

# South Indian River Water Control District District Engineer's Annual Report





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### District Engineer's Annual Report

September 2019

### Introduction

South Indian River Water Control District (SIRWCD or the District) was formed in 1923 pursuant to Chapter 298, Florida Statutes to provide flood control and drainage canals in a mostly focused agricultural area. Since 1923, the land use has changed from a primary agricultural use to more of a residential use. As the land use has changed, the District's duties have evolved to not only provide drainage and flood control, but also maintain and improve roads, bridges, and even a park to serve its landowners. SIRWCD continues serving its landowners with ongoing operation and maintenance plans, as well as implementing capital improvement projects and landowner-initiated improvements, where required.

With a clear majority of the District developed, operation and maintenance activities are the main focus. The District continues activities involving site specific drainage improvements that impact landowners, canal and culvert maintenance, and replacement or renewal of facilities that affect the works of the District. The District also continues to operate and maintain roadways and a park, as well as plan new capital and landowner-initiated improvements. The staff investigates whether improvements should be made to other existing infrastructure, such as canals, bridges, or drainage structures.

The focus, this year, has been investigating ways to improve the drainage within the District in terms of water control and water quality. The District has been investigating ways to increase storage and provide additional water quality treatment through its existing facilities. The District Engineer assists the Operations Manager in activities such as culvert replacements or renewals, drainage easement clearing, swale shaping, and roadway maintenance to aid in improving the District's level of service to its landowners. In addition, the engineer is evaluating other opportunities for possible capital improvements in the future such as acquiring land for stormwater ponds and investigating additional structures to improve storage and water quality.

The District is positioned as a strategic entity in the planning and management of water resources for Northern Palm Beach County. The Northwest and Southwest Forks of the Loxahatchee River are the ultimate discharge point for SIRWCD. Due to this strategic location, SIRWCD has an obligation to its landowners and to the surrounding area (Figure 1). Undoubtedly, SIRWCD is not an entity that can just look within its boundaries regarding its authorized activities. To the contrary, a major portion of SIRWCD's activities require participation in programs that look at infrastructure needs and ecosystem



management for the overall area and region. The District and its landowners share in the continued responsibility of being good stewards in maintaining compatibility with these natural systems.

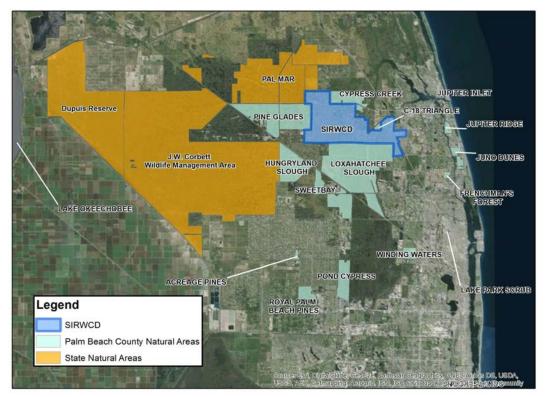


Figure 1. District Location

Each year, it is appropriately restated and recognized in the engineering report that the SIRWCD Board of Supervisors, through its policies and procedures, is responsible for formulating direction regarding District operations and intergovernmental issues. This is accomplished through a respected structure in which the District is managed through its Board of Supervisors and supporting staff. The Board of Supervisors establishes policy and provides direction to staff concerning budget, priorities, relationship with other public entities, and landowner issues. Staff is responsible for implementing Board policy. Accordingly, staff responds pursuant to the Board's direction. Engineering tasks continue to be formulated to respond to the Board of Supervisors by implementing their policies and directives, as well as supporting the General Manager in resolving various landowner issues. The relationship between the Board of Supervisors and District staff has been extremely effective in both the delivery of services to the residents and landowners within the District, and prospective management in response to requirements that are imposed upon the District by other governmental entities.

With regard to the current status of the District, to the best of my knowledge and belief, the District is in compliance with all regulatory requirements that affect works of the District and their operation, and the works of the District continue to be operated and maintained in a manner that achieves the available level of service. A separate report prepared by the District's Operations Manager discussing operation and maintenance of District facilities is included as an appendix to this document.

### Capital Improvements

### Nineteenth Plan of Improvement

Based on a landowner initiative, a referendum was prepared by SIRWCD and verified by the Palm Beach County Supervisor of Elections to implement the application of Palm Beach County Standard asphalt on the petitioners' roadway surfaces as a roadway improvement project. On February 16, 2017, the Board of Supervisors authorized staff to develop the Nineteenth (19<sup>th</sup>) Plan of Improvement. A public hearing was held May 18, 2017 where the resolution was approved and the Board authorized the Engineer's Report for the 19<sup>th</sup> Plan of Improvement. The public hearing for the Engineer's Report and the Plan of Improvement was held June 29, 2017 and the plan was approved. This plan includes the Unit of Development RI-19, which consists of the application of Palm Beach County Standard asphalt on approximately 2.3 miles of roadway within the District. These roads are listed as follows and are shown in Figure 3.

- 76<sup>th</sup> Trail N between 160<sup>th</sup> Lane N and 162<sup>nd</sup> Court N
- 76<sup>th</sup> Trail N between 163<sup>rd</sup> Court N and 165<sup>th</sup> Street N
- 78<sup>th</sup> Drive N between 165<sup>th</sup> Street N and 167<sup>th</sup> Court N
- 154<sup>th</sup> Court N between 75<sup>th</sup> Avenue N and 81<sup>st</sup> Terrace N
- 159<sup>th</sup> Court N between 78<sup>th</sup> Drive N and 83<sup>rd</sup> Way N
- 160<sup>th</sup> Street N between 72<sup>nd</sup> Drive N and 75<sup>th</sup> Avenue N and 72<sup>nd</sup> Drive N from 160<sup>th</sup> Street N to 160<sup>th</sup> Lane N
- 175<sup>th</sup> Road N between Jupiter Farms Road and West End

On April 15, 2018, an advertisement for bid on the project was published in the Palm Beach Post and the bids were accepted on May 15, 2018. After negotiations with the low bidder, contract documents were finalized, and the notice to proceed was issued July 9, 2018 (Figure 2). Construction was completed on June 27, 2019 with a final construction cost of \$900,196.47.



Figure 2. 175th Road North

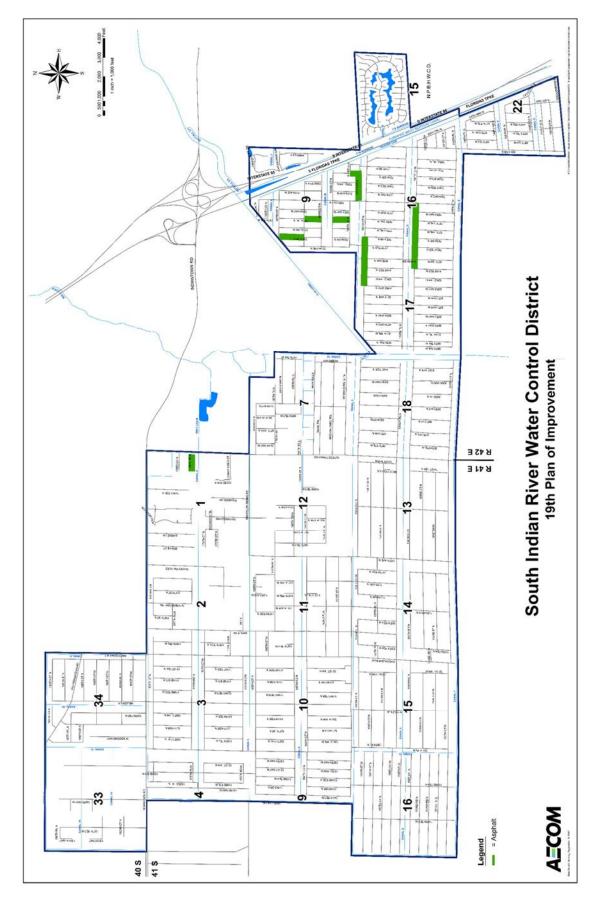


Figure 3. 19th Plan of Improvement



### Proposed Landowner Initiated Roadway Project

Under the current Enhanced Stabilization Policy adopted on April 20, 2017, landowners are allowed to obtain petition forms from the District office for new requests starting on the first business day in February of each year and must return the petition by the last business day in April of the same year. Enhanced stabilization projects require a petition by landowners having signatures from more than 50% of the lots abutting the road segment or lots within the benefitted area, as determined by the District Engineer.

On April 2018, the District received one petition for an enhanced stabilization project. The petition that was received and verified to meet the more than 50% requirements was for the roadway segment 74<sup>th</sup> Avenue N. between 150<sup>th</sup> Court N. and 154<sup>th</sup> Court N. for an asphalt surface (Figure 4). This segment was approximately 0.4 mile and had a preliminary cost estimate of \$200,000. The referendum was mailed on December 14, 2018 and was returned on January 25, 2019. The Supervisor of Elections verified the results with 8 in favor and 6 were opposed, which equated to 44% in favor. The referendum did not move forward because it did not meet the 90% affirmative vote of the benefited landowners.



Figure 4. 74th Ave between 150th and 154th

April 30, 2019 was the deadline for this year's acceptance of petitions, and the District did not receive any completed petitions.

### Proposed Capital Improvement Program

In order to improve drainage and water quality in the Jupiter Farms area, two separate analyses were approved last year. First, the Jupiter Farms area was being evaluated to provide feedback concerning the purchase of land for water quantity and water quality benefits as well as analyze what effect filling undeveloped lots has on the master system. In order to evaluate these elements, the District's hydrologic and hydraulic model needed to be updated to run various scenarios. The latest topographic information from Palm Beach County was obtained to assist in updating the model. The model has been updated and a sensitivity analysis is currently being prepared to run scenarios to determine the sensitivity to various types of projects within the District.

The second effort was to analyze localized projects on a section by section basis to benefit the system of the Jupiter Farms area. Section 7 was determined to be the pilot project for this type of analysis. During the analysis, SIRWCD easements were verified with the District's most available information and survey information was obtained. At the May Board Meeting, the results of the project were presented. The results of the analysis recommended clearing of SIRWCD's over vegetated easements, widening and deepening existing roadside swales, constructing new swales in areas that did not have them, and constructing 16 flashboard risers to the existing SIRWCD easement outfalls. This project proposes to improve the localized drainage as well as provide water quality benefit to the area. Last year, staff prepared a Loxahatchee River Preservation Initiative (LRPI) application for Fiscal Year 2020 funding. Money was not available and therefore, staff resubmitted the application for Fiscal Year 2021. The application was submitted on August 5, 2019, and the presentations were held August 12, 2019. The project was ranked third and has potential for receiving funds.

