Annual Report Form For Individual NPDES Permits For Municipal Separate Storm Sewer Systems (RULE 62-624.600(2), F.A.C.)

- This Annual Report Form must be completed and submitted to the Department to satisfy the annual reporting requirements established in Rule 62-621.600, F.A.C.
- Submit this fully completed and signed form and any REQUIRED attachments by email to the NPDES Stormwater Program Administrator or to the MS4 coordinator (http://www.dep.state.fl.us/water/stormwater/npdes/contacts.htm). Files larger than 10MB may be placed on the FTP site at: ftp://ftp.dep.state.fl.us/pub/NPDES_Stormwater/. After uploading files, email the MS4 coordinator or NPDES Program Administrator to notify them the report is ready for downloading; or by mail to the address in the box at right.
- Refer to the Form Instructions for guidance on completing each section.
- **Please print or type information in the appropriate areas below.**

Submit the form and attachments to:
Florida Department of Environmental Protection
Mail Station 3585
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

SECTION I. BACKGROUND INFORMATION

A.	Permittee Name: Northern Palm Beach County Improvement District (NPBCID)		
B.	Permit Name: Palm Beach County MS4		
C.	Permit Number: FLS000018		
D.	Annual Report Year: ☐ Year 1 ☐ Year 2 ☐ Year 3 ☒ Year 4 ☐ Year 5 ☐ Other, specify Year:		
E.	Reporting Time Period (month/year): 10 / 2019 through 09 / 2020		
F.	Name of the Responsible Authority: O'Neal Bardin		
	Title: Executive Director		
	Mailing Address: 359 Hiatt Drive		
	City: Palm Beach Gardens	Zip: 33418	County: Palm Beach
	Telephone Number: 561.624.7830	Fax Number: 561.624.7839	
	E-mail Address: oneal@npbcid.org		
G.	Name of the Designated Stormwater Management Program Contact (if different from Section I.F above): Jared Kneiss		
	Title: Programs & Facilities Maintenance Administrator		
	Department:		
	Mailing Address: 359 Hiatt Drive		
	City: Palm Beach Gardens	Zip: 33418	County: Palm Beach
	Telephone Number: 561.624.7830	Fax Number: 561.624.7839	
	E-mail Address: jared@npbcid.org		

SECTION II. MS4 MAJOR OUTFALL INVENTORY (Not Applicable in Year 1)

A.	Number of outfalls ADDED to the outfall inventory in the current reporting year (insert "0" if none): 0 (Does this number include non-major outfalls? ☐ Yes ☒ No ☐ Not Applicable)
B.	Number of outfalls REMOVED from the outfall inventory in the current reporting year (insert "0" if none): 0 (Does this number include non-major outfalls? ☐ Yes ☒ No ☐ Not Applicable)
C.	Is the change in the total number of outfalls due to lands annexed or vacated? ☐ Yes ☐ No ☒ Not Applicable

SECTION V. MATERIALS TO BE SUBMITTED WITH THIS ANNUAL REPORT FORM

Only the following materials are to be submitted to the Department along with this fully completed and signed Annual Report Form (check the appropriate box to indicate whether the item is attached or is not applicable):

Attached	N/A	Required Attachments	Permit Citation	Attachment Number/Title
☒	☐	Any additional information required to be submitted in this current annual reporting year in accordance with Part III.A of your permit that is not otherwise included in Section VII below.	Part III.A	See BPCP
☐	☒	An explanation of why the minimum inspection frequency in Table II.A.1.a. was not met, if applicable.	Part II.A.1	
☐	☒	A list of the flood control projects that did not include stormwater treatment and an explanation for each of why it did not (if applicable).	Part III.A.4	
☒	☐	A monitoring data summary as directed in Section III.C above and in accordance with Rule 62-624.600(2)(c), F.A.C.	Part V.B.3	See Joint Annual Report and attached Assessment Report
☐	☒	YEAR 1 ONLY: An inventory of all known major outfalls and a map depicting the location of the major outfalls (hard copy or CD-ROM) in accordance with Rule 62-624.600(2)(c), F.A.C.	Part III.A.1	
☐	☒	Year 3 ONLY: The estimates of pollutant loadings and event mean concentrations for each major outfall or each major watershed in accordance with Rule 62-624.600(2)(b), F.A.C.	Part V.A	
☐	☒	YEAR 3: Summary of TMDL Monitoring Results (if applicable).	Part VIII.B.2	
☐	☒	YEAR 3: Bacteria Pollution Control Plan (if applicable).	Part VIII.B.3	
☐	☒	YEAR 4: A follow-up report on plan implementation of changes to codes and regulations to reduce the stormwater impact from development.	Part III.A.7.a	No codes or regulations at NPBCID
☒	☐	YEAR 4: Permit re-application information in accordance with Rule 62-624.420(2), F.A.C. • The monitoring plan (with revisions, if applicable). • If the total annual pollutant loadings have not decreased over the past two permit cycles, revisions to the SWMP, as appropriate.	Part V.B.3 Part V.A.3	See Joint Annual Report
☐	☒	YEAR 4: TMDL Supplemental SWMP (if applicable).	Part VIII.B.3	

DO NOT SUBMIT ANY OTHER MATERIALS

(such as records and logs of activities, monitoring raw data, public outreach materials, etc.)

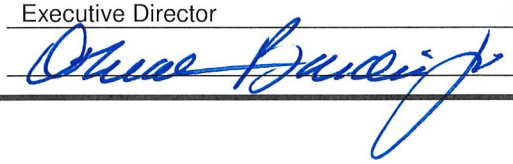
SECTION VI. CERTIFICATION STATEMENT AND SIGNATURE

The Responsible Authority listed in Section I.F above must sign the following certification statement, as per Rule 62-620.305, F.A.C:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based upon my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name of Responsible Authority (type or print): O'Neal Bardin, Jr.

Title: Executive Director

Signature:  Date: 03 / 09 / 2021

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE									
A.	B.			C.			D.	E.	F.
Permit Citation/ SWMP Element	Permit Requirement/Quantifiable SWMP Activity			Number of Activities Performed			Documentation / Record	Entity Performing the Activity	Comments
							U21 – Daily Wk Log / Spray Report (395) U23 – Activity Report (110) U24 – Activity Report (109) U27B – Daily Wk Log / Spray Report (21) U29 – Activity Report (46) U43 – Daily Wk Log / Spray Report (1106) U45 – Activity Report (46) U1 - Treatment Performed in Lakes and Canals (38) U2 – Treatment Performed in Lakes and Canals (48) U3 – Treatment Performed in Lakes and Canals (48) U3A – Treatment in Lakes and Canals (48) U4 – Treatment Performed in Lakes and Canals (48)	U21 - Lk. Masters U23 – Lk. Masters U24 – Lk Masters U27B – Aquagenix U29 – Lk Masters U43 – Aquagenix U45 – Lk Masters) U1 – Clark Aqua (R. Cross) 2 – Clark Aqua (R. Cross) U3 – Future Horizons (R. Cross) U3A –Future Horizons (R. Cross) U4 – Future	

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE									
A.	B.	C.					D.	E.	F.
Permit Citation/ SWMP Element	Permit Requirement/Quantifiable SWMP Activity	Number of Activities Performed					Documentation / Record	Entity Performing the Activity	Comments
							Lakes and Canals (48) U33 – Treatment Performed in Lakes and Canals (48) U43 – Treatment Performed in Lakes and Canals (0) U49 – Treatment Performed in Lakes and Canals (48)	Aqua (R. Cross) U32 Clark Aqua (R. Cross) U33 – Clark Aqua (R. Cross) U43 – Future Horizons (R. Cross) U49 – Future Horizons (R. Cross)	
	pump stations	16	340	100	340	100	1.) NPBCID Pump Station Checklist (38) 2.) Annual Facilities Inspection Report (16) 3.) Landscape maintenance matrix (268) 4.) Work Invoices (14) 5.) Work Invoices (4)	1.) NPBCID Staff – Corrias / JRM 2.) Annual Facilities Inspection Report - J. Iles 3.) Grassroots, Inc – J. Iles 4.) Genset, Inc. – R. Musgrove 5.) MWI Pumps – R. Musgrove	
	Major outfalls	22	22	100	0	0	Annual Facilities	J. Iles Annual Facilities	No problems found during

SECTION VII.	STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE								
A.	B.			C.			D.	E.	F.
Permit Citation/ SWMP Element	Permit Requirement/Quantifiable SWMP Activity			Number of Activities Performed			Documentation / Record	Entity Performing the Activity	Comments
	Inlets / catch basins / grates	924	26 (trips) x # C.B (924) = **24,024**	100	0	0	Visual catch basin/ Inlet Inspection Reports	NPBCID-J. Santo	
	Additional catch basin inspection & maintenance	942	942	100	942	100	Inspection, cleaning reports/Invoices	Shenandoah Constr., Crocs, LLC, Hinterland Group, Inc- R. Keith	
	Ditches / conveyance swales (miles)	48.92	1200	100	792	100	1.) Schedule of Values & Work Completed. (588) 2.) NPBCID Canal R.O.W. Inspection Form. (408) 3.) Treatment Performed in Lakes and Canal (192) 4.) Grassroots, Inc. contract (12)	1.)Grassroots, Inc- J. Iles 2.)NPBCID Staff – R Cross 3.)Clark Aquatics/Future Horizons –R Cross 4.) Grassroots, Inc.- R Cross	
	If the minimum inspection frequencies set forth in Table II.A.1.a. were not met, provide as an attachment an explanation of why they were not and a description of the actions that will be taken to ensure that they will be met.						0	0	All met

SECTION VII.	STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE				
A.	B.	C.	D.	E.	F.
Permit Citation/ SWMP Element	**Permit Requirement/Quantifiable SWMP Activity**	**Number of Activities Performed**	**Documentation / Record**	**Entity Performing the Activity**	**Comments**
	Report on the street sweeping program, including the frequency of the sweeping, total miles swept, an estimate of the quantity of sweepings collected, and the total nitrogen and total phosphorus loadings that were removed by the collection of sweepings. If no street sweeping program is implemented, provide the explanation of why not in column F.				
	Frequency of street sweeping	Monthly	Invoices and worksheets	NPBCID- Santos	Units 16,18, 45
	Total miles swept	64.11	Invoices	NPBCID- Santos	Units 16,18, 45
	Estimated quantity of sweeping material collected (tons)	50.116	Invoices	NPBCID- Santos	Units 16,18, 45
	Total phosphorous loadings removed (pounds)	32	2019 MS4 Tool	NPBCID- Santos	Units 16,18, 45
	Total nitrogen loadings removed (pounds)	59	2019 MS4 Tool	NPBCID- Santos	Units 16,18, 45
Part III.A.3 Summary	Provide an evaluation of the Stormwater Management Program according to Part VI.B.2 of the permit.				
	Strengths: *Number of inspection from employees and trained contractors*				
	Limitations: *None*				
	SWMP revisions implemented to address limitations: *None*				
Part III.A.4	**Flood Control Projects**				
	Report the total number of flood control projects that were constructed by the permittee during the reporting period and the number of those projects that did NOT include stormwater treatment. The permittee shall provide a list of the projects where stormwater treatment was not included with an explanation for each of why it was not. Report on any stormwater retrofit planning activities and the associated implementation of retrofitting projects to reduce stormwater pollutant loads from existing drainage systems that do not have treatment BMPs.				
	Flood control projects completed during the reporting period	2	Engineers AR	ARCADIS- K. Lesser	Unit 21: add pump PS-1 & PS-2
	Flood control projects completed that did <u>not</u> include stormwater treatment	0	Engineers AR	ARCADIS	No Projects
	Stormwater retrofit projects planned/under construction	4	Engineers AR	ARCADIS- K. Lesser	U-5A N. Culvert, U-14 Slip lining, U-15 W3,W4 Weir replacement,U-20 Weir and wing wall replacement
	Stormwater retrofit projects completed	2	Engineers AR	ARCADIS- K. Lesser	Unit 2C Mods & Unit 15 W-2 replacement
	If there were projects that did not include stormwater treatment, provide as an attachment a list of the projects and an explanation for each of why it did not.	0	Engineers AR	ARCADIS	All included treatment

SECTION VII.	STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE				
A.	B.	C.	D.	E.	F.
Permit Citation/ SWMP Element	**Permit Requirement/Quantifiable SWMP Activity**	**Number of Activities Performed**	**Documentation / Record**	**Entity Performing the Activity**	**Comments**
	and the number of Web site visits (if applicable).				
	Public Education and Outreach Program	The public outreach and education plan is carried out as a joint effort by the Palm Beach County Co-permittees. Please see the Palm Beach County Joint Annual Report for the public education and outreach information.			
Part III.A.6 Summary	Provide an evaluation of the Stormwater Management Program according to Part VI.B.2 of the permit.				
	Strengths: Guidelines and Documentation				
	Limitations: None				
	SWMP revisions implemented to address limitations: *None, Northern employees do not apply Herbicides, Pesticides or Fertilizers*				
Part III.A.7.a	**Illicit Discharges and Improper Disposal — Inspections, Ordinances, and Enforcement Measures**				
	Report amendments in Year 4.				
	Year 4 ONLY: Attach a report on amendments to applicable legal authority	☐	Florida Statutes	NPBCID staff	No amendments, No Legal Authority
Part III.A.7.c	**Illicit Discharges and Improper Disposal — Investigation of Suspected Illicit Discharges and/or Improper Disposal**				
	Report on the proactive inspection program, including the number of inspections conducted by the permittee, the number of illicit activities found, and the number and type of enforcement actions taken.				
	Proactive inspections for suspected illicit discharges	33,250	Inspection Reports & work orders	NPBCID Staff & Contractors	None
	Illicit discharges found during a proactive inspection	0	Inspection Reports	NPBCID Staff & Contractors	None
	NOV/WL/citation/fines issued for illicit discharges found during proactive inspection	0	Inspection Reports	NPBCID Staff & Contractors	None
	Report on the reactive investigation program as it relates to responding to reports of suspected illicit discharges, including the number of reports received, the number of investigations conducted, the number of illicit activities found, and the number and type of enforcement actions taken.				
	Reports of suspected illicit discharges received	1	Tracking Sheet	NPBCID, City of WPB	City of WPB processed
	Reactive investigations of reports of suspected illicit discharges etc.	1	Tracking Sheet	NPBCID, City of WPB	City of WPB processed
	Illicit discharges etc. found during reactive investigation	1	Tracking Sheet	NPBCID, City of WPB	City of WPB processed
	NOV/WL/citation/fines issued for illicit discharges etc. found during reactive investigation	0	Tracking Sheet	City of WPB	City of WPB processed
	Report the type of training activities, and the number of permittee personnel and contractors trained (both in-house and outside training) within the reporting year.				
	Personnel trained	7	Sign – in sheet	NPBCID	Video training
	Contractors trained	10	Pre Work Mtg.	NPBCID	Video training

SECTION VII.	STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE				
A.	B.	C.	D.	E.	F.
Permit Citation/ SWMP Element	Permit Requirement/Quantifiable SWMP Activity	Number of Activities Performed	Documentation / Record	Entity Performing the Activity	Comments
Part III.A.7.g	**Illicit Discharges and Improper Disposal — Limitation of Sanitary Sewer Seepage**				
	Advise the appropriate utility owner of a violation if constituents common to wastewater contamination are discovered in ITID, NPBCID, SIRWCD's MS4. Report the number of violations referred to the appropriate utility owner and the name of the utility owner.				
	Owner of the sanitary sewer system	NCON, Seacoast, City of WPB, Riviera Beach, Palm Beach County Water Utilities			
	Number of violations referred	0	Illicit and structural Inspection reports	NPBCID staff	None
Part III.A.7 Summary	For activities required by Part III.A.7: Provide an evaluation of the Stormwater Management Program according to Part VI.B.2 of the permit.				
	Strengths: None				
	Limitations: None				
	SWMP Revisions implemented to address limitations: None				
Part III.A.8.a	**Industrial and High-Risk Runoff — Identification of Priorities and Procedures for Inspections**				
	Report on the high-risk facilities inventory, including the type and total number of high risk facilities and the number of facilities newly added each year. Report on the high-risk facilities inspection program, including the number of inspections conducted and the number and type of enforcement actions taken.				
	Type of Facility	**Number of Facilities**	**Number of Inspections**	**Referral Enforcement**	
	Operating municipal landfills	0	0	0	floridadep.gov/waste/permitting website / NPBCID staff / No sites found within MS4
	Hazardous waste treatment, storage, disposal and recovery (HWTSDR) facilities	1	0	0	enviro.epa.gov website / NPBCID staff / Inspections start 20/21 reporting yr.
	EPCRA Title III, Section 313 facilities (TRI)	0	0	0	Enviro.epa.gov website / NPBCID staff / No sites found within MS4
	Facilities determined as high risk by the permittee	0	0	0	Illicit inspections / NPBCID staff / No sites found within MS4
Part III.A.8.b	**Industrial and High-Risk Runoff — Monitoring for High Risk Industries**				
	Report the number of high risk facilities sampled.				
	High risk facilities sampled	0	SOP	NPBCID staff	0

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE						
A.	**B.**		**C.**	**D.**	**E.**	**F.**
Permit Citation/ SWMP Element	**Permit Requirement/Quantifiable SWMP Activity**		**Number of Activities Performed**	**Documentation / Record**	**Entity Performing the Activity**	**Comments**
		DEP Certification	**Annual Training**			
	Permittee construction site inspectors	11	11	DEP Certification Card	NPBCID- Staff	
	Permittee construction site plan reviewers		2	DEP Certification Card	PBC Steering Committee	ARCADIS
	Permittee construction site operators		4	Pre-Work Meeting	ARCADIS	Unit 2C,(2)16,53
Part III.A.9 Summary	**Strengths:** Guidelines Documentation					
	Limitations: None					
	SWMP revisions implemented to address limitations: None					

SECTION VIII. CHANGES TO THE STORMWATER MANAGEMENT PROGRAM (SWMP) ACTIVITIES (Not Applicable in Year 4)		
A.	**Permit Citation/ SWMP Element**	**Proposed Changes to the Stormwater Management Program Activities Established as Specific Requirements Under Part III.A of the Permit (Including the Rationale for the Change) — REQUIRES DEP APPROVAL PRIOR TO CHANGE IF PROPOSING TO REPLACE OR DELETE AN ACTIVITY.**
		None
B.	**Permit Citation/ SWMP Element**	**Changes to the Stormwater Management Program Activities NOT Established as Specific Requirements Under Part III.A of the Permit (Including the Rationale for the Change)**
		None

SECTION IX. TMDL Status Report

A. Provide a table summarizing the status of the TMDL process. Include a list of prioritized TMDLs and their monitoring and implementation schedule; and include the Identification number of the outfall prioritized for TMDL monitoring.

WBID Number	Segment/ Waterbody/ Basin	Pollutant of Concern	TMDL DEP / EPA	Percent Reduction (WLA)	Priority Rank	Priority Outfall	Monitoring Summary / BPCP Due Date	Supplemental SWMP Due Date
3226C	**Loxahatchee River RAP**	Bacteria	☒ / ☐	91	1	N/A	N/A	N/A

B. YEAR 3 and annually thereafter, provide a summary of the estimated load reductions that have occurred for the pollutant(s) of concern being discharged from the MS4 to the TMDL water body during the reporting period and cumulatively since the date the Supplemental SWMP was implemented. N/A

Year 3: Submit a Monitoring data summary or BPCP (if applicable).

Year 4: Submit a Supplemental SWMP (if applicable).

WBID Number	Pollutant of Concern	Monitoring Summary / BPCP Submitted	Supplemental SWMP Submitted	Projected load reductions OR Actual load reductions to date
Loxahatchee River	Nutrients & Bacteria	Year 4 ARF	none	Estimated 46%. Refer to attached BPCP report.

