

Stormwater Utilities Master Plan Update 2022

FINAL | June 2022



Town of Jupiter
Utilities



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Executive Summary

Overview

Every five years the Town of Jupiter (Town) prepares an update to its Stormwater Master Plan to document stormwater utility accomplishments, assess current and future conditions, review regulatory requirements/impacts on utility needs, and financial needs forecasts and recommendations. The purpose of this 2022 Stormwater Master Plan Update is to evaluate the Town's Stormwater Utility challenges and recommend reasonable solutions, with input from Town staff involved in utility operations.

Mission and Goals

The Town of Jupiter Stormwater Utility's primary mission is to:

- Minimize risk of flooding (Water Quantity);
- Enhance stormwater runoff quality (Water Quality);
- and endeavor to achieve these two primary goals while proactively planning, and funding the Stormwater Utility through a separate and dedicated enterprise source, paid for by utility fees and grants

The Stormwater Utility achieves the primary goals of controlling stormwater quantity and quality by building, operating, and maintaining stormwater facilities to:

- Provide proper storage and conveyance of peak stormwater flows, to minimize flooding, and meet the Town's established level of service (LOS)
- Maintain a regional system of best management practices (BMPs) that treat the "first flush" of runoff to reduce pollutant loads to the maximum extent practicable to protect receiving body water quality.

Stormwater Master Planning Summary

The Town's LOS for structures, roadways, and parking lots was considered with respect to climate change and compared to other South Florida municipalities. It is apparent that in some cases, the Town's LOS is more stringent than other local governments such as Palm Beach County and Miami-Dade County. However, in an effort to more conservatively plan for projected sea level rise (SLR) and possible increases in rainfall frequency and duration, the Town may wish to reconsider its LOS standards.

The Town of Jupiter is a stakeholder in the Loxahatchee River Voluntary Pollutant Reduction (4e) Plan. The plan documents nutrient management activities by stakeholders in the Loxahatchee River area to make progress toward achieving the Loxahatchee River water quality criteria for pollutants of concern. Local stakeholders, including the Town, have initiated this plan voluntarily to proactively remedy water quality impairments without a state prescribed Total Maximum Daily Load (TMDL) or a Basin Management Action Plan (BMAP). The Town has responsibilities to monitor and update progress towards meeting the Pollutant Reduction Plan goals, which are discussed in the body of the report.

The impacts of climate change and sea level rise are likely to present numerous challenges to the Town of Jupiter Stormwater Utility. Therefore, SLR projections for planning were developed, areas most vulnerable to climate change were identified, and adaptation actions were proposed. Neighborhoods where inundation is likely to occur were identified. Several adaptation actions are underway by the Town, or are proposed, that target the areas identified as most vulnerable to SLR.

In 2019, the Federal Emergency Management Agency (FEMA) released new preliminary coastal Flood Insurance Rate Maps (FIRMs) for Palm Beach County (including municipalities within the County). The new FEMA maps have not been issued yet but are anticipated in the Summer of 2022. FEMA did not consider SLR in the 2019 Preliminary FIRMS. Therefore, building code referencing the FIRM map base flood elevations do not reflect future SLR risk. It may be incumbent upon the Town, to adopt their own enhanced standards beyond Florida Building Code (FBC), unless or until FBC is revised to account for SLR.

Various projects are planned for the purposes of improving flood protection and water quality treatment throughout the Town within the five-year planning horizon. Projects included consist of a wide spectrum of improvements prioritized with the Town Council in 2021. Additionally, water quality initiatives related to the Taylor Property (a.k.a. Loxahatchee Backwaters Natural Area) and elimination of the nutrient loadings associated with water treatment by-product discharges to the river are included which will solidify the Town's continuing commitment to preserving and protecting the Loxahatchee River for future generations to enjoy. Furthermore, A desktop asset management exercise was also performed to estimate future Renewal and Replacement costs for pipes and structures. Due to the relatively young age of the Town's infrastructure, a modest amount of repair and replacement work will likely be required in the next 25 years. However, it is recommended that the Town prioritize inspections of older assets using condition assessment methodology.

The stormwater master plan also details the development of a water quality monitoring program framework for non-residential properties within the Town. Water quality monitoring targets were developed specifically for total nitrogen (TN), and total phosphorous (TP), as these are the two pollutants of current concern relative to the Loxahatchee River Pollutant Reduction Plan. However, this monitoring plan could be adapted to other pollutants as needed.

Financial Strategies to Achieve Goals

A financial forecast was completed for the Stormwater Utility to:

- i) Present the basis for the funding of the capital program as identified in the plan, including the adequacy of the availability fees;
- ii) Evaluate trends in the expenditure requirements to be funded from rates (rate sufficiency and potential changes in rate levels to fund such expenditures); and
- iii) Estimate the projected financial position of the Stormwater Utility based on the forecast of assumptions regarding growth, inflation, and other factors and other observations for consideration by the Town.

The recommendations and conclusions of the Financial Forecast include the following:

- The Stormwater Utility should set policy consistent with the Water System, which will result in a financial position that would equate to a strong utility credit (assumed to be a “AAA” credit rating).
- There is a need to fund approximately \$56.2 Million in capital expenditures over the Fiscal Year 2022 to 2046-time, for renewal and replacement stormwater projects.
- It is recommended that the Town annually fund a deposit to the R&R Fund at the amounts identified in the financial forecast as follows:
 - Maintain the base annual deposit of approximately \$676,000 for the Fiscal Year 2022;
 - Increase the base annual deposit amount by the construction cost index as published annually in the Engineering News Record (not less than 3.0%) to account for changes in construction costs; and
 - Increase the base annual deposit based on the additional cash flow anticipated from recommended rates equal to \$500,000 through 2032 and \$250,000 subsequent to 2032 through 2046 based on the capital needs of the utility.
- The Town should increase Stormwater Utility rates by 7.00% annually for the Fiscal Years 2023 through 2026 to allow the utility to increase operating margins, fund the capital improvement program identified for the utility, continue to pay the assumed inter-fund loan from the Water System, and to maintain a strong financial credit rating. Based on a local utility rate survey, this rate adjustment is not anticipated to affect the competitiveness of rates when compared to other local governments in the Southeast Florida area.
- After the rate phasing plan through 2026, the Town should continue to implement an annual price index adjustment that is equal to the greater of the Consumer Price Index or 2.5%, to maintain net revenue margins and to continue to provide funds for renewals and replacement capital projects.

1. Introduction

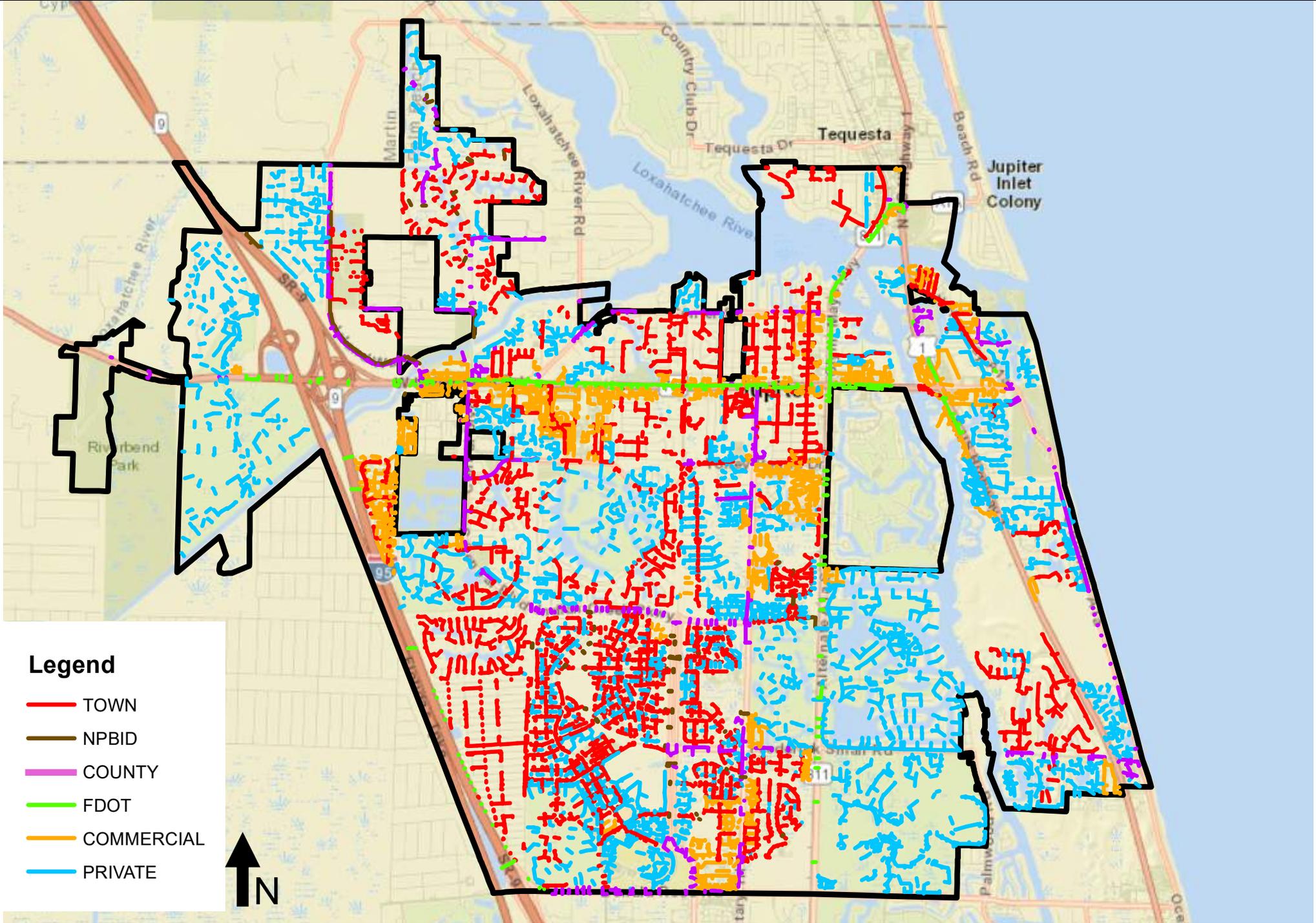
In 1994, the Jupiter Town Council took the prudent action to establish a Stormwater Utility focused on minimizing the risk of flooding while also taking proactive steps to improve stormwater runoff water quality. The stormwater utility is self-funded and charges fees used for the construction, operation and maintenance of stormwater infrastructure.

The purpose of this master plan update is to assist the Town in assessing the current and future position of the Town of Jupiter Stormwater Utility. The plan provides recommendations for future improvements and initiatives, determines and projects costs, and provides financial guidance to ensure future solvency of the stormwater utility.

1.1 Stormwater Service Planning Area

The Town of Jupiter (Town) is located in Northeastern Palm Beach County. The municipal boundaries encompass over 23 square miles. The 2020 United States Census estimated 61,047 people within the Town boundaries.

Management of stormwater throughout the Town's limits is achieved through naturally occurring and manmade surface water management features. The Town's Stormwater Utility Service Area includes all properties within the municipal boundaries. However, portions of the drainage network are shared between private and public entities. **Figure 1-1** depicts the extents of stormwater infrastructure within the Town of Jupiter Stormwater Utility Service Area and illustrates system ownership and maintenance responsibilities.



Legend

- TOWN
- NPBID
- COUNTY
- FDOT
- COMMERCIAL
- PRIVATE



1.2 Stormwater System Responsibility Throughout the Town

A review of public entities (other than the Town) involved with stormwater management within the Town's Stormwater Service area is as follows:

Northern Palm Beach County Improvement District (NPBCID)

Responsible for coordinating the design, construction, and maintenance of "units of development" within the Town. Responsibilities include operation of certain stormwater gates and structures, and maintenance of fixed structures, telemetry, canals, rain gauges, greenway trails, preserves, marshes, lakes, fences, observatory decks, culverts, and selected roadways. NPCID's service area within the Town fall's primarily within the Abacoa, Island Way, and Heights Boulevard areas. NPBCID serves 4,481 acres within the Town.

Florida Department of Transportation (FDOT)

Responsible for the stormwater management systems serving state roads within the Town. FDOT's service area within the Town is located primarily along Indiantown Road (SR 706), Alternate A1A (SR 811), and US1. FDOT is responsible for systems serving approximately 973 acres within the Town.

Palm Beach County

Responsible for the stormwater management systems serving County roads within the Town limits. Palm Beach County's service area within the Town is located primarily in unincorporated areas of Palm Beach County, along Central Boulevard and Military Trail, and in Jonathan's Landing. Palm Beach County operates a system serving 390 acres within the Town.

North Palm Beach Heights Water Control District (NPBHWCD)

Responsible for the primary surface water management system which serves the North Palm Beach Heights subdivision and multiple other developments along the Heights Canal within the Sims Creek watershed. Responsibilities include maintenance of canals and canal culverts. NPBHWCD operates a system serving 400 acres within the Town.

South Indian River Water Control District (SIRWCD)

Responsible for the primary stormwater management system which serves the unincorporated portion of Palm Beach County west of the Florida's Turnpike and south of the C-18 Canal, as well as areas within the Town such as Egrets Landing and Jupiter Park of Commerce. SIRWCD operates a system serving approximately 344 acres within the Town.

Jupiter Inlet District (JID)

Responsible for maintenance of the Jupiter Inlet and the tidal portions of its tributaries.

South Florida Water Management District (SFWMD)

Responsible for water resources management over a 16-county area, including Palm Beach County. The District's responsibilities include planning, construction, regulation, and operation and maintenance.

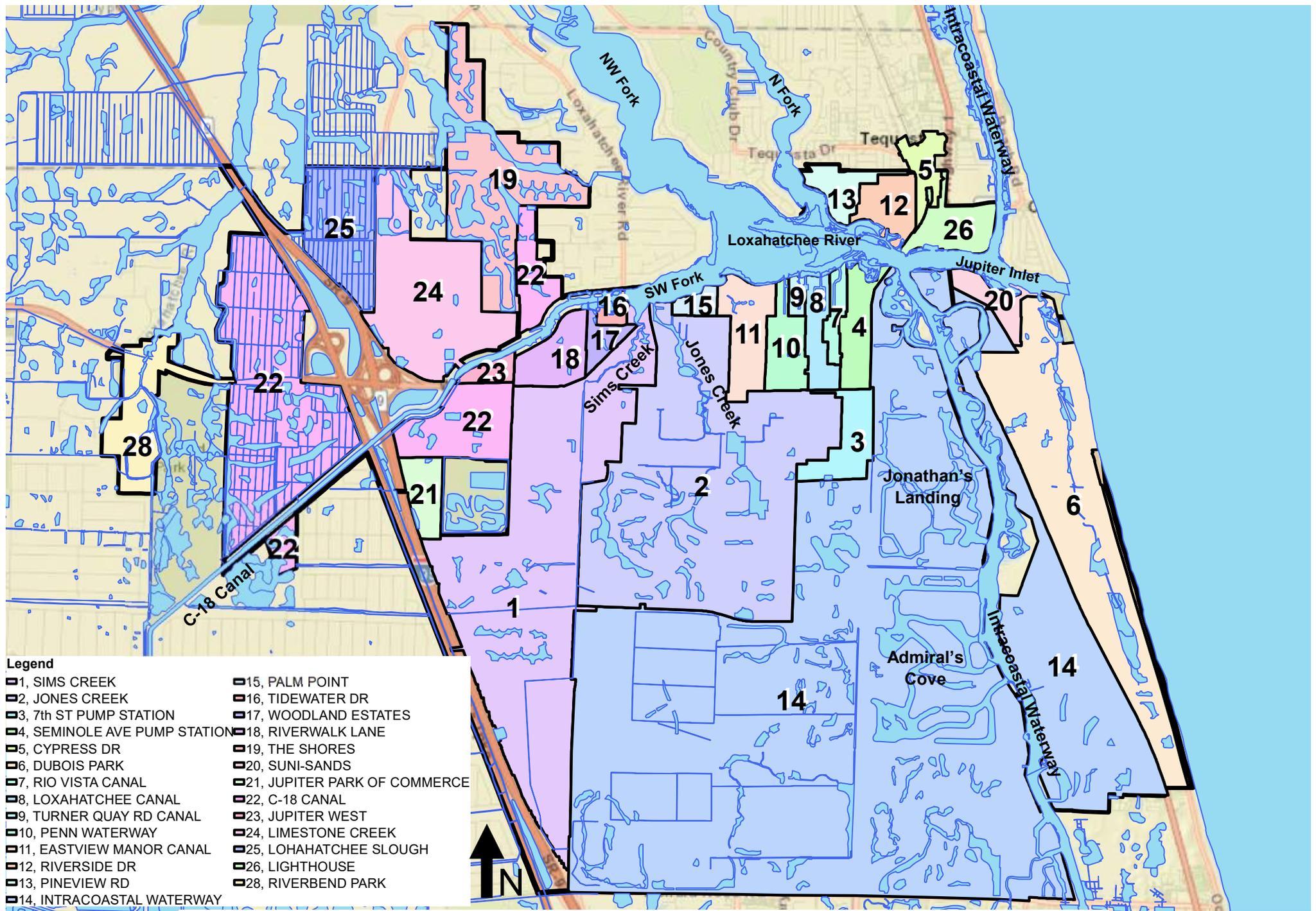
Loxahatchee River District (LRD)

Involved in preserving and protecting the Loxahatchee River through programs focused on pollution control and public awareness/involvement

1.3 Watersheds and Receiving Waterbodies

The primary receiving water bodies within the Town are the Loxahatchee River and the Intracoastal Waterway. Discharge of runoff to the Loxahatchee River from the Town is direct, but also occurs via the C-18 Canal, SIRWCD Border Canal, Jones Creek, and Sims Creek. Discharge to the Intracoastal Waterway is both direct and via several tributary water management systems including Jonathan's Landing and Admirals Cove.

Previous master planning efforts have defined 28 distinct watersheds throughout the Town, that ultimately outfall to the major waterbodies. The watershed boundaries are used for hydraulic modeling and permitting efforts. **Figure 1-2** illustrates the various defined watersheds and receiving waterbodies within the Town's limits.



- Legend**
- 1, SIMS CREEK
 - 2, JONES CREEK
 - 3, 7th ST PUMP STATION
 - 4, SEMINOLE AVE PUMP STATION
 - 5, CYPRESS DR
 - 6, DUBOIS PARK
 - 7, RIO VISTA CANAL
 - 8, LOXAHATCHEE CANAL
 - 9, TURNER QUAY RD CANAL
 - 10, PENN WATERWAY
 - 11, EASTVIEW MANOR CANAL
 - 12, RIVERSIDE DR
 - 13, PINEVIEW RD
 - 14, INTRACOASTAL WATERWAY
 - 15, PALM POINT
 - 16, TIDEWATER DR
 - 17, WOODLAND ESTATES
 - 18, RIVERWALK LANE
 - 19, THE SHORES
 - 20, SUNI-SANDS
 - 21, JUPITER PARK OF COMMERCE
 - 22, C-18 CANAL
 - 23, JUPITER WEST
 - 24, LIMESTONE CREEK
 - 25, LOXAHATCHEE SLOUGH
 - 26, LIGHTHOUSE
 - 28, RIVERBEND PARK



Project Name:
Stormwater Master Plan

Defined Watersheds and Receiving Waterbodies
H&S Project Number: 44250-067
Figure 1-2

2. Stormwater Utility Mission

The Town of Jupiter Stormwater Utility's primary mission is to:

- Minimize risk of flooding (Water Quantity)
- Enhance stormwater runoff quality (Water Quality)

Moreover, the Town endeavors to achieve these two primary goals while:

- Proactively planning to effectively and efficiently achieve desired outcomes
- Funding the Stormwater Utility through a separate and dedicated enterprise source, paid for by utility fees and grants

The two primary mission items of controlling water quantity, and water quality, are discussed in the following section.

2.1 Water Quantity

It is the Stormwater Utility's mission to minimize the risk of flooding throughout the Town. The Stormwater Utility achieves this by building, operating, and maintaining stormwater facilities to provide proper storage and conveyance of peak stormwater flows, to reduce flooding problems and meet the Town's desired level of service (LOS).

The LOS criteria corresponds to design storm events and varies depending on the function of the infrastructure being protected. For example, major highways require a greater LOS (i.e., lower frequency of flooding) compared to a smaller local road since it would be more critical for the major road to remain clear of flooding. The primary facilities for which service/protection criteria have been established include buildings, roadways, and parking lots.

In addition to specifying LOS criteria, the Town (along with other applicable authorities) regulates offsite discharge from private properties to neighboring properties, the public right of way, publicly-owned stormwater infrastructure, and receiving waterbodies during storm events. Regulation of the allowable offsite discharge is typically managed by the South Florida Water Management District (SFWMD), local water control districts (such as the South Indian River Water Control District or North Palm Beach Heights Water Control District), the Florida Department of Transportation (FDOT), and/or the Town. Regulations typically stipulate that post-development discharge flowrates must be equal to or less than pre-development discharge flowrates during a specified storm event.

The Town requires developers of private properties to follow the Town of Jupiter Water Utilities – Guide for Development Design and Construction Standards – Water and Stormwater, which establish guidelines for structural best management practices (BMPs) onsite to control water quantity and quality. The manual mandates design and plan review by the Town and enforces LOS standards.

2.2 Water Quality

It is the Stormwater Utility’s mission to maintain and enhance stormwater runoff quality throughout the Town. The Stormwater Utility achieves this by building, operating, and maintaining a regional system of best management practices (BMPs) that treat the “first flush” of runoff to reduce pollutant loads to the maximum extent practicable to protect water quality. Regulation of the volume required for water quality treatment is typically managed by the SFWMD. Per the SFWMD, ERP Applicant’s Handbook Volume II, wet detention volume shall be provided for the “first flush” first inch of runoff from the developed project, or the total runoff of 2.5 inches times the percentage of impervious area, whichever is greater.

The volumetric requirements for new development and redevelopment are that retention, detention, or both retention and detention in the overall system including swales, lakes, canals, greenways, etc., be provided for, in one of the following three criteria or equivalent combinations thereof:

1. Dry detention volume shall be provided equal to 75 percent of the above amounts computed for wet detention.
2. Retention volume shall be provided equal to 50 percent of the above amounts computed for wet detention.
3. In addition, commercial or industrial zoned projects must provide at least one-half inch of dry detention or retention pretreatment as part of the required retention/detention.

Controlling stormwater runoff quality, especially for nitrogen, is critical to protecting seagrass in the Loxahatchee River. Seagrasses are recognized as one of the most important habitats within the Loxahatchee River estuary. Seagrasses play a critical role in providing sediment stabilization, nutrient cycling, detrital food sources, and nursery grounds for many recreational and commercially important fisheries.

Some of the common pollutants found in stormwater runoff are listed in **Table 2-1** along with their specific adverse impact on the health of waterways and the environment.

Table 2-1: Common Stormwater Runoff Pollutants¹

Constituents	Sources	Adverse Impacts
Sediments Total Suspended Solids (TSS)	<ul style="list-style-type: none"> • disintegrating rock • eroding soil • organic material 	<ul style="list-style-type: none"> • increased turbidity • reduced light penetration • impaired respiration and reproduction of fish and aquatic invertebrates

¹ A portion of this information was sourced from “Best Management Practices for South Florida Urban Stormwater Management Systems”, dated April 2002 as prepared by the South Florida Water Management District.

Constituents	Sources	Adverse Impacts
Nutrients Nitrogen	<ul style="list-style-type: none"> • fertilizers • detergents • plant debris • atmospheric • septic tanks 	<ul style="list-style-type: none"> • increased primary biological productivity • uncontrolled growth of algae • undesirable aquatic weeds • water discoloration • release of toxins from sediment
Heavy Metals Lead Cadmium Chromium Copper Mercury, Zinc	<ul style="list-style-type: none"> • motor vehicles • industry fallout • degradation of highway materials 	<ul style="list-style-type: none"> • reproduction of fish and shellfish • accumulate in fish tissue posing a threat to humans • potential for ground water contamination
Oxygen Demanding Substances 5-day Biochemical Oxygen Demand (BOD ₅)	<ul style="list-style-type: none"> • microorganisms • high concentrations of decaying organic matter 	<ul style="list-style-type: none"> • oxygen deficit • reproduction of fish and other aquatic life forms
Petroleum Benzene Toluene Ethylene Xylene TRPHs	<ul style="list-style-type: none"> • parking lots and roadways • leaking storage tanks • vehicle emissions • improper disposal of waste oil 	<ul style="list-style-type: none"> • benthic communities
Pathogens Coliform bacteria Viruses	<ul style="list-style-type: none"> • animal waste • failing septic systems • illicit sewage connections • boats and marinas 	<ul style="list-style-type: none"> • benthic communities <ul style="list-style-type: none"> ♦ low species diversity ♦ reduced abundance
Toxins	<ul style="list-style-type: none"> • pesticides • solvents • household and industrial chemicals • detergents • synthetic organic surfactants • sanitary sewers • septic tanks 	<ul style="list-style-type: none"> • fish respiration • water conditioning phosphate-based chemicals
Water Temperature	<ul style="list-style-type: none"> • increased flows • decreased vegetative cover • increased imperviousness 	Changes to the physical properties and characteristics of water: <ul style="list-style-type: none"> • salinity • solubility • alkalinity • dissolved oxygen • ph • hardness • conductivity

2.3 Best Management Practices (BMPs)

The Town achieves their mission by implementing Best Management Practices (BMPs). Methods for controlling water quantity and water quality can be categorized as non-structural, or structural BMPs. The two methods are often used together to stormwater control runoff.

Non-Structural BMPs

Non-structural BMPs improve water quality by reducing the accumulation and generation of potential pollutants at or near their source. Non-structural BMPs do not require construction of a facility, but instead are a programmatic approach for pollution control. Some examples of non-structural BMPs in use or under consideration by the Town are shown in **Table 2-2**.

Table 2-2: Examples of Non-structural Best Management Practices²

Practice	Action	Examples
Planning and Regulatory Tools	Action plans and regulations that encourage or mandate management practices to prevent, reduce, or treat stormwater runoff	<ul style="list-style-type: none"> • Required setbacks from waterways • Minimum allowable impervious areas within a site • Mandated criteria for treating runoff
Ordinances and Regulatory Programs	Establish codes and ordinances to define objectives, permitting requirements, performance/design standards, and enforcement policies. Federal, state, local, and site-specific requirements provide the basis for building regulatory programs	Water management districts function under these codes and require permits for the construction and operation of water management systems, water usage, and water quality monitoring plans
Conservation Plan	Reduce or eliminate the amount of water potentially requiring stormwater treatment	<ul style="list-style-type: none"> • Appropriate lawn irrigation. • Adopt Xeriscape® landscape principles
Turf and Landscape Management	Employ turf and landscape management procedures consistent with vegetation use, growing season, and rainfall amounts. Provide routine irrigation, mowing, fertilization, targeted pest management, aeration, and dethatching of lawns and grasses planted for aesthetic and recreational uses, surface stabilization, and erosion control	<ul style="list-style-type: none"> • Perform mowing when no significant rainfall events are predicted • Post “no dumping” signs to prevent the disposal of cuttings and clippings in or near drainage facilities • Promote composting as a good disposal alternative

² A portion of this information was sourced from “Best Management Practices for South Florida Urban Stormwater Management Systems”, dated April 2002 as prepared by the South Florida Water Management District.

Practice	Action	Examples
Catch Basin Cleaning	Remove accumulated sediments from catch basins on a regular basis to prevent clogging	Mechanical cleaners such as eductors, vacuums, or bucket loaders
Road Maintenance and Street Cleaning	Provide maintenance programs to address deteriorating roadway surfaces that contribute to contamination of stormwater and provide routine street cleaning for the removal of accumulated depositions of solids that may otherwise be transported as contaminants in the first flush of stormwater	<ul style="list-style-type: none"> • Repair of potholes and worn pavement • Minimize size of the impervious areas • Remove particles (>50 microns) and associated pollutants (i.e., solids and heavy metals) via mechanical broom and or vacuum sweepers, and street flushers
Canal/Ditch Maintenance	Check ditches that carry heavy flow concentrations for collapsed or blocked flow ways, or degradation of flow way lining materials	<ul style="list-style-type: none"> • Dredge buildup of sediments • Remove illegally dumped items to reduce possible pollutants and achieve aesthetic enhancement • Post “No littering” signs with call-in number to report dumping in progress
Educational and Outreach Programs	Implement public education and outreach programs into a community’s overall stormwater management plan to educate employees, the public, and businesses about the importance of protecting stormwater from improperly used, stored, and disposed pollutants	<ul style="list-style-type: none"> • Frequent and consistent campaign messages • Provide door hangers, pamphlets, guidebooks, signs and press releases • Neighborhood programs

Structural BMPs

Structural BMPs involve engineering and building a “structure” or “asset” for controlling the quality of stormwater runoff. These structural BMPs treat runoff prior to the point of discharge (to either the receiving storm sewer system or receiving waters). Most structural BMPs require some level of routine maintenance. Some examples of stormwater treatment systems that the Town typically employs, and their advantages and or disadvantages are listed in **Table 2-3**, below.

Table 2-3: Advantages and Disadvantages of Structural BMPs³

System	Description	Advantages	Disadvantages
Wet and Dry Detention	<p>Wet detention ponds are designed to maintain a permanent pool of water and temporarily store runoff until it is released at a controlled rate. These systems are more efficient in removing soluble pollutants (nutrients) than dry detention due to the biological activity in the vegetation and water column.</p> <p>Dry detention ponds detain a portion of runoff for a short period using a fixed opening to regulate outflow at a specified rate and allowing solids and associated pollutants time to settle out. In general, these systems are effective in removing total suspended solids but have low treatment efficiency for nutrients. Requirements call for a minimum of one foot from control elevation to bottom of detention area.</p>	<ul style="list-style-type: none"> • reduces pollutant loads • maximizes groundwater recharge • reduces runoff volume/rates • long service life • low maintenance 	<ul style="list-style-type: none"> • potential standing water • reduction of infiltration rates over time • space requirements
Exfiltration Trenches	<p>Exfiltration trenches are perforated pipes buried in trenches backfilled with stone or aggregate. Runoff diverted into the pipe gradually infiltrates from the pipe into the trench and into the subsoil, eventually reaching the ground water. A filter cloth surrounding the rock trench is used to minimize clogging.</p>	<ul style="list-style-type: none"> • groundwater recharge • efficient layout • retrofit situations 	<ul style="list-style-type: none"> • short service life • high maintenance
Grassed Swales	<p>Grassed swales are typically shallow, vegetated, trenches used for filtration and conveyance prior to runoff being discharged to treatment systems. Grassed swales should be mowed to stimulate vegetative growth, control weeds, and maintain the capacity of the system.</p>	<ul style="list-style-type: none"> • attenuation of stormwater runoff • groundwater recharge • fits into limited spaces 	<ul style="list-style-type: none"> • standing water • limited pollutant reduction capabilities
Water Quality Inlets	<p>Water quality inlets rely on settling to remove pollutants before discharging water to the storm sewer or other collection system. They are also designed to trap floating trash and debris. When inlets are coupled with oil/grit separators and/or hydrocarbon absorbents, hydrocarbon loadings from high traffic/parking areas may be reduced.</p>	<ul style="list-style-type: none"> • limited space requirements • ideal for retrofit projects • long life • unaffected by soil conditions 	<ul style="list-style-type: none"> • serves only small drainage area • high maintenance • not accepted by all regulatory agencies
Green Infrastructure	<p>Physical stormwater control measures or infrastructure that use or mimic natural processes to infiltrate, evapotranspire, or reuse stormwater or runoff on the site where it is generated</p>	<ul style="list-style-type: none"> • Varies based on strategy used • In general, more aesthetically pleasing than hard infrastructure 	<ul style="list-style-type: none"> • Varies based on strategy used • Typically requires upkeep, mowing, etc

³ A portion of this information was sourced from "Best Management Practices for South Florida Urban Stormwater Management Systems", dated April 2002 as prepared by the South Florida Water Management District.

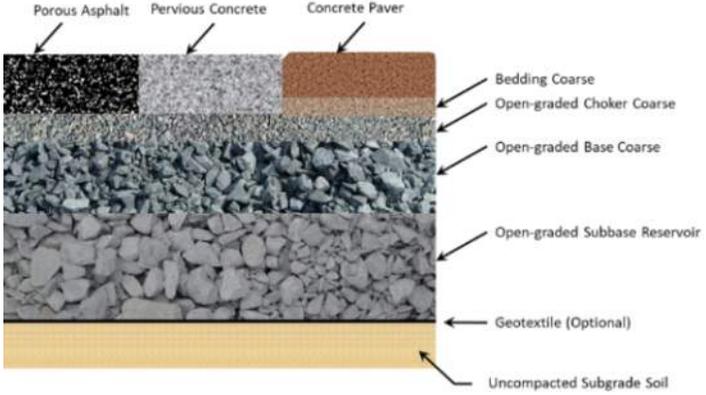
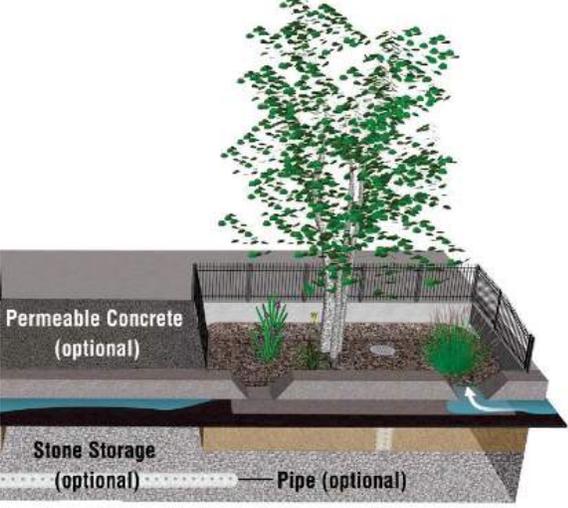
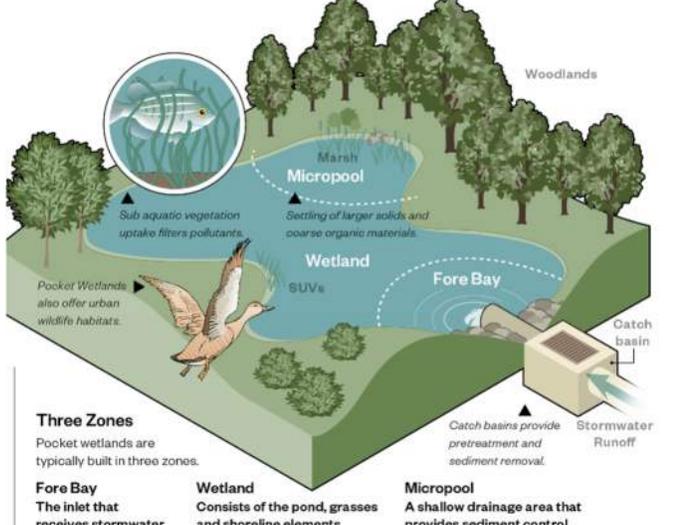
In addition to the standard structural stormwater treatment system BMPs outlined previously, there have been innovations in recent years to address water quality issues and reduce pollution in stormwater discharge. The Town has begun to evaluate and implement some of these innovative technologies, including advanced filtration media technology, hydrodynamic separators, and engineered filter media. **Table 2-4** provides some examples of these technologies that the Town has either implemented or is considering for implementation.

Green infrastructure is another category of structural BMPs that are increasing in use. The term “green infrastructure” indicates the physical stormwater control measures or infrastructure that use or mimic natural processes to infiltrate, evapotranspire (the return of water to the atmosphere either through evaporation or by plants), or reuse stormwater or runoff on the site where it is generated. Green infrastructure also includes leaving natural systems intact to provide benefits in addressing sea level rise and climate change. The Town has already implemented, and is considering further implementation, of various green infrastructure elements such as those listed in **Table 2-5**.

Table 2-4: Stormwater Treatment System Innovations

System	Illustration	Description
<p>Vortechs® Stormwater Treatment (Contech Engineered Solutions LLC)</p>		<ul style="list-style-type: none"> • Small footprint • Large swirl chamber with fine particle removal down to 50 microns • Mainly for TSS removal • Trash and floatables removal
<p>Jellyfish Filter® (Contech Engineered Solutions LLC)</p>		<ul style="list-style-type: none"> • Small footprint • Pleated filter membranes with high surface area membrane filtration, promotes TN removal (denitrification) • High TSS, TN, TP removal • Trash and floatables removal
<p>Bold and Gold® Filtration Media (Environmental Conservation Solutions)</p>		<ul style="list-style-type: none"> • A biosorption activated media (BAM) used to remove TN, TP, and TSS, and pathogens • Made of sand, clay and recycled tire • Installed within BMPs to increase water quality benefits

Table 2-5: Green Infrastructure⁴

System	Illustration	Description
<p>Permeable Pavement</p>		<ul style="list-style-type: none"> • Includes asphalt, concrete, concrete paver, structural turf, or various other designs • Generally made up of five material layers: 1) permeable pavement, 2) bedding coarse, 3) choker coarse, 4) reservoir base coarse, and 5) soil subgrade. • Most applicable to areas receiving light duty traffic loadings, such as low-intensity commercial parking lots, roadway shoulders, pedestrian and bicycle paths, and on-street parking stalls.
<p>Bioswales</p>		<ul style="list-style-type: none"> • Shallow, landscaped depressions with soil and vegetation • Receives runoff from impervious areas and treats stormwater primarily through infiltration and plant uptake of nutrients, metals, hydrocarbons and bacterial pollutants • For use in natural or existing low areas, parking lot islands, commercial or public landscaped areas, curb bump-outs or medians along city streets • Not suitable if there is less than two feet between high water table
<p>Enhanced Stormwater Ponds</p>	 <p>Three Zones Pocket wetlands are typically built in three zones.</p> <p>Fore Bay The inlet that receives stormwater.</p> <p>Wetland Consists of the pond, grasses and shoreline elements.</p> <p>Micropool A shallow drainage area that provides sediment control.</p>	<ul style="list-style-type: none"> • Like a wet detention/retention ponds but with multiple cells with varying depths to create habitats such as hardwood swamps, shallow freshwater marshes, and deep water ponds. • Multi-functional, incorporating physical design characteristics with vegetation to improve water quality treatment and create natural habitats in urban areas • Suitable for retrofits of existing stormwater ponds, as well as for construction in new developments. • Generally more effective at removing dissolved nutrients than standard retention ponds

⁴ A portion of this information was sourced from "Low-Impact Development and Green Infrastructure: Pollution Reduction Guidance for Water Quality in Southeast Florida", dated August 2019 as prepared by Bean, Eban et. al.

3. Level of Service

The Town’s current flooding level of service (LOS) criteria are documented in the Town of Jupiter Water Utilities – Guide for Development Design and Construction Standards – Water and Stormwater and are summarized in **Table 3-1**.

Table 3-1: Town of Jupiter Flooding LOS Criteria

Structure/Facility	Criteria
Houses/Buildings	Finished Floor Elevation (FFEL) shall be above the greater of the following: <ul style="list-style-type: none"> • FFEL above 100-yr – 72-hr storm elevation (16 inches) • FFEL 18” above FEMA 100-yr flood elevation • FFEL 18”/7” Above Avg. Adjacent Road Crown (for Residential/Commercial) • FFEL in accordance with most recent Florida Building Code
Arterial Roads	1/2 width dry in 25-yr – 72-hr storm (16 inches)
Collector Roads	Entire width dry in 10-yr – 24-hr storm (9 inches)
Local Roads	Flooding allowed to road crown in 10-yr – 24-hr storm (9 inches)
Parking Lots	No standing water during 5-yr – 1 hr storm (3 inches) Lowest drainage structure rim 6” above discharge elevation
Land Development	Positive drainage outfall, or recovery of system storage / drainage documented

3.1 LOS Comparison with Other Municipalities

Storms are expected to increase in frequency, intensity, and duration related to climate change. Also, coastal tailwater elevations are expected to increase, and groundwater levels are also expected to rise. With these changes, much of the Town’s existing stormwater infrastructure may eventually not meet its originally designed LOS.

Hazen and Sawyer prepared a Sea Level Rise and Climate Change report in 2017 for the Town, to assist the Town with their response to the Revision of Florida Law Section 163.3178(2)(f), F.S., (Peril of Flood legislation). In that memo, the Town’s LOS service was considered with respect to the pressures of climate change and compared to other South Florida municipalities. Local governments throughout South Florida have varying requirements for flood protection LOS for roads. The flood protection LOS for the Town compared with various local governments is provided in **Table 3-2**. It is apparent that in some cases, the Town’s LOS is more stringent than other local governments such as Palm Beach County and Miami-Dade County.

Table 3-2: Flood Protection LOS Comparison for Roads

	Town of Jupiter	Palm Beach County	Broward County	City of Fort Lauderdale	Miami-Dade County
Source	Guide for Development, Design and Construction Standards, Water and Stormwater	Comprehensive Plan, Stormwater Management Sub-Element, II, GOAL 1, OBJECTIVE 1.1, Table 1	Comprehensive Plan - Drainage and Groundwater Recharge Element, Policy 7.2.5	Comprehensive Plan - Future Land Use Element - Policy 1.1.11	Miami-Dade Department of Permitting Environment and Regulatory Affairs (PERA)
Arterial Roads	1/2 width dry during 25-year, 3-day	(See note 1)	ROW > 50', flood to edge of pavement during 10-yr	ROW > 50', flood to edge of pavement during 10-yr	<ul style="list-style-type: none"> • Principal Arterial evacuation route, flood to 8-inches above crown during 100-year, 3-day • Minor Arterial 4-lane roads in high traffic area, flood to outer edge during 10-year, 3-day
Collector Roads	Width dry during 10-year, 1-day	5-year, 1-day	ROW > 50', flood to edge of pavement during 10-yr	ROW > 50', flood to edge of pavement during 10-yr	Flood to crown during 5-year, 1-day
Local Roads	Flood to crown elevation during 10-year, 1-day	3-year, 1-day	Residential Streets < 50' ROW, flood to crown during 10-yr	Residential Streets < 50' ROW, flood to crown during 10-yr	Flood to crown during 5-year, 1-day
Parking Lots	No standing water during a 5-year, 1-hour	3-year, 1-day (5-year, 1-day when exfiltration trench used)	(See note 2)	(See note 2)	2-years, 1-day

Notes:

1. Per Florida Department of Transportation (FDOT) Drainage Manual, design guidelines for storm drains; General design, 3-year storm; General design work that involves replacement of a roadside ditch with a pipe system by extending side drain pipes, and general design on work to Interstate Facilities, 10-year storm; Interstate Facilities for which roadway runoff would have no outlet other than a storm drain system, such as in a sag inlet or cut section, and outlets of systems requiring pumping stations, 50-year storm
2. Per South Florida Water Management District (SFWMD) - ERP APPLICANT'S HANDBOOK VOLUME II, MAY 22, 2016, 3.5 Flood Protection of Roads and Parking Lots, (a) In cases where criteria are not specified by the local government: frequency - 5 years, duration - 1 day (road centerlines) or 1 hour (parking lots served by exfiltration systems)
3. **Green text** indicates criteria less stringent than Town, **Red text** indicates criteria more stringent than Town, no color indicates criteria approximately equivalent to Town

3.2 LOS Discussion

Due to continued sea level rise (SLR) and possible increases in rainfall frequency and duration, the Town may wish to reconsider its LOS standards. Broward County, for example, is the first municipality in South Florida to commission a detailed study in 2020 to project the effects of climate change on higher groundwater elevation, tailwater elevation, and design storm frequency and duration to update their LOS. SFWMD is currently planning a “Statewide Regional Climate Projections” project that may provide updated design storm data relevant to the Town for LOS planning. SLR, increases in rainfall frequency and duration, and the results of the Broward County study are discussed further in Section 5.

The Town currently has higher flood protection LOS standards for certain roads when compared to some other South Florida local governments such as Palm Beach County and Miami-Dade County. Therefore, the Town is taking an aggressive approach to maintaining a high LOS. If the Town wishes to continue this aggressive approach, the Town may consider clarifying in its Guide for Development Design and Construction Standards – Water and Stormwater, that the flood protection LOS standards are for LOS criteria established at the time of development, and not for existing neighborhoods that predate the establishment and enforcement of LOS standards.

The Town may also wish to consider investigating adding enhanced LOS standards for coastal areas prone to flooding, by implementing the following policy in its Comprehensive Plan:

*Town of Jupiter – Comprehensive Plan – Coastal Management Element – Proposed Policy–
Although flooding level of service criteria for existing roadways will generally be maintained as that which was established at the time of development, the Town shall endeavor to increase flooding level of service in coastal areas prone to tidal flooding due to sea level rise when deemed feasible by the Town.”*

4. Loxahatchee River Pollutant Reduction (4e) Plan

The Town of Jupiter is a stakeholder in the Loxahatchee River Voluntary Pollutant Reduction (4e) Plan. This plan was developed by a group of local stakeholders, including the municipalities of the Town of Jupiter, Village of Tequesta, City of Palm Beach Gardens, and counties of Martin County and Palm Beach County, and other entities such as FDOT, Florida’s Turnpike, FDEP, LRD, SIRWCD, and NPBHWCD. The voluntary plan was adopted to avoid the need for prescriptive enforcement measures by the FDEP. The plan documents nutrient management activities by stakeholders in the Loxahatchee River area to make progress toward achieving the Loxahatchee River water quality criteria for pollutants of concern, which are:

- Total nitrogen (TN) and Total phosphorus (TP) - Nutrients are linked to algal blooms, which decrease dissolved oxygen, threatening insect and fish communities.
- Chlorophyll-a - Chlorophyll-a is used as an indicator track the algae-growth in a water body, due to elevated of nitrogen and phosphorous.
- Fecal indicator bacteria (FIB) - FIBs are tracked to measure the bacteria levels in waters. High bacteria counts can affect people swimming or wading in contaminated water by causing illnesses and infections.

The Loxahatchee River Management Coordinating Council (LRMCC) provided the initial forum for stakeholder engagement to develop the pollutant reduction plan in 2016. Public meetings were held throughout the development of the plan to solicit feedback and information from stakeholders. Stakeholders participated with FDEP in the development of the plan, which was finalized and accepted by the FDEP in February 2020.

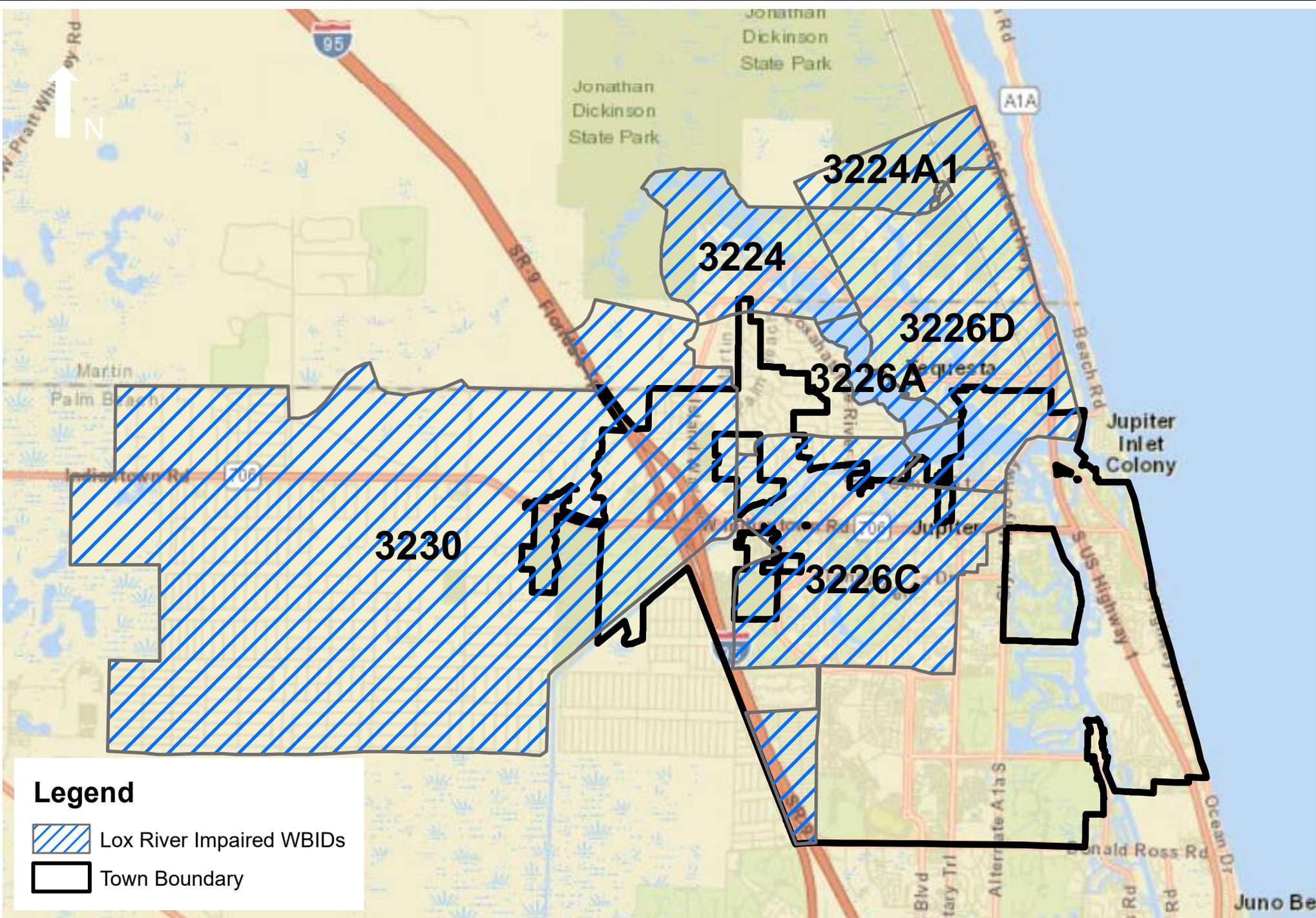
4.1 Description of the Impaired Waterbodies

The Impaired Waters Rule (IWR), Chapter 62-303, of the Florida Administrative Code (Identification of Impaired Surface Waters) establishes a formal mechanism for identifying surface waters in Florida that are impaired (do not meet the applicable water quality standards) by pollutants. Most waters that are verified by FDEP as impaired by a pollutant will be listed on the state’s 303(d) list submitted to EPA pursuant to the Florida Watershed Restoration Act (FWRA) and Section 303(d) of the Clean Water Act. Sections of the Loxahatchee River were listed on the IWR Group 2 list for St. Lucie – Loxahatchee Basin using data from January 1, 2007, to June 30, 2014.

The Loxahatchee River includes Class II waters, which are designated for shellfish propagation or harvesting, as well as Class III waters designated for fish consumption, recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife. There are 14 distinct sections of the Loxahatchee River (as identified by waterbody IDs (WBIDs), wholly within the Loxahatchee River Pollutant Reduction Plan area, six of which are verified as impaired under the IWR. **Table 4-1** provides the list of the six impaired WBIDs in the plan, and **Figure 4-1** shows the locations of each impaired WBID watershed basin.

Table 4-1: Listed Impaired WBIDs of the Loxahatchee River

WBID Number	Loxahatchee River Segment Name	Impaired Parameters	Status	Waterbody Classification
3224	Jonathan Dickinson State Park	FIB, Dissolved Oxygen	303(d) List	2
3224A1	North Fork Lower	FIB	303(d) List	2
3226A	Northwest Fork	Chlorophyll-A, FIB	303(d) List	2
3226C	Southwest Fork	Chlorophyll-A, FIB	303(d) List (Chl-A), TMDL (FIB)	2
3226D	North Fork, Marine Segment	FIB	303(d) List	2
3230	Above Cypress Creek	Nutrients (Algal Mats)	303(d) List	3F



4.2 Pollutant Reduction Goals

The goal of the pollutant reduction plan is to attain the numeric nutrient criterion (NNC) for chlorophyll-a in the Loxahatchee River segments (≤ 4.0 to 5.5 ug/L). FDEP identified the target load of 96,603 lbs/yr TN and 10,931 lbs/yr TP that would achieve chlorophyll-a criterion. To meet this, FDEP determined that the estimated target watershed reduction is 27% for TN and TP, or 36,500 lbs/yr TN and 4,200 lbs/yr TP.

Various stakeholders, including the Town, proposed multiple management activities to meet the nutrient reduction goals identified. Management activities eligible for credit towards pollutant reduction goals were those non-structural activities that are ongoing, such as street sweeping and education efforts, and structural activities such as new stormwater infrastructure that treat runoff (in cases where the stormwater infrastructure discharges into impaired water bodies). The 2020 version of the plan included management activities completed from 2008 through 2018, as well as planned management activities through 2022. It is expected that additional management activities will be provided beyond 2022, to make further progress towards water quality targets as new efforts are identified, and more information is available to estimate their associated water quality benefits.

Table 4-2 summarizes the estimated nutrient reductions from management activities by all stakeholders through 2022 documented in the Pollutant Reduction Plan. The Town of Jupiter’s projects and estimated load reductions, as proposed in the 2020 Pollutant Reduction Plan, are presented in **Table 4-3**. Fecal indicating bacteria (FIB) reduction activities are not a requirement of the Pollutant Reduction Plan but were voluntarily submitted by stakeholders. The stakeholders in the Pollutant Reduction Plan will be working on systematic programs to help in the identification of bacteria sources to address root causes of FIB impairments. **Table 4-4** provides a list of FIB management activities provided by the Town.

