

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



South Indian River
Water Control District™



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South Indian River Water Control District™

District Engineer's Annual Report

September 2017

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 with approximately 7,052 landowners in the District. 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 approximately 90% 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, and throughout the year, landowner initiated roadway improvement petitions for the application of Palm Beach County Standard Asphalt were received and reviewed by District staff.

In addition to operating and maintaining its public infrastructure for the benefit of its landowners, the District is involved in several intergovernmental activities due to its location within Palm Beach County and the Loxahatchee River watershed. As shown in *Figure 1*, SIRWCD is positioned in Northern Palm Beach County as a strategic entity in the planning and management of water resources to the surrounding area. Approximately 12,500 acres of SIRWCD discharges to the Loxahatchee River Basin, and therefore, as plans are being developed and implemented, the geographic area of the District is an element in any water management plan for the Loxahatchee River Basin.

Due to the District's location, the potential impacts from development, such as water quantity and quality, are being monitored by agencies and/or individuals that have a focused interest on maintaining a healthy ecosystem within the Loxahatchee River Basin and, specifically, the Northwest Fork of the Loxahatchee River. The Board of Supervisors and staff actively engage in the many external dealings that are influencing the District from a water supply, flood control, water quality, and ecosystem management perspective. The Board of Supervisors and staff are focused on making sure that the goals and expectations of these external activities do not conflict with the District's best interests with regard to the functioning of SIRWCD's system and the ability to deliver an appropriate level of service.

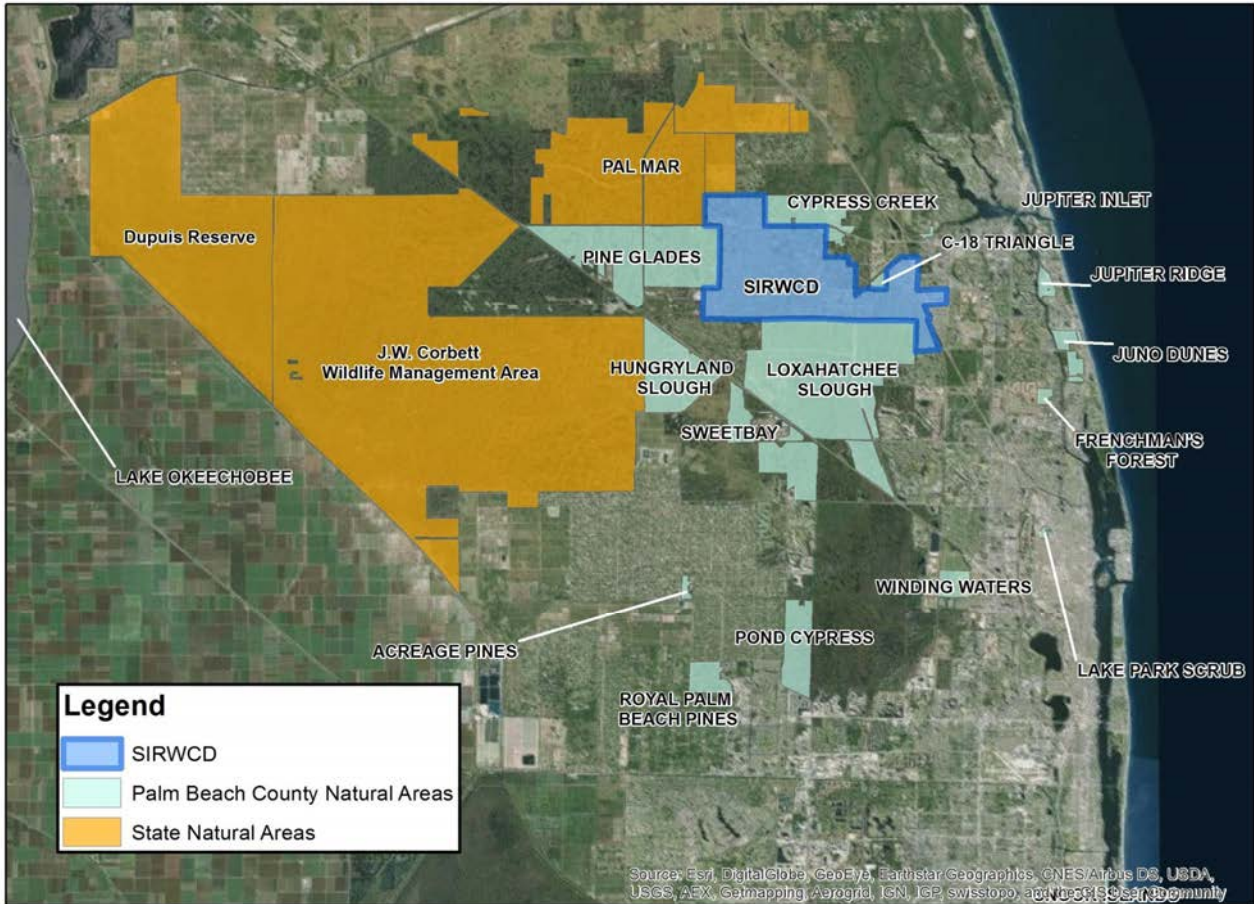


Figure 1. District Location

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

Eighteenth 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 May 14, 2015, the Board of Supervisors authorized staff to develop the Eighteenth (18th) Plan of Improvement. A public hearing was held August 20, 2015 where the plan was approved and the Board authorized the Engineer's Report for the 18th Plan of Improvement. The public hearing for the Engineer's Report was held October 15, 2015 and the plan was approved. This plan includes the Unit of Development RI-18, which consists of the application of Palm Beach County Standard asphalt on approximately 3.8 miles of roadway within Palm Beach Country Estates. These roads are listed as follows and are shown in *Figure 2*.

Unit of Development RI-18 (3.8 miles)

- 64th Way N Between 146th Road N and 149th Place N
- 67th Trail N Between 146th Road N and 149th Place N
- 68th Drive N between 146th Road N and 149th Place N
- 74th Avenue N Between 155th Place N and 159th Court N
- 75th Way N between 150th Court N and 154th Court N
- 77th Trail N between 150th Court N and 154th Court N
- 78th Drive N between 155th Place N and 159th Court N
- 81st Terrace N between 150th Court and 154th Court N
- 149th Place between 69th Drive N and 64th Way N
- 163rd Court N between 75th Avenue N and 79th Terrace N
- 163rd Court N between 75th Avenue N to East End

On May 20, 2016, an advertisement for bid on the project was published in the Palm Beach Post and the bids were due on June 27, 2016. After negotiations with the low bidder, contract documents were finalized, and the notice to proceed was issued October 1, 2016. Construction was completed in April 2017 with a final construction cost of \$1,333,650.55.