C. Provide a brief statement as to the status of TMDL implementation according to Part VIII.B of the permit (e.g. status of monitoring to validate WLA):

Refer to the attached letter from FDEP which allows addressing the bacteria TMDL at part of the Loxahatchee River RAP for nutrients and bacteria. Also attached is the December 2019 draft of Loxahatchee River Pollutant Reduction Plan, the working documentation for the LOX RAP efforts.

Northern Palm Beach County Improvement District

MS4 SWMP ASSESSMENT REPORT

CYCLE 4, YEAR 4

Abstract

This report is to evaluate the effectiveness of the MS4 permit programs and document the results of the SWMP Assessment Program, by Northern Palm Beach County Improvement District under the MS4 NPDES Permit No. 000018 -04

MOCK • ROOS
CONSULTING ENGINEERS

Table of Contents

Engineer's Signature Page

I hereby state, as a Professional Engineer in the State of Florida, that this report titled MS4 SWMP Assessment Report Cycle 4, Year 4, dated February 2021, for Northern Palm Beach County Improvement District, was prepared and assembled under my direct responsible charge.

02/08/2021

Alan D. Wertepny, P.E. Date

P.E. No. 32350

Project Engineer

MOCK • ROOS

CONSULTING ENGINEERS

5720 Corporate Way

West Palm Beach, FL 33407

Florida C.A. No. 48

(Reproductions are not valid unless signed, dated, and embossed with Professional's Seal)

1. Northern Palm Beach County Improvement District MS4 SWMP Assessment Report

1.1. Introduction

The Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) permit is part of a federal program designed to reduce stormwater pollutant discharges to receiving waters of the United States. Amendments to previous water controls acts of 1948, and 1972 resulted in the Clean Water Act of 1977. In 1987, the United States Environmental Protection Agency (EPA) was required under Section 402 (p) of the Clean Water Act to develop the permits for Municipal Storm Sewer Discharges. In 1997, the first 5-year permit (No. FLS000018) was issued by EPA to Palm Beach County's permittees. Northern Palm Beach County Improvement District (NPBCID) is the lead permittee of this permit, under Interlocal Agreements executed with all other permittees within the County. The current cycle (Cycle 4) permit was issued on September 8, 2016. This report is to document the ongoing activities under the Assessment Program and provide the annual evaluation of the effectiveness of the MS4 permit programs.

1.2. Goals

The fundamental goal of the NPDES is to reduce the pollutant loadings to the receiving water bodies to the maximum extent practicable. To this end, this report discusses the groups water quality monitoring program and trends of the ambient water quality that the NPBCID MS4 discharges into. NPBCID relied upon this information and the groups pollutant loading analysis to evaluate the overall effectiveness of NPBCID's Stormwater Management Programs (SWMPs).

2. Water Quality Monitoring Program

2.1. Description

The NPBCID participates in the county-wide Palm Beach County water quality monitoring program. Nine monitoring locations within the county-wide program are relevant to the discharge from NPBCID's stormwater discharge system.

The Palm Beach County NPDES MS4 water quality monitoring program includes the following components:

- Ambient Water Quality Sampling
- Water Quality Data Analyses
- Trend Analyses
- Annual Pollutant Loading Estimations in Year 3
- Program Modifications as Needed

The sites monitored by Palm Beach County Environmental Resource Management are sampled and initially analyzed in-situ using a multiparameter water quality monitoring instrument. Water samples are collected, preserved, and stored in accordance with Standard Operating Procedures. Final analysis of samples is conducted in laboratory settings under the direction of the agencies listed in Table 2.

2.2. Monitoring Sites

NPBCID reviewed the available data from the group's water quality monitoring program. Table 1 summarizes the parameters that are monitored at each station and indicates if the value is reported based on field or laboratory analysis. Table 2 provides information on the selected sites being used for the NPBCID assessment report. Location, receiving water body, responsible agency, and the frequency of sampling are provided. A map of monitoring stations and NPBCID's MS4 are provided in Figure 1 through Figure 3.

TABLE 1 : MS4 MONITORING PARAMETERS

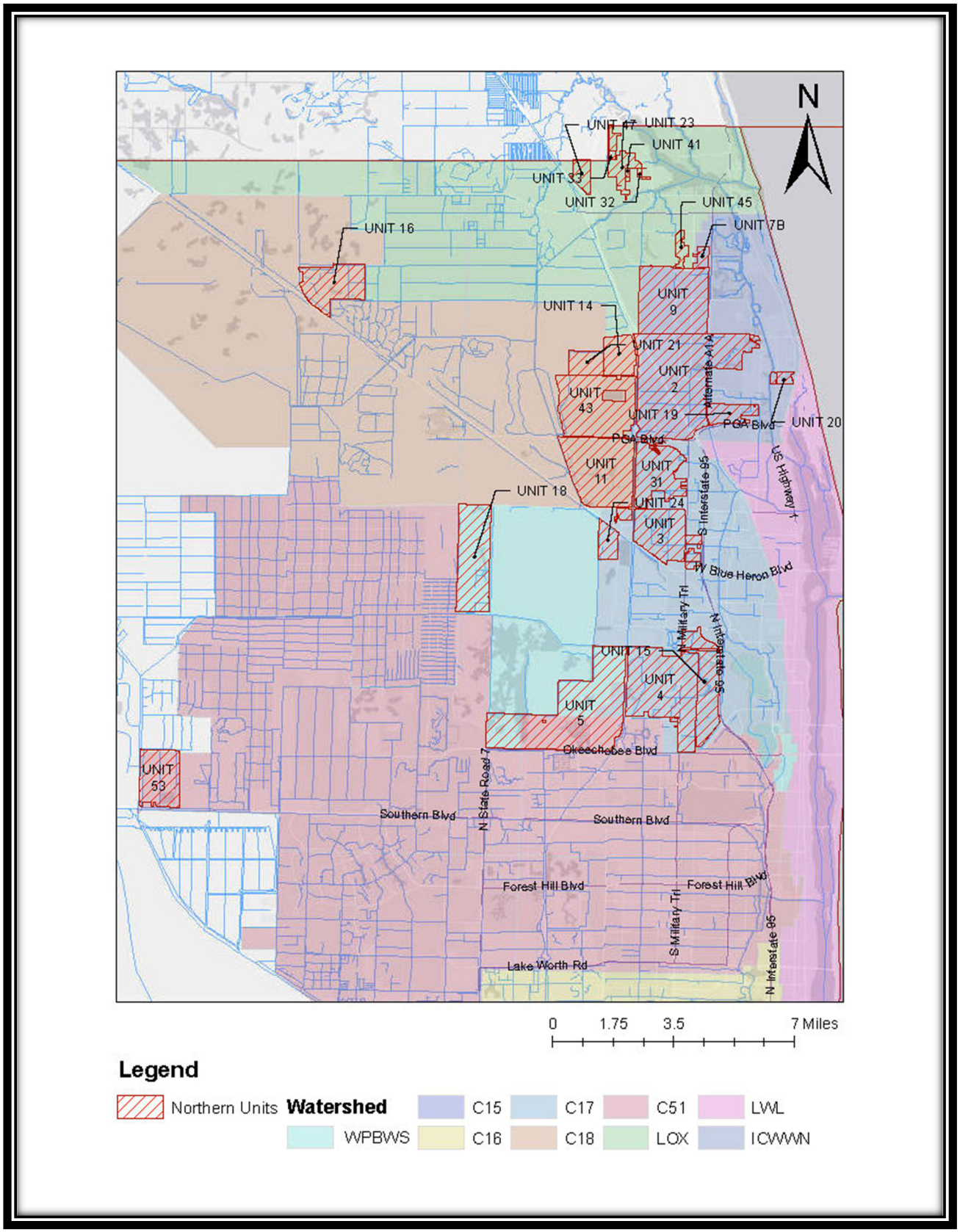
Parameter	Units	Field Measurement	Laboratory Analysis
Chlorophyll A	ug/l		*X*
Copper, Dissolved	ug/l		*X*
Oxygen	*% Saturation*	*X*	
Nitrate + Nitrite	*mg/l*		*X*
pH	*SU*	*X*	
Temperature	*˚c*	*X*	
Total Kjeldahl Nitrogen	*mg/l*		*X*
Total Nitrogen	*mg/l*		*X*
Total Phosphorus	*mg/l*		*X*
Total Suspended Solids	*mg/l*		*X*
Specific Conductivity	*umhos*	*X*	
Turbidity	*NTU*	*X*	

TABLE 2 : AMBIENT WATER QUALITY MONITORING STATIONS TABLE

Unit of Development	Station Number	Latitude/ Longitude	Receiving Waterbody	Agency*	Frequency
2	30	26.934576 -80.083153	Intracoastal Waterway (North)	LRD	Bi-Monthly
3	C17S44	26.817267 -80.082067	C-17 Canal	SFWMD	Monthly
4	12A	26.758688 -80.088300	C-17 Canal	ERM	Bi-Monthly
5	C51S155	26.644628 -80.056523	C-51 Canal	SFWMD	Monthly
9	30	26.934576 -80.083153	Intracoastal Waterway (North)	LRD	Bi-Monthly
11	81	26.933743 -80.141791	C-18 Canal	LRD	Monthly
14	81	26.933743 -80.141791	Unit 43	LRD	Monthly
15	12A	26.758688 -80.088300	C-17 Canal	ERM	Bi-Monthly
16	16	26.872281 -80.245657	Inactive Unit 10 to C-18 (West)	ERM	Bi-Monthly
18	CS-4	26.751119 -80.119002	Grassy Water Preserve (WPBWS)	CWPB	Monthly
19	30	26.934576 -80.083153	Intracoastal Waterway (North)	LRD	Bi-Monthly
20	30	26.934576 -80.083153	Intracoastal Waterway (North)	LRD	Bi-Monthly
21	81	26.933743 -80.141791	Unit 43	LRD	Monthly
23	72	26.943301 -80.121856	SW Fork Loxahatchee River	LRD	Monthly
24	C17S44	26.817267 -80.082067	C-17 Canal	SFWMD	Monthly
27B	30	26.934576 -80.083153	Intracoastal Waterway (North)	LRD	Bi-Monthly
29	42	26.950246 -80.108790	NW Fork Loxahatchee River	LRD	Bi-Monthly
31	C17S44	26.817267 -80.082067	C-17 Canal	SFWMD	Monthly
32	72	26.943301 -80.121856	SW Fork Loxahatchee River	LRD	Monthly
33	42	26.950246 -80.108790	NW Fork Loxahatchee River	LRD	Bi-Monthly
41	72	26.943301 -80.121856	SW Fork Loxahatchee River	LRD	Monthly
43	81	26.933743 -80.141791	C-18 Canal	LRD	Monthly
45	72	26.943301 -80.121856	SW Fork Loxahatchee River	LRD	Monthly
47	72	26.943301 -80.121856	SW Fork Loxahatchee River	LRD	Monthly
53	38B	31.852222 -73.949906	C-51 Canal	SFWMD	Monthly

*SFWMD – South Florida Water Management District, ERM – Palm Beach County Environmental Resource Management, LDR - Loxahatchee River District

FIGURE 1 : MONITORING LOCATIONS WITH WATERSHEDS



*LWL - Lake Worth Lagoon, LOX - Loxahatchee River, WPBWS – West Palm Beach Water Supply, ICWWN – Intracoastal Waterway North

FIGURE 2 : MONITORING LOCATIONS WITH WATERSHEDS

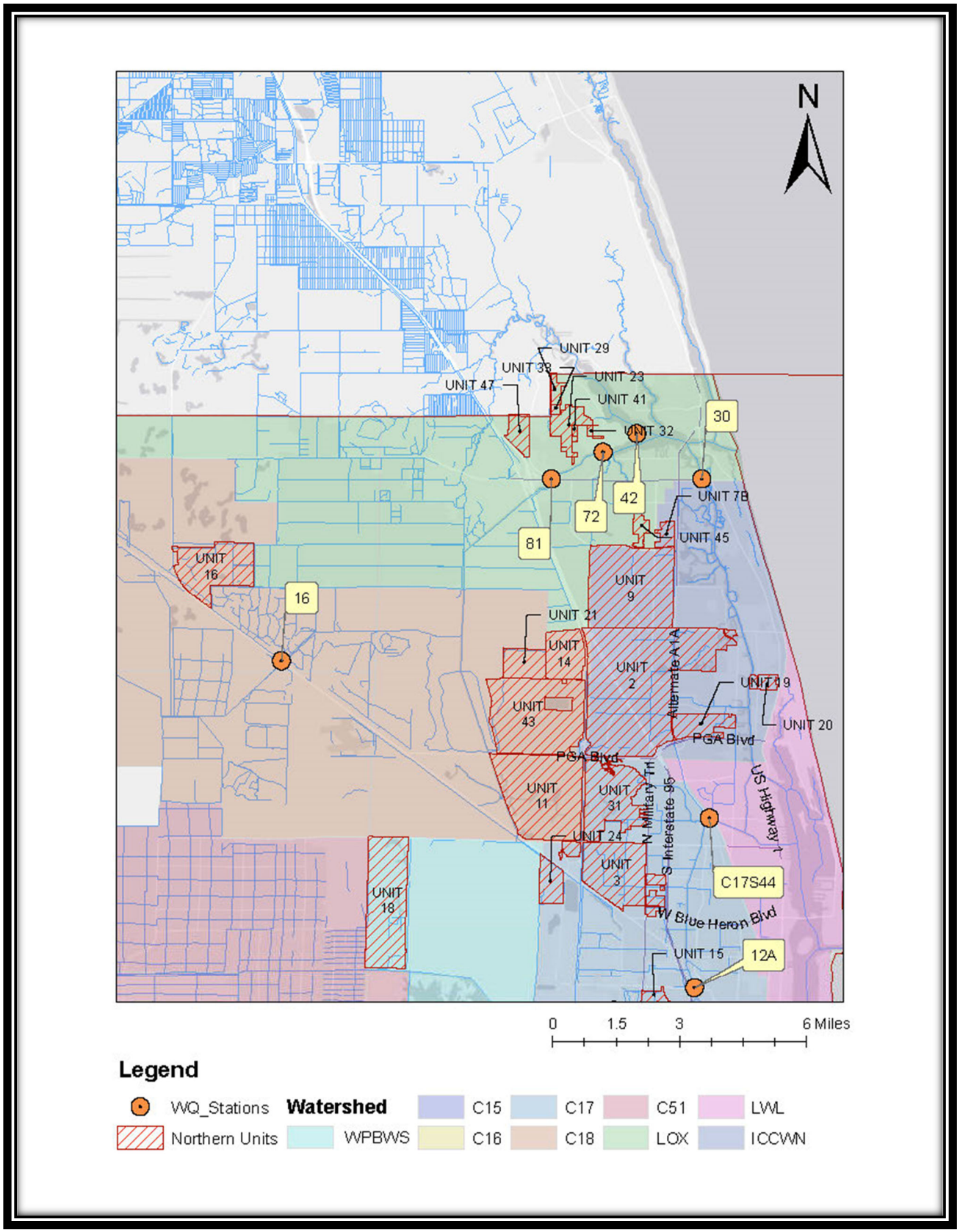


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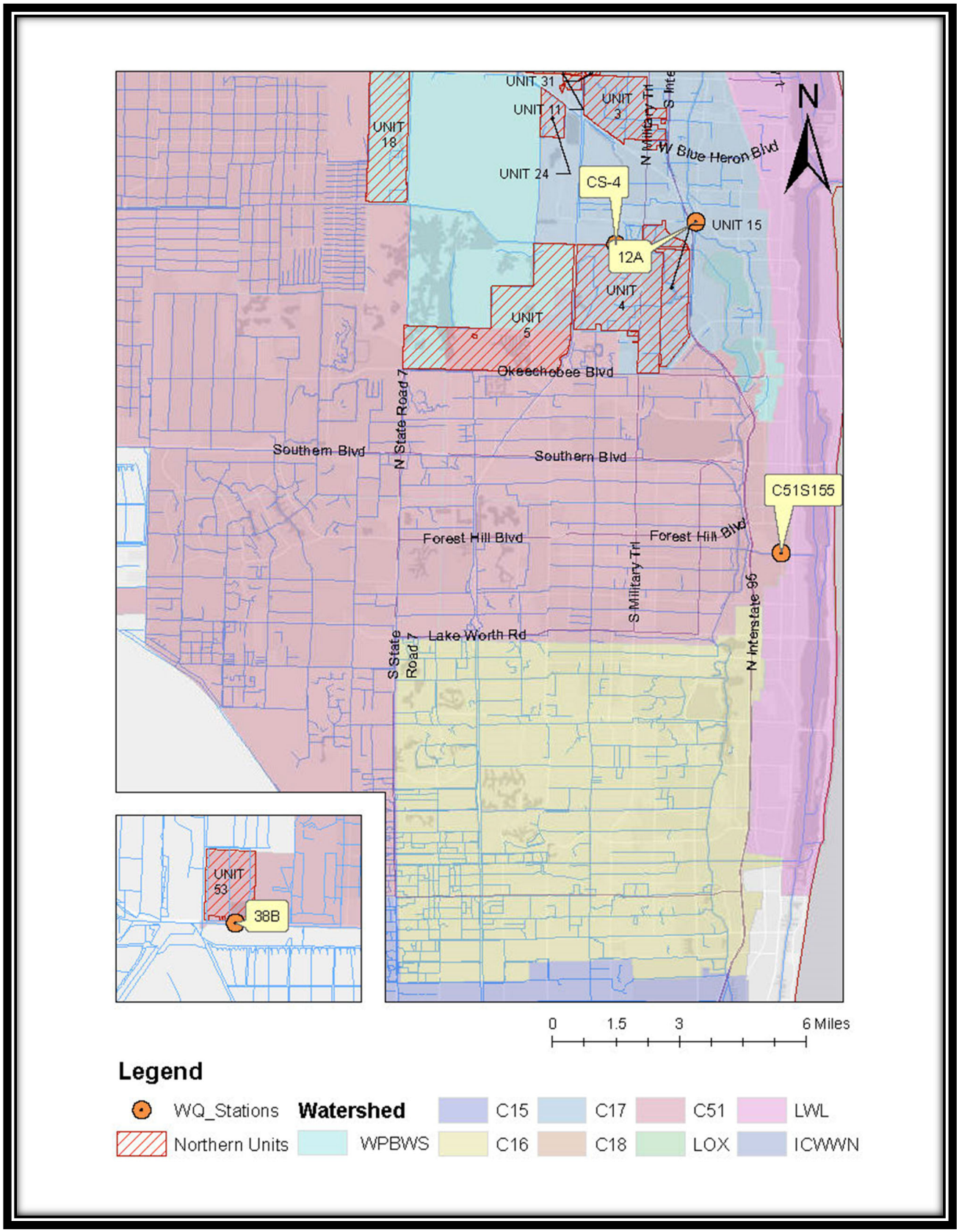
FIGURE 3 : MONITORING LOCATIONS WITH WATERSHEDS



*LWL - Lake Worth Lagoon, LOX - Loxahatchee River, WPBWS – West Palm Beach Water Supply, ICWWN – Intracoastal Waterway North

2.3. Water Quality Monitoring Results

The NPBCID relies on the groups monitoring program results for this assessment. The historical data for the selected nine stations are available on the group's website and can be found at:

http://www.pbco-npdes.org/annual.asp

Parameters are monitored monthly (typically) for marine environments and bi-monthly for freshwater. Parameters of primary interest to FDEP and NPBCID are phosphorus, and nitrogen. FDEP has cited chlorophyll-a as an indicator of nutrient enrichment and was therefore also included. Table 3 below provides a summary of the state of Florida water quality criteria for the South Florida region.