Table 4-2: Estimated Nutrient Reductions from Management Activities Proposed by all Stakeholders in the Pollutant Reduction Plan – 2008 to 2022

Description	TN (lb/yr)	TP (lb/yr)
Nutrient Removal Required by FDEP	36,489	4,129
Nutrient Reduction Proposed in 2020 Plan	34,198	5,385
Reduction Remaining	2,291	Planning Goal Met
Percentage of Reductions Toward Meeting FDEP Goal, Per 2020 Plan	94%	130%

**Table 4-3 - Nutrient Reduction Management Activities for the Town of Jupiter
(Excerpted from 2020 Loxahatchee River Pollutant Reduction Plan)**

Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
FDOT District 4	FDOT4-01A	I-95 From South of Donald Ross Rd to South of Indiantown Rd	Construction and operation of a surface water management system for this roadway widening project.	Grass swales with swale blocks or raised culverts	Completed	2012	351	24	Not provided	Florida Legislature	Not provided
FDOT District 4	FDOT4-01B	I-95 From South of Donald Ross Rd to South of Indiantown Rd	Construction and operation of a surface water management system for this roadway widening project.	Dry Detention Pond	Completed	2012	197	14	Not provided	Florida Legislature	Not provided
FDOT District 4	FDOT4-01C	I-95 From South of Donald Ross Rd to South of Indiantown Rd	Construction and operation of a surface water management system for this roadway widening project.	Dry Detention Pond	Completed	2012	10	1	Not provided	Florida Legislature	Not provided
FDOT District 4	FDOT4-02	US 1/SR 5 Bridges – Jupiter	Construction and operation of a surface water management system (French drains) for this bridge replacement project.	Off-line Retention BMPs	Completed	2013	32	5	Not provided	Florida Legislature	Not provided
FDOT District 4	FDOT4-03	Tequesta Drive Bridge Replacement Project	Construction and operation of a surface water management system for this bridge replacement project.	Grass swales with swale blocks or raised culverts	Completed	2010	7	1	Not provided	Florida Legislature	Not provided
FDOT District 4	FDOT4-04	I-95 Weigh-in-Motion Station	Construction and operation of a surface water management system.	Wet Detention Pond	Completed	2009	112	11	Not provided	Florida Legislature	Not provided
FDOT District 4	FDOT4-05	Street Sweeping	Estimated 1,648,053 kilograms per year (kg/yr) collected	Street Sweeping	Completed	N/A	2,046	1,312	Not provided	Florida Legislature	Not provided
FDOT District 4	FDOT4-06	Catch Basin Cleanout	Weight of material collected not provided.	BMP Cleanout	Completed	N/A	TBD	TBD	Not provided	Florida Legislature	Not provided
FDOT District 4	FDOT4-06	Public Education	Provided education outreach with joint National Pollutant Discharge Elimination System (NPDES) group. Actions included public service announcements, FYN brochure, public information, and outreach.	Education Efforts	Completed	N/A	N/A	N/A	Not provided	Florida Legislature	Not provided
Town of Jupiter	TOJ-01	Surface Water Recharge System Improvements II	Complete system to capture and retain up to 10 million gallons per day (MGD) of excess stormwater runoff from the C-18 basin in lieu of discharging to tide.	Dispersed Water Management (DWM)	Planned	2021	TBD	TBD	\$1,937,926	Town	Town - \$1,937,926
Town of Jupiter	TOJ-02	Pine Gardens South Water Quality Improvements	Installation of exfiltration trenches to provide an average of 0.41 inches of treatment in the project area.	Exfiltration Trench	Completed	2015	18	2	\$328,552	Town/Loxahatchee River Preservation Initiative (LRPI)	Town - \$200,000/ LRPI - \$128,552

**Table 4-3 - Nutrient Reduction Management Activities for the Town of Jupiter
(Excerpted from 2020 Loxahatchee River Pollutant Reduction Plan)**

Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
Town of Jupiter	TOJ-03	Public Education	Includes fertilizer (adopted June 18, 2013), landscape, pet waste and irrigation ordinances. Florida Yards & Neighborhoods (FYN) Program. Includes public service announcements (PSAs), information pamphlets, website, and inspection program (6 % credit). Items include the annual Jupiter Jubilee (stormwater festival), annual soil and sediment control training, annual distribution of hurricane preparedness information including information on stormwater management and drainage maintenance. Provided education outreach with joint NPDES group. Actions included public service announcements, FYN brochure, public information, and outreach.	Education Efforts	Completed	N/A	2,742	282	Not provided	Town	Not provided
Town of Jupiter	TOJ-04	Maintenance Dredging	Dredging in Rio Vista Waterway.	Muck Removal/Restoration Dredging	Completed	2012	74.1	18.6	\$70,500	Town	\$70,500
Town of Jupiter	TOJ-05	Street Sweeping	Periodic street sweeping to enhance water quality.	Street Sweeping	Completed	N/A	142	91	Not provided	Town	\$49,586
Town of Jupiter	TOJ-06	Cinquez Park Drainage Improvements I	Construction of drainage system, swales and roadways (existing roads were shell rock).	BMP Treatment Train	Completed	2011	36.20	2.58	\$569,518	Town	\$569,518
Town of Jupiter	TOJ-07	Cinquez Park Drainage Improvements II	Construction of new park stormwater management system to retain runoff.	On-line Retention BMPs	Completed	2018	14.22	0.65	\$329,400	Town	\$329,400
Town of Jupiter	TOJ-08	Water Plant Detention Pond Cleanout	Silt removal from wet detention pond located at the water plant.	Muck Removal/Restoration Dredging	Completed	2017	165	67	\$10,620	Town	\$10,620
Town of Jupiter	TOJ-09	Stormwater Quality Improvement Grants (Homeowners Association [HOA] Residential Grants)	Town cost-share program (50/50) with property owner and homeowner associations for storm water quality enhancements within their private systems. 28 grants awarded since 2008. Annual appropriation.	Stormwater System Rehabilitation	Underway	N/A	N/A	N/A	\$998,229	Town	\$998,229
Town of Jupiter	TOJ-09a	Indian Creek Exfiltration Trench	Indian Creek exfiltration trench funded as a part of the Town of Jupiter cost-share program (TOJ-09).	Exfiltration Trench	Completed	2017	5.52	0.55	Not provided	Town	Not provided
Town of Jupiter	TOJ-09b	Boyd Medical Retention	Boyd Medical on-line retention BMPs funded as a part of the Town of Jupiter cost-share program (TOJ-09).	On-line Retention BMPs	Completed	2016	2	0	Not provided	Town	Not provided

**Table 4-3 - Nutrient Reduction Management Activities for the Town of Jupiter
(Excerpted from 2020 Loxahatchee River Pollutant Reduction Plan)**

Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
Town of Jupiter	TOJ-10	Seminole Avenue Drainage Basin Improvements	Construct additional outfall and pump station to reroute discharge to FEC canal.	Stormwater System Rehabilitation	Planned	2022	65	6	\$2,174,461	Town	\$2,174,461
Town of Jupiter	TOJ-11	Pine Gardens North Water Quality Improvements	Construct exfiltration trenches within existing right-of-way.	Exfiltration Trench	Planned	2021	628	69	\$719,782	Town	\$719,782
Town of Jupiter	TOJ-12	Stormwater System Redevelopment Grants	Renewal or improvement of existing privately-owned stormwater systems under site redevelopment to ensure continued or enhanced functionality. Annual appropriation.	Stormwater System Rehabilitation	Completed	N/A	N/A	N/A	\$432,368	Town	\$432,368
Town of Jupiter	TOJ-13	Pennock Industrial Park Drainage Improvements	Improvements to include additional exfiltration systems to enhance runoff water quality.	Exfiltration Trench	Planned	2022	166	23	\$463,710	Town	\$463,710
Town of Jupiter	TOJ-14	Sonoma Isles Stormwater Harvesting	Removal and replacement of existing Town-owned stormwater systems to ensure continued functionality. Annual appropriation.	Stormwater System Rehabilitation	Completed	2016	124	221	Not provided	Private Owner	N/A
Town of Jupiter	TOJ-15	Evernia Street Alley Improvements	Construction of drainage system, which will include 100 linear feet (LF) of exfiltration trench	Exfiltration Trench	Planned	2020	13	1	Not provided	Not provided	Not provided
DEP FPS	FPS-01	Jonathan Dickinson State Park - Ditch Filling - FY 15/16	In the plan area, backfilled 177 acres of ditches which were ultimately discharging to the Loxahatchee River. Filling of the ditches restores the natural floodplain and retains runoff in the wetlands.	Wetland Restoration	Completed	2016	151	7	\$265,000	LRPI/ Florida Fish and Wildlife Conservation Commission (FWC) Aquatic Habitat Restoration Enhancement Section(AH RES)	\$265,000
DEP FPS	FPS-02	Jonathan Dickinson State Park - Wilson Creek	Ditch work to restore approximately 90 acres of pristine depression marshes.	Wetland Restoration	Completed	2019	36	1	\$150,000	North American Wetlands Conservation Act Grants	\$150,000
DEP FPS	FPS-03	Jonathan Dickinson State Park - Education Activities	Information pamphlets and website.	Education Efforts	Completed	N/A	N/A	N/A	N/A	N/A	N/A
Martin County	MC-01	Cypress Creek Restoration - Culpepper Ranch Wetland Restoration	Ditch plugs and fill berm breaches.	Hydrologic Restoration	Completed	2011	1,234	207	198811	County/ LRPI	County - \$99,406/ LRPI - \$99,405

**Table 4-4 - FIB Reduction Management Activities for the Town of Jupiter
(Excerpted from 2020 Loxahatchee River Pollutant Reduction Plan)**

Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	Location	Cost Estimate	Funding Source	Funding Amount
Palm Beach County	PBC-FIB-01	Public Education	Public education program that includes FIB-PCRV Program; landscaping, irrigation, and fertilizer ordinances; PSAs; pamphlets; website; and inspection program.	FIB- Stormwater	Completed	N/A		Not provided	Not provided	Not provided
Town of Jupiter	TOJ-FIB-01	Jones and Sims Creek Water Quality Master Plan	Master water quality plan to identify fecal bacteria contamination sources.	FIB- Source Identification Activities	Completed	2015	WBID 3226C	\$57,070	Town/ LRPI	\$28,535
Town of Jupiter	TOJ-FIB-02	Pine Gardens South Water Quality Improvements	Installation of exfiltration trenches to provide an average of 0.41 inches of treatment in the project area.	FIB- Stormwater	Completed	2015	WBID 3226W1	\$328,552	Town/ LRPI	Town - \$200,000/ LRPI - \$128,552
Town of Jupiter	TOJ-FIB-03	Public Education	Public education efforts related to actions such as proper pet waste management.	FIB- Stormwater	Completed	N/A	Town of Jupiter	Not provided	Town	Not provided
Town of Jupiter	TOJ-FIB-04	Street Sweeping	Periodic street sweeping to enhance water quality.	FIB- Stormwater	Completed	N/A	Town of Jupiter	Not provided	Town	\$49,586
Town of Jupiter	TOJ-FIB-05	Indian Creek Outfall Replacement and Canal Stabilization	Canal stabilization to reduced/prevent erosion of the canal banks.	FIB- Stormwater	Completed	2013	WBID 3234	\$199,922	Town	\$199,922
Town of Jupiter	TOJ-FIB-06	Cinquez Residential Area	Construction of drainage system to retain volume above what was required to offset the increase in impervious area.	FIB- Stormwater	Completed	2011	WBID 3226C	\$569,518	Town	\$569,518
Town of Jupiter	TOJ-FIB-07	Cinquez Park Drainage Improvements	Construction of new park stormwater management system to retain runoff.	FIB- Stormwater	Underway	2018	WBID 3226C	\$329,400	Town	\$329,400
Town of Jupiter	TOJ-FIB-08	Stormwater Quality Improvement Grants	Town cost-share program (50/50) with property owner and homeowner associations for storm water quality enhancements within their private systems. 28 grants awarded since 2008. Annual appropriation.	FIB- Stormwater	Completed	N/A	Town of Jupiter	\$432,368	Town	\$998,229
Town of Jupiter	TOJ-FIB-09	Pennock Industrial Park Drainage Improvements	Improvements to include additional exfiltration systems to enhance runoff water quality.	FIB- Stormwater	Planned	2022	WBID 3226C	\$463,710	Town	\$463,710
Town of Jupiter	TOJ-FIB-10	Sonoma Isles Stormwater Harvesting	Retention of excess stormwater runoff from the Sonoma Isles community for use for irrigation purposes.	FIB- Stormwater	Completed	2016	WBID 3230	Not provided	Privately Funded	Not provided
Town of Jupiter	TOJ-FIB-11	Water Quality Monitoring in Jones and Sims Creeks	Surface water sampling of nutrients, chlorophyll a, and FIB to characterize conditions and identify trends in Jones and Sims Creeks tributaries.	FIB- Source Identification Activities	Underway	N/A	WBID 3226C	Not provided	Town	Not provided
Town of Jupiter	TOJ-FIB-12	Datasonde Monitoring in Jones and Sims Creeks	Automated water quality equipment established at 3 stations to record water temperature, salinity, water depth, and dissolved oxygen.	FIB- Source Identification Activities	Underway	N/A	WBID 3226C	\$47,176	Town	Not provided
Town of Jupiter	TOJ-FIB-13	Jupiter River Estates Community Clean-up	Clean-up and trash removal from Jones Creek tributary by volunteer residents in Jupiter River Estates Community.	FIB- Trash Cleanup of Impaired Waterbody	Underway	N/A	WBID 3226C	Not provided	Not provided	Not provided

**Table 4-4 - FIB Reduction Management Activities for the Town of Jupiter
(Excerpted from 2020 Loxahatchee River Pollutant Reduction Plan)**

Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	Location	Cost Estimate	Funding Source	Funding Amount
Town of Jupiter	TOJ-FIB-14	Urban Stormwater Management System Rehabilitation - Phase III	Rehabilitation of swale systems within Maplewood Drive and North Palm Beach Heights.	FIB-Stormwater	Completed	2008	WBID 3226C	\$259,250	Town/ LRPI	Town - \$129,625/ LRPI - \$129,625
Town of Jupiter	TOJ-FIB-15	Urban Stormwater Management System Rehabilitation - Phase IV	Rehabilitation of swale systems within Jupiter River Estates.	FIB-Stormwater	Completed	2009	WBID 3226C	\$377,486	Town/ LRPI	Town - \$188,743/ LRPI - \$188,743
Town of Jupiter	TOJ-FIB-16	Urban Stormwater Management System Rehabilitation - Phase V	Rehabilitation of swale systems within North Palm Beach Heights.	FIB-Stormwater	Completed	2010	WBID 3226C	\$355,300	Town/ LRPI	Town - \$177,650/ LRPI - \$177,650
Town of Jupiter	TOJ-FIB-17	Urban Stormwater Management System Rehabilitation - Phase VI	Rehabilitation of swale systems within Maplewood Drive and Toney Penna.	FIB-Stormwater	Completed	2014	WBID 3226C	\$337,170	Town/ LRPI	Town - \$168,585/ LRPI - \$168,585
Town of Jupiter	TOJ-FIB-18	Maintenance Dredging in Rio Vista Waterway	Dredging and muck removal to restore Rio Vista Waterway.	FIB-Stormwater	Completed	2012	WBID 3226D	\$70,500	Town	\$70,500
Town of Jupiter	TOJ-FIB-19	Water Plant Detention Pond Cleanout	Silt removal from wet detention pond located at the water plant.	FIB-Stormwater	Completed	2017	WBID 3226C	\$10,620	Town	\$10,620
Town of Jupiter	TOJ-FIB-20	Pine Gardens North Water Quality Improvements	Construct exfiltration trenches within existing right-of-way.	FIB-Stormwater	Planned	2021	WBID 3226C	\$719,782	Town	\$719,782

4.3 Current Status and Five-Year Plan

The Town's recently completed projects, or projects underway, related to the Pollutant Reduction Plan are listed below:

Private Stormwater Improvement Grant Program – Ongoing

The Town maintains a continuing Private Stormwater Improvement Grant program. The purpose of the program is to provide financial assistance to homeowner associations and other private entities to improve water quality from stormwater runoff. Approximately \$100,000 are requested annually for potential grant funding for projects that include capital improvements to facilities that reduce existing flooding and/or result in tangible water quality benefits. A total of \$570,006 in assistance grants have been reimbursed to participating entities since 2000.

Street Sweeping Program – Ongoing

The Town hires a street sweeping contractor to provide street sweeping services for approximately 170 curb miles of paved Town owned roads four times a year, with an approximate additional 94 curb miles of street sweeping performed every week during the months of December through March on select, more heavily landscaped streets. Street sweeping is also performed twice a year for 125,000 square feet of asphalt drives and parking areas within the Town's Water Treatment Plant, and other areas at the direction of the Town. Street sweeping services are also procured for approximately 28 curbed miles of FDOT-owned roads and approximately 32 miles of Palm Beach County-owned roads four times a year. Sweeping operations remove sand, dirt, glass, litter, leaves, grass and other debris/pollutants from the surface of the roads.

SW System Redevelopment Grant Program – Ongoing

The Town of Jupiter maintains a Stormwater System Redevelopment Grant program. Funding is provided to local businesses to assist with redevelopment that includes stormwater improvements. Businesses must provide a 50% match. Grant application approvals require that the project must either enhance stormwater runoff quality or minimize the risk of flooding. Enhanced promotion to generate awareness of this grant funding opportunity is underway. Projects completed under this program to date include the Boyd Medical Building, Dog's World, Crosby's Kitchen & Bar, Seven O Nine/Sims House, and Jupiter Medical Center for a combined total funded amount of \$338,047.

Fertilizer Ordinance Update

The Town's existing fertilizer ordinance Section 23-123 was updated with the following language on October 9, 2018: *"No fertilizer containing nitrogen or phosphorous shall be applied between June 1 and September 30 as well during any other Prohibited Application Period."* The timeframe where fertilizers are prohibited is during Jupiter's rainy season. Due to the increase in precipitation during this time, the potential for runoff of nutrients found in fertilizers is much greater during those months. The fertilizer ordinance assists to maintain and preserve water quality in the Loxahatchee River and its tributaries, such as Jones Creek and Sims Creek. Farms, golf courses and specialized turf areas (such as athletic fields) are exempt but are encouraged to be judicious about fertilizer application during the rainy season. The new ordinance also applies to residents who maintain their own lawns.

Evernia St. Alley Improvements – 2020

The Evernia Street Alley Improvements project was constructed in 2020 for a cost of \$184,506, to alleviate nuisance flooding in the alley, improve LOS and enhance stormwater runoff quality to the Loxahatchee River. The project included installation of exfiltration trench in the commercial/industrial alley. Estimated pollutant load reductions resulting from these improvements will be estimated and submitted for credit towards the Pollutant Reduction Plan.

Recharge System – 2021

Since 1990, the Town has incrementally constructed a system of control structures, flow-ways and salinity barriers intended to increase surface water storage and surficial aquifer recharge utilizing freshwater that would otherwise be wasted to tide. The recharge system, when fully developed, is expected to offset some of the effects of urban groundwater withdrawals by replenishing the local aquifer, thereby minimizing the risk of environmental harm, including wetland drawdowns and saltwater intrusion. The recharge system is seen as a prudent insurance policy for Jupiter’s water supply given its susceptibility to impacts. The long-term sustainability of the region’s water resources and freshwater environment will be greatly enhanced through operation of this system.

Currently, the Town is permitted to withdraw approximately 12 cfs from the C-18 Canal to supply to the surficial aquifer recharge system. It is the Town’s goal to secure 25 cfs of recharge flows to Limestone Creek and the C-18 Canal for its surficial aquifer recharge system as part of the CERP Loxahatchee River Watershed restoration Project. Implementation of these recharge flows would aid significantly in reducing natural area impacts due to the Town’s groundwater withdrawals while providing protection to natural systems and wetlands. The Town worked with SFWMD to address restrictive permit criteria that limited the Town’s ability to use the system. The revised permit was issued November 2019. The Town is implementing improvements to better utilize the system going forward

CIP Projects

Certain CIP projects planned by the Town will result in nutrient reduction credits towards the Pollutant Reduction Plan. The following CIP projects are detailed further in Section 7.

- Pine Gardens North Infrastructure Improvements, 2021
- Seminole Ave Drainage Basin Improvements (Juno Street Stormwater Pump Station), 2022
- Pennock Industrial Park Drainage, 2023
- Bush Road Drainage Improvements, 2023

4.4 Monitoring Requirements

The Pollutant Reduction Plan requires water quality monitoring by stakeholders. The Town of Jupiter monitors six sites that were already monitored for other purposes prior to the Pollutant Reduction Plan, including monitoring in the Southwest Fork associated with its FDEP permit requirements for discharge of

reverse osmosis concentrate. The Town has added an additional seventh site at a location downstream of the S-46 structure, specifically for the Pollutant Reduction Plan.

Stakeholders participating in the monitoring and reporting plan collect water quality data in a manner consistent with the FDEP standard operating procedures (SOPs) for QA/QC and analyzed by the National Environmental Laboratory Accreditation Conference (NELAC) Institute, National Environmental Laboratory Accreditation Program (NELAP) certified laboratories, or other labs that meet the certification and other requirements outlined in the SOPs.

Table 4-5 demonstrates the water quality parameters monitored at each site. **Table 4-6** and **Figure 4-2** summarize the location of each site, and frequency of monitoring.

Table 4-5: Monitoring Station Water Quality Parameters

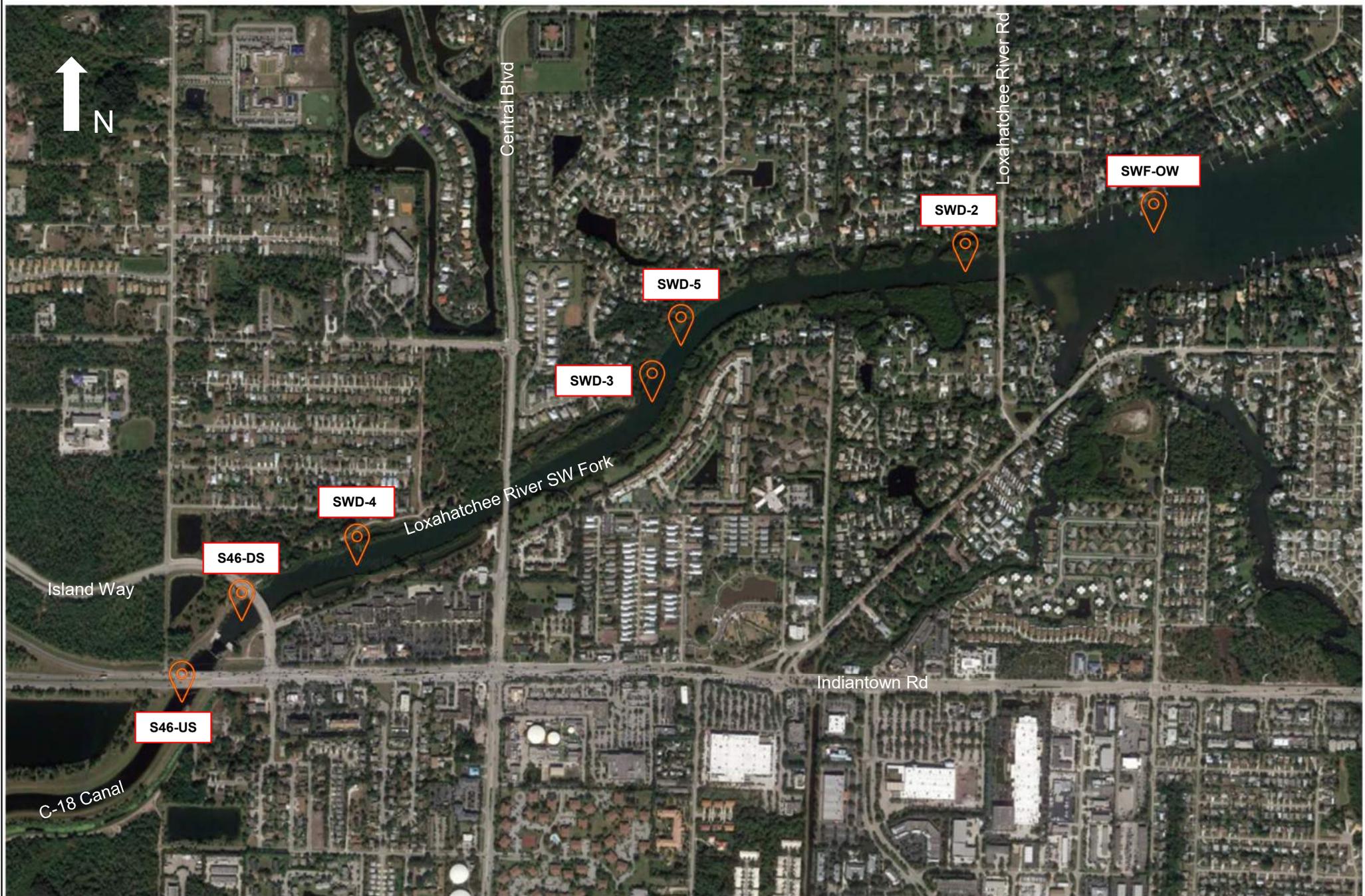
Core Parameters	Supplemental Parameters	Field Parameters
Chlorophyll-a	Nitrate + Nitrite (as N)	Water Temperature
Total Phosphorous	Total Kjeldahl Nitrogen	pH
Total Nitrogen	Turbidity	Specific Conductance
Ammonia as N	Total Suspended Solids	Salinity
	Ortho-Phosphorous	Sample Depth
	Total Organic Carbon	Tide Stage
	Total Inorganic Nitrogen	Dissolved Oxygen
	Total Dissolved Solids	

Table 4-6: Monitoring Station ID Description and Frequency of Monitoring

Station ID	Description	Sampling Frequency	Latitude	Longitude
S46-DS	Downstream of S46 Structure	Monthly	26° 56' 2" N	80° 8' 30" W
S46-US	Upstream of S46 Structure	Monthly	26° 56' 8" N	80° 8' 25" W
SWD-3	400-m east of outfall	Monthly	26° 56' 13" N	80° 8' 15" W
SWD-4	400-m west of outfall	Monthly	26° 56' 25" N	80° 7' 50" W
SWF-OW	500-m east of bridge in SW Fork	Monthly	26° 56' 28" N	80° 7' 48" W
SWD-5	500-m east of outfall	Quarterly	26° 56' 36" N	80° 7' 21" W
SWD-2	Loxahatchee River Road Bridge	Semi-Annually	26° 56' 39" N	80° 7' 4" W

The following sites are at Jones and Sims Creeks are monitored by LRD

CALC	Caloosahatchee Culvert	Monthly	26° 55' 44" N	80° 7' 2" W
TPJ	Toney Penna – Jones Creek	Monthly	26° 55' 35" N	80° 6' 39" W
71	SW Fork – Jones Creek	Monthly	26° 56' 30" N	80° 7' 5" W
72	SW Fork – Loxahatchee River Road	Monthly	26° 56' 36" N	80° 7' 18" W
73	SW Form – Sims Creek	Monthly	26° 56' 26" N	80° 7' 12" W
74	SR 706 – Sims Creek	Monthly	26° 56' 1" N	80° 7' 35" W
74DW	Sims Creek Downstream of weir at SR 706	Monthly	26° 56' 1" N	80° 7' 35" W
75	SR 706 – Jones Creek	Monthly	26° 56' 1" N	80° 6' 47" W



4.5 Data Reporting Requirements

The following data reporting requirements are required by the Pollutant Reduction Plan.

- Water quality data shall be entered into the Florida Watershed Information Network (WIN) Database. Frequency: Quarterly. (The Town is currently working towards routine upload of data. The Town has not yet established a routine upload frequency, but do conduct monitoring as detailed in the master plan.)
- The LRMCC will request an update from individual stakeholders on their implementation of management activities in advance of their January meeting, and LRMCC will provide updates to FDEP. Frequency: Yearly
- A project update may be prepared by the LRMCC periodically that will outline the progress of the pollutant reduction plan. Frequency: As requested by the LRMCC
- Every five years, a pollutant reduction plan update will be completed and submitted to the FDEP. The update will include results of water quality data assessments, updated annual pollutant loads, progress in achieving reductions, monitoring changes, status of project implementation, and additional management activities, if any, needed to meet the water quality criteria. Frequency: Every five years

If the water quality standards are not showing progress towards achieving the Pollutant Reduction Plan goals at the five-year milestones, the FDEP may require that a RAP be developed by stakeholders, or the FDEP may implement a total maximum daily load (TMDL) or a basin management action plan (BMAP).

4.6 Town Pollutant Reduction Plan Responsibilities

Local stakeholders devoted to restoring the Loxahatchee River and estuary have initiated this voluntary plan to proactively remedy water quality impairments without a state prescribed TMDL or a BMAP for restoring water quality of the Loxahatchee River. In the future, it is possible that a revised plan could be adopted as a reasonable assurance plan (RAP), which would replace the need for a TMDL. Alternatively, if stakeholders are unable to reach the water quality targets with voluntary efforts, FDEP could develop and adopt a TMDL.

The following items summarize the Town's responsibilities for participation in the Loxahatchee River Pollutant Reduction Plan.

- **Implement Management Activities** – The Town of Jupiter will implement various nutrient management activities to make progress toward achieving the Loxahatchee River water quality criteria for pollutants of concern, which are total nitrogen (TN), total phosphorus (TP), and secondary pollutants of chlorophyll-a, and fecal indicator bacteria (FIB). The activities are documented in **Table 4-3** and **Table 4-4**.
- **Monitor and Report Water Quality** – The Pollutant Reduction Plan requires that the Town monitor water quality at various locations. The Town is required to monitor six sites for various parameters on a monthly basis, one additional site on a quarterly basis, and one site on a semi-

annual basis. Water quality data shall be entered into the Florida Watershed Information Network (WIN) Database on a quarterly basis.

- **Track and Report Progress** – The LRMCC will request an update from individual stakeholders on their implementation of management activities in advance of their January meeting, and LRMCC will provide updates to FDEP. Every five years, a pollutant reduction plan update will be completed and submitted to the FDEP. The update will include results of water quality data assessments, updated annual pollutant loads, progress in achieving reductions, monitoring changes, status of project implementation, and additional management activities, if any, needed to meet the water quality criteria. Frequency: Every five years.
- **Periodically Modify and Update Plan** (such as annually) – As the Town completes, adds, or removes structural and non-structural management activities, the lists documented in **Table 4-3** and **Table 4-4** should be updated (such as on an annual basis, prior to submitting progress to the LRMCC).

5. Climate Change

The impacts of climate change and sea level rise will present numerous challenges to the Town of Jupiter Stormwater Utility. Climate change threats applicable to the Town stormwater utility include¹:

- Tidal Flooding
- Rainfall Induced Flooding
- Storm Surge
- High Water Table (reducing stormwater infiltration and increasing flooding)
- Harmful Algal Blooms

1. *From “Coastal Resilience Partnership – Southeast Palm Beach County Multi-Jurisdictional Climate Change Vulnerability Assessment”, July 2021, Collective Water Resources, LLC et. al.*

The main factors that exacerbate these occurrences are sea level rise (SLR), and increased rainfall frequency and duration. The following Section outlines SLR and rainfall related to climate change, that the Town should begin planning for. This Section also discusses the Town’s current approach for resiliency planning in response to these factors.

5.1 Sea Level Rise

During the 20th century, accelerated melting of glaciers and continental ice sheets, and thermal expansion of seawater, have caused global ocean levels to increase. Furthermore, it is apparent that there has been an acceleration of SLR in the past 20 years. Coastal communities, such as the Town, are particularly vulnerable to the effect of SLR. Therefore, it is incumbent upon the Town to prepare for the effects of climate change to protect property, infrastructure, and cultural and natural resources.

5.1.1 SEFCCC Projections

The Southeast Florida Climate Change Compact (SEFCCC) was created by Broward, Miami-Dade, Monroe, and Palm Beach Counties in January 2010 to facilitate coordination for mitigation and adaptation activities across county lines. On December 15, 2015, the Town of Jupiter – Town Council adopted Resolution No. 86-15, documenting the Town’s intent to coordinate with SEFCCC efforts.

The Compact published the first Unified Sea Level Rise Projection in 2011, updated in 2015, and again updated in 2019. In 2019, the projections were revised upward based on new data, and based on observed rising sea levels as previously predicted. While it is a certainty that sea levels are rising, the rate and acceleration of SLR is not certain. Therefore, the SEFCCC SLR predictions comprises three curves, described as follows (in order of increasing magnitude):

- Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report’s (AR5) Representative Concentration Pathways (RCP 8.5), a.k.a. (IPCC Median Scenario): The SEFCCC suggests using the IPCC Median projections for planning of most infrastructure projects before

2070, with design lives of less than 50 years, or projects whose failure would result in limited consequences to others. *From 2011 to 2019, sea level rose in approximate accordance with this IPCC Median Scenario prediction.*

- The NOAA Intermediate High curve: This data may be applied to projects in need of a greater factor of safety related to potential inundation, and with a design life beyond 50 years.
- The NOAA High curve: This data may be applied to major critical infrastructure, projects that are not easily replaceable or removable, and with a design life beyond 50 years.

Table 5-1 and **Figure 5-1** below indicates SLR for each aforementioned scenario, adjusted to start at year 2020, and adjusted to local NAVD datum (by -0.10 ft) in accordance with SEFCCC recommended methodology to account for the difference in mean sea level (MSL) elevation between the SEFCCC reference Key West NOAA monitoring gauge, and the nearest active NOAA monitoring gauge at the Lake Worth Pier - NOAA Station No 8722670.

Table 5-1: SEFCCC SLR Projections
 (Adjusted to Year 2020 and for Lake Worth Pier NOAA Monitoring Location)

Year	IPCC Med 50% (ft NAVD)	SLR from 2020 (inches)	NOAA 2017 Int-High (ft NAVD)	SLR from 2020 (inches)	NOAA 2017 High (ft NAVD)	SLR from 2020 (inches)
2020	-0.52	0	NA	-	NA	-
2030	-0.27	3	0.1	5	0.3	6
2040	-0.06	6	0.5	10	0.86	13
2050	0.23	9	1.05	16	1.58	21
2060	0.5	12	1.68	24	2.5	32
2070	0.81	16	2.43	33	3.61	46
2080	1.13	20	3.28	43	4.86	61
2090	1.49	24	4.24	55	6.2	77
2100	1.82	28	5.25	67	7.68	94

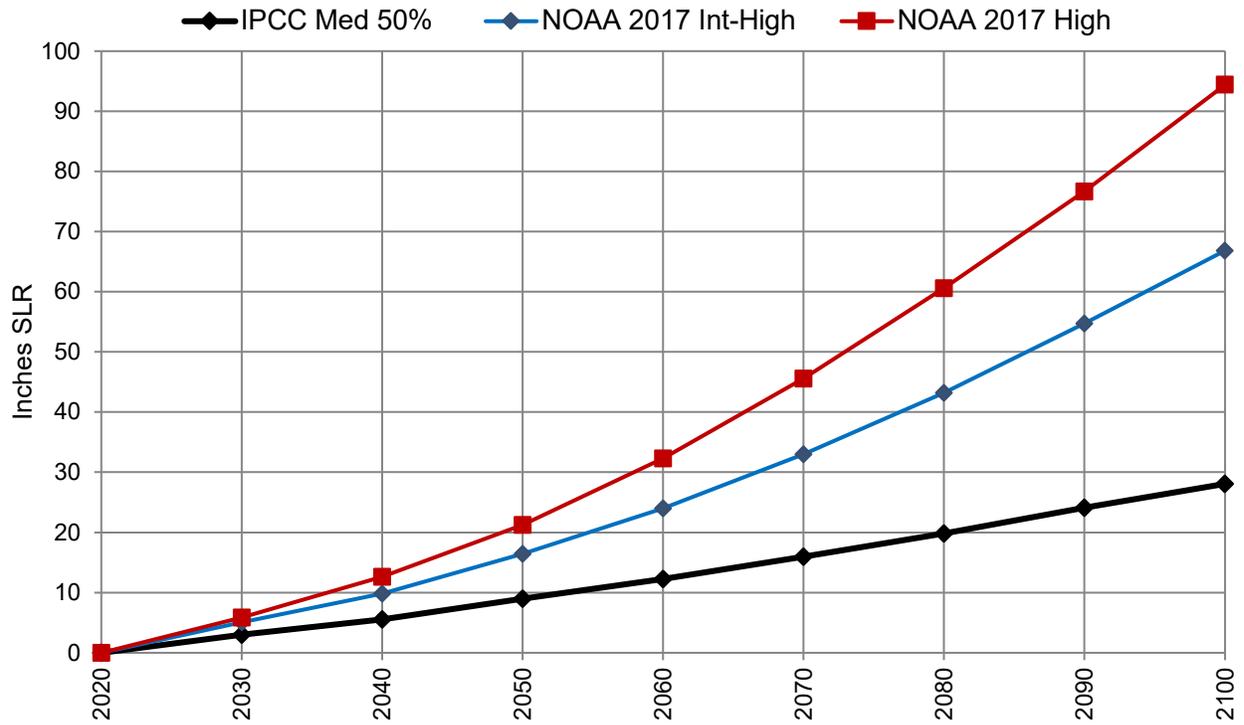


Figure 5-1: SEFCCC SLR Projections

(Adjusted for 2020 and for Lake Worth Pier NOAA Monitoring Location)

Figure 5-2 summarizes the most recent data available (2011-2021) for the Lake Worth Pier station. The linear trendline for the data shows an approximate elevation of -0.55 ft NAVD for the year 2020, approximately corresponding to the SEFCC projection of -0.52 ft NAVD.

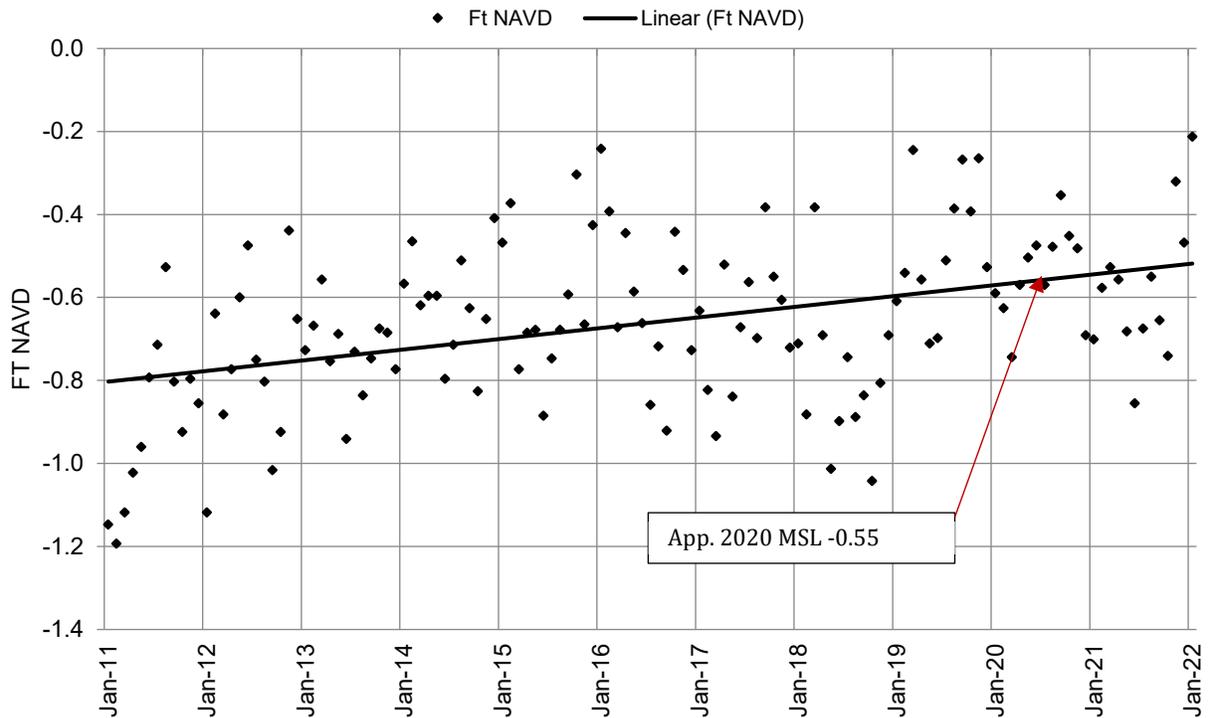


Figure 5-2: Lake Worth Pier NOAA Water Level Tidal Station – Historical Monthly MSL (2011-2021)

Source: *Tides and Currents, 2019, Mean Sea Level Trend 8722670, Lake Worth Pier, Florida, National Oceanic and Atmospheric Administration. Available at URL https://tidesandcurrents.noaa.gov/sltrends/plots/8722670_meantrend.png*

5.1.2 Baseline and Projected High Tide Elevations for the Town of Jupiter

The SEFCCC provides projections for MSL, but the high and maximum tide elevations are important for planning purposes, as infrastructure would first start to be regularly impacted or inundated during the high daily tidal cycles. Therefore, the Mean-High Water (MHW), Mean-High-High Water (MHHW), and Maximum Tide Elevation (Max) are projected for planning purposes.

The difference between the SEFCCC year 2020 projection and the Lake Worth Pier tidal station is +0.45 feet. Therefore, the year 2020 baseline MSL, MHW, and MHHW tidal elevations for the Town were determined by adjusting the NOAA National Tidal Datum Epoch data upwards by +0.45 feet. The Max tidal elevation was based the highest King Tide on record at the Lake Worth Pier on September 21, 2020.

Table 5-2 summarizes the NOAA National Tidal Datum Epoch data record for the Lake Worth Pier station and adjusted to current baseline conditions (+0.45 feet). The baseline condition is then used as the starting point to project MHW, MHHW, and Max high tide elevations to 2100 based on the IPCC Median Scenario. The NOAA Intermediate High of NOAA High Scenario elevations are not shown, but one can arrive at these values by adding the SLR values presented in **Table 5-2** to the baseline values. The values are shown in both NAVD and NGVD, since the Town currently still uses NGVD for many official purposes.

Table 5-2: Projected High Tide Elevations (in both NAVD and NGVD) – IPCC Median Scenario

Elevation (ft NAVD)				
Timeframe	MSL	MHW	MHHW	Max (King Tide)
1983-2001 NOAA National Tidal Epoch	-1.0	0.4	0.6	2.6
Current Baseline (Adjusted to 2020)	-0.5	0.9	1.1	2.7 ¹
2040	-0.1	1.4	1.6	3.1 ²
2070	0.8	2.3	2.4	4.0 ³
2100	1.8	3.3	3.4	5.0
Elevation (ft NGVD) (+1.52 ft)				
Timeframe	MSL	MHW	MHHW	Max (King Tide)
Current Baseline (Adjusted to 2020)	1.0	2.4	2.6	4.2 ¹
2040	1.5	2.9	3.1	4.7 ²
2070	2.3	3.8	4.0	5.5 ³
2100	3.3	4.8	5.0	6.5

Notes:

1. The Max tidal elevation was based on actual data for the highest King Tide on record at the Lake Worth Pier on September 21, 2020.
2. King Tide 2040 Corresponds to MHHW 2 ft SLR.
3. King Tide 2070 Corresponds to MHHW 3 ft SLR.

5.1.3 Location of Main Areas Affected by SLR

Inundation maps were evaluated for the Town of Jupiter to evaluate areas anticipated to be inundated due to SLR and/or storm surge. Future inundation layers for each sea level rise scenarios were downloaded from the NOAA Sea Level Rise and Coastal Impacts Viewer. The maps differentiate between low-lying areas that have a direct flooding pathway to the flood source (such as the Loxahatchee River or Intracoastal Waterway), vs. low-lying hydraulically disconnected areas. Low-lying disconnected areas may experience drainage issues due to increased tailwater elevations or elevated groundwater levels in the future.

Based on evaluation of the NOAA Sea Level Rise and Coastal Impacts Viewer data, locations where inundation are likely to occur are shown in **Figure 5-3** key map. The locations are as follows:

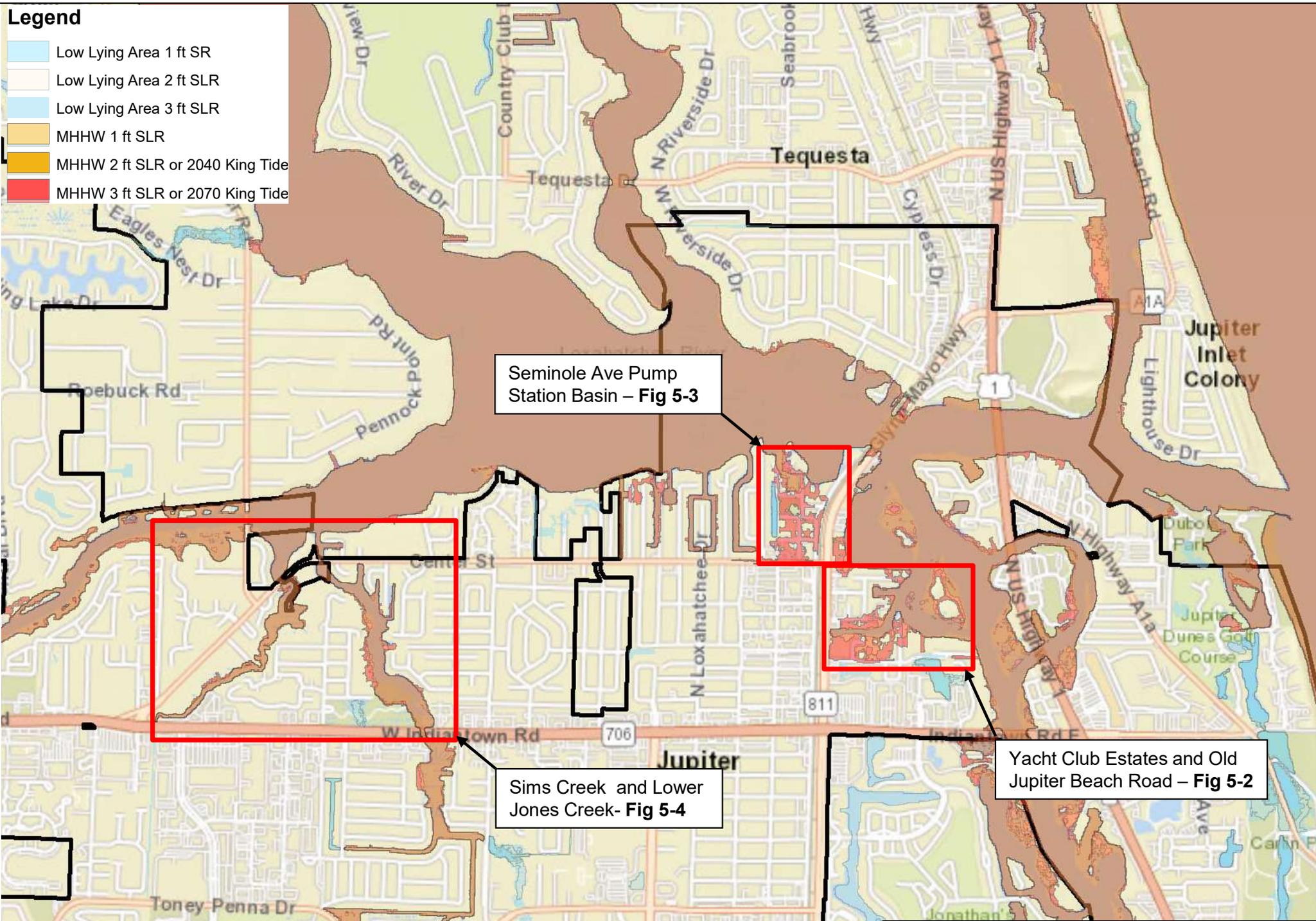
- Seminole Ave Pump Station Basin (**Figure 5-4**)
- Yacht Club Estates and Old Jupiter Beach Road (**Figure 5-5**)
- Burt Reynolds Park and Carlin Park

- In general, many properties that abut natural waterways such as the Loxahatchee River, Sim Creek, Lower Jones Creek, and the Intracoastal Waterway will encounter problems with encroaching tidewaters in yards and low-lying common areas of communities, and higher vulnerability during storms. These properties are dispersed throughout the Town. However, the impacts are typically limited to private property. An example of this is at Sims and Lower Jones Creeks (**Figure 5-6**).

The maps present the anticipated inundation of areas based on MHHW elevation. According to **Table 5-2**, King Tide 2040 elevation corresponds to MHHW 2 ft SLR, and King Tide 2070 Corresponds to MHHW 3 ft SLR.

It is recommended that the Town plan for detailed hydrologic/hydraulic modeling to incorporate the Town's stormwater infrastructure in order to more accurately estimate the impacts associated with rising sea levels. Taking into account head losses associated with the conveyance system would likely result in more expansive predicted inundation than the NOAA Sea Level Rise and Coastal Impacts.

- Legend**
- Low Lying Area 1 ft SR
 - Low Lying Area 2 ft SLR
 - Low Lying Area 3 ft SLR
 - MHHW 1 ft SLR
 - MHHW 2 ft SLR or 2040 King Tide
 - MHHW 3 ft SLR or 2070 King Tide



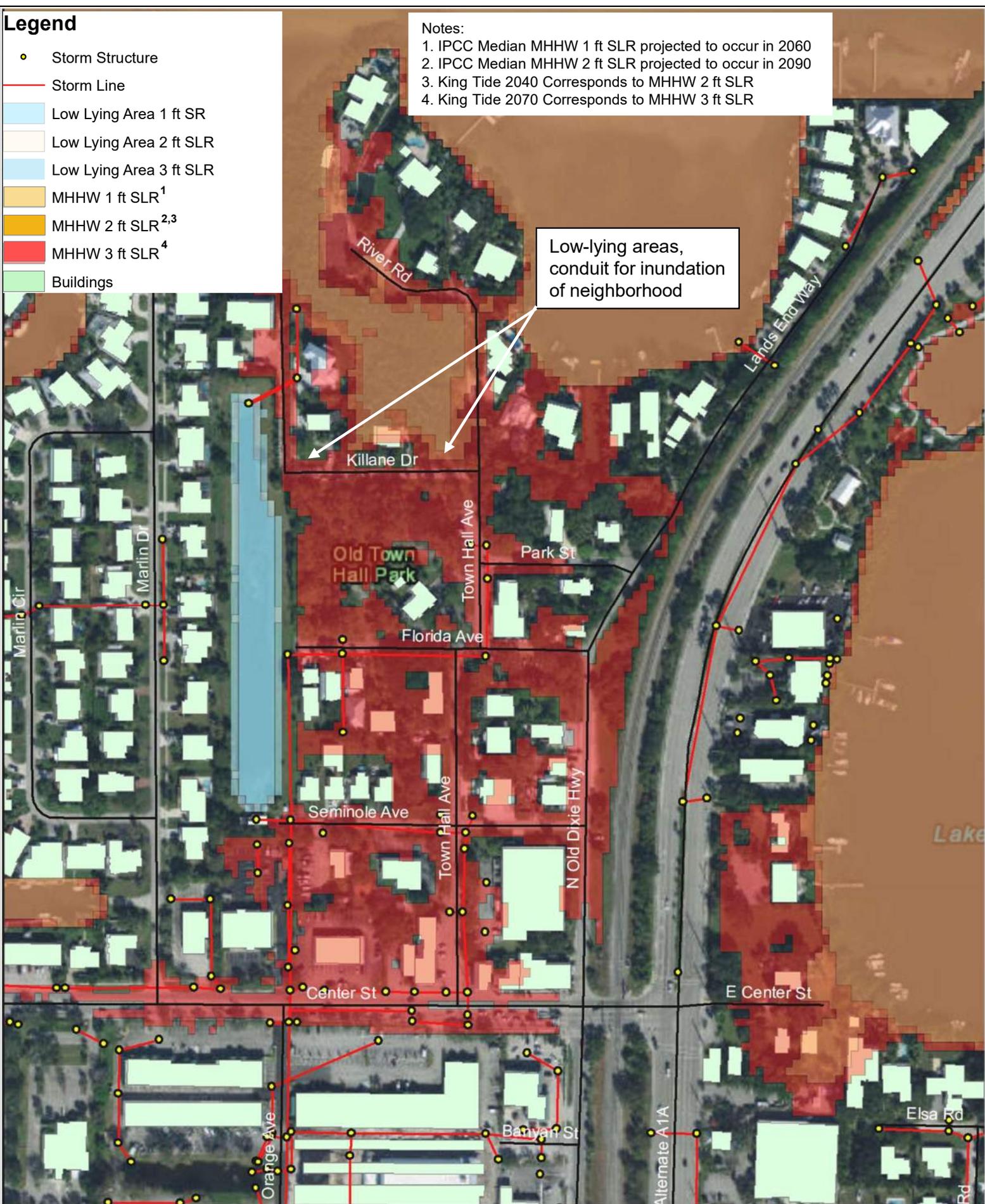
Project Name:
Stormwater Master Plan

Town of Jupiter –
Sea Level Rise Key Map
H&S Project Number:
44250-067
Figure 5-3

Legend

- Storm Structure
- Storm Line
- Low Lying Area 1 ft SR
- Low Lying Area 2 ft SLR
- Low Lying Area 3 ft SLR
- MHHW 1 ft SLR¹
- MHHW 2 ft SLR^{2,3}
- MHHW 3 ft SLR⁴
- Buildings

- Notes:
1. IPCC Median MHHW 1 ft SLR projected to occur in 2060
 2. IPCC Median MHHW 2 ft SLR projected to occur in 2090
 3. King Tide 2040 Corresponds to MHHW 2 ft SLR
 4. King Tide 2070 Corresponds to MHHW 3 ft SLR



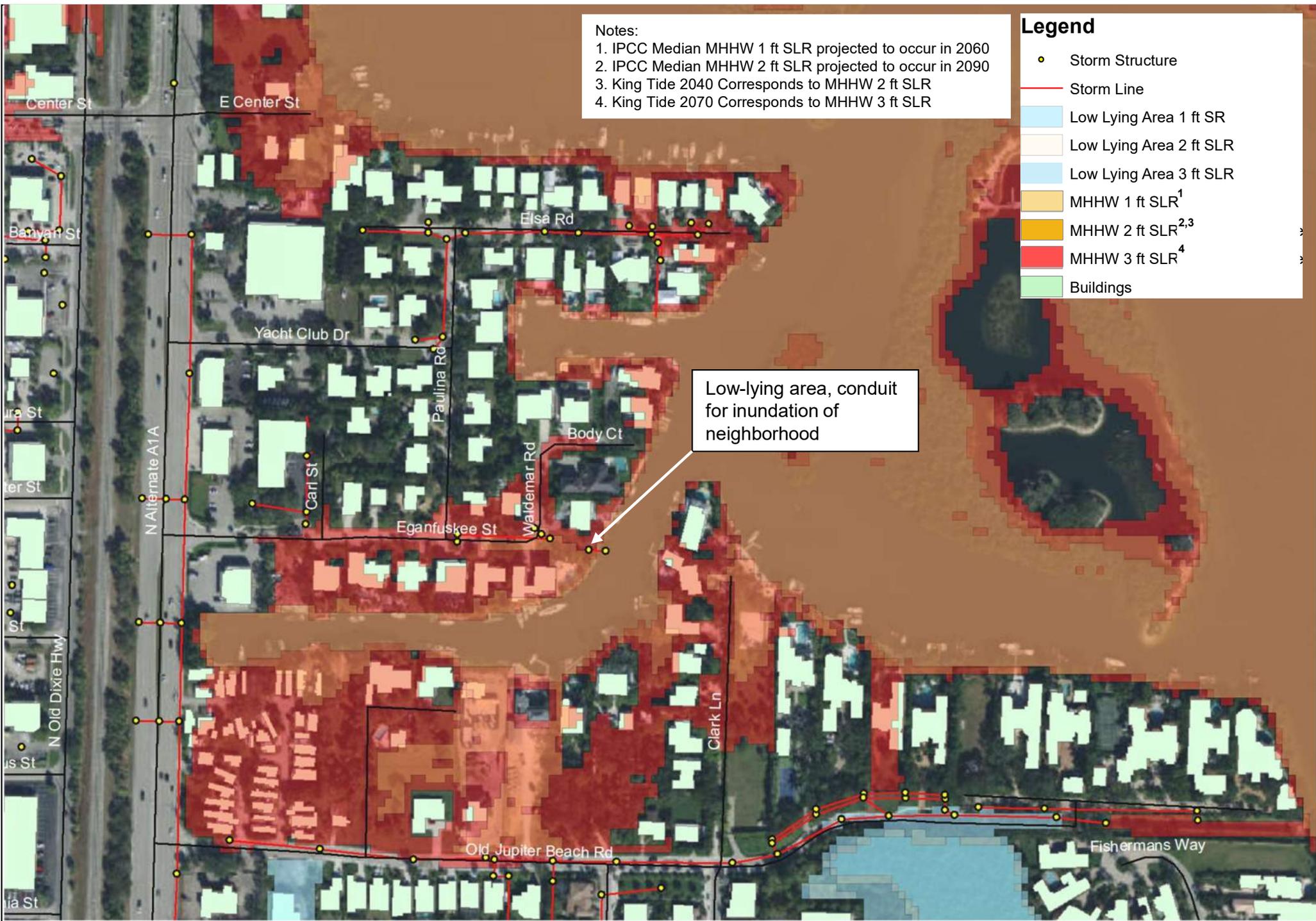
Project Name:
Stormwater Master Plan

Seminole Avenue Pump Station Basin – Sea Level Rise Map



H&S Project Number:
 44250-067

Figure 5-4



Notes:
 1. IPCC Median MHHW 1 ft SLR projected to occur in 2060
 2. IPCC Median MHHW 2 ft SLR projected to occur in 2090
 3. King Tide 2040 Corresponds to MHHW 2 ft SLR
 4. King Tide 2070 Corresponds to MHHW 3 ft SLR

Legend

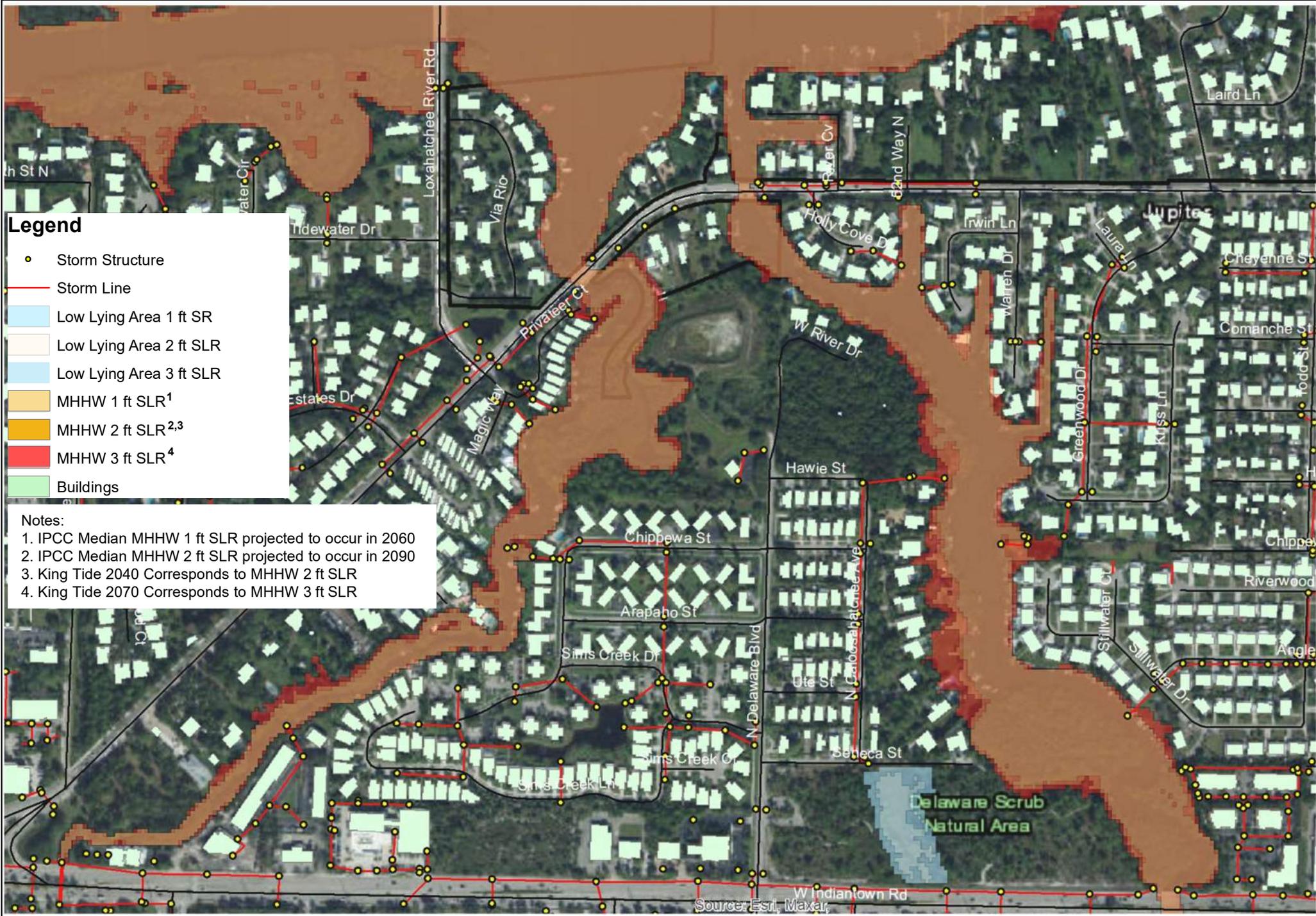
- Storm Structure
- Storm Line
- Low Lying Area 1 ft SR
- Low Lying Area 2 ft SLR
- Low Lying Area 3 ft SLR
- MHHW 1 ft SLR¹
- MHHW 2 ft SLR^{2,3}
- MHHW 3 ft SLR⁴
- Buildings

Low-lying area, conduit for inundation of neighborhood



Project Name:
 Stormwater Master Plan

Yacht Club Estates and Old Jupiter Beach Road –
 Sea Level Rise Map
 H&S Project Number:
 44250-067
 Figure 5-5



Legend

- Storm Structure
- Storm Line
- Low Lying Area 1 ft SR
- Low Lying Area 2 ft SLR
- Low Lying Area 3 ft SLR
- MHHW 1 ft SLR¹
- MHHW 2 ft SLR^{2,3}
- MHHW 3 ft SLR⁴
- Buildings

Notes:

1. IPCC Median MHHW 1 ft SLR projected to occur in 2060
2. IPCC Median MHHW 2 ft SLR projected to occur in 2090
3. King Tide 2040 Corresponds to MHHW 2 ft SLR
4. King Tide 2070 Corresponds to MHHW 3 ft SLR



Project Name:
 Stormwater Master Plan

Sims Creek and Lower Jones Creek –
 Sea Level Rise Map
 H&S Project Number:
 44250-067

Figure 5-6

5.2 Changes in Rainfall Frequency and Duration

Design storms for determining the Town’s LOS are based on the SFWMD rainfall frequency distributions in isohyetal maps from SFWMD’s Environmental Resource Permit (ERP) Information Applicant’s Handbook Volume II, effective May 22, 2016. SFWMD published this data in 1990 in a Technical Memorandum titled “Frequency Analysis of One and Three-day Rainfall Maxima for Central and Southern Florida.”

Broward County Environmental Planning and Community Resilience Division commissioned a study of increase in future rainfall for determining design storms, entitled “Future Rainfall Development Technical Memorandum - Future Conditions 100-Year Flood Elevation Map” prepared by Geosyntec Consultants, Inc. in January of 2020. While the results were specific to Broward County, it may be expected that a similar study would yield similar results from Jupiter due to the proximity to Broward County.

The Broward County study recommended that “change factors” be applied to the typical SFWMD design storms for use in determining critical flooding elevations. The current Town LOS criteria correlated with SFWMD design storms for the Town of Jupiter are presented in **Table 5-3**, and are multiplied by the change factors from the Broward County report. In lieu of completing a detailed data analysis and modeling exercise, the Town may wish to re-evaluate their LOS based on the Broward County change factors in the table.

Table 5-3: LOS Design Storm Rainfall Depths Adjusted Based on Broward County Study

Design Storm	SFWMD Design Storm Depth (inches)	Broward County Change Factor	Modeled Rainfall Depth (inches)
5-year, 1 hour	3	NA ¹	-
10-year, 24-hour	9	NA ¹	-
25-year, 72-hour	13	12%	14.6
100-year, 72-hour	16	13%	18.1

Notes:

1. Change factors for the 10-year, 24-hour storm or 5-year, 1-hour storm were not determined in the study

Changes in rainfall intensity, frequency, and duration result in potential changes to the stormwater network’s level of service. It is likely that despite the Town being proactive, increased nuisance flooding in low lying areas or areas with insufficient drainage is likely. The Town’s current level of service relative to flooding frequency is included in **Table 3-1**. This level of service is specified in the Guide for Development Design and Construction Standards – Water and Stormwater [Town of Jupiter Utilities, 2022].

5.3 Adaptation Strategies Accomplished to Date

The Stormwater Utility has been proactive in identifying ways to address impending SLR. There are two main types of adaptation strategies available to the Town, structural strategies and non-structural strategies. The following subsection discusses the Town’s recent accomplishments with respect to implementing these two strategies.

5.3.1 Structural Adaptation Strategies Recently Implemented

The following subsection documents examples of structural SLR adaptation strategies recently implemented by the Town.

5.3.1.1 Elsa Road Stormwater Pump Station Wet Well

The Town completed the Elsa and Paulina Roads - Drainage and Watermain Improvements project in 2018. Stormwater improvements consisted of 1,200 linear feet (lf) of 18 to 24-inch storm drain, 17 stormwater structures, a new outfall to the intracoastal waterway, a hydrodynamic separator device for water quality improvement, and installation of a stormwater pump station wet well (for future outfitting with pumps as sea level rise progresses). The project was successful at reducing the frequency of neighborhood flooding, while increasing the community's future resilience to the effects of rising sea level and climate change. This project is an example of phased infrastructure improvements, where the wet well for a pump station was installed in the public right of way, with future mechanical pumping and electrical improvements postponed to the future until sea level rise materializes further. **Figure 5-7** shows a photo of the pump station wet well location.



Figure 5-7: View of the Pump Station Wet Well on Elsa Road

5.3.1.2 Tidal Check Valves

Tidal check valves are devices that prevent back-flow of seawater into storm drain systems that discharge to tidal water bodies. Tidal inundation into storm drains reduces the conveyance capacity of the system, which can be exacerbated during rainfall events. The Town has begun to install these tidal check valves at various outfall locations, including:

- Elsa Road Stormwater Pump Station Wet Well (east end of Elsa Road)
- Juno Street Stormwater Pump Station (Alt A1A and FEC Canal, under construction)
- Loxahatchee Canal Watershed Discharge at (Center Street and Dolphin Drive)
- Lighthouse Cove Mini Golf (617 N A1A)
- Eganfuskee Street (east end of Eganfuskee Street)

Figure 5-8 shows an example of a tidal check valve in service.

