253,966
5	Administrative/ Legal Procurement	23,605	17,520	Inflation	17,678	17,979	18,357	18,761	19,193	19,615	20,047
6	Sludge	670,443	633,527	Sludge	644,297	658,472	674,934	691,807	709,794	727,539	745,727
7	Other	57,557	59,451	Inflation	59,986	61,006	62,287	63,657	65,121	66,554	68,018
8	Total Annual Cost	<u>\$3,480,389</u>	<u>\$2,594,373</u>		<u>\$2,661,283</u>	<u>\$2,733,864</u>	<u>\$2,810,755</u>	<u>\$2,889,907</u>	<u>\$2,972,082</u>	<u>\$3,055,813</u>	<u>\$3,141,921</u>
9	Annual Increase - %		(25.5%)		2.6%	2.7%	2.8%	2.8%	2.8%	2.8%	2.8%
<u>Allocation of Combined MWRP Operating Expenses</u>											
<u>Summary of Allocation References</u>											
10	FPUA Allocation	N/A	70%	FPUA-Capacity	70%	70%	70%	70%	70%	70%	70%
11	SLCUU Allocation	N/A	30%	SLCU-Capacity	30%	30%	30%	30%	30%	30%	30%
12	FPUA Allocation	N/A	93%	FPUA-Flows	93%	93%	93%	93%	93%	93%	93%
13	SLCUU Allocation	N/A	7%	SLCU-Flows	7%	7%	7%	7%	7%	7%	7%
<u>FPUA Allocated Expenses</u>											
14	Power	\$455,779	\$397,395	FPUA-Flows	\$409,316	\$421,596	\$434,244	\$447,271	\$460,689	\$474,510	\$488,746
15	Labor	1,155,316	808,721	FPUA-Capacity	832,983	857,972	883,711	910,222	937,529	965,655	994,624
16	Maintenance Parts Replacement Costs	109,279	61,320	FPUA-Capacity	63,160	65,055	67,006	69,017	71,087	73,220	75,417
17	Chemicals	106,009	198,697	FPUA-Flows	203,664	208,756	213,975	219,325	224,808	230,428	236,188
18	Administrative/ Legal Procurement	23,605	16,294	FPUA-Flows	16,441	16,720	17,072	17,448	17,849	18,242	18,644
19	Sludge	605,626	589,180	FPUA-Flows	599,196	612,379	627,689	643,381	660,108	676,611	693,526
20	Other	57,557	55,289	FPUA-Flows	55,787	56,736	57,927	59,201	60,563	61,895	63,257
	<i>Adjustment for Bulk Sales to SLCU</i>	<i>(245,853)</i>									
21	Total Annual Cost	<u>\$2,267,319</u>	<u>\$2,126,896</u>		<u>\$2,180,547</u>	<u>\$2,239,213</u>	<u>\$2,301,624</u>	<u>\$2,365,864</u>	<u>\$2,432,634</u>	<u>\$2,500,561</u>	<u>\$2,570,402</u>
21	Amount Allocated - %	65%	82%		82%	82%	82%	82%	82%	82%	82%
22	Annual Increase - %		(6.2%)		2.5%	2.7%	2.8%	2.8%	2.8%	2.8%	2.8%
<u>SLCU Allocated Expenses</u>											
23	Power	\$174,062	\$29,911	SLCU-Flows	\$30,809	\$31,733	\$32,685	\$33,666	\$34,676	\$35,716	\$36,787
24	Labor	545,164	346,595	SLCU-Capacity	356,993	367,702	378,733	390,095	401,798	413,852	426,268
25	Maintenance Parts Replacement Costs	183,174	26,280	SLCU-Capacity	27,068	27,881	28,717	29,579	30,466	31,380	32,321
26	Chemicals	0	14,956	SLCU-Flows	15,330	15,713	16,106	16,508	16,921	17,344	17,778
27	Administrative/ Legal Procurement	0	1,226	SLCU-Flows	1,237	1,259	1,285	1,313	1,344	1,373	1,403
28	Sludge	64,817	44,347	SLCU-Flows	45,101	46,093	47,245	48,426	49,686	50,928	52,201
29	Other	0	4,162	SLCU-Flows	4,199	4,270	4,360	4,456	4,558	4,659	4,761
	<i>Adjustment for Bulk Sales to SLCU</i>	<i>245,853</i>									
30	Total Annual Cost	<u>\$1,213,070</u>	<u>\$467,477</u>		<u>\$480,737</u>	<u>\$494,651</u>	<u>\$509,131</u>	<u>\$524,043</u>	<u>\$539,448</u>	<u>\$555,252</u>	<u>\$571,519</u>
30	Amount Allocated - %	35%	18%		18%	18%	18%	18%	18%	18%	18%
31	Annual Increase - %		(61.5%)		2.8%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%
32	Grand Total Annual Cost	<u>\$3,480,389</u>	<u>\$2,594,373</u>		<u>\$2,661,283</u>	<u>\$2,733,864</u>	<u>\$2,810,755</u>	<u>\$2,889,907</u>	<u>\$2,972,082</u>	<u>\$3,055,813</u>	<u>\$3,141,921</u>
33	Annual Increase - %		(25.5%)		2.6%	2.7%	2.8%	2.8%	2.8%	2.8%	2.8%