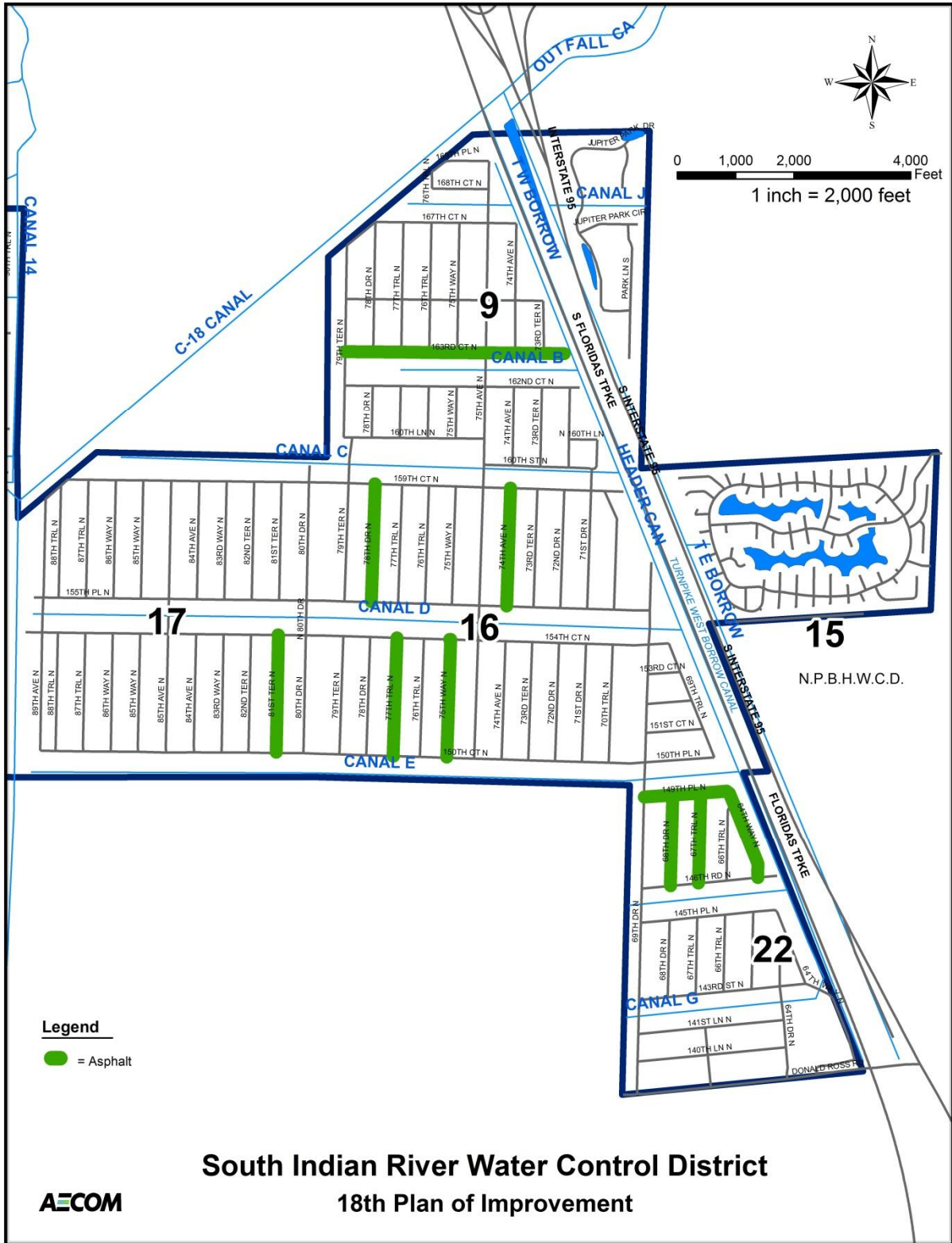


Figure 2. 18th Plan of Improvement

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 (19th) 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 19th 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*.

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

The plan was submitted to South Florida Water Management District (SFWMD) for review and approval and has been approved. The next steps are to prepare a topographic survey and construction documents for bidding. The preliminary estimate of probable construction cost for the plan is \$1,081,000.

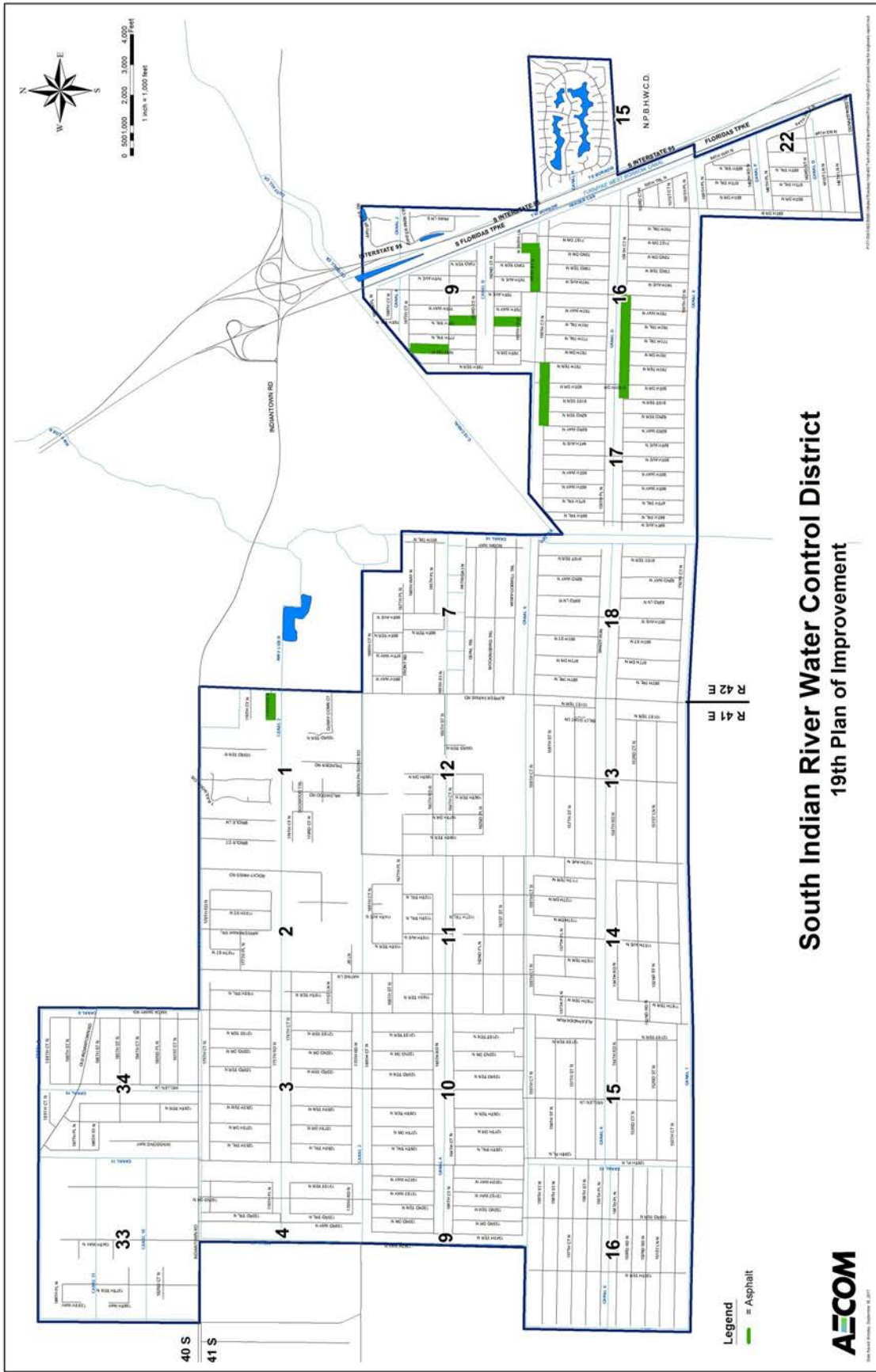


Figure 3. 19th Plan of Improvement

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. After the Cycle 4 Permit was issued last September, a new Interlocal Agreement, which reflects the current permit conditions, was executed with Northern Palm Beach County Improvement District, the lead co-permittee. This past year the meetings included discussions on Total Maximum Daily Loads (TMDLs), public education, the Annual Reports and Joint Report, and required refresher training videos on spill prevention, illicit discharges and sediment and erosion control. The sixth year Annual Reports were submitted to FDEP in January. In addition, FDEP presented their comments on the previous year's Annual Report and presented a slightly revised Annual Report Form in June. Lastly, a Water Quality Assessment Program, as required in the Cycle 4 Permit, was submitted on September 7, 2017, for FDEP review.