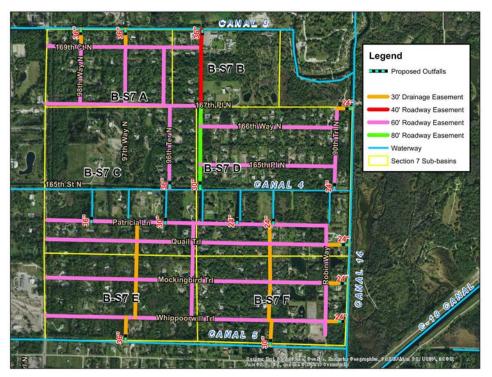


Figure 5. Section 7 Proposed Improvements

Due to the cost associated with a section by section analysis, the Board has requested to combine the two efforts into one effort to evaluate the Jupiter Farms area. This combined effort will utilize the results of the section by section analysis to develop templates for improvements for the remaining sections in Jupiter Farms. These improvements will be input into the updated model to review the results. This one effort will develop a conceptual plan that could potentially be utilized for a plan of improvements for the entire area.

In addition, as a result of the Section 7 project, the Board authorized evaluating Section 18. Section 18 represents a typical section layout of many of the sections within Jupiter Farms. The evaluation of Section 18 will be used to represent the other sections of the District for conceptual planning.



### Resource Regulations

### National Pollutant Discharge Elimination System (NPDES)

The current Palm Beach County Municipal NPDES Permit was issued by the Florida Department of Environmental Protection (FDEP) on September 8, 2016. SIRWCD is a co-permittee along with 34 municipalities, the Department of Transportation, Palm Beach County, and four special districts. In order to complete the permit-related activities that are performed collectively by the co-permittees, an NPDES Steering Committee was formed. The Steering Committee meets on a regular basis to evaluate the



program, to provide training and resources to the co-permittees, and to assist with the preparation of the annual reports. Staff continues to attend the Committee Meetings as a Steering Committee Board member. This past year the meetings included discussions on the Pollutant Assessment Plans, a TMDL update, public education, the Annual Reports and Joint Report, and required refresher training videos on spill prevention, illicit discharges and sediment and erosion control. The Cycle 4/Year 2 Annual Reports were submitted to FDEP in March. In June, FDEP presented their comments on the previous year's Annual Report.

### Waters of the United States (WOTUS) Proposed Rule

On April 21, 2014, the EPA and the Army Corps of Engineers proposed draft rules revising the definitions of Water of the United States or "WOTUS". The stated intent of the changes is to clarify what is and what is not a WOTUS. After many agency comments on the proposed rule, the rule was revised and the EPA and the Army Corps of Engineers published final rules revising the definitions of WOTUS that became effective on August 28, 2015. However if implemented as adopted, the new regulations will result in significant impacts on the NPDES program and municipal separate storm sewer system (MS4) permit holders because most ditches, stormwater conveyances, and certain flood control devices



will be considered to be "WOTUS" and subject to permit conditions and numeric nutrient criteria.

On August 27, 2015, a federal judge in North Dakota granted a petition filed by 13 western states to enjoin implementation of the rules – making implementation and application of the rules throughout the rest of the country even less certain. In addition, other states including Florida filed lawsuits challenging the rule.

On October 9, 2015, the Sixth Judicial Circuit Court of Appeals issued a nationwide injunction stopping the WOTUS rule from being implemented. On March 6, 2017, the President of the United States issued an Executive Order directing EPA and Department of the Army to review and rescind or revise the proposed rule. To meet the objectives of the Executive Order, federal agencies are following a two-step process that will provide as much certainty as possible, as quickly as possible, to the regulated community and the public during the development of the replacement rule.



In addition to the two-step process, on January 31, 2018, the Environmental Protection Agency and U.S. Department of the Army (the agencies) finalized a rule adding an applicability date to the 2015 Rule defining "waters of the United States." The 2015 Rule will not be applicable until February 6, 2020.

Given uncertainty about litigation in multiple district courts over the 2015 Rule, this action provides certainty and consistency to the regulated community and the public, and minimizes confusion as the agencies reconsider the definition of the "waters of the United States" that should be covered under the Clean Water Act.

The agencies' new rule is separate from the two-step process the agencies propose to take to reconsider the 2015 Rule.

The proposed rule was published in the Federal Register on November 22, 2017. The public comment closed on December 13, 2017. Comments can be found in the docket. The final rule was signed on January 31, 2018, and was published in the Federal Register on February 6, 2018.

Due to active court cases on the rule, the United States is operating under two rules; the 2015 Clean Water Rule and the Pre-2015 Regulations and Guidance. Currently, Florida is operating under the Pre-2015 Regulations and Guidance. Figure 6 shows which states are operating under the two rules. This map was revised since last year pursuant to the South Carolina district court's order. The 2015 Rule is in effect in 22 states, the District of Columbia, and the US territories.

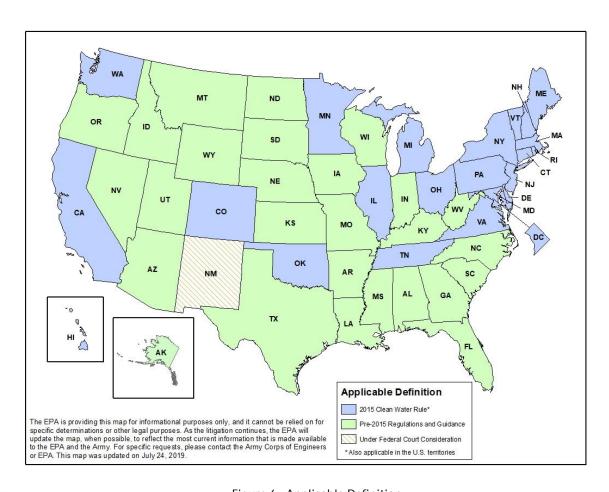




Figure 6. Applicable Definition

Over the past year, the following actions have occurred on this regulation:

- <u>December 11, 2018</u> EPA and the Army Corps of Engineers released a draft proposed rule narrowing the definitions of Waters of the United States.
- <u>February 14, 2019</u> EPA and the Army Corps of Engineers published a proposed rule replacing the 2015 WOTUS regulations with a significantly narrower set of definitions.
- March 15, 2019 The Florida Stormwater Association (FSA) and the Florida League of Cities, Rural Water Association and the Southeast Stormwater Association filed a Motion for Summary Judgement in US District Court for the Northern District of Florida in Tallahassee. The Motion asks the Court to invalidate the 2015 Rules.
- April 5, 2019 The reply briefs of the Environmental Protection Agency and Intervenors Natural Resources Defense Council, National Wildlife Federation and Tennessee Scenic Rivers Association were filed with the Court on April 5, 2019 in support of the 2015 WOTUS rules.
- <u>August 22, 2019</u> In early August a Federal Court for the Southern District of Georgia ruled against EPA and in favor of the Plaintiffs, in this case various state governments. FSA and its coplaintiffs are obligated to provide information concerning developments in similar cases. While the Georgia decision ruled in a manner favorable to most of the issues, the court was not asked to rule on one of our key issues - whether waters composing an MS4 system could simultaneously be jurisdictional waters or WOTUS.
- <u>September 12, 2019</u> EPA announced that it has finalized a repeal of the 2015 water rule. EPA will create a new rule to replace the WOTUS regulation.

### Triennial Review of Florida's Water Quality Standards

FDEP announced initiation of the Triennial Review of Florida's surface water quality standards. All surface water quality standards in Chapter 62-4, Chapter 62-302 Chapter 62-303, and Chapter 62-304, Florida Administrative Code, are under review and may be revised as part of the Triennial Review. States are required under the Federal Clean Water Act (40 CFR 131.20) to conduct a comprehensive review of all water quality standards at least once every three years (Triennial Review). At least one public hearing must be conducted during the Triennial review to receive public input on suggested standards changes, and to provide an opportunity for the public to suggest water quality standards changes. States must also consider adopting any new EPA 304(a) criteria recommendations (National Recommended Water Quality Criteria).

Three public workshops/hearings were held to solicit public input on the Triennial Review between May 14th - May 16th, 2019. These workshops/hearings were designed to provide a forum for the public to recommend revisions to Florida's water quality standards. DEP presented information about potential revisions to Florida's water quality standards, including consideration of U.S. EPA 304(a) criteria recommendations.



### Wetlands Delegation

After the passage of HB 7043 during the 2018 Legislative Session, FDEP began to actively pursue assumption of the federal dredge and fill permitting program from EPA and the Army Corps of Engineers. Proposed rules (Chapter 62-331) governing the administration of the program were issued by FDEP, and two draft Memoranda of Agreement - one between FDEP and EPA, and another between FDEP and the Corps - have been released.

### Public Facilities Report/Water Control Plan

Chapter 189 of the Florida Statutes, the Uniform Special District Accountability Act, requires the preparation and submission of a Public Facilities Report to governmental jurisdictions in which the District resides such as Palm Beach County, the Town of Jupiter, and South Florida Water Management District. Special Districts are required to submit an update to this report every five years and, at a minimum, the report must contain information as to the status of the District's public facilities and changes or revisions to those facilities that have occurred in the past year.

Since 1991, when the District filed its first Public Facilities Report, data collection has been an ongoing process to provide for better and more accurate mapping of the works of the District. The Public Facilities Report is continually modified as each Plan of Improvement is added to the District's facilities. The current modification includes the Nineteenth Plan of Improvements and updating the entire report. In accordance with Chapter 298.225 Florida Statutes, the Water Control Plan has been amended consistent with the preparation of the proposed Plan of Improvements during the last year.

With the re-evaluation of the District facilities, the conceptual plan may propose capital improvements to address water quantity and quality concerns. Should the proposed capital improvements be approved by the Board, the Public Facilities Report would be modified to illustrate these changes. The report would also include a capital improvement program as a result of the approved improvements.



### Government Agencies

A summary of regulatory agencies and cooperative associations affecting SIRWCD is listed in the Annual Report each year. The following list is offered to inform the landowners of the number of regulatory agencies and cooperative associations with which the District conducts business and their potential impact on the District's capital improvements, operations, and maintenance.