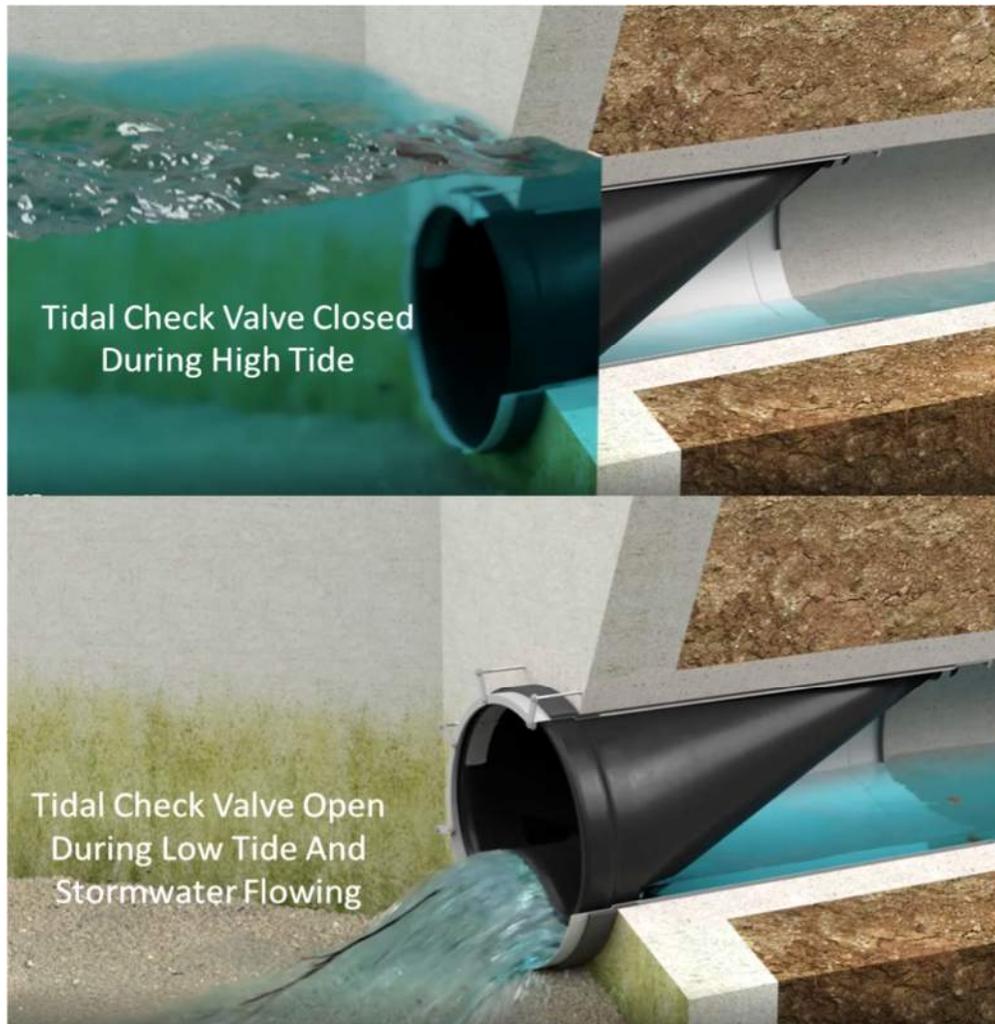


Figure 5-8: Example of Tidal Check Valve Operation (Wastop® Valve by Wapro, Inc.)

5.3.1.3 Green Infrastructure - Sims Creek Preserve

Sims Creek is an example of a recent success for the Open Space Program. The Town of Jupiter – Planning and Zoning Department is leading the construction of the Sims Creek Preserve, which is a passive park with public open space to include a natural preserve area, a pervious driveway and parking area, and a bio-swale connection to the FDOT pond. Not only does this park utilize green infrastructure (pervious pavement and bio-swale), but it also conserves land that directly abuts tidally influence waters, strengthening the Town’s SLR resiliency.

5.3.1.4 Green Infrastructure – Cinquez Park

Cinquez Park is another good example of a recent success for the Open Space Program. Located on Indiantown Road just northwest of Center Street, and discharging to nearby tidally influenced Sims Creek. Previous development proposals for this property included a big-box retail store and car dealership. Instead, this property was purchased by the Town as part of the Open Space Program.

The Town of Jupiter – Planning and Zoning Department led the design and construction of this park, which includes a lake for recreational fishing and accessible walking paths through the natural area. The lake also functions as a wet retention lake BMP to contain the 100-year 3 day storm completely on-site (enhanced standards beyond the 25-year 3 day requirement by SFWMD). The containment of stormwater on-site preserves the capacity of downstream stormwater BMPs that discharge to tidally-influence Sims Creek. The preservation of open space and the littoral planting zones in the lake are examples of green infrastructure. **Figure 5-9** provides an aerial photograph of Cinquez Park.



Figure 5-9: Aerial Photograph of Cinquez Park – Part of The Open Space Program

5.3.1.5 Green Infrastructure – Permeable Pavement

The Town has begun to implement permeable pavement on Town projects, and also requires it of developers where feasible. Projects where permeable pavement is being planned include:

- Indiantown Road – U.S. 1 to A-1-A (Town of Jupiter – Engineering Department)
- North Old Dixie Highway Parking (Private Developer, north of Center Street)
- Sims Creek Preserve (Town of Jupiter – Planning and Zoning Department)

5.3.2 Non-structural Adaptation Strategies Recently Implemented

The Town has already made great strides towards implementing non-structural adaptation strategies for addressing climate change, which are discussed in the following subsection.

5.3.2.1 Town Ordinances and Comprehensive Planning

The Town has been proactive in implementing ordinances and Comprehensive Plan Sections to prepare for climate change.

- A Climate Change section was implemented in the Coastal Management Element - Objective 2.6 in June 2015.
- The Town has also implemented key Comprehensive Plan policies and ordinances related to limitation of development in flood-prone coastal areas, including
 - Town of Jupiter - Code of Ordinances - Chapter 21 - BUILDINGS AND BUILDING REGULATIONS, ARTICLE X. - COASTAL CONSTRUCTION CODE, Sec. 21-326. - Oceanfront setbacks; Atlantic Ocean land.
 - Comprehensive Plan - Capital Improvements Element - Objective 1.5.
 - Comprehensive Plan - Future Land Use Element - Policy 1.3.15
 - Comprehensive Plan - Conservation Element - Policy 1.6.1
 - Comprehensive Plan - Infrastructure Element - Policy 1.3.9
 - Comprehensive Plan - Future Land Use Element - Policy 1.3.23 - Transfer of development rights

5.3.2.2 Town of Jupiter Open Space Program

Jupiter also has amazing “land” assets that reduce the possibility of flooding. The area’s nine largest parks and designated natural areas total 1,126 acres of open land. This land is part of the Town’s stormwater management system – natural areas that store rainwater and protect the community and recharge the groundwater aquifer.

In 2004, Town Council approved an open space bond referendum for \$17 million, with the goal of preserving remaining areas of rare and sensitive natural habitat, and link existing preserve areas and waterways. Jupiter residents overwhelmingly voted in favor of the bond referendum, which led to the creation of the Town's Open Space Program. Some of the land acquisition and subsequent management was accomplished in partnership with other agencies, such as Palm Beach County, the FDEP - Florida Communities Trust, the Loxahatchee River Preservation Initiative, and Florida Fish and Wildlife Conservation Commission. Most of the properties are directly adjacent to tidally-influenced waters, increasing community-wide SLR resilience by preventing development and providing natural space buffer between rising waters and infrastructure. Properties purchased through the 2004 Open Space Bond Program include:

- Fullerton Island - 12 Acres, \$2.9 M Purchase Price, Purchased June 2008
- Jones Creek Preserve - 2.7 Acres, \$1.4 M Purchase Price (Town cost = \$700 K), Purchased July 2005
- Delaware Scrub - 15.9 Acres, \$7 M Purchase Price (Town cost = \$1.7 M), Purchased May 2005
- Sims Creek Preserve - 2.8 Acres, \$2.5 M Purchase Price, Purchased November 2005
- Cinquez Park - 10.1 Acres, \$5.4 M Purchase Price, Purchased September 2008
- Washington Street Preserve - 16.6 Acres, \$4.3 M Purchase Price, Purchased March 2011
- Todd Street Mangrove Preserve - 1.2 Acres, \$15 K Purchase Price, Purchased May 2014

In 2019 Jupiter voters again approved a referendum authorizing the Town to issue up to \$20 million in general obligation bonds for the purpose of acquiring land. The first property purchased with \$3.3 million of the funds is the 7.6-acre Taylor Property on North Delaware Boulevard, located directly adjacent to the downstream portion of tidally-influenced Jones Creek. Therefore, the conservation of this property further increases the Town's SLR resilience. This property is proposed to be developed into Loxahatchee Backwaters, a passive park with green infrastructure (discussed elsewhere in this report).

5.3.2.3 Community Outreach

Sunny day King Tide flooding is an early visual predictor of areas that will flood more frequently as SLR advances. Therefore, the Town has started an awareness campaign, and also deputized their citizens to collect valuable evidence of King Tide flooding through the King Tide photo contest. **Figure 5-10** shows A screenshot of the King Tide photo contest page on the Town's website at <https://www.jupiter.fl.us/1197/King-Tide-Photo-Contest>. Not only does the contest raise awareness of impending SLR and engage citizen involvement, but it also provides valuable information to the stormwater utility on the locations, extent, and progression of King Tide flooding and SLR.

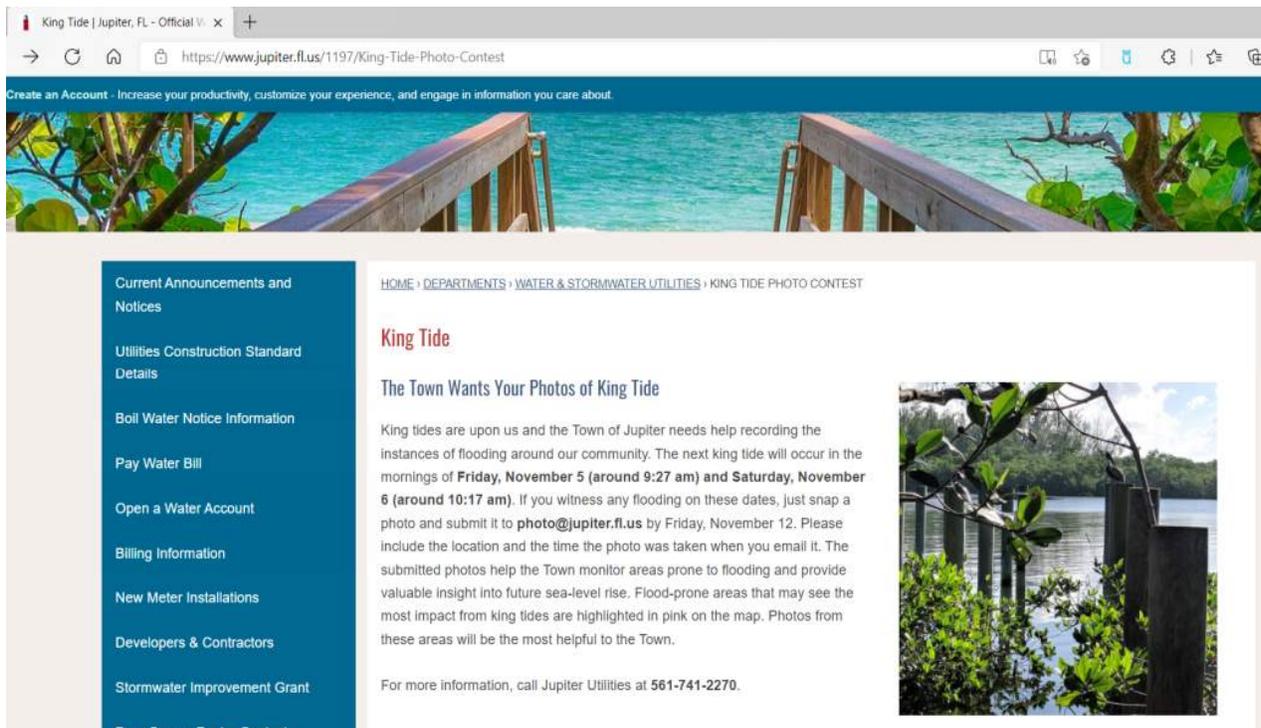


Figure 5-10: King Tide Photo Contest Website Screenshot

5.3.2.4 Alignment with South East Florida Climate Change Compact

On December 15, 2015, the Town of Jupiter – Town Council adopted Resolution No. 86-15, documenting the Town’s intent to coordinate with SEFCCC efforts. The SEFCCC guidance document, “Integrating Climate Change & Water Supply Planning in Southeast Florida,” outlines methodologies for incorporating Regional Climate Action Plan (RCAP) goals/recommendations into local water utility comprehensive planning. Appendix A of the Water Master summarizes the recommendations that are currently listed as completed/implemented by the Town of Jupiter on the SEFCCC website. According to the SEFCCC website RCAP database, the Town has already implemented 39 of the 110 recommendations of the RCAP.

5.4 Proposed Adaptation Actions

The previous subsections documented adaptation strategies implemented by the Town to date, to increase SLR resiliency. The following subsection discusses specific adaptation actions underway by the Town, or recommended for action.

5.4.1 Recommended and Planned Structural Adaptation Actions

The following subsection discusses planned and recommended structural adaptation actions that the Town should implement, to increase SLR resiliency.

5.4.1.1 Juno Street Pump Station

The Juno Street Stormwater Pump Station project includes a 50 CFS stormwater pump station, large diameter reinforced concrete pipe (RCP) and stormwater structures, and large diameter discharge piping to the Intracoastal Waterway crossing beneath the FEC railroad and Alternate A1A right-of-way (ROW). Hydraulic modeling was performed to show that the proposed pump station would increase the discharge capacity of the system, reducing the frequency, severity, and duration of flooding events. It will also provide pumping redundancy in the system to the existing Seminole Avenue Stormwater Pump Station. This project is under construction at the time of this writing. The details of this project are discussed further in Section 7 – Future Capital Needs.

5.4.1.2 River Road Drainage Improvements

River Road and Killane Drive exist within the low-lying Seminole Avenue Stormwater Pump Station Basin, which was identified by the NOAA Sea Level Rise and Coastal Impacts View inundation maps as a vulnerable area to SLR. Both of these roads abut Alma's Place, which is a tidally influence mangrove preserve area within the Town of Jupiter. Previously presented **Figure 5-4** shows that low areas on Killane Drive appear to be conduits for future inundation of the surrounding neighborhood (vulnerable to current storm surge, King Tide beyond 2040, MHHW sea level beyond 2090). Therefore, the Town may increase SLR resiliency by installing a 1-2 foot high berm along the north side of Killane Road, and assist the residential properties through cooperative planning on raising the road crowns of River Road. The details of this project are discussed further in Section 7 – Future Capital Needs.

5.4.1.3 Eganfuskee Street Infrastructure Improvements

Eganfuskee Street exists within the low-lying Yacht Club Estates neighborhood, which was identified by the NOAA Sea Level Rise and Coastal Impacts View inundation maps as a vulnerable area to SLR. This neighborhood currently experiences nuisance flooding and King Tide flooding. A low-lying area at the east end of Eganfuskee Street owned by the Town of Jupiter abuts the Intracoastal Waterway. Previously presented **Figure 5-5** shows that this low-lying area appears to be a conduit for current and future inundation (vulnerable to current storm surge, King Tide before 2040, MHHW seal level by 2090). To reduce high/king tide flooding in the neighborhood and increase SLR resilience, a berm has been installed at the east property line to an elevation equal to the north-adjacent residence seawall, and a tidal backflow valve was installed. The details of this project are discussed further in Section 7 – Future Capital Needs.

5.4.1.4 Elsa Road Stormwater Pump Station – Phase 2

Elsa Road exists within the low-lying Yacht Club Estates neighborhood, which was identified by the NOAA Sea Level Rise and Coastal Impacts View inundation maps as a vulnerable area to SLR and previously presented **Figure 5-5**. A stormwater pump station wetwell was installed as part of the Elsa and Paulina Roads – Drainage and Watermain Improvements project in 2018, in the Yacht Club Estates neighborhood. This second phase proposes to outfit the existing stormwater wetwell with two submersible propeller column pumps and a jockey pump, and associated mechanical and electrical improvements. The details of this project are discussed further in Section 7 – Future Capital Needs.

5.4.1.5 Loxahatchee Backwaters Natural Area

The Town recently acquired a 7.6-acre property located east of Delaware Boulevard and north of Hawie Street, as part of the Open Space Program. It is proposed to redevelop this area with a public access wetland park with public non-motorized waterfront access to Jones Creek. Green infrastructure is proposed in the form of a 3-acre stormwater treatment wetland. A living shoreline is also proposed along the eastern 10 feet of the property that will consist of a rip-rap slope with planted mangroves. The details of this project are discussed further in Chapter 7 – Future Capital Needs.

5.4.1.6 Outfall Gate and Valve Survey

Conduct an inventory of stormwater system outfalls that discharge to tidally-influenced water bodies. The inventory should survey the invert elevation of each outfall, grate elevation of upstream structure, critical elevations of the upstream stormwater infrastructure or BMPs, and the presence/absence and status of flap gates or backflow valves. The inventory should also include coordination with other municipalities, such as Palm Beach County, who may own outfall infrastructure connected to Town systems. The Town can then prioritize installation of flap gates and tidal check valves.

5.4.2 Non-structural

The following subsection discusses planned and recommended non-structural adaptation actions that the Town should implement, to increase SLR resilience.

5.4.2.1 Create an Adaptation Action Plan

It is recommended that the Town complete an Adaptation Action Plan. The analysis may be focused on the stormwater utility and/or water utility, but there may also be benefits to coordinating the plan with a Town-wide analysis with other agencies and focusing on other non-water categories. Additionally, the Town may consider partnering with other municipalities to achieve one or more components of the Adaptation Action Plan.

The Statewide Flooding and Sea Level Rise Resilience Plan was recently authorized by the State of Florida to designate up to \$100 million in annual funding for 50% cost share projects that address the risks of flooding and SLR. Municipalities may provide lists of proposed projects to FDEP for inclusion in the plan, FDEP must then assess projects for inclusion in the plan by implementing a four-tiered scoring system.

Projects submitted by counties and municipalities must have been identified in vulnerability assessments (VAs) that are in compliance with Subsection (3) of 380.093 F.S. In general, Section 380.093, F.S. states that VAs must analyze risks to critical assets, include the depth of: tidal flooding, high tide flooding, current and future storm surge flooding, rainfall-induced flooding (to the extent practicable), and must include at least two local sea level rise scenarios (from NOAA), and two planning horizons (2040 and 2070), etc.

The Coastal Resilience Partnership – Southeast Palm Beach County was formed in 2019, comprising eight municipalities (Cities of Lake Worth Beach, Boynton Beach, Delray Beach, Boca Raton, and Towns of Lantana, Ocean Ridge, Highland Beach, and Palm Beach County). The partnership coordinated to produce the document entitled “Multi-Jurisdictional Climate Change Vulnerability Assessment”, recently published

in July 2021 by a team of consultants led by Collective Water Resources, LLC. This document is instructive for the Town as it provides a recent and local example as to how the Town may approach a vulnerability assessment component of the action plan. The document identifies main categories of climate change threats beyond just those related to stormwater that local municipalities are facing, including drought, extreme heat, high winds, pest and disease outbreaks, saltwater intrusion, shoreline recession, and wildfire. Since 2018, the partnership has received two grants from the FDEP through the Florida Resilient Coastlines Program and one through the new Resilient Florida Grant Program, to complete the vulnerability assessment.

The Town may wish to follow the format of the Florida Adaptation Planning Guidebook for a vulnerability assessment process that is in compliance with Subsection (3) of 380.093 F.S., and thus be eligible for funding. The guidebook was created as part of the Community Resiliency Initiative (CRI) directed by FDEP and the Florida Department of Economic Opportunity (DEO) as part of the Florida Coastal Management Plan. The guidebook is intended to be used by local government planners to provide a framework for developing an Adaptation Plan based on current Florida laws, requirements, and recommendations. The adaptation plan may include the following four-step procedure:

- Establish Context: Assemble a steering committee, set guiding principles and motivations, establish planning area, and define public outreach approach
- Complete a Vulnerability Assessment: Conduct an exposure analysis, sensitivity analysis, and determine focus areas
- Develop Adaptation Strategies: Prioritize needs, identify strategies, then integrate into existing plans
- Implement Adaptation Strategies: Assess capabilities, create an action plan, monitor and evaluate

5.4.2.2 Perform Hydrologic/Hydraulic Modeling Analysis

It is recommended that the Town consider completing detailed hydrologic/hydraulic modeling in vulnerable areas, which incorporates the Town's stormwater infrastructure to more accurately estimate the impacts associated with rising sea levels and increased rainfall duration and frequency. Taking into account head losses associated with the conveyance system would likely result in more expansive predicted inundation than the NOAA Sea Level Rise and Coastal Impacts. The hydrologic/hydraulic modeling should not only be used for the Adaptation Action Plan but could also be leveraged for future stormwater master planning efforts.

5.4.2.3 Establish Seawall Height Ordinance

Many South Florida local governments have increased minimum seawall height requirements in their code of ordinances. It is recommended that the Town investigate the feasibility of implementing minimum seawall heights for new construction, reconstruction, or rehabilitation of public and private seawalls, and mandatory replacement/raising of seawalls observed to allow tidal flooding. The Town may also consider requiring that seawalls constructed below certain elevations be designed to accommodate future upgrades to higher elevations.

It is recommended that a study be completed to examine the consequences and benefits of implementing seawall elevation requirements. The study may include:

- Study existing public and private seawall elevations and condition, and prevailing FFE and FEMA BFE of waterfront properties.
- Identify code language and construction standards for new or rehabilitated seawalls, including required minimum and maximum seawall elevations for construction, reconstruction, or rehabilitation.
- Prioritize improvements and formulate plan and schedule for rehabilitating and/or raising public seawalls.

5.4.2.4 Establish Adaptation Action Areas

In 2011, language was introduced into Florida Statutes Chapter 163 that created the concept of Adaptation Action Areas (AAAs). Excerpts from the Florida Statutes below provide a definition of AAAs.

Florida Statutes - Section 163.3164(1) - "Adaptation action area" or "adaptation area" means a designation in the coastal management element of a local government's comprehensive plan which identifies one or more areas that experience coastal flooding due to extreme high tides and storm surge, and that are vulnerable to the related impacts of rising sea levels for the purpose of prioritizing funding for infrastructure needs and adaptation planning."

Florida Statutes - Section 163.3177(6)(g)(10). – "At the option of the local government, develop an adaptation action area designation for those low-lying coastal zones that are experiencing coastal flooding due to extreme high tides and storm surge and are vulnerable to the impacts of rising sea level. Local governments that adopt an adaptation action area may consider policies within the coastal management element to improve resilience to coastal flooding resulting from high-tide events, storm surge, flash floods, stormwater runoff, and related impacts of sea level rise. Criteria for the adaptation action area may include, but need not be limited to, areas for which the land elevations are below, at, or near mean higher high water, which have a hydrologic connection to coastal waters, or which are designated as evacuation zones for storm surge."

As already identified in the Town of Jupiter - Comprehensive Plan - Coastal Management Element - Policy 2.6.5 to be completed by 2023 (and as indirectly required by the Florida DEO), the Town may wish to investigate and report on the feasibility of AAAs. The purpose of the AAA would be to provide the Town with a method, enshrined in state law, to tailor enhanced requirements for the vulnerable areas such as:

- Limitations on types of development
- Enhanced building code requirements such as minimum finished floor elevations and freeboard
- Increased requirements for roadway, parking lot, and seawall elevations
- Requirements for minimum pervious area, or implementation of green infrastructure and low-impact development techniques
- Prioritization for focused vulnerability assessments

- Prioritization for funding and grant applications

Locations to consider as AAAs include:

- Seminole Ave Pump Station Basin
- Yacht Club Estates and Old Jupiter Beach Road
- Properties that abut natural waterways such as the Loxahatchee River, Sim Creek, Lower Jones Creek, and the Intracoastal Waterway.

5.4.2.5 Encourage Green Infrastructure

The Town should continue to promote the use of green infrastructure, by creating a suite of green infrastructure practices approved by the Town. The Town should consider the issuance of standard green infrastructure details for use by consultants and developers such as bioswales, bioretention, and permeable pavement. The City of Fort Lauderdale has recently instituted such standards which could be instructive for the Town as a reference.

6. FEMA FIRM Maps Update

In 2019, the Federal Emergency Management Agency (FEMA) released new preliminary coastal flood maps for Palm Beach County (including municipalities within the County). These maps, when officially released, will replace the current flood maps which are based on 30-plus-year-old studies. The FIRM maps are relevant to the Town and its citizens in two major ways:

1. The FEMA Coastal Flood Maps, otherwise known as Flood Insurance Rate Maps (FIRMs), are referenced in Florida Building Code (FBC) and used by most municipalities to determine the minimum elevation needed for construction to reduce the risk of flooding, as well as construction methods required in certain zones.
2. The maps are also used to determine flood insurance rates as well as whether mortgage holders are required to buy flood insurance. As a result of the revised FIRMs, some buildings that were previously in high risk areas may be reassigned out of the high risk areas, and vice versa. The flood insurance rates in high risk zones are higher than the lower risk zones, and owners of buildings that are proposed to be added to the high risk zones should expect to see flood insurance rate increases.

The new FEMA maps have not been issued yet, and are not yet in effect, but are anticipated in the Summer of 2022. The maps are not expected to change substantially from the Preliminary Maps released in 2019.

This Section explores the impact of the new FIRM and other recent FIRM issues on the Town, including:

- Palm Beach County's appeal of the 2019 FIRMs
- Sea level rise and the new FIRMs
- FEMA's new risk rating system (Risk Rating 2.0)
- FIRM maps change impact on flood zone classifications of properties throughout the Town

6.1 Palm Beach County Appeal

Palm Beach County conducted a comprehensive review and evaluation of data and methods used by FEMA to prepare the Preliminary FIRMs. The County's review determined that storm surge and wave model configurations used in the modeling process were too high. In addition, FEMA used older light detection and ranging (LiDAR) elevation data from 2001 to 2007, whereas Palm Beach County collected new and higher resolution LiDAR data in 2018 that was not used in the modeling or mapping of the flood hazard areas.

Palm Beach County submitted a formal appeal expressing their concerns on July 9, 2021. The County's appeal argued that the methods used by FEMA could result in significant financial implications for County residents and businesses. However, it is not anticipated that FEMA will implement the concerns mentioned in the appeal. The County expects that FEMA will issue a Letter of Final Determination for the 2019 Preliminary FIRMs in Palm Beach County in the Summer of 2022.

6.2 Sea Level Rise and Updated FEMA FIRM Maps

Federal legislation (Public Law 112-141) directed FEMA to consider sea level rise in their mapping studies. However, FEMA did not consider SLR in the 2019 Preliminary Maps. The Palm Beach County appeal mentioned this omission in early documents but did not include this as a complaint in their formal appeal.

The 2020 Florida Building Code requires finished floor elevations (FFE) of buildings constructed in FEMA FIRM flood hazard areas to be in accordance with American Society of Civil Engineers Standard - Flood Resistant Design and Construction (ASCE 24-05). ASCE 24-05 requires that the FFE of most buildings (called Category II structures) be constructed with 1 foot of freeboard (in most instances) above the base flood elevation (BFE) identified on the FEMA FIRMs, depending on the flood hazard zone and the importance of the building. However, the revised FEMA FIRM maps, when officially released, will likely not incorporate projected sea level rise. Therefore, building code referencing the FIRM map BFEs reflect current flooding risk, but not future SLR risk. It may be incumbent upon municipalities to adopt their own enhanced standards beyond FBC, unless or until FBC is revised to account for SLR.

6.3 Risk Rating 2.0

Starting October 1, 2021, FEMA fundamentally changed the way it rates a property’s flood risk and prices insurance. FEMA claims that the new system is actuarily sound, equitable, easier to understand and better reflection of a property’s flood risk. Reportedly, the new methodology includes multiple variables that were not previously considered, including flood frequency, flood type, (river overflow, storm surge, coastal erosion and heavy rainfall), distance to a water source, finished floor elevations, and the costs to rebuild. FEMA released data by zip code to indicate the anticipated change in FEMA flood insurance policy costs. **Table 6-1** demonstrates the anticipated change in monthly premiums in the three main zip codes within the Town. **Figure 6-1** shows the geolocated data from the FEMA Risk Rating 2.0: Projected Premium Changes by Zipcode website located at the following link:

<https://www.arcgis.com/apps/dashboards/ad25fc43b31e46e6a66a4c632d6746f6>

Table 6-1: Anticipated Change in Annual Premiums by Zip Code for Town of Jupiter

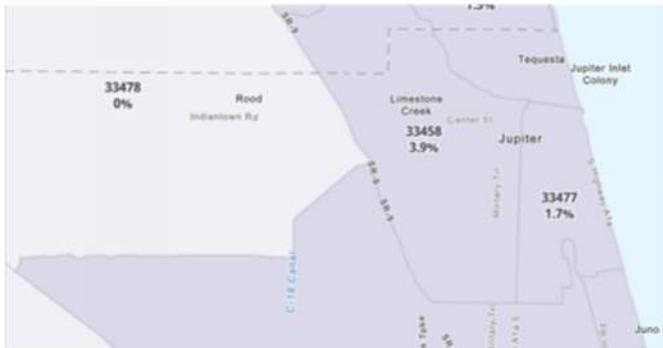
Parameter	Zip Code					
	33477		33458		33478	
	Policies (amt)	Policies (% of total)	Policies (amt)	Policies (% of total)	Policies (amt)	Policies (% of total)
Policies Decreased:	1,247	22.7%	185	4.8%	215	25.1%
Policies Incr. \$0-\$120:	4,092	74.4%	3,455	89.2%	643	74.9%
Policies Incr. \$120-\$240:	94	1.7%	152	3.9%	0	0.0%
Policies Incr. \$240+:	64	1.2%	82	2.1%	0	0.0%
Total Policies	5,497	100.0%	3,874	100.0%	858	100.0%



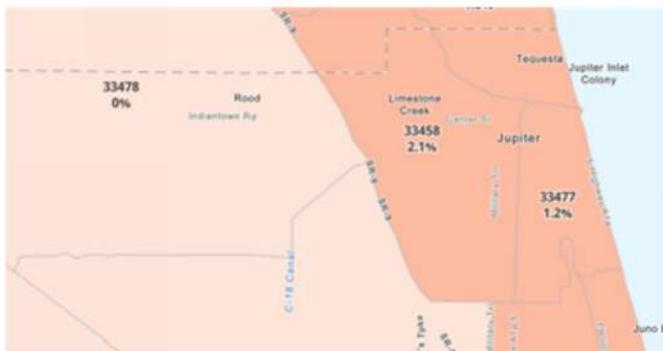
Map A:
 Percent of Policies
 With Decreased
 Premiums



Map B:
 Percent of Policies With
 Increased Annual
 Premiums of \$0-\$120



Map C:
 Percent of Policies With
 Increased Annual
 Premiums of \$120-\$240



Map D:
 Percent of Policies With
 Increased Annual
 Premiums > \$240

Figure 6-1: Geolocated Data FEMA Risk Rating 2.0: Projected Premium Changes by Zipcode For Town of Jupiter

6.4 FEMA FIRM Maps Impact on Properties Within the Town

Hazen compared the current 2017 work maps to the preliminary 2019 maps and identified areas that showed obvious and significant variations in Zone AE, AO and VE classifications between the two work maps. The buildings that appear to have increased flood risk in the proposed work maps are summarized in **Table 6-2**. The buildings that appear to have reduced flood risk in the proposed work maps are summarized in **Table 6-3**.

Table 6-2: Structures with Obvious Increased Flood Risk¹

FIRM Panel	New Classified Zone	Addresses
178	AE	398, 402, 434, 438, 442, 446 Dover Road
		404, 406, 410, 414, 418 Dover Circle
		202, 203, 204, 208 River Terrace Drive
178	AE	122, 201, 202, 205, 207 Windsor Road West
		200, 204, 208, 210, 211, 217 West Norfolk Road
		223, 227, 229, 233, 235 West Riverside Drive
178	AE	219, 223, 300, 303 West Norfolk Road
		232 River Terrace Drive
		315, 319 West Riverside Drive
178	AE	228, 234 West Riverside Drive
178	AE	118, 120, 122, 124 West Riverside Drive
178	AE	5570, 5604 Center Street
178	AE	5483, 5499, 5505 Center Street
		1215, 1250, 1252, 1253, 1254, 1255, 1256, 1258, 1260 Holly Cove Drive
178	AE	701, 702, 703, 704, 705, 706 Warren Drive
178	AE	18169, 18175 49th Terrace North
178	AE	812 Center Street
		704 North Whitney Drive
		801, 805, 807 Northview Drive
178	AE	1600 Center Street
		800, 801, 804, 805, 808, 809 Lee Court
		808 Philadelphia Drive

FIRM Panel	New Classified Zone	Addresses
		17961, 17964 April Lane
178	AE	550 Center Street
178	AE	400, 401, 405 Douglas Drive
		400 North Perry Avenue
178	AE	400, 401, 405, 409, 501, 503, 505, 509, 601, 603, 605, 607 Willet Avenue
		500, 502, 504, 508, 510, 702, 706, 708 North Loxahatchee Drive
		508 Edmund Street
		403 Center Street
		404, 410 Hugh Street
178	AE	615, 680, 710, 806 North Orange Avenue
178	AE	112, 124, 130, 134, 140 Jupiter Street
178	AE	400 North Old Dixie Highway
178	AE	221, 227, 231, 237, 241, 245, 251 Jupiter Street
178	AE	400, 403, 405, 406, 407, 408, 409, 410, 411, 500, 502, 503, 504, 505 Pinegrove Avenue
		307 Hugh Street
179	AE	26 East Riverside Drive
179	AE	621, 623 North Alternate A1A
		16 Yacht Club Drive
186	AE	114 Faith Way
186	AE	117 North Caloosahatchee Avenue
186	AE	1215 Seneca Street
186	AE	409, 411, 417 Call Place
		404, 410, 424 Hugh Street
		300, 302 North Loxahatchee Drive
186	AE	301, 309, 311, 319 Evernia Street
186	AE	21, 101, 115 North Hepburn Avenue
		221, 233, 237 Hibiscus Street

FIRM Panel	New Classified Zone	Addresses
186	AE	114, 122, 126, 130, 134, 140, 150, 201, 205, 206, 211, 212, 216, 225, 232, 236, 237, 242 Evernia Street
		115, 127, 131, 143, 243 Fern Street
		221 North Hepburn Street
		218 North Orange Avenue
		222 North Old Dixie Highway
187	AE	200 North US Highway 1 (Harbourside Place)
		102 North Coastal Way
		1 South Coastal Way
		Riverwalk Park and South Coastal Way
187	AE	1070, 1080 East Indiantown Road
187	AE	700 South US Highway 1
187	AE	149 Tierra Lane
		1352 South US Highway 1

Table 6-3: Structures with Decreased Flood Risk¹

FIRM Panel	Addresses
178	948 Pompano Drive
178	940 Dolphin Drive
178	949, 953, 957, 961, 963 Dolphin Court
178	933, 937, 938, 941, 945, 950, 968, 972 Marlin Drive
187	217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233 Commodore Drive

Notes:

1. This effort included a comparison of 2017 published FEMA maps to preliminary proposed 2019 FEMA maps. Areas with structures of obvious increased or reduced flood risk were noted. However, this was not an exhaustive attempt to identify each and every structure or area of significance that may be affected by the proposed map changes.

7. Future Capital Needs Assessment

The following is an overview of upcoming projects planned for the purposes of improving flood protection and water quality treatment throughout the Town within the five-year planning horizon. Planned projects are divided into two categories:

- **Flood Control** improvement projects to improve the level of service for the existing stormwater system
- **Water Quality** improvement projects to provide treatment of runoff with the intent of enhancing the local receiving waters.

Descriptions of the stormwater projects currently being proposed within the Town's limits are provided below.

7.1 Flood Control Projects

7.1.1 Pine Gardens North Infrastructure Improvements

The Pine Gardens North area consists of commercial and residential parcels within the Town. The project includes installation of approximately 1,200 lf of stormwater exfiltration trench and structures along portions of Hugh Street, Kennedy Street, and Fern Street, to improve water quality. These exfiltration trenches are a component of the ERP permit requirement for the Juno Street Stormwater Pump Station project to provide compensating treatment for the reduction of total phosphorous. Installation of RCP, curbing and catch basins to address localized flooding throughout multiple various streets in the basin is also proposed. The project also includes replacement of existing watermain, valves, and fire hydrants.

Figure 7-1 on the following page shows a photo of the flooded intersection of Hugh Street and Willet Avenue following a heavy storm. **Figures 7-1A and 7-2A** in Appendix 7 show a conceptual plan view of the proposed improvements. **Figure 7-3A** in Appendix 7 shows a conceptual plan view of the proposed improvements superimposed upon the LIDAR ground elevation map. The estimated total project cost is \$3,929,000 (including water distribution improvements).



Figure 7-1: View of Flooded Intersection of Willet Avenue and Hugh Street, Looking East

7.1.2 Fisherman's Landing Infrastructure Improvements

Approximately 300 lf of existing 24" high density polyethylene (HDPE) pipe exfiltration trench along Riverwood Lane is causing settlement of the road where water services penetrate the trench. The areas of failed exfiltration trench will be repaired, and the settled roadway will be restored. At the Stillwater Court cul-de-sac, an existing undersized 6" drainage pipe will be removed, and two catch basins and 40 lf of RCP will be installed to connect to the existing discharge ditch. In all areas watermain replacement and drainage installation is occurring, existing swales will be regraded to improve drainage.

Figure 7-2 shows a photo of the road settling above the exfiltration trench on Riverwood Lane. **Figure 7-4A** in Appendix 7 show a conceptual plan view of the proposed improvements, and **Figure 7-5A** in Appendix 7 shows a conceptual plan view of the proposed improvements superimposed upon the LIDAR ground elevation map.

The project also includes replacement of existing watermain, which is accounted for in the Water Master Plan update. The estimated total project cost for the stormwater improvements is \$392,000.



Figure 7-2: View of Settled Exfiltration Trench on Riverwood Lane, Looking West

7.1.3 Juno Street Stormwater Pump Station

The Seminole Basin is an approximate 92-acre stormwater drainage basin within the Town of Jupiter comprising predominantly commercial / industrial land use with small residential areas. The Seminole Basin is bounded to the south by Indiantown Road, to the north by the Loxahatchee River, to the east by the FEC Railway, and roughly to the west by Hepburn Avenue and Marlin Drive. Stormwater runoff from the Seminole Basin is currently collected and discharged to a detention pond via the existing Seminole Avenue Stormwater Pump Station located at the north end of the basin, which then discharges to the Loxahatchee River.

The Juno Street Pump Station project includes a new stormwater pump station, large diameter reinforced concrete pipe (RCP) and stormwater structures, and large diameter discharge piping to the Intracoastal Waterway crossing beneath the FEC railroad and Alternate A1A. The project is proposed to reduce peak flood stages and flooding duration within the low-lying Seminole Avenue Stormwater Pump Station Basin area of the Town of Jupiter.

The Juno Street Stormwater Pump Station is proposed to be constructed in the south half of the basin. The new pump station is proposed to achieve the following benefits:

- Hydraulic modeling was performed to show that the proposed pump station would increase the discharge capacity of the system, reducing the frequency, severity, and duration of flooding events.
- The proposed pump station would provide pumping redundancy in the system to the existing Seminole Pump Station.
- By locating the proposed pump station in the south portion of the basin, the primary discharge points will be effectively spaced, and reduce runoff travel time to discharge points for further flood control improvement.

These proposed infrastructure improvements are intended to reduce flood stage levels and flooding duration within the Seminole Basin and provide pumping redundancy to the existing Seminole Avenue Stormwater Pump Station connected to the same basin and system, while resulting in no net increase in nutrient discharge to downstream receiving water bodies.

An innovative stormwater best management practice (BMP) stormwater filtration device (known as a Jellyfish Filter by ConTech Engineered Solutions) will be installed just prior to the proposed Juno Street Pump Station. The main benefits of the stormwater filtration device are small footprint with high published nutrient removal efficiencies. The intent of the stormwater filtration device is to satisfy multiple nutrient removal and stormwater control goals, including:

- No net nutrient discharge increase to receiving waterbodies as required by the SFWMD;
- Making progress towards Loxahatchee River Reasonable Assurance Plan (RAP) total nitrogen (TN) removal goals; and
- Good stewardship of the Loxahatchee River and alignment with Loxahatchee River Preservation Initiative (LRPI) funding criteria.
- Moreover, by preventing a net increase in nutrient loading to downstream water bodies, installing this device prior to the new pump station will also provide the added capability to operate the Juno Street Stormwater Pump Station under normal service, and not just for peak flows as originally required by the SFWMD.

Figure 7-6A in Appendix 7 show a conceptual plan view of the proposed improvements, and **Figure 7-7A** in Appendix 7 shows a conceptual plan view of the proposed improvements superimposed upon the LIDAR ground elevation map. The estimated total project cost is \$4,200,000.

7.1.4 North A1A Drainage Improvements

A section of North A1A, located north of the intersection with Indiantown Road and adjacent to the northeast entrance of the Maltz Theater, experiences long duration flooding following heavy rainfall events. Improvements are rec in an effort to reduce flooding along North A1A. This project will consist of the installation of approximately 600 lf of drainage pipes, catch basins, and manholes complete with water quality improvements (exfiltration trench or water quality device such as hydrodynamic separator) for a portion of North A1A bounded by E. Indiantown Road to the Maltz Theater Parking Lot to the northwest.

Figure 7-3 shows a photo of the flooded roadway at North A1A following a heavy storm, taken from the intersection of the rear entrance of the Maltz Theater, looking north. **Figure 7-8A** in Appendix 7 show a conceptual plan view of the proposed improvements, and **Figure 7-9A** in Appendix 7 shows a conceptual plan view of the proposed improvements superimposed upon the LIDAR ground elevation map. The estimated total project cost is \$952,000.



Figure 7-3: View of Flooded Roadway at North A1A Looking North

7.1.5 Bush Road Drainage Improvements

Rainfall driven nuisance flooding occurs routinely along Bush Road between Indiantown Road and Sentimental Journey causing traffic problems requiring road closures. In order to alleviate flooding, this project proposes to add four new drainage inlets, exfiltration trench, and reinforced concrete pipe on the west side of Bush Road to tie into existing drainage infrastructure on the east and west sides of Bush Road. Existing swales will be regraded to facilitate positive drainage to drainage structures.

Figures 7-10A in Appendix 7 show a conceptual plan view of the proposed improvements, and **Figure 7-11A** in Appendix 7 shows a conceptual plan view of the proposed improvements superimposed upon the LIDAR ground elevation map. The estimated total project cost is \$269,000.

7.1.6 Dolphin Drive Drainage Improvements

Rainfall driven nuisance flooding occurs routinely along Dolphin Drive. To alleviate flooding, this project proposes to construct drainage improvements into the southern portions of the roadway where it is topographically lowest and currently void of drainage infrastructure. Existing swales will also be graded to facilitate drainage to the new catch basin locations allowing runoff from the area to be discharged to the Loxahatchee River through the existing outfall.

Figure 7-12A in Appendix 7 show a conceptual plan view of the proposed improvements, and **Figure 7-13A** in Appendix 7 shows a conceptual plan view of the proposed improvements superimposed upon the LIDAR ground elevation map. The estimated total project cost is \$378,000.

7.1.7 Pennock Industrial Park Infrastructure Improvements

Commerce Way West and Commerce Lane within the Pennock Industrial Park do not consistently meet the Town's level of service for stormwater drainage. Existing drainage swales and failing high density polyethylene pipe (HDPE) exfiltration trench are inadequate to prevent flooding during average and heavy rainfall events. This project will replace approximately 1,280 lf of drainage swales with reinforced concrete pipe (RCP), drainage structures, and exfiltration trench to alleviate flooding and enhance water quality of stormwater runoff. In addition, approximately 200 lf of failing HDPE exfiltration trench will be replaced with RCP exfiltration trench, and approximately 235 lf of existing 15 to 24-inch RCP will be slip lined or replaced. Limited replacement of water isolation and hydrants will also be performed.

Figure 7-14A in Appendix 7 show a conceptual plan view of the proposed improvements, and **Figure 7-15A** in Appendix 7 shows a conceptual plan view of the proposed improvements superimposed upon the LIDAR ground elevation map. The estimated total project cost is \$1,148,000 (including water improvements).

7.1.8 Eganfuskee Road Infrastructure Improvements

Rainfall driven nuisance flooding occurs routinely at the east end of Eganfuskee Road. This project proposes to construct a hydrodynamic separator here for water quality and connecting underground piping directly to the existing outfall. To prevent high/King Tide flooding in the neighborhood, a berm and backflow valve structure have already been completed. An additional stormwater inlet is proposed at the northwest corner of Paulina Road and Eganfuskee Road to alleviate local ponding there.

Figure 7-4 shows a photo of the east end of Eganfuskee Road following a heavy storm, looking east. **Figure 7-16A** in Appendix 7 show a conceptual plan of the proposed improvements, and **Figure 7-17A** in Appendix 7 shows a conceptual plan of the proposed improvements superimposed on the LIDAR ground elevation map. The estimated total project cost is \$378,000.



Figure 7-4: View of Flooded Roadway at East End of Eganfuskee Road Looking East

7.1.9 Eastview Manor Drainage Improvements

The Eastview Manor basin currently consists primarily of single and multi-family residential land use. Stormwater runoff within the basin is currently discharged to the Loxahatchee River via a flap gate discharge at the terminus of the drainage ditch located along the eastern property boundary of the Jupiter Plantation townhomes neighborhood. Recent incidents of excessive flooding within the drainage system have been reported, including East Apex Circle. It is apparent that redevelopment and drainage improvements have added additional stormwater subsystems over the years, likely conveying additional stormwater runoff into the system since original development.

At the south end of the Eastview Manor basin, Town staff suspect that drainage from FDOT-owned Indiantown Road is entering the system, to prevent this a plug has been installed at the interconnecting structure. It is proposed to remove the plug and install a new structure with an inline check valve.

Figures 7-18A and 7-19A in Appendix 7 show a conceptual plan view of the proposed improvements, and **Figure 7-20A** in Appendix 7 shows a conceptual plan view of the proposed improvements superimposed upon the LIDAR ground elevation map. The estimated total project cost is \$182,000.

It is apparent that redevelopment and drainage improvements have added additional stormwater subsystems over the years, likely conveying additional stormwater runoff into the system since original development, and since the last time that modeling was performed on the basin in the 1996 Stormwater Utility Master Plan. Therefore, a stormwater model will be developed for the area to reflect the current configuration of the system, and to predict performance. The model will be used to evaluate potential improvements to the system. The estimated cost for the stormwater model is \$55,000, (accounted for within the \$182,000 fee, however improvement recommended by the stormwater model are unknown).

7.1.10 Cypress Drive Drainage Improvements

Rainfall driven nuisance flooding occurs routinely at the south half of Cypress Drive. This project proposes to install 450 lf of valley gutter, three stormwater inlet structures, and 300 lf of RCP between 1420 and 1432 Cypress Drive properties. The RCP will connect to the existing 42” RCP along the stormwater easement between the commercial properties and the FEC railway.

The property owner at 1432 Cypress Drive is reportedly agreeable to granting the easement. The Town is still awaiting confirmation from the owner of 1420 Cypress, whose response will determine if the easement will be split over the two properties (7.5’ wide each property) or traverse 15 feet width of one property. The property manager requested that the drainage work be performed in the summer months. The existing asphalt at Cypress Dr. near the proposed structures is in poor condition and will need to be addressed. Also, the property line chain link fence should be replaced.

Figure 7-21A in Appendix 7 shows a conceptual plan view of the proposed improvements, and **Figure 7-22A** in Appendix 7 shows a conceptual plan view of the proposed improvements superimposed upon the LIDAR ground elevation map. The estimated total project cost is \$224,000.

7.1.11 Elsa Road Stormwater Pump Station – Phase 2

A stormwater pump station wetwell was installed as part of the Elsa and Paulina Roads – Drainage and Watermain Improvements project in 2018. The project included a 1,700 cf concrete wetwell (with provisions for future pumping equipment), energy dissipation / effluent structure, 24” RCP, 4” to 16” DIP discharge piping, concrete bank revetment, and manatee grate at outfall to Intracoastal Waterway. This project proposes to outfit the existing stormwater wetwell with two 5 CFS submersible propellor column pumps with formed suction inlets and a jockey pump, discharge columns, DIP piping, internal concrete baffles, control panel, electrical, and instrumentation improvements. A view of the proposed improvement internal to the wetwell is provided as **Figure 7-5**. The estimated total project cost is \$714,000.

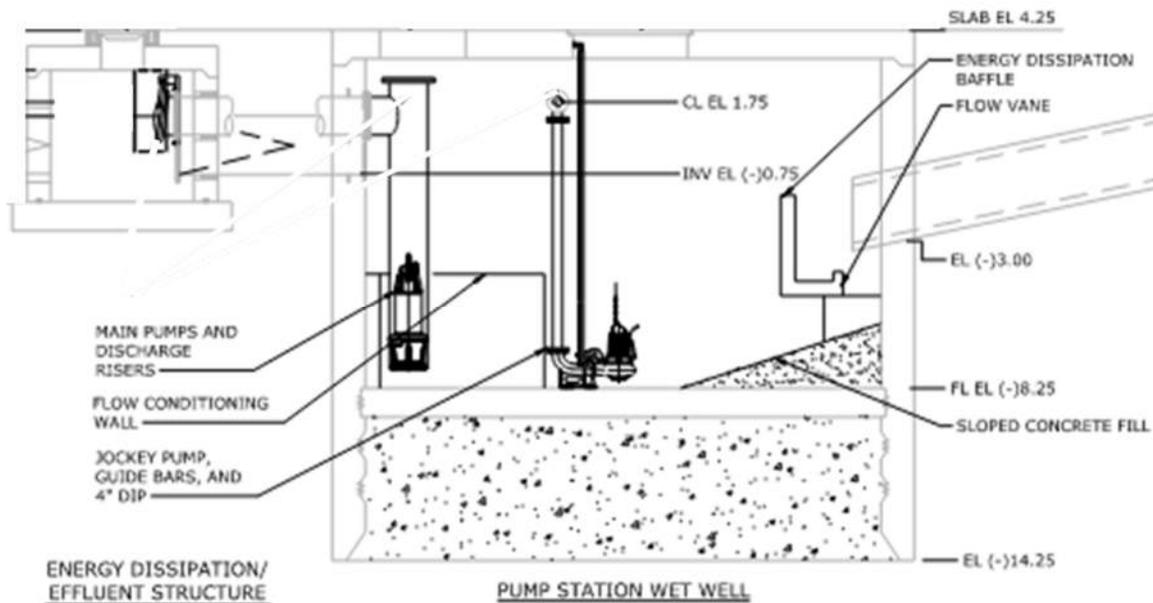


Figure 7-5: Proposed Improvements to Existing Elsa Road Pump Station Wet Well

7.1.12 Pine Gardens North / Seminole Avenue Stormwater Pump Station Basin Drainage Interconnect

Currently, stormwater collected in the Loxahatchee Drive Canal and Rio Vista Canal Basins (Pine Gardens North) discharge via gravity flow northward, to the aforementioned canals. The Pine Gardens North neighborhood experiences nuisance flooding throughout. The installation of the new Juno Street Stormwater Pump Station will increase the discharge capacity of the Seminole Basin by 50%. This project proposes to perform a study to investigate the permitability and hydraulic benefit of interconnecting the basins, to provide pumped discharge of stormwater from the Loxahatchee Drive Canal and Rio Vista Canal basins. Construction of the improvements will be considered if the results of the study are favorable. On a conceptual basis, five E structures, and 1,225 lf of 36” RCP are proposed to interconnect from the existing structure at the intersection of Loxahatchee Drive and Hugh Street, to the existing structure on Venus Street. **Figure 7-23A** in Appendix 7 show a conceptual plan view of the proposed improvements. The estimated total project cost is \$1,610,000.

7.1.13 River Road Drainage Improvements

The residential privately-owned road known as River Road exists at the north extension of Town Hall Avenue and experiences flooding. Reportedly, the existing culvert crossing under River Road/Town Hall Avenue is too deep and has become blocked with sediment. The culvert connects the Town-owned natural area known as Alma’s Place to the Loxahatchee River. Additionally, based on LIDAR and anticipated future sea level rise inundation maps, it appears that Alma’s Place provides low spots that, when breached, may serve as conduits for inundation to the Seminole Basin area north of Center Street. Therefore, it appears that the Town may increase SLR resiliency by assisting the residential properties through cooperative

planning on raising the road crown of River Road by 1-2 feet. Additionally, the Town should consider installing a 1-2 foot high berm along the north side of Town-owned Killane Drive, and installing two structures and stormwater pipe beneath Killane Drive with a tidal check valve discharging to the Town-owned mangrove preserve at Alma's Place.

Figure 7-24A in Appendix 7 shows a conceptual plan view of the proposed improvements, and **Figure 7-25A** in Appendix 7 shows a conceptual plan view of the proposed improvements superimposed upon the LIDAR ground elevation map. **Figure 7-26A** in Appendix 7 shows the project location in reference to the Palm Beach County – Sea Level Rise Countywide Vulnerability Analysis Map. The estimated total project cost is \$392,000.

7.2 Water Quality Projects

7.2.1 Town Hall / Daniels Way Water Quality Improvements

Jupiter High School, Jupiter Town Hall, and the surrounding areas including Military Trail lie within the upper reaches of the Jones Creek Watershed. Water quality monitoring has shown consistently high fecal indicator bacteria (FIB) levels in Jones Creek canals. Jones Creek discharges to the Southwest Fork of the Loxahatchee River, which is currently on the FDEP study list and included in the Loxahatchee River Pollutant Reduction Plan.

This project proposes to implement stormwater BMPs discharging into the Jupiter High School ditch. A hydrodynamic separator is proposed at the south end of Daniels Way. Additionally, it is proposed to reroute one of the Jupiter Town Hall discharge locations to upstream of the existing water quality structure. **Figure 7-27A** in Appendix 7 show a conceptual plan view of the proposed improvements. The estimated total project cost is \$168,000.

7.2.2 Loxahatchee Backwaters Natural Area

The Town recently acquired a 7.6-acre property located east of Delaware Boulevard and north of Hawie Street. The property is currently vacant land that historically housed radio station facilities. Currently, small areas of the property are cleared and used as residential access and yard area, whereas the remaining and majority of the property is abandoned, forested with a dominance of exotic vegetation, and includes remnants of previous land uses.

It is proposed to redevelop this area with a public access wetland park with public non-motorized waterfront access to Jones Creek. A 3-acre stormwater treatment wetland is proposed, and 6,000 sf separate wet retention area. Installation of approximately 2,500 lf RCP pipe and seven E structures would be required to connect the stormwater systems currently surrounding neighborhoods and businesses to the proposed treatment wetland. A living shoreline is proposed along the eastern 10 feet of the property that will consist of a rip-rap slope with planted mangroves.

This project will capture runoff from downstream portions of the Sims Creek and Jones Creek watersheds and provide additional water quality treatment. The project will also redirect the stormwater runoff discharge location currently located at Indiantown Road, to further downstream in Sims Creek. The project

will maintain and create new habitat for upland and wetland wildlife and provide passive recreation and public access.

Figure 7-6 presents a conceptual level sketch of the Loxahatchee Backwaters Natural Area (from the Town of Jupiter Planning Department). **Figure 7-28A** in Appendix 7 show a conceptual plan view of the proposed improvements, and **Figure 7-29A** in Appendix 7 shows a conceptual plan view of the proposed improvements superimposed upon the LIDAR ground elevation map. The estimated total project cost is \$6,370,000.



Figure 7-6: Loxahatchee Backwater Natural Area Conceptual Sketch
(Town of Jupiter Planning and Zoning Department)

7.2.3 Center Street / Jones and Sims Creek Water Quality Improvements

Two stormwater outfall locations discharge to Sims Creek, and one stormwater outfall location discharges to Jones Creek, at the Center Street bridge crossings over Sims Creek and Jones Creek. The locations of discharge are located just prior to the Southwest Fork of the Loxahatchee River. The stormwater systems servicing Center Street are owned by Palm Beach County. Each discharge receives some level of treatment by exfiltration trench prior to discharge.

This project proposes to provide an additional treatment for total suspended solids (TSS) and floatables removal prior to discharge at two of the three locations by installing hydrodynamic separators prior to the discharge. Due to space limitations, it is likely that the existing control structures would need to be removed to make room for the hydrodynamic separators. Manufacturer's literature indicates 100% removal performance of floatables, and 80% removal performance of TSS (sediment), for hydrodynamic separators.

Figure 7-30A in Appendix 7 show a conceptual plan view of the proposed improvements. The estimated total project cost is \$280,000.

7.2.4 Seminole Basin Wet Retention Pond Water Quality Improvements

The Seminole Basin receives stormwater treatment from the existing wet detention area located between the Seminole Avenue Stormwater Pump Station discharge, and the Loxahatchee River. This project proposes to enhance the removal of TN and TP in the wet retention area by installing engineered filter media (known as Bold and Gold) along the shelf of the existing basin. A plan view of the proposed improvement internal to the wetwell is provided as Figure 7-7. The estimated total project cost is \$350,000.

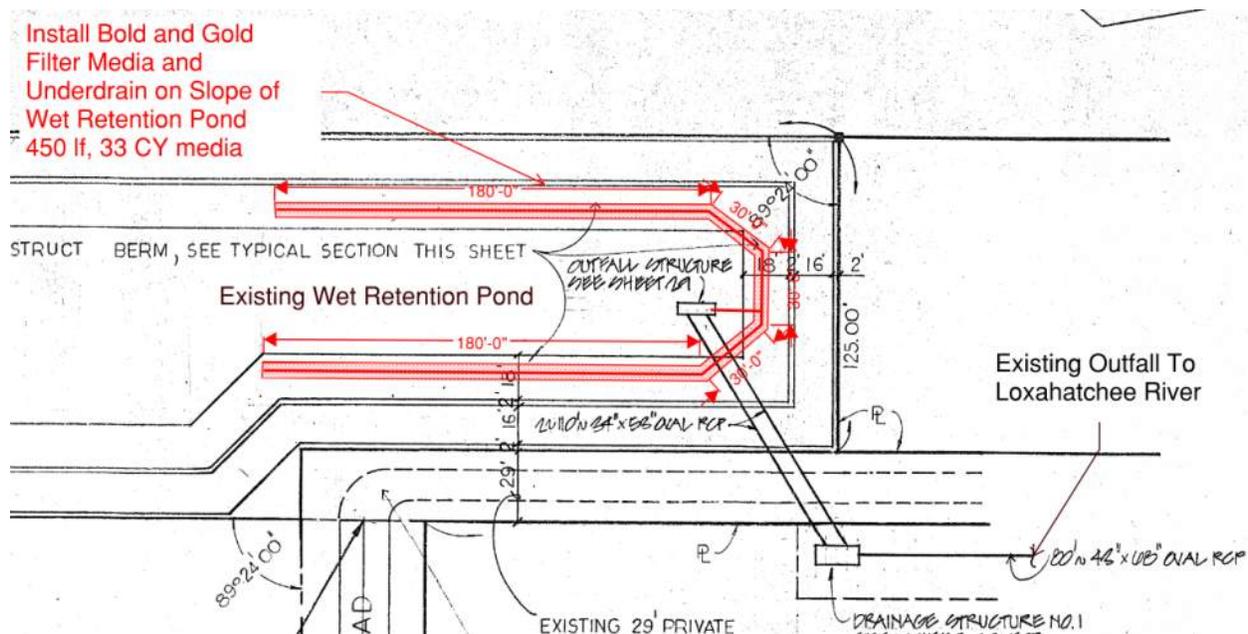


Figure 7-7: Proposed Improvements at Seminole Basin Wet Retention Pond

7.2.5 Dover Ditch Water Quality Improvement Project

The Dover Ditch exists partially within the Village of Tequesta, and partially within the Town of Jupiter municipal boundaries. Dredging of accumulated sediment and installation of bank stabilization using living shoreline techniques for nutrient removal is proposed in the west segment. Construction of a sediment trap and installation of bank stabilization using living shoreline techniques is proposed in the central segment. Construction of exfiltration trench is proposed in the east segment. Because the ditch exists partially within the Village of Tequesta and partially within the Town, the cost of any improvements would be split between the two municipalities consistent with the existing interlocal agreement. A plan view of the proposed improvements are provided as **Figure 7-8**. The estimated total project cost is \$800,000. This project is assumed to be 50% grant funded with 40% local matching funds to be provided by the Town of Jupiter pursuant to the existing interlocal agreement with the Village of Tequesta.