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 February 28, 2017, the President of the United

States issued as Executive Order directing EPA and Department of the Army to review and rescind or revise the proposed rule. EPA, Department of Army, and the Army Corps of Engineers are in the process of reviewing the proposed rule and considering a revised definition of “waters of the United States” consistent with the Executive Order. 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.

The first step is to revise the Code of Federal Regulations to re-codify the definition of “Waters of the United States” which currently governs administration of the Clean Water Act, in light of a decision by the U.S. Court of Appeals for the Sixth Circuit staying a definition of “Waters of the United States” promulgated by the agencies in 2015. This action will simply make the text of the Code of Federal Regulations reflect the definition currently in effect under the Sixth Circuit stay. This action, when final, will not change current practice with respect to the how the definition applies, which is consistent with Supreme Court decisions, agency guidance documents, and longstanding practice. The proposed rule was published in the Federal Register on July 27, 2017, and will be open for public comment until September 27, 2017.

The second step is a public notice-and-comment rulemaking involving a substantive reevaluation and revision of the definition of “Waters of the U.S.” in accordance with the executive order. On April 19, 2017, EPA initiated a formal process known as Federalism consultation, which requires agencies to conduct pre-proposal discussions with elected state and local officials and their associations where a rule may have implications for the distribution of power and responsibilities among federal, state, and local governments. On April 20, 2017, EPA, with the participation of Department of Army and the Army Corps of Engineers, initiated the consultation process with tribal leaders. Like the Federalism consultation, this process assures that the agencies consider tribal concerns and interests whenever EPA’s actions and/or decisions may affect tribes, and it enables the agencies to coordinate with tribes and get their input before proposing a rule. The written comment periods for these consultation periods have now closed. The agencies will consider all comments received under these formal processes before submitting a proposed step two rule to the Office of Management and Budget under Executive Order 12866. The public will have an opportunity to provide comments once the step two proposed rule is published in the Federal Register. Staff will continue to monitor the proposed rule and provide updates to the District.

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 on-going 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. 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.

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

Intergovernmental Coordination

Loxahatchee River Management Coordinating Council (LRMCC)

SIRWCD continues to participate as an active member of the Loxahatchee River Management Coordinating Council. This Council 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 inter-governmental 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 4* shows a map of the Loxahatchee River.



Figure 4. Loxahatchee River

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 Lainhart and Masten Dam Refurbishment Projects, an assessment of implementation of the 2010 LRMCC Plan Objectives, the George MacNeil Request for Pavilion at Jonathan Dickinson State Park, and the development of a Reasonable Assurance Plan (RAP) for the Loxahatchee River.

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 5*. 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 from impairment. FDEP is developing a TMDL concurrently with the RAP process until the RAP process has been finalized by the stakeholders.

This year, stakeholders defined the RAP boundaries and FDEP began preliminary modeling to determine allocations and reductions to restore the Loxahatchee River. Review of the model is ongoing and final allocations and reductions have not been determined by FDEP and the LRMCC. 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 6*) 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.

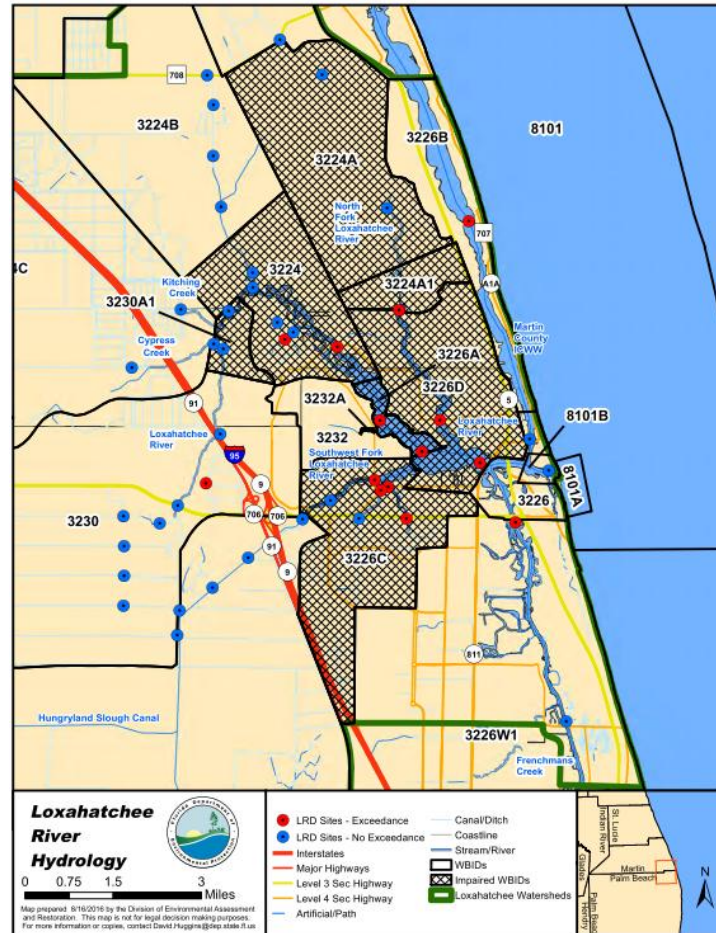


Figure 5. Impaired WBIDs



Figure 6. Loxahatchee River

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 a drainage improvement project on 127th Drive North located north of Indiantown Road and clearing several outfalls, for the second time, since last year funding was not available. A presentation for the approval of these projects was held on August 28, 2017 for the fiscal year 2019. A Florida State Senator was at the meeting and presented other opportunities for funding. SIRWCD will continue to apply for grants in the future.

South Florida Water Management District (SFWMD) Everglades Restoration Strategies

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.

Design and construction of the treatment and storage projects in the Restoration Strategies Regional Water Quality Plan will take place in three phases with completion of all projects set for 2025. These projects are shown in *Figure 7*.