- United States Environmental Protection Agency (EPA)
- United States Army Corps of Engineers (ACOE)
- United States Fish and Wildlife Service
- Florida Department of Environmental Protection (FDEP)
- Florida Department of Economic Opportunity (DEO)
- Florida Department of Transportation (FDOT)
- Florida Fish and Wildlife Conservation Commission
- South Florida Water Management District (SFWMD)
- Palm Beach County
- Loxahatchee River Environmental Control District (LRD)
- Town of Jupiter
- Loxahatchee River Preserve Initiative (LRPI)

- Northern Palm Beach County Improvement District (NPBCID)
- City of West Palm Beach
- Indian Trail Improvement District
- Jupiter Inlet District
- City of Palm Beach Gardens
- Martin County
- United States Geological Survey (USGS)
- Loxahatchee River Ecosystem Management Area Committee
- Loxahatchee River Management Coordinating Council (LRMCC)
- Solid Waste Authority of Palm Beach County (SWA)
- Numerous Citizen Interest Groups and Committees



### Loxahatchee River Management Coordinating Council (LRMCC)

The LRMCC was established by Chapter 83-358, F.S. The Council is comprised of federal, state, and regional agencies and local representatives. It advises the FDEP and SFWMD on matters that affect administration of the Loxahatchee River, to identify and resolve intergovernmental coordination problems and to enhance communications. The Council is also responsible for the development of the Loxahatchee River Management Plan, which contains the principal goals to preserve and enhance the river's unique natural values, restore the river's historic hydrology and reverse the deleterious impacts of saltwater intrusion on the River's ecosystems.

Figure 7 shows a map of the Loxahatchee River.

LRMCC also continually assesses the implementation of the plan's objectives. These objectives are:



Figure 7. Loxahatchee River

- Preserve and enhance the river's unique natural and cultural values
- Restore the river's historical hydrologic regime and reverse deleterious saltwater intrusion

SIRWCD participates as a member of the Coordinating Council due to the fact that the Northwest Fork of the Loxahatchee River is the primary stormwater outfall for the entire portion of SIRWCD lying west of the SFWMD C-18 Canal, and the area east of the SFWMD C-18 discharges into the middle of the Loxahatchee River. SIRWCD and the LRMCC also have several mutual issues and interests.

Over the past year, the LRMCC has been actively monitoring projects that could affect the Loxahatchee River. These projects include the Cypress Creek Kayak Launch, Loxahatchee River Watershed Restoration Project, Assessment of Implementation of 2010 LRMCC Plan Objectives, Cypress Creek Floodplain Restoration Project, and the development of a Reasonable Assurance Plan (RAP) for the Loxahatchee River. They also monitor activities that may affect the river such as supporting land acquisition activities by SFWMD.



### Reasonable Assurance Plan (RAP)

On March 28, 2016, the FDEP approached the LRMCC on the proposed development of a Total Maximum Daily Load (TMDL) within some waterbody identification units (WBID) within the Loxahatchee River that have shown impairments in Chlorophyll a (nutrients) and Fecal Coliform as shown in Figure 8. FDEP suggested that instead of development of a TMDL through the state process, LRMCC could take the lead on developing a Reasonable Assurance Plan (RAP), which would replace the TMDL and subsequent Basin Action Management Plan. The RAP is a stakeholder driven plan that examines the impairments and prepares solutions to aid in restoring the Loxahatchee River impairment. FDEP is developing a TMDL concurrently with the RAP process until the RAP process has been finalized by the stakeholders.

Stakeholders decided to move forward with the RAP. They also agreed on the methodology of the model for determining allocations and reductions and the need to develop a water quality monitoring plan. Over the past year, FDEP has been updating the model with the stakeholders' inputs as well as implementing projects into the model that aid in reducing pollutants to restore the Loxahatchee River.

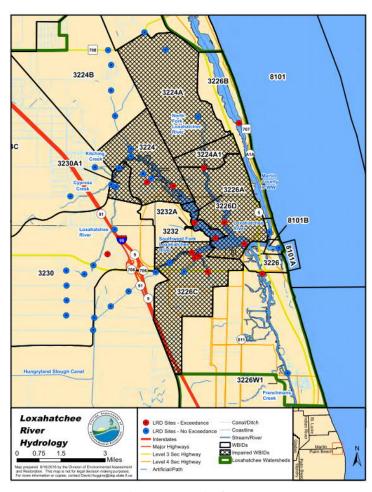


Figure 8. Impaired WBIDs

At the June 2019 LRMCC meeting, FDEP presented the results of the modeling with the current projects submitted. Table 1 represents the current estimated loading and reductions needed to meet the water quality standards. The estimated reductions are proposed to meet the chlorophyll-a standard of 5.5 ug/L.

Table 1. Estimated	Loadings and Red	uctions
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Loading	TN	TP
Target Load	96,603	10,931
Starting Load (80th pct)	133,093	15,060
Reduction %	27%	27%
Reduction lbs/yr	36,489.23	4,128.85

Table 2 represents the reductions made based on the current proposed projects identified in the modeling. With the current projects planned, the nutrient reduction is achieved for total phosphorus (TP), but not for total nitrogen (TN).



Table 2. Completed, Planned, and Underway Projects (since 2008)

Description	TN (lb/yr)	TP (lb/yr)
Revised PLSM Reduction Estimate	36,489	4,129
Reductions from All Projects	26,409	4,406
Reductions Remaining	10,080	(277)
Percentage of Reductions Achieved	72%	107%

As a result of this modeling effort, the LRMCC decided to support a 4E Plan of the RAP, which means the RAP is submitted as a plan that does not meet all the requirements, but it shows that the stakeholders are working on meeting the reduction requirements. FDEP is continually collecting projects from the stakeholders to determine if further reductions can be made. Staff continues to participate in the development of this plan.

### Loxahatchee River Preservation Initiative

The Loxahatchee River Preservation Initiative (LRPI) is the outgrowth of a watershed management effort that the FDEP spearheaded in 1996. This multi-agency and stakeholder based advisory group was organized primarily for the purpose of soliciting, ranking and submitting to the Florida Legislature a list of projects focused on the preservation and restoration of the water quality and habitats of the Loxahatchee River (Figure 9) and its watershed. Agencies and stakeholders are given an avenue to apply for funding on several key projects that are critical to preserving the long-term health of the Loxahatchee and have not been implemented due to lack of resources and other regional priorities taking precedence.

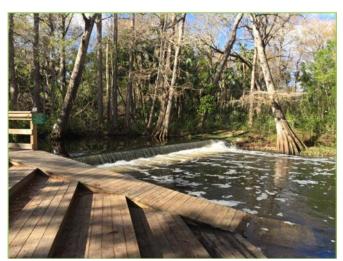


Figure 9. Masten Dam

SIRWCD participates as a member of the LRPI due to its location within the Loxahatchee River watershed. This year, SIRWCD applied for grant funding for Section 7 Drainage Improvements. This project is the first of the section by section analysis. A presentation for the approval of this project was held on August 12, 2019 for the fiscal year 2021 funding. SIRWCD presented swale improvements, drainage easement clearing, and updated outfall structures to help reduce water quantity and to provide water quality treatment. The project was ranked third this year and has potential for obtaining some funding. SIRWCD will continue to apply for grants in the future.

# South Florida Water Management District (SFWMD) Everglades Restoration Strategies

The State of Florida and the EPA reached a consensus on new strategies for improving water quality in America's Everglades. The SFWMD's Everglades Restoration Strategies Regional Water Quality Plan has been developed in order to address water quality–based effluent limits for Stormwater Treatment Areas to meet NPDES permitting requirements by EPA. Under these strategies, the SFWMD is



implementing a technical plan to complete several projects that will create more than 6,500 acres of new stormwater treatment areas (STAs) and 116,000 acre-feet of additional water storage through construction of flow equalization basins (FEBs). FEBs provide a more steady flow of water to the STAs, helping to maintain desired water levels needed to achieve optimal water quality treatment performance.

Construction of the treatment, storage and conveyance improvement projects in the Restoration Strategies Regional Water Quality Plan will be complete by 2025. Several projects are already operational, and many others are underway. These projects are shown in Figure 10 and are described as follows:

- A-1 Flow Equalization Basin With a capacity of 60,000 acre-feet, this project is the largest of three flow equalization basins in the plan. This project was completed in July 2015 and is operational.
- <u>S-5AS Structure Modifications</u> Implementation of the projects within the plan will increase the use of this existing structure due to direct stormwater runoff north to the L-8 FEB for storage. As a result, some modifications and upgrades to the structure were required. This project was completed in May 2016 and is operational.
- <u>L-8 Divide Structure (G-541)</u> G-541 is a fully automated water control structure located within the L-8 canal, just east of the L-8 FEB. This project was completed in July 2016 and is operational.
- <u>S-375 Structure Expansion (G-716)</u> The new G-716 structure expands the capacity of the existing S-375 structure, located within STA-1 East. This structure was completed in April 2017 and is operational.
- <u>L-8 Flow Equalization Basin</u> Building on a strategically located 950-acre former rock mine, this deep below-ground reservoir is capable of storing 45,000 acre-feet of water. Initially, this project will function as a multipurpose FEB to capture, store and deliver water to STA-1 East and STA-1 West to improve performance and restoration. When the STA-1 West expansion is operational, the L-8 FEB will transition to primarily storing stormwater runoff and delivering flows to optimize the treatment performance of STA-1 East and STA-1 West. The project was completed in July 2017 and is operational.
- <u>STA-1 West Expansion</u> Located immediately northwest of the Arthur R. Marshall Loxahatchee national Wildlife Refuge, STA- West removed excess phosphorus and other nutrients from stormwater flowing into the Refuge and other parts of the greater Everglades. The 6,500-acre expansion of STA-1 West, which will take place in two phases, will double its effective treatment area and further reduce phosphorus concentrations. The STA-1 West Phase 1 Expansion construction was completed January 2019. Phase 2 consists of land acquisition, which was completed in January 2018. Preliminary design started to start by October 2018 with construction completion scheduled in December 2022.
- <u>G-341 Related Conveyance Improvements</u> This project is a multi-phase, multi-year project intended to improve conveyance within the eastern Everglades Agricultural Area, specifically in the Bolles East, Ocean and Hillsboro canals. Improvements to Bolles East Canal Segments 1 and 2 are complete. Segment 3 construction and Segment 4 design are ongoing. Construction completion is anticipated in December 2024.





Figure 10. Final State Proposal of Key Projects and Components

### Loxahatchee River Watershed Restoration Project (LRWRP)

In December 2014, SFWMD and the Army Corp of Engineers (ACOE) kicked off the Loxahatchee River Watershed Restoration Project (formerly known as North Palm Beach County – Part 1), which is part of the Comprehensive Everglades Restoration Plan (CERP). The renewed purpose of the project is to restore and sustain the overall quantity, quality, timing, and distribution of freshwaters to the federally designated "National Wild and Scenic" Northwest Fork of the Loxahatchee River for current and future generations. This project also seeks to restore, sustain, and reconnect the area's wetlands and watersheds that form the historic headwaters for the river and its tributaries. Figure 11 indicates the study area.