Figure 7-8: Plan View of the Dover Ditch Project Location

7.2.6 Reverse Osmosis Concentrate Discharge to Deep Injection Well

The Town of Jupiter WTP performs advanced treatment of groundwater from the Floridan aquifer using reverse osmosis (RO) treatment. The Town's RO concentrate management practice since 1990 has been through a permitted surface water discharge via outfall to the C-18 Canal/Southwest Fork Loxahatchee River. The Town is currently considering construction of a deep injection well as their primary nanofiltration concentrate method. If a well is constructed for nanofiltration concentrate disposal, it is financially and environmentally beneficial to also divert RO concentrate to the well. The concurrent 2022 Water Master Plan Update provides detailed information on this subject.

Diverting RO concentrate to a deep well would prevent discharge of TN, and to a lesser extent TP, contained in the RO concentrate water to the C-18 Canal/Southwest Fork Loxahatchee River, therefore benefiting the Loxahatchee River Pollutant Reduction Plan nutrient reduction goals. Conceptual planning of a deep injection well (DIW) is still underway. However, feasibility and timing has not been determined due the significant investment required for permitting and construction. **Table 7-1** shows the estimated nutrient loading reduction to the C-18 Canal / Southwest Fork of the Loxahatchee River that would result from diverting RO concentrate to a deep injection well, based on an analysis of monthly RO concentrate data from 2021. The costs for this are not included in the Stormwater Master Plan, as they are accounted for in the concurrent Water Master Plan update.

Table 7-1: Estimated Nutrient Reduction to C-18 Canal/Loxahatchee River
 (Based on 2021 Monthly RO Concentrate Data)

RO Concentrate (mgd)	Average TN (mg/L)	TN Load (lb/yr)	Average TP (mg/L)	TP Load (lb/yr)
2.49	4.4	33,370	0.06	470

7.3 Recommended Capital Improvement Program

This section of the master plan provides opinions of probable project cost for the recommended stormwater projects identified in earlier sections of the report. The tables presented in this section include the following columns: 1) project number, 2) project name, 3) improvement type and 4) costs. The project number is a unique identification code to facilitate project tracking. The project name is a short descriptive title related to the project scope. Detailed descriptions of the project scopes are presented in prior sections of this report.

The order that the projects are presented in this Section is neither an indication of the sequence that the projects should be implemented nor a ranking of their priority. A fundable plan for implementation of identified projects is presented in **Section 10 – Financial Forecasts and Recommendations**.

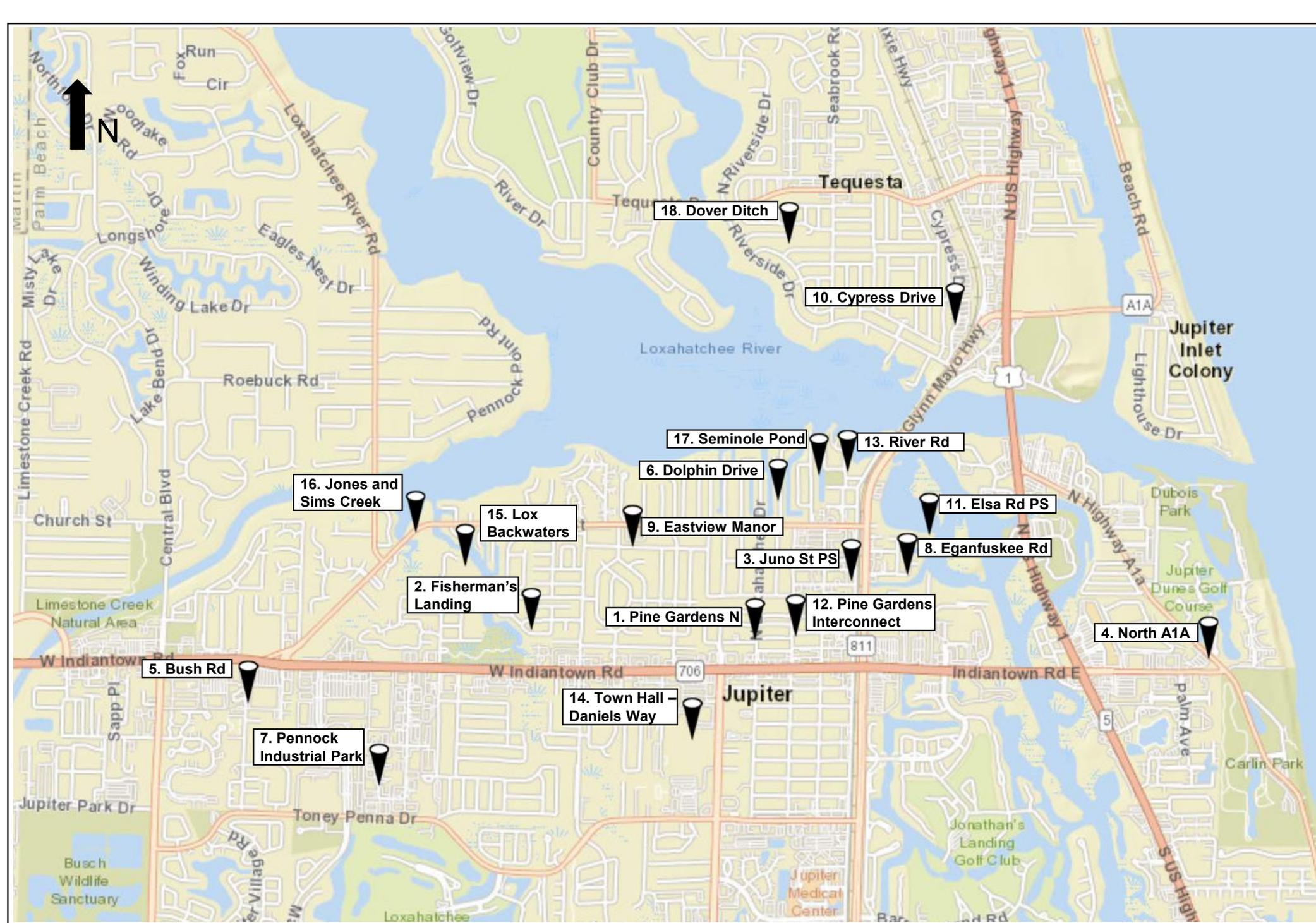
7.4 Opinion of Probable Project Costs

The opinion of probable costs presented herein has been prepared by Hazen based upon master plan level information. Because of the level of scope development at this stage the opinion is an “Order of Magnitude” estimate as defined by the Association for the Advancement of Cost Engineering International (AACE). The expected range of accuracy for this type of opinion is +100 percent to -50 percent. These opinions of probable cost have been prepared for guidance in project evaluation and implementation from the information available at this stage of the estimate. The final costs of the projects will depend on actual labor and material cost, competitive market conditions, final project scope, implementation schedule, and other variable conditions. As a result, the final project costs will vary from the opinions presented herein.

The cost opinions are “project costs” and where applicable are inclusive of: construction costs; contractor overhead and profit; estimated allowance for permit application fees; 20 percent estimated allowance for engineering services during the design, permitting, construction and startup of the project; along with a 20 percent contingency to cover supply chain issues. The costs are based upon year 2021 dollars and do not include escalation for inflation. The opinion of probable costs for stormwater projects are presented in **Table 7-2**. A location map for the proposed projects is included as **Figure 7-9**.

Table 7-2: Opinion of Probable Project Cost for Stormwater Projects

Project ID No.	Project Name	Improvement Type	Cost (FY Year 2021 \$)
1	Pine Gardens North Drainage Infrastructure Improvements	Flood Control	\$3,929,000
2	Fisherman's Landing Drainage Infrastructure Improvements	Flood Control	\$392,000
3	Juno St Stormwater Pump Station	Flood Control	\$4,200,000
4	North A1A Drainage Improvements	Flood Control	\$952,000
5	Bush Road Drainage Improvements	Flood Control	\$269,000
6	Dolphin Drive Drainage Improvements	Flood Control	\$378,000
7	Pennock Industrial Park Drainage Infrastructure Improvements	Flood Control	\$1,148,000
8	Eganfuskee Road Drainage Infrastructure Improvements	Flood Control	\$378,000
9	Eastview Manor Drainage Improvements	Flood Control	\$1,105,000
10	Cypress Drive Drainage Improvements	Flood Control	\$224,000
11	Elsa Road Stormwater Pump Station - Phase 2	Flood Control	\$714,000
12	Pine Gardens / Seminole Avenue Stormwater Pump Station Basin Drainage Interconnect	Flood Control	\$1,610,000
13	River Road Drainage Improvements	Flood Control	\$392,000
14	Town Hall - Daniels Way Water Quality Improvements	Water Quality ¹	\$168,000
15	Loxahatchee Backwaters Natural Area	Water Quality ¹	\$6,370,000
16	Center Street / Jones and Sims Creek Water Quality Improvements	Water Quality ¹	\$280,000
17	Seminole Basin Wet Retention Pond Water Quality Improvements	Water Quality ¹	\$350,000
18	Dover Ditch Water Quality Improvement Project	Water Quality ¹	\$800,000 (\$160,000 TOJ)
1. All Water Quality projects assumed to be 50% grant funded for financial planning purposes		Total	\$22,096,000



8. Desktop Asset Management Assessment

A desktop asset management exercise was performed to estimate future Renewal and Replacement costs. The desktop assessment included the stormwater utility assets available in the Town’s GIS database, including structures, pipelines, exfiltration trench, and pump stations (based solely on estimated useful life, accounting for age and material, and adjusted based on TOWN reported condition or reduced service life). No field investigation or gathering of field data are included in this task. “Earthen infrastructure” such as swales, retention/detentions ponds, canals, and ditches were excluded from the analysis.

8.1 Asset Characteristics

The Town’s GIS database was evaluated to determine the amount and characteristics of Town owned infrastructure. **Table 8-1** and **Table 8-2**, below, summarize the pipe installation date, lengths, and material -category of Town-owned stormwater linear (pipe) assets.

Table 8-1: Pipe Installation Date

Install Decade	Length (ft)
1960-1969	380
1970-1979	23,920
1980-1989	162,922
1990-1999	114,182
2000-2009	155,542
2010-2019	32,293
2020-Current	NA
NA	6,133
Total	495,000

Table 8-2: Pipe Material

Material Category	Length (ft)
Exfiltration Trench	8,457
Concrete	415,255
DIP	254
Metal	19,736
PVC/HDPE	22,570
NA	28,276
Total	495,000

Table 8-3 and **Table 8-4**, below, summarize the pipe Stormwater structures and pump stations Town-owned stormwater linear (pipe) assets.

Table 8-3: Structure Count

Element	Amount
Catch Basins	3961
Control Structures	78
Manholes	765
End Walls	525

Table 8-4: Pump Station List

Pump Station
Seminole Basin Pump Station
7th Avenue Pump Station

8.2 Asset Remaining Useful Life, and Replacement/Rehabilitation Cost

Remaining useful life (RUL) of an asset is used to project in general when replacement of the asset is required. RUL is calculated by subtracting age of each asset from the anticipated useful life of the asset. The approximate life associated with various materials of construction were used for this calculation and are shown as **Table 8-5**.

Table 8-5: Assumed Useful Life for Materials of Construction

Pipe/Structure Material	Years
Concrete	75
DIP	75
Metal	50
PVC/HDPE	75
Concrete Structures	75

The replacement cost of each asset is also required to project costs for future replacement or rehabilitation. It is assumed that all pipe would either be replaced using RCP pipe, or if rehabilitated would be relined using Cure-in-Place-Pipe (CIPP). **Table 8-6** shows the replacement/rehabilitation costs for each linear asset, and **Table 8-7** shows the assumed costs for structures.

Table 8-6: Assumed Replacement/Rehabilitation Costs for Linear Assets

Diameter (in)	Replacement Cost (2021 \$)	Repair (CIPP) Cost (2021 \$)	Diameter (in)	Replacement Cost (2021 \$)	Repair (CIPP) Cost (2021 \$)
4	\$333	\$44	24	\$760	\$163
6	\$333	\$44	27	\$808	\$188
8	\$333	\$50	30	\$855	\$225
10	\$380	\$58	36	\$903	\$250
12	\$475	\$69	42	\$950	\$281
14	\$475	\$69	48	\$1,045	\$313
15	\$523	\$75	54	\$1,093	\$375
16	\$523	\$75	60	\$1,140	\$438
18	\$570	\$100	66	\$1,188	\$500
20	\$570	\$100	72	\$1,235	\$563
21	\$665	\$138	84	\$1,359	\$619

Table 8-7: Assumed Repair/Replacement Costs for Structures

Element	Replacement Cost (2021 \$)	Repair Cost (2021 \$)
Catch Basins	\$10,000	\$2,000
Control Structures	\$10,000	\$3,000
Manholes	\$10,000	\$2,000
End Walls	\$5,000	\$2,000
Pump Stations - Seminole Basin	\$2,000,000	\$550,000
Pump Station - 7th Avenue	\$20,000,000	\$550,000

8.3 Anticipated Repair and Replacement for Stormwater Pipes and Structures

The remaining useful life and replacement/rehabilitation values for each asset were aggregated into five year intervals through the 25-year planning horizon. The schedule of estimated replacement or rehabilitation cost for various assets near the end of their RUL are shown in **Table 8-8**, and the list of specific linear assets are provided in **Appendix 8**.

Table 8-8: Schedule of Estimated Repair or Replacement Costs for Pipes/Structures

RUL	Length (ft)	Replacement Cost (\$)	(or) Repair Cost (\$)	Length % of Total
0-5	107	\$101,000	\$25,000	0.0%
6-10	2,148	\$2,020,000	\$519,000	0.4%
11-15	7,235	\$6,450,000	\$1,570,000	1.5%
16-20	4,854	\$4,660,000	\$998,000	1.0%
21-25	4,437	\$4,030,000	\$984,000	0.9%
Beyond 25	437,223	\$372,000,000	\$87,500,000	89.6%
No info in GIS	31,908	NA	NA	6.5%

Note that stormwater structures (catch basins, control structures, manholes, endwalls) do not have assigned installation dates in the GIS database. Therefore, the structure installation dates were approximated at the same installation dates as the linear (pipe) assets, and the costs shown in Table 8-8 are inclusive of costs for repair or replacement of stormwater structures.

Both repair and replacement costs are shown. It is recommended to assume replacement costs, unless inspection of the individual assets reveals that they are suitable for CIPP lining or some other method of rehabilitation.

It can be concluded from **Table 8-8**, that there is a modest amount of repair and replacement work required in the next 25 years, when anticipating condition of infrastructure based solely on age and pipe material. RUL's may also be adjusted based on inspection of individual assets. Therefore, it is recommended that the Town prioritize inspections of assets nearing or beyond their RUL using condition assessment methodology. The RUL's can then be adjusted upwards or downwards accordingly. This would likely require the Town to carry out cleaning then CCTV inspections of pipe sections (estimated to be \$5 to \$10 per linear foot depending on pipe diameter and condition).

9. Water Quality Monitoring Program

The purpose of this section is to detail the development of water quality targets and methodology, for implementation of a water quality monitoring program for non-residential properties within the Town. Sites envisioned to be included in the monitoring program include existing and new golf course communities, commercial plazas, and utility plants. Water quality monitoring targets are developed here specifically for total nitrogen (TN), and total phosphorous (TP), as these are the two pollutants of current concern relative to the Loxahatchee River Pollutant Reduction Plan. However, this monitoring plan could be adapted to other pollutants as needed.

9.1 Regulatory Authority

Town authority for regulating discharge of pollutants, and allowing Town inspection and sampling activities, appears to be reasonably well codified in current Town of Jupiter – Code of Ordinances / Subpart A – Administrative Regulations - Chapter 20 – Utilities, ARTICLE VI. - STORMWATER MANAGEMENT SYSTEM, under the following sections:

- Sec. 20-278. – Prohibitions - General
- Sec. 20-279. - Industrial pollutants
- Sec. 20-280. - Stormwater discharge
- Sec. 20-311. - Operation of the stormwater utility

9.2 Determining Post-BMP Discharge Limits for Properties

Runoff concentrations are commonly expressed in terms of an event mean concentration (EMC), where $EMC = \text{pollutant loading} / \text{runoff volume}$. EMCs developed by Harper, H.H. are recommended as the reference values to be used for different land uses. Land uses are categorized by the Florida Land Use and Cover Classification System (FLUCCS). **Table 9-1** shows typical EMC values of TN and TP anticipated prior to receiving treatment from BMPs based on different land uses that the Town may monitor in the future.

Table 9-1: Typical EMC Values of TN and TP Based on Land Use¹

Description of FLUCCS Code	FLUCCS	TN (mg/L)	TP (mg/L)	Applicable Entities
Residential, Medium Density	1200	1.87	0.301	Golf Courses
Commercial and Services	1400	2.20	0.248	Shopping Plazas
Industrial	1500	1.19	0.213	
Transport, Communication & Utilities	8000	1.37	0.167	LRD WWTP and TOJ WTP
Barren Land	7000	1.15	0.055	For Reference

¹ Harper, H. H., 2011, *New Updates to the Florida Runoff Concentration (EMC) Database*. Florida Stormwater Association Annual Meeting; Harper, H. H., 2003, *Evaluation of Alternative Stormwater Regulations for Southwest Florida*. ERD, Inc. Orlando, FL.

Two methods may be considered to adapt the values in **Table 9-1** to allowable EMC discharge values from sites. The Town may consider applying the greater value of the two following methods to enforce post-BMP discharge EMCs:

- Method 1: One approach for enforcing post-BMP discharge limits may be for the Town to apply the expected TN and TP removal efficiency of properties that are monitored based on the actual characteristics of the BMPs on each site. In this case, the FDEP - Statewide Best Management Practice (BMP) Efficiencies for Nonpoint Source Management of Surface Waters, Draft – July 2018 reference document could be used. The anticipated removal efficiencies in that document would be applied to the values shown in **Table 9-1** to reach the expected discharge EMC from the site, where post-BMP discharge limit = (1 – % removal efficiency) x EMC.
- Method 2: Another approach for enforcing post-BMP discharge limits may be for the Town to apply the EMC for Barren Land – FLUCCS 7000 shown in **Table 9-1** as a minimum standard.

9.3 Sampling Plan

It is recommended to collect samples to analyze for the following parameters using currently established Town procedures for sampling, quality control, and chain of custody:

- Total Suspended Solids (TSS) (Method SM 2540D)
- Total Nitrogen (EPA 351.2 + EPA 353.2)
- Total Phosphorus (Method EPA 365.1)

9.3.1 Phased Sampling Approach

To optimize Town resources and limit unnecessary sampling efforts, a phased approach is proposed for a water quality monitoring program.

- **Phase 1 - First-Flush Sampling:** It is possible that many of the monitoring sites are meeting the EMC's post-BMP EMC limits allowed by the methodology discussed in section 9.2. Therefore, the Town may wish to conduct an initial round of screening level sampling events, where only "first-flush" discharges are sampled. The term "first-flush" in this context refers to when stormwater runoff first begins to discharge from the site, following treatment through existing BMPs. The first-flush discharges would be expected to be the most heavily-laden by pollutants. Therefore, if the first-flush discharges are near or below the post-BMP EMC limits, then no further sampling would be merited.
- **Phase 2 - Enhanced EMC Sampling:** If it is determined that first-flush discharges at certain sites are exceeding post-BMP EMC limits, then those certain sites can be focused on for enhanced monitoring. Enhanced monitoring may comprise additional grab samples, or an automatic discrete sampler, collected over the entire duration of site discharge to more accurately determine EMC.

9.3.2 Qualifying Event

The Town should monitor weather ahead of time to prepare for stormwater monitoring events. This is envisioned as follows:

- **Phase 1 – First-Flush Retention:** For Phase 1 – First-Flush Retention, for the purposes of confirming that minimum water quality retention is being met, it is recommended to target precipitation events that are forecasted to be between **0.5 inches but less than 1.0 inch** over a 24-hour period.

The Town may view rainfall forecasts in 6-hour increments through the National Weather Service's Graphical Forecasts display map. The map shows 6-hour increments of various forecast statistics, from current time to three days ahead of time. This tool can be used to determine likelihood and amount of rainfall forecasted. The Town can use this method to determine likelihood and quantity of rain forecasted. Actual precipitation can be measured from Town-monitored rain gauges. **Figure 9-1** shows a screenshot of the tool for the Town of Jupiter. The website address for the National Weather Service's Graphical Forecasts display map is provided here: <https://digital.weather.gov/>

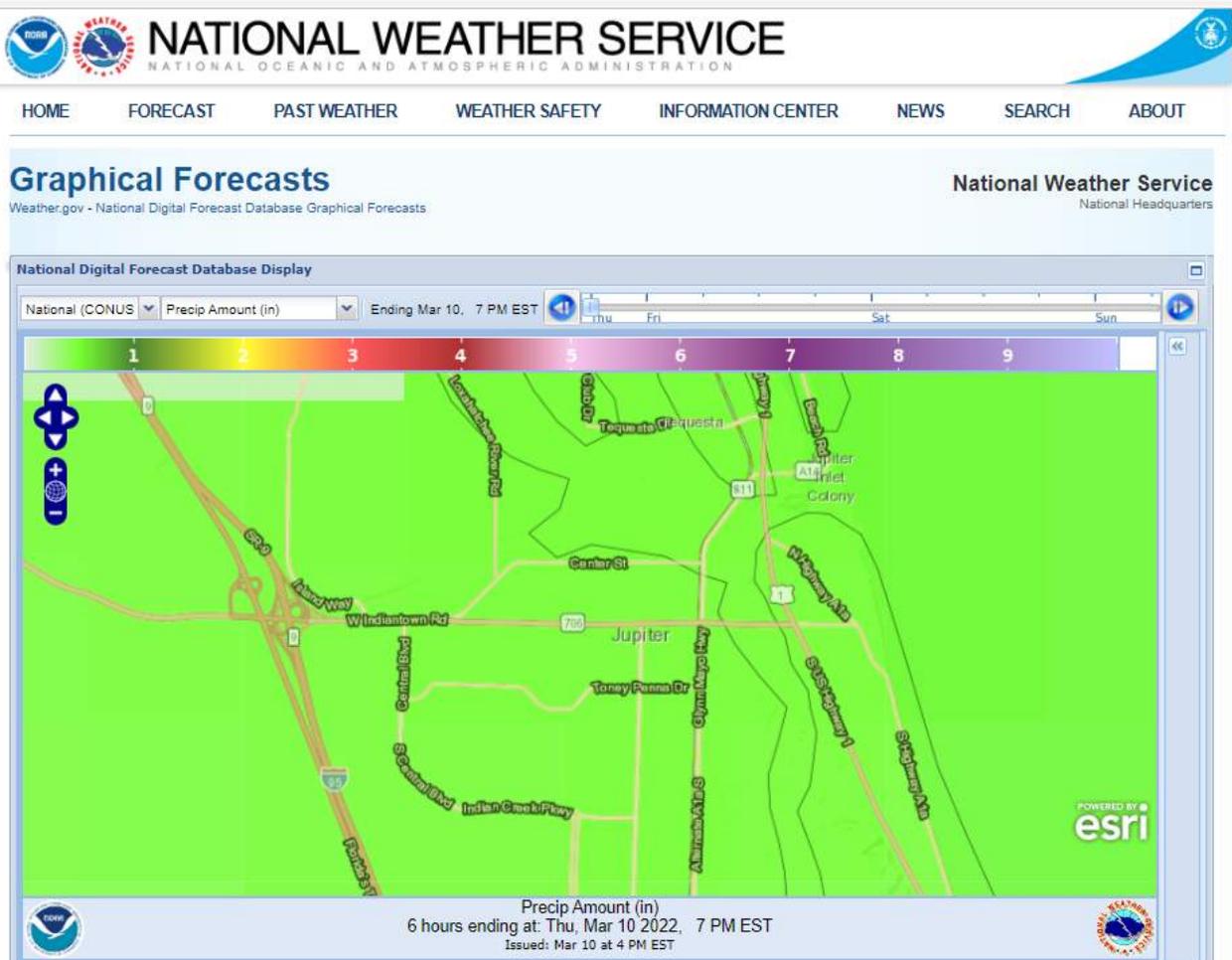


Figure 9-1: Screenshot of National Weather Service Graphical Forecasts Map Interface

9.3.3 Grab Sample Procedure

The frequency and timing of samples should be as follows:

- For storm water discharges, the initial grab sample should be obtained during the first 30 minutes of a discharge. If using a stormwater sampler device (discussed later), the first-flush would be collected automatically upon first discharge.
- A minimum of 72 hours must have occurred between the start of the current qualifying rain event and the end of the previous one (no more than 1/10 inch should occur).
- The precise sampling time should be recorded on a chain of custody sheet and transported to the lab with the samples.

Phase 1 - First-Flush Sampling: For Phase 1 – First-Flush Sampling event, only a first-flush sample is proposed. These can typically be collected using the stormwater sampler device (discussed later).

Phase 2 - Enhanced EMC Sampling: For Phase 2 – Enhanced EMC Sampling event, multiple grab samples are proposed. It is possible that a limited number of sites would be eligible for a Phase 2 event. Because it is not possible to determine when a site will stop discharging, it is recommended to collect grab samples either every half hour or hourly, until the discharge ceases. Then the Town may only analyze the first, middle, and last samples for determining pollutant loading. The runoff volume could be estimated based on best available rain gauge data.

A summary of the monitoring criteria is shown in **Table 9-2**.

Table 9-2: Summary of Watershed Wet-Weather Monitoring Criteria

Monitoring Criteria Category	Criteria
Qualifying storm event depth ¹	Forecasted to be >0.5", <1.0"
Qualifying storm event inter-event period	A minimum of 72 hours between events
Number of events per year	Minimum five (5)
Sampling locations	To Be Determined
Analytes	TSS, TP, TN

¹Qualifying storm events to be adjusted on a site-by-site basis based on permitted storage, and actual observed discharges observed in the field correlated to storm events of certain depths

9.3.4 Storm Water First-Flush Sampler

A storm water first-flush sampler may be considered as a convenient and affordable device for collecting storm water grab samples. The sample bottle placed in a protective mounting tube and left in place and will collect a one liter grab sample of first flush storm water runoff where positioned. The sampler collects as soon as water starts flowing over the device, satisfying the requirement to collect the sample during the first 30 minutes of outfall flow. A ball valve closes off the sample chamber once the bottle is full. The mounting kit is equipped with a screen for collecting debris for visual observation. **Figure 9-2** demonstrates an example of mounting a first-flush sampler.

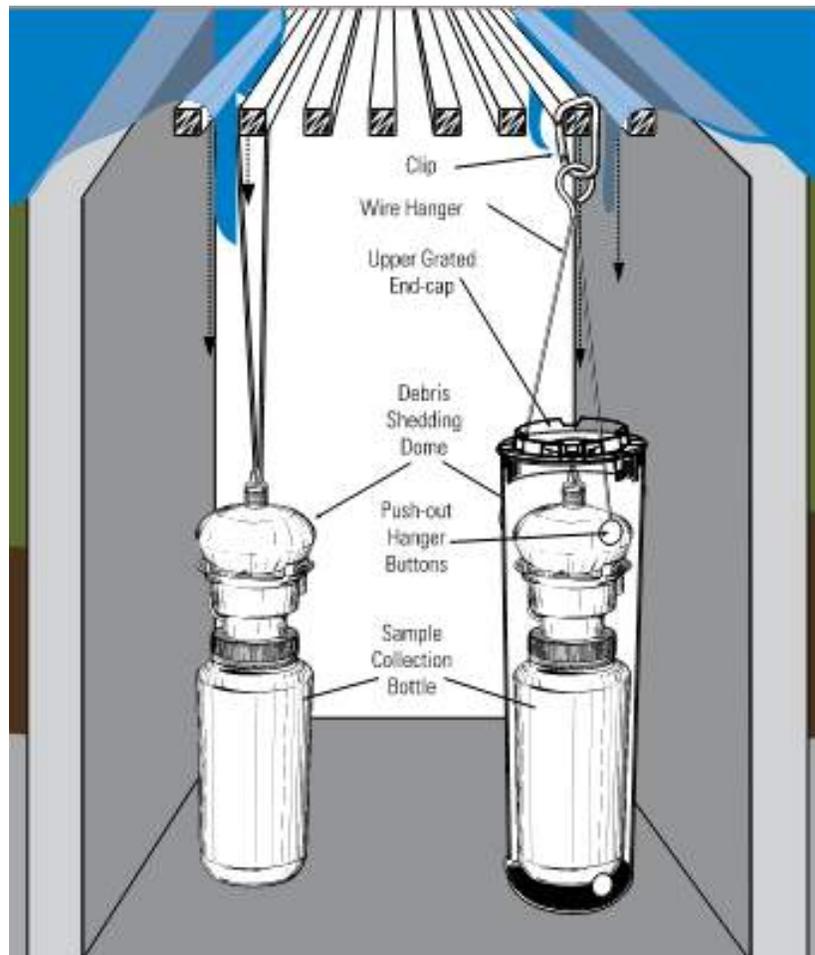


Figure 9-2: First-Flush Stormwater Sampler (Thermo Scientific-Nalgene)

10. Financial Forecast and Recommendations

This section of the Stormwater Master Plan provides a discussion of the financial forecast to i) present the basis for the funding of the capital program as identified in the plan, including the adequacy of the availability fees; ii) evaluate trends in the expenditure requirements to be funded from rates (rate sufficiency and potential changes in rate levels to fund such expenditures); and iii) estimate the projected financial position of the Stormwater Utility based on the forecast of assumptions regarding growth, inflation, and other factors and other observations for consideration by the Town. The overall purpose of this analysis is to provide the Town additional information for strategic and business planning purposes as it evaluates the capital funding and stormwater service plans as well as certain risks to the utility, which may affect the projections, and which need to be monitored by the Town in the future. This forecast is intended to be dynamic and will be adjusted yearly as part of the annual budget and capital planning process currently employed by the Town as part of the overall management of the Stormwater Utility.

10.1 Capital Expenditure Overview

The capital plan as identified in the Stormwater Master Plan, which also includes projects that have previously been approved by the Council in prior periods, is summarized in **Table 10.1**. The capital plan includes the following expenditures by functional type:

Table 10-1: Summary of Stormwater Capital Projects – Fiscal Years 2022 to 2046 (\$000s)

Summary of Capital Expenditures ¹	2022 to 2026	2027 to 2031	2032 to 2036	2037 to 2041	2042 to 2046	Totals	2022 to 2046
Renewals, Replacements, and Rehabilitation Projects	\$12,731	\$8,342	\$5,251	\$5,546	\$7,701	\$39,571	70.44%
General Operating (Budgetary) Projects	1,275	907	1,051	1,219	1,413	5,865	10.44%
Contributions and Grant Projects	4,306	6,433	---	---	---	10,739	19.12%
Service Availability Fees	---	---	---	---	---	---	0.00%
Total Capital Expenditures	\$18,311	\$15,682	\$6,302	\$6,765	\$9,114	\$56,175	100.00%

1. Amounts derived from Table 10.2 on following page.

As can be seen above, all of the identified capital expenditures identified in the Stormwater Master Plan are for renewals, replacements, rehabilitation, improvements, and upgrades (“renewals and replacements”) of the stormwater utility enterprise (the “Stormwater Utility”) (there are no projects that are considered as being “expansion-related”). This would be expected since the majority of the Stormwater Utility service area encompasses the Town limits and is essentially at a built-out condition from both a service availability and a facility need standpoint. This is further amplified by the fact that during the next 20 years, many of the installed assets are expected to have reached their average service lives and will begin to need replacement or upgrades to continue to provide ongoing stormwater management service. It should be noted that the capital costs include an allowance for inflation at 3.0% annually beginning in Fiscal Year 2023 (i.e., above the estimates assumed for the Fiscal Year 2022, which have been adjusted to reflect current installed / construction costs) to account for the then future cost of the capital needs placed upon the

Stormwater Utility. The 3.0% factor is representative of the average annual increase in construction costs as reported by the Engineering News Record, which tracks such changes in cost, over the past 25 years. The increased capital needs allocable to the existing customers and will need to be funded primarily from Stormwater Utility operations (rates) since all the capital costs are classified as renewals and replacements for infrastructure replacement, upgrades and betterments. This will result in the need for the recognition of continued annual transfers to the Renewal and Replacement Fund (“R&R Fund”) and other capital reserves, which will be critical to the ability to fund the capital improvements while limiting the need to issue additional bonds / debt above amounts already identified in the capital financing plan and as considered fiscally prudent for the Stormwater Utility. A detailed breakdown of proposed projects is provide in **Table 10-2**.

Table 10-2: Summary of Capital Improvement Plan – Fiscal Years 2022 to 2046

Capital Project Description	Project Type	Fiscal Year Planning Period					Total Planning Period
		2022 to 2026	2027 to 2031	2032 to 2036	2037 to 2041	2042 to 2046	
Town Road Outfall R&R	RR – Contributions / Grants	\$233,477	\$0	\$0	\$0	\$0	\$233,477
Urban Stormwater Management System Rehab	RR – Contributions / Grants	220,000	---	---	---	---	\$220,000
Private Stormwater Improvement Grants	Operating	685,408	452,025	524,022	607,486	704,241	\$2,973,182
Stormwater System Rehabilitation	RR – Contributions / Grants	1,696,667	827,147	958,888	1,111,616	1,288,667	\$5,882,985
-----Stormwater System Rehabilitation	RR – Contributions / Grants	480,229	---	---	---	---	\$480,229
SW Management System Redevelopment Grants	Operating	554,265	454,931	527,389	611,389	708,766	\$2,856,740
Utility Billing Services & Enterprise Asset Mgt System	RR – Contributions / Grants	---	---	26,878	---	36,122	\$63,000
Asset Maintenance Program	RR – Contributions / Grants	3,021,766	2,117,383	4,265,103	3,805,657	6,376,076	\$19,585,985
TMDL/NNC Regulatory Response Modeling	RR – Contributions / Grants	49,639	---	---	---	---	\$49,639
Cinquez Park Open Space (Eng)	Operating	35,069	---	---	---	---	\$35,069
Seminole Ave Stormwater Basin Improvements (Juno St Pump Station)	RR – Contributions / Grants	646,165	---	---	---	---	\$646,165
Seminole Ave Stormwater Basin Improvements (Juno St Pump Station)	ARPA Funded Projects	3,795,479	---	---	---	---	\$3,795,479
Old Jupiter Beach Rd/Eganfuskee Rd Drainage Improvements	RR – Contributions / Grants	627,463	---	---	---	---	\$627,463
Pine Gardens North Infrastructure Improvements	RR – Contributions / Grants	1,506,260	---	---	---	---	\$1,506,260
Pine Gardens North Infrastructure Improvements	Contributions and Grant Projects	243,264	---	---	---	---	\$243,264
Fisherman's Landing Drainage Improvements	RR – Contributions / Grants	415,873	---	---	---	---	\$415,873

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Capital Project Description	Project Type	2022 to 2026	2027 to 2031	2032 to 2036	2037 to 2041	2042 to 2046	Planning Period
Curb Replacements in the Hamptons	RR – Contributions / Grants	17,662	---	---	---	---	\$17,662
Jupiter River Estates Canal Vegetation Trimming	RR – Contributions / Grants	665,000	---	---	---	---	\$665,000
Dolphin Dr Drainage Improvements	RR – Contributions / Grants	401,020	---	---	---	---	\$401,020
North A1A Drainage Improvements	RR – Contributions / Grants	75,000	---	---	---	---	\$75,000
New Haven/The Island Curb Replacements	RR – Contributions / Grants	93,209	---	---	---	---	\$93,209
Bush Road Drainage Improvements	RR – Contributions / Grants	185,127	---	---	---	---	\$185,127
Bush Road Drainage Improvements	N/A	100,255	---	---	---	---	\$100,255
Pennock Industrial Park Drainage Improvements	RR – Contributions / Grants	1,142,913	---	---	---	---	\$1,142,913
Pennock Industrial Park Drainage Improvements	N/A	75,000	---	---	---	---	\$75,000
Cypress Drive Drainage Improvements	RR – Contributions / Grants	237,642	---	---	---	---	\$237,642
Curb Replacements	RR – Contributions / Grants	490,920	---	---	---	---	\$490,920
N Pennock Ln Swale Improvements	RR – Contributions / Grants	47,000	---	---	---	---	\$47,000
Town Hall - Daniels Way BMPs Water Quality	RR– Contributions/ Grants	91,789	---	---	---	---	\$91,789
Town Hall - Daniels Way BMPs Water Quality Improvements	Contributions and Grant Projects	91,789	---	---	---	---	\$91,789
Dover Ditch Water Quality Improvements	RR – Contributions / Grants	174,836	---	---	---	---	\$174,836
Eastview Manor Drainage Improvements	RR – Contributions / Grants	210,988	---	---	---	---	\$210,988
Seminole Basin Pond - Bold and Gold	RR – Contributions / Grants	---	208,959	---	---	---	\$208,959
Seminole Basin Pond - Bold and Gold	Contributions and Grant Projects	---	208,959	---	---	---	\$208,959
Center St to Jones and Sims - Hydrodynamic Separators	RR – Contributions / Grants	---	172,182	---	---	---	\$172,182
Center St to Jones and Sims - Hydrodynamic Separators	Contributions and Grant Projects	---	172,182	---	---	---	\$172,182
Pine Gardens N/Seminole Basin Interconnect	RR – Contributions / Grants	---	2,039,500	---	---	---	\$2,039,500
Loxahatchee Backwaters Natural Area	RR – Contributions / Grants	---	2,017,331	---	---	---	\$2,017,331
Loxahatchee Backwaters Natural Area	Contributions and Grant Projects	---	2,017,331	---	---	---	\$2,017,331

Capital Project Description	Project Type	2022 to 2026	2027 to 2031	2032 to 2036	2037 to 2041	2042 to 2046	Planning Period
Loxahatchee Backwaters Natural Area	Contributions and Grant Projects	---	4,034,663	---	---	---	\$4,034,663
Elsa & Paulina Pump Outfit	RR – Contributions / Grants	---	959,556	---	---	---	\$959,556
River Road (Berm W & S Sides Alma's Preserve)	RR – Contributions / Grants	---	---	---	629,045	---	\$629,045
Total Projects		\$18,311,174	\$15,682,149	\$6,302,280	\$6,765,193	\$9,113,872	\$56,174,668
Percent of Total		33%	28%	11%	12%	16%	100.00%

The capital improvement program forecast recognizes that the level of the expenditure needs will fluctuate over time (generally an increasing trend) as assets reach their useful service life (many of the primary Stormwater Utility assets are relatively new based on the type of capital facilities [lines] located within the Stormwater Utility service area [Town limits], being in service less than 30 years). The primary projects recognized during the financial forecast are shown in **Table 10-3**.

Table 10-3: Summary of Primary Stormwater Utility Capital Projects (\$000s)

Project Description	Amount ¹ (Rounded)	Fiscal Years of Expenditure
Seminole Avenue Stormwater Basin Improvements	\$4,442	2022
Pine Gardens North Infrastructure Improvements	\$1,750	2022
Asset Maintenance Program (Various Improvements)	\$19,586	Annually for Period
Stormwater System Rehabilitation Projects	\$6,363	Annually for Period
Pennock Industrial Park Drainage Improvements	\$1,218	2023
Pine Gardens North / Seminole Basin Interconnect	\$2,040	2029
Loxahatchee Backwaters Natural Area	\$8,069	2029

1. Amounts derived from Table 10.2.

10.2 Long-Term Cash Flow Projections and Financial Position

To evaluate the funding of the capital program and the financial position of the Stormwater Utility, a detailed financial forecast was prepared. Included in **Appendix 10** at the end of this section are financial projections for the Stormwater Utility. The analysis was for the current budget year 2022 and an additional 24 year period ending 2046 (the “Forecast Period”) and includes annual projections of Gross Revenues, Operating Expenses, payment of the debt service requirement, and the funding of the capital expenditures, which is a primary driver relative to system costs and the need for future rate adjustments. Projected revenue includes those from the application of the stormwater fees, other operating revenues earned by the Stormwater Utility, interest income on the available fund balances maintained by the Town, and other miscellaneous revenues derived from Stormwater Utility operations. Additionally, projections of service availability fees were also recognized since this represents a financial resource to the Stormwater Utility and are used to fund expansion-related capital projects within Inlet Village (since these fees represent

contributions from the Village although according to the Town it is currently unlikely that development will occur in the Village for the purposes of the financial forecast).

The development of the financial forecast required certain assumptions with respect to conditions, which may occur in the future. While we believe the assumptions are reasonable for the preparation of the financial forecast, they are dependent upon future events and actual conditions may differ from those assumed. The following is a summary of the primary assumptions recognized in the development of the financial forecast.

- A. Projected fee revenue for the Stormwater Utility were based on growth projections in customers / equivalent residential dwelling units (“ERUs”), which recognizes the estimated remaining equivalent residential developable units / properties that are considered available for connection as identified in the master plan. The customer forecast was based on historical growth trends and the recognition that the remaining units / properties in the stormwater service area will connect (develop) over time and become active accounts of the stormwater system. The customer forecast recognizes a compound growth rate until the estimated build-out year of 2042 at 0.10% (assumes connections from Inlet Village Area after build-out of Town in 2037) with a higher growth rate experienced during the first ten (10) years of the development period (0.15%) and a lower growth rate as the Town approaches build-out in the last ten (10) years of the development period (0.05%).

Additionally, the projected revenue included in the financial forecast recognizes the following rate adjustments based on discussions with the Town:

- i. An annual 2.5% rate index applied each October 1 beginning in Fiscal Year 2023 with such index being generally consistent with Town Council action over the past several years (although the index applied in 2022 was only 1.1% and the Utility has experienced, and is experiencing, high inflationary levels, which are impacting the cost of operations for the Utility). The continuation of the rate index application should be continued throughout the Forecast Period since all future revenue growth will come from the application of the index because new customer growth is marginal (essentially no growth) and to maintain operating margins and to continuously fund ongoing renewals and replacements to depreciable plant in service.
 - ii. In order to meet future expenditure needs, to recapture the effects of inflation (especially for Fiscal Years 2021 and 2022, which are experiencing high inflation levels as mentioned above) and recognizing reductions in cash flow due to projected declining margins, additional annual fixed rate increases of 4.5% for the Fiscal Years 2023 through 2026 were assumed in order to meet cash flow needs and operating margins and recapture the historical increases in the cost of service (from both an operating perspective and a capital or infrastructure perspective).
- B. Interest income has been estimated on balances in certain funds created by the Town, including balances in the Operating Fund (operating reserves) and the Renewal and Replacement (capital) Fund. An assumed average interest earnings rate of approximately 0.10% in Fiscal Year 2024, which was assumed to increase to 1.00% by Fiscal Year 2045, was recognized and applied to the average account balances projected during the Forecast Period. The low rates of interest were continued based on recent trends and the recognition that interest earnings are somewhat speculative and that the primary revenue and source of expenditure funding should be from annual rate revenues, a recurring and stable funding source.

- C. Beginning in 2010, the Town initiated the Infrastructure Equity Program to develop an equitable process to assume the ownership and maintenance of roadways and connected drainage systems from private owner associations and communities. In general, the Town established that the transfer of responsibility for the stormwater management infrastructure would be acceptable provided that extraordinary maintenance neglect was addressed in addition to the community providing the Town funding for facility renewals and replacements relative to the then current level of depreciation. There were approximately 45 communities that were identified that may participate in the transfer process; approximately 13 communities have been either accepted into the program or have applied / initiated the transfer process and 33 communities have expressed an interest or have the potential to enter the program. Beginning in Fiscal Year 2015, the renewal and replacement contributions provided by the communities that opted into the transfer program to fund the accumulated renewal and replacement liability were redirected to the Town's General Fund and are no longer considered as a financial resource of the Stormwater Utility. The financial forecast assumes contributions from those private communities that had been accepted into the program prior to the Fiscal Year 2015; the remainder of the liability payments was assumed to be a resource transferred to the General Fund with only a minimal future benefit to the Stormwater Utility. The total estimated payments to be received from the communities for the Forecast Period (all assumed to be collected by 2024 or in the first half of the Forecast Period) is estimated to receive only \$18,585. This prior change in policy did have a financial impact on the utility and was a supporting reason why Stormwater Utility rates were increased above inflation in prior years. To potentially limit rate adjustments over the Forecast Period and recognizing that the payments relate to stormwater capital recovery, the redirection of these payments back to the Stormwater Utility would be recommended and should be reconsidered by the Town.
- D. The Town will receive service availability fees from Inlet Village in accordance with the provisions of Ordinance No. 26 10 adopted by the Town Council on May 4, 2010 (the "Inlet Village Ordinance"), which related to the funding of stormwater improvements in the respective service area. Based on the terms of the Inlet Village Ordinance, the Town shall receive system availability charges for the construction of stormwater management facilities within the Inlet Village CRA limits; all fees received by the Town shall be dedicated to improvements within the Village CRA limits. Service availability fees from Inlet Village were based on projected development in the Village CRA limits, recent trends in availability fee collection and the allocated capital expenditures in the service area. It was assumed, based on discussions with the Town, that the Stormwater Utility would receive approximately \$38,700 annually (beginning in Fiscal Year 2028) in annual capital contributions through Fiscal Year 2046.
- E. Projected operating expenses are based on various factors such as projected expense increases due to inflation and projected changes in expenses associated with anticipated changes in operations. The escalation was based on historical trends, projections of inflation prepared by the Congressional Budget Office, and other factors. The escalation rates ranged from 2.5% (general inflation) to 5.0% for repairs and maintenance expenses. Salaries and Benefits were increased by approximately 4.0% through 2023 and then reflected a declining trend in adjustment due to employees capping out in terms of salary adjustments, changes resulting from changes in the work force, and other factors (resulting in an average annual increase of approximately 3.0% beginning with Fiscal Year 2033).

During the Forecast Period, the change in operating expenses averaged approximately 4.25% annually since a major driver of the expenses for the Stormwater Utility is associated with personnel and repairs and maintenance, which accounts for approximately 71% percent of the total operating expenses and these costs are required (e.g., set by regulation, uncontrollable as to cost, etc.) for ongoing utility operations and service, as demonstrated in **Figure 10-1**.

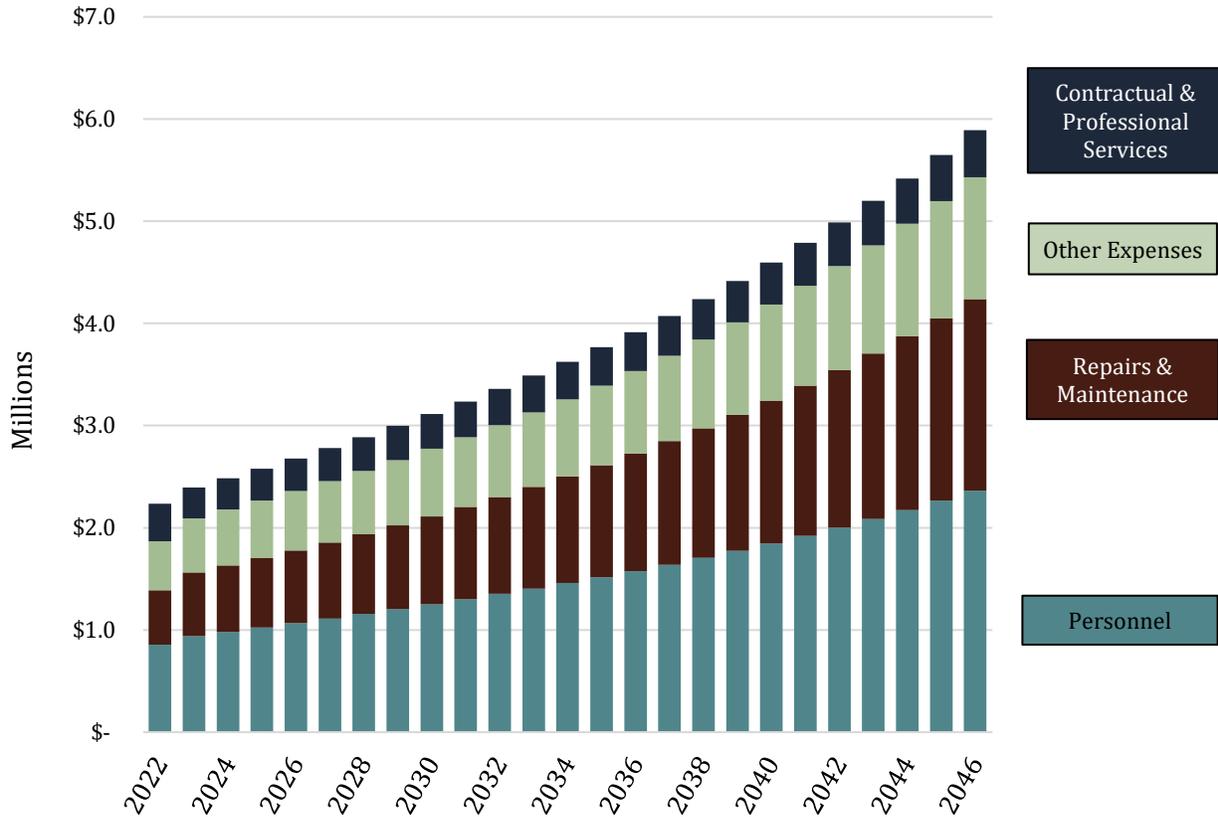


Figure 10-1: Operating Expense Summary

- F. The forecast of operating expenses includes a cost allocation payment to the General Fund to account for expenses accounted for in the General Fund that are allocable to the Stormwater Utility. The budgeted payment for the Fiscal Year 2022 is \$181,439 and the anticipated amount for Fiscal Year 2023 is \$198,205; this payment was assumed to increase by 5.0% annually during the Forecast Period.
- G. Although considered a System operating expense for financial reporting purposes, depreciation and amortization expenses have not been recognized as an operating expense since such amounts represent non-cash expenses and the fees for service are based on a cash-flow / funding needs basis. In lieu of depreciation and amortization expenses, the financial forecast recognizes the annual funding of the R&R Fund and the payment of principal on loans secured to fund capital expenditures of the Stormwater Utility.

- H. In 2020, the Town provided an internal loan to the Stormwater enterprise fund from the Water enterprise fund in the principal amount of \$5,700,000 to finance drainage facility improvements for the Stormwater Utility. This internal loan provided a benefit to the Stormwater Utility in that the financing was made at a favorable interest rate (also no issuance costs were incurred that would have increased the overall amount needed to be borrowed), which reduced the costs to the Stormwater Utility customers, but which also resulted in interest earnings to the Water System that were higher than what could generally be earned on its investments, which benefited the water customers due to higher system revenues. As of October 1, 2021, a total principal amount of \$5,047,536 is estimated to be outstanding (the “Outstanding Loan”). The annual payment made to the Water enterprise fund from the revenues of the Stormwater Utility is on level basis (i.e., annual constant payment) in the amount of \$453,623 with principal and interest payments being paid on or by September 30th of each year during the repayment term. The loan was for a term of 15 years and matures on September 30, 2034.

Based on the financial forecast and capital plan as presented in this section, no additional debt (whether internally funded from available funds of the Water enterprise fund or the Town’s General Fund or revenue-based debt obtained externally through traditional means) has been recognized at this time.

- I. The capital program as identified on Table 10.2 was funded based on: i) the nature of the project (e.g., renewal and replacement); ii) the availability of funds to the Town for project funding; iii) the timing of the capital projects; and iv) the policy to maintain an adequate cash balance in the operating and capital funding reserves. With respect to the operating reserves (working capital) and to maintain an “AAA” credit rating (the Stormwater Utility has not been rated by the credit rating agencies; general policy is to be consistent with the Water System credit rating), a minimum liquidity fund balance equal to 180 days of operating expenses is recommended and was recognized. For the R&R Fund, the maintenance of a minimum ending balance of approximately \$910,000 (adjusted annually for inflation), which is equal to approximately the annual depreciation expense at the beginning of the Forecast Period is recommended and was targeted. When one looks at the funds collectively, it is recommended that a total reserve balance recognizing between \$3 million and \$4 million is prudent and is recommended.

Table 10-4 summarizes the capital program funding plan recognized in the financial forecast by five- (5) year forecast period increments:

Table 10-4: Capital Program – Funding Plan

Forecast Period – Capital Expenditures	Total Capital Projects [1]	Recognized Funding Plan ¹			
		Renewal & Replacement Fund	Service Availability Fees	Operating Fund and Contributions	External Funds – Bonds
FY 2022 – FY 2026	\$18,311,174	\$12,730,645	\$0	\$5,580,529	\$0
FY 2027 – FY 2031	\$15,682,149	\$8,342,058	\$0	\$7,340,091	0
FY 2032 – FY 2036	\$6,302,280	\$5,250,869	\$0	\$1,051,411	0
FY 2037 – FY 2041	\$6,765,193	\$5,546,318	\$0	\$1,218,875	0
FY 2042 – FY 2046	\$9,113,872	\$7,700,865	\$0	\$1,413,007	0
Total Forecast Period	\$56,174,668	\$39,570,755	\$0	\$16,603,913	\$0
Percent of Total CIP	100.0%	70.44%	0.00%	29.56%	0.00%

1. Amounts shown based on information presented on Table 6.2.

As can be seen above, approximately \$40 Million or 70% of the assumed capital expenditure program will be funded from the R&R Fund (derived from deposits from annual operations and not including contributed capital). There are no expansion-related projects anticipated for the extension of stormwater service during the Forecast Period based on current service and regulatory requirements, which also indicates that the system is essentially built-out from an infrastructure standpoint.

- J. A significant component associated with the funding of the capital program is the continued deposits to the R&R Fund, the annual funding that is critical to the financial health of the Stormwater Utility. For the Fiscal Year 2022 (first year of Forecast Period), the financial plan recognizes an initial base deposit to the fund of approximately \$675,879 and then increased annually thereafter for construction cost increase allowances of 3.0%. This base level of R&R Fund deposits was previously presented to the Town Council as part of the R&R Fund evaluation during Fiscal Year 2011, which was then established at \$500,000 based on the installed assets and service lives for the utility; the increase in the deposit is due primarily to the application of the capital inflation index over time coupled with the need to fund the capital program on a pay-as-you-go basis to the extent possible. In addition to the base deposit to the R&R Fund, additional deposits to the fund have been recognized based on the capital needs of the Stormwater Utility as shown on Table 10.2. Specifically, the capital funding plan recognizes an additional transfer to the R&R Fund of \$500,000 annually through Fiscal Year 2032 with the remainder of the Forecast Period recognizing additional deposits of \$250,000 annually.

It is appropriate to fund the R&R Fund annually from operations since this matches the use of the stormwater management facilities by the existing customer base and the need to replace such facilities at the end of the useful service life of such assets (a depreciation expense equivalent). It should be noted that the annual funding of the R&R Fund in relationship to annual depreciation expense has become a key indicator with the credit rating agencies since the more “equity-based”

capital funding a utility has, the less risk on the utility in terms of funding capital improvements coupled with the need to issue or secure additional debt. We would recommend that the Town consider continuing this level of R&R funding in the future, which we think is prudent and promotes the long-term stability of rates to the Town’s customers. This capital funding level is further discussed below regarding the review of certain key financial ratios associated with the evaluation of the projected financial position of the Stormwater Utility.

During the Forecast Period and predicated on the rate assumptions recognized in the development of the financial plan, it is projected that the Stormwater Utility will not need to secure or issue debt to finance a portion of the capital program.

Based on the primary assumptions discussed above, **Figure 10-2** illustrates the capital appropriation forecast and corresponding funding sources for the Stormwater Utility for the Forecast Period:

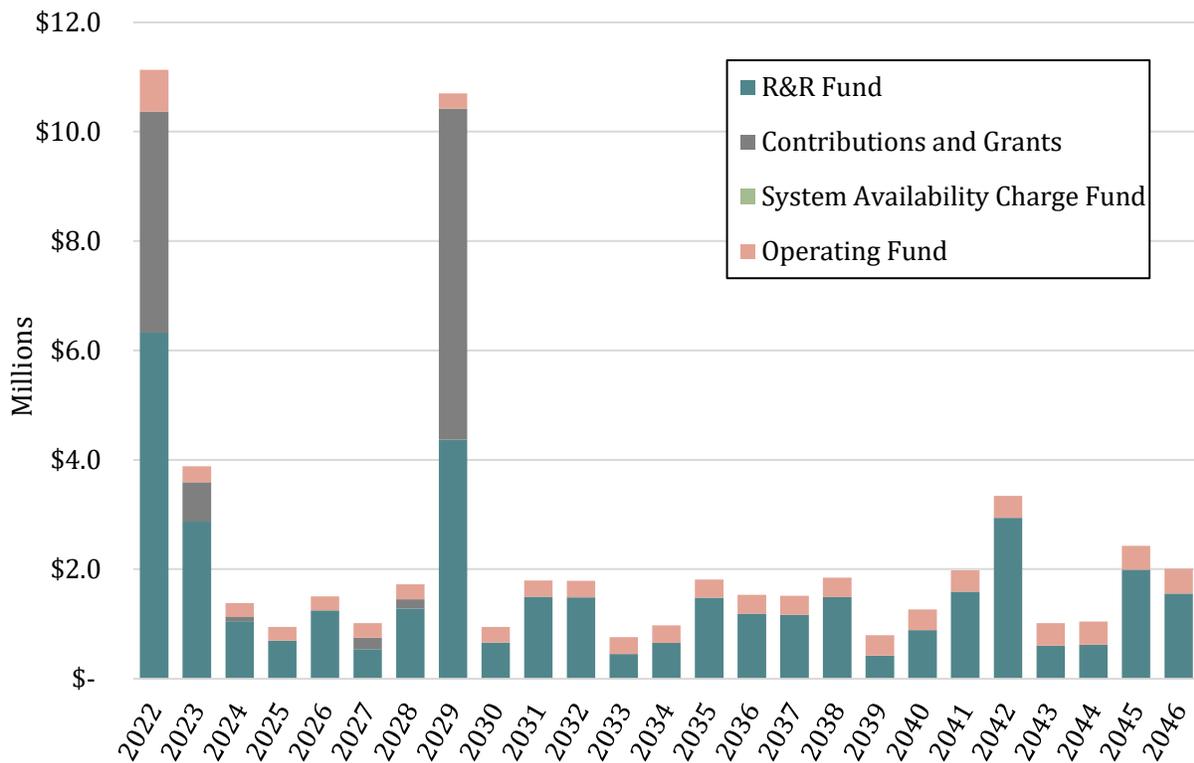


Figure 10-2: Total System CIP Requirements by Funding Source

As can be seen above, the capital program varies from year to year primarily due to when assets reach their useful service life and must be replaced. As can be seen above, there is a significant capital expenditure requirement identified for the Fiscal Years 2022 and 2029 and that is a primary reason for the recommendation to implement the additional fixed rate adjustments in the beginning of the Forecast Period as previously discussed.

Based on the assumptions discussed above regarding the funding requirements of the Stormwater Utility and as previously mentioned, the forecast assumes the need for immediate rate adjustments above an annual allowance for indexing. This is primarily due to the need to fund the identified capital needs of the utility and recapture the increased effects of inflation on the cost of providing service, which was not anticipated. **Figure 10-3** summarizes the projected revenue compared to the total estimated revenue requirements / expenditure funding needs for the Forecast Period as reflected in the financial forecast (with emphasis being placed on the near-term needs of the utility).