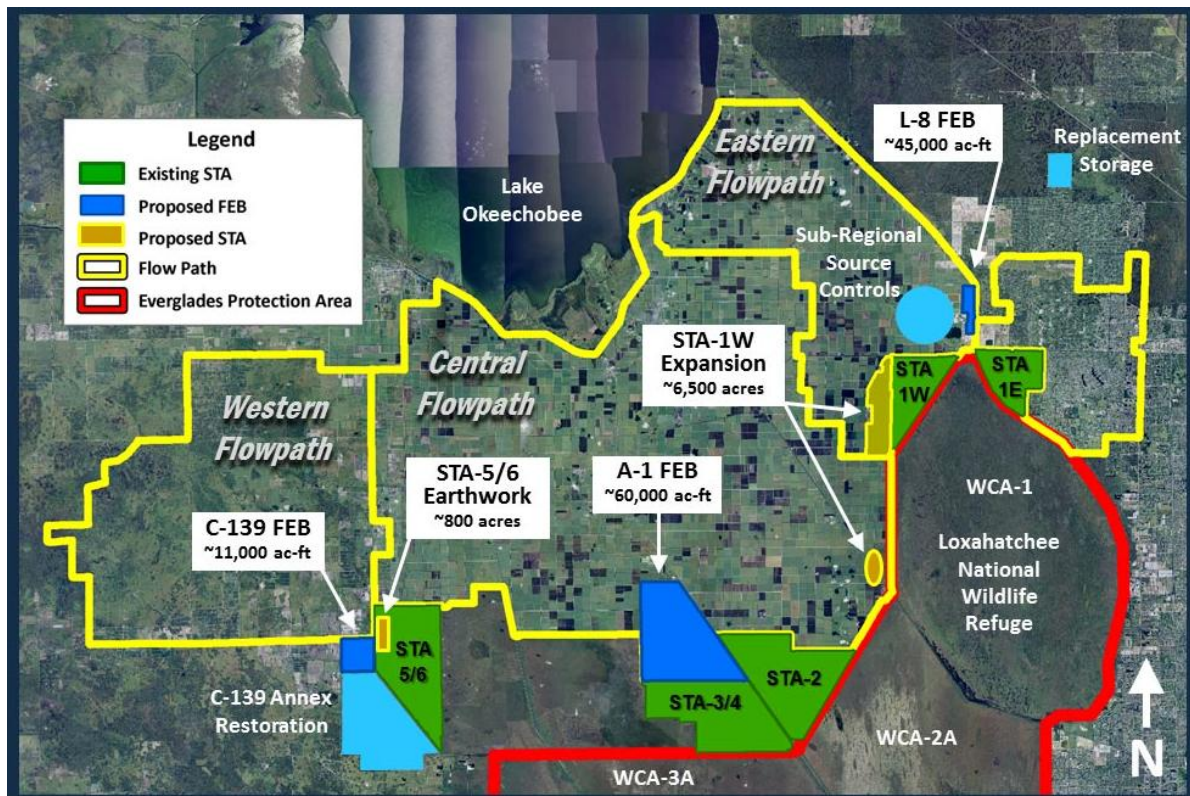


Figure 7. Final State Proposal of Key Projects and Components

As part of the program's Technical Plan, both STA expansions and Flow Equalization Basins (FEBs) upstream of STA's are proposed. The A-1 FEB construction is complete and operational (60,000 acre-feet of storage). The plan includes designation of the L-8 Reservoir as a 45,000 ac-ft FEB that will have a multipurpose function to capture, store and deliver water to STA-1 East, STA-1 West, and the Loxahatchee River and for other restoration purposes. When the STA-1 West expansion is completed and in-basin storage for the Loxahatchee River comes online, the L-8 FEB will transition to primarily delivering consistent flows needed to optimize performance of STA-1 East and STA-1 West as part of the plan. The L-8 Flow Equalization Basin construction is ongoing and is expected to be complete in 2017. The STA-1 West Phase 1 Expansion construction is ongoing and is expected to be complete by December 2018 (approximately 4,300 acres of effective treatment area). In addition, conveyance improvements required for the movement of water to and from the new FEBs and STAs are under construction.

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 8* indicates the basins that the project area includes.

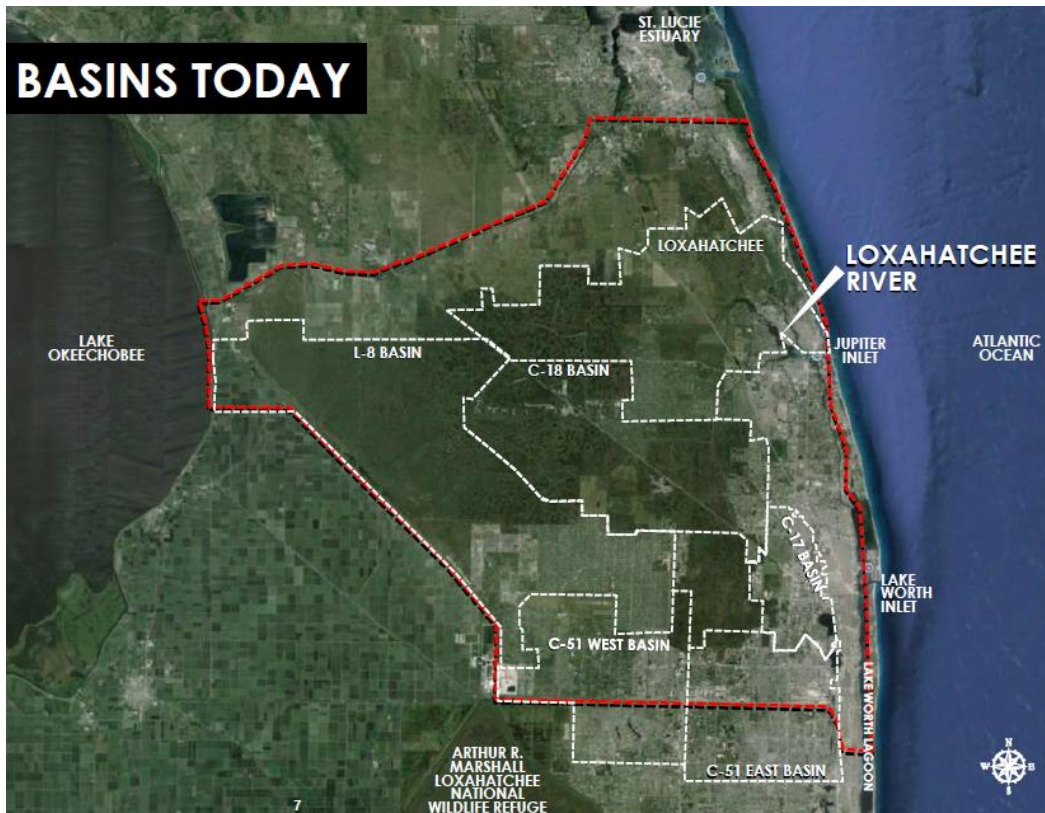


Figure 8. LRWRP Project Area

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 and Environmental Impact Statement, to prepare for congressional authorization.

Over the past year, the SFWMD and the ACOE have been conducting the alternative formulation and analysis process of the plan formation. This consisted of meeting to discuss 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, further calibration was needed along with the processing of alternative models. SIRWCD has been attending these meetings along with participating in the modeling sub-team to ensure that SIRWCD's operations are being represented correctly within the modeling effort.

Florida Association of Special Districts



SIRWCD's Board of Supervisors and staff are active participants in the Florida Association of Special Districts (FASD). 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.

Culvert Replacement Program



Figure 9. Driveway Culvert Installation

Culverts under driveways have been aging over the years. These culverts are the landowner's responsibility to maintain and to replace them when their life span has ended. These culverts, when not maintained, are collapsing and blocking 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. *Figure 9* shows a typical driveway culvert installation. This year, the District installed 207 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.