TABLE 3 SOUTH FLORIDA REGION WATER QUALITY CRITERIA

Applicable Class III - Freshwater Quality Criteria C-17 (Stations C17S44, and 12A)		
Parameter	**Unit**	**Criteria**
Chlorophyll-a (corrected)	ug/L	≤ 20 AGM
Nitrogen, Total	mg/L	Narrative
Phosphorus, Total	mg/L	Narrative
Applicable Class I - Freshwater Canal Quality Criteria C-18 (Stations 81 and 16)		
Parameter	**Unit**	**Criteria**
Chlorophyll-a (corrected)	ug/L	≤ 20 AGM
Nitrogen, Total	mg/L	≤ 1.54 AGM
Phosphorus, Total	mg/L	≤ 0.12 AGM
Applicable Class I - Freshwater Quality Criteria C-51 (Stations C51S155, 38B)		
Parameter	**Unit**	**Criteria**
Chlorophyll-a (corrected)	ug/L	≤ 20 AGM
Nitrogen, Total	mg/L	Narrative
Phosphorus, Total	mg/L	Narrative
Applicable Class III - Freshwater Canal Quality Criteria WPBWS (Stations CS-4)		
Parameter	**Unit**	**Criteria**
Chlorophyll-a (corrected)	ug/L	≤ 20 AGM
Nitrogen, Total	mg/L	Narrative
Phosphorus, Total	mg/L	Narrative
Applicable Class III - Marine Water Quality Criteria ICWWN (Stations 30)		
Parameter	**Unit**	**Criteria**
Chlorophyll-a (corrected)	ug/L	≤ 4.7 AGM
Nitrogen, Total	mg/L	≤ 0.66 AGM
Phosphorus, Total	mg/L	≤ 0.035 AGM
Applicable Class II – Marine Northwest Fork Loxahatchee River Criteria LOX (Stations 42)		
Parameter	**Unit**	**Criteria**
Chlorophyll-a (corrected)	ug/L	≤ 4.0 AGM
Nitrogen, Total	mg/L	≤ 0.8 AGM
Phosphorus, Total	mg/L	≤ 0.030 AGM
Applicable Class II - Marine Southwest Loxahatchee River Criteria LOX (Stations 72)		
Parameter	Unit	Criteria
Chlorophyll-a (corrected)	ug/L	≤ 5.5 AGM
Nitrogen, Total	mg/L	≤ 1.26 AGM
Phosphorus, Total	mg/L	≤ 0.075 AGM

The group provided a summary table of water quality results for the years 2011 through 2020. These tables indicate if a station is meeting the State's criteria for that parameter, for each water body, each year. A summary of these tables for the stations that are being used for the NPBCID assessment report are provided in Table 4. The majority of the stations are meeting the criteria, with the exception of stations 42 and 72, which have had chronic exceedances of the criteria. Recent efforts by the stakeholders and the FDEP in this area have resulted in a pollutant reduction plan. These planned activities are expected to reduce phosphorus and nitrogen in the receiving water, thus reducing chlorophyll-a overtime.

TABLE 4 RESULTS OF WATER QUALITY MONITORING FOR YEARS 2010 THROUGH 2019

Total Nitrogen (Annual Geometric Mean)										
	12A	C17S44	16	81	38B	C51S155	CS-4	30		72
2011	1.31	0.91	1.27	0.86	2.13	0.88		0.34	0.29	0.38
2012	1.16	0.91	1.08	0.90	1.40	0.95		0.21	0.26	0.51
2013	0.92	0.89	0.87	0.82	1.15	1.96	1.12	0.15	0.27	0.41
2014	0.93	0.39	0.66	0.25	1.39	0.73	0.94	0.24	0.33	0.57
2015	1.07	0.77	0.77	0.74	1.19	0.97	1.11	0.20	0.27	0.52
2016	0.98	0.88	0.94	0.91	1.37	1.14	1.19	0.25	0.28	0.70
2017	1.03	0.69	0.88	0.97	1.14	0.79	1.08	0.25	0.26	0.69
2018	0.39	0.86	1.08	0.83	2.22	1.34	1.12	0.37	0.52	0.79
2019	0.98	0.78	0.96	0.87	0.48	0.96	1.12	0.28	0.21	0.58
2020	0.68	0.78	0.62	0.87	1.75	0.88	1.10	0.36	0.37	0.63

Red = Not meeting criteria, Black = Meeting Criteria or No Numeric Criteria, Blank = No Data

Total Phosphorus (Annual Geometric Mean)										
	12A	C17S44	16	81	38B	C51S155	CS-4	30	42	72
2011	0.06	0.05	0.03	0.02	0.07	0.04		0.05	0.03	0.03
2012	0.06	0.05	0.03	0.02	0.13	0.03		0.03	0.02	0.04
2013	0.06	0.05	0.03	0.02	0.09	0.06	0.07	0.02	0.02	0.04
2014	0.05	0.04	0.01	0.02	0.11	0.06	0.08	0.02	0.03	0.04
2015	0.04	0.04	0.02	0.02	0.11	0.08	0.06	0.02	0.02	0.04
2016	0.06	0.04	0.02	0.03	0.08	0.06	0.04	0.02	0.02	0.05
2017	0.05	0.03	0.03	0.02	0.18	0.06	0.05	0.02	0.02	0.03
2018	0.06	0.05	0.02	0.03	0.16	0.09	0.06	0.03	0.04	0.04
2019	0.07	0.05	0.03	0.02	0.04	0.07	0.07	0.02	0.02	0.04
2020	0.05	0.05	0.03	0.02	0.08	0.05	0.050	0.03	0.02	0.04

Red = Not meeting criteria, Black = Meeting Criteria or No Numeric Criteria, Blank = No Data

Total Chlorophyll-a (Annual Geometric Mean)										
	12A	C17S44	16	81	38B	C51S155	CS-4	30	42	72
2011	12.41		6.44		19.35				4.12	3.48
2012	17.74		6.17		8.64				3.46	9.86
2013	12.50		5.65		5.16				5.26	8.66
2014	20.44		2.14		4.07	0.03			5.00	11.23
2015	12.94		2.54		5.64				4.12	10.83
2016	11.78		5.63	8.05	10.17		3.39		3.73	7.07
2017	8.10		4.80	6.71	3.16		5.45		3.07	7.71
2018	5.98		2.57	5.52	4.22		1.90		3.75	4.90
2019	7.61		2.71	7.80	3.90		2.80	3.75	4.06	9.45
2020	14.67		6.83	6.76	19.55	0.72	2.36	4.51	4.31	8.30

Red = Not meeting criteria, Black = Meeting Criteria or No Numeric Criteria, Blank = No Data

2.4. Trend Analysis

The group also provided a statistical analysis of the trends using the Mann-Kendall Tau Test Method for the period of record at each of the monitoring stations for TN, TP, and Chl-a. A general summary of the trends is provided in Table 5 below.

TABLE 5 : SUMMARY OF TRENDS

Trends				
Period of Record	**Station Number**	**Nitrogen**	**Phosphorus**	**Chlorophyll-a**
1999-2020	12A	Significant Decreasing	Decreasing	Decreasing
1999-2020	C17S44	Significant Decreasing	Decreasing	Decreasing
1999-2020	16	Decreasing	Significant Decreasing	Increasing
1999-2020	81	Decreasing	Slight Increasing	Significant Increasing
1999-2020	38B	Significant Decreasing	Increasing	Increasing
1999-2020	C51S155	Significant Decreasing	Decreasing	Decreasing
2011-2020	CS-4	Decreasing	Decreasing	Decreasing
2000-2020	30	Significant Decreasing	Decreasing	Decreasing
2004-2020	42	Significant Decreasing	Decreasing	Slight Increasing
2000-2020	72	Decreasing	Decreasing	Decreasing

Source Cycle 4, Year 4, Palm Beach County NPDES MS4 Joint Annual Report

Review of the trend (in the group's joint annual report) indicates the following:

Total Nitrogen: graphs indicate the concentrations are improving in the watersheds.

Total Phosphorus: graphs indicate the concentrations are improving (no significant increasing trend) in the watersheds, with the exception of stations 38B and 81. The likely source of the increase for station 38B is the operational southern releases from Lake Okeechobee into canals discharges into the C-51 canal. It is of note that the slight increasing trend for station 81 is well below the water quality standard.

Chlorophyll-a graphs indicate the concentrations are improving in general (not increasing) in the watersheds, with the exception of sites 16, 38B, 42 and 81. Review of the trend graphs (http://www.pbco-npdes.org/monitoring.asp?menu=JointMenu) indicates that values are below the standards set by the State. Only station 42 is above the State Standard.

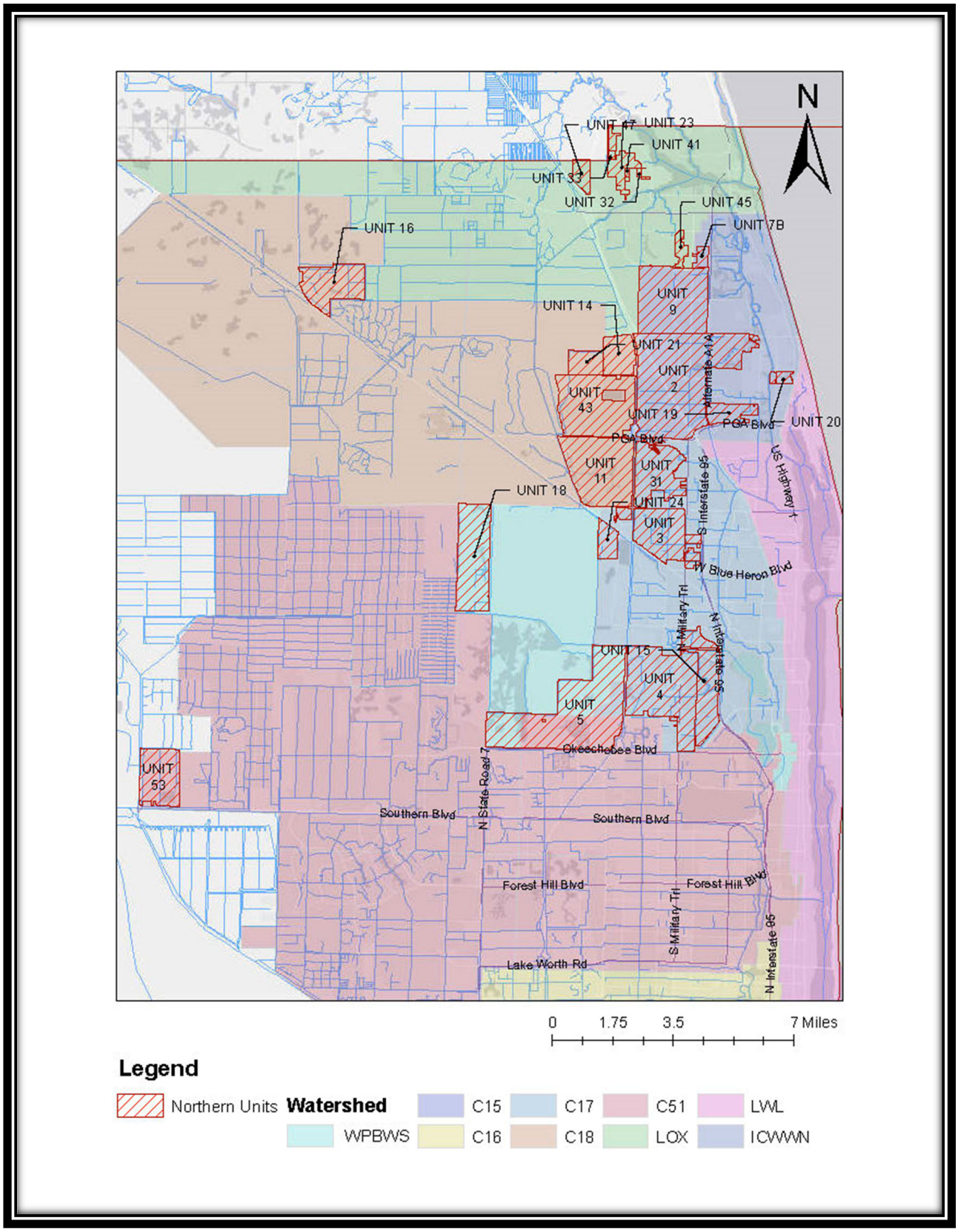
3. Pollutant Loading Estimates

3.1. Description

One of the requirements of the permit is for average annual pollutant loading estimates to be made during year three of each permit cycle. Event mean concentration (EMC) estimates are to be provided for six parameters. The six parameters identified by the FDEP are five-day biochemical oxygen demand (BOD_5), total copper (Cu), total nitrogen (as N) (TN), total phosphorus (TP), total suspended solids (TSS), and total zinc (Zn), all in the units of (mg/L). Pollutant loading models have been used to compare the effects of varying contributing area conditions over a time interval. The permit allows and the group modeled pollutant loading on a watershed basis.

During year three, a pollution loading model was developed as a joint activity by the Palm Beach County MS4 group. NPBCID's MS4 is within six watersheds: C-17, C-18, C-51, Intracoastal Waterway North (ICWWN), Loxahatchee (Lox), West Palm Beach Water Supply (WPBWS). Figure 4 graphicly depicts these watersheds. Within the report prepared for the group, several summary tables provide the estimated loading from each MS4 for each watershed for both 2013 and 2018. The corresponding tables for each basin provided in Tables 16, 17, 18-19, 23, 25, 28 of the joint pollutant loading report.

FIGURE 4 WATERSHED AND UNITS MAP FOR NORTHERN PALM BEACH COUNTY IMPROVEMENT DISTRICT'S MS4 BOUNDARY



*LWL - Lake Worth Lagoon, LOX - Loxahatchee River, WPBWS – West Palm Beach Water Supply, ICWWN – Intracoastal Waterway North

3.2. Pollutant Loading Results

The modeling effort indicated that the highest pollutant load estimates, both total and area weighted, were generated in the C-17 watershed, followed by the ICWWN. A summary of the results can be found per cycle in Table 6 and Table 7.

TABLE 6 : RESULTS FROM LOADING ANALYSIS CYCLE 3

NPBCID Units	Watershed	Tributary Area (acres)	BOD (lb/yr)	TSS (lb/yr)	TP (lb/yr)	TN (lb/yr)	CU (lb/yr)	ZN (lb/yr)
3, 4, 24, 31, 15	C-17	6,880.11	182,804	401,084	6,656	327	1,722	81,521
11, 43, 14, 21, 16	C-18	7,173.47	132,467	209,578	4,879	240	1,176	57,077
5, 53	C-51	2,563.30	50,665	79,328	1,771	87	448	18,166
18	WPBWS	1,785.09	40,446	58,906	1,321	71	364	13,884
2, 9, 19, 20, 27B	ICWWN	8,324.82	195,257	430,840	7,204	378	1,800	79,669
29, 33, 23, 32, 41, 45, 47	Loxahatchee	1,653.80	30,678	55,771	1,190	63	288	11,476
Totals		28,381	632,317	1,235,507	23,021	1,166	5,798	261,793

TABLE 7 : RESULTS FROM LOADING ANALYSIS CYCLE 4

NPBCID Units	Watershed	Tributary Area (acres)	BOD (lb/yr)	TSS (lb/yr)	TP (lb/yr)	TN (lb/yr)	CU (lb/yr)	ZN (lb/yr)
3, 4, 24, 31, 15	C-17	6,880.11	181,610	396,636	6,634	322	1,694	81,240
11, 43, 14, 21, 16	C-18	7,173.47	132,260	208,576	4,713	237	1,159	49,575
5, 53	C-51	2,563.30	51,669	80,105	1,787	88	453	18,383
18	WPBWS	1,785.09	40,451	58,931	1,321	71	364	13,885
2, 9, 19, 20, 27B	ICWWN	8,324.82	198,550	438,214	7,258	371	1,794	80,404
29, 33, 23, 32, 41, 45, 47	Loxahatchee	1,653.80	30,804	55,707	1,131	61	290	11,175
Totals		28,381	635,344	1,238,169	22,844	1,150	5,754	254,662

*LWL - Lake Worth Lagoon, LOX - Loxahatchee River, WPBWS – West Palm Beach Water Supply, ICWWN – Intracoastal Waterway North

TABLE 8 TOTAL AND PERCENT REDUCTION OF LOAD SUMMARY

	BOD (lb/yr)	TSS (lb/yr)	TP (lb/yr)	TN (lb/yr)	CU (lb/yr)	ZN (lb/yr)
Cycle 3 Totals	632,317	1,235,507	23,021	1,166	5,798	261,793
Cycle 4 Totals	635,344	1,238,169	22,844	1,150	5,754	254,662
Public Education Reduction	-38121	-74290	-1371	-69	-345	-15280
FY 19-20 Street Sweeping Reduction	0	0	-32	-59	0	0
Total Load Reduction	-38121	-74290	-1403	-128	-345	-15280
Adjusted Total Loading Cycle 4	597,223	1,163,879	21,441	1,022	5,409	239,382
Percent Reduction	6%	6%	7%	12%	7%	9%

4. Conclusions

Generally, the water quality monitoring results are encouraging. Nutrient trends are improving. SWMP activities between Cycle 3 and Cycle 4 appear to have reduced pollutant loading estimates into the watersheds. NPBCID SWMPs are effective and no revisions to the SWMP are needed.

BACTERIAL POLLUTION CONTROL PLAN FOR SOUTH WEST FORK OF THE LOXAHATCHEE RIVER (WBID 3226C)

February 2021

Prepared By

MOCK • ROOS

CONSULTING ENGINEERS

Table of Contents

Introduction and Background Information

Purpose

This report presents the Bacterial Pollution Control Plan (BPCP) for Units of Development 23, 29, 32, 33, 41, 45 and 47, in accordance with the Florida Department of Environmental Protection (FDEP) issued National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit for Palm Beach County and specifically, co-permittee Northern Palm Beach County Improvement District (NPBCID). The BPCP is required because a Total Maximum Daily Load (TMDL) for bacteria was established by FDEP for the Southwest Fork of Loxahatchee River, Water Body Identification (WBID 3266C) in an effort to restore the waterbody so that it meets its applicable water quality criteria for fecal coliform, in accordance with the 1972 Federal Clean Water Act and the 1999 Florida Watershed Restoration Act (FWRA) (Chapter 99-223, Laws of Florida). TMDLs are developed for waterbodies that are verified as impaired, i.e., not meeting their water quality standards, as set by the State of Florida. These NPBCID Units of Development identified above, and the WBID, are in the northeastern part of Palm Beach County, in FDEP's St. Lucie-Loxahatchee Group 2 Basin.

The purpose of this report is to identify the possible sources of bacteria pollution discharging from the MS4 of these Units of Development, and the activities that can be implemented to reduce them. The preparation of this report was a joint effort between NPBCID staff and Mock•Roos (MR).

Bacteria Impairment and TMDL

The Southwest Fork of Loxahatchee River was identified as impaired in a 1998 Consent Decree and was verified as impaired for fecal coliform during Cycle 1 (January 1996 – June 2003) of FDEP's ongoing water quality evaluation, and therefore was included on the Verified List of Impaired waters for the St. Lucie and Loxahatchee Basin that was adopted by Secretarial Order in May 2004. The waterbody was re-assessed during Cycle 2 (January 2001 – June 2008) and remained impaired for fecal coliform bacteria (FDEP, 2012). A TMDL was established by FDEP for the Southwest Fork of Loxahatchee River, and sets a restoration target by determining the maximum or allowable amount of fecal coliform loading that the waterbody can assimilate and still meet water quality standards and designated uses (Chapter 62-304, Florida Administrative Code [F.A.C.]).