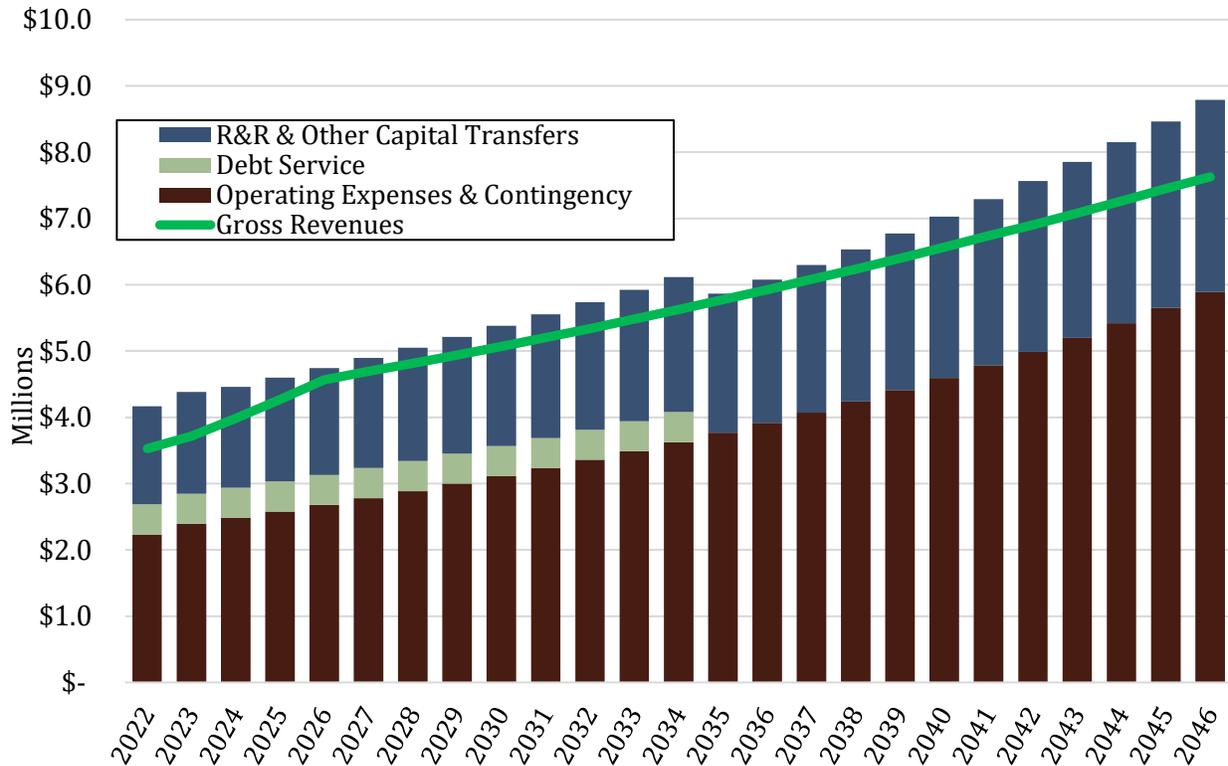


Figure 10-3: Revenue Sufficiency

In the development of the financial forecast, a projection of certain other financial ratios was developed to evaluate the projected financial position of the Stormwater Utility. The analysis includes a series of charts and figures prepared to provide the Town with a visual representation of the financial and statistical trends in the selected financial ratios or benchmarks, which are considered as critical ratios by the credit rating agencies, anticipated for the Stormwater System over the Forecast Period. The performance ratios discussed below considered the credit rating rationale or findings identified by Fitch Ratings with respect to their review of the water utility credit for the Town, which recognized the following:

- Strong Financial Performance (favorable “all-in” debt service coverage);
- Manageable debt burden (no near-term borrowing plans were also identified);
- Capital plan maintains the System’s prudent practice of substantial investment in R&R Funds to upgrade and modernize the stormwater system (results in no future additional debt needs);

- Favorable liquidity position (especially as it relates to the funding of the capital plan);
- Rates are competitive (low) relative to regional utilities; and
- Strong financial management policies and stewardship.

The key rating driver identified by Fitch Ratings and S&P in their reports was “sustained financial performance at current high levels” and is the key business principle relative to the financial evaluation included herein. The following is a brief description of other financial ratios and financial results evaluated for the Town’s consideration based on the primary assumptions mentioned above.

10.2.1 Debt Service Coverage Ratio

An important component in the development of a financial forecast is the determination of the ability of the monthly rates to pay the annual loan or debt service payments allocable to a utility; the higher this ability (ratio) to meet the payments, generally the stronger the financial credit will be. As previously discussed, after the Fiscal Year 2034, it is currently anticipated that there will be no outstanding debt allocated to the Stormwater Utility; this will provide future leveraging capability to fund the ongoing capital improvement needs of the utility. To fund the future capital needs in prior years, the Stormwater Utility secured a \$5.70 million inter-fund loan from the Water Utility in Fiscal Year 2020. It should be noted that even with this outstanding debt, the projected amount of debt liability for the Stormwater Utility is low; representing approximately 12% of the net plant in service for the utility (reported as of September 30, 2021). To the extent that changes in regulation or unknown major capital expenditures are further required during the Forecast Period, this ratio could become more critical to the Town.

Although the debt service coverage ratio is not a critical ratio for the Stormwater Utility at this time (since no debt is outstanding that is being rated by the credit rating agencies), it is a key ratio considered by credit rating agencies and has been presented for informational purposes. The debt coverage ratio is calculated by dividing the annual net revenue (gross revenue less operating expenses) without system availability charges by the annual debt service payment for each year of the calculation and illustrates the financial margin (ability) of Stormwater Utility revenues to meet current total debt service payments (the higher the percent, the stronger the ratio). The Town’s anticipated Net Revenue, assuming that the Town continues to index the stormwater rates annually (assumed at 2.5% per year) and increases the rates for the identified additional fixed rate adjustments (i.e., 4.5% in Fiscal Years 2023 through 2026) for the Forecast Period as recognized in the financial plan will result in a favorable debt coverage ratio as shown on **Figure 10-4**.

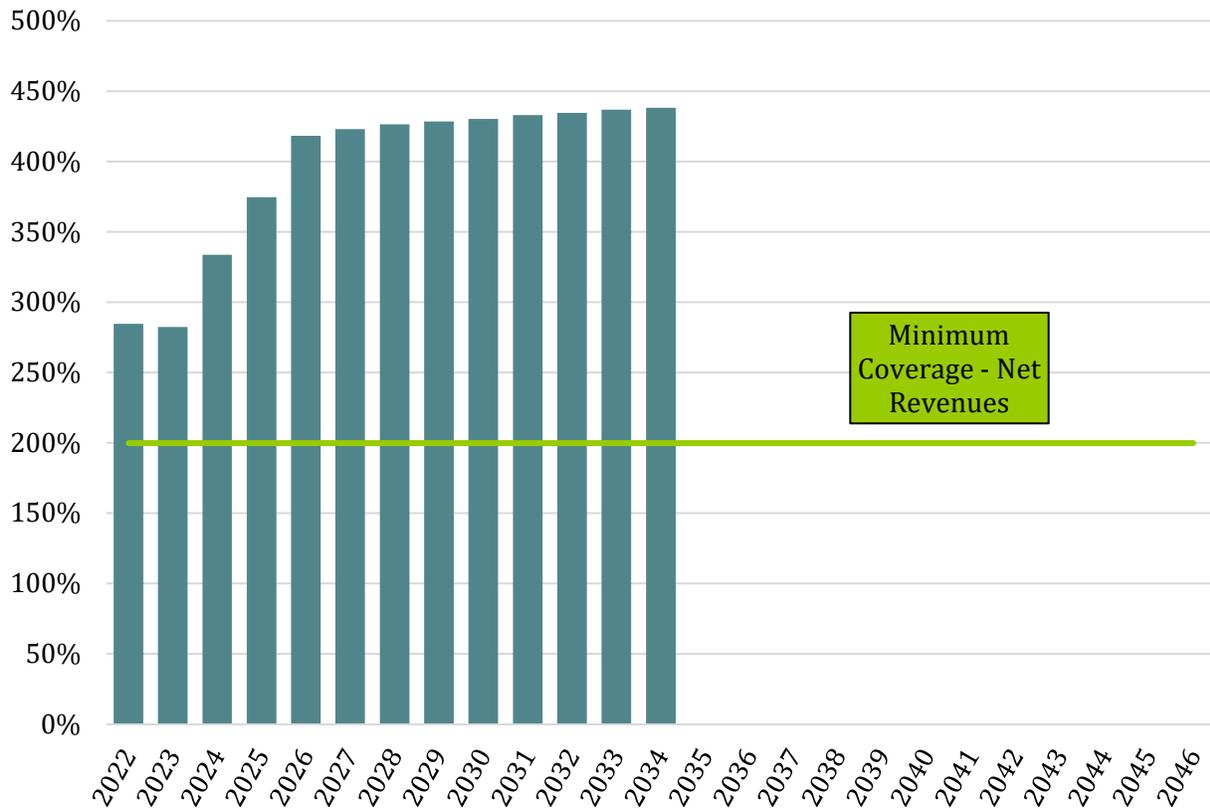


Figure 10-4: All-in Debt Coverage

As can be seen above, the debt coverage ratio is anticipated to be favorable (increasing) during the term that the inter-fund loan is outstanding. The primary reason for the favorable debt coverage ratio is due to: i) having a constant debt service payment that is low when compared to the net plant in service and no increase in debt liability during the Forecast Period is assumed coupled with ii) having a favorable capital re-investment (R&R Fund deposit) rate from utility operations, which is increasing in amount over time, and which is considered subordinate to the payment of the debt requirements. **Figure 10-5** showing annual debt service payments demonstrates that the only debt assumed for the Forecast Period is the inter-fund loan between the Water and the Stormwater Utilities.

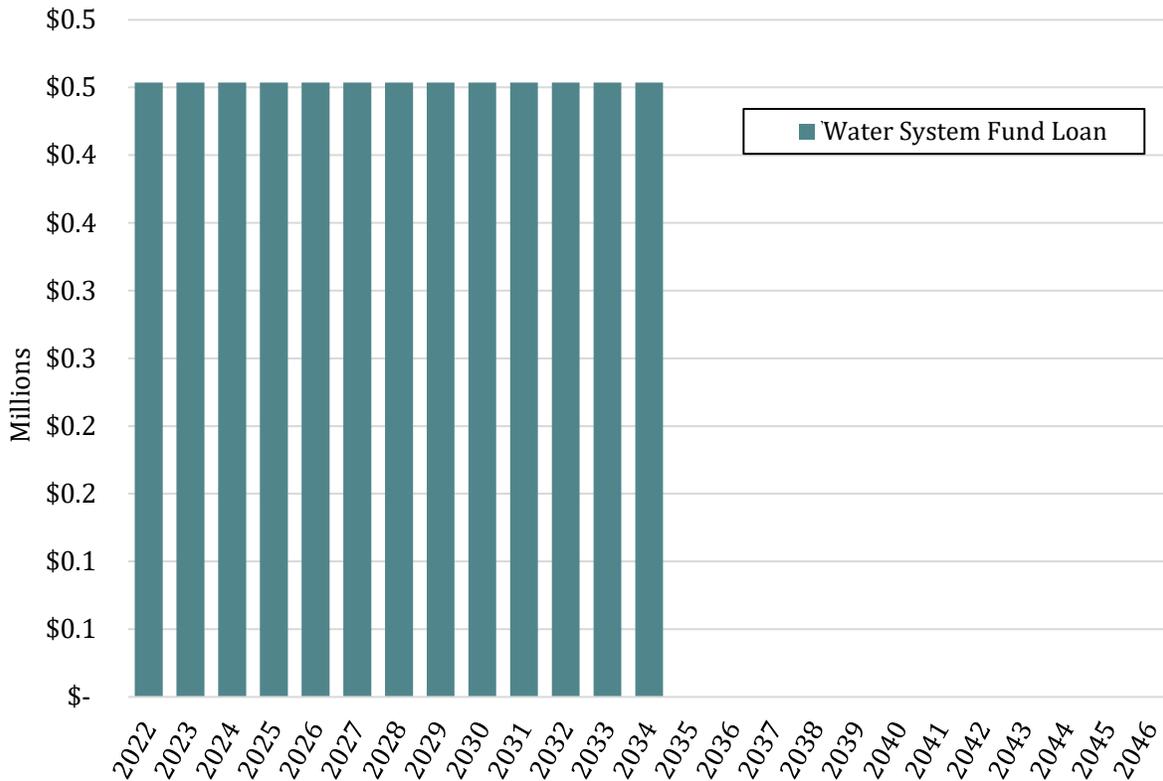


Figure 10-5: Annual Debt Service Payments

10.2.2 Projected Net Revenue Margin

The net revenue margin ratio is a measure of a utility system’s ability to meet its operating expenses and indicates the net contribution margin estimated to be earned by the Stormwater Utility. The contribution margin represents the amount of net revenues from operations that are available to meet the other utility expenditure requirements after the payment of the operating expenses (e.g., primarily for deposits to the R&R Fund to fund capital re-investment in the utility). Since the service availability charges are for the reimbursement of capital expenditures and not a recurring operating revenue, such charges are not included in the evaluation of the net revenue margin. A relatively low net revenue margin ratio (for example, 25%) indicates that a large portion of operating revenue is used to pay operating expenses and there could be limited flexibility in funding on-going capital (either through debt or direct deposits to the R&R Fund). A high net revenue margin ratio (for example, 45%) indicates a significant portion of operating revenues is available for Stormwater Utility expenditures other than the payment of operating expenses. A minimum target of 35% was assumed as it relates to the median for water utilities for this ratio recognized by credit rating agencies (i.e., the Fitch 2020 Median for AAA-rated utilities) and was assumed to be representative for stormwater management programs as well. Assuming the implementation of the recommended rate adjustments, **Figure 10-6** shows that the net revenue margin ratio is projected to decrease during the Forecast Period.

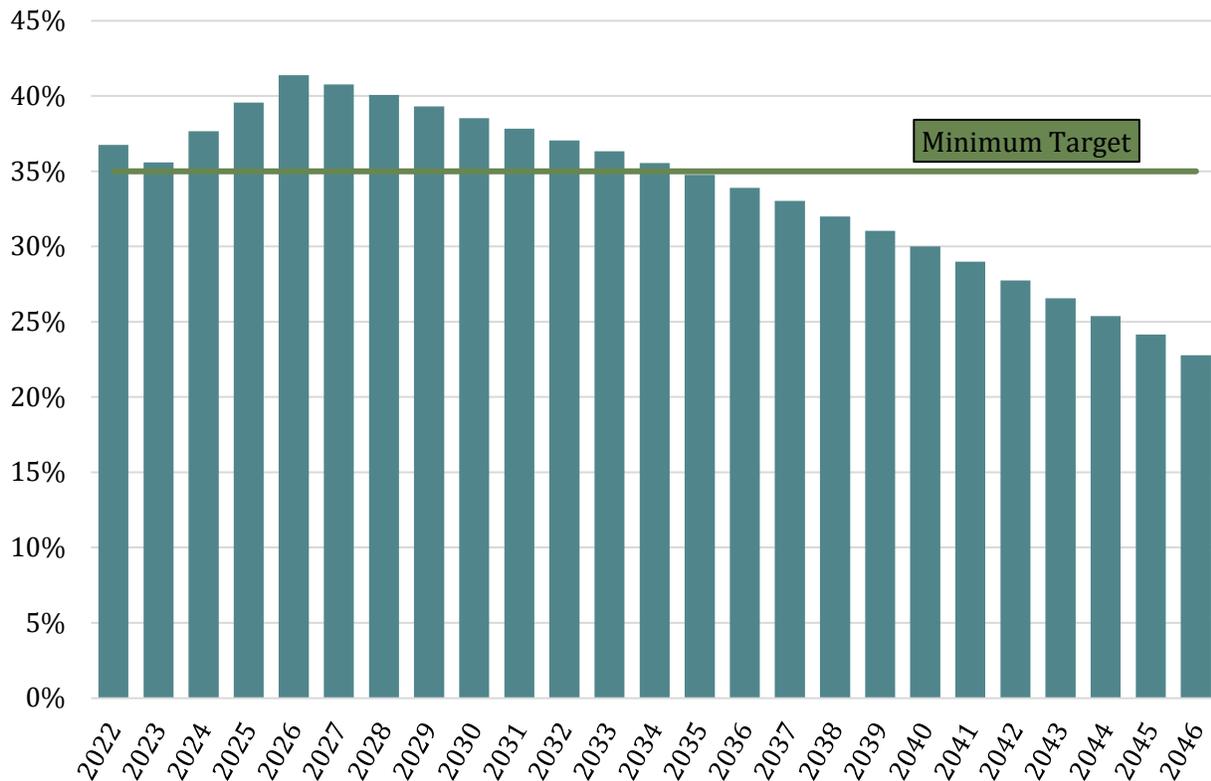


Figure 10-6: Annual Debt Service Payments

Although a higher net revenue margin ratio is recommended for the latter part of the Forecast Period, one must recognize that it is projected that there will be no debt service payments in the latter part of the Forecast Period (i.e., after Fiscal Year 2034 (a driver for a higher net revenue ratio) and therefore there is less pressure to have a higher ratio. However, it must be recognized that the future rate increases may be required in the future as the net revenue margins continue to decline and the need to continue to fund ongoing capital from Stormwater Utility operations continues (which could be increasing due to inflation and overall need). The reason for the decline in the net revenue margin ratio is due to: i) the service area achieving a built-out condition essentially by Fiscal Year 2037, which results in rate revenue growth resulting only from the application of the annual price index; and ii) the projection of operating expenses increasing at a growth rate greater than the price index assumption. This trend will need to be monitored closely in the future by the Town to assure that sufficient funds are available to finance the capital re-investment requirements of the Stormwater Utility. In addition, as previously mentioned, the ratio does not include service availability charges that may be realized since they represent non-operating revenues associated with the recovery of prior capital expenditures for the Inlet Village. If the contributed revenue was recognized, the ratio would be more favorable but would still illustrate a declining margin for the Stormwater Utility.

10.2.3 Liquidity Cash Position

A major credit component deals with the amount of liquidity a utility maintains relative to working capital (operating) and capital reserves. With respect to working capital reserves, a minimum target of 180 days of

operating expenses is recommended, which was considered appropriate for a mature utility (generally includes a service area that is becoming built-out, with limited customer growth and the inability to expand the service area). Specifically, a minimum operating reserve balance ranging from \$1.1 million (2022) to \$2.9 million (2046) is recommended and would be exclusive of any capital reserves maintained by the Town for the Stormwater Utility. Further, it would be considered prudent for the working capital reserves to be higher if a low net revenue margin is being experienced to provide a rate stabilization / financial risk hedge on operations and to provide emergency reserves in the event of force majeure incidents (e.g., a major storm event). **Figure 10-7** summarizes the projected working capital reserves for the Forecast Period based on the assumptions delineated earlier in this section of the Stormwater Master Plan:

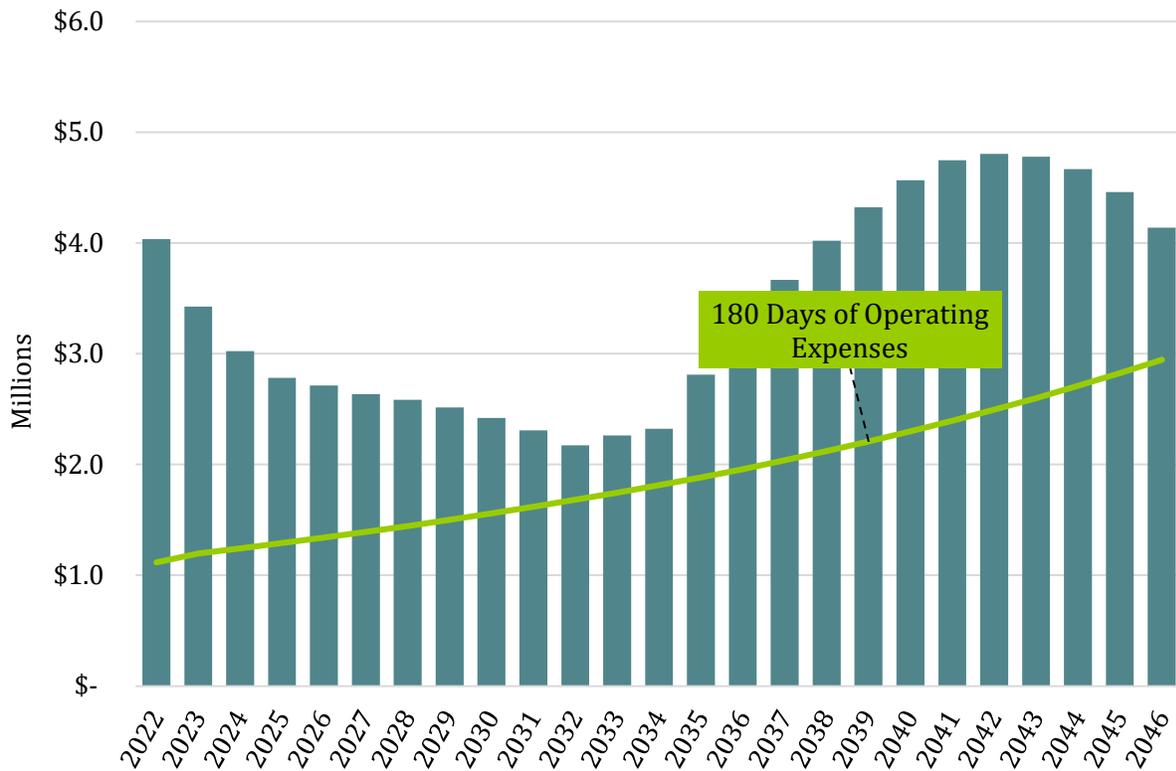


Figure 10-7: Operating Liquidity – Ending Cash Balances

As can be seen above, in the early portion of the Forecast Period, the available working capital reserves are approximating the target working capital reserve, which is only achieved through the implementation of additional fixed rate increases (adjustments above the annual price index of 2.5%). Without the additional rate adjustments and recognizing that operating expenses are increasing, the operating reserves would fall below the target level by 2029 and would result in the need for immediate rate relief at higher rates than have been recognized in the financial plan.

In addition to working capital reserves that are for ongoing operations and the payment of debt financing, the Stormwater Utility should also maintain a capital reserve to accrue funds for ongoing renewals and replacements but to also have funds for extraordinary or unplanned capital expenditures that occur from time to time. Further, the capital reserve would allow for the continuity of funding the capital program since

funds would be available in advance of appropriation such that the Utility Department can more effectively plan for capital expenditures (e.g., bundling of projects to achieve a better price bid). **Figure 10-8** summarizes the projected capital reserves for the Forecast Period based on the assumptions delineated earlier in this section of the Stormwater Master Plan:

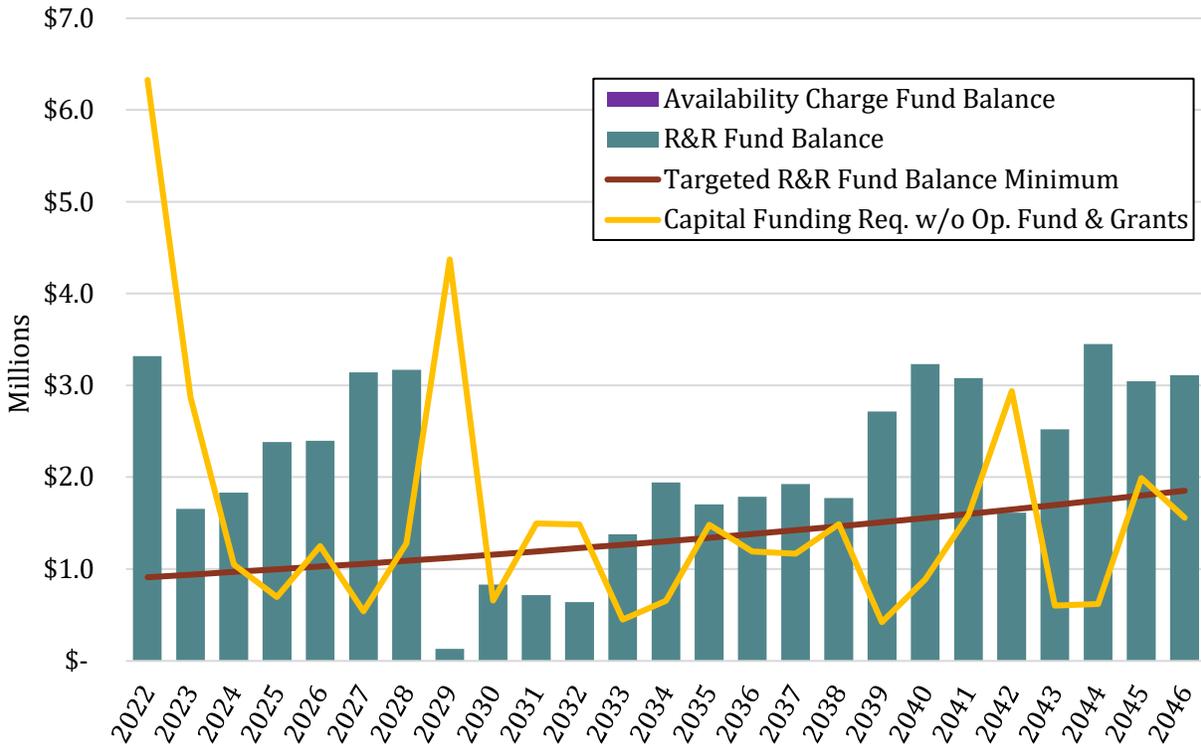


Figure 10-8: Capital Expenditures and Ending Cash Balances

As can be seen on the figure above, the balance in the R&R Fund falls well below the minimum recommended target balance in Fiscal Year 2029, which is a large capital expenditure (i.e., cash outlay) year for the Stormwater Utility. All other years are at or above target, which is favorable. An option to the Town would be to issue additional debt to fund the capital expenditures in that year but it is recommended that maintaining a pay-as-you-go approach with slightly higher rate adjustments in the near term is the most fiscally prudent approach from a fiscal standpoint, limits financial risk since all expenditures are funded from operations, and promotes long-term rate sustainability due to lower overall costs to finance capital.

The R&R Fund capital reserve target was estimated to equate to one (1) year of annual depreciation expense, which is expected to increase over time as additional utility plant or assets are added to the Stormwater System (added at a higher cost when compared to the historic embedded cost for the assets being replaced). The funding of the R&R Fund and maintenance of a minimum capital reserve fund balance equal at least to the annual depreciation expense was considered as a prudent financial objective of the Town by Fitch Ratings. Additionally, this reserve allows for the continuation of capital projects for the subsequent year (if there was an issue in making the annual deposit to the R&R Fund) since the funds are considered available for future expenditures, which promotes the continuity of the program (essentially would allow the Town

one [1] year to correct or recalibrate the R&R Fund deposits to meet the ongoing capital needs of the System).

In addition to the R&R Fund, the Town also receives system availability charge funds from developing properties within the Inlet Village to reimburse the Town for capital expenditures made for the benefit of the CRA. Any funds received (realized) from these contribution charges for the Forecast Period were assumed to be deposited into the operating funds of the utility since it represents a reimbursement of capital costs, which were funded from available reserves of the Stormwater utility and should be available to finance other capital projects of the Stormwater Utility.

10.2.4 Free Cash As A Percent Of Depreciation

A key ratio recently identified by the credit rating agencies is the “free cash as a percent of depreciation”, which measures the amount of net revenues available after the payment of debt service and other required transfers (absent the R&R Fund, which is a capital fund). The ratio indicates the annual financial capacity to maintain facilities at current levels of service from existing cash flows. The issue being addressed by the rating agencies is whether there are the proper resources generated annually to maintain and replace utility plant such that there is less risk in the need to issue additional bonds or secure additional loans, or due to increased expenditures funded from net revenues due to the need for emergency capital / repairs and maintenance expenditures. These deposits link to the utility being a “going concern” in that it will have funds to replace and upgrade infrastructure as needed in order to continue to provide stormwater service on an ongoing (uninterrupted) basis. **Figure 10-9** demonstrates that the ratio is projected to be favorable and indicates that annual re-investment in the System is adequately being accomplished based on current funding objectives.

It should be noted that the reason for the increase in the ratio in the first several years of the Forecast Period is due to the implementation of the additional fixed rate (estimated at 4.5%) phasing plan (resulting in estimated annual increases when including an index allowance of 7.0%) with the objective to increase the capital re-investment levels for overall system sustainability and to limit future debt. These increases are critical in the ability to fully fund the capital plan and maintain a positive cash balance in the R&R Fund recognizing the large expenditure requirements anticipated by the Town in Fiscal Year 2029. Beginning with the Fiscal Year 2027, it is anticipated that rates will only require an annual index and is projected to provide the necessary cash flow to address inflationary impacts on the cost of providing service and funding the ongoing capital program. We believe the rate phasing and capital funding plan is attainable and promotes the long-term sustainability in the rate setting process for the Stormwater Utility.

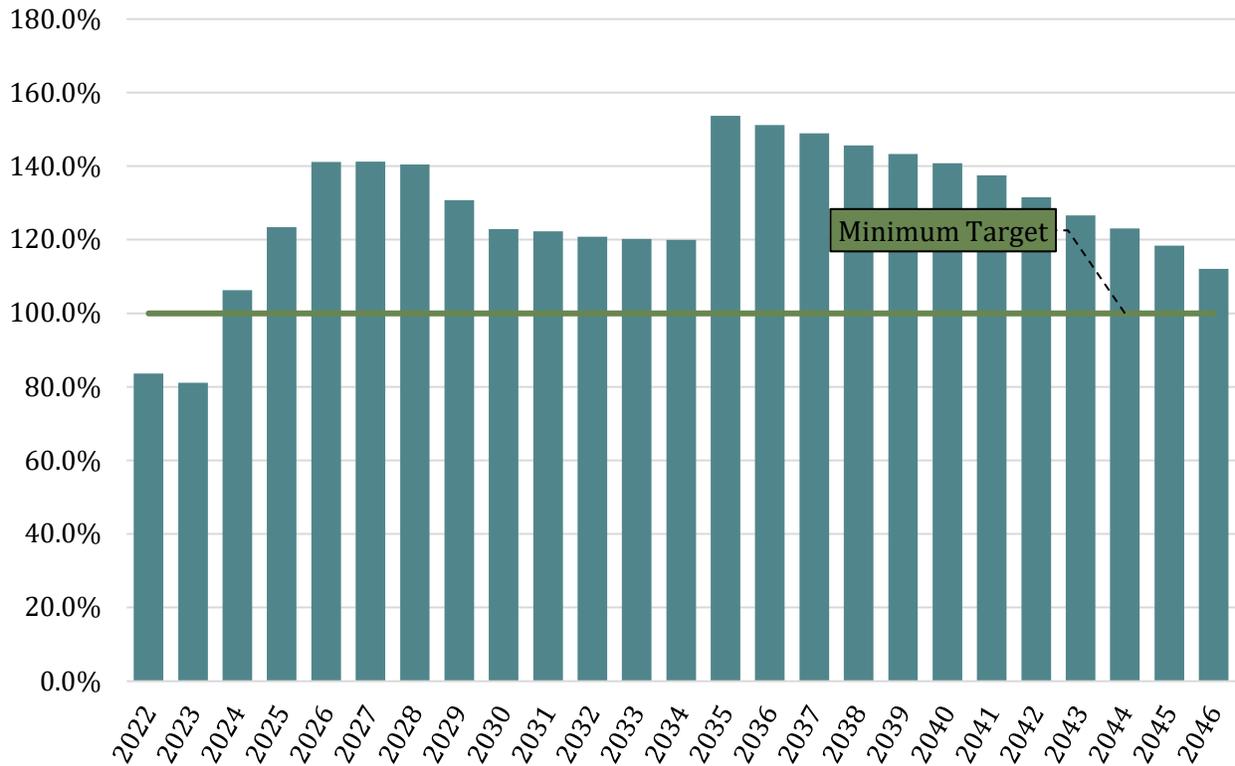


Figure 10-9: Free Cash Flow As Percent of Depreciation

10.3 Rate Comparisons

A primary indicator used by credit rating agencies, neighboring utilities, and the Town’s peers is the comparability of the rates for monthly stormwater service. Generally, a utility that has a strong financial and rate implementation policy has competitive rates. **Table 10-5** provides a comparison of the current and proposed Fiscal Year 2023 monthly stormwater fee charged by the Town to a standard single family residential unit (represents the majority of accounts served by the Town). Also included on the comparison are the stormwater fees currently being charged by other neighboring jurisdictions presented on an ERU-basis (single-family equivalent residential unit). Additionally, the comparison shows the level of service for each jurisdiction to impute the average cost per 1,000 square feet to provide a more comparative analysis. This information was obtained from information provided by the local governments surveyed. As can be seen in the comparison, the fees currently charged by the Town for stormwater service are lower than the average of the 16 jurisdictions surveyed from both a total monthly bill basis and rate per 1,000 square feet impervious surface basis and are considered as being competitive and reasonable on a comparative basis only.

Table 10-5: Comparison of Typical Monthly Bills for Stormwater Service

Description	Comparison of Bills for Stormwater Service		
	Stormwater Fees ¹	Estimated Level of Service / Sq. Footage	Stormwater Fees per 1,000 Sq. Ft.
Town of Jupiter			
Existing Rates as of October 1, 2021	\$6.17	2,651	\$2.32
Proposed Rates Effective October 1, 2022	\$6.52	2,651	\$2.46
Other Surveyed Florida Utilities: [2]			
City of Boca Raton	\$3.65	2,837	\$1.29
City of Boynton Beach	\$7.50	1,937	\$3.87
City of Delray Beach	\$5.33	2,502	\$2.13
City of Fort Lauderdale	\$21.52	N/A	N/A
City of Fort Pierce	\$5.75	2,186	\$2.63
City of Hollywood	\$7.62	2,250	\$3.39
City of Lake Worth	\$6.52	1,748	\$3.73
City of Melbourne	\$3.67	2,500	\$1.47
City of Port St. Lucie	\$14.00	2,280	\$6.14
City of Riviera Beach	\$9.00	1,920	\$4.69
City of Stuart	\$7.00	3,707	\$1.89
City of Sunrise	\$9.17	1,884	\$4.87
City of Tamarac	\$11.86	1,830	\$6.488
Village of Tequesta	\$9.98	3,564	\$2.80
Village of Wellington	\$19.17	N/A	N/A
City of West Palm Beach	\$14.83	2,171	\$6.83
Other Surveyed Florida Utilities' Average	<u>\$9.79</u>		<u>\$3.73</u>

1. Unless otherwise noted, amounts shown reflect stormwater rates in effect beginning April 2022, per information provided by the local governments surveyed and information published by the Florida Stormwater Association.

2. Many Utilities bill on an annual basis as a non-ad valorem assessment as allowed by Florida Statutes, Chapter 197; for the purposes of this comparison, charges shown is reflected on a monthly basis.

In the development of the financial forecast, a primary rate assumption included the annual implementation of the price index rate adjustment for all years during the Forecast Period. The application of the index: i) allows the utility a recurring basis to maintain utility revenue margins and promote overall financial performance; ii) is considered as a prudent financial and management policy by the rating agencies; iii) limits the need for large rate adjustments in the future since rates are marginally increased annually for the customer's benefit; iv) allows the utility to achieve the higher credit rating, which reduces the overall cost of borrowing for the long-term benefit of the customers and the Town; v) is acceptable to the customers since there is no significant change in rates and no material impact on the affordability of stormwater service to such customers; and vi) generally results in the lowest rates over the long-term. The Town implemented the price index for these reasons and such application has assisted the Town in securing the highest financial credit rating for the Water System (the Stormwater Utility is currently not rated but the rating criteria is

extended to the utility). By not implementing the price index, the utility loses the “time value of money” relative to the financial impact to the System and places the utility in a fiscally greater financial risk position (e.g., results in the inability to fund capital over the long-term coupled with the need to issue more debt beyond what may be considered prudent for the utility). For example, the 2.5% index component of the rate adjustment assumed for the Fiscal Year 2023 (the first real year of the Forecast Period) generates an additional \$3.1 million in additional funds over the 24 year Forecast Period. This indexing benefit is increased as an index adjustment is applied each year coupled with the compounding effect over the 24 year period. The application of the index promotes the sustainability of the utility for the long-term in terms of revenue generation and funds availability and use.

As previously mentioned and even with the continued application of the price index to the Stormwater Utility rates by the Town, it is projected that the Town will need to increase rates above the annual consumer price index (assumed at 2.5%) for the next several years. Specifically, it is recommended that the Stormwater Utility rates be increased by 7.0% annually for the Fiscal Years 2023 to 2026 to allow the utility to increase operating margins, fund the capital improvement program projected for the utility and the associated repayment of the assumed inter-fund loan secured for capital project funding in prior years, and to maintain a long-term favorable financial credit rating. This rate adjustment recognizes the inclusion of the estimated annual price index adjustment assumed at 2.5% per year. In addition, it should be noted that each 1% increase in Stormwater Utility rates currently produces approximately \$35,000 in additional rate revenue (based on estimated Fiscal Year 2022 revenues). Assuming the application of the proposed rate adjustments identified for the financial forecast, the rates in the last year of the rate phasing period (i.e., 2026) will still be competitive with the rates charged by neighboring local governments (as of April 2022 with many of the surveyed utilities probably also raising rates during the comparison period) as shown below:

Table 10-6: Comparison of Average Monthly Residential Bill

Fiscal Year	Percent Adjustment	Monthly Rate
Town of Jupiter		
Fiscal Year 2022 (In Effect)		\$6.17
Fiscal Year 2023 (Proposed)	7.00%	\$6.52
Fiscal Year 2026 (Recommended)	7.00% Annually	\$7.99
Other Surveyed Florida Utilities' Average – As of April 2022 [1]		
		\$9.79

1. Reference Table 10.5

10.4 Observations and Recommendations

Based on the financial evaluation as presented herein in support of the funding of the anticipated capital needs of the Stormwater Utility, we offer the observations and recommendations:

- The Stormwater Utility should set policy consistent with the Water System, which will result in a financial position that would equate to a strong utility credit (assumed to be a “AAA” credit rating). In addition to providing consistent financial policies for the benefit of the enterprise funds, this should: i) promote stability in long-term rate competitiveness; ii) limit the risk to the utility due to market changes such as increased regulations; iii) allow for future debt borrowing at lowest interest costs; and iv) provide benefit to the overall credit rating of the Town.
- The Stormwater Master Plan identifies the need to fund approximately \$56.2 Million in capital expenditures and rehabilitation for the Fiscal Year 2022 to 2046-time frame. All of the capital expenditures is for renewals and replacements and is attributable to utility infrastructure reaching its useful service lives during the Forecast Period. This is typical for a mature system, which the Stormwater Utility is now transitioning to (from a growth-based system) and for the stormwater utilities in the south Florida area.
- Renewal and replacement-related capital expenditures generally benefit existing customers since the assets are in service to serve such customers. Prudent utility business practices suggest that the funding of such expenditures should be from an annual deposit to a capital fund (i.e., R&R Fund) to match asset use to asset replacement. This is generally considered as a “depreciation equivalent.” It is recommended that the Town annually fund a deposit to the R&R Fund at the amounts identified in the financial forecast as follows:
 - Maintain the base annual deposit of approximately \$676,000 for the Fiscal Year 2022;
 - Increase the base annual deposit amount by the construction cost index as published annually in the Engineering News Record (not less than 3.0%) to account for changes in construction costs; and
 - Increase the base annual deposit based on the additional cash flow anticipated from recommended rates equal to \$500,000 through 2032 and \$250,000 subsequent to 2032 through 2046 based on the capital needs of the utility.
- The Town should increase Stormwater Utility rates by 7.00% annually for the Fiscal Years 2023 through 2026 to allow the utility to increase operating margins, fund the capital improvement program identified for the utility, continue to pay the inter-fund loan from the Water System, and to maintain a strong financial credit rating. Based on a local utility rate survey, this rate adjustment is not anticipated to affect the competitiveness of rates when compared to other local governments in the Southeast Florida area.
- After the rate phasing plan through 2026, the Town should continue to annually index the stormwater rates to maintain net revenue margins and to continue to provide funds for renewals and replacement capital projects. The indexing of rates is critical to the financial forecast and strong financial position of the Stormwater Utility especially since the utility will be in a built-out condition and the only real rate revenue growth will be derived through the application of the annual

price index. The financial forecast assumes an annual 2.5% price index adjustment effective each October 1st beginning in Fiscal Year 2023, which is consistent with the estimated consumer price index assumptions used in the development of the financial forecast. The need to continue the annual application of the price index during the Forecast Period is due to the need to fund the anticipated increase in operating expenses and renewals and replacements due to the effects of inflation on the cost of providing service during such period.

- Recognizing the need for continued rate adjustments to maintain the overall revenue sufficiency of rates and that there is no specific stormwater index used in the industry, it is recommended that the Town adopt a price index that is equal to the greater of the Consumer Price Index or 2.5%. This approach would more closely align with the financial forecast yet allow for the recovery of costs if inflation rates significantly increase. This rate phasing plan should be closely monitored as a significant regulatory or capital event could still result in a financial strain on the utility.
- The Town should update the financial forecast every 1 to 3 years to monitor trends and changes in Stormwater Utility operations and capital needs to evaluate business and rate strategies to maintain the financial position of the Stormwater Utility.

Appendix 4: Pollutant Reduction Plan – Management Activities for Further Consideration

4.0 Management Activities for Further Consideration

The Town is currently investigating the feasibility of the following structural and non-structural management activities, which may contribute to progress towards the Pollutant Reduction Plan goals:

4.1 Non-Structural BMPs

Non-Structural Best Management Practices (BMPs) aim to improve water quality by reducing the accumulation and generation of potential pollutants at or near their source without construction of a facility, but instead provide for the development of pollution control programs that include prevention, education, and regulation. Some examples of nonstructural BMPs that the Town can evaluate for implementation are show in **Table 2-2** of chapter 2.

4.2 Code Research

The Town of Jupiter requested that Hazen perform limited research on codes used by other municipalities to limit or control setbacks of developments on waterfront properties, or to control stormwater runoff and water quality. Excerpts from the various municipalities codes and standards are provided, that the Town may consider emulating for their codes. The following section summarizes the results of this research:

Monroe County, FL

“Section 118-12 - Shoreline Setback

“(a) Purpose. The purpose of this Section is to...ensure good water quality,... protect structures from the effects of long-term sea level rise, protect beaches and shores from erosion....”

“(b) Principal structures. Principal structures shall be set back as follows:...”

“(c) Accessory structures. Accessory structures, as defined in Section 101-1, within the shoreline setback shall be constructed at a foundation height not to exceed 18 inches above existing grade and shall meet the following design criteria...”

“...(d) Stormwater and pollutant runoff. All structures shall be designed such that stormwater and pollutant runoff is contained on site, consistent with the stormwater management standards of this Land Development Code. ...Structures should be made of permeable materials, whenever practical, to allow the infiltration of stormwater runoff.”

“...(h) Preservation of native vegetation. Structures shall be located in existing cleared areas before encroaching into native vegetation. The remaining upland area of the shoreline setback shall be maintained as native vegetation or landscaped areas that allow the infiltration of stormwater runoff.”

City of Fort Lauderdale, FL

“Section 47-23.8 – Waterway Use

Buildings and land uses on parcels abutting waterways in nonresidential districts and in multifamily districts shall...A twenty-foot landscaped yard is required adjacent to the existing bulkhead line. The required twenty-foot yard shall not be used or developed for any purpose other than landscaping and the minimum amount of driveways or walkways reasonably necessary to serve permitted nonresidential or multifamily waterfront uses, unless specifically approved by the planning and zoning board. The twenty-foot yard shall not apply to marinas or yacht clubs.”

Shellfish Setbacks/Coastal Zone buffers

Example - Town of Mt Pleasant, South Carolina

“Additionally, a 30-foot setback for all impervious surfaces on property located in any zoning district shall apply to the DHEC-OCRM critical line.”

Stormwater/Zoning/Tree Protection Ordinances

Example - Stormwater, South Carolina

Town of Mt Pleasant, SC: “Impervious lot coverage. No more than 40% of the lot may be covered by impervious surfaces. For lots containing tidally influenced saltwater wetlands/marsh or open water beyond the delineated DHEC-OCRM critical line, impervious lot coverage shall be calculated using only the "high ground" of the lot and specifically excluding the wetlands/marsh or open water.”

Appendix 7: Capital Projects Figures



Install catch basins and RCP throughout neighborhood

Install RCP and structures along N. Old Dixie, connect to existing drainage

Perform general swale restoration and driveway apron regrading north of Hugh St

Install exfiltration trench (typ of 3 places, total 1,200 lf)

Legend

- Lift Station
- Catch Basin
- Roadway Centerline
- Gravity Sewer
- Sewer Forcemain
- Watermain
- Drainage Pipe
- Approximate Basin Boundary
- Proposed Drainage

Project Name:

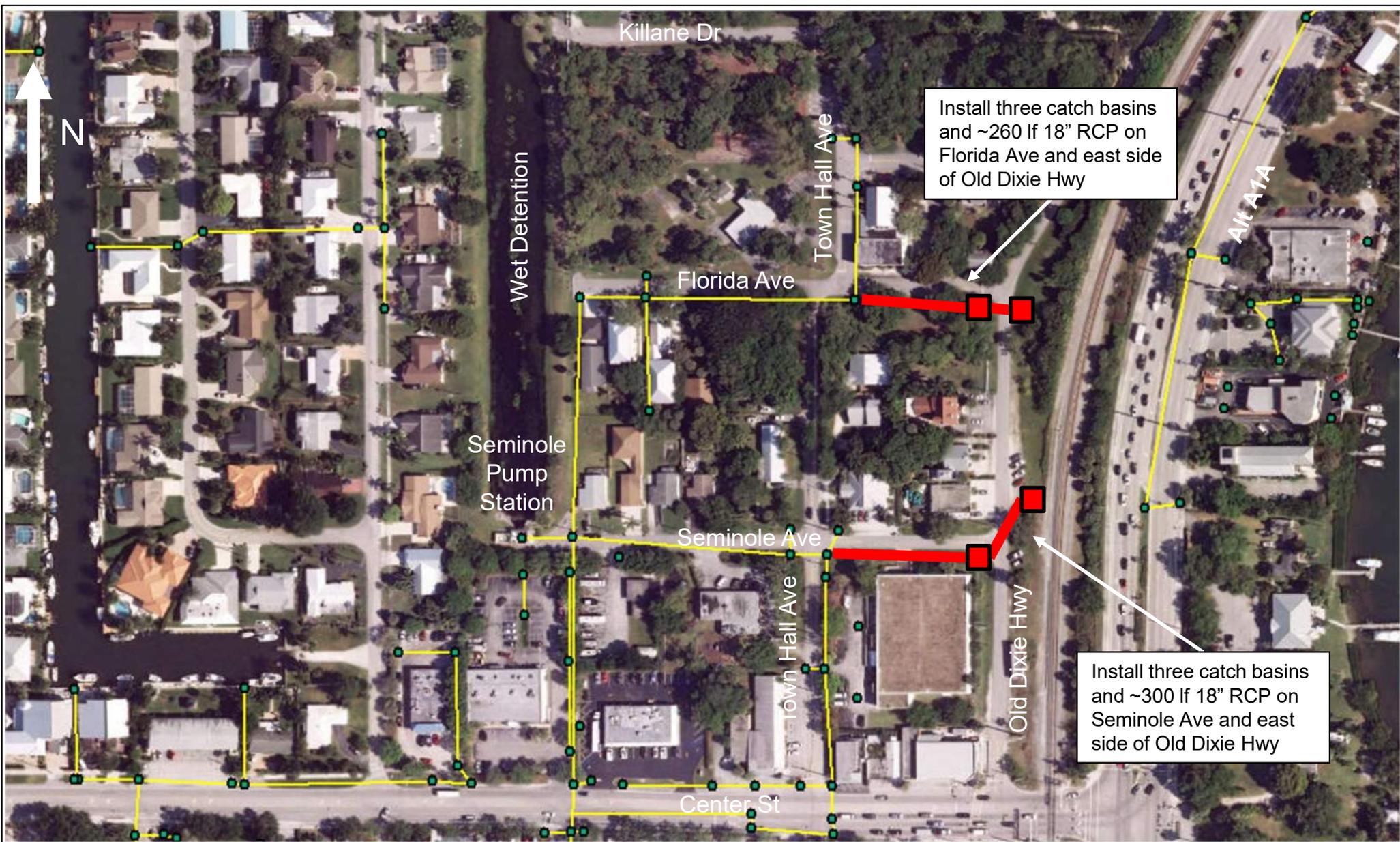
Stormwater Master Plan
Pine Gardens North

Proposed Drainage Improvements

H&S Project Number:
44250-067

Figure 7-1A





Legend



Amendment No. 3 Proposed New Project Components



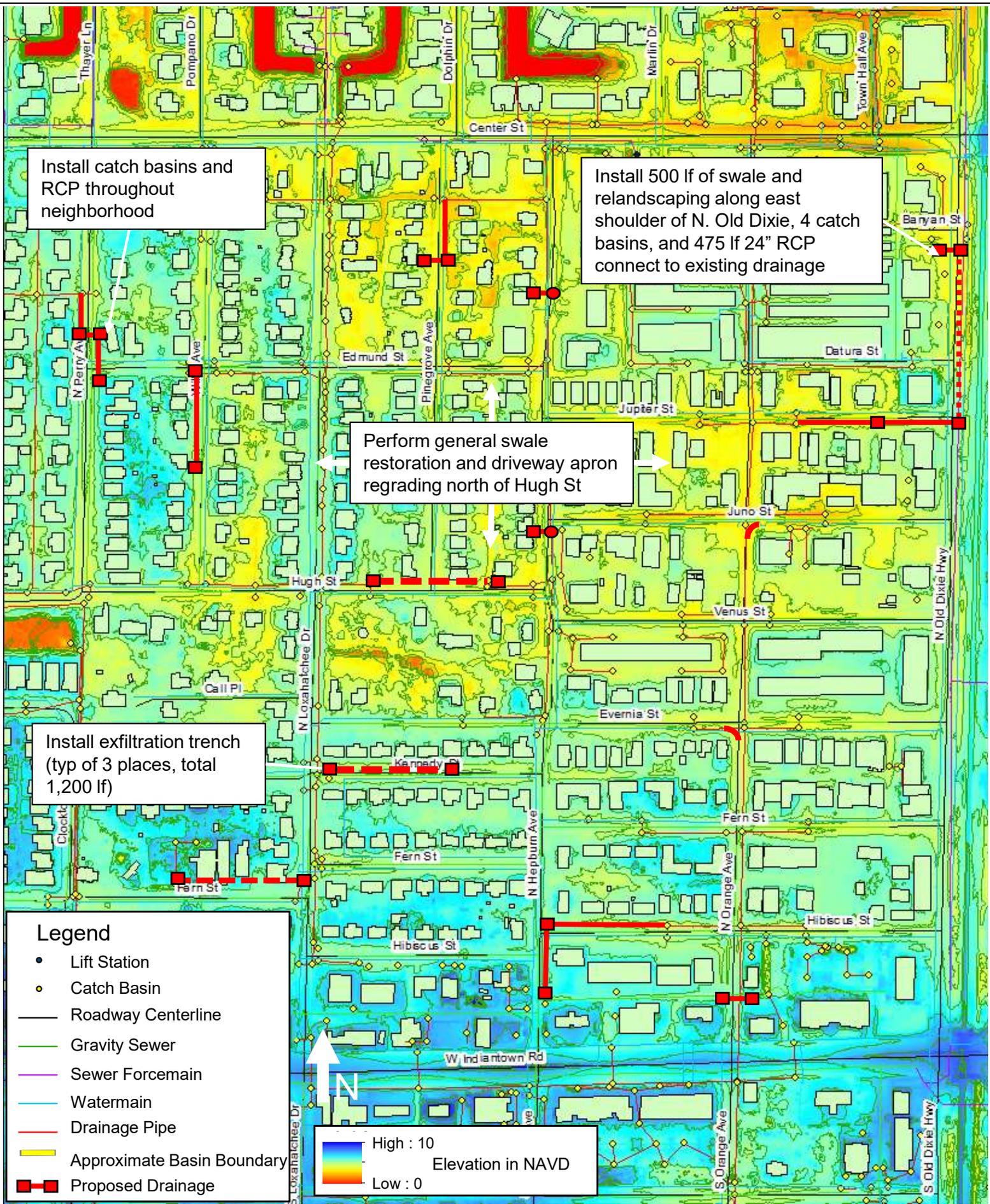
Project Name:

Stormwater Master Plan
Pine Gardens North

Proposed Drainage Additions

H&S Project Number:
44250-067

Figure 7-2A



Install catch basins and RCP throughout neighborhood

Install 500 lf of swale and relandscaping along east shoulder of N. Old Dixie, 4 catch basins, and 475 lf 24" RCP connect to existing drainage

Perform general swale restoration and driveway apron regrading north of Hugh St

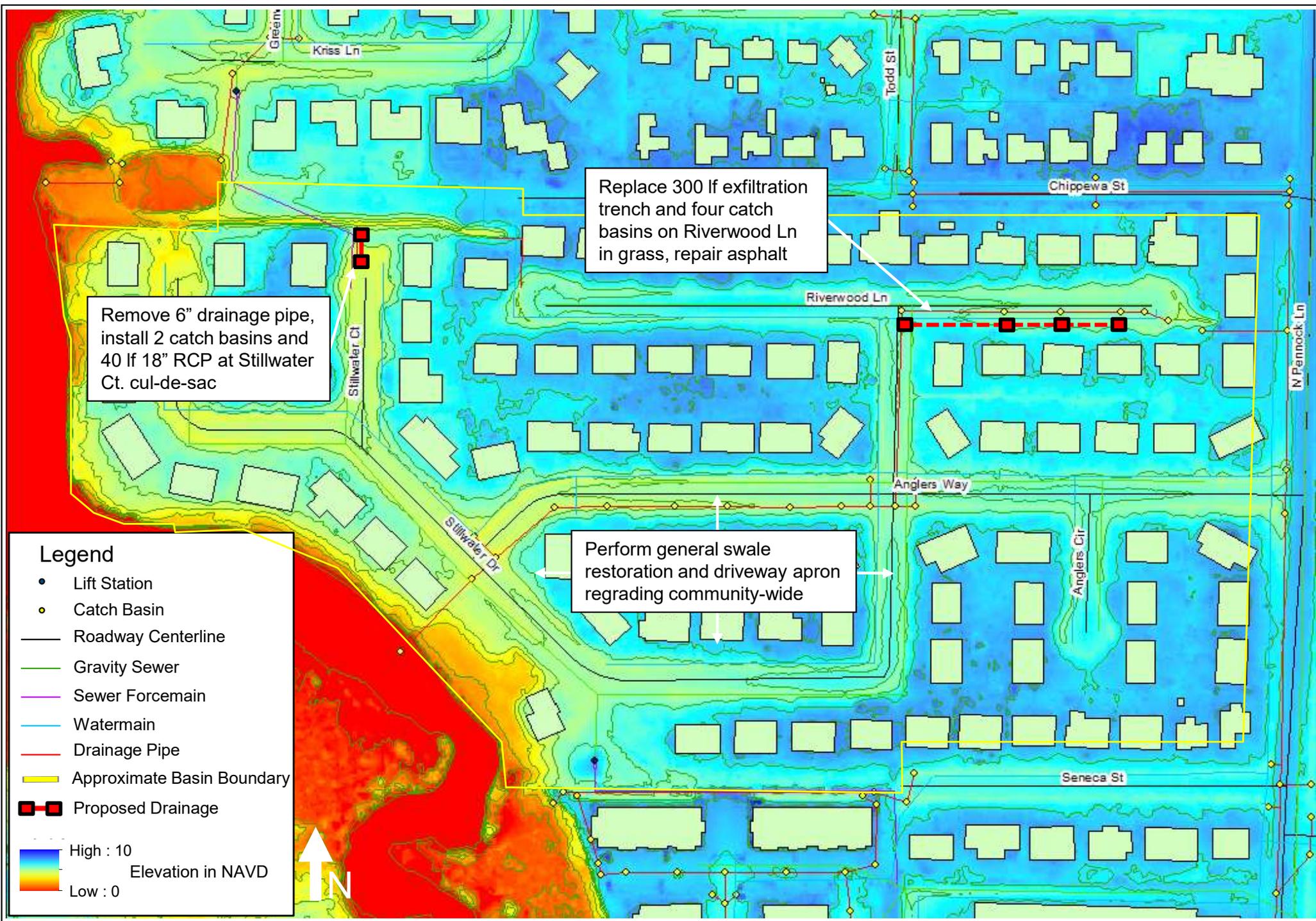
Install exfiltration trench (typ of 3 places, total 1,200 lf)

Legend

- Lift Station
- Catch Basin
- Roadway Centerline
- Gravity Sewer
- Sewer Forcemain
- Watermain
- Drainage Pipe
- Approximate Basin Boundary
- Proposed Drainage

High : 10
 Low : 0
 Elevation in NAVD





Legend

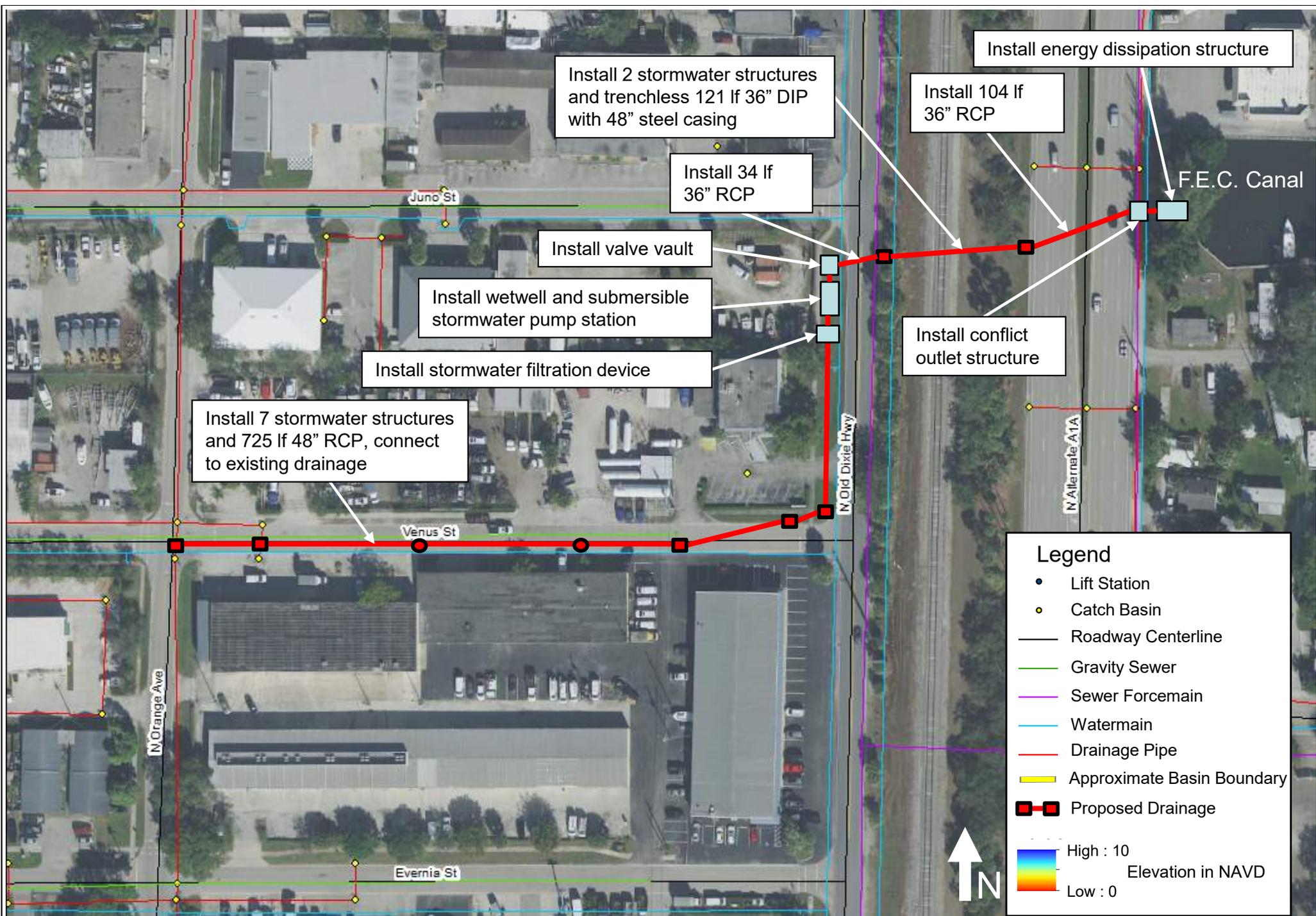
- Lift Station
- Catch Basin
- Roadway Centerline
- Gravity Sewer
- Sewer Forcemain
- Watermain
- Drainage Pipe
- Approximate Basin Boundary
- Proposed Drainage