Culvert Installation in Canal 6 and Canal 8

The District has been investigating options for the potential of reducing its operation and maintenance costs. One way those costs are reduced is to add additional access points to the canal system. The first location is across Canal 6 just west of 129th Place N (*Figure 10*), and the second location is across Canal 8 just east of Canal 10. The project included the installation of approximately 60 feet of 72-inch diameter pipe across Canal 6, approximately 60 feet of 48-inch diameter pipe across Canal 8, fill material, rip rap, and sod. The construction cost for the project was \$78,000.



Figure 10. Canal 6 Culvert Installation

Canal Clearing and Maintenance



Figure 11. New 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 11* 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. *Figure 12* shows an example of one located on 154th Street.



Figure 12. 154th Outfall Swale

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. 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 93.7 miles of improved roads (paved and OGEM) and 94.3 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. *Figure 13* illustrates an example of a canal.

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.



Figure 13. Canal 2

Water Quality Monitoring

Due to the 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. SIRWCD had historically taken samples through a co-operative agreement with the United States Geological Survey (USGS), but due to reduced funding by the federal government, the program was abandoned. 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 14. Due to the new water quality legislation, the Board of Supervisors instructed staff to implement a water quality monitoring program that augments and expands the current LRD program.

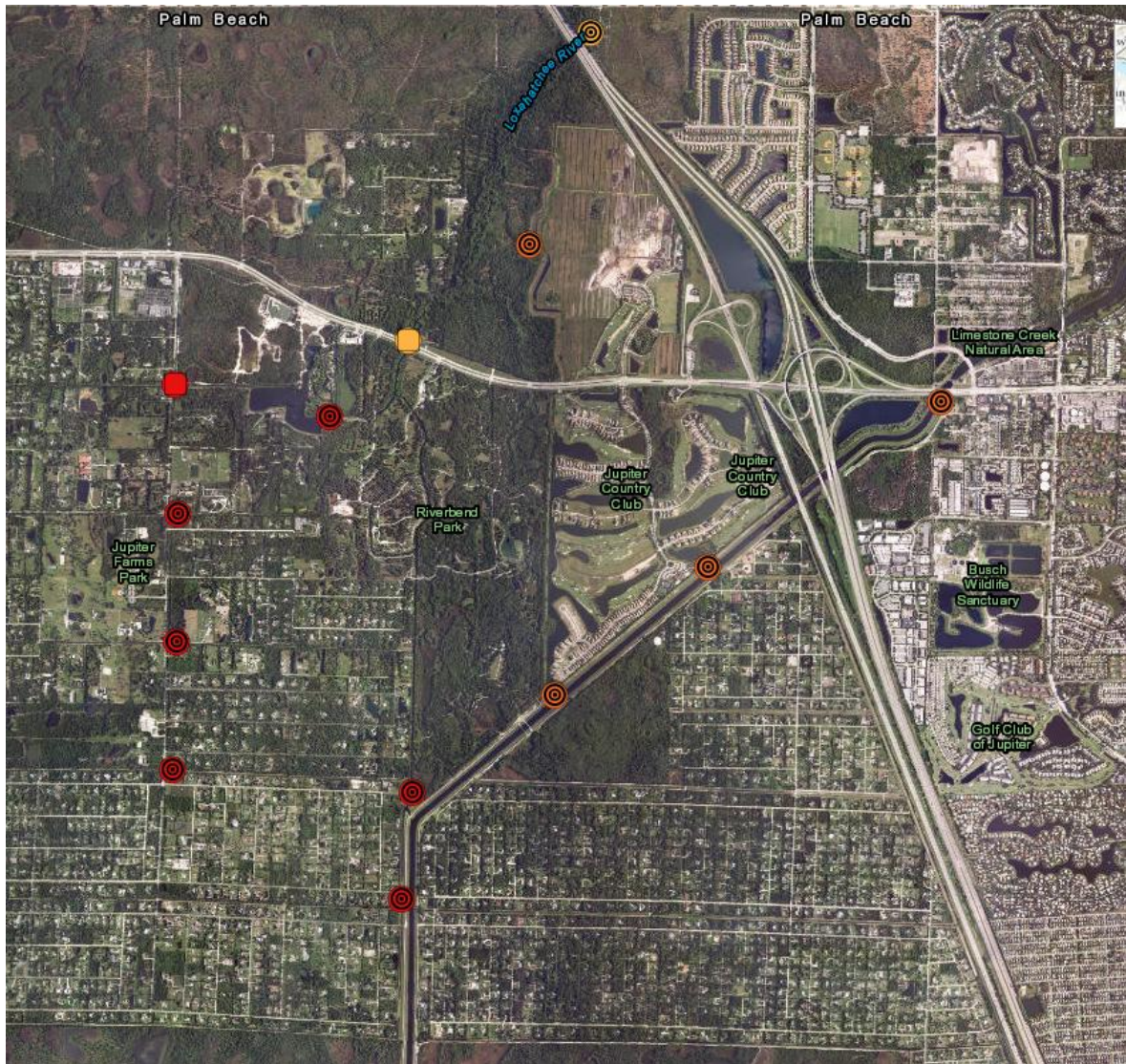


Figure 14. LRD Sampling Locations

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 15 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. This 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.