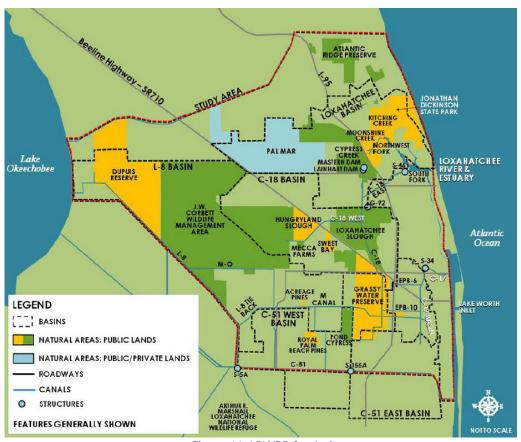


Figure 11. LRWRP Study Area

Planning efforts for the project were put on hold in 2011 and were restarted on January 12, 2015. The project was re-scoped under ACOE's New Planning Paradigm and existing plan formulation data and analysis is being used in the development of a final plan, known as a Project Implementation Report (PIR) and Environmental Impact Statement, to prepare for congressional authorization.

The SFWMD and the ACOE conducted an alternative formulation and analysis process for the plan formation. This consisted of evaluating alternative plan selections for determining the best project scenarios. A calibration report was produced to illustrate the existing watershed conditions at the same time that alternative project analyses are being conducted. As a result of these evaluations and updated modeling, Alternative 5R was selected for the tentatively selected plan (TSP). This plan consists of 10 components and is shown in Figure 12. On August 1, 2018, the PDT was notified that the ACOE



Headquarters concurred with the PDT's recommendation for Alternative 5R. ACOE prepared a draft Project Implementation Report (PIR) and Environmental Impact Statement. The draft report was released on March 22, 2019. Two public meetings were held on April 18, 2019 and April 19, 2019 to solicit public comment. SIRWCD submitted comments on May 6, 2019 concerning the plan. As part of this effort, SIRWCD will be meeting with SFWMD to re-evaluate the 1989 agreement concerning the operation of the G-92 structure. The current scheduled date to release the draft report is October 2019. SIRWCD has been attending these meetings along with participating in the engineering and modeling sub-team to ensure that SIRWCD's operations are being represented correctly within the modeling effort.

### Florida Association of Special Districts

Serving the Special Needs of Your Community



SIRWCD's Board of Supervisors and staff are active participants in the Florida Association of Special Districts (FASD). This year, Michael Dillon has joined the board of this organization. FASD is the recognized, collective voice of special purpose government across the State of Florida. This diverse network of both Independent and

Dependent Special Districts have come together to provide resources uniquely developed to meet the needs of Florida's Special Districts. The purpose of the FASD is to keep the public informed of the benefits of Special Districts, update members with information useful to themselves and their community, review all government activities as they affect the interest of Special Districts, and to forward requests and comments to the Florida Legislature. FASD provides primary education and training to satisfy the educational requirements of Ch. 189, Florida Statutes. The purpose of the education program is to ensure that elected boards and district managers comply with Florida Statutes governing special districts. The Department of Economic Opportunity, Division of Community Development, assists with educational programs for board members and the annual conference by partnering with FASD.

The FASD holds regular meetings throughout the year where information from other water control districts, improvement districts, community development districts, and special taxing districts can be shared with regard to policies, procedures, operation, and maintenance issues. In addition, members of FASD are "watchdogs" for codes, ordinances, rules, and/or legislation that can either help or hinder the activities of Special Districts. To this end, a significant effort is put forward during the annual legislative session. FASD members continue to benefit from each other's experiences.

The FASD will continue to follow this order and represent the interests of its members and provide information on pertinent legal requirements, sunshine laws, economic challenges, environmental, emergency management, and homeland security issues.

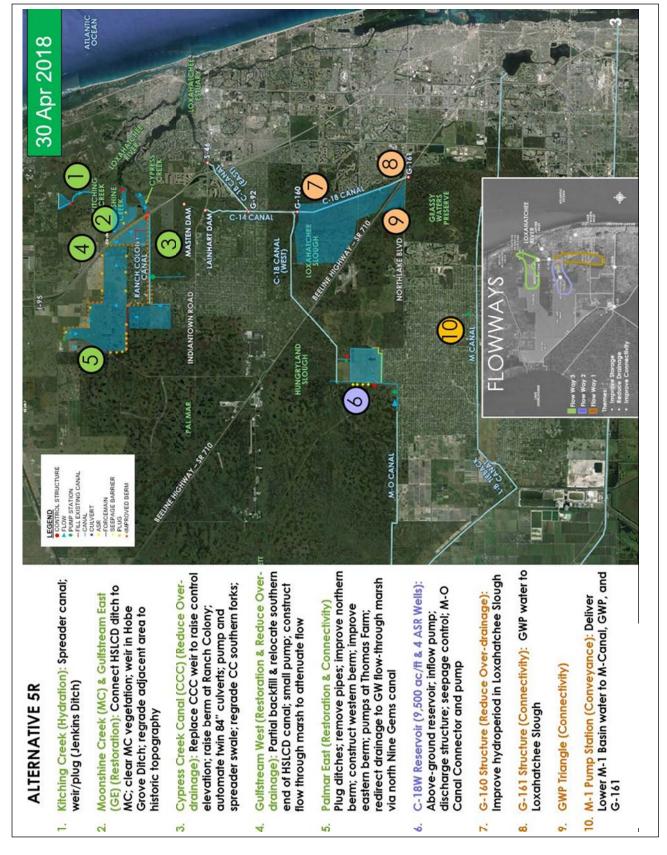


Figure 12. Alternative 5R

### Debris Removal

On September 10, 2017, Hurricane Irma made landfall. As a result of this storm event, the District has been working with the Federal Emergency Management Agency (FEMA) and the National Resource Conservation Service (NRCS) for funding on debris removal within the canal system. For the reimbursement from FEMA, the District identified approximately 27 sites along the perimeter canal system and 2 sites in Section 33. FEMA would only reimburse for the actual tree removal along the banks and within the canals. The construction contract for this work was authorized on February 21, 2018 with completion on May 2018. Over the past year,



Figure 13. Completed Slope Repair

staff has been working with FEMA on additional information needed to process the funding.

Since FEMA only funds for actual tree removal, SIRWCD requested funds from the NRCS to reimburse for slope repair. The slope repair project includes 17 sites for minor repair and 1 site for rip rap stabilization. The agreement with the NRCS was signed June 2018. The construction contract began July 27, 2018 and was completed with the final certification was signed on March 21, 2019.

As a result of this hurricane, SIRWCD was proactive this year by solicitating contracts for debris removal. The contract is a three (3) year contract with three contractors with the ability to renew the contract for up to five (5) years. By having this contract in place, SIRWCD can avoid solicitating contractors after the storm and can immediately begin debris removal.

### **Culvert Replacement Program**



Figure 14. Canal Culvert under 175th

Culverts under driveways have been aging over the years. These culverts are the landowner's responsibility to maintain and to replace when their life span has ended. These culverts, when not maintained, collapse and block the secondary drainage system of the District. The District has instituted a culvert replacement program which allows the landowner's to pay the District for the replacement of their culverts.

In addition to driveway culverts, the District inspects the outfall culverts to the



canals, cross drain culverts under roadways, and other culverts that the District operates and maintains. The District assesses the condition of these culverts and replaces them as needed. The District identified the two 60-inch diameter culverts under 175<sup>th</sup> Drive North and 176<sup>th</sup> Lane North to replace this year. These culverts were replaced due to their condition and due to the timing of the asphalt improvement of 175<sup>th</sup> Drive North. These culverts were replaced with 9 feet by 5 feet box culverts to aid in the reduction of debris blocking the openings during storms. The replacement of these culverts was completed in January 2019. Figure 14 shows the culvert under 175<sup>th</sup> Road N.

### Canal Clearing and Maintenance



Figure 15. Excavator

The District's canal network consists of over 60 miles of canals which are continuously in need of being maintained, restored, and enhanced. The canal clearing and maintenance program's objective is to keep the canal sections easily accessible and, to the best extent possible, free from trees and other vegetation that may potentially enter the canal during a major storm event and thereby create a restriction that would aggravate flooding.

The canal clearing and maintenance program provides services that include clearing, grading and shaping of the canals as well as restoring, replacing or enhancing structural improvements. The program is an ongoing effort and the District has continued to work to maintain and achieve the desired goals.

The Board has authorized an on-going swale maintenance program which allows the District Engineer and General Manager to identify areas within SIRWCD that could be improved for conveyance and storage. District staff will continue to work toward the desired goals of the District in the swale maintenance program. Figure 15 shows equipment that is used to clean swales.

### Secondary Ditch Reclamation

Over the years, landowners have been filling in their swales and ditches that are used for our secondary drainage system or they do not realize that they have an outfall swale on their property. The District has been examining the outfall swales throughout the District to determine the need for vegetation removal and/or outfall pipe replacements. The District has also been conducting title searches to determine whether the outfall swales are under a drainage easement so the maintenance can be conducted. Several outfalls have been reclaimed this year. The District plans on continuing this service. In addition, the section by section evaluation allows



Figure 16. Mockingbird Outfall Ditch



the District to evaluate the needs at a more local level for swale capacity. Figure 16 shows an example of a ditch that needs to be reclaimed on Mockingbird Lane, which will be part of the Section 7 Drainage Improvement Project.

### Policies and Procedures Manual

In accordance with the provisions of the Florida Statutes, the District maintains a Policies and Procedures Manual that is available to the public. The Manual presents and discusses items including: District organization, agenda formulation and execution, processing of permits that affect works of the District, the budget process, etc. Periodic revisions including deletions, additions, and amendments are made to maintain consistency with Florida Statutes and other codes and rules. The entire manual is being updated to include new policies that have been added throughout the year. This year Chapters 1 through 6 have been re-evaluated and updated. This year, staff is concentrating on Chapters 7 through 9. The update will continue through next year and includes the new Enhanced Stabilization Policy that was approved in April 2017.

### Roadways

There are approximately 189 miles of roads within SIRWCD. These roads give access to each subdivided parcel of land. Currently there are 96 miles of improved roads (paved and OGEM) and 92 miles of unpaved roads in SIRWCD. The improved roads include roads that are operated and maintained by Palm Beach County, the Town of Jupiter, and private entities or owners, which consist of approximately 42 miles of roadway.