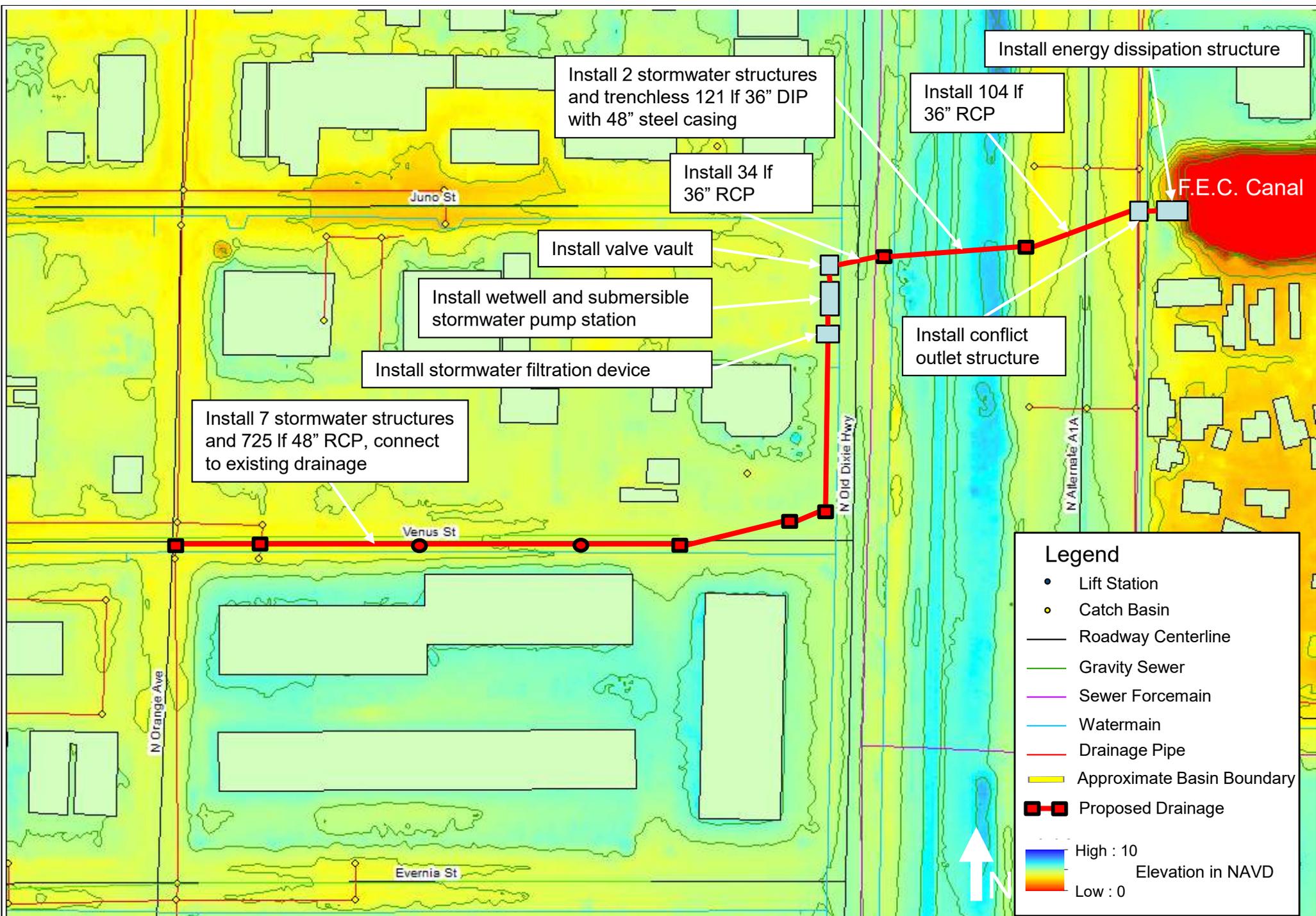
High : 10
Elevation in NAVD
Low : 0

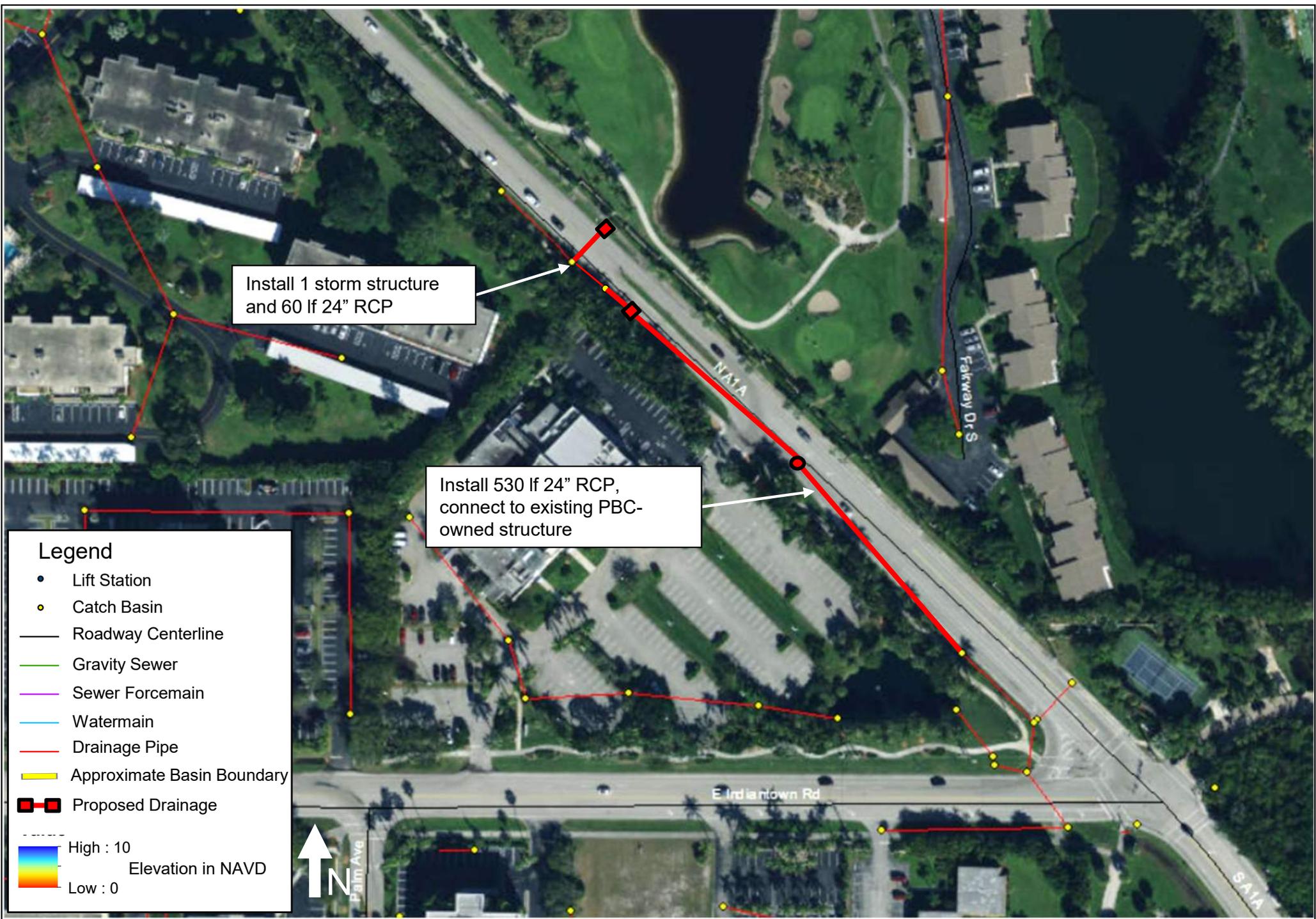


Project Name:
 Stormwater Master Plan
 Fisherman's Landing

LiDAR Map
 H&S Project Number:
 44250-067
 Figure 7-5A







Install 1 storm structure and 60 lf 24" RCP

Install 530 lf 24" RCP, connect to existing PBC-owned structure

Legend

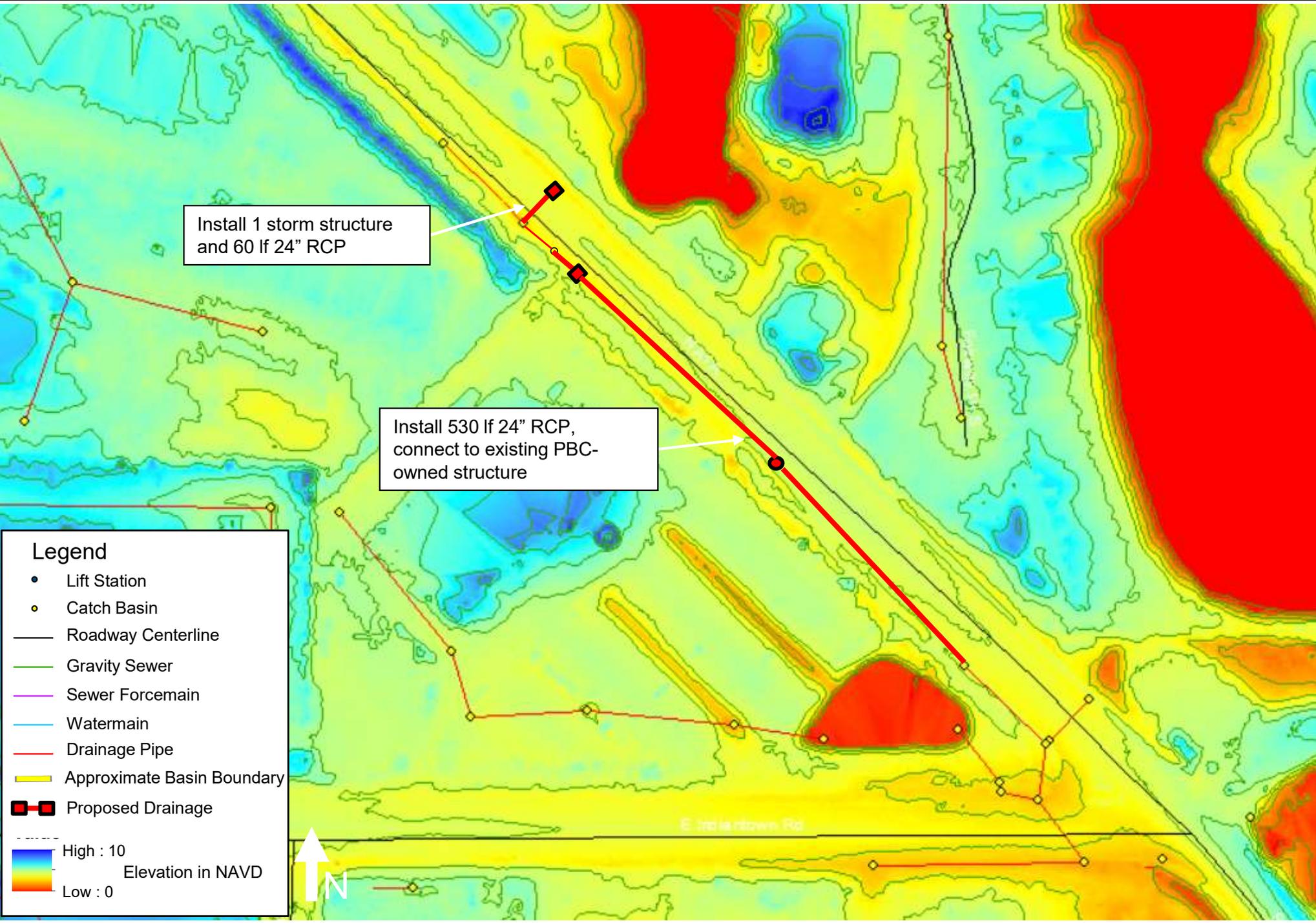
- Lift Station
- Catch Basin
- Roadway Centerline
- Gravity Sewer
- Sewer Forcemain
- Watermain
- Drainage Pipe
- Approximate Basin Boundary
- Proposed Drainage

High : 10
Elevation in NAVD
Low : 0



Project Name:
 Stormwater Master Plan
 North A1A Infrastructure Improvements

Proposed Drainage Improvements
 H&S Project Number:
 44250-067
 Figure 7-8A



Install 1 storm structure and 60 lf 24" RCP

Install 530 lf 24" RCP, connect to existing PBC-owned structure

Legend

- Lift Station
- Catch Basin
- Roadway Centerline
- Gravity Sewer
- Sewer Forcemain
- Watermain
- Drainage Pipe
- Approximate Basin Boundary
- Proposed Drainage

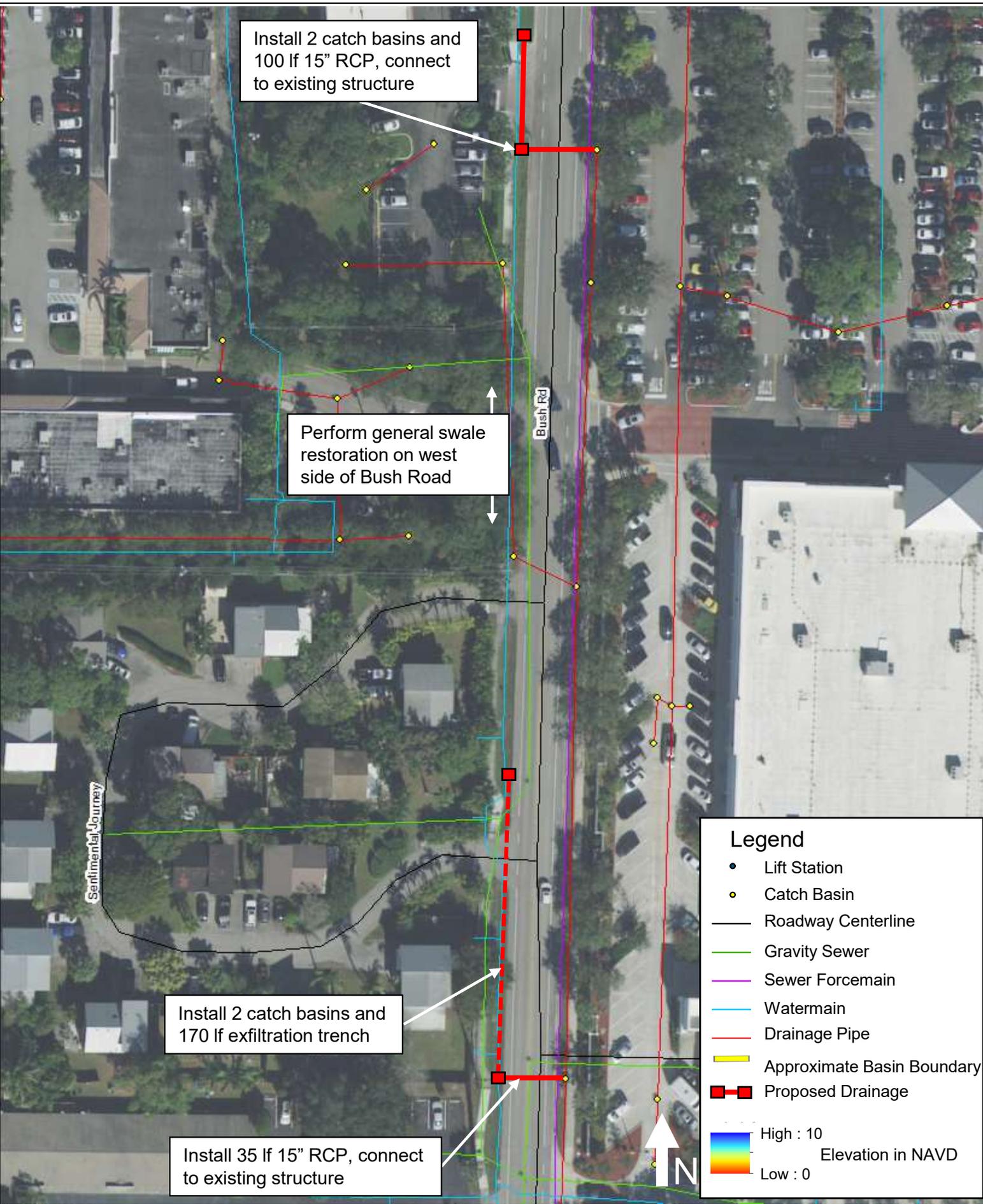
High : 10
Elevation in NAVD
Low : 0



Project Name:
 Stormwater Master Plan
 North A1A Infrastructure Improvements

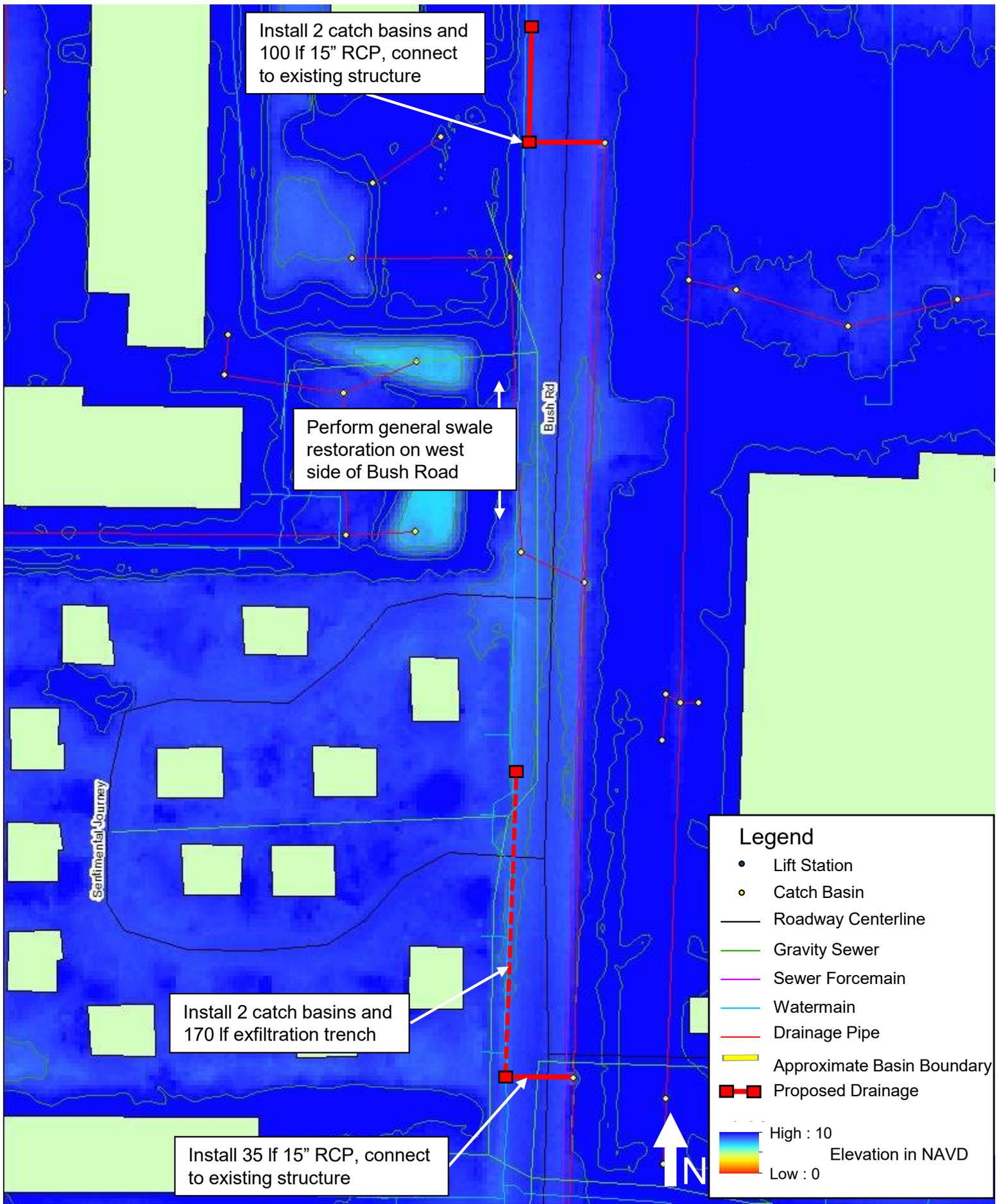
LiDAR Map
 H&S Project Number:
 44250-067

Figure 7-9A



Project Name:
 Stormwater Master Plan
 Bush Road

Proposed Drainage Improvements
 H&S Project Number:
 44250-067
 Figure 7-10A



Install 2 catch basins and 100 lf 15" RCP, connect to existing structure

Perform general swale restoration on west side of Bush Road

Install 2 catch basins and 170 lf exfiltration trench

Install 35 lf 15" RCP, connect to existing structure

Legend

- Lift Station
- Catch Basin
- Roadway Centerline
- Gravity Sewer
- Sewer Forcemain
- Watermain
- Drainage Pipe
- Approximate Basin Boundary
- Proposed Drainage

High : 10
Elevation in NAVD
Low : 0



Project Name:
Stormwater Master Plan
Bush Road

LiDAR Map
H&S Project Number:
44250-067
Figure 7-11A



Install 4 catch basins, 1 manhole and 360 lf of new stormwater piping

Legend

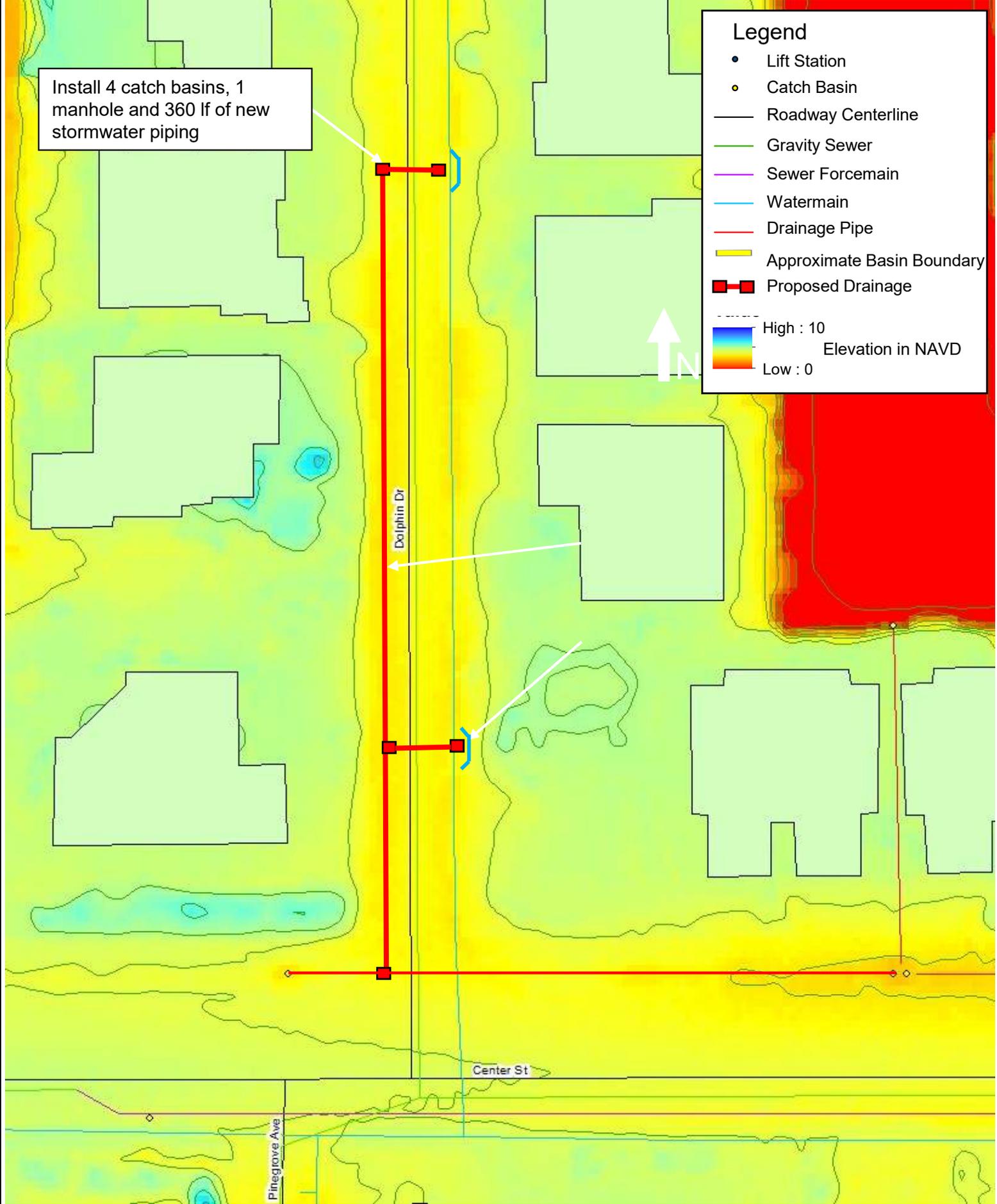
- Lift Station
- Catch Basin
- Roadway Centerline
- Gravity Sewer
- Sewer Forcemain
- Watermain
- Drainage Pipe
- Approximate Basin Boundary
- Proposed Drainage

High : 10
 Elevation in NAVD
 Low : 0



Project Name:
 Stormwater Master Plan
 Dolphin Drive

Proposed Drainage Improvements
 H&S Project Number:
 44250-067
 Figure 7-12A

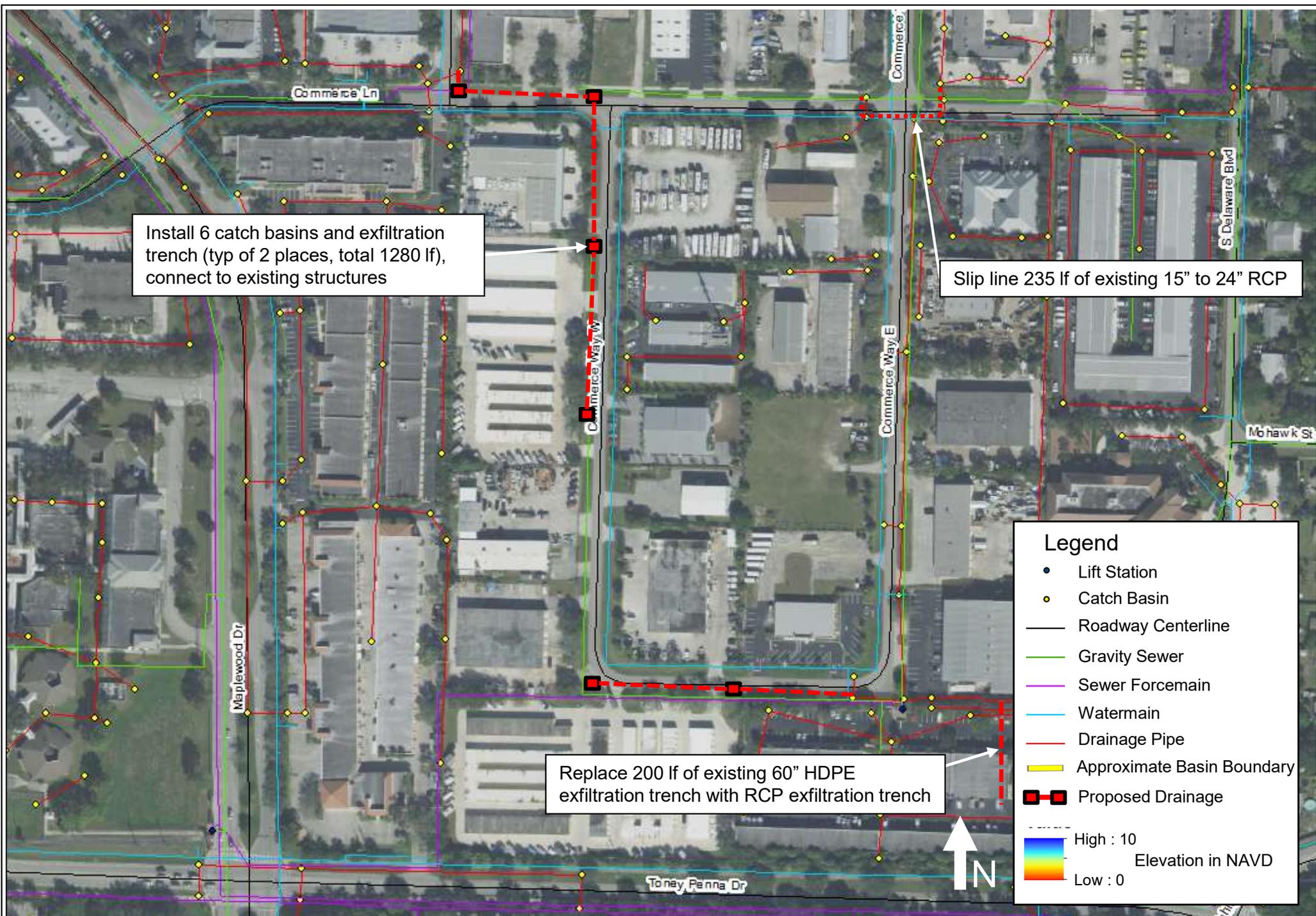


Legend

- Lift Station
- Catch Basin
- Roadway Centerline
- Gravity Sewer
- Sewer Forcemain
- Watermain
- Drainage Pipe
- Approximate Basin Boundary
- Proposed Drainage

High : 10
 Low : 0
 Elevation in NAVD

Install 4 catch basins, 1 manhole and 360 lf of new stormwater piping



Install 6 catch basins and exfiltration trench (typ of 2 places, total 1280 lf), connect to existing structures

Slip line 235 lf of existing 15" to 24" RCP

Replace 200 lf of existing 60" HDPE exfiltration trench with RCP exfiltration trench

Legend

- Lift Station
- Catch Basin
- Roadway Centerline
- Gravity Sewer
- Sewer Forcemain
- Watermain
- Drainage Pipe
- Approximate Basin Boundary
- Proposed Drainage

High : 10
Elevation in NAVD
Low : 0



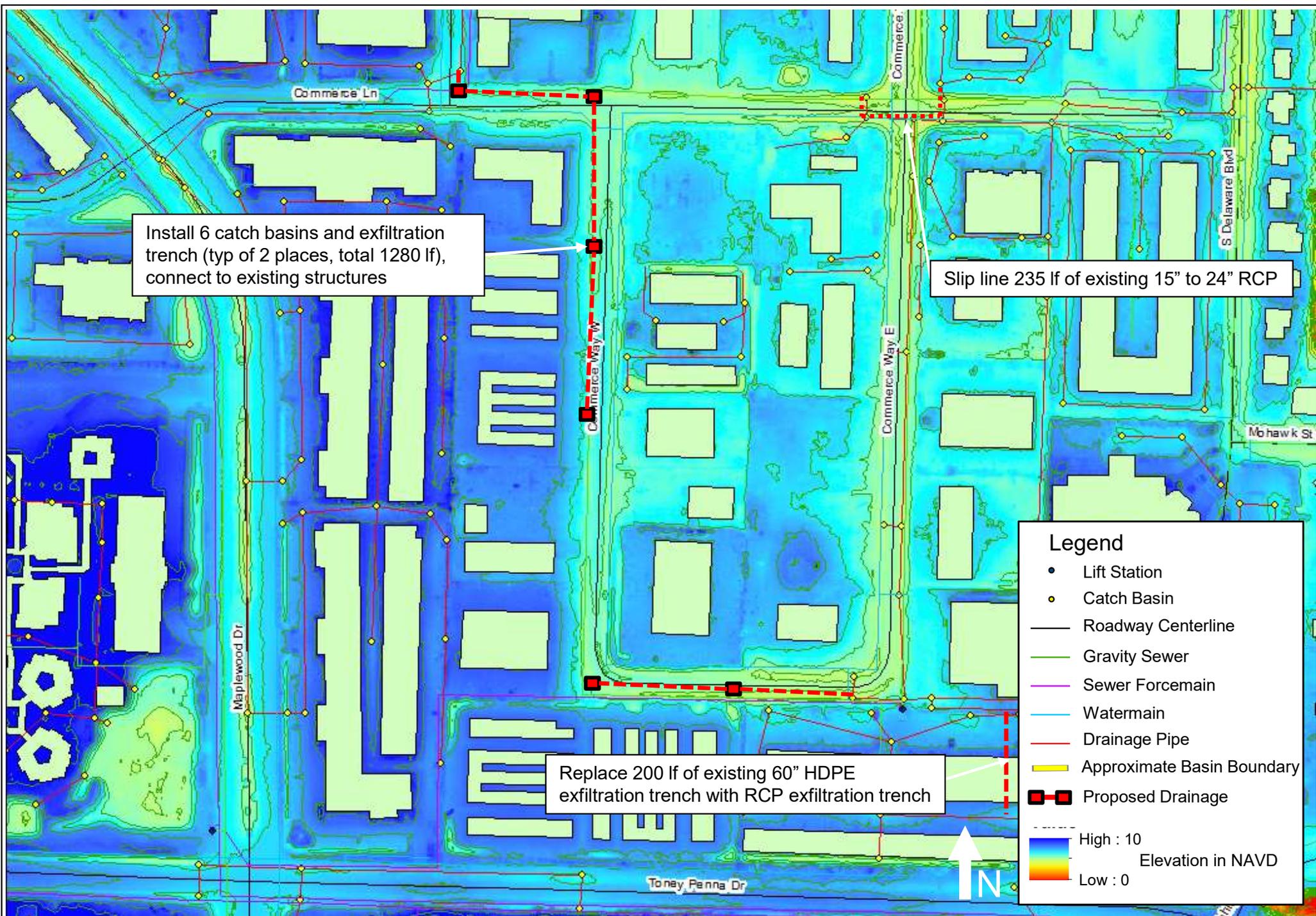
Project Name:

Stormwater Master Plan
Pennock Industrial Park

Proposed Drainage Improvements

H&S Project Number:
44250-067

Figure 7-14A



Install 6 catch basins and exfiltration trench (typ of 2 places, total 1280 lf), connect to existing structures

Slip line 235 lf of existing 15" to 24" RCP

Replace 200 lf of existing 60" HDPE exfiltration trench with RCP exfiltration trench

Legend

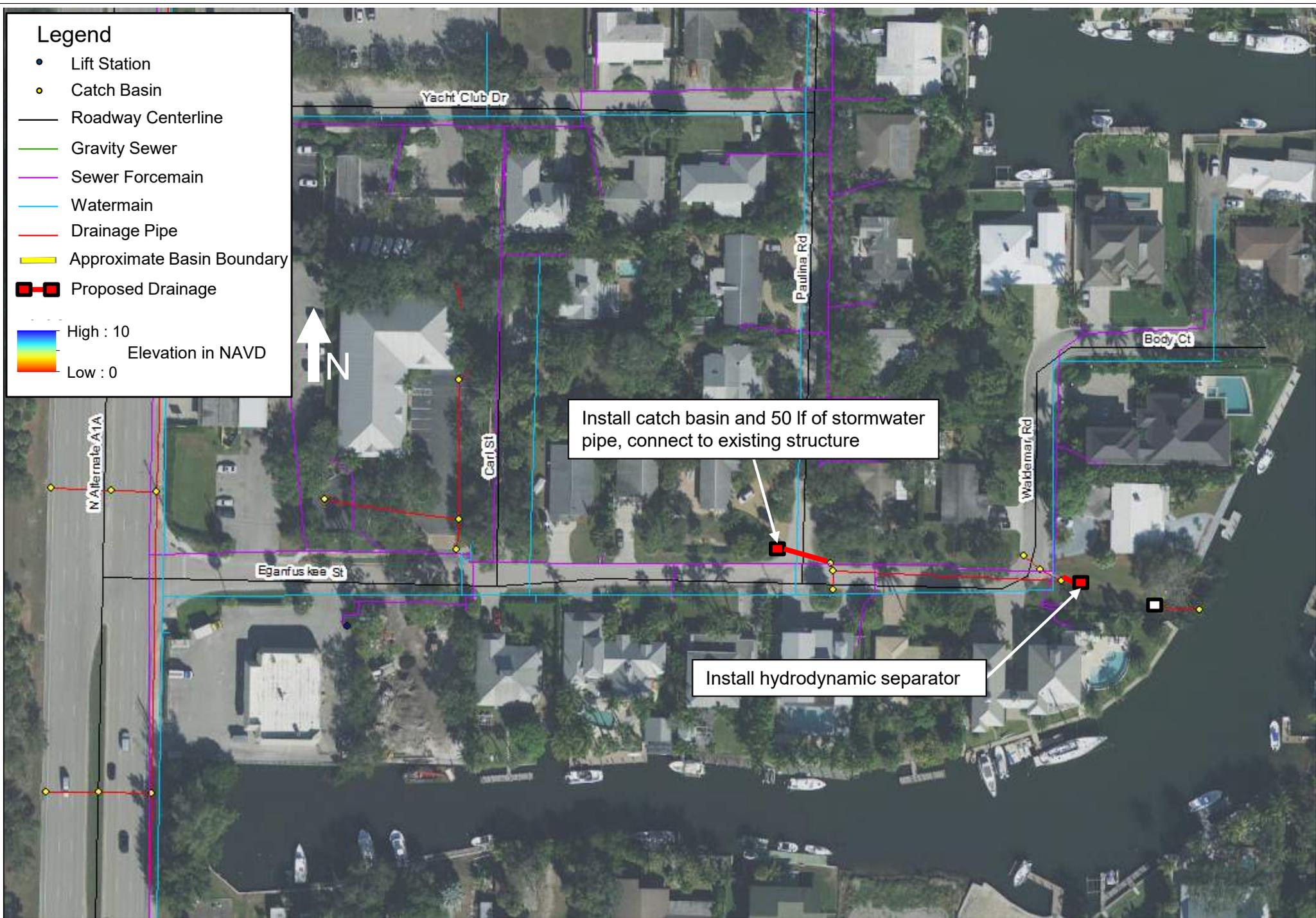
- Lift Station
- Catch Basin
- Roadway Centerline
- Gravity Sewer
- Sewer Forcemain
- Watermain
- Drainage Pipe
- Approximate Basin Boundary
- Proposed Drainage

High : 10
Elevation in NAVD
Low : 0

Legend

- Lift Station
- Catch Basin
- Roadway Centerline
- Gravity Sewer
- Sewer Forcemain
- Watermain
- Drainage Pipe
- Approximate Basin Boundary
- Proposed Drainage

High : 10
Elevation in NAVD
Low : 0



Project Name:

Stormwater Master Plan
Eganfuskee Road

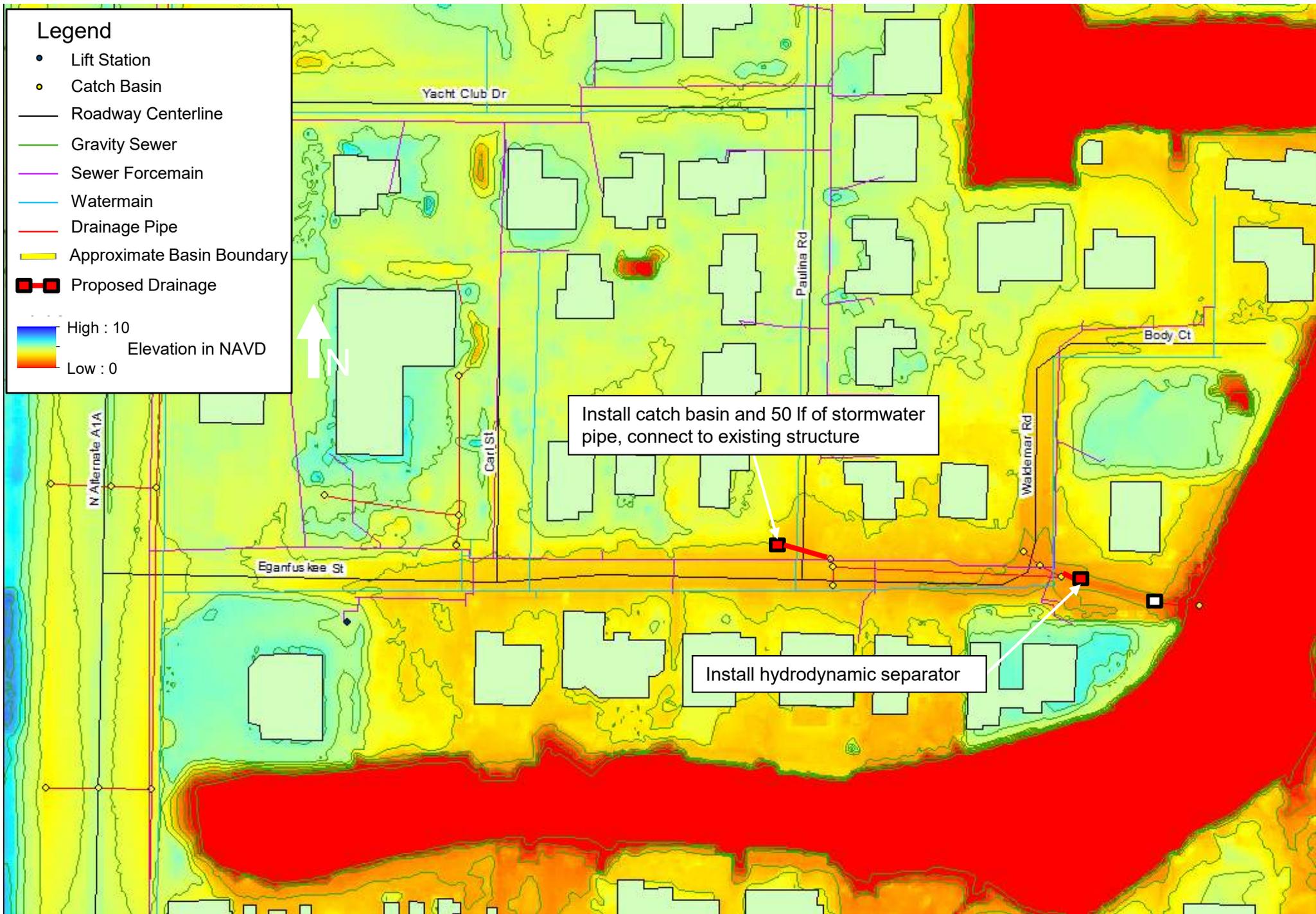
Proposed Drainage Improvements

H&S Project Number:
44250-067

Figure 7-16A

Legend

- Lift Station
 - Catch Basin
 - Roadway Centerline
 - Gravity Sewer
 - Sewer Forcemain
 - Watermain
 - Drainage Pipe
 - Approximate Basin Boundary
 - Proposed Drainage
- High : 10
Elevation in NAVD
Low : 0



Install catch basin and 50 lf of stormwater pipe, connect to existing structure

Install hydrodynamic separator



Project Name:

Stormwater Master Plan
Eganfuskee Road

LiDAR Map

H&S Project Number:
44250-067

Figure 7-17A



Existing Drainage Ditch to Loxahatchee River

See **Figure 3A** for existing discharge to Palm Beach County system

See **Figure 3B** for proposed improvements at N. Whitney Dr and Center Street

Existing Discharge To FDOT-Owned System

Legend

- Lift Station
- Catch Basin
- Roadway Centerline
- Gravity Sewer
- Sewer Forcemain
- Watermain
- Drainage Pipe
- Approximate Basin Boundary
- Proposed Drainage

High : 10
 Elevation in NAVD
 Low : 0

Project Name:

Stormwater Master Plan
 Eastview Manor

Proposed Drainage Improvements

H&S Project Number:
 44250-067

Figure 7-18A



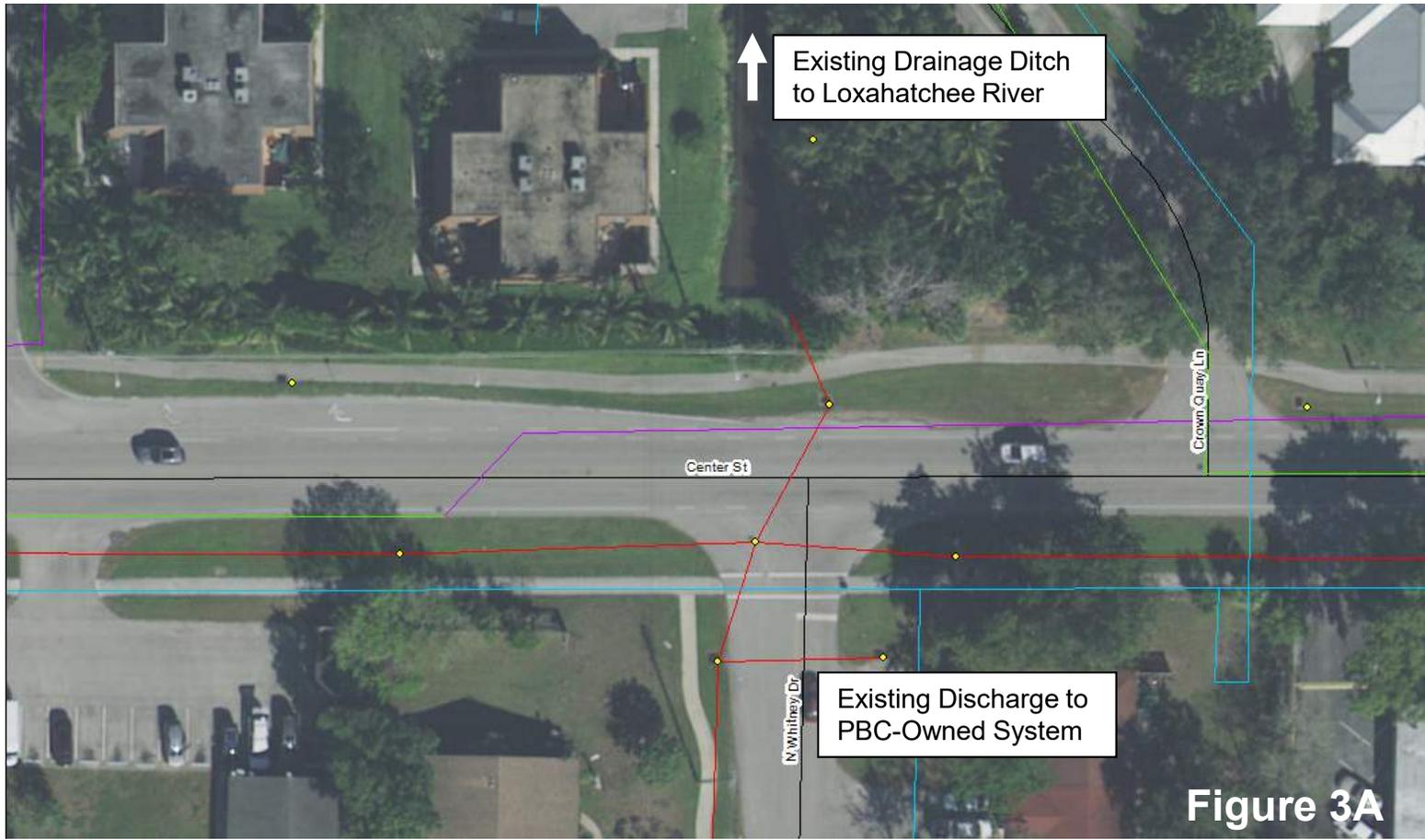
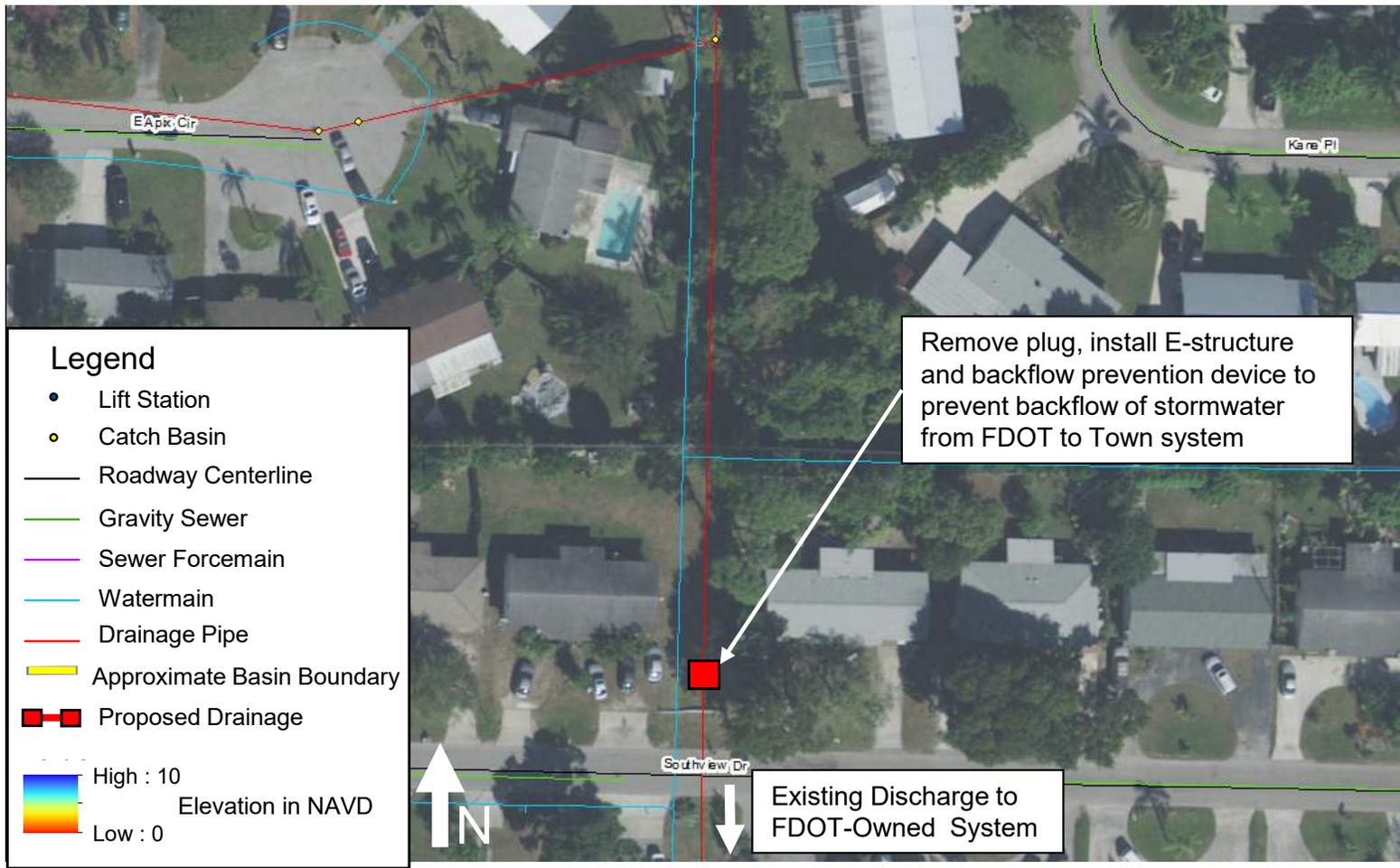


Figure 3A



Legend

- Lift Station
- Catch Basin
- Roadway Centerline
- Gravity Sewer
- Sewer Forcemain
- Watermain
- Drainage Pipe
- Approximate Basin Boundary
- Proposed Drainage

High : 10
Elevation in NAVD
Low : 0

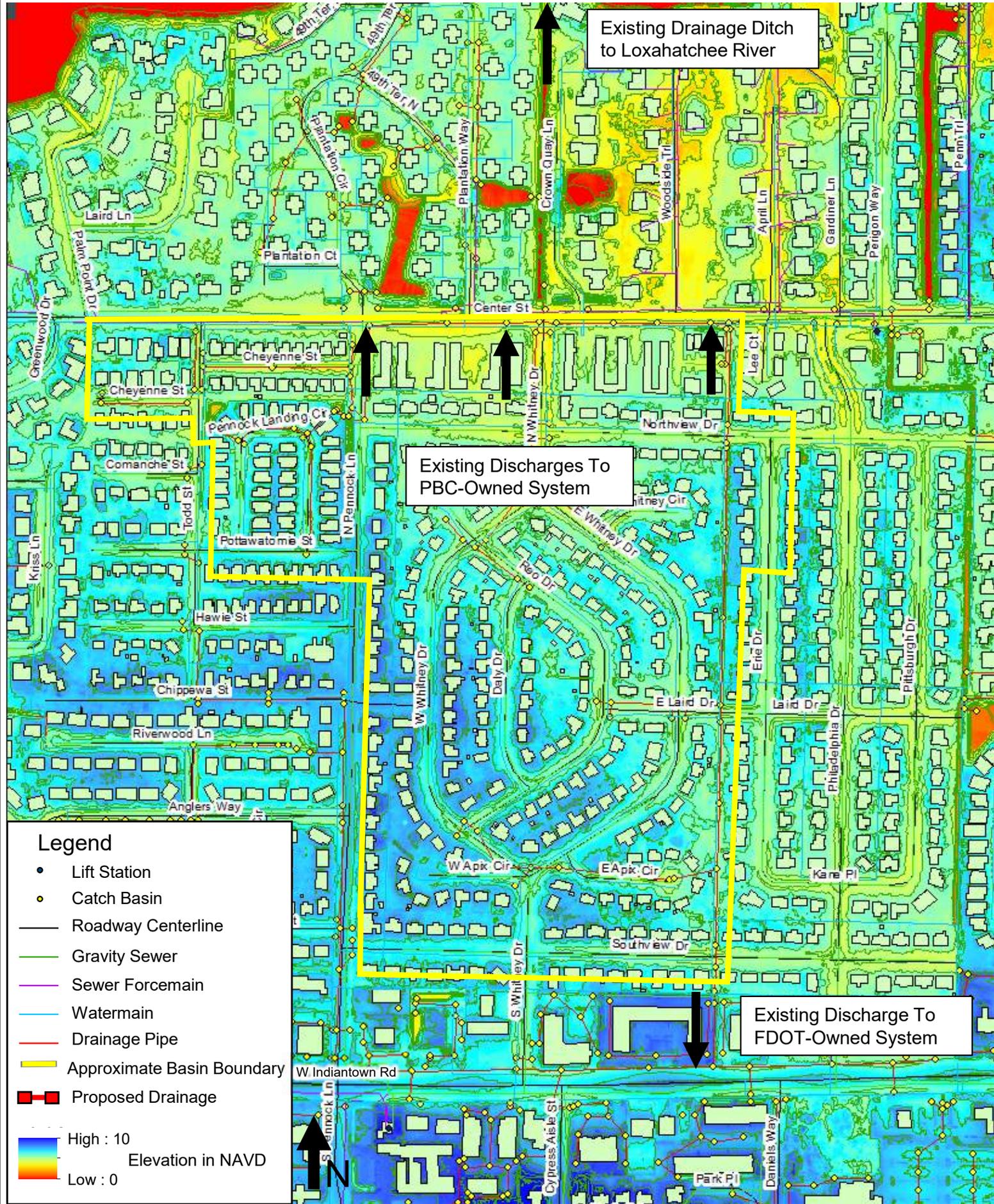


Project Name:
**Stormwater Master Plan
Eastview Manor**

Proposed Drainage Details

H&S Project Number:
44250-067

Figure 7-19A



Existing Drainage Ditch to Loxahatchee River

Existing Discharges To PBC-Owned System

Existing Discharge To FDOT-Owned System

Legend

- Lift Station
- Catch Basin
- Roadway Centerline
- Gravity Sewer
- Sewer Forcemain
- Watermain
- Drainage Pipe
- Approximate Basin Boundary
- Proposed Drainage

High : 10
Elevation in NAVD
Low : 0

Project Name:

Stormwater Master Plan
Eastview Manor

LiDAR Map

H&S Project Number:
44250-067

Figure 7-20A





Install 450 lf of valley gutter

Obtain 15' w easement, Install 300 lf of 18" RCP and three catch basins, connect to exist. 42-in HDPE pipe

Legend

- Lift Station
- Catch Basin
- Roadway Centerline
- Gravity Sewer
- Sewer Forcemain
- Watermain
- Drainage Pipe
- Approximate Basin Boundary
- Proposed Drainage

High : 10
Elevation in NAVD
Low : 0

Project Name:

Stormwater Master Plan
Cypress Drive

Proposed Drainage Improvements

H&S Project Number:
44250-067

Figure 7-21A





Install 450 lf of valley gutter

Obtain 15' w easement, Install 300 lf of 18" RCP and three catch basins, connect to exist. 42-in HDPE pipe

Legend

- Lift Station
- Catch Basin
- Roadway Centerline
- Gravity Sewer
- Sewer Forcemain
- Watermain
- Drainage Pipe
- Approximate Basin Boundary
- Proposed Drainage

High : 10
Elevation in NAVD
Low : 0

Project Name:

Stormwater Master Plan
Cypress Drive

LiDAR Map

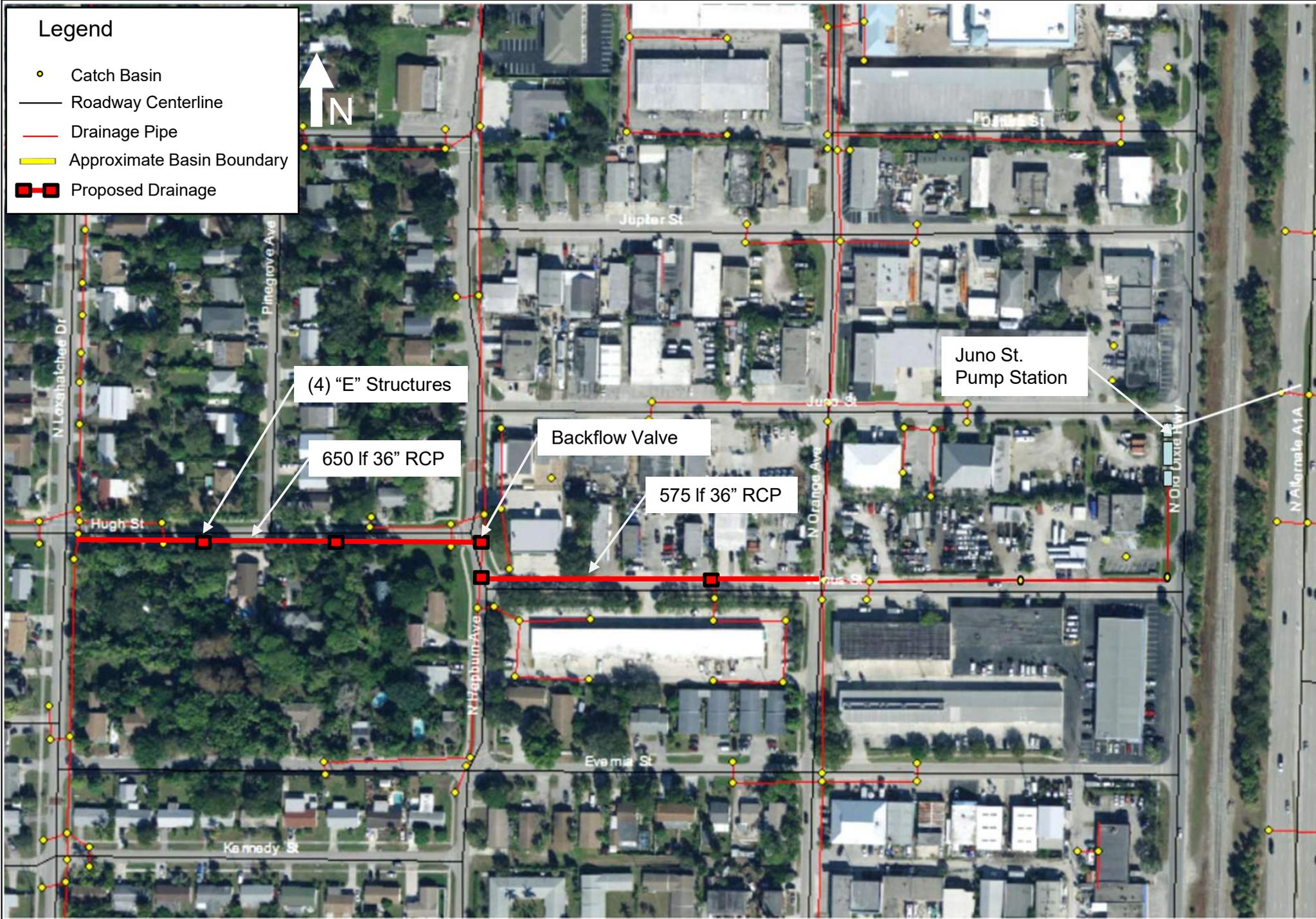
H&S Project Number:
44250-067

Figure 7-22A



Legend

- Catch Basin
- Roadway Centerline
- Drainage Pipe
- Approximate Basin Boundary
- Proposed Drainage



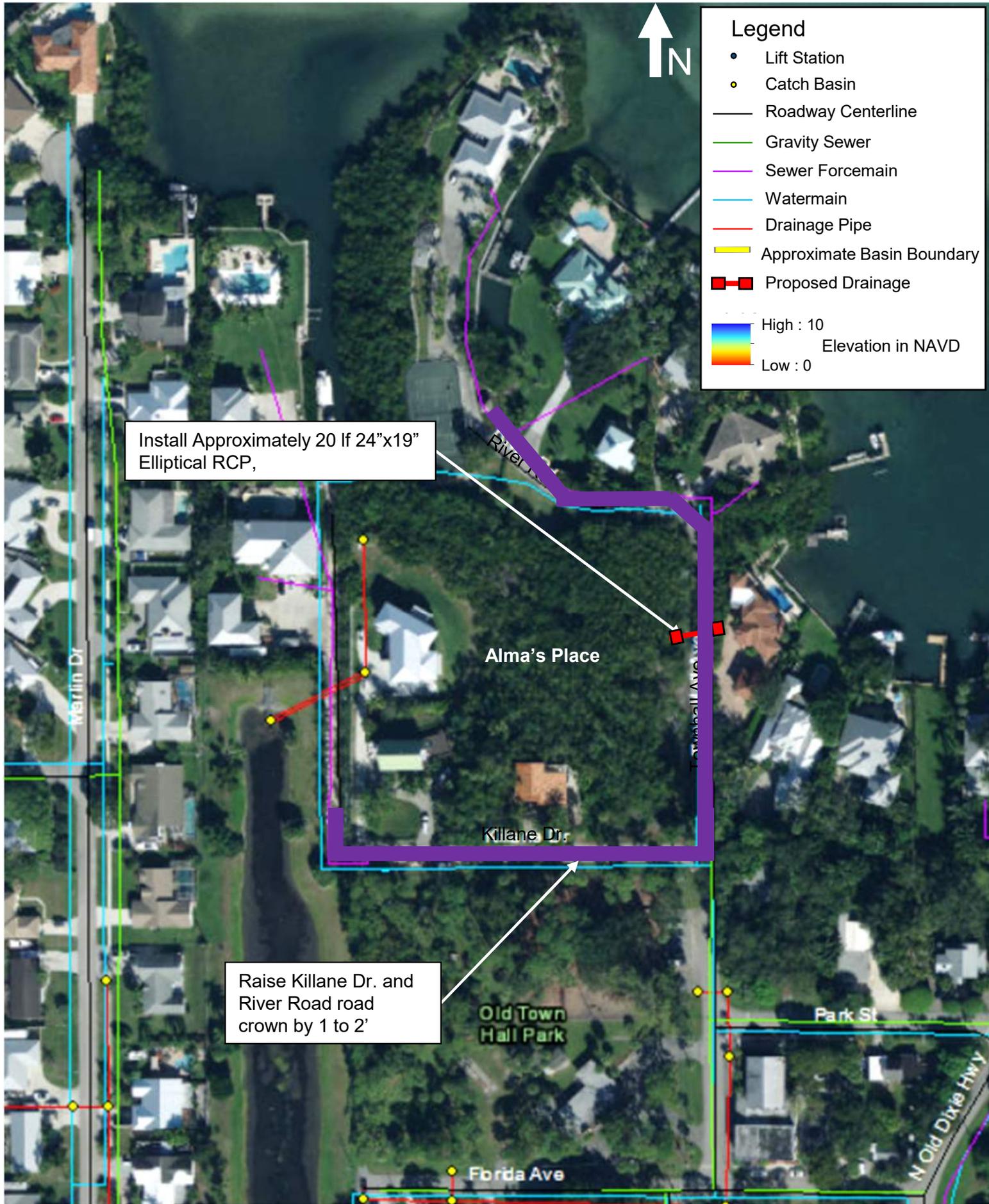
Project Name:

Pine Gardens Interconnect
Town of Jupiter

Proposed Improvements

H&S Project Number:
44250-067

Figure 7-23A



Legend

- Lift Station
 - Catch Basin
 - Roadway Centerline
 - Gravity Sewer
 - Sewer Forcemain
 - Watermain
 - Drainage Pipe
 - Approximate Basin Boundary
 - Proposed Drainage
- High : 10
Elevation in NAVD
Low : 0

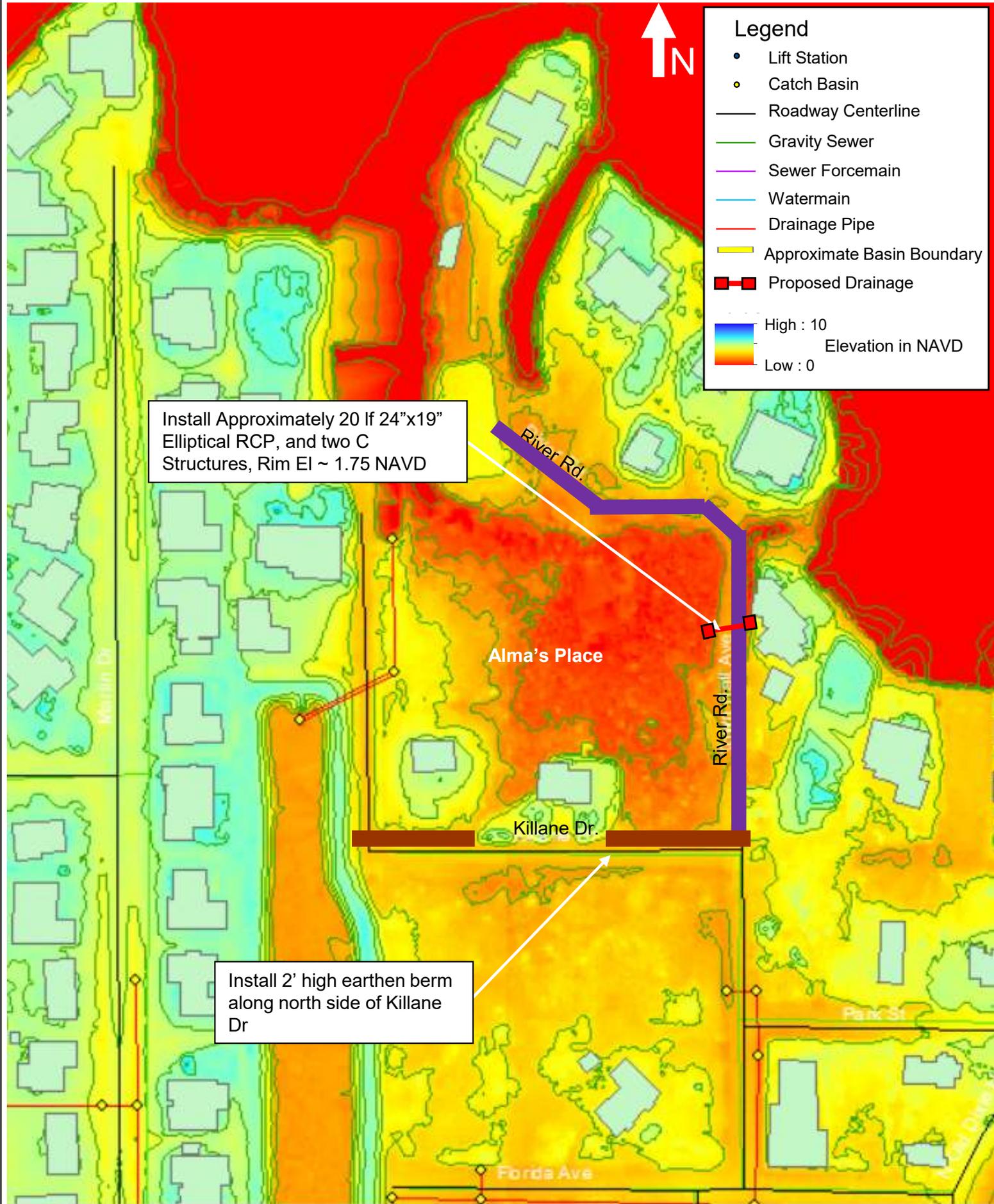
Install Approximately 20 lf 24"x19"
Elliptical RCP,

Raise Killane Dr. and
River Road road
crown by 1 to 2'



Project Name:
**Stormwater Master Plan
Killane Drive**

Proposed Drainage Improvements
H&S Project Number:
44250-067
Figure 7-24A



Install Approximately 20 lf 24"x19" Elliptical RCP, and two C Structures, Rim El ~ 1.75 NAVD

Install 2' high earthen berm along north side of Killane Dr



Project Name:
 Stormwater Master Plan
 River Road

LiDAR Map
 H&S Project Number:
 44250-067
 Figure 7-25A



Sea Level Rise Countywide Vulnerability Analysis Map

The Vulnerability Analysis for Southeast Florida to Sea Level Rise, conducted in 2012, provides 1, 2 and 3 foot sea level rise scenarios. Of the four counties analyzed, Palm Beach County has higher topography and less waterways west of the Intracoastal Waterway, which help limit the potential impacts to our communities.