Footnotes:

[1] Amounts derived from Table 7 based on the actual operating expenses and the proposed MWRP under existing operating conditions.

[2] Escalation references and factors are derived from Table 9.

Table 9
Wastewater Plant Relocation Conceptual Analysis

Summary of Projected Escalation Factors

Line No.	Description	Reference	Projected Fiscal Year Ending September 30, [1]						
			2021	2022	2023	2024	2025	2026	2027
1	Labor and Benefits [2]	Labor	1.0300	1.0300	1.0300	1.0300	1.0300	1.0300	1.0300
2	Repairs and Maintenance [3]	Repairs	1.0300	1.0300	1.0300	1.0300	1.0300	1.0300	1.0300
3	Consumer Price Index - CPI-U [4]	Inflation	1.0090	1.0170	1.0210	1.0220	1.0230	1.0220	1.0220
4	GDP Price Deflator Index - 1-yr. Lag [4]	FPSC Index	1.0179	1.0060	1.0150	1.0190	1.0200	1.0210	1.0210
5	Marginal Change	Marginal	1.0050	1.0050	1.0050	1.0050	1.0050	1.0050	1.0050
6	Eliminate	Eliminate	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
7	Growth in Treated Flows	Flows	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
8	Fuel	Fuel	1.0300	1.0300	1.0300	1.0300	1.0300	1.0300	1.0300
9	Power - Base	Power - Base	1.0300	1.0300	1.0300	1.0300	1.0300	1.0300	1.0300
10	Power + System Growth	Power	1.0300	1.0300	1.0300	1.0300	1.0300	1.0300	1.0300
11	Chemicals - Base	Chemicals - Base	1.0250	1.0250	1.0250	1.0250	1.0250	1.0250	1.0250
12	Chemicals + System Growth	Chemicals	1.0250	1.0250	1.0250	1.0250	1.0250	1.0250	1.0250
13	Sludge - Base	Sludge - Base	1.0170	1.0220	1.0250	1.0250	1.0260	1.0250	1.0250
14	Sludge + System Growth	Sludge	1.0170	1.0220	1.0250	1.0250	1.0260	1.0250	1.0250
15	Other Categories	Other1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
16	Other Categories	Other2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Footnotes:

- [1] Amounts estimated for the study period as shown below.
- [2] Amounts estimated based on FPUA's most recently completed rate study completed in June 2020.
- [3] Amounts based on the actual annual average increase in the Engineering News Record (ENR) Index.
- [4] Amount based on estimates provided by the Congressional Budget Office (CBO), July 2020.

Table 10
Wastewater Plant Relocation Conceptual Analysis

Summary of Projected Test Year Analysis - Option #1 (Assumed Bond Financing)