### Aquatic Weed Control Program

SIRWCD implements an Aquatic Weed Control Program in order to maintain the primary canals throughout the District. This Program is an ongoing process aimed at reducing and managing the amount of weeds in the canal network to allow unobstructed drainage following rain events. The Aquatic Weed Control Program is necessary to prevent canals from becoming overgrown and to provide a clean channel through the canal system to the outfall.

The program controls emergent vegetation growth through the use of herbicides approved in permits obtained from the State of Florida as well as mechanical removal of dead or accumulated vegetation that may present a potential for impeding the flow of storm water through the primary canal system.

In the future, greater emphasis may be needed for this program as a result of NPDES water quality programs, the FDEP and EPA proposed storm water criteria, the Loxahatchee River Management Plan, and other intergovernmental coordinating activities.



### Water Quality Monitoring

With many ecological and regulatory pressures being exerted over the Loxahatchee River Basin area, it was recommended that the District sample and monitor water quality within and adjacent to its boundaries. The Loxahatchee River Environmental Control District (LRD) has been obtaining water quality samples in recent years. The existing locations sampled by LRD are depicted on Figure 17. LRD posts the results of these locations on their website.



Figure 17. LRD Sampling Locations

Due to the water quality legislation, the Board of Supervisors instructed staff to implement a water quality monitoring program that augments and expands the current LRD program. In July 2011, SIRWCD entered into a contract with a water sampling and testing firm. The samples are tested to analyze the surface water and groundwater for various metal, organic and inorganic contaminants as well as water quality criteria. Figure 18 illustrates the sampling locations for this program. Staff monitors these locations on a monthly basis. Samples are only taken when the District discharges outside its boundaries.

As a requirement of the NPDES MS4 Permit, SIRWCD was required this year to develop an Assessment Program. The purpose of this assessment program is to provide information for SIRWCD to determine the overall effectiveness of its Stormwater Management Program (SWMP) in reducing stormwater pollutant loadings from its MS4 to receiving water bodies. The water quality information is being used to monitor the District's discharge and will be used in future analysis as needed for the NPDES permit and the RAP.



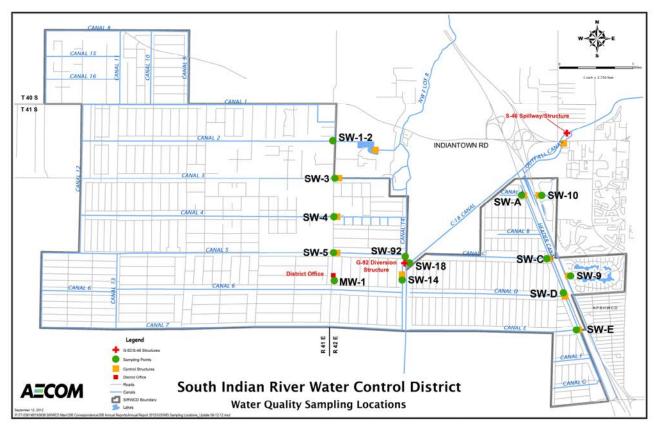


Figure 18. SIRWCD Sampling Locations

#### Rainfall

The SIRWCD work center monitors and records the total rainfall the District receives throughout the year. For the twelve-month period from September 2018 through August 2019, the District received 69.02 inches of rainfall. The District's historical monthly rainfall data dating back to 1987 as well as the calculated monthly average rainfall is illustrated in Table 3. The average annual rainfall for SIRWCD is 66.24 inches with this year's data. The 2018-2019-year rainfall was approximately 3 inches higher than the historical rainfall average within the District. Historical rainfall data obtained by LRD, the Town of Jupiter Water Department (TOJ), and the SFWMD are shown below in Tables 4, 5, and 6, respectively.

The 2018-2019 monthly rainfall data from SIRWCD, LRD, and TOJ have been averaged to determine the rainfall for an area referred to as North County. The average total year rainfall in North County from September 2018 to August 2019 was 65.16 inches. The North County Averages can be found in Table 7.

The SFWMD data represents the historical averages of numerous rainfall measuring stations throughout Palm Beach County. Table 6 and Figure 19 compare the rainfall data from 2018-2019 SIRWCD, the 30-year SFWMD average, and the 2018-2019 North County average. The cumulative rainfall for 2018-2019 SIRWCD, the 30-year SFWMD average, and the North County average are shown in Table 9 and Figure 20.



Table 3. SIRWCD Rainfall Data

	Historical Rainfall Data (inches)												
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	TOTAL
1987-1988	8.08	6.03	12.92	1.25	4.00	2.60	3.20	2.50	9.30	13.25	14.20	10.75	88.08
1988-1989	1.00	1.35	1.70	1.75	0.40	0.25	4.10	5.50	1.90	6.95	7.90	6.75	39.55
1989-1990	3.80	3.75	1.40	2.15	1.10	1.80	6.20	2.20	4.85	5.85	4.85	9.40	47.35
1990-1991	11.35	3.05	2.65	2.55	7.75	4.20	4.25	7.35	5.50	15.90	9.80	5.72	80.07
1991-1992	9.95	4.35	4.85	0.55	0.75	6.25	4.70	3.00	2.45	16.85	2.80	11.95	68.45
1992-1993	9.00	0.75	9.85	0.75	12.60	4.15	10.75	2.10	7.18	7.30	4.75	3.73	72.91
1993-1994	8.15	12.00	2.57	0.47	2.09	4.12	1.67	2.50	2.65	7.23	4.91	9.77	58.13
1994-1995	7.55	7.15	7.87	7.51	2.32	1.83	2.68	3.57	1.43	10.08	10.73	14.80	77.52
1995-1996	4.78	25.90	0.71	1.22	1.39	1.00	11.94	2.01	10.62	7.39	9.74	8.31	85.01
1996-1997	7.41	6.60	4.37	0.98	4.11	6.41	2.51	7.24	5.45	14.60	6.18	12.39	78.25
1997-1998	10.26	1.78	3.53	5.45	6.54	7.84	4.78	5.71	1.91	1.88	8.74	7.13	65.55
1998-1999	10.81	4.03	10.86	1.26	9.76	0.68	0.37	0.87	2.59	16.38	7.21	15.22	80.04
1999-2000	9.79	17.41	0.76	5.39	1.23	1.55	3.27	4.16	0.89	3.21	7.33	2.49	57.48
2000-2001	6.45	12.06	1.03	3.15	1.10	0.03	5.56	0.65	5.92	9.78	8.28	11.81	65.82
2001-2002	14.26	6.65	3.17	2.73	1.25	6.41	1.29	5.31	2.03	10.56	9.71	5.63	69.00
2002-2003	3.67	2.40	3.13	2.95	0.17	1.61	7.62	6.22	10.70	5.81	2.62	9.41	56.31
2003-2004	4.65	6.45	5.81	3.38	2.09	2.07	0.81	2.11	3.11	3.95	8.66	7.70	50.79
2004-2005	25.72	1.44	1.39	1.04	1.50	1.44	9.44	2.05	6.80	12.69	4.07	7.00	74.58
2005-2006	13.21	11.80	3.08	0.74	0.43	2.97	0.67	2.67	2.39	8.59	6.06	12.04	64.65
2006-2007	4.56	2.22	1.58	3.58	0.28	1.40	0.74	3.37	5.09	10.72	12.93	9.44	55.91
2007-2008	12.38	7.55	1.92	4.43	0.95	4.07	4.15	2.32	4.78	8.14	5.40	9.07	65.16
2008-2009	4.98	4.62	1.47	2.08	0.05	0.74	4.89	1.39	11.15	6.30	8.87	6.68	53.22
2009-2010	3.82	1.92	2.92	7.32	1.86	2.15	9.46	4.98	6.50	7.06	5.71	9.99	63.69
2010-2011	9.20	1.20	1.59	0.44	3.21	0.39	2.33	1.02	3.91	7.10	7.63	7.70	45.72
2011-2012	9.72	11.30	1.59	2.00	0.75	6.62	4.50	1.18	6.93	5.97	4.30	15.66	70.52
2012-2013	3.87	4.59	0.51	3.66	1.22	2.40	1.18	3.60	8.72	9.65	10.74	9.35	59.49
2013-2014	9.40	0.81	6.98	1.49	11.65	2.84	4.43	1.62	6.14	11.80	9.37	5.90	72.43
2014-2015	7.23	4.25	1.58	1.27	1.41	10.97	3.06	4.36	2.67	4.63	7.26	8.69	57.38
2015-2016	9.50	0.98	3.62	10.04	7.91	3.51	6.40	1.67	5.65	6.47	2.21	10.42	68.38
2016-2017	4.25	4.71	0.21	2.48	2.25	3.19	1.32	6.64	4.22	11.26	11.04	2.48	54.05
2017-2018	12.42	18.46	7.20	1.23	3.81	0.49	0.52	5.74	17.71	17.00	11.45	9.10	105.13
2018-2019	6.84	1.41	4.05	0.70	7.18	2.92	3.85	5.78	5.17	5.60	9.92	15.60	69.02
AVG	8.38	6.22	3.65	2.69	3.22	3.09	4.15	3.48	5.51	9.06	7.67	9.13	66.24