Select Sea Level Rise Scenario

- 1 ft
- 2 ft
- 3 ft

Legend

- Likely to be inundated
- May be inundated

For additional functionality and map layers:
 Visit PBC's myGeoNav Website

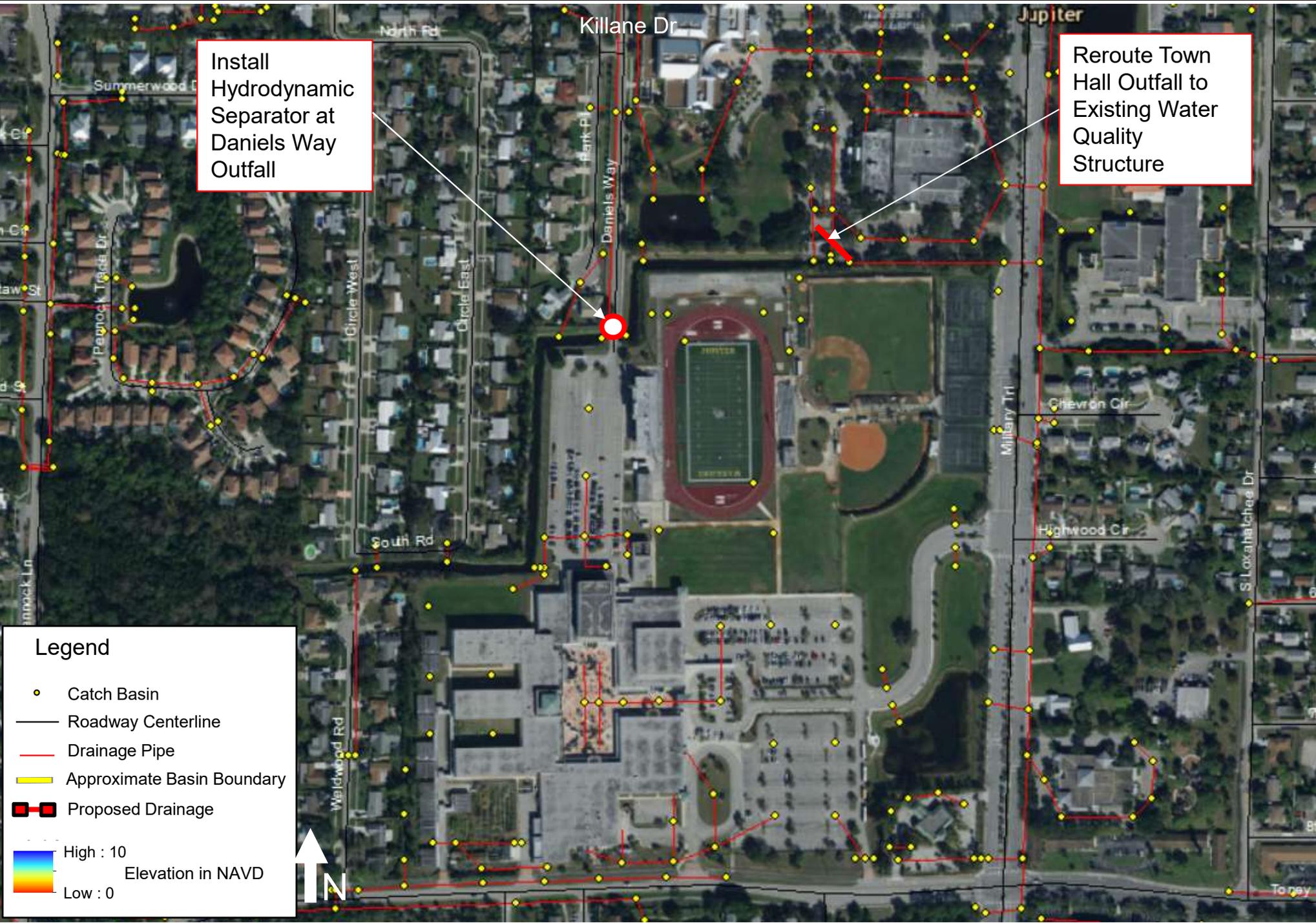
Project Name:
 Stormwater Master Plan
 River Road

Sea Level Rise 3 Feet
 Long View
 H&S Project Number:
 44250-067
 Figure 7-26A



Install Hydrodynamic Separator at Daniels Way Outfall

Reroute Town Hall Outfall to Existing Water Quality Structure



Legend

- Catch Basin
- Roadway Centerline
- Drainage Pipe
- Approximate Basin Boundary
- Proposed Drainage

High : 10
Elevation in NAVD
Low : 0



Project Name: Stormwater Master Plan
Town Hall – JHS – Military Trail

Proposed Drainage Improvements

H&S Project Number: 44250-067

Figure 7-27A

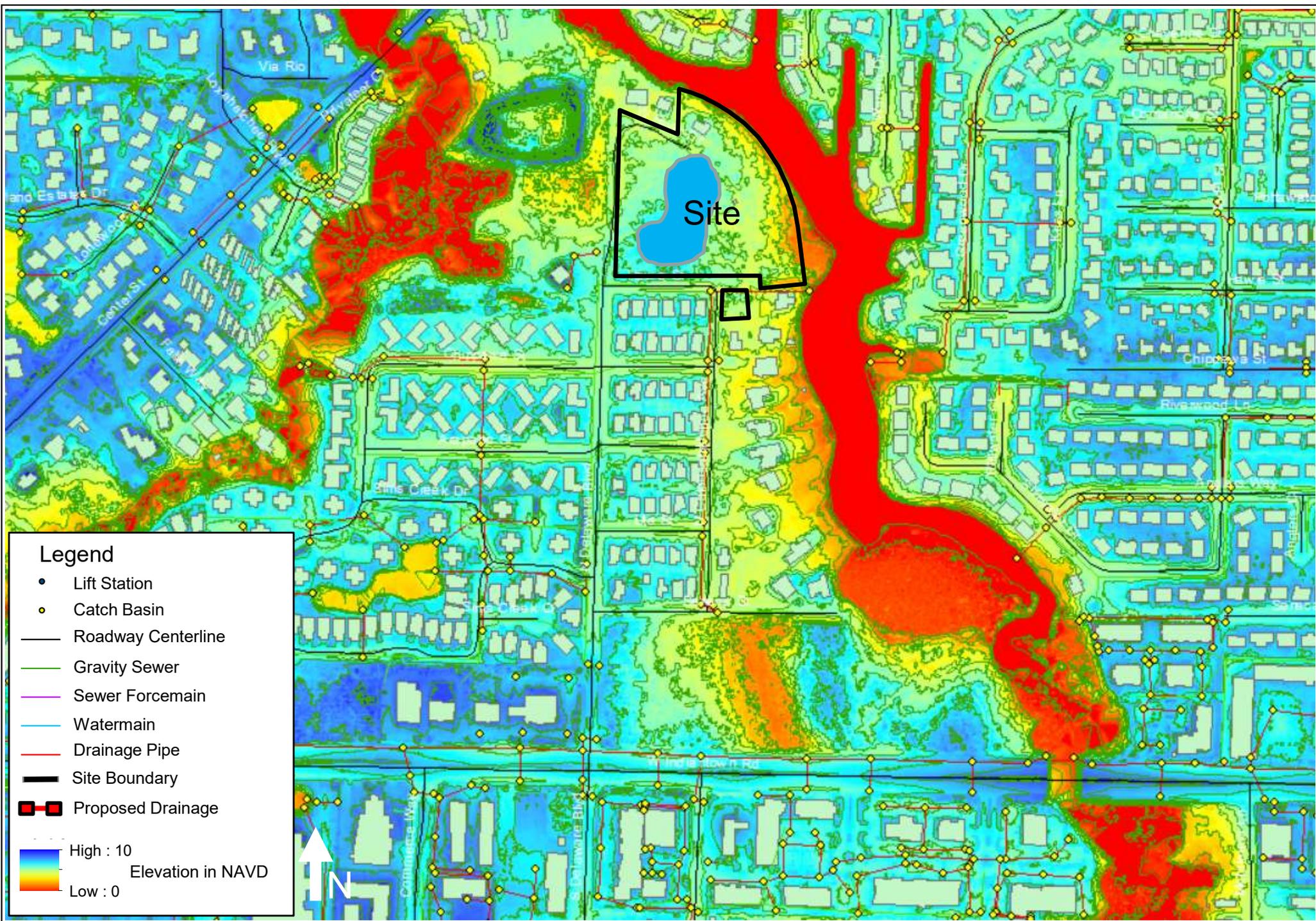


Legend

- Lift Station
- Catch Basin
- Roadway Centerline
- Gravity Sewer
- Sewer Forcemain
- Watermain
- Drainage Pipe
- Site Boundary
- Proposed Drainage

High : 10
Elevation in NAVD
Low : 0

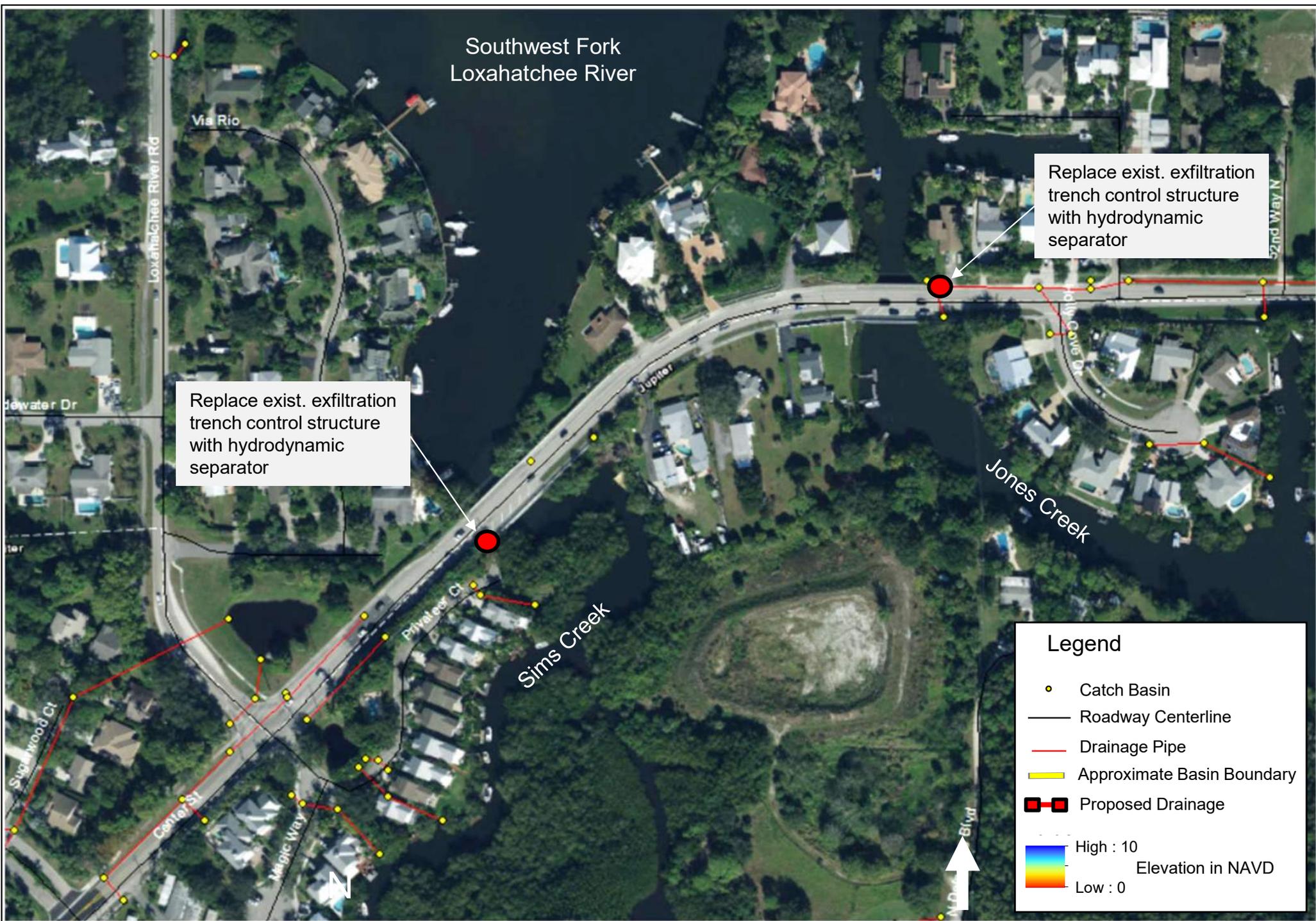




Project Name: Stormwater Master Plan
Loxahatchee Backwaters Natural Area

LiDAR Map
H&S Project Number:
44250-067

Figure 7-29A



Appendix 8: List of Assests – RULs 25 Yrs or Less

Town of Jupiter
Stormwater Master Plan

List of Linear Stormwater Assets
With RULs 25 Years or Less

INSTYEAR	LLENGTH	FSIZE	FMATERIAL	Useful Life	Replacement Cost (per LF)	Replacement Cost (Total)	CIPP Cost (Per LF)	CIPP Cost (Total)	Remaining Useful Life	Material Class	Date Range	Depreciated Cost	AREANAME	ASBUILT
1971	50	24	BCCMP	50	760	38000	163	8125	0	Metal	1970-1979	0	WaterPlant	TurnerQuay_PGD_sht_2of4.pdf
1963	57	36	BCCMP	50	903	51798	250	14349	0	Metal	1960-1969	0	WaterPlant	BrentwoodNorth_PD.pdf
1963	50	36	BCCMP	50	903	45125	250	12500	0	Metal	1960-1969	0	Radio Rd	BrentwoodNorth_PD.pdf
1977	194	24	BCCMP	50	760	147146	163	31462	5	Metal	1970-1979	14715	JupiterRiverEstates	CapitalImprovementsToPhaseD_sht_18of47.pdf
1977	118	12	CAP	50	475	55935	69	8096	5	Metal	1970-1979	5593	GreenwoodCove	CapitalImprovementsToPhaseD_sht_18of47.pdf
1977	291	24	PCAP	50	760	221169	163	47290	5	Metal	1970-1979	22117	Highwood	CapitalImprovements_Zone_1_Area_A_sht_08of39.pdf
1977	279	24	PCAP	50	760	212031	163	45336	5	Metal	1970-1979	21203	NPennockLane	CapitalImprovements_Zone_1_Area_A_sht_08of39.pdf
1978	671	18	CAP	50	570	382676	100	67136	6	Metal	1970-1979	45921	Highwood	dev.pdf
1978	119	18	CAP	50	570	68088	100	11945	6	Metal	1970-1979	8171	Highwood	dev.pdf
1979	35	18	CAP	50	570	20072	100	3521	7	Metal	1970-1979	2810	SouthviewDr	NorthJupiterDrainage_Preliminary.pdf
1980	398	36	CAP	50	903	358821	250	99396	8	Metal	1980-1989	57411	GreenwoodCove	MaplewoodDrive_Widening_PlanDetails_sht_3of5.pdf
1980	251	48	CAP	50	1045	262501	313	78499	8	Metal	1980-1989	42000	GreenwoodCove	HomeDepot_OffSite_Roadway_Improvements_sht_C13of15.f
1980	376	48	CAP	50	1045	392933	313	117504	8	Metal	1980-1989	62869	GreenwoodCove	HomeDepot_OffSite_Roadway_Improvements_sht_C13of15.f
1980	88	48	CAP	50	1045	91523	313	27369	8	Metal	1980-1989	14644	GreenwoodCove	HomeDepot_OffSite_Roadway_Improvements_sht_C13of15.f
1980	209	48	CAP	50	1045	218568	313	65361	8	Metal	1980-1989	34971	GreenwoodCove	HomeDepot_OffSite_Roadway_Improvements_sht_C13of15.f
1984	45	15	CAP	50	523	23660	75	3396	12	Metal	1980-1989	5678	GreenwoodCove	JupiterLandings_PD_sht_3of7.pdf
1984	48	15	CAP	50	523	24956	75	3582	12	Metal	1980-1989	5989	GreenwoodCove	JupiterLandings_PD_sht_3of7.pdf
1984	37	18	CAP	50	570	21275	100	3732	12	Metal	1980-1989	5106	GreenwoodCove	JupiterLandings_PD_sht_3of7.pdf
1984	27	18	CAP	50	570	15157	100	2659	12	Metal	1980-1989	3638	Olympus	JupiterLandings_PD_sht_3of7.pdf
1984	30	18	CAP	50	570	17065	100	2994	12	Metal	1980-1989	4096	Olympus	JupiterLandings_PD_sht_3of7.pdf
1984	30	18	CAP	50	570	17100	100	3000	12	Metal	1980-1989	4104	Olympus	JupiterLandings_PD_sht_2of7.pdf
1984	30	18	CAP	50	570	17100	100	3000	12	Metal	1980-1989	4104	Olympus	JupiterLandings_PD_sht_2of7.pdf
1984	30	18	CAP	50	570	17100	100	3000	12	Metal	1980-1989	4104	Olympus	JupiterLandings_PD_sht_2of7.pdf
1984	30	24	CAP	50	760	23001	163	4918	12	Metal	1980-1989	5520	Olympus	JupiterLandings_PD_sht_3of7.pdf
1984	24	24	CAP	50	760	18050	163	3859	12	Metal	1980-1989	4332	Olympus	JupiterLandings_PD_sht_2of7.pdf
1984	30	24	CAP	50	760	22800	163	4875	12	Metal	1980-1989	5472	Olympus	JupiterLandings_PD_sht_3of7.pdf
1984	30	30	CAP	50	855	25650	225	6750	12	Metal	1980-1989	6156	Olympus	JupiterLandings_PD_sht_3of7.pdf
1984	318	36	CAP	50	903	287349	250	79598	12	Metal	1980-1989	68964	Olympus	JupiterLandings_PD_sht_3of7.pdf
1984	197	36	CAP	50	903	177895	250	49278	12	Metal	1980-1989	42695	OceanWay	JupiterLandings_PD_sht_3of7.pdf
1984	74	18	PCAP	50	570	42377	100	7435	12	Metal	1980-1989	10171	OceanWay	JupiterLandings_PD_sht_4of7.pdf
1984	122	18	PCAP	50	570	69529	100	12198	12	Metal	1980-1989	16687	GreenwoodCove	JupiterLandings_PD_sht_3of7.pdf
1984	128	18	PCAP	50	570	72900	100	12789	12	Metal	1980-1989	17496	GreenwoodCove	JupiterLandings_PD_sht_3of7.pdf
1984	125	18	PCAP	50	570	71250	100	12500	12	Metal	1980-1989	17100	Olympus	JupiterLandings_PD_sht_2of7.pdf
1984	125	18	PCAP	50	570	71250	100	12500	12	Metal	1980-1989	17100	SPennockLane	JupiterLandings_PD_sht_2of7.pdf
1984	130	18	PCAP	50	570	74100	100	13000	12	Metal	1980-1989	17784	ThelmaAve	JupiterLandings_PD_sht_2of7.pdf
1984	126	18	PCAP	50	570	71942	100	12621	12	Metal	1980-1989	17266	ThelmaAve	JupiterLandings_PD_sht_3of7.pdf
1984	125	24	PCAP	50	760	95000	163	20313	12	Metal	1980-1989	22800	ThelmaAve	JupiterLandings_PD_sht_3of7.pdf
1984	133	24	PCAP	50	760	101080	163	21613	12	Metal	1980-1989	24259	JupiterRiverEstates_Nori	JupiterLandings_PD_sht_3of7.pdf
1984	131	24	PCAP	50	760	99883	163	21356	12	Metal	1980-1989	23972	JupiterRiverEstates_Nori	JupiterLandings_PD_sht_3of7.pdf
1984	125	30	PCAP	50	855	106875	225	28125	12	Metal	1980-1989	25650	JupiterRiverEstates_Nori	JupiterLandings_PD_sht_3of7.pdf
1985	68	36	CAP	50	903	61369	250	17000	13	Metal	1980-1989	15956	JupiterRiverEstates_Nori	MaplewoodDrive_Widening_PlanDetails_sht_3of5.pdf
1986	20	24	BCCSP	50	760	15200	163	3250	14	Metal	1980-1989	4256	JupiterRiverEstates_Nori	TheShores_Plat_3_PD_Plan_sht_3of8_C.pdf
1986	20	24	BCCSP	50	760	15200	163	3250	14	Metal	1980-1989	4256	JupiterRiverEstates_Nori	TheShores_Plat_3_PD_Plan_sht_4of8_C.pdf
1986	20	24	BCCSP	50	760	15200	163	3250	14	Metal	1980-1989	4256	JupiterRiverEstates_Nori	TheShores_Plat_3_PD_Plan_sht_4of8_C.pdf
1986	59	30	BCCSP	50	855	50114	225	13188	14	Metal	1980-1989	14032	JupiterRiverEstates_Nori	TheShores_Plat_3_PD_Plan_sht_5of8_C.pdf
1986	20	30	BCCSP	50	855	17100	225	4500	14	Metal	1980-1989	4788	JupiterRiverEstates_Nori	TheShores_Plat_3_PD_Plan_sht_4of8_C.pdf
1986	20	30	BCCSP	50	855	17100	225	4500	14	Metal	1980-1989	4788	JupiterRiverEstates_Nori	TheShores_Plat_2_PD_Plan_sht_6of8_C.pdf
1986	20	36	BCCSP	50	903	18050	250	5000	14	Metal	1980-1989	5054	JupiterRiverEstates_Nori	TheShores_Plat_3_PD_Plan_sht_3of8_C.pdf
1986	20	42	BCCSP	50	950	19000	281	5625	14	Metal	1980-1989	5320	JupiterRiverEstates_Nori	TheShores_Plat_3_PD_Plan_sht_3of8_C.pdf
1986	125	24	CAP	50	760	95000	163	20313	14	Metal	1980-1989	26600	ThelmaAve	TheShores_PD_Plan_sht_06of9C.pdf
1986	109	24	CAP	50	760	82840	163	17712	14	Metal	1980-1989	23195	ThelmaAve	TheShores_Plat_2_PD_Plan_sht_6of8_C.pdf
1986	140	30	CAP	50	855	119651	225	31487	14	Metal	1980-1989	33502	JupiterVillage	TheShores_Plat_2_PD_Plan_sht_5of8_C.pdf
1986	100	30	CAP	50	855	85307	225	22449	14	Metal	1980-1989	23886	SeaLoftersAtJOAndRC	TheShores_Plat_2_PD_Plan_sht_5of8_C.pdf
1986	143	30	CAP	50	855	121975	225	32099	14	Metal	1980-1989	34153	OceanWay	TheShores_Plat_3_PD_Plan_sht_5of8_C.pdf
1986	137	30	CAP	50	855	117135	225	30825	14	Metal	1980-1989	32798	SeaLoftersAtJOAndRC	TheShores_Plat_3_PD_Plan_sht_4of8_C.pdf
1986	148	36	CAP	50	903	133570	250	37000	14	Metal	1980-1989	37400	SeaLoftersAtJOAndRC	TheShores_Plat_3_PD_Plan_sht_3of8_C.pdf
1986	50	12	CMP	50	475	23969	69	3469	14	Metal	1980-1989	6711	OceanWay	HeightsOfJupiter_Culvert_EndWall_Rehabilitation_sht_C4_6o
1986	259	15	CMP	50	523	135558	75	19458	14	Metal	1980-1989	37956	JupiterOceanRC	HeightsOfJupiter_Culvert_EndWall_Rehabilitation_sht_C4_6o
1986	338	24	CMP	50	760	256516	163	54847	14	Metal	1980-1989	71824	JupiterOceanRC	NPBHWCD_ImprovementBond_1985_sht_05of18.pdf
1986	249	24	CMP	50	760	189503	163	40519	14	Metal	1980-1989	53061	JupiterBay	NPBHWCD_ImprovementBond_1985_sht_05of18.pdf
1986	48	30	CMP	50	855	41229	225	10850	14	Metal	1980-1989	11544	JupiterBay	NPBHWCD_ImprovementBond_1985_sht_05of18.pdf

Town of Jupiter
Stormwater Master Plan

List of Linear Stormwater Assets
With RULs 25 Years or Less

INSTYEAR	LLENGTH	FSIZE	FMATERIAL	Useful Life	Replacement Cost (per LF)	Replacement Cost (Total)	CIPP Cost (Per LF)	CIPP Cost (Total)	Remaining Useful Life	Material Class	Date Range	Depreciated Cost	AREANAME	ASBUILT
1986	259	30	CMP	50	855	221116	225	58188	14	Metal	1980-1989	61912	JupiterBay_East	HeightsOfJupiter_Culvert_EndWall_Rehabilitation_sht_C4_6c
1986	267	36	CMP	50	903	241231	250	66823	14	Metal	1980-1989	67545	JupiterBay	NPBHWCD_ImprovementBond_1985_sht_05of18.pdf
1986	62	36	CMP	50	903	55892	250	15482	14	Metal	1980-1989	15650	JupiterBay_East	HeightsOfJupiter_Culvert_EndWall_Rehabilitation_sht_C1_3c
1986	82	36	CMP	50	903	74195	250	20553	14	Metal	1980-1989	20775	JupiterBay_East	HeightsOfJupiter_Culvert_EndWall_Rehabilitation_sht_C1_3c
1986	62	36	CMP	50	903	55544	250	15386	14	Metal	1980-1989	15552	JupiterBay_East	HeightsOfJupiter_Culvert_EndWall_Rehabilitation_sht_C1_3c
1986	52	36	CMP	50	903	46644	250	12921	14	Metal	1980-1989	13060	IndianCreek	HeightsOfJupiter_Culvert_EndWall_Rehabilitation_sht_C1_3c
1986	369	36	CMP	50	903	333293	250	92325	14	Metal	1980-1989	93322	Town Hall Ave	HeightsOfJupiter_Culvert_EndWall_Rehabilitation_sht_C4_6c
1986	297	36	CMP	50	903	267642	250	74139	14	Metal	1980-1989	74940	Bluffs_Ridge	NPBHWCD_ImprovementBond_1985_sht_05of18.pdf
1986	52	42	CMP	50	950	49101	281	14536	14	Metal	1980-1989	13748	FloridaAve	HeightsOfJupiter_Culvert_EndWall_Rehabilitation_sht_C1_3c
1986	62	60	CMP	50	1140	70122	438	26911	14	Metal	1980-1989	19634	LoxahatcheeClub	HeightsOfJupiter_Culvert_EndWall_Rehabilitation_sht_C1_3c
1986	82	60	CMP	50	1140	92925	438	35662	14	Metal	1980-1989	26019	JupiterParkOfCommerce	HeightsOfJupiter_Culvert_EndWall_Rehabilitation_sht_C1_3c
1986	61	60	CMP	50	1140	69586	438	26705	14	Metal	1980-1989	19484	JupiterParkOfCommerce	HeightsOfJupiter_Culvert_EndWall_Rehabilitation_sht_C1_3c
1986	51	60	CMP	50	1140	58415	438	22418	14	Metal	1980-1989	16356	JupiterParkOfCommerce	HeightsOfJupiter_Culvert_EndWall_Rehabilitation_sht_C1_3c
1986	53	60	CMP	50	1140	59956	438	23009	14	Metal	1980-1989	16788	JupiterParkOfCommerce	HeightsOfJupiter_Culvert_EndWall_Rehabilitation_sht_C1_3c
1986	132	15	PCAP	50	523	68746	75	9868	14	Metal	1980-1989	19249	JupiterParkOfCommerce	MarlinRidge_sht_2of6.pdf
1986	111	15	PCAP	50	523	58115	75	8342	14	Metal	1980-1989	16272	JupiterParkOfCommerce	MarlinRidge_sht_2of6.pdf
1987	159	24	BCCSP	50	760	120697	163	25807	15	Metal	1980-1989	36209	JupiterParkOfCommerce	MysticCove_sht_3of5.pdf
1987	130	24	CAP	50	760	98800	163	21125	15	Metal	1980-1989	29640	JupiterParkOfCommerce	TheShores_Plat_5_PD_Plan_sht_3of5_C.pdf
1987	145	24	CAP	50	760	110200	163	23563	15	Metal	1980-1989	33060	Hamptons	TheShores_Plat_5_PD_Plan_sht_3of5_C.pdf
1987	139	24	CAP	50	760	105640	163	22588	15	Metal	1980-1989	31692	TheHeightsOfJupiter	TheShores_Plat_5_PD_Plan_sht_3of5_C.pdf
1987	31	24	CAP	50	760	23205	163	4962	15	Metal	1980-1989	6962	TheHeightsOfJupiter	TheShores_Plat_5_PD_Plan_sht_3of5_C.pdf
1987	140	36	CAP	50	903	126520	250	35047	15	Metal	1980-1989	37956	TheHeightsOfJupiter	TheShores_Plat_6_PD_Plan_sht_2of5_C.pdf
1987	76	42	CAP	50	950	72063	281	21335	15	Metal	1980-1989	21619	TheHeightsOfJupiter	TheShores_Plat_4_PD_Plan_sht_3of7_C.pdf
1988	20	15	ALCMP	50	523	10450	75	1500	16	Metal	1980-1989	3344	TheHeightsOfJupiter	TheHamptonsAtMaplewood_PGD_Plans_sht_09of26.pdf
1988	20	18	ALCMP	50	570	11400	100	2000	16	Metal	1980-1989	3648	TheHeightsOfJupiter	TheHamptonsAtMaplewood_PGD_Plans_sht_06of26.pdf
1988	20	18	ALCMP	50	570	11400	100	2000	16	Metal	1980-1989	3648	TheHeightsOfJupiter	TheHamptonsAtMaplewood_PGD_Plans_sht_08of26.pdf
1988	20	24	ALCMP	50	760	15200	163	3250	16	Metal	1980-1989	4864	TheHeightsOfJupiter	TheHamptonsAtMaplewood_PGD_Plans_sht_06of26.pdf
1988	20	24	ALCMP	50	760	15200	163	3250	16	Metal	1980-1989	4864	TheHeightsOfJupiter	TheHamptonsAtMaplewood_PGD_Plans_sht_06of26.pdf
1988	20	24	ALCMP	50	760	15200	163	3250	16	Metal	1980-1989	4864	TheHeightsOfJupiter	TheHamptonsAtMaplewood_PGD_Plans_sht_08of26.pdf
1988	20	24	ALCMP	50	760	15200	163	3250	16	Metal	1980-1989	4864	TheHeightsOfJupiter	TheHamptonsAtMaplewood_PGD_Plans_sht_08of26.pdf
1988	20	30	ALCMP	50	855	17100	225	4500	16	Metal	1980-1989	5472	TheHeightsOfJupiter	TheHamptonsAtMaplewood_PGD_Plans_sht_09of26.pdf
1988	20	36	ALCMP	50	903	18050	250	5000	16	Metal	1980-1989	5776	TheHeightsOfJupiter	TheHamptonsAtMaplewood_PGD_Plans_sht_08of26.pdf
1988	20	36	ALCMP	50	903	18050	250	5000	16	Metal	1980-1989	5776	TheHeightsOfJupiter	TheHamptonsAtMaplewood_PGD_Plans_sht_09of26.pdf
1988	20	36	ALCMP	50	903	18050	250	5000	16	Metal	1980-1989	5776	TheHeightsOfJupiter	TheHamptonsAtMaplewood_PGD_Plans_sht_09of26.pdf
1988	20	42	ALCMP	50	950	19000	281	5625	16	Metal	1980-1989	6080	TheHeightsOfJupiter	TheHamptonsAtMaplewood_PGD_Plans_sht_07of26.pdf
1988	242	24	CAP	50	760	184212	163	39387	16	Metal	1980-1989	58948	TheHeightsOfJupiter	HammockTrace_PGD_sht_2of3.pdf
1988	59	24	CAP	50	760	44585	163	9533	16	Metal	1980-1989	14267	TheHeightsOfJupiter	CapitalImprovements_Zone_1_Area_A_sht_24of39.pdf
1988	65	24	CAP	50	760	49510	163	10586	16	Metal	1980-1989	15843	TheHeightsOfJupiter	CapitalImprovements_Zone_1_Area_A_sht_24of39.pdf
1988	38	24	CAP	50	760	29191	163	6242	16	Metal	1980-1989	9341	TheHeightsOfJupiter	CapitalImprovements_Zone_1_Area_A_sht_24of39.pdf
1988	61	24	CMP	50	760	46519	163	9947	16	Metal	1980-1989	14886	TheHeightsOfJupiter	CapitalImprovements_Zone_1_Area_A_sht_24of39.pdf
1963	113	18	RCP	75	570	64559	100	11326	16	Concrete	1960-1969	13773	TheHeightsOfJupiter	RioVista_sht_1of1.pdf
1989	65	12	CAP	50	475	31028	69	4491	17	Metal	1980-1989	10549	TheHeightsOfJupiter	JupiterMunicipalBuilding_Addition-Alteration_PD_Plan_sht_A-
1989	52	36	CAP	50	903	46653	250	12923	17	Metal	1980-1989	15862	TheHeightsOfJupiter	IndianCreekDriveWest_sht_04of12.pdf
1989	175	12	CMP	50	475	82935	69	12004	17	Metal	1980-1989	28198	TheHeightsOfJupiter	JupiterMunicipalBuilding_Addition-Alteration_PD_Plan_sht_A-
1989	204	12	CMP	50	475	97023	69	14043	17	Metal	1980-1989	32988	TheHeightsOfJupiter	JupiterMunicipalBuilding_Addition-Alteration_PD_Plan_sht_A-
1990	88	24	AAP	50	760	66521	163	14223	18	Metal	1990-1999	23948	TheHeightsOfJupiter	EastviewManorDitch_sht_2of6.pdf
1990	272	24	AAP	50	760	206708	163	44197	18	Metal	1990-1999	74415	TheHeightsOfJupiter	EastviewManorDitch_sht_2of6.pdf
1990	236	29	AAP	50	855	201471	225	53019	18	Metal	1990-1999	72530	TheHeightsOfJupiter	EastviewManorDitch_sht_2of6.pdf
1990	290	29	AAP	50	855	248374	225	65362	18	Metal	1990-1999	89415	TheHeightsOfJupiter	EastviewManorDitch_sht_2of6.pdf
1990	309	29	AAP	50	855	264438	225	69589	18	Metal	1990-1999	95198	TheHeightsOfJupiter	EastviewManorDitch_sht_2of6.pdf
1990	308	29	AAP	50	855	263289	225	69286	18	Metal	1990-1999	94784	TheHeightsOfJupiter	EastviewManorDitch_sht_2of6.pdf
1990	303	29	AAP	50	855	258878	225	68126	18	Metal	1990-1999	93196	TheHeightsOfJupiter	EastviewManorDitch_sht_2of6.pdf
1992	342	29	AAP	50	855	292383	225	76943	20	Metal	1990-1999	116953	TheHeightsOfJupiter	EastviewManorDitch_sht_2of6.pdf
1992	22	29	AAP	50	855	18704	225	4922	20	Metal	1990-1999	7481	TheHeightsOfJupiter	EastviewManorDitch_sht_2of6.pdf
1992	309	48	BCCSP	50	1045	322667	313	96491	20	Metal	1990-1999	129067	TheHeightsOfJupiter	GreenbrierAtIndianCreek_PD_Plan_sht_2of5C.pdf
1992	264	48	BCCSP	50	1045	276343	313	82638	20	Metal	1990-1999	110537	TheHeightsOfJupiter	GreenbrierAtIndianCreek_PD_Plan_sht_2of5C.pdf
1992	213	48	BCCSP	50	1045	222231	313	66457	20	Metal	1990-1999	88893	TheHeightsOfJupiter	GreenbrierAtIndianCreek_PD_Plan_sht_2of5C.pdf
1992	20	48	CMP	50	1045	20900	313	6250	20	Metal	1990-1999	8360	TheHeightsOfJupiter	JPC_Phase_II_A_GPD_sht_07of21.pdf
1993	41	18	CMP	50	570	23370	100	4100	21	Metal	1990-1999	9815	TheHeightsOfJupiter	EgretLanding_011of141.pdf
1993	13	18	CMP	50	570	7200	100	1263	21	Metal	1990-1999	3024	TheHeightsOfJupiter	EgretLanding_013of141.pdf
1993	21	20	CMP	50	570	11990	100	2104	21	Metal	1990-1999	5036	TheHeightsOfJupiter	JupiterRiverEstates_WaterDistributionImprovements_sht_C_3

INSTYEAR	LLENGTH	FSIZE	FMATERIAL	Useful Life	Replacement Cost (per LF)	Replacement Cost (Total)	CIPP Cost (Per LF)	CIPP Cost (Total)	Remaining Useful Life	Material Class	Date Range	Depreciated Cost	AREANAME	ASBUILT
1993	22	20	CMP	50	570	12307	100	2159	21	Metal	1990-1999	5169	TheHeightsOfJupiter	JupiterRiverEstates_WaterDistributionImprovements_sht_C_3
1993	23	20	CMP	50	570	13016	100	2283	21	Metal	1990-1999	5467	TheHeightsOfJupiter	JupiterRiverEstates_WaterDistributionImprovements_sht_C_3
1993	20	20	CMP	50	570	11438	100	2007	21	Metal	1990-1999	4804	TheHeightsOfJupiter	JupiterRiverEstates_WaterDistributionImprovements_sht_C_3
1993	20	24	CMP	50	760	15200	163	3250	21	Metal	1990-1999	6384	TheHeightsOfJupiter	EgretLanding_062of141.pdf
1993	20	24	CMP	50	760	15200	163	3250	21	Metal	1990-1999	6384	TheHeightsOfJupiter	EgretLanding_051of141.pdf
1993	20	24	CMP	50	760	15200	163	3250	21	Metal	1990-1999	6384	TheHeightsOfJupiter	EgretLanding_052of141.pdf
1993	20	24	CMP	50	760	15200	163	3250	21	Metal	1990-1999	6384	TheHeightsOfJupiter	EgretLanding_053of141.pdf
1993	13	24	CMP	50	760	9528	163	2037	21	Metal	1990-1999	4002	TheHeightsOfJupiter	EgretLanding_063of141.pdf
1993	20	24	CMP	50	760	15200	163	3250	21	Metal	1990-1999	6384	TheHeightsOfJupiter	EgretLanding_060of141.pdf
1993	20	24	CMP	50	760	15200	163	3250	21	Metal	1990-1999	6384	TheHeightsOfJupiter	EgretLanding_054of141.pdf
1993	20	24	CMP	50	760	15081	163	3225	21	Metal	1990-1999	6334	Pinecrest	EgretLanding_050of141.pdf
1993	20	24	CMP	50	760	15200	163	3250	21	Metal	1990-1999	6384	ThelmaAve	EgretLanding_041of141.pdf
1993	20	24	CMP	50	760	15445	163	3302	21	Metal	1990-1999	6487	ThelmaAve	EgretLanding_040of141.pdf
1993	18	24	CMP	50	760	13946	163	2982	21	Metal	1990-1999	5857	ThelmaAve	EgretLanding_039of141.pdf
1993	20	24	CMP	50	760	15525	163	3320	21	Metal	1990-1999	6521	MaplewoodDr	EgretLanding_036of141.pdf
1993	43	30	CMP	50	855	36547	225	9618	21	Metal	1990-1999	15350	MaplewoodDr	EgretLanding_037of141.pdf
1993	21	30	CMP	50	855	17647	225	4644	21	Metal	1990-1999	7412	MaplewoodDr	EgretLanding_010of141.pdf
1993	20	30	CMP	50	855	17100	225	4500	21	Metal	1990-1999	7182	Shores	EgretLanding_021of141.pdf
1993	21	36	CMP	50	903	18903	250	5236	21	Metal	1990-1999	7939	Shores	EgretLanding_020of141.pdf
1993	5	36	CMP	50	903	4874	250	1350	21	Metal	1990-1999	2047	Shores	EgretLanding_029of141.pdf
1993	6	36	CMP	50	903	5093	250	1411	21	Metal	1990-1999	2139	EgretCove	EgretLanding_029of141.pdf
1993	20	36	CMP	50	903	18050	250	5000	21	Metal	1990-1999	7581	MaplewoodDr	EgretLanding_010of141.pdf
1993	20	36	CMP	50	903	18050	250	5000	21	Metal	1990-1999	7581	Shores	EgretLanding_010of141.pdf
1993	20	36	CMP	50	903	18050	250	5000	21	Metal	1990-1999	7581	Shores	EgretLanding_026of141.pdf
1993	56	36	CMP	50	903	50846	250	14085	21	Metal	1990-1999	21355	Shores	EgretLanding_031of141.pdf
1993	40	42	CMP	50	950	37625	281	11139	21	Metal	1990-1999	15803	Shores	EgretLanding_015of141.pdf
1993	20	42	CMP	50	950	19007	281	5627	21	Metal	1990-1999	7983	SPennockLane	EgretLanding_058of141.pdf
1993	20	42	CMP	50	950	19000	281	5625	21	Metal	1990-1999	7980	SPennockLane	EgretLanding_044of141.pdf
1993	19	42	CMP	50	950	18226	281	5396	21	Metal	1990-1999	7655	S A1A	EgretLanding_032of141.pdf
1995	132	24	CAP	50	760	100210	163	21427	23	Metal	1990-1999	46097	Hamptons	dev.pdf
1995	22	18	CMP	50	570	12591	100	2209	23	Metal	1990-1999	5792	ToneyPennaDr	OldJupiterBeachRoad_PD_Project_sht_07_PandP.pdf
1970	48	8	PVC	75	333	15814	50	2378	23	PVC/HDPE	1970-1979	4850	ToneyPennaDr	FishermansLanding_SwaleImprovements_sht_3of4.pdf
1970	37	15	RCP	75	523	19212	75	2758	23	Concrete	1970-1979	5892	ToneyPennaDr	TOJ_JonesCreekBasinImprovements_sht_05of12.pdf
1970	36	15	RCP	75	523	18947	75	2720	23	Concrete	1970-1979	5811	ToneyPennaDr	TOJ_JonesCreekBasinImprovements_sht_06of12.pdf
1970	172	15	RCP	75	523	89897	75	12904	23	Concrete	1970-1979	27569	ToneyPennaDr	TOJ_JonesCreekBasinImprovements_sht_05of12.pdf
1970	83	15	RCP	75	523	43334	75	6220	23	Concrete	1970-1979	13289	ToneyPennaDr	TOJ_JonesCreekBasinImprovements_sht_06of12.pdf
1970	198	18	RCP	75	570	112881	100	19804	23	Concrete	1970-1979	34617	DanielsWay	DrKsAnimalHospital_sht_3of6.pdf
1970	88	18	RCP	75	570	50292	100	8823	23	Concrete	1970-1979	15423	ToneyPennaDr	TOJ_JonesCreekBasinImprovements_sht_05of12.pdf
1970	104	18	RCP	75	570	59312	100	10406	23	Concrete	1970-1979	18189	Hamptons	AllWebEnterprises_sht_D1.pdf
1970	383	24	RCP	75	760	291349	163	62295	23	Concrete	1970-1979	89347	Hamptons	CommerceLaneExtension_sht_2of4.pdf
1970	51	24	RCP	75	760	38445	163	8220	23	Concrete	1970-1979	11790	Yacht Club Estates	TOJ_JonesCreekBasinImprovements_sht_06of12.pdf
1970	187	24	RCP	75	760	142225	163	30410	23	Concrete	1970-1979	43616	JupiterCommunityPark	TOJ_JonesCreekBasinImprovements_sht_06of12.pdf
1970	17	36	RCP	75	903	15359	250	4255	23	Concrete	1970-1979	4710	JupiterCommunityPark	TOJ_JonesCreekBasinImprovements_sht_05of12.pdf
1970	697	36	RCP	75	903	629154	250	174281	23	Concrete	1970-1979	192941	JupiterCommunityPark	AllWebEnterprises_sht_D1.pdf
1996	21	24	CMP	50	760	15931	163	3406	24	Metal	1990-1999	7647	JupiterCommunityPark	JupiterParkOfCommerce_GPD_Plan_sht_03of13.pdf
1996	20	24	CMP	50	760	15200	163	3250	24	Metal	1990-1999	7296	JupiterCommunityPark	JupiterParkOfCommerce_GPD_Plan_sht_03of13.pdf
1996	20	54	CMP	50	1093	21850	375	7500	24	Metal	1990-1999	10488	JupiterCommunityPark	JupiterParkOfCommerce_GPD_Plan_sht_03of13.pdf
1971	33	24	RCP	75	760	25028	163	5351	24	Concrete	1970-1979	8009	JupiterCommunityPark	TurnerQuay_PGD_sht_2of4.pdf
1997	108	18	CAP	50	570	61614	100	10809	25	Metal	1990-1999	30807	JupiterCommunityPark	RiversideDr_NorfolkRd_sht_07of16.pdf
1997	109	24	CMP	50	760	82567	163	17654	25	Metal	1990-1999	41283	JupiterCommunityPark	FishermansLanding_SwaleImprovements_sht_3of4.pdf

Appendix 10: Financial Forecast

TOWN OF JUPITER - STORMWATER SYSTEM
Appendix 10A - Cash Flow Analysis

Line No.	Description	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
1	Growth % of Stormwater Utility Charges Over Prior Yr	101.2%	107.2%	107.2%	107.2%	107.2%	102.6%	102.7%	102.6%	102.6%	102.6%
2	Adjusted Operating Fund Balance	\$ 5,383,269	\$ 4,033,569	\$ 3,424,870	\$ 3,023,653	\$ 2,782,192	\$ 2,711,997	\$ 2,635,336	\$ 2,584,182	\$ 2,513,317	\$ 2,420,020
3	Add: Operating Income Excluding GF Xfers & FCA	1,508,745	1,532,064	1,716,054	1,914,553	2,125,837	2,155,191	2,184,385	2,212,347	2,238,538	2,264,340
4	Less: General Fund Transfers & Full Cost Allocation	(181,439)	(198,205)	(208,115)	(218,521)	(229,447)	(240,919)	(252,965)	(265,614)	(278,894)	(292,839)
5	Add: Debt/Bond Proceeds for Operating Fund	-	-	-	-	-	-	-	-	-	-
6	Less: Debt Service	(453,623)	(453,623)	(453,623)	(453,623)	(453,623)	(453,623)	(453,623)	(453,623)	(453,623)	(453,623)
7	Less: Capital Project Expenditures	(639,753)	(151,780)	(156,333)	(161,023)	(165,853)	(170,829)	(175,954)	(181,233)	(186,670)	(192,270)
8	Less: Capital Equipment Expenditures	(125,500)	(141,000)	(87,125)	(89,303)	(91,536)	(93,824)	(96,170)	(98,574)	(101,038)	(103,564)
9	Less: Capitalized Salaries	(18,400)	-	-	-	-	-	-	-	-	-
10	Less: Transfers to R&R Fund	(675,879)	(696,155)	(717,040)	(738,551)	(760,708)	(783,529)	(807,035)	(831,246)	(856,183)	(881,868)
11	Less: Additional Transfer to R&R Fund	-	(500,000)	(500,000)	(500,000)	(500,000)	(500,000)	(500,000)	(500,000)	(500,000)	(500,000)
12	Less: Transfer to Availability Fee Fund	(764,751)	-	-	-	-	-	-	-	-	-
13	Add: Transfer fr Availability Fee Fund	-	-	-	-	-	-	38,691	38,691	38,691	38,691
14	Less: Transfers to CIP	-	-	-	-	-	-	-	-	-	-
15	Less: Reimbursement to Water Fund	-	-	-	-	-	-	-	-	-	-
16	Adj: Adjustment to Tie to Financial Statement	-	-	-	-	-	-	-	-	-	-
18	Oper. Funds Avail. for Future CIP before Int. Income	4,032,669	3,424,870	3,018,688	2,777,185	2,706,863	2,624,463	2,572,665	2,504,931	2,414,137	2,298,887
19	Add Interest Income	900	-	4,965	5,008	5,134	10,873	11,516	8,386	5,883	9,390
20	Oper Fund Bal Incl Working Capital & Reserves	4,033,569	3,424,870	3,023,653	2,782,192	2,711,997	2,635,336	2,584,182	2,513,317	2,420,020	2,308,278
21	Renewal & Replacement Fund Balance	8,960,406	3,319,230	1,654,481	1,831,631	2,382,805	2,396,086	3,140,429	3,168,034	128,408	827,453
22	Add: Annual Contribution to R&R Fund	675,879	696,155	717,040	738,551	760,708	783,529	807,035	831,246	856,183	881,868
23	Add: Additional Transfer from Operating Fund	-	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000
24	Add: Other Non-Oper Income (Grants & Open Space)	4,038,743	175,255	91,789	-	-	208,959	172,182	4,034,663	-	-
25	Add: Infrastructure Equity Program Cash Receipts	10,195	6,195	6,195	6,195	-	-	-	-	-	-
26	Add: Debt/Bond Proceeds for R&R	-	-	-	-	-	-	-	-	-	-
27	Add: Transfers From 310 IEP/Open Space	-	549,212	-	-	-	-	-	2,017,331	-	-
28	Less: Capital Project Expenditures	(10,365,993)	(3,591,566)	(1,137,874)	(693,572)	(1,247,427)	(748,145)	(1,451,612)	(10,422,866)	(657,138)	(1,495,432)
29	Adj: Adjustment for Balance Sheet Items - AP	-	-	-	-	-	-	-	-	-	-
30	Net R&R Funds Avail for Future CIP before Int	3,319,230	1,654,481	1,831,631	2,382,805	2,396,086	3,140,429	3,168,034	128,408	827,453	713,889
31	Add Interest Income	-	-	-	-	-	-	-	-	-	-
32	R&R Fund Balance After Adjustment	3,319,230	1,654,481	1,831,631	2,382,805	2,396,086	3,140,429	3,168,034	128,408	827,453	713,889
33	Availability Fees/Inlet Village Fund Balance	(764,751)	-	-	-	-	-	-	-	-	-
34	Add: Annual Contribution to Inlet Village Fund	-	-	-	-	-	-	38,691	38,691	38,691	38,691
35	Less: Debt Service	-	-	-	-	-	-	-	-	-	-
36	Less: Capital Project Expenditures	-	-	-	-	-	-	-	-	-	-
37	Add: Transfer from Operating Fund	764,751	-	-	-	-	-	-	-	-	-
38	Less: Transfer to Operating Fund	-	-	-	-	-	-	(38,691)	(38,691)	(38,691)	(38,691)
39	Adj: Adjustment for Balance Sheet Items - AP	-	-	-	-	-	-	-	-	-	-
41	Net Inlet Village Funds Avail before Int	-	-	-	-	-	-	-	-	-	-
42	Add Interest Income	-	-	-	-	-	-	-	-	-	-
43	Availability Fees/Inlet Village Fund Balance	-	-	-	-	-	-	-	-	-	-
44	Total Fund Balance at Year End	\$ 7,352,799	\$ 5,079,351	\$ 4,855,284	\$ 5,164,997	\$ 5,108,083	\$ 5,775,765	\$ 5,752,216	\$ 2,641,725	\$ 3,247,473	\$ 3,022,167

- Notes:
- (1) Transfers for the Microsoft Enterprise Agreement. Total project cost is \$500,715 and includes funding from Water and general revenue.
 - (2) Per Resolution 48-10, annual R&R reserve funding deposit goal is \$500,000.
 - (3) Minimum R&R reserve balance goal is \$500,000.
 - (4) Minimum fund balance goal is \$3,000,000.