Line No.	Description	Existing Costs - FY20	MWRF Test Year Projected Costs - FY27	Net Increase (Decrease) in Costs
<u>Comparison of Existing and Proposed System Costs</u>				
<u>FPUA Allocated Costs</u>				
1	Existing IWRP Operating Expenses [1]	\$2,513,172	\$0	(\$2,513,172)
2	Proposed MWRF Allocated Operating Expenses [2]	0	2,570,402	2,570,402
3	Proposed MWRF Allocated Debt Service Costs [3]	0	6,864,550	6,864,550
4	Proposed Allowance for Debt Service Coverage (35%) [4]	35%	2,402,593	2,402,593
5	Adjustment for Bulk Sales to SLCU [5]	(245,853)	0	245,853
6	Adjustment for Leachate Revenues [5]	70%	(125,718)	(294,282)
7	Adjustment for FMPA Cooling Tower Revs. (Reclaimed Sales) [5]	70%	0	(765,795)
8	Adjustment for Septage Hauling Revenues [5]	70%	0	(26,075)
9	Adjustment for Strong Waste and Industrial Permits [5]	70%	(79,124)	23,737
10	Adjustment for Annual FPSC Index (If any)	No	0	0
11	Other	0	0	0
12	Total Annual Cost	<u>\$2,062,477</u>	<u>\$10,570,288</u>	<u>\$8,507,811</u>
13	Projected Wastewater Retail Revenues Under Existing Retail Rates [6]			\$12,489,070
14	Projected Cumulative Revenue Need			68.1%
15	Projected Annual Wastewater Retail Revenue Increase FY22-27			<u>9.0%</u>
16	Projected Water and Wastewater Retail Revenues Under Existing Retail Rates [6]			\$29,059,410
17	Projected Cumulative Revenue Need			29.3%
18	Projected Annual Water and Wastewater Retail Revenue Increase FY22-27			<u>4.4%</u>
<u>SLCU Allocated Costs</u>				
19	Existing WWTP Operating Expenses [1]	\$967,217	\$0	(\$967,217)
20	Proposed MWRF Allocated Operating Expenses [2]	0	571,519	571,519
21	Proposed MWRF Allocated Debt Service Costs [3]	0	2,941,950	2,941,950
22	Proposed Allowance for Debt Service Coverage (25%) [4]	35%	1,029,683	1,029,683
23	Adjustment for Bulk Purchases from FPUA [5]	245,853	0	(245,853)
24	Adjustment for Leachate Revenues [5]	30%	0	(180,000)
25	Adjustment for FMPA Cooling Tower Revs. (Reclaimed Sales) [5]	30%	0	(328,198)
26	Adjustment for Septage Hauling Revenues [5]	30%	(37,250)	26,075
27	Adjustment for Strong Waste and Industrial Permits [5]	30%	0	(23,737)
28	Adjustment for Annual FPSC Index (If any)	No	0	0
29	Other	0	0	0
30	Total Annual Cost	<u>\$1,175,820</u>	<u>\$4,000,042</u>	<u>\$2,824,222</u>
31	Projected Wastewater Retail Revenues Under Existing Retail Rates [6]			\$5,307,240
32	Projected Cumulative Revenue Need			53.2%
33	Projected Annual Wastewater Retail Revenue Increase FY22-27			<u>6.3%</u>
34	Projected Water and Wastewater Retail Revenues Under Existing Retail Rates [6]			\$8,982,214
35	Projected Cumulative Revenue Need			31.4%
36	Projected Annual Water and Wastewater Retail Revenue Increase FY22-27			<u>4.7%</u>

Footnotes:

- [1] Amounts derived from Table 6 based on actual operating expenses provided by FPUA and SLCU.
- [2] Amounts derived from Table 8 based on the projected operating expenses of the proposed MWRF for Fiscal Year 2027, which represents the first year the plant may be in service.
- [3] Amounts derived from Table 3 based on estimated bond financing assumptions provided by PFM.
- [4] Based on discussions with PFM, the parties should establish rates that will provide at least a 35% margin above the annual principal and interest payments on the projected debt to meet minimum debt service coverage requirements, capital re-investment and provide
- [5] Existing and proposed amounts provided by FPUA and SLCU staff. As shown, FPUA will lose any existing bulk wastewater revenues under the proposed plan since such costs to SLCU are included in the total allocated expenses. In addition, any revenue offset to expenses was assumed to be allocated based on the established capacity allocation.
- [6] Existing revenues provided by FPUA and SLCU staff.