Table 4. Loxahatchee River District (LRD) Rainfall

	Historical Rainfall Data (inches)												
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	TOTAL
1974-1975	5.01	6.07	1.81	1.66	0.46	2.80	1.63	1.92	8.20	10.19	6.78	1.46	47.99
1975-1976	5.67	3.83	1.10	2.15	0.40	6.30	0.36	1.89	10.57	4.70	1.59	5.20	44.26
1975-1976	8.91	4.12	3.69	2.13	4.48	1.54	1.77	2.00	8.60	3.06	2.33	5.97	49.18
1976-1977		1.13		6.21		2.60		0.25	4.15	11.95	13.15		
	13.39		1.14		4.80		3.40					10.71	72.88
1978-1979	9.45	3.40	7.30	13.62	5.10	0.47	1.16	3.81	5.45	4.32	3.36	5.61	63.05
1979-1980	18.96	5.22	4.16	1.49	3.84	2.58	1.79	2.88	5.40	4.83	7.94	4.22	63.31
1980-1981	6.42	6.16	4.72	3.04	0.63	3.65	1.00	0.92	3.35	4.67	3.59	16.71	54.86
1981-1982	8.61	2.73	3.87	0.58	1.88	9.38	18.16	7.71	11.38	12.65	3.85	8.79	89.59
1982-1983	8.02	2.83	21.95	2.11	6.19	7.13	5.26	4.05	3.14	9.02	4.04	8.19	81.93
1983-1984	16.40	6.98	4.86	7.59	1.12	2.77	5.22	3.05	7.92	5.01	6.57	3.61	71.10
1984-1985	11.55	2.19	9.52	1.35	1.13	0.29	1.88	3.73	2.53	4.98	5.06	4.37	48.58
1985-1986	11.74	6.51	1.21	4.31	5.51	1.81	14.00	0.25	1.17	11.40	7.30	5.93	71.14
1986-1987	5.39	6.75	6.13	6.97	2.62	3.11	6.88	0.30	6.93	7.64	4.09	3.88	60.69
1987-1988	7.09	3.94	12.25	0.19	4.18	4.91	3.39	1.84	8.24	7.09	7.95	7.41	68.48
1988-1989	2.02	2.79	6.32	1.32	1.22	0.37	3.84	4.73	2.82	3.33	6.75	5.70	41.21
1989-1990	2.36	3.16	1.41	2.18	1.68	1.38	6.36	1.49	3.84	2.51	4.29	3.16	33.82
1990-1991	8.25	3.02	0.97	1.83	7.45	2.75	2.99	2.92	6.71	7.68	5.57	3.80	53.94
1991-1992	5.88	4.28	2.72	0.47	1.74	3.30	3.74	3.67	1.46	15.44	2.16	9.27	54.13
1992-1993	10.54	1.63	9.17	1.02	12.75	4.57	9.73	2.22	3.32	8.50	2.99	2.22	68.66
1993-1994	8.59	11.29	5.66	0.81	3.38	4.20	1.97	3.74	3.41	8.31	4.87	10.06	66.29
1994-1995	7.48	5.60	10.27	7.30	2.54	1.49	2.81	3.40	0.80	9.56	8.98	13.02	73.25
1995-1996	5.44	23.64	1.42	1.89	1.33	1.30	11.00	1.51	8.57	6.63	5.96	6.77	75.46
1996-1997	4.81	5.04	4.77	7.77	3.53	2.44	2.50	9.19	6.08	19.35	8.42	18.52	92.42
1997-1998	9.37	2.24	2.92	4.76	6.84	6.51	4.93	3.18	2.46	3.93	8.41	7.78	63.33
1998-1999	12.00	4.60	8.61	2.04	9.33	0.63	0.30	0.92	4.11	13.62	6.24	10.70	73.10
1999-2000	12.25	18.04	0.41	2.19	1.11	1.02	2.18	5.40	2.05	1.63	4.81	3.93	55.02
2000-2001	10.17	12.88	2.05	4.08	1.19	0.40	6.99	0.92	5.41	9.12	10.96	12.02	76.19
2001-2002	18.95	5.81	2.48	2.94	0.76	6.71	1.47	3.62	1.36	10.11	9.58	7.58	71.37
2002-2003	6.02	3.20	3.22	3.60	0.19	1.60	8.64	4.90	10.74	4.91	1.77	7.56	56.35
2003-2004	5.91	2.50	6.06	3.19	1.77	2.25	0.64	1.62	3.20	3.18	6.38	8.35	45.05
2004-2005	22.28	1.30	1.05	1.02	1.38	2.50	5.18	2.09	5.23	10.57	1.85	8.12	62.57
2005-2006	4.54	11.25	4.38	1.43	0.44	3.15	0.49	3.13	1.64	8.43	5.81	11.25	55.94
2006-2007	5.04	2.14	1.92	3.80	0.45	1.77	1.06	2.88	4.07	12.36	8.19	4.06	47.74
2007-2008	12.27	6.83	3.13	3.41	1.08	3.94	4.41	2.48	4.56	7.70	5.99	11.15	66.95
2008-2009	6.36	6.34	1.82	6.34	0.41	1.20	4.86	1.87	10.17	8.07	8.65	6.90	62.99
2009-2010	3.51	0.79	4.72	6.89	1.57	3.02	9.08	5.34	2.79	10.37	5.42	11.70	65.20
2010-2011	8.36	1.49	2.21	1.11	3.62	0.66	3.27	2.89	3.48	5.00	4.74	9.70	46.53
2011-2012	8.07	8.73	2.22	0.98	3.62	5.89	2.67	1.66	7.97	6.81	3.85	16.44	68.91
2012-2013	7.60	5.61	1.88	8.45	1.77	2.27	1.23	5.42	8.00	11.65	5.49	7.60	66.97
2013-2014	12.18	0.81	6.88	2.69	7.83	2.13	5.15	2.19	4.46	9.41	8.90	8.50	71.13
2014-2015	8.29	4.93	2.02	0.92	0.00	6.47	2.22	5.25	2.72	5.39	8.61	9.25	56.07
2015-2016	10.15	0.95	4.34	9.14	7.85	3.77	7.01	1.01	9.99	6.32	3.79	8.70	73.02
2016-2017	5.58	3.61	0.19	1.94	1.67	3.88	1.04	5.60	3.37	11.45	10.94	2.88	52.15
2017-2018	9.68	13.00	5.18	1.27	3.75	0.26	0.12	5.25	14.72	13.29	7.21	6.01	79.74
2018-2019	3.13	2.04	2.75	0.46	8.63	2.93	3.01	3.82	6.06	8.41	6.34	16.18	63.76
AVG	8.75	5.36	4.37	3.36	3.19	2.98	4.15	3.09	5.39	8.10	6.03	8.02	62.81
710	0.75	5.50	4.37	5.50	J.17	2.70	4.10	J.U7	J.J7	0.10	0.03	0.02	02.01

Table 5. Town of Jupiter Water Department (TOJ) Rainfall

	Historical Rainfall Data (inches)												
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	TOTAL
1976-1977	4.65	4.62	3.20	0.80	3.33	1.70	0.70	2.09	3.00	5.20	5.80	8.25	43.34
1977-1978	14.06	2.90	2.97	7.70	4.80	2.60	3.40	0.25	4.15	11.95	13.15	10.71	78.64
1978-1979	9.45	3.40	7.30	16.39	5.05	0.22	1.34	3.98	6.14	4.31	2.63	5.49	65.70
1979-1980	16.86	5.98	4.54	1.58	5.00	2.67	1.91	2.50	6.12	3.61	9.69	5.22	65.68
1980-1981	6.65	6.33	4.83	2.00	0.62	3.11	1.12	0.46	4.60	6.16	3.27	15.65	54.80
1981-1982	7.20	2.56	1.75	0.36	1.70	6.54	14.70	8.24	14.14	13.25	2.82	6.97	80.23
1982-1983	7.94	2.16	22.49	2.59	6.26	8.10	5.11	4.29	3.38	9.40	3.25	8.30	83.27
1983-1984	15.21	8.29	3.94	7.20	0.79	3.49	6.50	2.97	9.04	2.30	6.13	3.65	69.51
1984-1985	10.23	2.40	13.80	0.17	1.13	0.29	1.88	6.66	1.95	4.66	4.65	4.49	52.31
1985-1986	15.65	5.15	0.73	4.02	5.38	2.23	14.00	0.28	1.19	13.60	5.44	5.25	72.92
1986-1987	4.24	6.75	6.13	6.49	1.86	5.17	7.58	0.34	3.57	7.18	3.68	3.28	56.27
1987-1988	9.07	8.12	13.58	0.31	3.86	5.94	3.51	1.48	7.10	7.98	8.79	8.60	78.34
1988-1989	2.41	2.53	2.40	1.11	1.04	0.53	4.46	3.90	2.60	3.07	5.69	4.87	34.61
1989-1990	2.47	3.21	1.24	2.54	1.35	1.40	5.95	1.94	5.07	2.32	4.07	4.60	36.16
1990-1991	8.81	2.90	1.43	1.83	10.86	3.15	3.32	2.59	6.65	8.28	6.29	3.06	59.17
1991-1992	6.38	5.42	3.02	1.31	1.74	4.16	3.81	3.58	1.50	15.44	2.61	10.40	59.37
1992-1993	9.35	1.66	9.90	0.95	18.13	3.64	5.22	1.97	2.62	8.45	2.79	3.11	67.79
1993-1994	9.89	11.59	6.06	0.94	4.15	4.47	2.26	4.99	4.85	10.02	6.67	10.09	75.98
1994-1995	10.11	7.20	11.83	8.13	3.00	1.76	3.25	4.50	0.56	9.62	10.56	13.22	83.74
1995-1996	5.94	22.32	1.39	2.36	1.04	1.64	13.61	2.04	9.45	9.13	6.56	7.27	82.75
1996-1997	6.05	7.81	5.48	1.71	3.95	2.31	4.25	7.16	4.97	14.56	7.96	14.48	80.69
1997-1998	9.02	2.80	2.99	5.14	6.43	7.73	5.39	3.03	3.35	4.00	6.48	6.53	62.89
1998-1999	13.46	5.60	9.95	1.91	10.83	0.83	0.26	1.01	3.64	14.35	7.93	9.77	79.54
1999-2000	14.92	18.09	0.73	2.59	1.06	1.22	3.28	6.27	1.50	1.10	4.61	1.75	57.12
2000-2001	9.50	12.44	1.54	2.79	1.24	0.32	5.81	0.99	4.24	9.70	9.72	11.99	70.28
2001-2002	18.47	6.27	3.11	2.64	0.70	7.68	1.24	5.05	0.76	13.32	9.36	6.96	75.56
2002-2003	5.75	3.46	3.59	3.66	0.23	1.76	9.22	5.50	10.09	4.07	1.90	9.83	59.06
2003-2004	5.70	2.05	6.14	3.67	1.77	2.46	0.85	1.60	2.78	2.83	3.89	8.00	41.74
2004-2005	27.63	1.28	1.09	1.11	1.50	1.53	7.93	2.27	4.46	11.96	2.43	8.63	71.82
2005-2006	6.89	10.51	5.08	1.70	0.56	2.75	0.46	3.55	1.63	8.00	4.07	10.69	55.89
2006-2007	5.43	2.21	1.35	7.62	0.50	2.40	0.77	3.17	3.80	15.62	9.45	3.79	56.11
2007-2008	10.21	8.21	1.56	2.42	1.10	4.21	4.59	3.07	3.78	9.03	6.08	13.60	67.86
2008-2009	6.25	5.55	1.51	1.90	0.23	1.65	6.12	1.87	10.40	9.81	8.34	5.60	59.23
2009-2010	2.22	1.22	2.25	6.90	1.61	2.25	7.90	4.26	2.56	7.59	3.30	10.72	52.78
2010-2011	8.48	0.63	1.42	0.43	1.89	0.53	2.56	1.19	3.65	4.48	7.64	11.03	43.93
2011-2012	9.04	8.20	2.41	1.09	1.44	5.13	4.18	1.86	9.35	7.11	6.45	21.36	77.62
2012-2013	7.60	7.43	2.77	10.15	1.48	2.56	1.44	4.54	5.33	13.35	5.25	7.89	69.79
2013-2014	12.64	1.05	5.58	2.85	9.07	2.33	6.97	2.53	6.02	10.59	11.31	9.66	80.60
2014-2015	8.64 9.94	6.28	3.34	1.86	1.42 12.01	7.84	1.61	4.34	2.28	4.08 3.54	7.32 3.75	6.08	55.09
2015-2016		0.86		8.89		3.46	7.30	1.03	8.29			5.54	68.36
2016-2017 2017-2018	5.50 8.99	3.36 9.70	0.06 5.56	2.21 1.05	5.70 3.73	3.19 0.64	0.70	6.17 5.26	2.33 16.47	11.37 11.57	6.67 8.97	2.04 3.31	49.30 75.88
2017-2018	3.24	2.10	2.61	0.72	6.72	1.89	2.99	4.48	6.77	9.56	7.04	14.57	62.69
AVG	9.12	5.64	4.57	3.34	3.63	3.01	4.42	3.24	5.03	8.31	6.15	8.05	64.52
AVG	7.12	5.04	4.37	3.34	ა.0ა	3.01	4.42	3.24	5.03	0.31	0.15	0.00	04.52