TOWN OF JUPITER - STORMWATER SYSTEM
Appendix 10A - Cash Flow Analysis

Line No.	Description	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
1	Growth % of Stormwater Utility Charges Over Prior Yr	<u>102.6%</u>	<u>102.6%</u>	<u>102.6%</u>	<u>102.6%</u>	<u>102.6%</u>	<u>102.5%</u>	<u>102.5%</u>	<u>102.5%</u>	<u>102.5%</u>	<u>102.5%</u>
2	Adjusted Operating Fund Balance	\$ 2,308,278	\$ 2,171,398	\$ 2,261,485	\$ 2,323,335	\$ 2,809,525	\$ 3,257,827	\$ 3,665,288	\$ 4,018,936	\$ 4,321,998	\$ 4,565,187
3	Add: Operating Income Excluding GF Xfers & FCA	2,289,313	2,313,361	2,335,272	2,354,830	2,371,922	2,382,082	2,387,141	2,389,162	2,387,891	2,382,951
4	Less: General Fund Transfers & Full Cost Allocation	(307,481)	(322,855)	(338,998)	(355,948)	(373,745)	(392,432)	(412,054)	(432,657)	(454,289)	(477,004)
5	Add: Debt/Bond Proceeds for Operating Fund	-	-	-	-	-	-	-	-	-	-
6	Less: Debt Service	(453,623)	(453,623)	(453,623)	-	-	-	-	-	-	-
7	Less: Capital Project Expenditures	(198,038)	(203,979)	(210,099)	(216,401)	(222,894)	(229,581)	(236,468)	(243,562)	(250,869)	(258,395)
8	Less: Capital Equipment Expenditures	(106,153)	(108,807)	(111,527)	(114,316)	(117,173)	(120,103)	(123,105)	(126,183)	(129,338)	(132,571)
9	Less: Capitalized Salaries	-	-	-	-	-	-	-	-	-	-
10	Less: Transfers to R&R Fund	(908,324)	(935,574)	(963,641)	(992,550)	(1,022,327)	(1,052,997)	(1,084,587)	(1,117,125)	(1,150,639)	(1,185,158)
11	Less: Additional Transfer to R&R Fund	(500,000)	(250,000)	(250,000)	(250,000)	(250,000)	(250,000)	(250,000)	(250,000)	(250,000)	(250,000)
12	Less: Transfer to Availability Fee Fund	-	-	-	-	-	-	-	-	-	-
13	Add: Transfer fr Availability Fee Fund	38,691	38,691	38,691	38,691	38,691	38,691	38,691	38,691	38,691	38,691
14	Less: Transfers to CIP	-	-	-	-	-	-	-	-	-	-
15	Less: Reimbursement to Water Fund	-	-	-	-	-	-	-	-	-	-
16	Adj: Adjustment to Tie to Financial Statement	-	-	-	-	-	-	-	-	-	-
18	Oper. Funds Avail. for Future CIP before Int. Income	2,162,663	2,248,613	2,307,561	2,787,642	3,233,998	3,633,487	3,984,905	4,277,263	4,513,445	4,683,700
19	Add Interest Income	8,735	12,873	15,774	21,883	23,828	31,801	34,032	44,735	51,742	62,245
20	Oper Fund Bal Incl Working Capital & Reserves	2,171,398	2,261,485	2,323,335	2,809,525	3,257,827	3,665,288	4,018,936	4,321,998	4,565,187	4,745,945
21	Renewal & Replacement Fund Balance	713,889	638,665	1,377,769	1,939,935	1,702,294	1,785,436	1,923,561	1,770,100	2,715,180	3,232,678
22	Add: Annual Contribution to R&R Fund	908,324	935,574	963,641	992,550	1,022,327	1,052,997	1,084,587	1,117,125	1,150,639	1,185,158
23	Add: Additional Transfer from Operating Fund	500,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000
24	Add: Other Non-Oper Income (Grants & Open Space)	-	-	-	-	-	-	-	-	-	-
25	Add: Infrastructure Equity Program Cash Receipts	-	-	-	-	-	-	-	-	-	-
26	Add: Debt/Bond Proceeds for R&R	-	-	-	-	-	-	-	-	-	-
27	Add: Transfers From 310 IEP/Open Space	-	-	-	-	-	-	-	-	-	-
28	Less: Capital Project Expenditures	(1,483,548)	(446,470)	(651,475)	(1,480,191)	(1,189,185)	(1,164,872)	(1,488,048)	(422,045)	(883,141)	(1,588,212)
29	Adj: Adjustment for Balance Sheet Items - AP	-	-	-	-	-	-	-	-	-	-
30	Net R&R Funds Avail for Future CIP before Int	638,665	1,377,769	1,939,935	1,702,294	1,785,436	1,923,561	1,770,100	2,715,180	3,232,678	3,079,624
31	Add Interest Income	-	-	-	-	-	-	-	-	-	-
32	R&R Fund Balance After Adjustment	638,665	1,377,769	1,939,935	1,702,294	1,785,436	1,923,561	1,770,100	2,715,180	3,232,678	3,079,624
33	Availability Fees/Inlet Village Fund Balance	-	-	-	-	-	-	-	-	-	-
34	Add: Annual Contribution to Inlet Village Fund	38,691	38,691	38,691	38,691	38,691	38,691	38,691	38,691	38,691	38,691
35	Less: Debt Service	-	-	-	-	-	-	-	-	-	-
36	Less: Capital Project Expenditures	-	-	-	-	-	-	-	-	-	-
37	Add: Transfer from Operating Fund	-	-	-	-	-	-	-	-	-	-
38	Less: Transfer to Operating Fund	(38,691)	(38,691)	(38,691)	(38,691)	(38,691)	(38,691)	(38,691)	(38,691)	(38,691)	(38,691)
39	Adj: Adjustment for Balance Sheet Items - AP	-	-	-	-	-	-	-	-	-	-
41	Net Inlet Village Funds Avail before Int	-	-	-	-	-	-	-	-	-	-
42	Add Interest Income	-	-	-	-	-	-	-	-	-	-
43	Availability Fees/Inlet Village Fund Balance	-	-	-	-	-	-	-	-	-	-
44	Total Fund Balance at Year End	<u>\$ 2,810,063</u>	<u>\$ 3,639,255</u>	<u>\$ 4,263,270</u>	<u>\$ 4,511,819</u>	<u>\$ 5,043,263</u>	<u>\$ 5,588,849</u>	<u>\$ 5,789,036</u>	<u>\$ 7,037,178</u>	<u>\$ 7,797,865</u>	<u>\$ 7,825,569</u>

Notes:

- (1) Transfers for the Microsoft Enterprise Agreement. Total project cost is \$500,715 and includes funding from Water and general revenue.
- (2) Per Resolution 48-10, annual R&R reserve funding deposit goal is \$500,000.
- (3) Minimum R&R reserve balance goal is \$500,000.
- (4) Minimum fund balance goal is \$3,000,000.

TOWN OF JUPITER - STORMWATER SYSTEM
Appendix 10A - Cash Flow Analysis

Line No.	Description	2042	2043	2044	2045	2046
1	Growth % of Stormwater Utility Charges Over Prior Yr	<u>102.5%</u>	<u>102.5%</u>	<u>102.5%</u>	<u>102.5%</u>	<u>102.5%</u>
2	Adjusted Operating Fund Balance	\$ 4,745,945	\$ 4,803,237	\$ 4,777,806	\$ 4,665,287	\$ 4,458,892
3	Add: Operating Income Excluding GF Xfers & FCA	2,374,147	2,359,767	2,340,800	2,316,782	2,287,323
4	Less: General Fund Transfers & Full Cost Allocation	(500,854)	(525,897)	(552,192)	(579,801)	(608,791)
5	Add: Debt/Bond Proceeds for Operating Fund	-	-	-	-	-
6	Less: Debt Service	-	-	-	-	-
7	Less: Capital Project Expenditures	(266,146)	(274,131)	(282,355)	(290,825)	(299,550)
8	Less: Capital Equipment Expenditures	(135,885)	(139,282)	(142,764)	(146,334)	(149,992)
9	Less: Capitalized Salaries	-	-	-	-	-
10	Less: Transfers to R&R Fund	(1,220,713)	(1,257,334)	(1,295,054)	(1,333,906)	(1,373,923)
11	Less: Additional Transfer to R&R Fund	(250,000)	(250,000)	(250,000)	(250,000)	(250,000)
12	Less: Transfer to Availability Fee Fund	-	-	-	-	-
13	Add: Transfer fr Availability Fee Fund	-	-	-	-	-
14	Less: Transfers to CIP	-	-	-	-	-
15	Less: Reimbursement to Water Fund	-	-	-	-	-
16	Adj: Adjustment to Tie to Financial Statement	-	-	-	-	-
18	Oper. Funds Avail. for Future CIP before Int. Income	4,746,493	4,716,360	4,596,241	4,381,203	4,063,959
19	Add Interest Income	56,744	61,447	69,046	77,689	73,377
20	Oper Fund Bal Incl Working Capital & Reserves	4,803,237	4,777,806	4,665,287	4,458,892	4,137,336
21	Renewal & Replacement Fund Balance	3,079,624	1,613,948	2,521,263	3,448,298	3,042,953
22	Add: Annual Contribution to R&R Fund	1,220,713	1,257,334	1,295,054	1,333,906	1,373,923
23	Add: Additional Transfer from Operating Fund	250,000	250,000	250,000	250,000	250,000
24	Add: Other Non-Oper Income (Grants & Open Space)	-	-	-	-	-
25	Add: Infrastructure Equity Program Cash Receipts	-	-	-	-	-
26	Add: Debt/Bond Proceeds for R&R	-	-	-	-	-
27	Add: Transfers From 310 IEP/Open Space	-	-	-	-	-
28	Less: Capital Project Expenditures	(2,936,389)	(600,019)	(618,019)	(1,989,251)	(1,557,187)
29	Adj: Adjustment for Balance Sheet Items - AP	-	-	-	-	-
30	Net R&R Funds Avail for Future CIP before Int	1,613,948	2,521,263	3,448,298	3,042,953	3,109,689
31	Add Interest Income	-	-	-	-	-
32	R&R Fund Balance After Adjustment	1,613,948	2,521,263	3,448,298	3,042,953	3,109,689
33	Availability Fees/Inlet Village Fund Balance	-	-	-	-	-
34	Add: Annual Contribution to Inlet Village Fund	-	-	-	-	-
35	Less: Debt Service	-	-	-	-	-
36	Less: Capital Project Expenditures	-	-	-	-	-
37	Add: Transfer from Operating Fund	-	-	-	-	-
38	Less: Transfer to Operating Fund	-	-	-	-	-
39	Adj: Adjustment for Balance Sheet Items - AP	-	-	-	-	-
41	Net Inlet Village Funds Avail before Int	-	-	-	-	-
42	Add Interest Income	-	-	-	-	-
43	Availability Fees/Inlet Village Fund Balance	-	-	-	-	-
44	Total Fund Balance at Year End	<u>\$ 6,417,186</u>	<u>\$ 7,299,070</u>	<u>\$ 8,113,585</u>	<u>\$ 7,501,845</u>	<u>\$ 7,247,025</u>

Notes:

- (1) Transfers for the Microsoft Enterprise Agreement. Total project cost is \$500,715 and includes funding from Water and general revenue.
- (2) Per Resolution 48-10, annual R&R reserve funding deposit goal is \$500,000.
- (3) Minimum R&R reserve balance goal is \$500,000.
- (4) Minimum fund balance goal is \$3,000,000.

**TOWN OF JUPITER - STORMWATER SYSTEM
Appendix 10B - Capital Improvement Plan**

Line No.	Obj	Proj	Capital Improvement Projects	Funding Source	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
1	563100	S0339	Town Road Outfall R&R	R&R	233,477	-	-	-	-	-	-	-	-	-
2	563100	S0912	Urban Stormwater Management System Rehab	R&R	220,000	-	-	-	-	-	-	-	-	-
3	563100	S0912	Urban Stormwater Management System Rehab	LRPI	-	-	-	-	-	-	-	-	-	-
4	582001	S1007	Private Stormwater Improvement Grants	O&M	368,930	75,647	77,916	80,254	82,661	85,141	87,695	90,326	93,036	95,827
5	563100	S1009	Stormwater System Rehabilitation	R&R	908,196	-	490,359	146,853	151,259	155,797	160,471	165,285	170,243	175,351
6	563100	S1009	Stormwater System Rehabilitation	R&R-IEP	-	480,229	-	-	-	-	-	-	-	-
7	582002	S1201	SW Management System Redevelopment Grants	O&M	235,754	76,133	78,417	80,769	83,192	85,688	88,259	90,907	93,634	96,443
8	566000	W1219	Utility Billing Services & Enterprise Asset Mgt System	R&R	-	-	-	-	-	-	-	-	-	-
9	546092	S1290	AMRR - SCADA	R&R	35,802	-	-	-	-	-	-	-	-	-
10	564001	S1290	AMRR - SCADA New Equipment	R&R	20,384	-	-	-	-	-	-	-	-	-
11	546094	S1290	AMRR - GIS	R&R	44,563	-	-	-	-	-	-	-	-	-
12	546084	S1290	AMRR - SW Pumps Rehab	R&R	314,651	-	-	-	-	-	-	-	-	-
13	546081	S1290	AMRR - High School Ditch Improvements	R&R	273,709	-	-	-	-	-	-	-	-	-
14	546090	S1290	AMRR - General	R&R	611,159	319,126	139,061	406,819	743,480	174,430	946,777	148,756	486,895	360,525
15	546090	S1290	AMRR - General	R&R-IEP	-	68,983	-	-	-	-	-	-	-	-
16	546093	S1290	AMRR - Painting	R&R	44,029	-	-	-	-	-	-	-	-	-
17	563100	S1401	TMDL/NNC Regulatory Response Modeling	R&R	49,639	-	-	-	-	-	-	-	-	-
18	563100	R0018	Cinquez Park Open Space (Eng)	O&M	35,069	-	-	-	-	-	-	-	-	-
19	563100	S1606	Seminole Ave Stormwater Basin Improvements (Juno St Pump)	R&R	646,165	-	-	-	-	-	-	-	-	-
20	563100	S1606	Seminole Ave Stormwater Basin Improvements (Juno St Pump)	ARPA	3,795,479	-	-	-	-	-	-	-	-	-
21	563100	S1917	Old Jupiter Beach Rd/Eganfuskee Rd Drainage Impr	R&R	303,850	323,613	-	-	-	-	-	-	-	-
22	563100	S2012	Pine Gardens North Infrastructure Improvements	R&R	1,506,260	-	-	-	-	-	-	-	-	-
23	563100	S2012	Pine Gardens North Infrastructure Improvements	CDBG	243,264	-	-	-	-	-	-	-	-	-
24	563100	S2117	Fisherman's Landing Drainage Improvements	R&R	-	415,873	-	-	-	-	-	-	-	-
25	563100	S2122	Curb Replacements in the Hamptons	R&R	17,662	-	-	-	-	-	-	-	-	-
26	546096	S2005	Jupiter River Estates Canal Vegetation Trimming	R&R	665,000	-	-	-	-	-	-	-	-	-
27	563100	S2213	Dolphin Dr Drainage Improvements	R&R	264,495	136,525	-	-	-	-	-	-	-	-
28	531000	S2218	North A1A Drainage Improvements	R&R	75,000	-	-	-	-	-	-	-	-	-
29	563100	S2227	New Haven/The Island Curb Repl	R&R	93,209	-	-	-	-	-	-	-	-	-
30	563100	Sxxxx	Bush Road Drainage Improvements	R&R	-	185,127	-	-	-	-	-	-	-	-
31	563100	Sxxxx	Bush Road Drainage Improvements	LRPI	-	100,255	-	-	-	-	-	-	-	-
32	563100	Sxxxx	Pennock Industrial Park Drainage Improvements	R&R	-	1,142,913	-	-	-	-	-	-	-	-
33	563100	Sxxxx	Pennock Industrial Park Drainage Improvements	LRPI	-	75,000	-	-	-	-	-	-	-	-
34	563100	Sxxxx	Cypress Drive Drainage Improvements	R&R	-	237,642	-	-	-	-	-	-	-	-
35	563100	Sxxxx	Curb Replacements	R&R	-	106,280	103,040	139,900	141,700	-	-	-	-	-
36	563100	Exxxx	N Pennock Ln Swale Improvements	R&R	-	-	47,000	-	-	-	-	-	-	-
37	563100	Sxxxx	Town Hall - Daniels Way BMPs Water Quality Improves	R&R	-	-	91,789	-	-	-	-	-	-	-
38	563100	Sxxxx	Town Hall - Daniels Way BMPs Water Quality Improves	Grant	-	-	91,789	-	-	-	-	-	-	-
39	563100	Sxxxx	Dover Ditch Water Quality Improvements	R&R	-	-	174,836	-	-	-	-	-	-	-
40	563100	Sxxxx	Eastview Manor Drainage Improvements	R&R	-	-	-	-	210,988	-	-	-	-	-
41	563100	Sxxxx	Seminole Basin Pond - Bold and Gold	R&R	-	-	-	-	-	208,959	-	-	-	-
42	563100	Sxxxx	Seminole Basin Pond - Bold and Gold	Grant	-	-	-	-	-	208,959	-	-	-	-
43	563100	Sxxxx	Center St to Jones and Sims - Hydrodynamic Separators	R&R	-	-	-	-	-	-	172,182	-	-	-
44	563100	Sxxxx	Center St to Jones and Sims - Hydrodynamic Separators	Grant	-	-	-	-	-	-	172,182	-	-	-
45	563100	Sxxxx	Pine Gardens N/Seminole Basin Interconnect	R&R	-	-	-	-	-	-	-	2,039,500	-	-
46	563100	Sxxxx	Loxahatchee Backwaters Natural Area	R&R	-	-	-	-	-	-	-	2,017,331	-	-
47	563100	Sxxxx	Loxahatchee Backwaters Natural Area	OpenS	-	-	-	-	-	-	-	2,017,331	-	-
48	563100	Sxxxxb	Loxahatchee Backwaters Natural Area	Grant	-	-	-	-	-	-	-	4,034,663	-	-
49	563100	Sxxxx	Elsa & Paulina Pump Outfit	R&R	-	-	-	-	-	-	-	-	-	959,556
50	563100	Sxxxx	River Road (Berm W & S Sides Alma's Preserve)	R&R	-	-	-	-	-	-	-	-	-	-
51			Total Projects		\$ 11,005,746	\$ 3,743,346	\$ 1,294,207	\$ 854,595	\$ 1,413,280	\$ 918,974	\$ 1,627,566	\$ 10,604,099	\$ 843,808	\$ 1,687,702
			<u>Funding by Source of Funds</u>											
52			Intergov - Grant Funds - State - SW	State	-	-	-	-	-	-	-	-	-	-
53			Intergov - Grant (Source TBD)	Grant	-	-	91,789	-	-	208,959	172,182	4,034,663	-	-
54			Intergov - Grant Funds - Lox River Pres Init - SW	LRPI	\$ -	\$ 175,255	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
55			Intergov - Grant Funds - DCA/Palm Beach County	CDBG	243,264	-	-	-	-	-	-	-	-	-
56			Intergov - Federal - ARPA	ARPA	3,795,479	-	-	-	-	-	-	-	-	-
57			Property Owners - Municipal Services Taxing Unit	MSTU	-	-	-	-	-	-	-	-	-	-
58			Stormwater Fund, O&M	O&M	639,753	151,780	156,333	161,023	165,853	170,829	175,954	181,233	186,670	192,270
59			Stormwater Fund, R&R	R&R	6,327,250	2,867,099	1,046,085	693,572	1,247,427	539,186	1,279,430	4,370,872	657,138	1,495,432
60			Infrastructure Equity Program Funds	R&R-IEP	-	549,212	-	-	-	-	-	-	-	-
61			Open Space Funds	OpenS	-	-	-	-	-	-	-	2,017,331	-	-
62			Stormwater Availability Charges (Inlet Village)	Avail	-	-	-	-	-	-	-	-	-	-
63					-	-	-	-	-	-	-	-	-	-
64			Total Projects		\$ 11,005,746	\$ 3,743,346	\$ 1,294,207	\$ 854,595	\$ 1,413,280	\$ 918,974	\$ 1,627,566	\$ 10,604,099	\$ 843,808	\$ 1,687,702

TOWN OF JUPITER - STORMWATER SYSTEM
Appendix 10B - Capital Improvement Plan

Line No.	Obj	Proj	Capital Improvement Projects	Funding Source	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
1	563100	S0339	Town Road Outfall R&R	R&R	-	-	-	-	-	-	-	-	-	-
2	563100	S0912	Urban Stormwater Management System Rehab	R&R	-	-	-	-	-	-	-	-	-	-
3	563100	S0912	Urban Stormwater Management System Rehab	LRPI	-	-	-	-	-	-	-	-	-	-
4	582001	S1007	Private Stormwater Improvement Grants	O&M	98,702	101,663	104,713	107,854	111,090	114,423	117,855	121,391	125,033	128,784
5	563100	S1009	Stormwater System Rehabilitation	R&R	180,611	186,029	191,610	197,359	203,279	209,378	215,659	222,129	228,793	235,657
6	563100	S1009	Stormwater System Rehabilitation	R&R-IEP	-	-	-	-	-	-	-	-	-	-
7	582002	S1201	SW Management System Redevelopment Grants	O&M	99,336	102,316	105,386	108,547	111,804	115,158	118,613	122,171	125,836	129,611
8	566000	W1219	Utility Billing Services & Enterprise Asset Mgt System	R&R	26,878	-	-	-	-	-	-	-	-	-
9	546092	S1290	AMRR - SCADA	R&R	-	-	-	-	-	-	-	-	-	-
10	564001	S1290	AMRR - SCADA New Equipment	R&R	-	-	-	-	-	-	-	-	-	-
11	546094	S1290	AMRR - GIS	R&R	-	-	-	-	-	-	-	-	-	-
12	546084	S1290	AMRR - SW Pumps Rehab	R&R	-	-	-	-	-	-	-	-	-	-
13	546081	S1290	AMRR - High School Ditch Improvements	R&R	-	-	-	-	-	-	-	-	-	-
14	546090	S1290	AMRR - General	R&R	1,276,059	260,441	459,865	1,282,832	985,906	326,449	1,272,389	199,916	654,348	1,352,555
15	546090	S1290	AMRR - General	R&R-IEP	-	-	-	-	-	-	-	-	-	-
16	546093	S1290	AMRR - Painting	R&R	-	-	-	-	-	-	-	-	-	-
17	563100	S1401	TMDL/NNC Regulatory Response Modeling	R&R	-	-	-	-	-	-	-	-	-	-
18	563100	R0018	Cinquez Park Open Space (Eng)	O&M	-	-	-	-	-	-	-	-	-	-
19	563100	S1606	Seminole Ave Stormwater Basin Improvements (Juno St Pump)	R&R	-	-	-	-	-	-	-	-	-	-
20	563100	S1606	Seminole Ave Stormwater Basin Improvements (Juno St Pump)	ARPA	-	-	-	-	-	-	-	-	-	-
21	563100	S1917	Old Jupiter Beach Rd/Eganfuskee Rd Drainage Impr	R&R	-	-	-	-	-	-	-	-	-	-
22	563100	S2012	Pine Gardens North Infrastructure Improvements	R&R	-	-	-	-	-	-	-	-	-	-
23	563100	S2012	Pine Gardens North Infrastructure Improvements	CDBG	-	-	-	-	-	-	-	-	-	-
24	563100	S2117	Fisherman's Landing Drainage Improvements	R&R	-	-	-	-	-	-	-	-	-	-
25	563100	S2122	Curb Replacements in the Hamptons	R&R	-	-	-	-	-	-	-	-	-	-
26	546096	S2005	Jupiter River Estates Canal Vegetation Trimming	R&R	-	-	-	-	-	-	-	-	-	-
27	563100	S2213	Dolphin Dr Drainage Improvements	R&R	-	-	-	-	-	-	-	-	-	-
28	531000	S2218	North A1A Drainage Improvements	R&R	-	-	-	-	-	-	-	-	-	-
29	563100	S2227	New Haven/The Island Curb Repl	R&R	-	-	-	-	-	-	-	-	-	-
30	563100	Sxxxx	Bush Road Drainage Improvements	R&R	-	-	-	-	-	-	-	-	-	-
31	563100	Sxxxx	Bush Road Drainage Improvements	LRPI	-	-	-	-	-	-	-	-	-	-
32	563100	Sxxxx	Pennock Industrial Park Drainage Improvements	R&R	-	-	-	-	-	-	-	-	-	-
33	563100	Sxxxx	Pennock Industrial Park Drainage Improvements	LRPI	-	-	-	-	-	-	-	-	-	-
34	563100	Sxxxx	Cypress Drive Drainage Improvements	R&R	-	-	-	-	-	-	-	-	-	-
35	563100	Sxxxx	Curb Replacements	R&R	-	-	-	-	-	-	-	-	-	-
36	563100	Exxxx	N Pennock Ln Swale Improvements	R&R	-	-	-	-	-	-	-	-	-	-
37	563100	Sxxxx	Town Hall - Daniels Way BMPs Water Quality Improves	R&R	-	-	-	-	-	-	-	-	-	-
38	563100	Sxxxx	Town Hall - Daniels Way BMPs Water Quality Improves	Grant	-	-	-	-	-	-	-	-	-	-
39	563100	Sxxxx	Dover Ditch Water Quality Improvements	R&R	-	-	-	-	-	-	-	-	-	-
40	563100	Sxxxx	Eastview Manor Drainage Improvements	R&R	-	-	-	-	-	-	-	-	-	-
41	563100	Sxxxx	Seminole Basin Pond - Bold and Gold	R&R	-	-	-	-	-	-	-	-	-	-
42	563100	Sxxxx	Seminole Basin Pond - Bold and Gold	Grant	-	-	-	-	-	-	-	-	-	-
43	563100	Sxxxx	Center St to Jones and Sims - Hydrodynamic Separators	R&R	-	-	-	-	-	-	-	-	-	-
44	563100	Sxxxx	Center St to Jones and Sims - Hydrodynamic Separators	Grant	-	-	-	-	-	-	-	-	-	-
45	563100	Sxxxx	Pine Gardens N/Seminole Basin Interconnect	R&R	-	-	-	-	-	-	-	-	-	-
46	563100	Sxxxx	Loxahatchee Backwaters Natural Area	R&R	-	-	-	-	-	-	-	-	-	-
47	563100	Sxxxx	Loxahatchee Backwaters Natural Area	OpenS	-	-	-	-	-	-	-	-	-	-
48	563100	Sxxxxb	Loxahatchee Backwaters Natural Area	Grant	-	-	-	-	-	-	-	-	-	-
49	563100	Sxxxx	Elsa & Paulina Pump Outfit	R&R	-	-	-	-	-	-	-	-	-	-
50	563100	Sxxxx	River Road (Berm W & S Sides Alma's Preserve)	R&R	-	-	-	-	-	629,045	-	-	-	-
51			Total Projects		\$ 1,681,586	\$ 650,449	\$ 861,574	\$ 1,696,592	\$ 1,412,079	\$ 1,394,453	\$ 1,724,516	\$ 665,607	\$ 1,134,010	\$ 1,846,607
			<u>Funding by Source of Funds</u>											
52			Intergov - Grant Funds - State - SW	State	-	-	-	-	-	-	-	-	-	-
53			Intergov - Grant (Source TBD)	Grant	-	-	-	-	-	-	-	-	-	-
54			Intergov - Grant Funds - Lox River Pres Init - SW	LRPI	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
55			Intergov - Grant Funds - DCA/Palm Beach County	CDBG	-	-	-	-	-	-	-	-	-	-
56			Intergov - Federal - ARPA	ARPA	-	-	-	-	-	-	-	-	-	-
57			Property Owners - Municipal Services Taxing Unit	MSTU	-	-	-	-	-	-	-	-	-	-
58			Stormwater Fund, O&M	O&M	198,038	203,979	210,099	216,401	222,894	229,581	236,468	243,562	250,869	258,395
59			Stormwater Fund, R&R	R&R	1,483,548	446,470	651,475	1,480,191	1,189,185	1,164,872	1,488,048	422,045	883,141	1,588,212
60			Infrastructure Equity Program Funds	R&R-IEP	-	-	-	-	-	-	-	-	-	-
61			Open Space Funds	OpenS	-	-	-	-	-	-	-	-	-	-
62			Stormwater Availability Charges (Inlet Village)	Avail	-	-	-	-	-	-	-	-	-	-
63					-	-	-	-	-	-	-	-	-	-
64			Total Projects		\$ 1,681,586	\$ 650,449	\$ 861,574	\$ 1,696,592	\$ 1,412,079	\$ 1,394,453	\$ 1,724,516	\$ 665,607	\$ 1,134,010	\$ 1,846,607

TOWN OF JUPITER - STORMWATER SYSTEM
Appendix 10B - Capital Improvement Plan

Line No.	Obj	Proj	Capital Improvement Projects	Funding Source	2042	2043	2044	2045	2046	Total2022 to 2046
1	563100	S0339	Town Road Outfall R&R	R&R	-	-	-	-	-	233,477
2	563100	S0912	Urban Stormwater Management System Rehab	R&R	-	-	-	-	-	220,000
3	563100	S0912	Urban Stormwater Management System Rehab	LRPI	-	-	-	-	-	-
4	582001	S1007	Private Stormwater Improvement Grants	O&M	132,647	136,627	140,725	144,947	149,295	2,973,182
5	563100	S1009	Stormwater System Rehabilitation	R&R	242,726	250,008	257,508	265,234	273,191	5,882,985
6	563100	S1009	Stormwater System Rehabilitation	R&R-IEP	-	-	-	-	-	480,229
7	582002	S1201	SW Management System Redevelopment Grants	O&M	133,499	137,504	141,630	145,878	150,255	2,856,740
8	566000	W1219	Utility Billing Services & Enterprise Asset Mgt System	R&R	36,122	-	-	-	-	63,000
9	546092	S1290	AMRR - SCADA	R&R	-	-	-	-	-	35,802
10	564001	S1290	AMRR - SCADA New Equipment	R&R	-	-	-	-	-	20,384
11	546094	S1290	AMRR - GIS	R&R	-	-	-	-	-	44,563
12	546084	S1290	AMRR - SW Pumps Rehab	R&R	-	-	-	-	-	\$ 314,651
13	546081	S1290	AMRR - High School Ditch Improvements	R&R	-	-	-	-	-	273,709
14	546090	S1290	AMRR - General	R&R	2,657,541	350,011	360,511	1,724,017	1,283,996	18,783,864
15	546090	S1290	AMRR - General	R&R-IEP	-	-	-	-	-	68,983
16	546093	S1290	AMRR - Painting	R&R	-	-	-	-	-	44,029
17	563100	S1401	TMDL/NNC Regulatory Response Modeling	R&R	-	-	-	-	-	49,639
18	563100	R0018	Cinquez Park Open Space (Eng)	O&M	-	-	-	-	-	35,069
19	563100	S1606	Seminole Ave Stormwater Basin Improvements (Juno St Pump)	R&R	-	-	-	-	-	646,165
20	563100	S1606	Seminole Ave Stormwater Basin Improvements (Juno St Pump)	ARPA	-	-	-	-	-	3,795,479
21	563100	S1917	Old Jupiter Beach Rd/Eganfuskee Rd Drainage Impr	R&R	-	-	-	-	-	627,463
22	563100	S2012	Pine Gardens North Infrastructure Improvements	R&R	-	-	-	-	-	1,506,260
23	563100	S2012	Pine Gardens North Infrastructure Improvements	CDBG	-	-	-	-	-	243,264
24	563100	S2117	Fisherman's Landing Drainage Improvements	R&R	-	-	-	-	-	415,873
25	563100	S2122	Curb Replacements in the Hamptons	R&R	-	-	-	-	-	17,662
26	546096	S2005	Jupiter River Estates Canal Vegetation Trimming	R&R	-	-	-	-	-	665,000
27	563100	S2213	Dolphin Dr Drainage Improvements	R&R	-	-	-	-	-	401,020
28	531000	S2218	North A1A Drainage Improvements	R&R	-	-	-	-	-	75,000
29	563100	S2227	New Haven/The Island Curb Repl	R&R	-	-	-	-	-	93,209
30	563100	Sxxxx	Bush Road Drainage Improvements	R&R	-	-	-	-	-	185,127
31	563100	Sxxxx	Bush Road Drainage Improvements	LRPI	-	-	-	-	-	100,255
32	563100	Sxxxx	Pennock Industrial Park Drainage Improvements	R&R	-	-	-	-	-	1,142,913
33	563100	Sxxxx	Pennock Industrial Park Drainage Improvements	LRPI	-	-	-	-	-	75,000
34	563100	Sxxxx	Cypress Drive Drainage Improvements	R&R	-	-	-	-	-	237,642
35	563100	Sxxxx	Curb Replacements	R&R	-	-	-	-	-	490,920
36	563100	Exxxx	N Pennock Ln Swale Improvements	R&R	-	-	-	-	-	47,000
37	563100	Sxxxx	Town Hall - Daniels Way BMPs Water Quality Improves	R&R	-	-	-	-	-	91,789
38	563100	Sxxxx	Town Hall - Daniels Way BMPs Water Quality Improves	Grant	-	-	-	-	-	91,789
39	563100	Sxxxx	Dover Ditch Water Quality Improvements	R&R	-	-	-	-	-	174,836
40	563100	Sxxxx	Eastview Manor Drainage Improvements	R&R	-	-	-	-	-	210,988
41	563100	Sxxxx	Seminole Basin Pond - Bold and Gold	R&R	-	-	-	-	-	208,959
42	563100	Sxxxx	Seminole Basin Pond - Bold and Gold	Grant	-	-	-	-	-	208,959
43	563100	Sxxxx	Center St to Jones and Sims - Hydrodynamic Separators	R&R	-	-	-	-	-	172,182
44	563100	Sxxxx	Center St to Jones and Sims - Hydrodynamic Separators	Grant	-	-	-	-	-	172,182
45	563100	Sxxxx	Pine Gardens N/Seminole Basin Interconnect	R&R	-	-	-	-	-	2,039,500
46	563100	Sxxxx	Loxahatchee Backwaters Natural Area	R&R	-	-	-	-	-	2,017,331
47	563100	Sxxxx	Loxahatchee Backwaters Natural Area	OpenS	-	-	-	-	-	2,017,331
48	563100	Sxxxxb	Loxahatchee Backwaters Natural Area	Grant	-	-	-	-	-	4,034,663
49	563100	Sxxxx	Elsa & Paulina Pump Outfit	R&R	-	-	-	-	-	959,556
50	563100	Sxxxx	River Road (Berm W & S Sides Alma's Preserve)	R&R	-	-	-	-	-	629,045
51			Total Projects		\$ 3,202,535	\$ 874,150	\$ 900,374	\$ 2,280,076	\$ 1,856,737	\$ 56,174,668
			<u>Funding by Source of Funds</u>							
52			Intergov - Grant Funds - State - SW	State	-	-	-	-	-	-
53			Intergov - Grant (Source TBD)	Grant	-	-	-	-	-	4,507,593
54			Intergov - Grant Funds - Lox River Pres Init - SW	LRPI	\$ -	\$ -	\$ -	\$ -	\$ -	175,255
55			Intergov - Grant Funds - DCA/Palm Beach County	CDBG	-	-	-	-	-	243,264
56			Intergov - Federal - ARPA	ARPA	-	-	-	-	-	3,795,479
57			Property Owners - Municipal Services Taxing Unit	MSTU	-	-	-	-	-	-
58			Stormwater Fund, O&M	O&M	266,146	274,131	282,355	290,825	299,550	5,864,991
59			Stormwater Fund, R&R	R&R	2,936,389	600,019	618,019	1,989,251	1,557,187	39,021,543
60			Infrastructure Equity Program Funds	R&R-IEP	-	-	-	-	-	549,212
61			Open Space Funds	OpenS	-	-	-	-	-	2,017,331
62			Stormwater Availability Charges (Inlet Village)	Avail	-	-	-	-	-	-
63					-	-	-	-	-	-
64			Total Projects		\$ 3,202,535	\$ 874,150	\$ 900,374	\$ 2,280,076	\$ 1,856,737	\$ 56,174,668

TOWN OF JUPITER - STORMWATER SYSTEM
Appendix 10C - Asset Maintenance R&R Program

Line No.	ASSET MAINTENANCE R&R PROGRAM	ORG	OBJ	PROJ	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
PAINTING & CLEANING (EVERY 10 YEARS)																
1	Field Operations Center:				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2	Clean & Paint				-	-	-	-	-	-	-	-	-	-	-	-
3	Building Rehab				-	-	-	-	22,689	-	-	-	-	-	-	-
4	Pump Stations: Clean & Paint				-	-	-	-	-	-	-	-	-	-	-	-
5	Seminole Pump Station				-	-	-	-	-	12,396	-	-	-	-	-	-
6	7th Street Pump Station				-	-	-	-	-	12,396	-	-	-	-	-	-
7	Salinity Barrier: Clean & Paint				35,644	-	-	-	-	-	-	-	-	-	47,903	-
8	Total Painting & Cleaning	41150238	546093	S1290	\$ 44,029	\$ -	\$ -	\$ -	\$ 22,689	\$ 24,792	\$ -	\$ -	\$ -	\$ 35,070	\$ 47,903	\$ -
PUMPS (EVERY 15 YEARS)																
9	Pump Stations: Pumps/Electrical R&R				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
10	Seminole Pump Station				-	-	-	-	-	-	-	-	-	-	-	-
11	7th Street Pump Station				-	-	-	-	-	-	-	-	-	-	-	-
12	Total Pumps	41150238	546084	S1290	\$ 314,651	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
OTHER IMPROVEMENTS: MAINTENANCE OF CONTROL STRUCTURES/ PIPING/DETENTION & RETENTION AREAS/CANALS (EVERY 10 YEARS)																
13	Pine Gardens South Infrastructure				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
14	Jupiter Village Control Structure				-	252,370	-	-	-	-	-	-	-	-	-	-
15	Seminole Ave Drainage Area				-	-	-	-	-	-	-	-	170,243	-	-	-
16	Seminole Ave Drainage Area				-	-	-	-	-	-	-	-	-	-	-	-
17	Jupiter River Estates N Detention Area & Outfalls				-	-	-	-	-	-	-	-	-	79,964	-	-
18	Olympus Outfalls				-	-	-	264,336	-	-	-	-	-	-	-	-
19	Bluffs Outfalls				-	-	-	-	574,784	-	-	-	-	-	-	-
20	Egret Landing Outfalls				-	-	-	-	-	-	802,353	-	-	-	-	-
21	Old Jupiter Beach Rd Detention Area				-	-	-	-	-	-	-	-	85,122	-	-	-
22	Maplewood Drainage System				-	-	-	-	-	-	-	-	-	87,675	-	-
23	Shores Outfalls				-	-	-	-	-	-	-	-	-	-	903,056	-
24	Love Street Detention Area				-	-	-	-	-	-	-	-	-	-	-	93,015
25	Clemons Street Detention Area				-	-	-	-	-	-	-	-	-	-	-	-
26	Paseos Outfalls				-	-	-	-	-	-	-	-	-	-	-	-
27	Greenwood Detention Area				-	-	-	-	-	-	-	-	-	-	-	-
28	Rio Vista Canal Dredging				-	-	-	-	-	-	-	-	-	-	126,428	-
29	Penn Ditch Rehab				-	-	-	-	-	-	-	-	-	-	36,122	-
30	Jonathan's Landing Canal Dredging				-	-	-	-	-	-	-	-	51,073	-	-	-
31	Old Dixie Ditch Rehab				-	-	-	-	-	-	-	-	27,239	-	-	-
32	High School Ditch Erosion Control				-	-	-	-	-	-	-	-	-	-	-	-
33	Other Misc. Improvements				100,794	103,818	106,932	110,140	113,444	116,848	120,353	123,964	127,682	131,513	135,458	139,522
34	Total Other Improvements	41150238	546090	S1290	\$ 611,159	\$ 356,188	\$ 106,932	\$ 374,476	\$ 688,228	\$ 116,848	\$ 922,706	\$ 123,964	\$ 461,359	\$ 299,152	\$ 1,201,064	\$ 232,537
OTHER																
35	EOC Roof Replacement	41150238	562000	S1290	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
36	High School Ditch Improvements	41150238	546081	S1290	273,709	-	-	-	-	-	-	-	-	-	-	-
37	Total Other				\$ 273,709	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
INFORMATION SYSTEMS																
38	SCADA Upgrades	41150038	546092	S1290	\$ 35,802	\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000	\$ 16,047	\$ 16,528	\$ 17,024	\$ 17,535	\$ 18,061	\$ 18,603
39	SCADA New Equipment	41150038	564001	S1290	20,384	-	-	-	-	-	-	-	-	-	-	-
40	Total SCADA				\$ 56,186	\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000	\$ 16,047	\$ 16,528	\$ 17,024	\$ 17,535	\$ 18,061	\$ 18,603
41	GIS Upgrades	41150038	546094	S1290	\$ 44,563	\$ 6,921	\$ 7,129	\$ 7,343	\$ 7,563	\$ 7,790	\$ 8,024	\$ 8,264	\$ 8,512	\$ 8,768	\$ 9,031	\$ 9,301
42	Total GIS				\$ 44,563	\$ 6,921	\$ 7,129	\$ 7,343	\$ 7,563	\$ 7,790	\$ 8,024	\$ 8,264	\$ 8,512	\$ 8,768	\$ 9,031	\$ 9,301
43	Total Asset Maintenance R&R Program		Index F:	0.03	\$ 1,344,297	\$ 388,109	\$ 139,061	\$ 406,819	\$ 743,480	\$ 174,430	\$ 946,777	\$ 148,756	\$ 486,895	\$ 360,525	\$ 1,276,059	\$ 260,441

TOWN OF JUPITER - STORMWATER SYSTEM
Appendix 10C - Asset Maintenance R&R Program

Line No.	ASSET MAINTENANCE R&R PROGRAM	ORG	OBJ	PROJ	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
PAINTING & CLEANING (EVERY 10 YEARS)																
1	Field Operations Center:				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2	Clean & Paint				-	-	-	-	-	-	-	-	-	-	-	-
3	Building Rehab				-	-	30,492	-	-	-	-	-	-	-	-	-
4	Pump Stations: Clean & Paint				-	-	-	-	-	-	-	-	-	-	-	-
5	Seminole Pump Station				-	-	-	16,660	-	-	-	-	-	-	-	-
6	7th Street Pump Station				-	-	-	16,660	-	-	-	-	-	-	-	-
7	Salinity Barrier: Clean & Paint				-	-	-	-	-	-	-	-	64,377	-	-	-
8	Total Painting & Cleaning	41150238	546093	S1290	\$ -	\$ -	\$ 30,492	\$ 33,320	\$ -	\$ -	\$ -	\$ -	\$ 64,377	\$ -	\$ -	\$ -
PUMPS (EVERY 15 YEARS)																
9	Pump Stations: Pumps/Electrical R&R				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
10	Seminole Pump Station				-	-	-	-	-	-	915,171	-	-	-	-	-
11	7th Street Pump Station				-	-	-	-	-	-	-	942,626	-	-	-	-
12	Total Pumps	41150238	546084	S1290	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 915,171	\$ 942,626	\$ -	\$ -	\$ -	\$ -
OTHER IMPROVEMENTS: MAINTENANCE OF CONTROL STRUCTURES/ PIPING/DETENTION & RETENTION AREAS/CANALS (EVERY 10 YEARS)																
13	Pine Gardens South Infrastructure				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
14	Jupiter Village Control Structure				191,610	-	-	-	-	-	-	-	-	-	-	-
15	Seminole Ave Drainage Area				-	-	-	-	-	-	228,793	-	-	-	-	-
16	Seminole Ave Drainage Area				-	-	-	-	-	-	-	-	-	-	-	-
17	Jupiter River Estates N Detention Area & Outfalls				-	-	-	-	-	-	-	107,465	-	-	-	-
18	Olympus Outfalls				-	355,246	-	-	-	-	-	-	-	-	-	477,420
19	Bluffs Outfalls				-	-	772,462	-	-	-	-	-	-	-	-	-
20	Egret Landing Outfalls				-	-	-	-	1,078,296	-	-	-	-	-	-	-
21	Old Jupiter Beach Rd Detention Area				-	-	-	-	-	-	114,396	-	-	-	-	-
22	Maplewood Drainage System				-	-	-	-	-	-	-	117,828	-	-	-	-
23	Shores Outfalls				-	-	-	-	-	-	-	-	1,213,631	-	-	-
24	Love Street Detention Area				-	-	-	-	-	-	-	-	-	125,004	-	-
25	Clemons Street Detention Area				95,805	-	-	-	-	-	-	-	-	-	128,754	-
26	Paseos Outfalls				-	749,963	-	-	-	-	-	-	-	-	-	1,007,887
27	Greenwood Detention Area				-	-	-	104,689	-	-	-	-	-	-	-	-
28	Rio Vista Canal Dredging				-	-	-	-	-	-	-	-	169,908	-	-	-
29	Penn Ditch Rehab				-	-	-	-	-	-	-	-	48,545	-	-	-
30	Jonathan's Landing Canal Dredging				-	-	-	-	-	-	68,638	-	-	-	-	-
31	Old Dixie Ditch Rehab				-	-	-	-	-	-	36,607	-	-	-	-	-
32	High School Ditch Erosion Control				-	-	-	-	-	-	-	-	-	-	-	-
33	Other Misc. Improvements				143,708	148,019	152,460	157,033	161,744	166,597	171,595	176,742	182,045	187,506	193,131	198,925
34	Total Other Improvements	41150238	546090	S1290	\$ 431,123	\$ 1,253,228	\$ 924,922	\$ 261,722	\$ 1,240,040	\$ 166,597	\$ 620,029	\$ 402,035	\$ 1,614,129	\$ 312,510	\$ 321,885	\$ 1,684,232
OTHER																
35	EOC Roof Replacement	41150238	562000	S1290	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
36	High School Ditch Improvements	41150238	546081	S1290	-	-	-	-	-	-	-	-	-	-	-	-
37	Total Other				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
INFORMATION SYSTEMS																
38	SCADA Upgrades	41150038	546092	S1290	\$ 19,161	\$ 19,736	\$ 20,328	\$ 20,938	\$ 21,566	\$ 22,213	\$ 22,879	\$ 23,566	\$ 24,273	\$ 25,001	\$ 25,751	\$ 26,523
39	SCADA New Equipment	41150038	564001	S1290	-	-	-	-	-	-	-	-	-	-	-	-
40	Total SCADA				\$ 19,161	\$ 19,736	\$ 20,328	\$ 20,938	\$ 21,566	\$ 22,213	\$ 22,879	\$ 23,566	\$ 24,273	\$ 25,001	\$ 25,751	\$ 26,523
41	GIS Upgrades	41150038	546094	S1290	\$ 9,581	\$ 9,868	\$ 10,164	\$ 10,469	\$ 10,783	\$ 11,106	\$ 11,440	\$ 11,783	\$ 12,136	\$ 12,500	\$ 12,875	\$ 13,262
42	Total GIS				\$ 9,581	\$ 9,868	\$ 10,164	\$ 10,469	\$ 10,783	\$ 11,106	\$ 11,440	\$ 11,783	\$ 12,136	\$ 12,500	\$ 12,875	\$ 13,262
43	Total Asset Maintenance R&R Program	Index F:	0.03		\$ 459,865	\$ 1,282,832	\$ 985,906	\$ 326,449	\$ 1,272,389	\$ 199,916	\$ 654,348	\$ 1,352,555	\$ 2,657,541	\$ 350,011	\$ 360,511	\$ 1,724,017

TOWN OF JUPITER - STORMWATER SYSTEM
Appendix 10C - Asset Maintenance R&R Program

Line No.	ASSET MAINTENANCE R&R PROGRAM	ORG	OBJ	PROJ	2046	Total2022 to 2046
PAINTING & CLEANING (EVERY 10 YEARS)						
1	Field Operations Center:				\$ -	
2	Clean & Paint				-	
3	Building Rehab				-	
4	Pump Stations: Clean & Paint				-	
5	Seminole Pump Station				-	
6	7th Street Pump Station				-	
7	Salinity Barrier: Clean & Paint				-	
8	Total Painting & Cleaning	41150238	546093	S1290	\$ -	302,672
PUMPS (EVERY 15 YEARS)						
9	Pump Stations: Pumps/Electrical R&R				\$ -	
10	Seminole Pump Station				-	
11	7th Street Pump Station				-	
12	Total Pumps	41150238	546084	S1290	\$ -	2,172,448
OTHER IMPROVEMENTS: MAINTENANCE OF CONTROL STRUCTURES/ PIPING/DETENTION & RETENTION AREAS/CANALS (EVERY 10 YEARS)						
13	Pine Gardens South Infrastructure				\$ -	
14	Jupiter Village Control Structure				-	
15	Seminole Ave Drainage Area				-	
16	Seminole Ave Drainage Area				-	
17	Jupiter River Estates N Detention Area & Outfalls				-	
18	Olympus Outfalls				-	
19	Bluffs Outfalls				1,038,124	
20	Egret Landing Outfalls				-	
21	Old Jupiter Beach Rd Detention Area				-	
22	Maplewood Drainage System				-	
23	Shores Outfalls				-	
24	Love Street Detention Area				-	
25	Clemons Street Detention Area				-	
26	Paseos Outfalls				-	
27	Greenwood Detention Area				-	
28	Rio Vista Canal Dredging				-	
29	Penn Ditch Rehab				-	
30	Jonathan's Landing Canal Dredging				-	
31	Old Dixie Ditch Rehab				-	
32	High School Ditch Erosion Control				-	
33	Other Misc. Improvements				204,893	
34	Total Other Improvements	41150238	546090	S1290	\$ 1,243,017	15,970,082
OTHER						
35	EOC Roof Replacement	41150238	562000	S1290	\$ -	
36	High School Ditch Improvements	41150238	546081	S1290	-	
37	Total Other				\$ -	273,709
INFORMATION SYSTEMS						
38	SCADA Upgrades	41150038	546092	S1290	\$ 27,319	
39	SCADA New Equipment	41150038	564001	S1290	-	
40	Total SCADA				\$ 27,319	584,238
41	GIS Upgrades	41150038	546094	S1290	\$ 13,660	
42	Total GIS				\$ 13,660	282,836
43	Total Asset Maintenance R&R Program			Index Fc 0.03	\$ 1,283,996	\$ 19,585,985

TOWN OF JUPITER - STORMWATER SYSTEM
Appendix 10D - Assumptions By Year For Projections

Line											
No.	Assumptions	Escal. Ref.	2022	2023	2024	2025	2026	2027	2028	2029	2030
Expenses											
1	Salaries	Salaries	104.00%	104.00%	103.90%	103.80%	103.70%	103.60%	103.50%	103.40%	103.30%
2	OT Admin	Admin-OT	107.73%	123.88%	103.90%	103.80%	103.70%	103.60%	103.50%	103.40%	103.30%
3	OT Field	Field-OT	103.16%	110.55%	103.90%	103.80%	103.70%	103.60%	103.50%	103.40%	103.30%
4	FICA	FICA	104.00%	104.00%	103.90%	103.80%	103.70%	103.60%	103.50%	103.40%	103.30%
5	FRS	FRS	104.00%	104.00%	103.90%	104.28%	103.70%	103.60%	103.50%	103.40%	103.67%
6	Health/Life Insurance	Health	107.50%	107.50%	107.50%	107.50%	107.50%	107.50%	107.50%	107.50%	107.50%
7	Workers Comp	WC	103.50%	103.50%	103.50%	103.50%	103.50%	103.50%	103.50%	103.50%	103.50%
8	OPEB	OPEB	101.04%	101.04%	101.04%	101.04%	101.04%	101.04%	101.04%	101.04%	101.04%
9	Consumer Price Index - Gen Inflation	CPI	102.50%	102.50%	102.50%	102.50%	102.50%	102.50%	102.50%	102.50%	102.50%
10	Repairs and Maintenance	R&M	104.20%	104.30%	104.40%	104.50%	104.60%	104.70%	104.80%	104.90%	105.00%
11	Utility Costs	Utility	102.67%	102.67%	102.67%	102.67%	102.67%	102.67%	102.67%	102.67%	102.67%
12	Gasoline	Gas	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%
13	Insurance Costs	Insurance	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%
14	Marginal Increase	Marginal	101.51%	101.51%	101.51%	101.51%	101.51%	101.51%	101.51%	101.51%	101.51%
15	Constant	Constant	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
16	Customer Growth Plus Inflation	Customer	102.59%	102.71%	102.68%	102.67%	102.66%	102.65%	102.66%	102.65%	102.64%
17	Change in Allowance for Doubtful Accounts	Doubtful Accts.	102.34%	105.27%	107.18%	107.17%	107.16%	102.65%	102.66%	102.65%	102.64%
18	Depreciation as a % of Total Assets		101.43%	101.43%	101.43%	101.43%	101.43%	101.43%	101.43%	101.43%	101.43%
19	Cost Allocation	CA	168.15%	105.41%	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%
Other											
20	Working Capital-% of Oper/Non-Oper Expenses		16.67%	16.67%	16.67%	16.67%	16.67%	16.67%	16.67%	16.67%	16.67%
Revenues											
21	Fuel Reimbursement		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
22	Interest Rate on Investments		0.10%	0.10%	0.10%	0.10%	0.10%	0.20%	0.20%	0.20%	0.20%
23	R&R Contributions		\$ 675,879	\$ 696,155	\$ 717,040	\$ 738,551	\$ 760,708	\$ 783,529	\$ 807,035	\$ 831,246	\$ 856,183
24	Growth in Stormwater Utility Charges		101.19%	107.21%	107.18%	107.17%	107.16%	102.65%	102.66%	102.65%	102.64%
25	User Charge Indexing - CPI-U		1.10%	7.00%	7.00%	7.00%	7.00%	2.50%	2.50%	2.50%	2.50%
26	Customer Growth		0.09%	0.21%	0.18%	0.17%	0.16%	0.15%	0.16%	0.15%	0.14%
27	FY Budgeted ERUs		47,279	-	-	-	-	-	-	-	-
28	ERUs Connected EOY		47,001	47,101	47,185	47,264	47,339	47,409	47,484	47,554	47,619
29	Change in ERUs over prior year		41	100	84	79	75	70	75	70	65
30	Normal Growth		-	100	84	79	75	70	65	60	55
31	Service Availability Redevelopment Growth - Inlet Village Area		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1000.00%	1000.00%	1000.00%
32	Percentage Growth in ERUs		100.09%	100.21%	100.18%	100.17%	100.16%	100.15%	100.16%	100.15%	100.14%

TOWN OF JUPITER - STORMWATER SYSTEM
Appendix 10D - Assumptions By Year For Projections

Line											
No.	Assumptions	Escal. Ref.	2031	2032	2033	2034	2035	2036	2037	2038	2039
Expenses											
1	Salaries	Salaries	103.20%	103.10%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%
2	OT Admin	Admin-OT	103.20%	103.10%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%
3	OT Field	Field-OT	103.20%	103.10%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%
4	FICA	FICA	103.20%	103.10%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%
5	FRS	FRS	103.20%	103.10%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%
6	Health/Life Insurance	Health	107.50%	107.50%	107.50%	107.50%	107.50%	107.50%	107.50%	107.50%	107.50%
7	Workers Comp	WC	103.50%	103.50%	103.50%	103.50%	103.50%	103.50%	103.50%	103.50%	103.50%
8	OPEB	OPEB	101.04%	101.04%	101.04%	101.04%	101.04%	101.04%	101.04%	101.04%	101.04%
9	Consumer Price Index - Gen Inflation	CPI	102.50%	102.50%	102.50%	102.50%	102.50%	102.50%	102.50%	102.50%	102.50%
10	Repairs and Maintenance	R&M	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%
11	Utility Costs	Utility	102.67%	102.67%	102.67%	102.67%	102.67%	102.67%	102.67%	102.67%	102.67%
12	Gasoline	Gas	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%
13	Insurance Costs	Insurance	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%
14	Marginal Increase	Marginal	101.51%	101.51%	101.51%	101.51%	101.51%	101.51%	101.51%	101.51%	101.51%
15	Constant	Constant	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
16	Customer Growth Plus Inflation	Customer	102.63%	102.62%	102.60%	102.59%	102.58%	102.58%	102.53%	102.52%	102.52%
17	Change in Allowance for Doubtful Accounts	Doubtful Accts.	102.63%	102.62%	102.60%	102.59%	102.58%	102.58%	102.53%	102.52%	102.52%
18	Depreciation as a % of Total Assets		101.43%	101.43%	101.43%	101.43%	101.43%	101.43%	101.43%	101.43%	101.43%
19	Cost Allocation	CA	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%
Other											
20	Working Capital-% of Oper/Non-Oper Expenses		16.67%	16.67%	16.67%	16.67%	16.67%	16.67%	16.67%	16.67%	16.67%
Revenues											
21	Fuel Reimbursement		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
22	Interest Rate on Investments		0.30%	0.30%	0.40%	0.40%	0.50%	0.50%	0.60%	0.60%	0.70%
23	R&R Contributions		\$ 881,868	\$ 908,324	\$ 935,574	\$ 963,641	\$ 992,550	\$ 1,022,327	\$ 1,052,997	\$ 1,084,587	\$ 1,117,125
24	Growth in Stormwater Utility Charges		102.63%	102.62%	102.60%	102.59%	102.58%	102.58%	102.53%	102.52%	102.52%
25	User Charge Indexing - CPI-U		2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
26	Customer Growth		0.13%	0.12%	0.10%	0.09%	0.08%	0.08%	0.03%	0.02%	0.02%
27	FY Budgeted ERUs		-	-	-	-	-	-	-	-	-
28	ERUs Connected EOY		47,679	47,734	47,784	47,829	47,869	47,905	47,921	47,931	47,941
29	Change in ERUs over prior year		60	55	50	45	40	36	16	10	10
30	Normal Growth		50	45	40	35	30	26	6	-	-
31	Service Availability Redevelopment Growth - Inlet Village Area		1000.00%	1000.00%	1000.00%	1000.00%	1000.00%	1000.00%	1000.00%	1000.00%	1000.00%
32	Percentage Growth in ERUs		100.13%	100.12%	100.10%	100.09%	100.08%	100.08%	100.03%	100.02%	100.02%

TOWN OF JUPITER - STORMWATER SYSTEM
Appendix 10D - Assumptions By Year For Projections

Line No.	Assumptions	Escal. Ref.	2040	2041	2042	2043	2044	2045	2046
Expenses									
1	Salaries	Salaries	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%
2	OT Admin	Admin-OT	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%
3	OT Field	Field-OT	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%
4	FICA	FICA	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%
5	FRS	FRS	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%
6	Health/Life Insurance	Health	107.50%	107.50%	107.50%	107.50%	107.50%	107.50%	107.50%
7	Workers Comp	WC	103.50%	103.50%	103.50%	103.50%	103.50%	103.50%	103.50%
8	OPEB	OPEB	101.04%	101.04%	101.04%	101.04%	101.04%	101.04%	101.04%
9	Consumer Price Index - Gen Inflation	CPI	102.50%	102.50%	102.50%	102.50%	102.50%	102.50%	102.50%
10	Repairs and Maintenance	R&M	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%
11	Utility Costs	Utility	102.67%	102.67%	102.67%	102.67%	102.67%	102.67%	102.67%
12	Gasoline	Gas	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%	103.00%
13	Insurance Costs	Insurance	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%
14	Marginal Increase	Marginal Increase	101.51%	101.51%	101.51%	101.51%	101.51%	101.51%	101.51%
15	Constant	Constant	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
16	Customer Growth Plus Inflation	Customer	102.52%	102.52%	102.52%	102.50%	102.50%	102.50%	102.50%
17	Change in Allowance for Doubtful Accounts	Doubtful Accts.	102.52%	102.52%	102.52%	102.50%	102.50%	102.50%	102.50%
18	Depreciation as a % of Total Assets		101.43%	101.43%	101.43%	101.43%	101.43%	101.43%	101.43%
19	Cost Allocation	CA	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%	105.00%
Other									
20	Working Capital-% of Oper/Non-Oper Expenses		16.67%	16.67%	16.67%	16.67%	16.67%	16.67%	16.67%
Revenues									
21	Fuel Reimbursement		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
22	Interest Rate on Investments		0.70%	0.80%	0.80%	0.90%	0.90%	1.00%	1.00%
23	R&R Contributions		\$ 1,150,639	\$ 1,185,158	\$ 1,220,713	\$ 1,257,334	\$ 1,295,054	\$ 1,333,906	\$ 1,373,923
24	Growth in Stormwater Utility Charges		102.52%	102.52%	102.52%	102.50%	102.50%	102.50%	102.50%
25	User Charge Indexing - CPI-U		2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
26	Customer Growth		0.02%	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%
27	FY Budgeted ERUs		-	-	-	-	-	-	-
28	ERUs Connected EOY		47,951	47,961	47,971	47,971	47,971	47,971	47,971
29	Change in ERUs over prior year		10	10	10	-	-	-	-
30	Normal Growth		-	-	-	-	-	-	-
31	Service Availability Redevelopment Growth - Inlet Village Area		1000.00%	1000.00%	1000.00%	0.00%	0.00%	0.00%	0.00%
32	Percentage Growth in ERUs		100.02%	100.02%	100.02%	100.00%	100.00%	100.00%	100.00%