The objective of a TMDL is to provide a basis for allocating acceptable loads among all known stakeholders in the contributing watershed. Therefore, it is critical to recognize and comprehend the pollution sources to ensure resources are effective and their allocations are targeted toward correct control measures. Potential sources that can impact the water quality for fecal coliform are agriculture, failed septic tanks, farm animals, pets, sanitary sewer overflows (SSOs), wildlife and homeless encampments. A TMDL is the sum of point sources (waste load allocations or WLAs), non-point sources (load allocations or LAs) and an appropriate margin of safety (MOS), which considers any uncertainty concerning the relationship between effluent limitations and water quality.

According to the TMDL Report prepared by FDEP in May 2012 named Fecal Coliform TMDL for Southwest Fork Loxahatchee River WBID 3226C, a 91.3% reduction from the 2012 estimated loading

(based on water quality data from 2001 through 2007) is needed to reduce bacterial load and to achieve the concentration target of 43 counts/100mL.

Affected Units of Developments and bacteria water quality criteria.

NPBCID has over 75 geographical taxing areas called Units of Development that have unique budgets to defray the cost of services provided to that area. Some of the services that NPBCID provides are stormwater management, right-of-way maintenance including roadways and sidewalks, maintenance of canals, waterways and lakes, water quality monitoring, environmental mitigation, and management, permit and plat review as well as hurricane response and emergency operations.

For assessment purposes, the FDEP has divided the St. Lucie and Loxahatchee Basin into water assessment areas with a unique WBID number. The Southwest Fork of Loxahatchee River is WBID 3226C. NPBCID Units of Development 23, 29, 32, 33, 41, 45 and 47 are within the vicinity of WBID 3226C, as shown in Figures 1 through 8. The south end of Unit 23 and two sections of Unit 32 are within the WBID boundary, while the rest of the Units are located to the north of WBID 3226C, except for Unit 45 that is in the south east. Despite the fact that these Units, for the most part, are not within WBID 3226C, they are relevant to this study since these areas might be indirectly impacting the bacterial loadings into the Southwest Fork of the Loxahatchee River.

Drainage in this area of Palm Beach County is highly regulated by the South Florida Water Management District (SFWMD) Environmental Resources Permits and via a series of canals and control structures. The Southwest Fork of Loxahatchee River originates where the C-18 Canal passes through the SFWMD S-46 gated spillway structure on the western edge of Jupiter, in northeast Palm Beach County. The Loxahatchee River Southwest Fork flows generally in an easterly direction for approximately 1 mile until it meets with the Northwest Fork to form the Loxahatchee River that flows to the Atlantic Ocean, at Jupiter Inlet. Most of the Units of Development in this study drain into the Southwest Fork of Loxahatchee River, while the Units 29 and 33 drain east, into the Northwest Fork of Loxahatchee River.

The Southwest Fork of Loxahatchee River is a Class II (estuarine) waterbody. The bacteriological water quality criterion for the protection of Class II waters, as established by Rule 62-302, F.A.C., expresses that the most probable number (MPN) for fecal coliform shall not exceed a median value of 14, with not more than 10% of the samples exceeding 43, nor exceed 800 on any one day. However, considering that the surface waters within the Units of Development are predominantly fresh water, the Units were evaluated using Class III waters. The bacteriological criterion for fresh water is Escherichia Coli Bacteria (e. Coli). The standard for Class III waters states that the MPN counts of e. Coli shall not exceed a monthly geometric mean of 126 nor exceed the Ten Percent Threshold Value (TPTV) of 410 in 10% or more of the samples during any 30-day period.

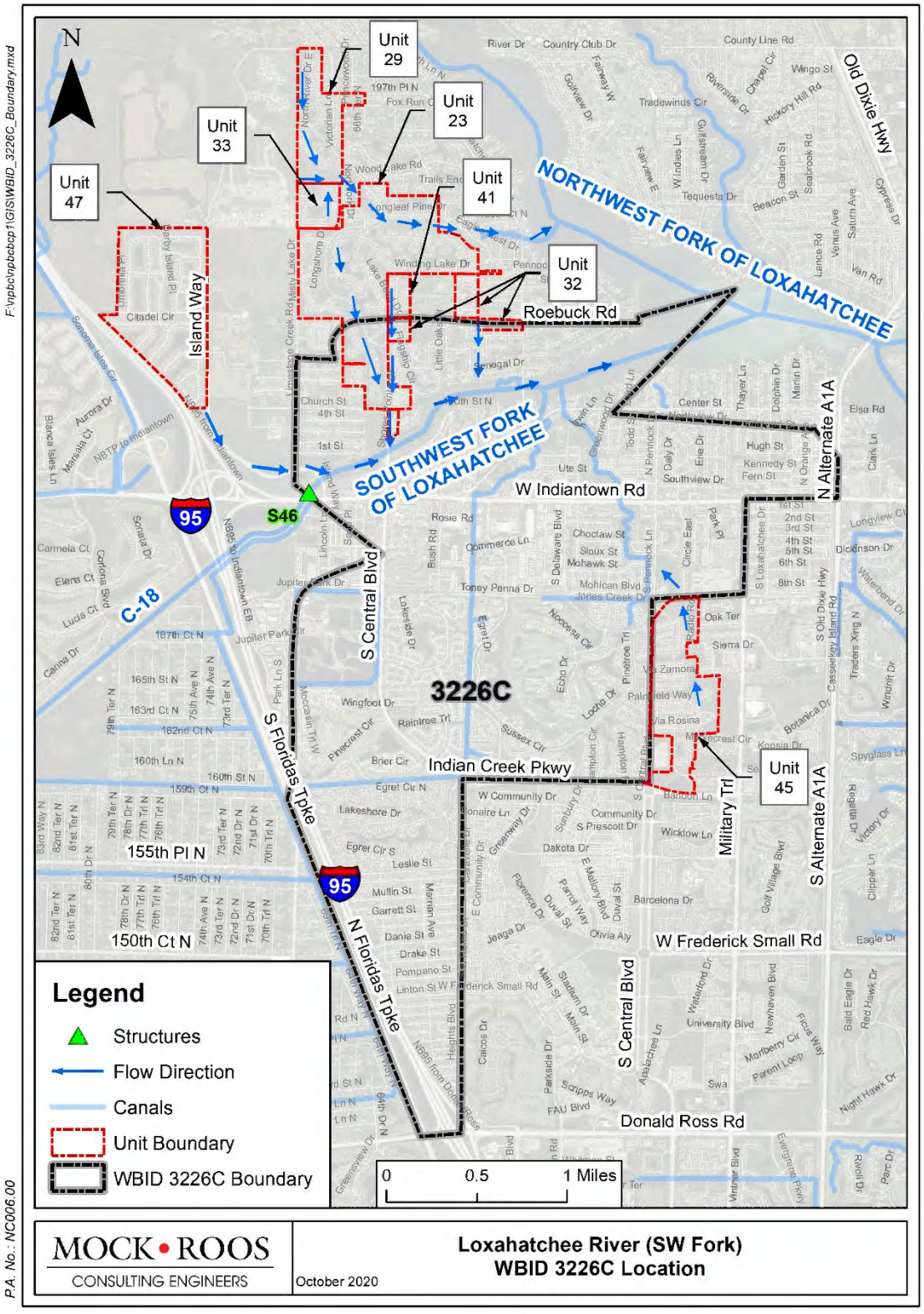


Figure 1. Location of the studied Units of Development and WBID 3226C.

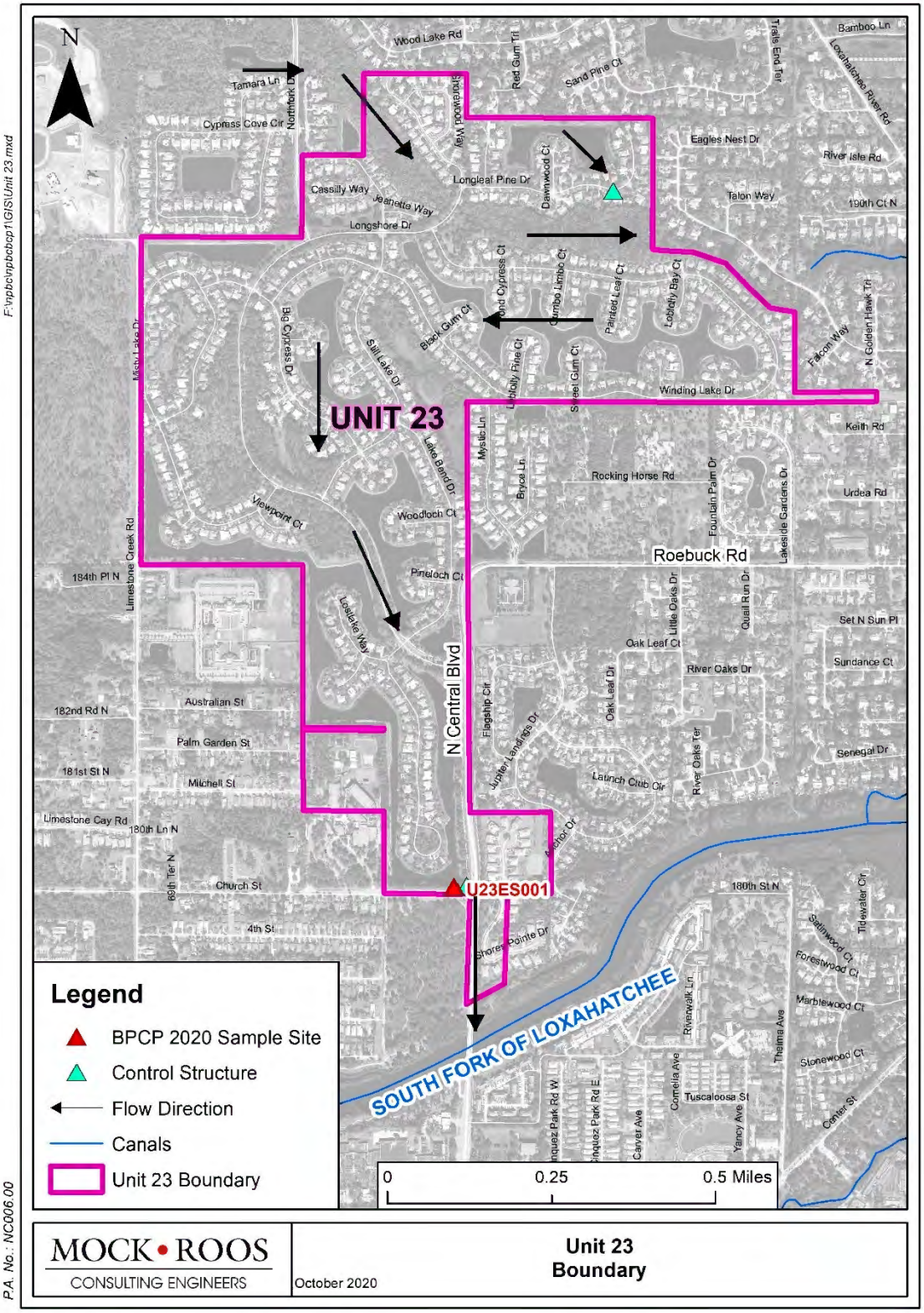


Figure 2.. Unit 23 drainage pattern into South Fork of Loxahatchee River.

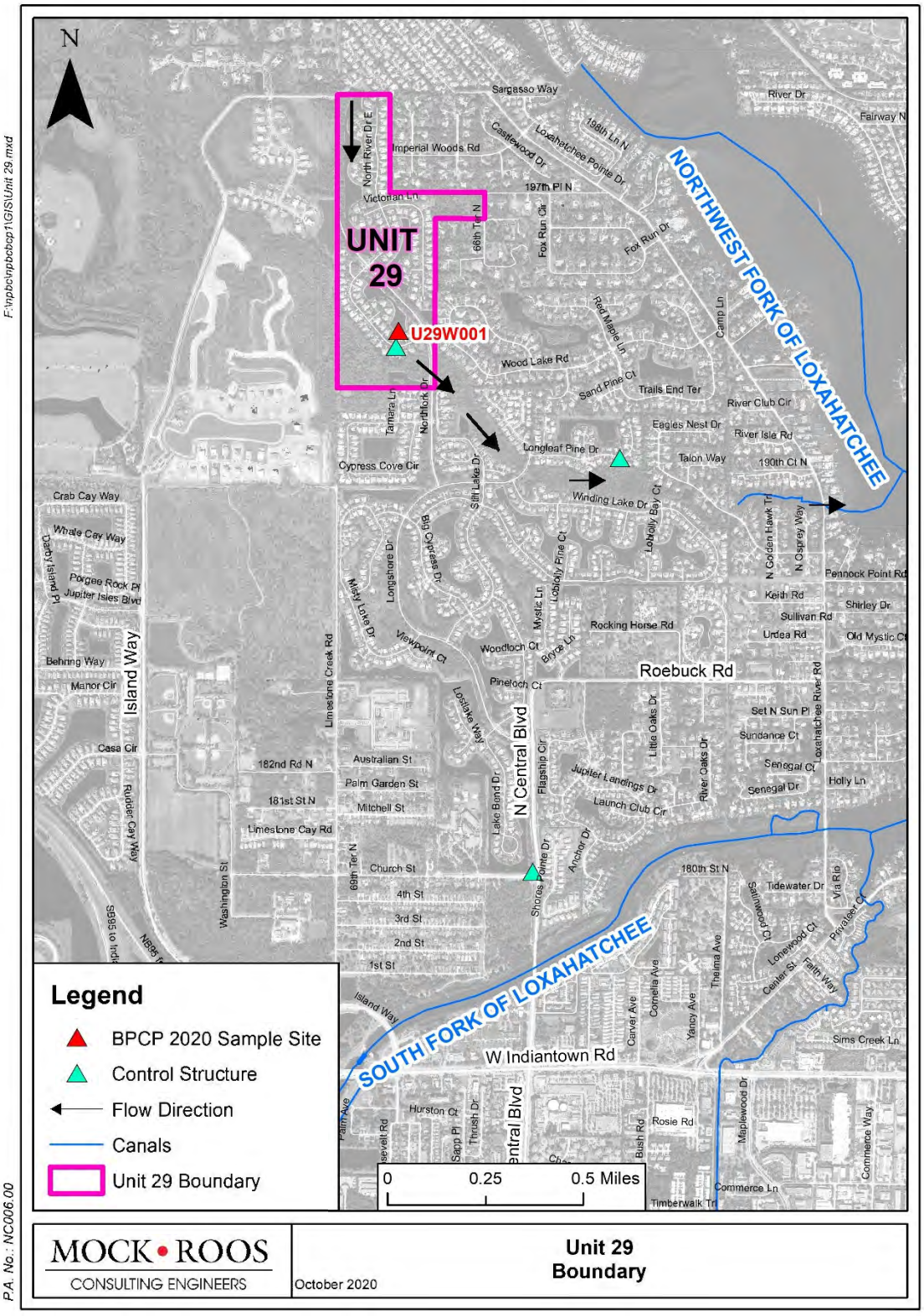


Figure 3. Unit 29 drainage pattern into Loxahatchee River.

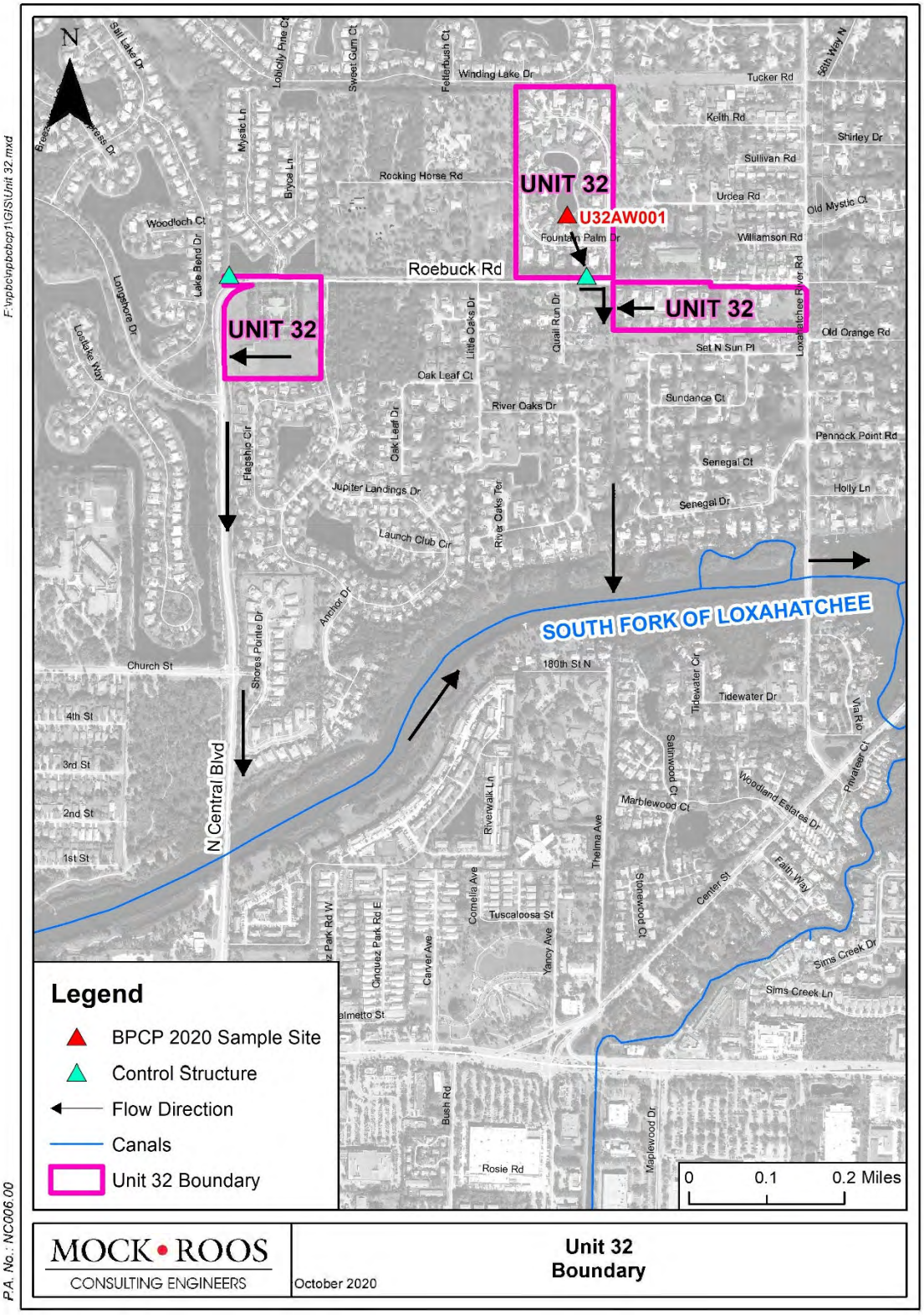


Figure 4. Unit 32 drainage pattern into South Fork of Loxahatchee River.