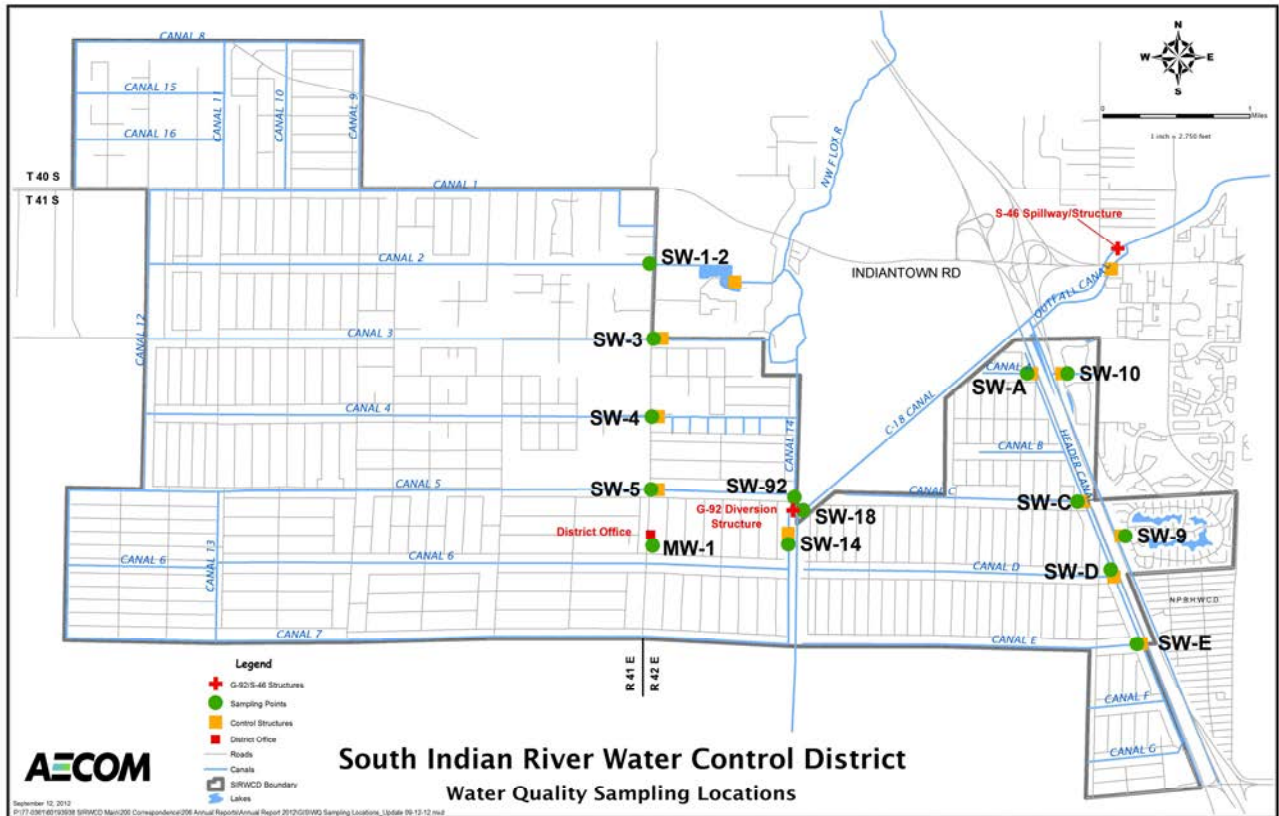


Figure 15. SIRWCD Sampling Locations

Rainfall

The SIRWCD work center monitors and records the total rainfall the District receives throughout the year. For the twelve month period from September 2016 through August 2017, the District received 54.05 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 1*. The average annual rainfall for SIRWCD is 64.85 inches. The 2016-2017 year rainfall was more than ten (10) inches lower than the historical rainfall average within the District. Historical rainfall data obtained by LRD, the Town of Jupiter Water Department (TOJ), and the SFWMD is shown below in *Tables 2, 3, and 4*, respectively.

The 2016-2017 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 2016 to August 2017 was 51.83 inches. The North County Averages can be found in *Table 5*.

The SFWMD data represents the historical averages of numerous rainfall measuring stations throughout Palm Beach County. *Table 6* and *Figure 16* compare the rainfall data from 2016-2017 SIRWCD, the 30 year SFWMD average, and the 2015-2016 North County average. The cumulative rainfall for 2015-2016 SIRWCD, the 30 year SFWMD average, and the North County average are shown in *Table 7* and *Figure 17*.

Table 1: 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
AVG	8.29	5.97	3.52	2.80	3.07	3.18	4.28	3.33	5.11	8.91	7.47	8.91	64.85

Table 2: 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	0.90	6.30	0.36	1.89	10.57	4.70	1.59	5.20	44.26
1976-1977	8.91	4.12	3.69	2.71	4.48	1.54	1.77	2.00	8.60	3.06	2.33	5.97	49.18
1977-1978	13.39	1.13	1.14	6.21	4.80	2.60	3.40	0.25	4.15	11.95	13.15	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
AVG	8.86	5.26	4.39	3.48	3.05	3.04	4.27	3.02	5.16	7.97	6.00	7.88	62.39

Table 3: 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	6.28	3.34	1.86	1.42	7.84	1.61	4.34	2.28	4.08	7.32	6.08	55.09
2015-2016	9.94	0.86	3.75	8.89	12.01	3.46	7.30	1.03	8.29	3.54	3.75	5.54	68.36
2016-2017	5.50	3.36	0.06	2.21	5.70	3.19	0.70	6.17	2.33	11.37	6.67	2.04	49.30
AVG	9.27	5.63	4.59	3.46	3.56	3.10	4.55	3.16	4.70	8.20	6.06	8.01	64.66

Table 4: SFWMD Palm Beach County-Wide Rainfall Averages

Historical Rainfall Data (inches)													
	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	8.01	1.94	3.29	3.75	9.18	2.58	2.39	1.19	7.11	8.63	5.38	8.20	61.65
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

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 5: 2016-2017 North County Rainfall Average

Historical Rainfall Data (inches)													
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	TOTAL
SIRWCD Avg.	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
LRD Avg.	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
TOJ Avg.	5.50	3.36	0.06	2.21	5.70	3.19	0.70	6.17	2.33	11.37	6.67	2.04	49.30
N. County Avg.	5.11	3.89	0.15	2.21	3.21	3.42	1.02	6.14	3.31	11.36	9.55	2.47	51.83

N. County Avg. is based on the average monthly rainfall data from SIRWCD, the Loxahatchee River Environmental Control District (LRD), and the Town of Jupiter Water Department (TOJ) through August 31, 2017.

Table 6: SIRWCD 2016-2017 Rainfall Analysis

Historical Rainfall Data (inches)													
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	TOTAL
SIRWCD 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
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.	5.11	3.89	0.15	2.21	3.21	3.42	1.02	6.14	3.31	11.36	9.55	2.47	51.83

N. County Avg. is based on the average monthly rainfall data from SIRWCD, the Loxahatchee River Environmental Control District (LRD), and the Town of Jupiter Water Department (TOJ) through August 31, 2017. Refer to *Figure 16* for a graphical representation of this data.