Table 6. SFWMD Palm Beach County-Wide Rainfall Averages

				Н	istorical	Rainfall [	Data (inch	nes)					
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	TOTAL
30 Year Avg. (1981-2010)	8.49	5.56	4.15	2.92	2.96	2.88	4.12	3.23	4.66	8.20	6.54	8.06	61.77
1995-1996	6.26	15.06	1.10	1.52	1.54	0.53	7.09	2.49	8.01	8.46	4.63	4.75	61.44
1996-1997	7.17	6.78	2.26	1.77	3.87	4.73	3.37	5.47	3.74	12.67	5.64	10.10	67.57
1997-1998	7.52	1.44	3.93	5.02	5.23	6.93	4.33	2.32	1.71	2.51	7.29	4.85	53.08
1998-1999	13.93	2.91	9.85	2.99	7.26	1.50	0.50	2.72	2.58	15.41	3.22	8.20	71.07
1999-2000	8.94	12.66	3.16	1.69	1.28	0.78	3.58	4.72	1.08	3.59	6.74	4.36	52.58
2000-2001	5.02	7.39	2.60	1.83	0.78	0.26	5.57	0.40	4.44	6.57	9.41	7.95	52.22
2001-2002	15.14	5.77	2.02	2.16	0.51	5.11	1.20	2.60	1.80	12.59	7.97	5.05	61.92
2002-2003	4.04	2.35	2.75	2.88	0.48	1.17	4.42	3.85	8.45	6.35	3.85	8.92	49.51
2003-2004	5.51	1.27	4.77	2.69	2.54	2.69	0.78	2.38	2.22	3.14	5.03	7.70	40.72
2004-2005	17.71	2.94	0.75	0.85	1.23	1.09	5.87	1.72	5.72	12.45	4.84	2.80	57.97
2005-2006	7.30	7.22	4.49	1.44	0.67	2.80	1.31	2.38	4.09	4.48	6.03	7.32	49.53
2006-2007	6.68	1.48	2.27	5.47	0.74	1.31	0.51	2.64	3.35	12.41	8.73	6.05	51.64
2007-2008	8.11	8.77	0.68	1.76	1.87	4.56	5.48	2.92	3.12	7.03	6.52	11.04	61.86
2008-2009	6.77	5.37	0.76	1.24	0.17	0.34	3.46	1.48	10.12	8.44	6.57	5.76	50.48
2009-2010	6.90	1.31	2.93	5.84	1.66	3.34	7.72	5.62	3.91	4.85	4.82	9.25	58.15
2010-2011	7.89	0.93	1.17	1.02	2.24	0.58	2.36	1.24	2.46	4.79	5.41	9.84	39.93
2011-2012	7.06	9.35	1.28	1.05	0.30	2.99	2.42	4.90	8.48	7.49	5.45	16.30	67.07
2012-2013	6.68	6.47	0.69	1.64	1.07	2.71	1.17	4.45	11.06	9.91	9.50	4.38	59.73
2013-2014	8.15	0.81	3.82	1.39	7.02	1.73	2.54	1.72	3.60	7.79	8.55	7.34	54.46
2014-2015	9.10	4.39	1.66	1.20	0.74	4.37	1.20	4.27	1.57	4.41	5.50	7.21	45.62
2015-2016	7.49	1.66	3.09	6.52	9.09	2.83	4.23	1.03	6.52	6.46	3.14	8.61	60.67
2016-2017	6.10	5.04	0.30	1.65	1.66	2.37	1.49	3.66	4.20	13.14	5.60	6.20	51.41
2017-2018	10.00	12.30	4.39	1.02	2.80	0.47	0.53	6.01	15.29	8.13	6.15	5.82	72.91
2018-2019	4.90	2.03	2.50	1.26	5.44	3.49	2.70	1.99	6.27	8.21	4.82	9.02	52.63

Monthly Averages are based on information provided by the South Florida Water Management District. These are weighted averages based on data from recording stations located throughout Palm Beach County. The 30 Year Average is an unofficial average of rainfall in eastern Palm Beach County for the period of 1981-2010.

Table 7. 2018-2019 North County Rainfall Average

	Historical Rainfall Data (inches)												
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	TOTAL
SIRWCD Avg.	6.84	1.41	4.05	0.70	7.18	2.92	3.85	5.78	5.17	5.60	9.92	15.60	69.02
LRD Avg.	3.13	2.04	2.75	0.46	8.63	2.93	3.01	3.82	6.06	8.41	6.34	16.18	63.76
TOJ Avg.	3.24	2.10	2.61	0.72	6.72	1.89	2.99	4.48	6.77	9.56	7.04	14.57	62.69
N. County Avg.	4.40	1.85	3.14	0.63	7.51	2.58	3.28	4.69	6.00	7.86	7.77	15.45	65.16

N. County Avg. is based on the average monthly rainfall data from SIRWCD, the Loxahatchee River Environmental Control District (LRECD), and the Town of Jupiter Water Department (TOJ) through August 31, 2019.



Table 8. SIRWCD 2018-2019 Rainfall Analysis

	Historical Rainfall Data (inches)												
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	TOTAL
SIRWCD 2018-													
2019	6.84	1.41	4.05	0.70	7.18	2.92	3.85	5.78	5.17	5.60	9.92	15.60	69.02
30 Year Avg.													
(1981-2010)	8.49	5.56	4.15	2.92	2.96	2.88	4.12	3.23	4.66	8.20	6.54	8.06	61.77
N. County													
Avg.	4.40	1.85	3.14	0.63	7.51	2.58	3.28	4.69	6.00	7.86	7.77	15.45	65.16

N. County Avg. is based on the average monthly rainfall data from SIRWCD, the Loxahatchee River Environmental Control District (LRECD), and the Town of Jupiter Water Department (TOJ) through August 31, 2019. Refer to Figure 19 for a graphical representation of this data.

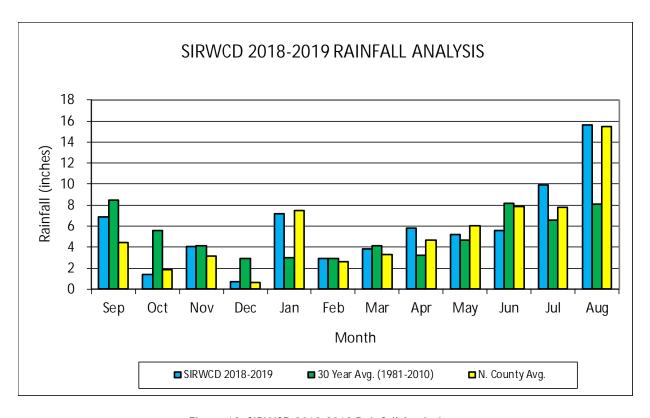


Figure 19. SIRWCD 2018-2019 Rainfall Analysis



Table 9. 2018-2019 Annual Cumulative Rainfall Comparison

	Historical Rainfall Data (inches)													
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug		
SIRWCD 2018-														
2019	6.84	8.25	12.30	13.00	20.18	23.10	26.95	32.73	37.90	43.50	53.42	69.02		
30 Year Avg.														
(1981-2010)	8.49	14.05	18.20	21.12	24.08	26.96	31.08	34.31	38.97	47.17	53.71	61.77		
N. County														
Avg.	4.40	6.25	9.39	10.02	17.53	20.11	23.39	28.08	34.08	41.94	49.71	65.16		

The annual cumulative totals include the average monthly figures plus the prior monthly averages of the report year. Refer to Figure 20 for a graphical representation of this data.

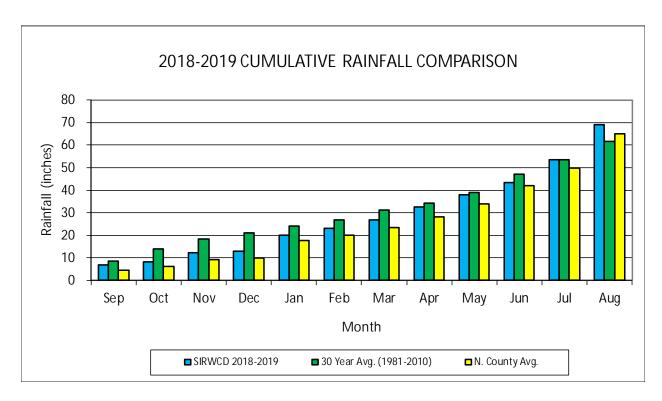


Figure 20. 2018-2019 Cumulative Rainfall Comparison

### General Operation and Maintenance

The District's Manager of Operations Annual Report is included in this document as Appendix A. It offers a summary of significant events and issues that have been identified by the Operations Manager. The Operations Manager and staff of the District are the agents for day to day activities. They are primarily focused on maintaining the primary and secondary elements of the surface water management system and the graded roadways throughout the District. Further, the Operations Manager facilitates interagency coordination with other public entities that operate and maintain assets within the District such as Palm Beach County Road and Bridge Division, Palm Beach County



Figure 21. Canal Maintenance

Parks and Recreation, Palm Beach County Fire Control, School District of Palm Beach County, Florida Department of Transportation, South Florida Water Management District, Town of Jupiter, the Loxahatchee River Environmental Control District, and others.