**Table 11
Wastewater Plant Relocation Conceptual Analysis**

Summary of Projected Test Year Analysis - Option #2 (Assumed WIFIA / SRF Financing)

Line No.	Description	Existing Costs - FY20	MWRF Test Year Projected Costs - FY27	Net Increase (Decrease) in Costs
<u>Comparison of Existing and Proposed System Costs</u>				
<u>FPUA Allocated Costs</u>				
1	Existing IWRf Operating Expenses [1]	\$2,513,172	\$0	(\$2,513,172)
2	Proposed MWRF Allocated Operating Expenses [2]	0	2,570,402	2,570,402
3	Proposed MWRF Allocated Debt Service Costs [3]	0	4,060,000	4,060,000
4	Proposed Allowance for Debt Service Coverage (35%) [4]	35%	1,421,000	1,421,000
5	Adjustment for Bulk Sales to SLCU [5]	(245,853)	0	245,853
6	Adjustment for Leachate Revenues [5]	70%	(420,000)	(294,282)
7	Adjustment for FMPA Cooling Tower Revs. (Reclaimed Sales) [5]	70%	(765,795)	(765,795)
8	Adjustment for Septage Hauling Revenues [5]	70%	(26,075)	(26,075)
9	Adjustment for Strong Waste and Industrial Permits [5]	70%	(55,387)	23,737
10	Adjustment for Annual FPSC Index (If any)	No	0	0
11	Other	0	0	0
12	Total Annual Cost	<u>\$2,062,477</u>	<u>\$6,784,145</u>	<u>\$4,721,668</u>
13	Projected Wastewater Retail Revenues Under Existing Retail Rates [6]			\$12,489,070
14	Projected Cumulative Revenue Need			<u>37.8%</u>
15	Projected Annual Wastewater Retail Revenue Increase FY22-27			<u>5.5%</u>
16	Projected Water and Wastewater Retail Revenues Under Existing Retail Rates [6]			\$29,059,410
17	Projected Cumulative Revenue Need			<u>16.2%</u>
18	Projected Annual Water and Wastewater Retail Revenue Increase FY22-27			<u>2.5%</u>
<u>SLCU Allocated Costs</u>				
19	Existing WWTP Operating Expenses [1]	\$967,217	\$0	(\$967,217)
20	Proposed MWRF Allocated Operating Expenses [2]	0	571,519	571,519
21	Proposed MWRF Allocated Debt Service Costs [3]	0	1,740,000	1,740,000
22	Proposed Allowance for Debt Service Coverage (35%) [4]	35%	609,000	609,000
23	Adjustment for Bulk Purchases from FPUA [5]	245,853	0	(245,853)
24	Adjustment for Leachate Revenues [5]	30%	(180,000)	(180,000)
25	Adjustment for FMPA Cooling Tower Revs. (Reclaimed Sales) [5]	30%	(328,198)	(328,198)
26	Adjustment for Septage Hauling Revenues [5]	30%	(11,175)	26,075
27	Adjustment for Strong Waste and Industrial Permits [5]	30%	(23,737)	(23,737)
28	Adjustment for Annual FPSC Index (If any)	No	0	0
29	Other	0	0	0
30	Total Annual Cost	<u>\$1,175,820</u>	<u>\$2,377,409</u>	<u>\$1,201,589</u>
31	Projected Wastewater Retail Revenues Under Existing Retail Rates [6]			\$5,307,240
32	Projected Cumulative Revenue Need			<u>22.6%</u>
33	Projected Annual Wastewater Retail Revenue Increase FY22-27			<u>3.5%</u>
34	Projected Water and Wastewater Retail Revenues Under Existing Retail Rates [6]			\$8,982,214
35	Projected Cumulative Revenue Need			<u>13.4%</u>
36	Projected Annual Water and Wastewater Retail Revenue Increase FY22-27			<u>2.1%</u>

Footnotes:

- [1] Amounts derived from Table 6 based on actual operating expenses provided by FPUA and SLCU.
- [2] Amounts derived from Table 8 based on the projected operating expenses of the proposed MWRF for Fiscal Year 2027, which represents the first year the plant may be in service.
- [3] Amounts derived from Table 4 based on estimated WIFIA / SRF financing assumptions provided by PFM.
- [4] Based on discussions with PFM, the parties should establish rates that will provide at least a 35% margin above the annual principal and interest payments on the projected debt to meet minimum debt service coverage requirements, capital re-investment and provide
- [5] Existing and proposed amounts provided by FPUA and SLCU staff. As shown, FPUA will loose any existing bulk wastewater revenues under the proposed plan since such costs to SLCU are included in the total allocated expenses. In addition, any revenue offset to expenses was assumed to be allocated based on the established capacity allocation.
- [6] Existing revenues provided by FPUA and SLCU staff.