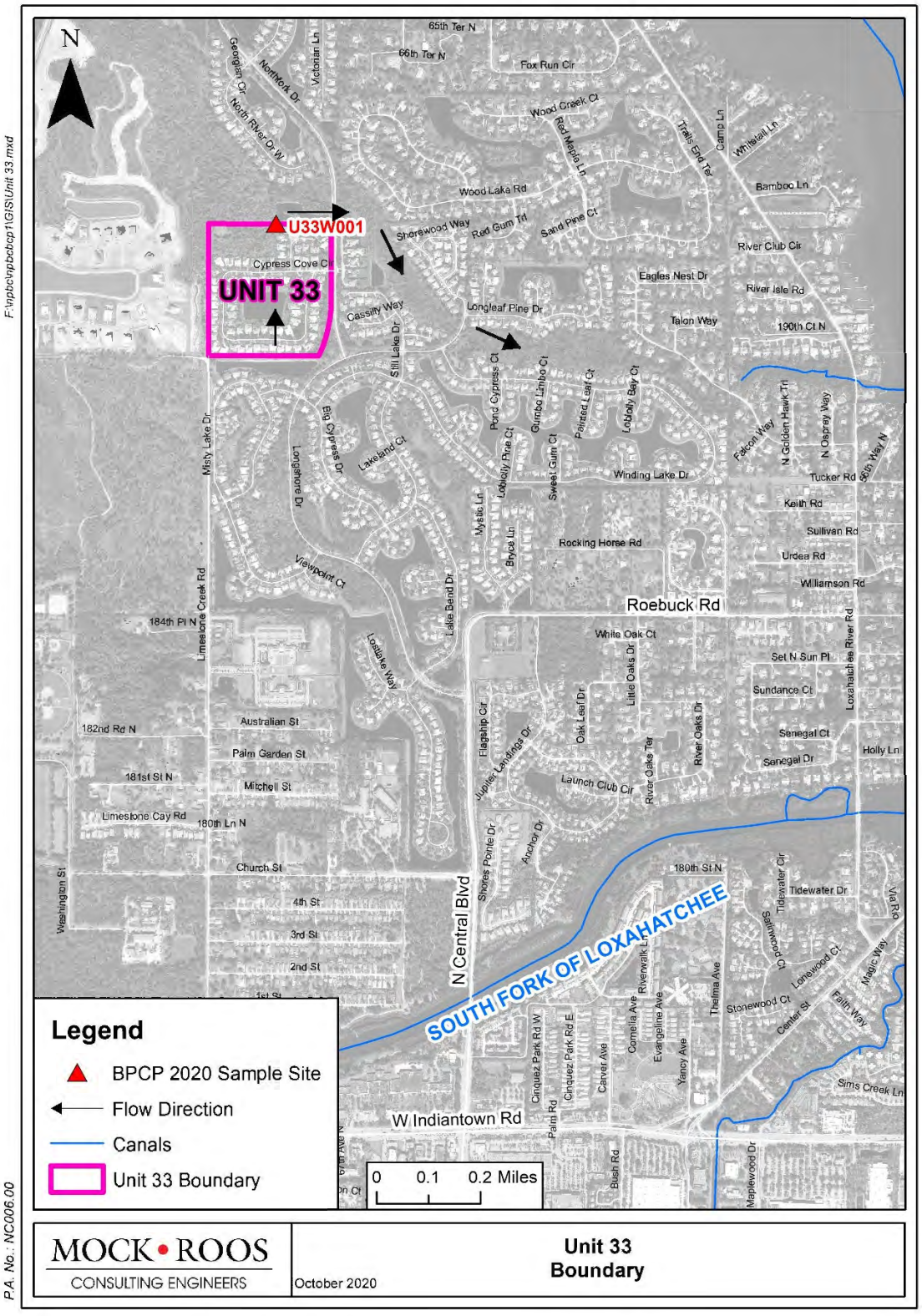


Figure 5. Unit 33 drainage pattern into Loxahatchee River.

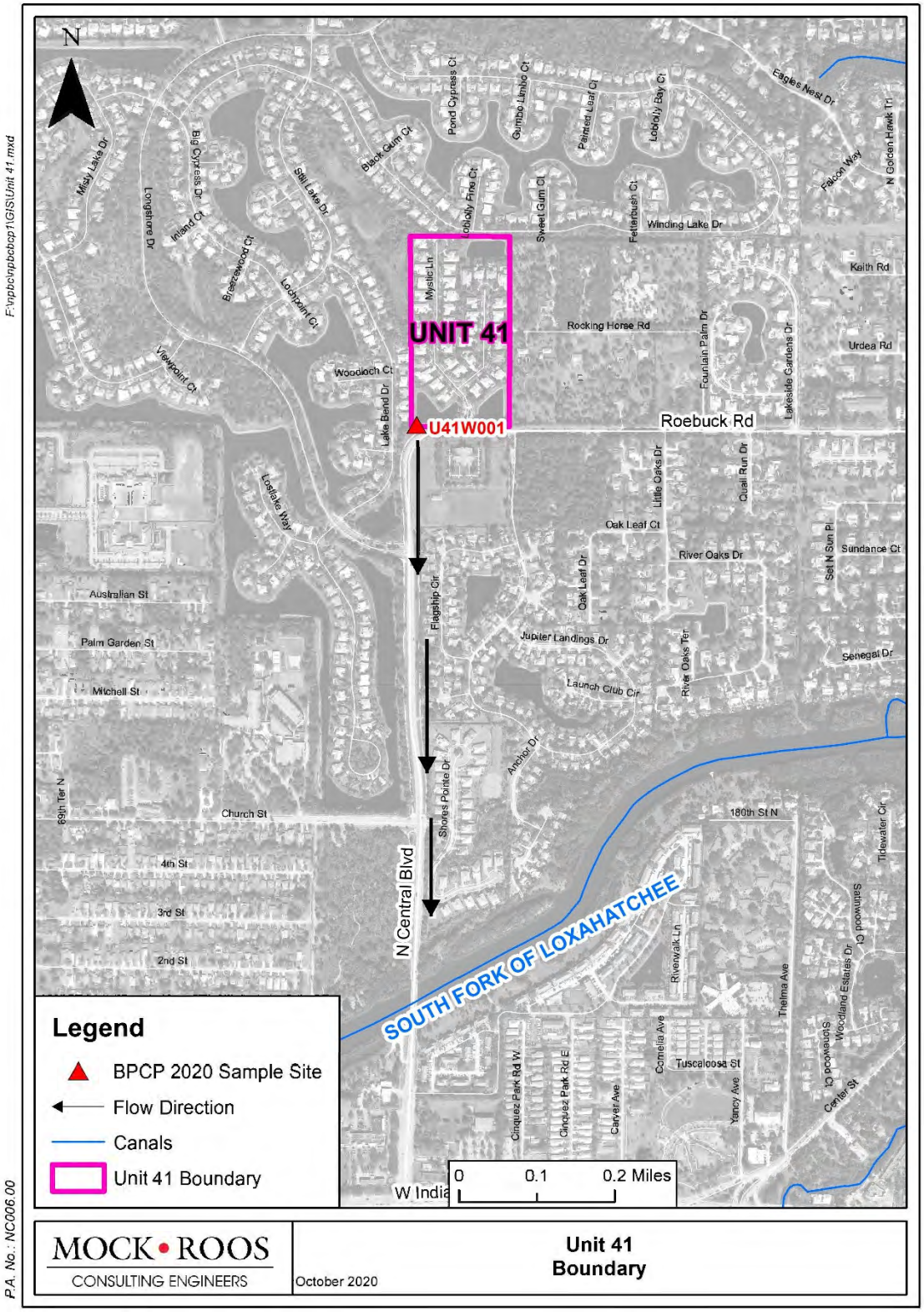


Figure 6. Unit 41 drainage pattern into South Fork of Loxahatchee River.

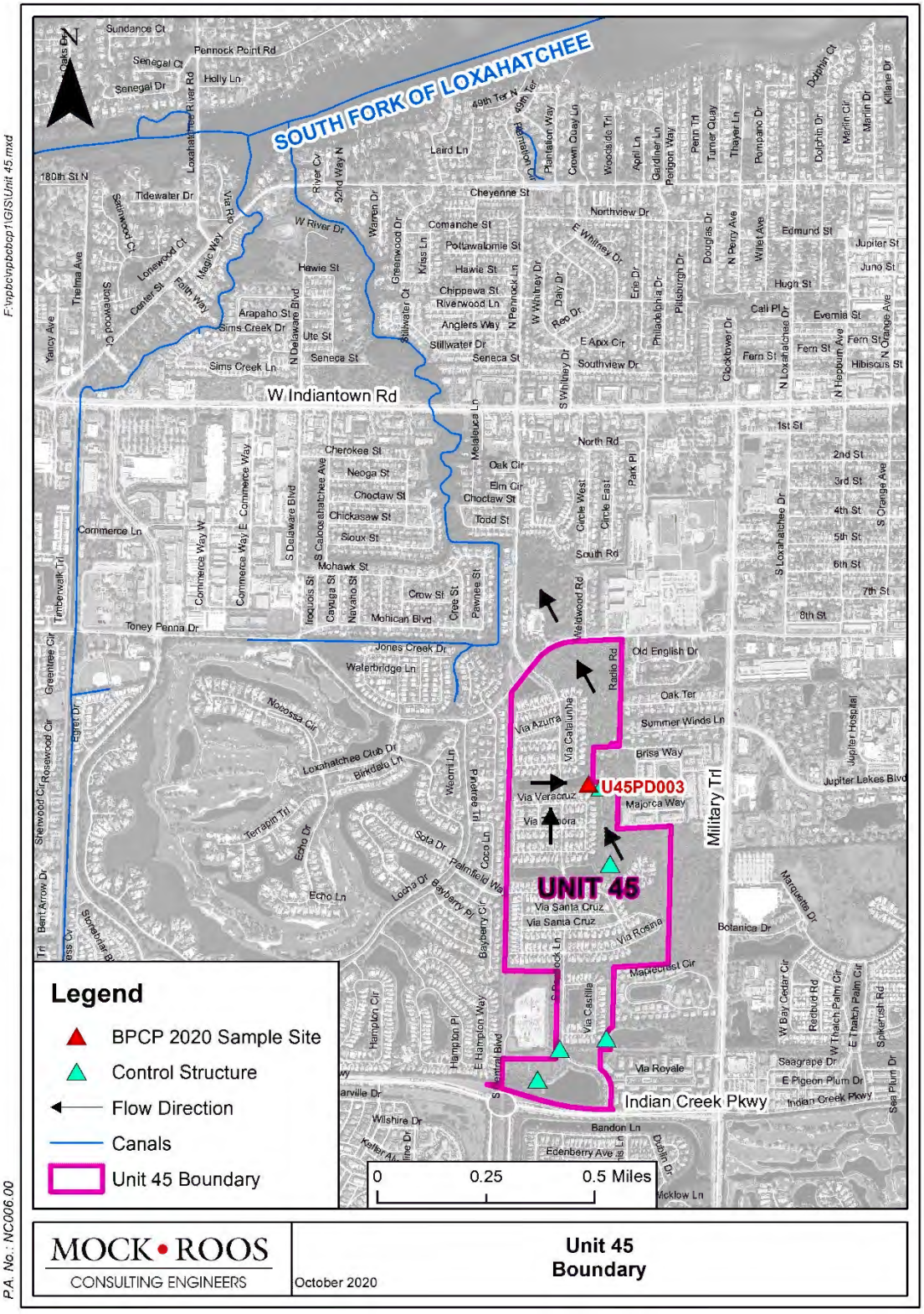


Figure 7. Unit 45 drainage pattern into South Fork of Loxahatchee River.

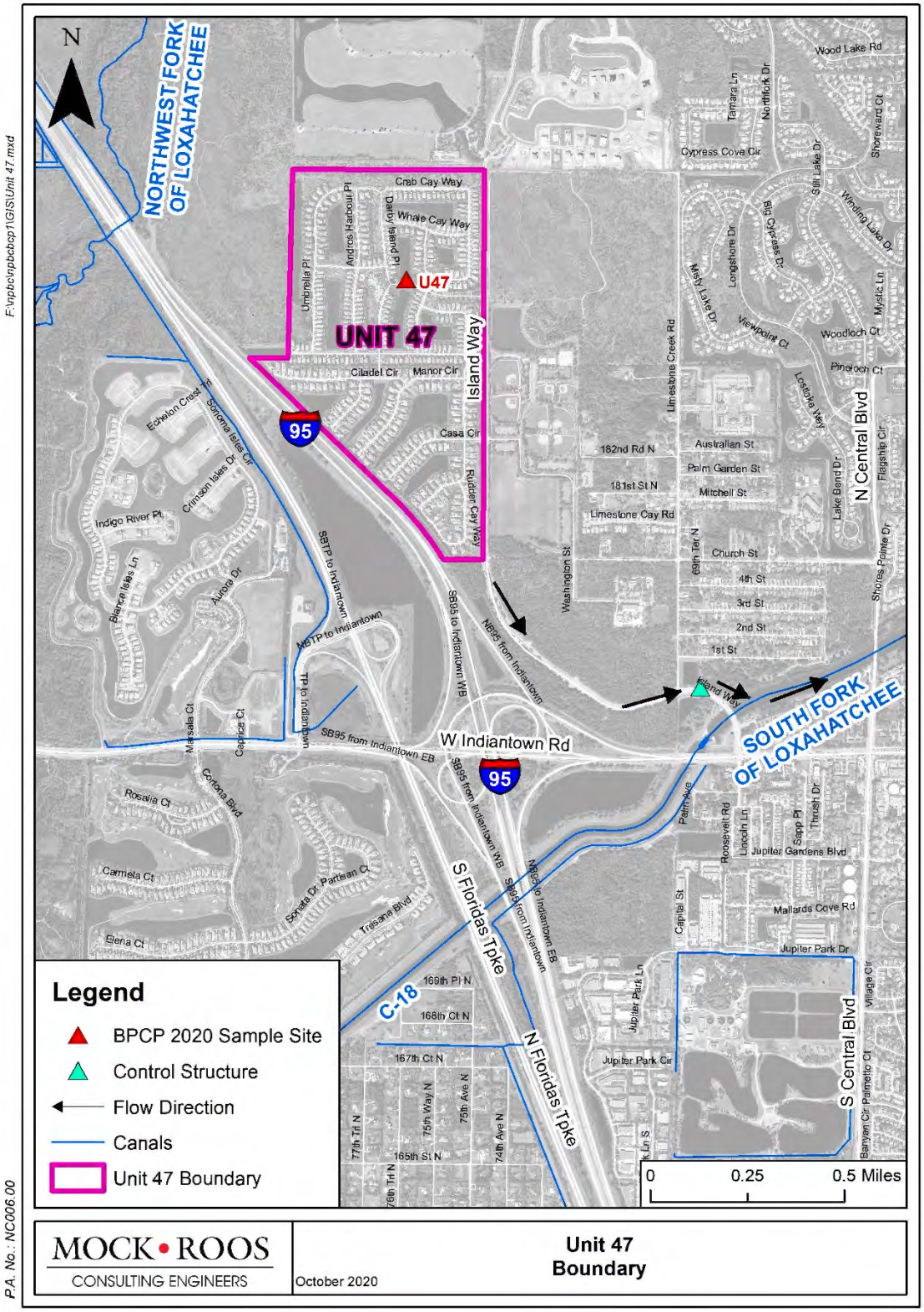


Figure 8. Unit 47 drainage pattern into South Fork of Loxahatchee River.

Potential Source Identification

Pet Waste

Pets whose waste is deposited outdoors can be a significant source of bacteria pollution through surface runoff in the Southwest Fork Loxahatchee River watershed. Studies report that up to 95 percent of the Fecal Indicator Bacteria (FIB) found in urban stormwater can have non-human origins. The most important nonhuman fecal coliform contributors appear to be dogs and cats. Using bacteria source tracking techniques, it was found in Stevenson Creek in Clearwater, Florida, that the bacteria contributed by dogs was as significant as those from septic tanks (Watson, 2002).

Sanitary Sewer System

The area where the Units are located is served by a sanitary sewer system that consist of 20 lift stations and 176,590 linear feet of force mains that convey raw sewage to the wastewater treatment plant (Figure 9). The system, built in the 1990s, was designed and constructed to achieve total containment of sanitary wastes and maximum exclusion of infiltration and inflow. Furthermore, since 2008, over 1,500 Onsite Sewage Treatment and Disposal Systems (OSTDS) have been converted to the public sewer system in the Loxahatchee River Neighborhood.

Sanitary Sewer Overflows

LRD recorded two sanitary sewer overflows (SSOs) that occurred within the area of the NPBCID Units of Development in the last 5 years. As shown in the map below (Figure 10), sewage was spilled in Unit 23 and inside the WBID boundary.

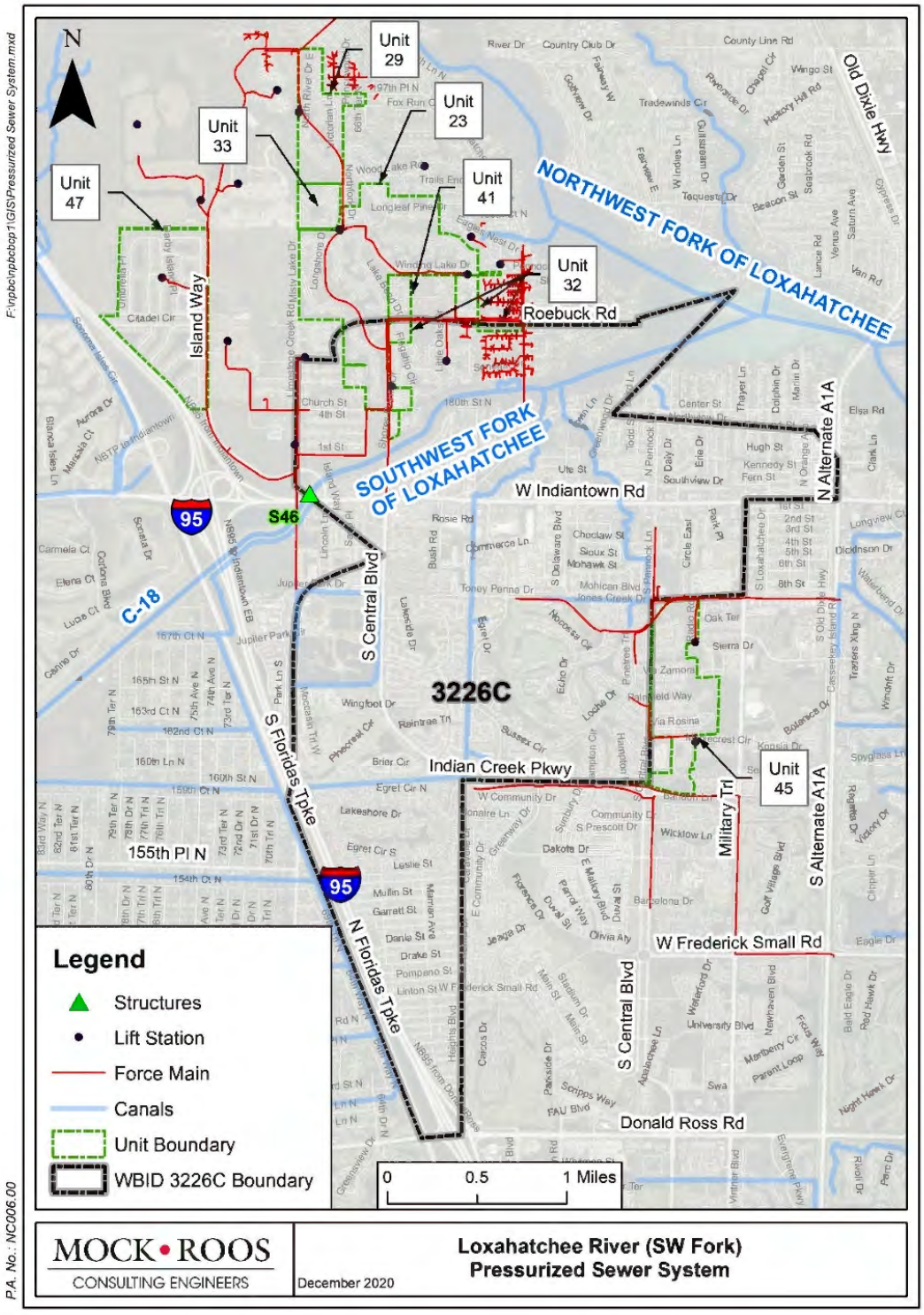


Figure 9. Lift Stations and Force Main System in the Units of Development.