Each year, a portion of this report is utilized to state that the District's surface water management system is designed, operated, and maintained for a mostly rural residential community with some commercial, industrial, and urban residential areas. Accordingly, certain low-lying areas within the District will experience ponding and storage of water during the wet season and following significant storms. Swales will have standing water, and many areas will be saturated for extended periods of time during the wet season. The continued development of low-lying areas in the District will result in a commensurate consumption of storage within the District's watershed. Where ponds are excavated on individual lots to supply the fill for house pads and related improvements, the consumption of available storage is not as severe because the pond serves as a compensating factor. Unfortunately, many landowners have decided to fill in their ponds and the storage is being reduced. Due to these instances, the District has been working with Palm Beach County to enforce its rules concerning the filling of lots. Palm Beach County is now implementing their code through a permit process and they have asked landowners to notify them on these types of activities. These issues are regularly discussed by the Board of Supervisors and District staff at the monthly meetings, with individual landowners, in forums and meetings within the District, and within the District's newsletter and other publications distributed throughout the District. The District's Board of Supervisors and staff work to assure that the surface water management system functions to the extent of its permitted capacity while recognizing the regulatory requirements imposed on the District by other agencies. All of the District work must be implemented within the adopted budget and utilization of existing manpower, equipment and any other resources available to accomplish the tasks.

### General Comments

Due to the location of the District within Palm Beach County, a major portion of SIRWCD's activities, both internal and external to the District, require participation from others, particularly activities that look at infrastructure needs and ecosystem management for the region. The District and its landowners share in the continued responsibility of being good stewards in maintaining compatibility with these natural systems. Coordination with other entities who share in that responsibility are an asset in bettering the area.

The goals and objectives of SIRWCD are consistent with those for the Loxahatchee River Watershed Restoration Project, the Loxahatchee River Management Coordinating Council, and the Comprehensive Everglades Restoration Plan. The District will continue to work with South Florida Water Management District and other agencies in developing and implementing compatible plans for the District and the Loxahatchee River Basin to serve its landowners and its surrounding community.

SIRWCD will continue to serve its landowners by providing support during emergency situations, maintaining and operating the surface water management system at optimal levels, and providing services that coincide with the system capabilities, board policies, and the community.

AECOM has appreciated the opportunity to continue serving as the South Indian River Water Control District Engineer, and we look forward to working with the Board of Supervisors, landowners, and staff in the coming year.





### Manager's Report for October 2018 – September 2019

South Indian River Water Control District (the District) is a special taxing district established in 1923 and serves Jupiter Farms, Palm Beach Country Estates (PBCE), Egret Landing and Jupiter Commerce Park. Within SIRWCD's 12,600 acres, there are 189 miles of roads, 378 miles of roadside swales, and 60 miles of drainage canals. The District provides both road maintenance and water control and operates under limitations imposed by chapter 298 of the Florida Statutes. The District does not have Traffic, Police, or Fire authority. We are also not responsible for garbage or debris pick up.

The District's stormwater discharge system essentially functions as a dual basin system, with PBCE, Egret Landing, and Jupiter Commerce Park lying East of South Florida Water Management District's (SFWMD) Canal 18 and Jupiter Farms lying West of Canal 18. East of Canal 18, there are 15 miles of canals that flow into the Turnpike's Borrow canals. These canals are located on the East and West side of the Florida Turnpike. PBCE has four weirs that are located at Canals A, C, D, and E which allow drainage from the west to flow east into the Borrow Canals, and then empty into the Southwest fork of the Loxahatchee River. Egret Landing and Jupiter Commerce Park have weirs that allow drainage from East to West into the East Borrow Canal that also empty into the Loxahatchee River.

West of Canal 18 in Jupiter Farms, there are 45 miles of canals that drain West to East through five water control structures that empty into the Northwest Fork of the Loxahatchee River. During heavy rainfall events, we receive assistance from SFWMD to allow storm water from Jupiter Farms to drain by way of the G-92 structure into Canal 18 and in PBCE by way of Canal 18 PC-8A which is located at the West end of Canal C.

In addition to working with SFWMD, the District interacts with several other agencies including Palm Beach County, Town of Jupiter, Loxahatchee River District, and Jupiter Inlet District. In addition, SIRWCD participates as committee members on several agencies which include Florida Association of Special District's, Loxahatchee River Coordinating Council, Loxahatchee River Preservation Initiative, and the Safety Council of Palm Beach County. These

interactions ensure good relationships with governmental department heads that benefit those they serve.

The District's maintenance programs involve road grading and re-surfacing, swale recontouring, culvert replacement, and mowing. We also maintain Berman Park in PBCE.

The District has approximately 95 miles of dirt roads that are monitored and graded when needed. Periodically, roads are re-contoured and at times material is brought in to stabilize the road surface. Other roads in the District that have been paved with Asphalt or Open Grade Emulsified Mix (OGEM) are reviewed annually, and resurfaced when needed.

An important part of the District's drainage program includes maintenance of canals. Canals and canal culverts are the main component in any gravity-fed drainage system. Without proper maintenance, clogged culverts could severely impact drainage. We inspect culverts annually for signs of deterioration, damage, or sediment buildup. This past year we replaced four corrugated steel culverts with two concrete box culverts along the District's Canal 18, located just west of Jupiter Farms Road at 175<sup>th Rd</sup> N and 176<sup>th</sup> Rd N. These culverts will minimize backups due to vegetation buildup after heavy rain events. This coming year we are installing a 60" culvert to connect Canal 6 and Canal 13. This will benefit our maintenance operations and avoid the risk of backing down the canals with our equipment. It will also aid first responders in the event of an emergency. Canals banks are continually inspected for erosion particularly after heavy rain fall. When areas of erosion are discovered, equipment is dispatched to remove the sediment and at times, material is brought in to stabilize the canal banks. Even though the canals are mowed every 6-8 weeks, grass along the canal banks can get tall in the summer and areas of erosion can be difficult to identify. It's important to be mindful of this situation if you use these canals for the enjoyment of walking or horseback riding. And remember, walking or riding the canals is at your own risk. In addition, there are no unauthorized motor vehicles allowed on the canals. Also, as a part of the maintenance program, the District continues to apply regulated and permitted herbicides in the canal systems for the control of aquatic weeds. These services are contracted and reviewed on an annual basis.

The District's secondary drainage system has been at the forefront when it comes to discussions related to water management. As more people move into the District, vacant properties are purchased, and developed, resulting in acres of land that no longer provide retention. The landscape of the District has changed due to development, and the secondary drainage system plays a more prominent role in relation to water control.

Maintenance of the secondary drainage system includes culvert replacement, and roadside and outfall swale re-contouring. In 2016, the District created a program to replace driveway culverts that were inoperable due to age, damage or sediment buildup. For a reasonable fee, culverts are replaced and set to proper grade. Rip-rap headwalls and sod are installed for stabilization. Since driveway culverts are a benefit to the landowner by providing ingress/egress for the property, maintenance of the culvert is the landowner's responsibility. When maintained properly, a fully functional culvert will allow maximum discharge during heavy rainfall events. Along with functional culverts, roadside and outfall drainage swales can provide the same benefit when properly designed and maintained.

Roadside swales have three main functions: storm water runoff, retention, and percolation. If not properly constructed, they could create negative impacts to the drainage system. By clearing and widening the existing ditches, storm water can be collected, treated, and conveyed to the surrounding canals. Having water in the swales is not a bad thing, though. It actually allows for any particulate to settle before entering the canal system which benefits our water quality.

The same can be said of our outfall drainage swales, which are easements in various locations within the District. They are ditches that run between properties from the roadside swales to the canals. They were designed to minimize the distance stormwater has to travel. Over the years, the budget has allowed the District to remove trees and vegetation within these easements to allow for access, swale cleaning, and stabilization. In Palm Beach Country Estates alone, we restored over 20 outfalls followed by inspections of dump culverts. This year, more outfalls are scheduled.

As the landscape within the District's changes, so does our scope of work and the equipment needed to accomplish that work. Over the past few years, we have purchased equipment that enables us to provide more detailed work. Machines like mini excavators, skid steers and commercial mowers are now a part of our fleet. This equipment enables us to accomplish our projects with more speed and accuracy. It also allows us access to areas of the District that are difficult, if not impossible, with the larger equipment. The smaller equipment has also benefited the driveway culvert program and allowed us to install more culverts on a weekly basis.

Of course, our equipment only works as well as the operators who run them. Each employee is properly trained before entering the field. They learn the basic functions of each machine, including its limitations and maintenance. Employees are also trained in safety procedures, including use of personal protective equipment, such as gloves, eye and ear wear, fire extinguishers and first aid supplies. They are also trained and certified on proper fueling procedures and how to handle an emergency. This training has resulted in our lowest workman's compensation rating which helps to keep insurance costs down. Employee safety has also been recognized by the Safety Council of Palm Beach County. The District has received awards for employee and vehicle safety for 21 consecutive years. This recognition has boosted morale and shows operators that their efforts do not go unnoticed.

Other areas of training involve inspections of our waterways for illicit discharge into our system as well as illegal dumping. If an illicit discharge is suspected, Palm Beach County Department of Environmental Protection (DEP) is notified and the area investigated. If an illicit discharge is found, those responsible are notified and cited for the violation. Inspections are also performed along our canals for illegal dumping. Abandoned cars, vegetation and construction debris are all considered illegal dumping. When illegal dumping occurs, we work with Solid Waste Authority and their investigative unit to determine who is responsible. Both agencies can levy fines for the removal and for any damage to the drainage system.

For these, or any other questions you may have, please call our office at 561-747-0550 or visit our website at sirwcd.org. We are located at 15600 Jupiter Farms Road, and our office hours are Monday through Friday, 8:00 am to 4:30pm.

SIRWCD 15600 Jupiter Farms Road Jupiter, Florida 33478 T 561.747.0550 www.sirwcd.org

#### **About SIRWCD**

South Indian River Water Control District (SIRWCD) was formed pursuant to Chapter 298, Florida Statutes in July of 1923. The initial works of SIRWCD were comprised of primary drainage canals, mainly used for agricultural purposes. In the mid 1960's, most of the property within the District was registered with the Florida Land Installment Sales Board for sale as a home site subdivision. Today, SIRWCD consists of approximately 12,500 acres and serves approximately 7,323 parcels with facilities such as canals, roads, swales, control structures, and parks.

More information on SIRWCD and its services can be found at www.sirwcd.org.