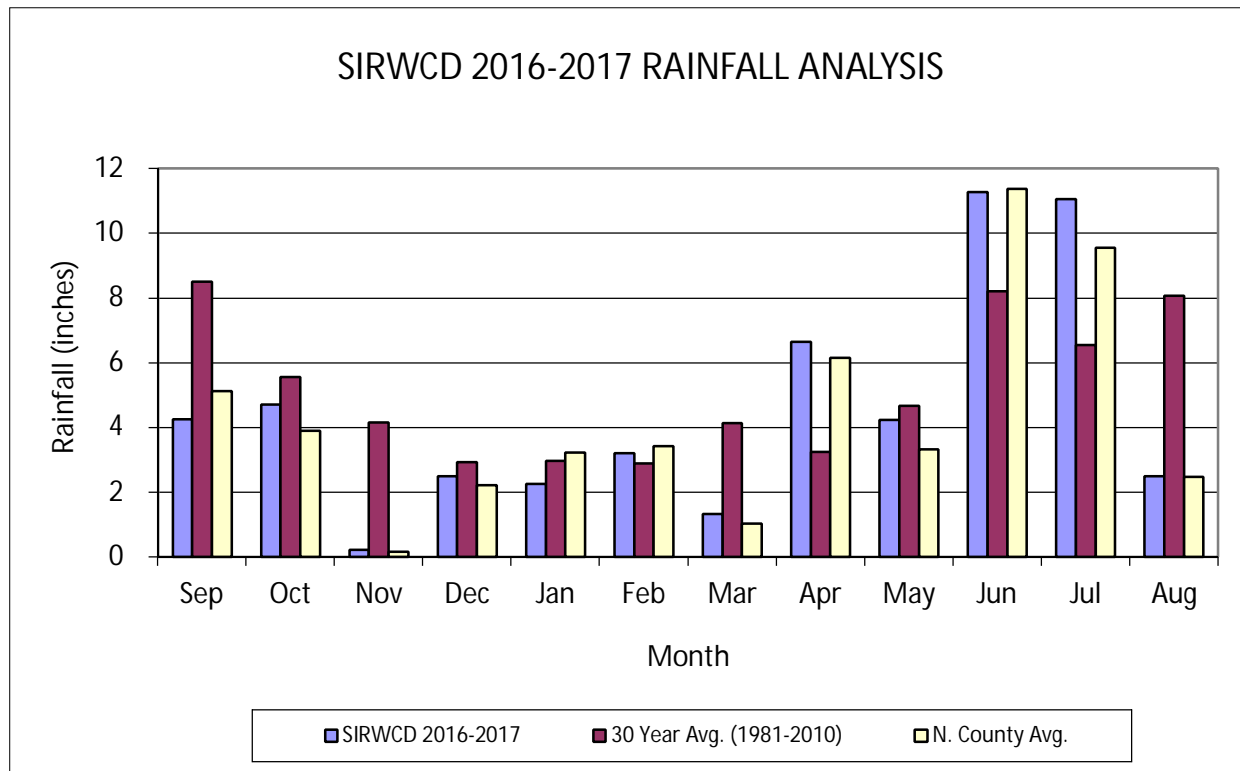


Figure 16. SIRWCD 2016-2017 Rainfall Analysis

Table 7: 2016-2017 Annual Cumulative Rainfall Comparison

Historical Rainfall Data (inches)												
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
SIRWCD 2016-2017	4.25	8.96	9.17	11.65	13.90	17.09	18.41	25.05	29.27	40.53	51.57	54.05
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.	5.11	9.00	9.16	11.37	14.57	17.99	19.01	25.15	28.46	39.82	49.37	51.83

The annual cumulative totals include the average monthly figures plus the prior monthly averages of the report year. Refer to Figure 17 for a graphical representation of this data.

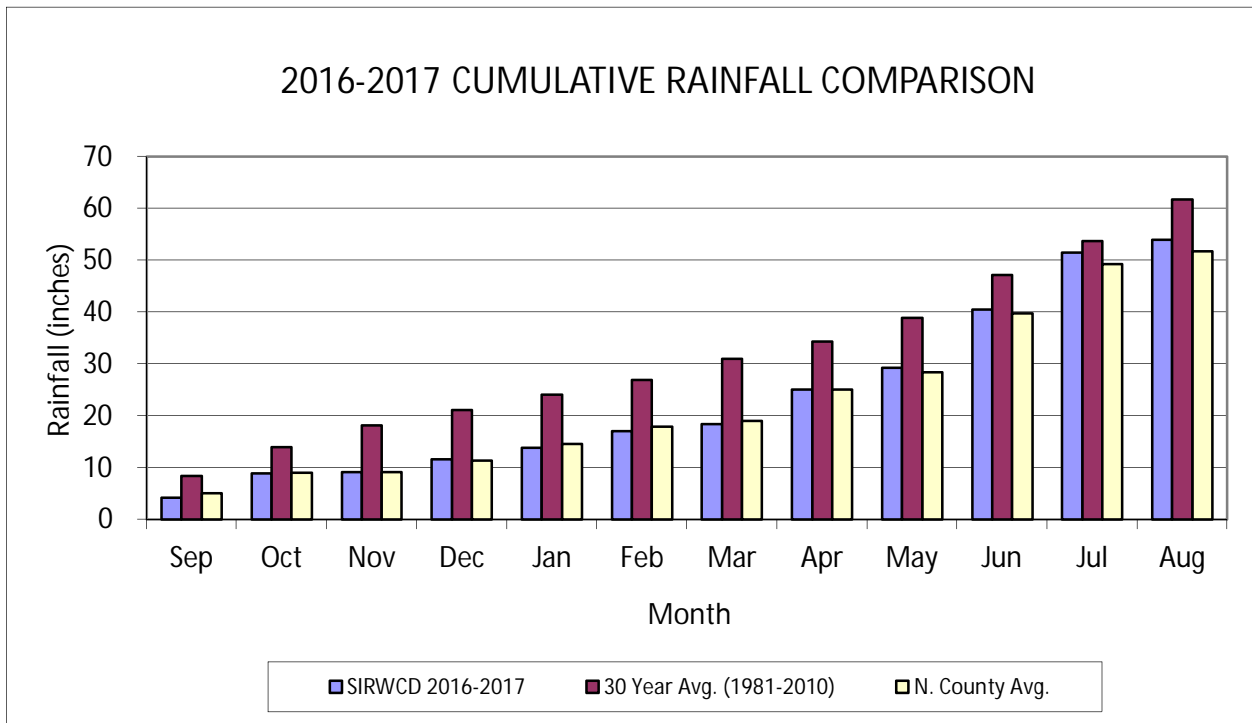


Figure 17. 2016-2017 Cumulative Rainfall Comparison

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 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.



Figure 18. Canal Maintenance

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. These factors 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

SIRWCD is almost fully developed. It has the unique identity as a significant residential estate community that is virtually surrounded by premiere natural systems such as the Loxahatchee Slough and the Wild and Scenic Northwest Fork of the Loxahatchee River. These environmental assets guarantee a limited growth in the area and offer special recreational opportunities. On the other hand, the District and its landowners have the responsibility of being good stewards in maintaining compatibility with these ecological systems. To that end, the District is exploring how it can improve its surface water management system while at the same time contributing to the enhancement of the Loxahatchee Slough and Loxahatchee River. The goals and objectives of SIRWCD are not inconsistent with those being discussed for the Loxahatchee River Watershed Restoration Project Delivery Team, the Loxahatchee River Management Coordinating Council, Department of Environmental Protection, Corps of Engineers, and South Florida Water Management District. However, the necessary ingredient is that all of these entities, including the District, must identify and implement action plans that merge the goals of each agency into a functional and affordable outcome.

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 appreciates the opportunity to continue serving as your 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 2016- September 2017

South Indian River Water Control District (The District) is a special Taxing District established in 1923 and serves Jupiter Farms, Palm Beach Country Estates, Jupiter Commerce Park, and Egret Landing. Within the District's 12,600 acres, there are 189 miles of roads, 378 miles of drainage swales, and 60 miles of canals. The District provides both water control and road maintenance for landowners and operates under limitations imposed by Chapter 298 of the Florida Statutes.

The District's day to day operations focus on road maintenance, drainage, culvert replacement, and mowing. Other areas of maintenance that are subcontracted include aquatic weed control, repair and restoration of paved roads, canal construction projects, tree removal, and park maintenance.

The District currently has 15 employees; 14 full-time and 1 part-time. Office staff includes the Manager of Operations, Office Administrator, and Office Assistant. Our field crew includes one Superintendent, one Field Supervisor, one Mechanic, and 9 operators. This year, long time operator Matt Wood was promoted to Superintendent and I hired a new mechanic, two operators, and one laborer.

The District's equipment includes two motor graders, two combination backhoes, three tractors with 10 foot batwing mowers, three side boom mowers, one trackhoe with multiple attachments, one loader, three dump trucks, and four fleet trucks. This year, we replaced our 2006 boom mower for a new John Deere 6110M mower. We also purchased a used dump truck, a mechanic's truck, and added another new Kubota mini-excavator. These excavators have allowed us to access confined areas and have enabled us to make significant improvements to our drainage.

The District has over 100 miles of dirt roads that are graded once a week, on average. Throughout the year, roads are monitored and when needed, material is spread to restore road surfaces. "Crowning" the road is a method we

use to provide proper storm water runoff and minimize standing water which can create ponding and deterioration. During this process, the shoulders of the road are pulled into the center, and then the material is mixed, re-graded, and re-sloped for proper runoff.