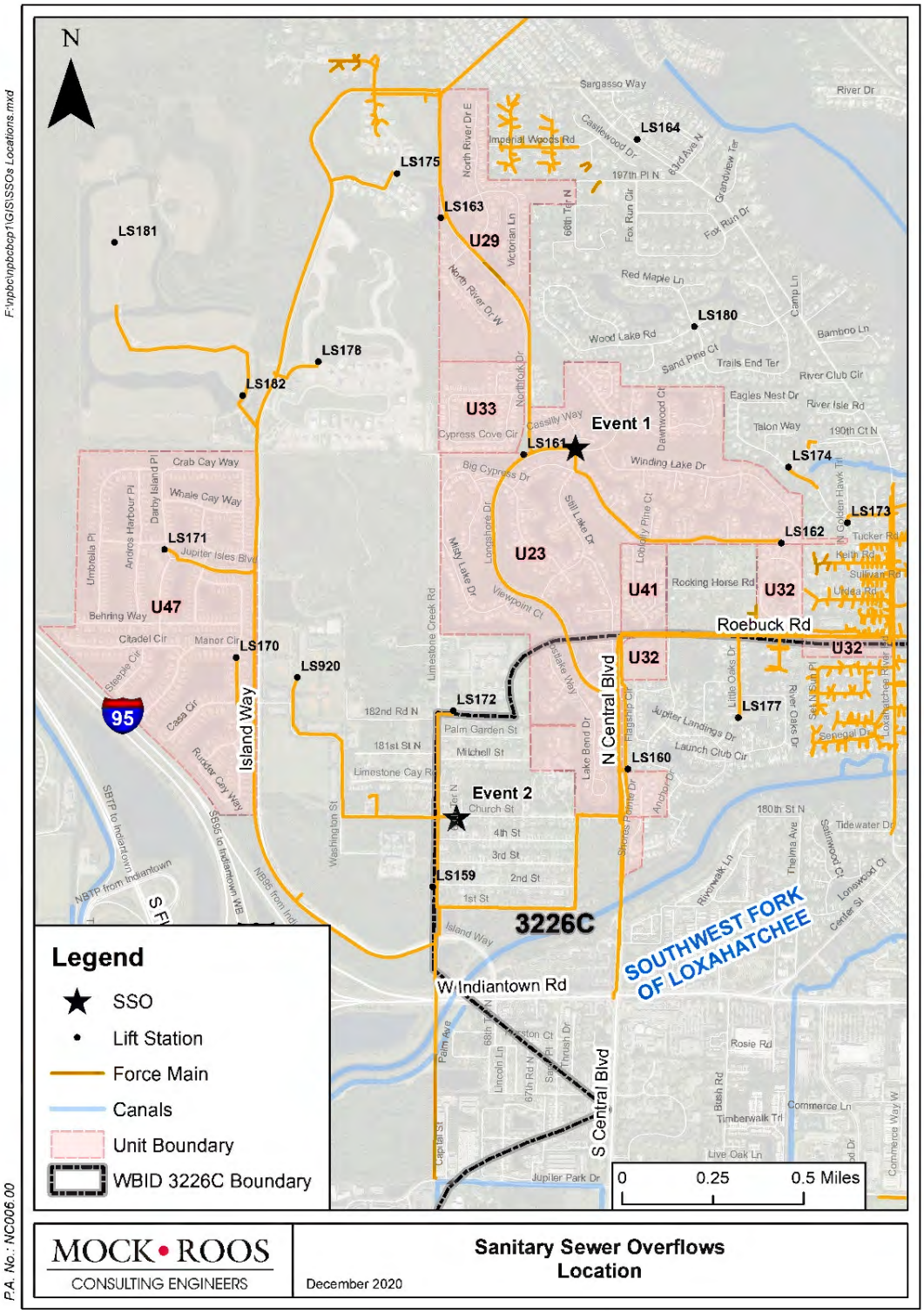


Figure 10. Sanitary Sewer Overflow Events

Event 1: 100-gallon spill on 02/24/2020. Sewage bubbled out of ground when working valve LS161-VL001

Figure 11. Sanitary Sewer Overflow Event 1 location

Event 2: 100,000-gallon spill on 06/06/2020. sewage coming out of manhole due to LS160 gravity system being flooded from rain event of 06/05/2020

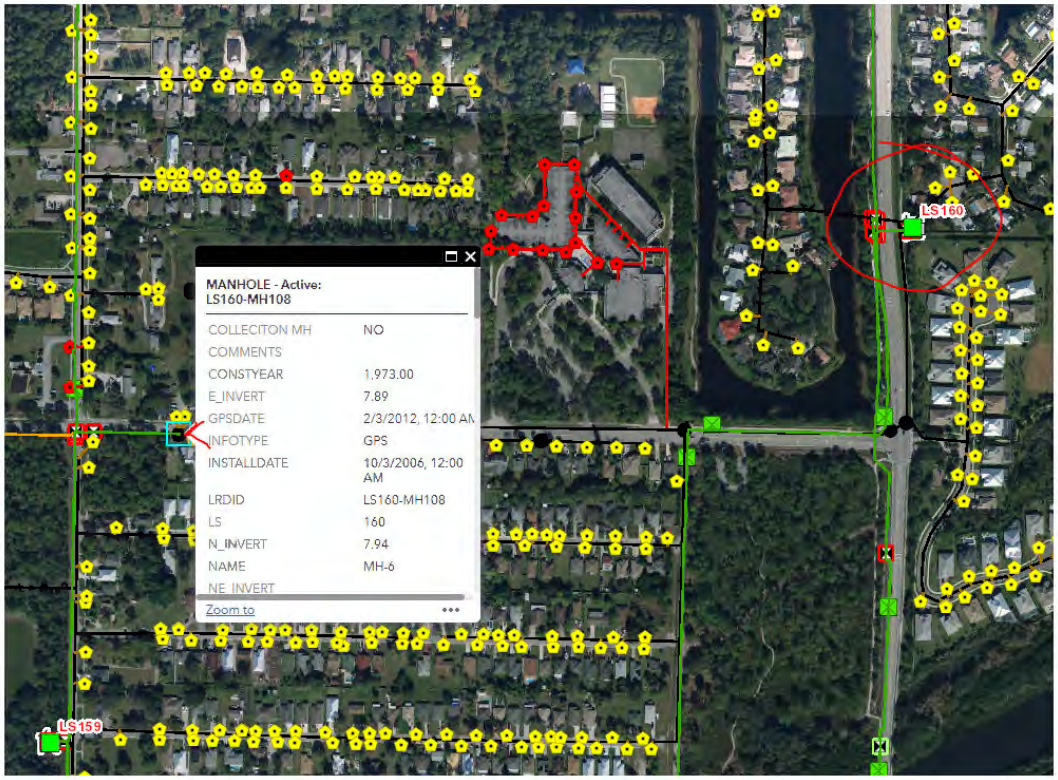


Figure 12. Sanitary Sewer Overflow Event 2 location

Land Uses and Mapping

The spatial distribution and acreage of different land use categories were identified utilizing the 2018-2019 land use coverage prepared by MR for the MS4 permit Year 3 pollutant loading estimates. The area of the Units of Development is predominantly comprised of built-up urban and residential areas, as shown in Figure 13 and Table 1. Development history begins with conversions of regional wet prairies to cattle operations, harvesting within flatwoods and cypress swamps, and ditching to lower water tables. Development began near the estuary and fanned outward. As residential development increased from the 1970s to date, pockets of residential development, most often with associated golf courses, converted wetland and mesic areas. Residential development increased rapidly in the 1990s through middle 2000s. NPBCID, South Indian River Water Control District (SIRWCD) and SFWMD manage stormwater control infrastructure in the area, including canals, sluices, and gate systems.

Table 1. Land Cover breakdown in the Units of Development

Land Use Description	Area (ac)	% of Total Area
Residential Medium Density	430.3119	41.83%
Forest/Open Land	176.2475	17.13%
Major Highways	167.5969	16.29%
Water	161.9014	15.74%
Wetlands	69.5762	6.76%
Commercial	23.1266	2.25%
Residential Low Density	0.0038	<1%
Residential High Density	0.0077	<1%
Total	**1,028.7720**	**100%**

Table 2. Acreage breakdown of the studied Units of Development

Unit	Acres of SF Homes	Acres of SW	Other acres
Unit 23: The Shores	368.80	97	3 created marshes
Unit 29: North Fork	106.3	16	2 created marshes
Unit 32: Palm Cove	38.66	1	-
Unit 33: Cypress Cove	37.27	4	-
Unit 41: Mystic Cove	20.20	2.2	-
Unit 45: Paseos	213.24	11.82	25.59 created Uplands 28.13 Preserves
Unit 47: Jupiter Isles	266	32.48	-

SF = Single Family, SW = Surface Water

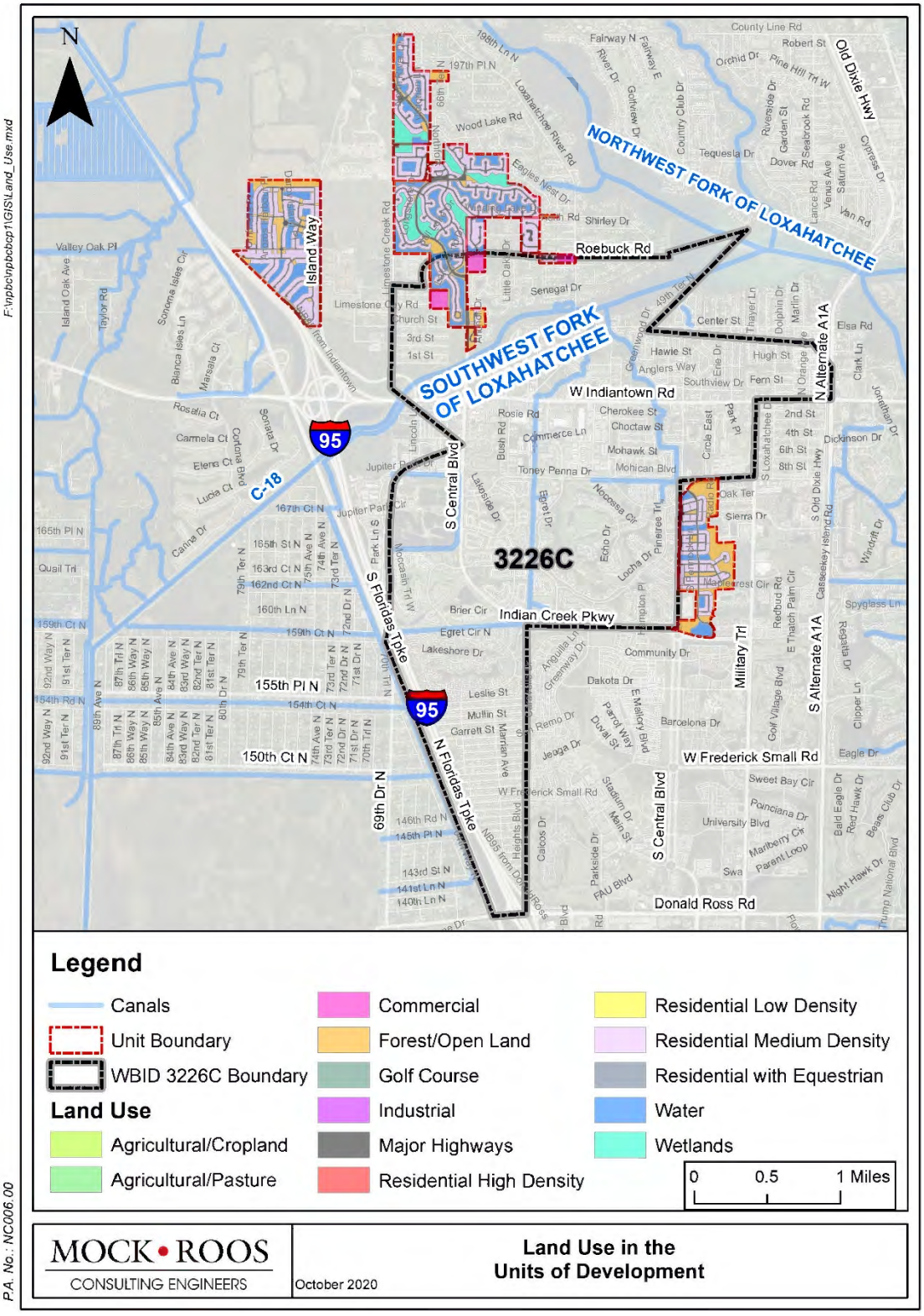


Figure 13. Land Use Classification within the studied Units of Development.

NPBCID's Walk the WBID

Walk the WBID or Watershed (WTW) is a field reconnaissance effort to gain a better understanding of a watershed, including the hydrology of the basin and its contributing area, where infrastructure (sewer and stormwater) is located, and what potential sources may be contributing bacterial pollution to the waterbody. This activity is a useful tool for impaired waterbodies in which the sources of the bacterial loading are not readily apparent.

On December 9th, 2020, NPBCID staff conducted a WTW survey. No homeless camps were found within the properties nor any signs of camps in the immediate surrounding area. Minimal wildlife – a few ducks and egrets – was observed in the retention areas during the walk. Tracks from other small species such as raccoons were observed. Property Owners Associations (POA) have contracted landscape services to collect trash during maintenance activities, therefore, trash and debris were minimal to non-existent. The following photos are representative of typical systems and conditions within the WBID under NPBCID control.

Unit 23

Figure 14. Outfall and Water Quality sample location of Unit 23

Figure 15. Unit 23 pet waste station

Figure 16. Unit 29 Water Quality sample site

Figure 17. Typical Pet Waste station in Unit 29

Unit 32

Figure 18. Unit 32 Water Quality sample site

Figure 19. Unit 32 typical road section with valley gutter

Unit 33

Figure 20. Outfall and Water Quality sample location of Unit 33

Figure 21. Unit 33 typical grass swale

Unit 41

Figure 22. Outfall location and water quality sample location in Unit 41

Figure 23. Unit 41 typical roadway with valley gutter system

Figure 24. Unit 45 water quality sample location

Figure 25. Typical pet waste stations installed throughout the development in Unit 45

Figure 26. Unit 47 water quality sample location

Figure 27. Greenspace in Unit 47

Monitoring

a. TMDL Stations

For the Cycle 2 verified period, FDEP analyzed samples from 6 stations to detect fecal coliform concentrations exceeding the state criterion of 43 counts/100mL (Figure 25) and to define the TMDL. The highest number of exceedances were recorded at Stations 21FLLOX 71 (Sims Creek) and 21FLLOX 73 (Jones Creek), located in the middle reach of the Southwest Fork of Loxahatchee River, an area receiving residential stormwater runoff from Sims Creeks and combination of residential and natural areas of stormwater runoff from Jones Creek.

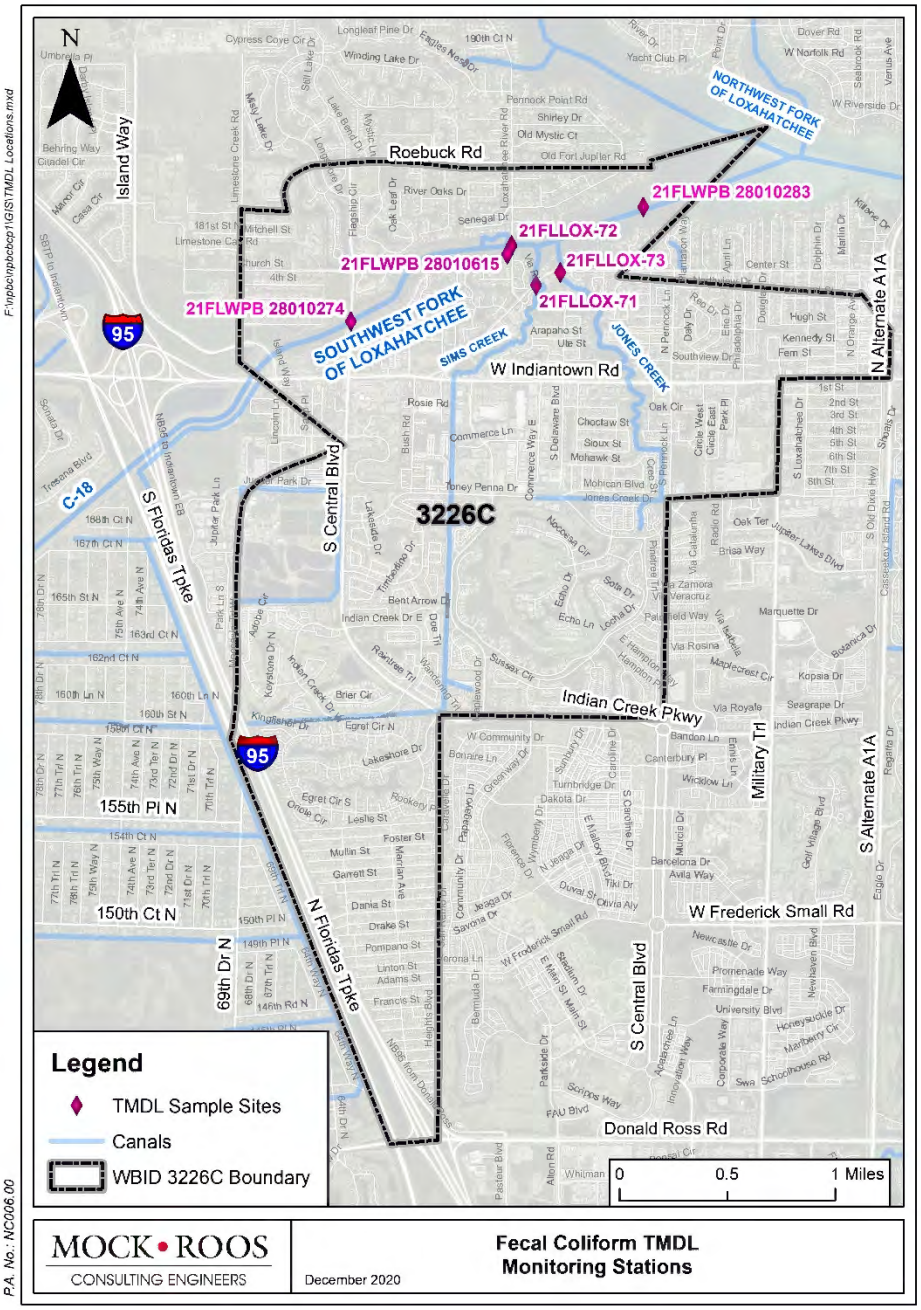


Figure 25. Fecal Coliform TMDL Monitoring Stations

The lowest number of exceedances (1 and 0 respectively) occurred at Stations 21FLWPB 28010274 and 21FLWPB 28010283 which may indicate that the bacterial loads influencing the Southwest Fork of the Loxahatchee River might be coming from Sims and/or Jones Creeks.

b. Northern Stations

NPBCID collected samples from the stormwater management system of each Unit in the period December 2019 – December 2020. As shown in the WTW photos above, the samples were collected near the ponds located in the neighborhoods. The monitoring stations are shown on Figure 25. A total of 27 samples were analyzed in the lab for e. Coli and the MPN/100mL results are summarized in Table 3.