There are approximately 53 miles of District roads that are paved with Asphalt or Open Graded Emulsion Mix (OGEM), which is a cold mix asphalt base. Once paved, these roads are inspected each year, and when needed, re-surfaced with Asphalt or Micro Overlay. The District does not pave roads unless initiated by the landowners.

The District's storm water discharge system functions as a dual basin system with Palm Beach Country Estates, Jupiter Commerce Park, and Egret Landing east of South Florida Water Management District's (SFWMD) Canal 18 and Jupiter Farms which is west of Canal 18. East of Canal 18, there are 15 miles of canals that drain west to east through 4 set weirs prior to entering the Florida Turnpikes East Borrow Canal system. Waters are then routed towards the SW fork of the Loxahatchee River. West of Canal 18, there are 45 miles of canals that also drain west to east through 5 water control structures into the District's Canal 14, then north to the NW fork of the Loxahatchee River. During heavy rainfall events, we receive assistance from SFWMD to drain excess water from Jupiter Farms through Canal 18 by way the of SFWMD G-92 structure, and in Palm Beach Country Estates by way of SFWMD PC8-A Riser Culvert located at the west end of Canal C.

This year, our focus has been clearing and re-contouring outfall drainage swales as well as making improvements to roadside swales. Roadside swales are part of our secondary drainage system. Their three main functions are stormwater runoff, retention and percolation. The outfall swales are swales that run between two properties and connect with one of our main canal systems. They were designed to shorten the distance stormwater has to travel and are located in some of the lowest areas of the District. Over the past couple of years, we have made significant improvements to outfalls that were inaccessible due to heavy vegetation and erosion. The landowners who live by these outfalls have

been very cooperative and understanding to the needs of the District, and we have been able to move forward with no complications or delays.

With the economy back on its feet, we have noticed an increase in new construction within the District. Vacant lots, which for years, acted as water retention and drainage for other properties, are now being filled in and built upon, therefore changing the topography of the land and the way the water flows. By doing this, roadside swales now play a more prominent role for drainage than ever before. To compound the issue, some residents fill their swale in for the convenience of mowing, or to eliminate standing water in front of their property. Together, these situations have created drainage concerns for some residents and for the District. The re-contouring of swales, combined with our *Driveway Culvert Replacement Program* has helped minimize these concerns and provides the most effective drainage possible. Keep in mind that during heavy rainfall events, the drainage system could get overwhelmed and some flooding may occur, but with culverts and swales that are properly designed, I feel that the drainage will be much improved. It is the combined efforts of the District and the landowners that will make the difference.

Our *Driveway Culvert Replacement Program* has been very productive. To date, we have installed 207 culverts and have 59 on schedule. This program allows the District to replace culverts at a cost of \$300.00 for a standard install. This fee includes an 18" - 20' culvert, rip-rap headwalls, and sod along the culvert ends. We also install driveway culverts on County roads at a cost of \$750.00. This fee includes a County approved 24" mitered end culvert with poured concrete end-walls. Keep in mind, that culvert maintenance is still the responsibility of the landowner. Landowners are responsible to remove sediment buildup in the culvert and to regularly inspect for erosion or for any type of damage. We have seen improvements in many areas of the District where driveway culverts have been replaced and as a result receive fewer calls related to drainage issues. If you have questions regarding the condition of your culvert, please contact our office and we can set up an inspection.

With 378 miles of drainage swales and 60 miles of canals, our mowing program can be challenging at times. It takes an average of 6-8 weeks to complete our mowing schedule, with June through October being the busiest months. A few years back, the District created a “Do Not Mow” list for landowners who choose to mow their easements. This list is checked by the operators each day to ensure that they these properties are bypassed. However, if someone on the list is not maintaining the easement, the District will mow, and then try to contact the landowner for updated information. We also have a maintenance agreement with Palm Beach County to mow county roads in Jupiter Farms and Palm Beach Country Estates.

This year 51.57 inches of rain was recorded at the District Work Center from September 2016 to August 2017. Here is a breakdown of the monthly totals and the ten year average:

2016-2017	Monthly Total	10 Year Average by Month
September	4.2	6.87
October	4.71	3.82
November	.21	2.25
December	2.48	3.42
January	2.25	3.37
February	3.19	3.65
March	1.32	4.54
April	6.64	2.95
May	4.22	6.23
June	11.26	7.71
July	11.04	7.46
August	2.48	9.55

The District continues to apply regulated and permitted herbicides in the canal and outfall systems for the control of Aquatic Weeds. These systems are checked regularly and sprayed on an as needed basis.

In addition to the District's day to day operations, we interact with agencies and municipalities who also serve the community. They include Palm Beach County Road and Bridge, Palm Beach County Sheriff's Office Wildland Taskforce, Fire and Rescue, South Florida Water Management District, Solid Waste Authority, Town of Jupiter, and The Loxahatchee River District. The District also participates as committee members with the Florida Association of Special Districts, The Loxahatchee River Coordinating Council, The Loxahatchee River Preservation Initiative, and The Safety Council of Palm Beach County. These interactions ensure good relationships with governmental department heads to provide service and information within the District.

One agency that has provided much needed support has been the Wild Land Taskforce. This Taskforce helps monitor for unauthorized motor vehicles which are prohibited on District canal right-of-ways. Use of any unauthorized vehicle on a District canal has the potential for property damage, injuries or even fatalities. Operators are subject to citations and vehicles will be confiscated if apprehended. If you notice any type of vehicle on canals, please call the Palm Beach County Sheriff's Office.

In May of this year, operator Jeff Borus completed the Stormwater Erosion and Sediment Control Inspector Training Program sponsored by the Florida Department of Environmental Protection. This course is logged as a part of our annual report for the National Pollutant Discharge Elimination System (NPDES). The NPDES report also includes inspections of illicit discharge in the District's drainage system, structural inspections of canal culverts, flood control structures, weir structures, and field reports for construction projects.

Safety is of utmost importance and I am happy to report that this year there were no reported work-related accidents at the District. As a result, the District received awards from the Safety Council of Palm Beach County for Outstanding Achievements in Driver and Employee safety. This marks the 20th year in a row that the District has received these awards. Employees regularly participate in safety related seminars presented by the Safety Council, such as First Aid, CPR,

and equipment safety. In addition, safety meetings are held throughout the year at the District Work Center for all employees.

In July, The Palm Beach County Sheriff's Office Crime Prevention Unit performed a safety assessment of the District Work Center. As a result, security cameras were installed. More preventative measures are planned in the future to ensure the safety of all District employees.

Throughout the year, the District receives numerous calls requesting services that we do not provide. One of more frequent requests is the removal of landscape debris. Solid Waste Authority is responsible for debris pick-up. The debris needs to be properly cut and placed in front of your property before they will pick up, they do not pick up debris in front of vacant lots, and they do not transport tree stumps. It is illegal to dump any kind of trash onto District right-of-ways, or any type of illicit discharge that could enter the District's drainage system. If you notice any of these illegal activities, please call our office at 561-747-0550.

The District office is open Monday-Friday between the hours of 8:00 am - 4:30 pm. Please call or stop by if you have a question or concern regarding District related issues. We will do our best to assist you within the realm of our responsibility.

SIRWCD
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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.