Table 3. E. Coli Water Quality Monitoring Results

Date	Station	Result MPN/100 mL
12/23/2019	U23ES001	41
	U32AW001	31
	U45PD003	135
	U45PD003	201
	U45PD003	712
12/26/2019	U47	135
08/11/2020	U23ES001	86
	U29W001	10
	U32AW001	31
	U33W001	41
	U41W001	10
	U45PD003	31
	U47	10
09/08/2020	U23ES001	305
	U29W001	206
	U32AW001	259
	U33W001	63
	U41W001	327
	U45PD003	148
	U47	85
11/11/2020	U23ES001	350
	U29W001	399
	U32AW001	1260
	U33W001	471
	U41W001	813
	U45PD003	711
	U47	691

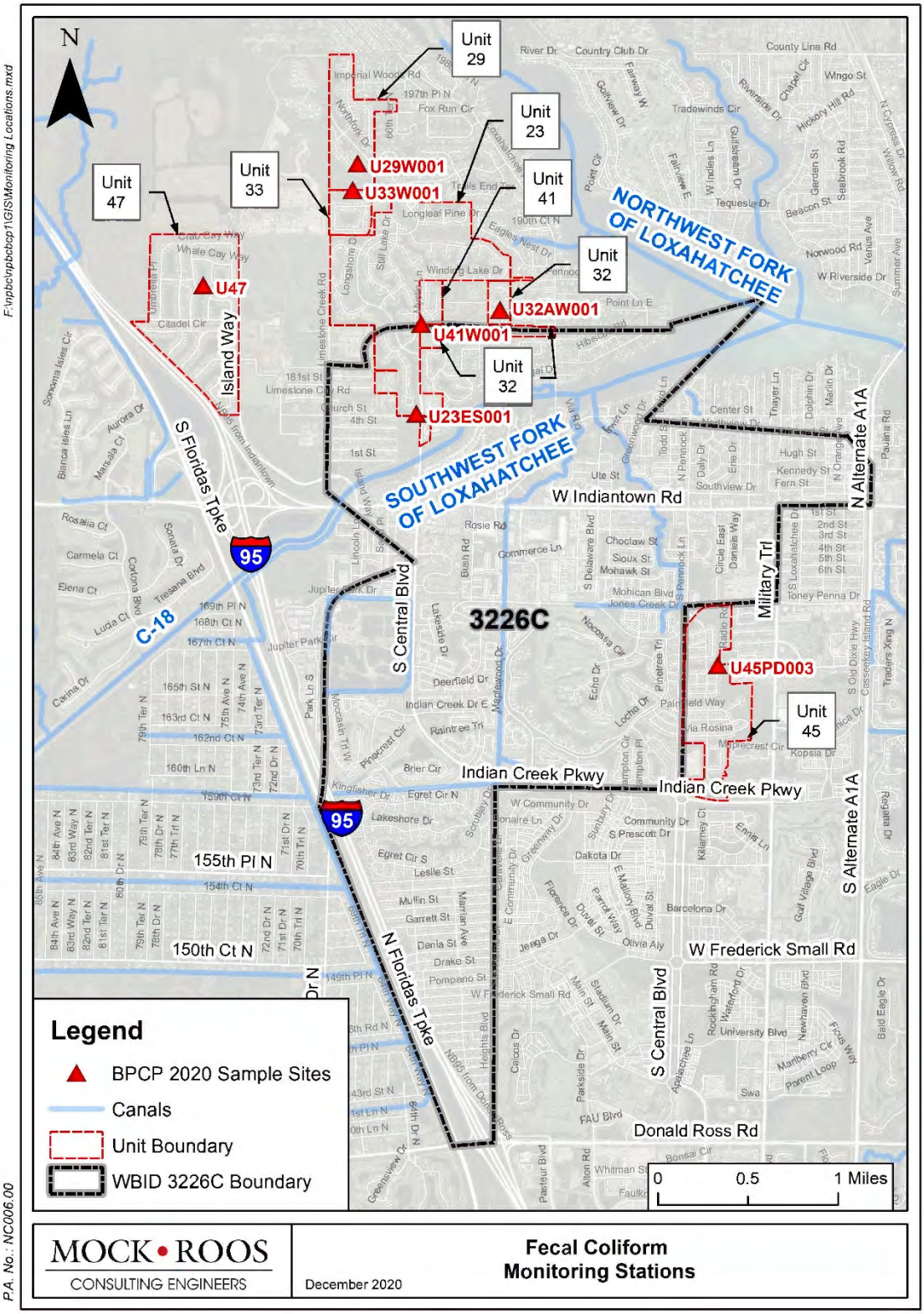


Figure 26. E. Coli Monitoring Stations

Using the Hazen method for estimating percentiles, the 90th percentile, also called the 10 percent exceedance event or that threshold above which only 10% of exceedances occur, was calculated, to determine the percentile value of each data point and the exceedances. Data were ordered from the lowest to the highest and are shown in Table 4.

Table 4. Calculations of e. Coli Reductions based on the Hazen Method

Date	Station	Result MPN/100 mL	Rank	Percentile
08/11/2020	U29W001	10	1	2%
08/11/2020	U41W001	10	2	6%
08/11/2020	U47	10	3	9%
12/23/2019	U32AW001	31	4	13%
08/11/2020	U32AW001	31	5	17%
08/11/2020	U45PD003	31	6	20%
12/23/2019	U23ES001	41	7	24%
08/11/2020	U33W001	41	8	28%
09/08/2020	U33W001	63	9	31%
09/08/2020	U47	85	10	35%
08/11/2020	U23ES001	86	11	39%
12/23/2019	U45PD003	135	12	43%
12/26/2019	U47	135	13	46%
09/08/2020	U45PD003	148	14	50%
12/23/2019	U45PD003	201	15	54%
09/08/2020	U29W001	206	16	57%
09/08/2020	U32AW001	259	17	61%
09/08/2020	U23ES001	305	18	65%
09/08/2020	U41W001	327	19	69%
11/11/2020	U23ES001	350	20	72%
11/11/2020	U29W001	399	21	76%
11/11/2020	U33W001	471	22	80%
11/11/2020	U47	691	23	83%
11/11/2020	U45PD003	711	24	87%
12/23/2019	U45PD003	712	25	90%
11/11/2020	U41W001	813	26	94%
11/11/2020	U32AW001	1260	27	98%

Table 5. Summary statistics of e. Coli data for all the stations

Description	Value
Total # samples	27
Total # exceedances	6
62-302 maximum # of exceedances allowed	2
% of exceedances	22%

To calculate the percent reduction needed to reduce the bacterial load for NPBCID units in 2020, the following equations was used.

$$\%\ Reduction = \frac{90^{th}\ Percentile\ Concentration - Allowable\ Concentration}{90^{th}\ Percentile\ Concentration} x100 \qquad \text{(Eq. 1)}$$

From Table 5, the 90th Percentile Concentration is 712 MPN/100mL, which is above the Chapter 62-302, F.A.C. Ten Percent Threshold Value of 43. Using Eq. 1, the needed percent reduction is:

$$\%\ Reduction = \frac{(712 - 410)\ MPN/100mL}{712\ MPN/100mL} x100$$

$$\%\ Reduction = 42.4\%$$

This is a significant improvement from the TMDL reduction goal of 91.3%

Temporal Patterns

E. Coli data for the NPBCID studied period were analyzed for annual and seasonal trends. Seasonally, a peak in bacterial concentrations and exceedance rates is expected during the summer (July–September), when conditions are rainy and warm (Florida's rainy season). Conversely, lower concentrations and fewer exceedances are often observed in the winter (January–March) and fall (October–December), when conditions are drier and cooler. Using rainfall data collected at the SFWMD structure S-46, and stored in SFWMD's DBHYDRO database, it was possible to compare monthly rainfall with e. Coli exceedance rates over the studied period. As shown in Table 6, most of the exceedances observed occurred in the month of November.

Table 6. Summary statistics of e. Coli data for all the stations by month

Month	Number of samples	Number of exceedances	% Exceedances
December	6	1	17
January	0		
February	0		
March	0		
April	0		
May	0		
June	0		
July	0		
August	7	0	0
September	7	0	0
October	0		
November	7	5	71
December	0		

Peak bacterial loads commonly coincide with periods of increased rainfall, especially rainfalls that individually or cumulatively provide volumes that flush through surface soils and flush through stormwater ponds to surface waters. Comparison of table 6 and Figure 28 confirms that there is a good correlation with rainfall and number of water quality exceedances.

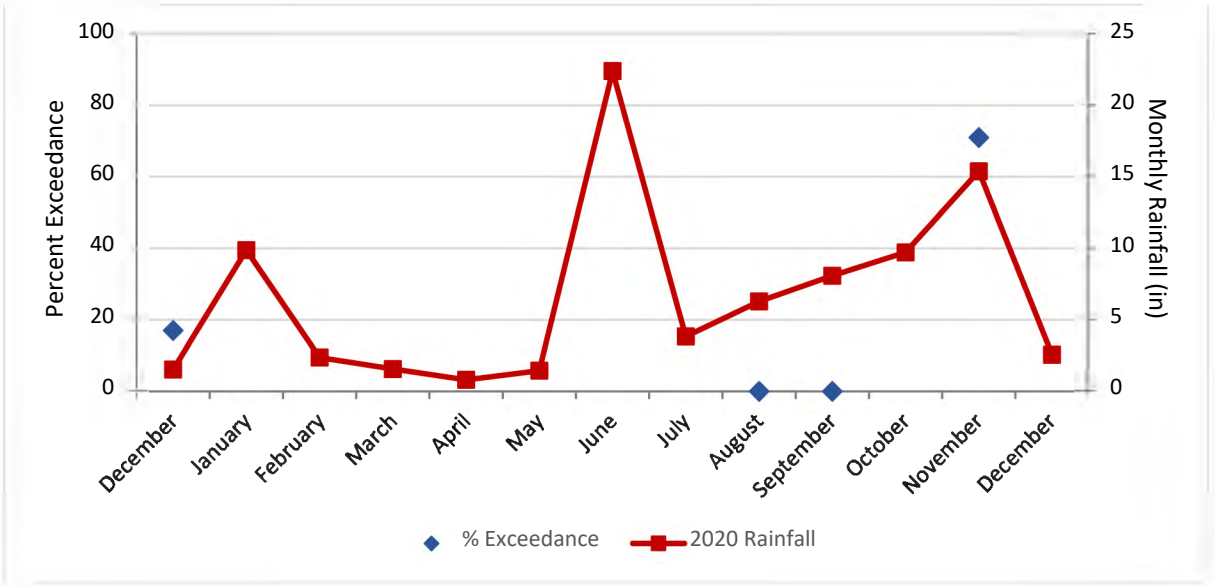


Figure 28. E. Coli exceedances and rainfall at all stations in the Units of Development in 2020 by month

Spatial Patterns

E. Coli data for the studied period from the stations were analyzed to detect spatial trends in the data (Table 7). Concentrations of E. Coli exceeding the state criterion (410 counts/100mL) were observed at the Units 32, 33, 41, 45 and 47. The highest concentration were recorded at stations U33W001, U41W001 and U45PD003, areas that receive mostly residential stormwater runoff (Figure 29). Station U32AW001 registered the maximum concentration of 1260 (counts/100mL). Station U45PD0003 had the most exceedance.

As previously shown on Figure 7, unit 45 discharges into Jones Creek, and as it was described in Table 2 and consists of a large residential area. According to the 2012 TMDL Report by FDEP, station 21FLLOX 73 (Jones Creek) reported the highest concentrations. Only one of seven NPBCID, Unit 45, drains into Jones Creek. As noted previously, Jones Creek is a suspected source of bacteria affecting concentrations in the Southwest Fork of the Loxahatchee River.

Table 7. Station Summary Statistics of E. Coli

Unit	Number of samples	Number of exceedances	% Exceedances
U23ES001	4	0	0
U29W001	3	0	0
U32AW001	4	1	25
U33W001	3	1	33
U41W001	3	1	33
U45PD003	6	2	33
U47	4	1	25

Since sampling activities were not performed in February nor June, the impact of the mentioned SSOs above in the Units waters and WBID were not evaluated.

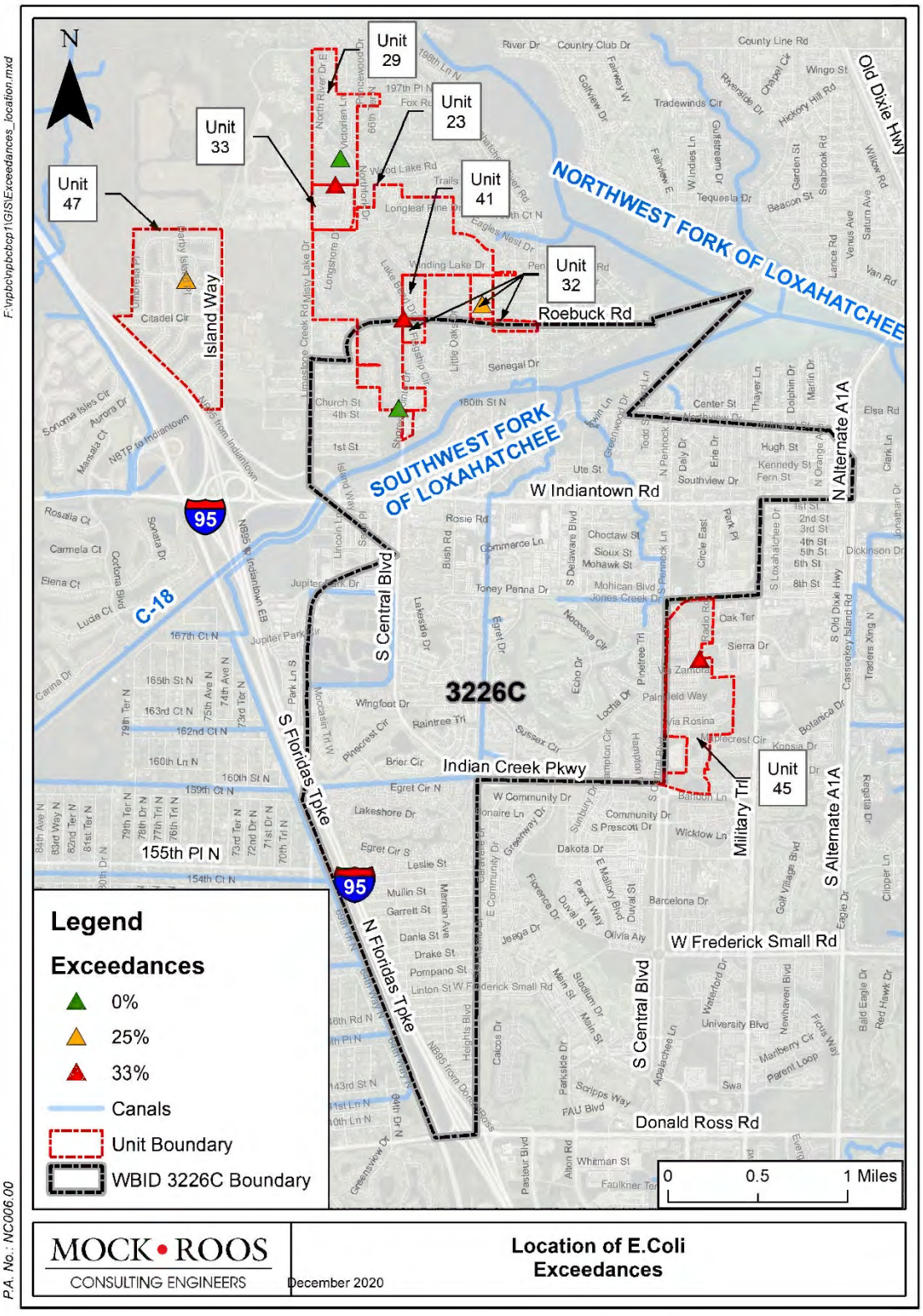


Figure 29. Location of E. Coli exceedances

c. LRD Stations

Over the past several years, the LRD, in partnership with the Town of Jupiter (TOJ), has conducted extensive water quality monitoring and thoroughly explored the watersheds to try and identify the potential source(s) of Fecal Indicator Bacteria (FIB). With no obvious source of the high FIB values, LRD and FDEP partnered to capitalize on FDEP's more sophisticated analytical methods to further investigate the potential sources of FIB in Jones Creek.

Samples were collected in the 2019 wet season from five Jones Creek locations between Indiantown Road and Toney Penna foot bridge. Samples were analyzed for Enterococci, five common chemicals that can be detected in human waste material (acetaminophen, naproxen, ibuprofen, hydrocodone, and sucralose), and genetic markers for human and canine material. Enterococci bacteria serve as an indicator for fecal contamination in salt and brackish waters. These organisms are not harmful themselves but indicate that other potentially harmful organisms may be present. Results of the sample testing indicated continued high levels of Enterococci in Jones Creek, the presence of human waste, and the presence of human and canine genetic material. Jupiter concluded that the presence of human waste in the genetic markers, with the absence in the chemical indicators is indicative of low concentrations indicative of a single household, rather than broken wastewater infrastructure.

The findings have led LRD to adjust its monitoring locations to try and narrow in on those potential pollution sources such as a camper discharge, a homeless encampment, a residence still utilizing a septic system, or a broken sewer lateral line joining the home to the gravity sewer line.

Dry season sample collection is under way and a summary report will be prepared once the test results are finalized.

LRD also collects and tests water quality samples for Enterococci bacteria each week throughout the Loxahatchee River Estuary in popular recreation areas (Figure 30).

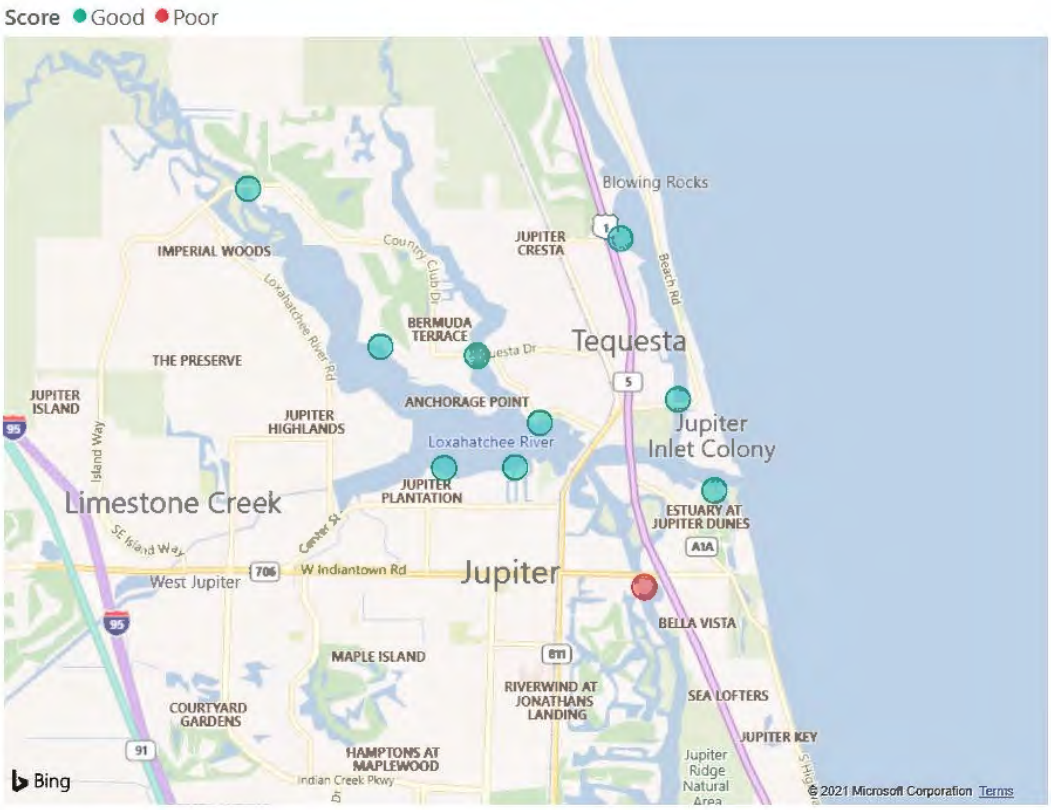


Figure 30. Loxahatchee River District monitoring locations

In 2020, 65 samples were taken from the Southwest Fork and South Channel West stations and were analyzed for enterococci bacteria (Figure 31). The Hazen method was applied to the data and the results are shown in Table 8. The bacteriological water quality criterion for enterococci bacteria states that MPN counts shall not exceed a monthly geometric mean of 35 nor exceed the Ten Percent Threshold Value (TPTV) of 130 in 10% or more of the samples during any 30-day period.

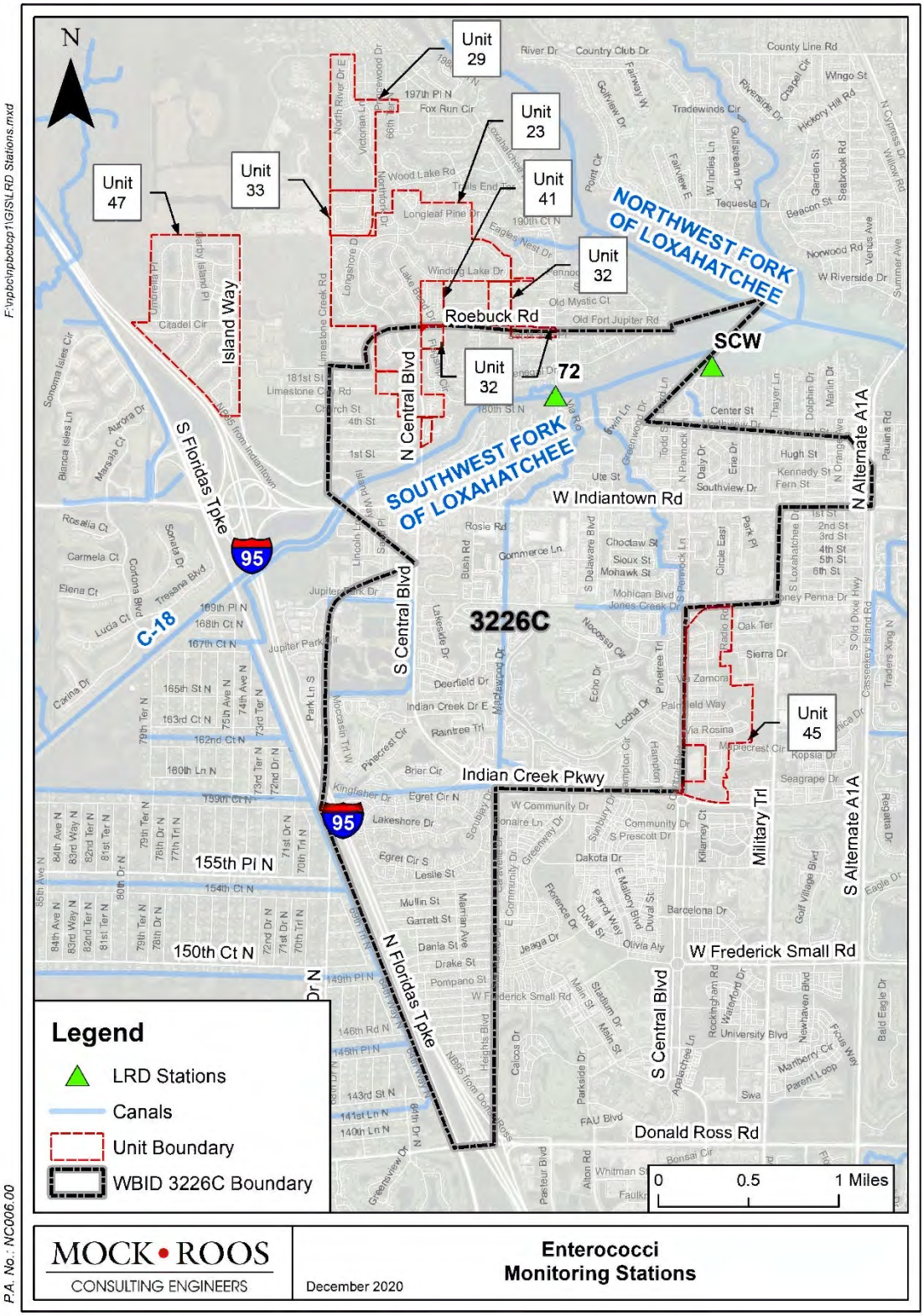


Figure 31. Enterococci Monitoring Stations

Table 8. Enterococci bacteria monitoring results

Date	Station ID	Site Name	Average of CURVALUE (MPN/100mL)	Rank	Percentile
15-Jan-20	SCW	South Channel West	5	1	1%
26-Feb-20	SCW	South Channel West	5	2	3%
4-Mar-20	SCW	South Channel West	5	3	4%
11-Mar-20	SCW	South Channel West	5	4	6%
25-Mar-20	SCW	South Channel West	5	5	7%
2-Apr-20	SCW	South Channel West	5	6	9%
15-Apr-20	SCW	South Channel West	5	7	10%
29-Apr-20	SCW	South Channel West	5	8	12%
7-May-20	SCW	South Channel West	5	9	14%
13-May-20	SCW	South Channel West	5	10	15%
20-May-20	SCW	South Channel West	5	11	17%
30-Jun-20	SCW	South Channel West	5	12	18%
22-Jan-20	SCW	South Channel West	10	13	20%
8-Apr-20	SCW	South Channel West	10	14	21%
22-Apr-20	SCW	South Channel West	10	15	23%
12-Aug-20	SCW	South Channel West	10	16	24%
30-Sep-20	SCW	South Channel West	10	17	26%
18-Aug-20	72	SW Fork - Lox. Riv. Rd.	10	18	27%
29-Jan-20	SCW	South Channel West	20	19	29%
18-Mar-20	SCW	South Channel West	20	20	30%
20-Aug-20	SCW	South Channel West	20	21	32%
28-Oct-20	SCW	South Channel West	20	22	34%
9-Dec-20	SCW	South Channel West	20	23	35%
16-Dec-20	SCW	South Channel West	20	24	37%
30-Dec-20	SCW	South Channel West	20	25	38%
14-Sep-20	72	SW Fork - Lox. Riv. Rd.	30	26	40%
13-Oct-20	72	SW Fork - Lox. Riv. Rd.	31	27	41%
2-Jan-20	SCW	South Channel West	31	28	43%
12-Feb-20	SCW	South Channel West	31	29	44%
2-Sep-20	SCW	South Channel West	31	30	46%
11-Feb-20	72	SW Fork - Lox. Riv. Rd.	41	31	47%
5-Feb-20	SCW	South Channel West	42	32	49%
19-Feb-20	SCW	South Channel West	42	33	50%
17-Sep-20	SCW	South Channel West	42	34	52%
11-Nov-20	72	SW Fork - Lox. Riv. Rd.	52	35	54%
17-Jun-20	SCW	South Channel West	53	36	55%
5-Aug-20	SCW	South Channel West	53	37	57%

Date	Station ID	Site Name	Average of CURVALUE (MPN/100mL)	Rank	Percentile
24-Nov-20	SCW	South Channel West	53	38	58%
9-Mar-20	72	SW Fork - Lox. Riv. Rd.	63	39	60%
14-Jul-20	72	SW Fork - Lox. Riv. Rd.	72	40	61%
6-Apr-20	72	SW Fork - Lox. Riv. Rd.	74	41	63%
23-Jun-20	SCW	South Channel West	75	42	64%
21-Jul-20	SCW	South Channel West	75	43	66%
22-Dec-20	SCW	South Channel West	75	44	67%
15-Jun-20	72	SW Fork - Lox. Riv. Rd.	86	45	69%
8-Jul-20	SCW	South Channel West	87	46	70%
29-Jul-20	SCW	South Channel West	87	47	72%
27-Aug-20	SCW	South Channel West	87	48	74%
21-Oct-20	SCW	South Channel West	87	49	75%
2-Dec-20	SCW	South Channel West	87	50	77%
13-Oct-20	SCW	South Channel West	97	51	78%
8-Jan-20	SCW	South Channel West	99	52	80%
4-Nov-20	SCW	South Channel West	111	53	81%
19-Nov-20	SCW	South Channel West	111	54	83%
10-Jun-20	SCW	South Channel West	114	55	84%
14-Jan-20	72	SW Fork - Lox. Riv. Rd.	132	56	86%
14-Dec-20	72	SW Fork - Lox. Riv. Rd.	158	57	87%
19-May-20	72	SW Fork - Lox. Riv. Rd.	228	58	89%
23-Sep-20	SCW	South Channel West	238	59	90%
15-Jul-20	SCW	South Channel West	254	60	92%
9-Sep-20	SCW	South Channel West	406	61	94%
27-May-20	SCW	South Channel West	504	62	95%
7-Oct-20	SCW	South Channel West	738	63	97%
3-Jun-20	SCW	South Channel West	2005	64	98%
10-Nov-20	SCW	South Channel West	2005	65	100%

From Table 8, the 90th Percentile Concentration is 238 MPN/100mL, which is above the Chapter 62-302, F.A.C. Ten Percent Threshold Value of 130. Using Eq. 1, the needed percent reduction is:

$$\%\ Reduction = \frac{(238 - 130)\ MPN/100mL}{238\ MPN/100mL} x100$$

$$\%\ Reduction = 45.4\%$$

Despite the fact, that the TMDL, NPBCID and LRD stations analyzed different types of bacterial indicators, all of them are indicators of fecal contamination, and the reductions needed to achieve the target concentrations can be compared. The reductions observed when analyzing e. Coli and Enterococci bacteria for the study period, showed that bacterial loads have been reduced approximately 46% from the required loading indicated in the 2012 TMDL Report.

Management Actions

Management Action Items and Responsible Entities

Most management actions to reduce bacterial pollution within the WBID are ongoing by Palm Beach County, Town of Jupiter, NPBCID, LRD and SIRWCD. Some of the continuous maintenance and operations work reported in this section are for a larger area than just WBID 3226C (i.e., inspections, street sweeping and pet waste ordinances). Reported management actions are divided into structural and nonstructural activities. Table 9 provides a summary of management actions and the responsible entity.

Table 9. Management Actions Related to Bacteria Sources Identified

Management Actions	PB County	Town of Jupiter	NPBCID	LRD	SIRWCD
Street Sweeping	X	X			
Public Outreach and Education	X	X	X		
Water Quality Monitoring		X		X	
Stormwater Ordinance	X	X			
Pet Waste Ordinance	X	X			
Sanitary Sewer Inspection and Maintenance				X	
Stormwater Inspection and Maintenance	X	X	X		X
Sanitary Sewer Improvement Projects				X	
Code and Stormwater Enforcement	X	X			

Non-Structural Controls

Sanitary: Inspections, Cleaning, and I&I programs

LRD has an ongoing program of assessment, prioritization and lining of systems that need rehabilitation. This program is focused in areas with older infrastructure and pipe materials more prone to problems. Furthermore, the program targets lift stations showing excess pumping during storm events as

compared to dry conditions. The NPBCID Units are newer neighborhoods where the infrastructure is early in its life cycle and in good condition.

Stormwater: Inspections and Cleaning

NPBCID inspections and maintains a stormwater treatment ponds, littoral zone plantings, culverts, catch basins and control structures within its Units of Development. As such they constantly have personnel in the field which receive annual training regarding illicit discharges and how to document and report incidents.

SIRWCD is responsible for maintaining over 376 miles of swales and canals. Every effort is made to conserve the stormwater runoff generated from rainstorms by directing its flow into the natural holding areas in and around the District, such as the slough, water catchment areas and wetlands. The drainage system, maintained by SIRWCD, operates by gravity flow. First the water flows from impervious surfaces such as roofs, driveways and roadways into ponds, natural depressions, and swales. This initial drainage is referred to as the "tertiary" system. Any stormwater that is not held by the swales and absorbed into the ground, moves eastward across the District through a network of maintained canals and is known as the "secondary" drainage system. The final movement of the water is into the "primary" drainage system that consists of larger canals, such as the C-18, and the Loxahatchee River. The primary drainage system is the responsibility of the SFWMD. SIRWCD staff also receives training on illicit discharges and reporting requirements to governmental agencies with enforcement authority.

Litter Control

Periodic cleaning projects were scheduled by the Town of Jupiter in or near the Units of Development. These activities are listed in Table 10.

Table 10. Litter control scheduled projects

Lead Entity	Project Number	Project Name	Project Description	Project Type
Town of Jupiter	TOJ-FIB-04	Street Sweeping	Periodic street sweeping to enhance water quality.	FIB-Stormwater
Town of Jupiter	TOJ-FIB-13	Jupiter River Estates Community Clean-up	Clean-up and trash removal from Jones Creek tributary by volunteer residents in Jupiter River Estates Community.	FIB- Trash Cleanup of Impaired Waterbody

Pet Waste Ordinances

Pet waste disposal containers were observed in multiple residential areas within the Units of Development. All NPBCID Units are either within the Town of Jupiter or Palm Beach County jurisdiction and as such is subject to their respectively ordinances and regulations. The Palm Beach County has the following pet waste ordinance:

Sec. 4-9. - Animal waste.

The owner of every dog and cat shall be responsible for the removal of any feces deposited by his/her animal on public property, public walks, public beaches, recreation areas or private property of others. (Ord. No. 98-22, § 9, 6-16-98)

The Town of Jupiter has the following ordinance:

Sec. 5-8. - Animal waste.

The owner of every animal shall be responsible for the removal of any excreta deposited by his animal on public walks, recreation areas or private property of others. (Code 1975, § 4-16; Code 1992, § 5-10)

Public Education

The Palm Beach County MS4 permittees agreed to address the public education requirements of the MS4 NPDES permit as a joint effort. Outreach on the proper use of Pesticides, Herbicides, and Fertilizers and on the identification and reporting of illicit discharge and illegal dumping is carried out through the joint Stormwater And Me (SAM) public education program (Figure 32 and Figure 33). Two to four public service announcements (PSAs), targeting the public outreach topics are selected each year. An annual video PSA campaign (Figure 34) is carried out on a number of Comcast channels aired in Palm Beach County. The selected videos are also exposed over 50,000 times during each campaign via pre- and mid-roll impressions on the internet. In addition, the SAM program has created and produced educational materials such as posters, brochures, door hangers, and the StormwaterAndMe.org website for use by all permittees and the general public.

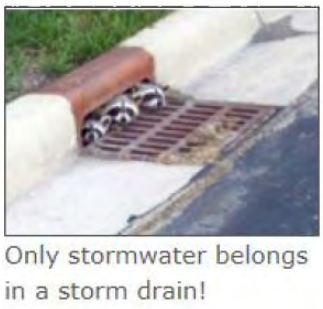


Figure 32. Public Education

Figure 33. SAM education program

Figure 34. Video PSA campaign

Furthermore, the Palm Beach County MS4 permit requires that permittees provide training on three topics. Annual follow-up (or "refresher") training is required for those that have received the initial training. The three topics are:

- Identification & reporting procedures for a suspected illicit discharge or dumping in the MS4 for all appropriate permittee personnel (including field crews, fleet maintenance staff, and inspectors) and contractors. (Part III.A.7.c)
- Spill prevention, containment & response procedures (including techniques for mitigating pollution from spills) for all appropriate permittee personnel (including field crews, firefighters, fleet maintenance staff, and inspectors. (Part III.A.7.d)
- Stormwater management and erosion and sedimentation control BMPs for construction sites for site plan reviewers, site operators, and site inspectors. Construction site inspectors must be certified through the Florida Stormwater, Erosion, and Sedimentation Control Inspector Training program, or equivalent. (Part III.A.9.c). Note that construction sites pollution presentation plan includes the proper collection and disposal of waste material which is a potential source of bacteria.

The TOJ developed a project (TOJ-03) for Public Education during public events, such as the annual Jupiter Jubilee (stormwater festival), that includes PSAs and information pamphlets on landscape, pet waste and irrigation ordinances. TOJ also provides annual soil and sediment control training and annual distribution of hurricane preparedness information including information on stormwater management and drainage maintenance.

Enforcement Referrals

NPBID does not have enforcement powers granted by the state legislature. NPBID staff is competent in observing and reporting an illicit discharge to the applicable legal authorities. Within NPBCID Units of Developments noted above, these authorities include Palm Beach County, Town of Jupiter, SFWMD,

and FDEP. PBC Environmental Resources Management (ERM) is responsible for the protection of surface water in Palm Beach County. The County's Stormwater Pollution Prevention Ordinance NO. 2004-050 (administered by ERM) goal is to prohibit non-stormwater discharges (e.g., illicit) from entering all stormwater systems within Unincorporated Palm Beach County. Violations are subject to fines and corrective measures. Town of Jupiter stormwater ordinance No. 33-93 covers illicit discharges into the Towns stormwater system or into public waters.

Structural Controls

Sanitary: Planned Improvements

The Loxahatchee River Pollutant Reduction Plan, developed by the stakeholders in the Loxahatchee River Basin in February 2020, focuses its efforts on projects located mostly south of the Southwest Fork. However, the plan incorporates two major septic conversion projects relevant to the NPBCID Units:

Table 11. Sanitary Planned Improvements

Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date
Loxahatchee River District	LRD-13	Loxahatchee River Neighborhood Sewering Phase 12	Convert 232 septic systems to sewer.	OSTDS Phase Out	Underway	2019
Loxahatchee River District	LRD-14	Loxahatchee River Neighborhood Sewering Phase 13	Convert 56 septic systems to sewer.	OSTDS Phase Out	Planned	2020

OSTDS = Onsite Sewage Treatment and Disposal System

Stormwater: Planned Improvements

Town of Jupiter recently completed the Stormwater System Redevelopment Grants project, of which the main objective was to renew or improve existing privately-owned stormwater systems under site redevelopment to ensure continued or enhanced functionality. Meanwhile, LRD is working on a project to evaluate storm drain filter boxes.

Table 12. Stormwater planned improvements

Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date
Town of Jupiter	TOJ-09	Stormwater Quality Improvement Grants (Homeowners Association [HOA] Residential Grants)	Town cost-share program (50/50) with property owner and homeowner associations for storm water quality enhancements within their private systems. 28 grants awarded since 2008. Annual appropriation.	Stormwater System Rehabilitation	Underway	N/A

Summary

- The analyses carried out by NPBCID and LRD on data from a 2019 - 2020 period of record, indicate a loading rate that is approximately 45% less than the loading indicated in the 2012 FDEP TMDL Report.
- Unit 45, located in the Jones Creek basin showed the highest percentage of exceedances, consistent with the information in the TMDL Report of 2012. Both The LRD and Town of Jupiter have initiated additional bacteria source tracking studies in the Jones Creek Basin to identify the potential sources.
- Most of the sanitary and stormwater planned improvements described in the Loxahatchee River Pollutant Reduction Plan are already targeting the areas located south of the Southwest Fork of the Loxahatchee River, therefore it is expected that the loadings will continue to decrease.
- Non-structural management actions such as street sweeping, pet waste ordinances and public education are already demonstrating benefit in maintaining the bacterial loads below the accepted threshold or reducing them in all the NPBCID Units of Development.

References

- Municipal Separate Storm Sewer System National Pollutant Discharge Elimination System Joint Annual Report Cycle 4 Year 3 Northern Palm Beach Improvement District.
- Fecal Coliform TMDL for Southwest Fork Loxahatchee River WBID 3226C - Florida Department of Environmental Protection (May 2012).
- Restoring Bacteria-Impaired Waters toolkit - Florida Department of Environmental Protection (Version 3.0 August 2018).
- Loxahatchee River Pollutant Reduction Plan - Stakeholders in the Loxahatchee River Basin (February 2020).