Tributary DRI

(Formerly Known as Three Rivers DRI)
Nassau County, Florida

Surface Water Quality Monitoring Plan

Prepared By

SES Environmental Resource Solutions LLC

3550 St. Johns Bluff Road South
Jacksonville, FL 32224

For

Three Rivers Developers, LLC
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2300 Glades Road, Suite 410w
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January 2023

Patrick Pierce
Senior Project Manager

1.0 INTRODUCTION

On behalf of the Developer, Three Rivers Developers, LLC, SES Environmental Resource Solutions LLC (ERS), has developed and intends to implement a Surface Water Quality Monitoring Program (SWQMP) for the Tributary Development of Regional Impact (DRI) upon approval by the Florida Department of Environmental Protection (FDEP). The SWQMP is developed in accordance with the DRI Development Order (DO) Special Condition No. 18 as described in Resolution No. 2021-172 of the Board of County Commissioners of Nassau County, Florida, adopted on 23 August 2021. Pursuant to Special Condition No. 18, ERS will seek approval of the SWQMP from the Northeast District of FDEP.

It should be noted that the current Developer acquired the project and assumed the Developer role in 2019, well after the original DO (Resolution No. 2006-126, 28 August 2006), that included the requirement for a SWQMP, had been issued. Additionally, at the time of acquisition by the current Developer, land clearing and construction activities had commenced in the project area. The original project developer failed to implement a SWQMP. As such, baseline sampling was not completed for the SWQMP and is no longer feasible. As an alternative to the typical method of utilizing baseline sampling data to establish pre-development, target conditions for water quality parameters, ERS is proposing to utilize a method of comparison between proposed stations downstream of existing development areas and a "control" station that is located downstream of undisturbed lands within the project area to establish reasonable standards for parameter analysis (see below for additional detail).

2.0 SCOPE

2.1 Location of Sampling Stations

The project area generally drains from north to south with C.R. 200 defining the northern boundary of the project's drainage area and Mills Creek and the Nassau River defining the southern boundary (Appendix 1, Exhibits 1 and 2). Sampling stations have been placed on two unnamed tributaries to Mills Creek, itself a tributary of the Nassau River, and one unnamed tributary to the Nassau River. Sampling stations were established with permanent markers in the field on 11 January 2023 and were intentionally selected at locations that appeared to be upstream of tidal influence and estuarine habitats associated with the Nassau River to ensure sampling locations are representative of freshwater flows through the project area and not tidally influenced waters.

> **Station TS-1.** This station is located in the northwest section of the project area, west of Police Lodge Road and north of Logan Road. This station is situated on an unnamed tributary to Mills Creek. Because no development has been initiated in the drainage basin upstream of this station, Station TS-1 will initially serve as the control station to establish appropriate pre-development target levels for analyzed water quality parameters at Stations TS-2 and TS-3 because of the previously noted lack of baseline sampling data for the project area.

Station TS-2. This station is located centrally along the southern boundary of the project area at a location just north of Police Lodge Road. TS-2 is located on the largest unnamed tributary of Mills Creek that captures drainage from the central area of the project and includes the largest existing construction footprint.

Station TS-3. Station TS-3 is located in the southeast section of the project on an unnamed tributary that flows directly to the Nassau River. The Station is located immediately west of an existing recreational park near the southern end of Edwards Road. The drainage basin upstream of this sampling station has been impact by construction of the recreational park and residential development further to the north.

2.2 Baseline Monitoring

As noted above, because the original developer did not implement the SWQMP prior to initiating construction, typical baseline monitoring is no longer feasible. Because the drainage basin associated with TS-1 has not been impacted by development activities, initial samples from TS-1 will serve as control values for assessment of water quality parameters observed at Stations TS-2 and TS-3. Additionally, parameter trends will be noted at TS-1 as construction progresses into that drainage area.

Because of the lack of baseline data, the initial quarterly samples at TS-1 will be intentionally timed to collect two "wet" and two "dry" sample events. Dry and wet weather sampling criteria will follow the U.S. Environmental Protection Agency's Environmental Monitoring and Assessment Program (EMAP) protocols. Wet weather samples will be collected within 24 hours after a rain event of greater than 0.1 inches of rainfall but following an interevent period of at least 72 hours (three days of dry weather). Dry weather samples will be taken following at least 7 consecutive days of dry weather.

2.3 Construction-Phase Monitoring Program

ERS will monitor water quality at TS-1, TS-2, and TS-3 throughout development of the Tributary DRI. The construction-phase monitoring program has been designed to identify any impacts, trends, or changes to water quality occurring because of construction activities since the initial implementation of the sampling program. The construction-phase monitoring program will consist of quarterly sampling events for a minimum of two year following the implementation of sampling and will continue through build-out of the project. Parameters to be assessed at each sampling event are identified in Table 1 (attached). If all construction activities have been complete within a sampling station's basin and no significant impacts to water quality have been identified, ERS may request a reduction in sampling frequency at that station or elimination of that station from the protocol.

ERS will notify FDEP personnel at least 24 hours prior to each planned sampling event, affording FDEP the opportunity to collect split samples or to audit sampling methodologies.

3.0 METHODS

3.1 Quality Assurance/Quality Control

All field measurement (*in situ* measurements and collection of water samples) will be conducted in accordance with FDEP Standard Operating Procedures (SOPs) 001/01 revision date January 2017 for collection of water quality data and samples. Instrument calibration, replicate sampling, and other specific quality assurance procedures are described in the section.

3.2 Surface Water Sampling

3.2.1 Field Measurements and Observations. Weather, stream conditions, and field measurements will be recorded at each station using an ERS field data capture sheet (Appendix 2). Weather data will include 24-hour antecedent rainfall based on published data for the Jacksonville International Airport weather station. Stream conditions to be noted will include flow regime, water color, surface clarity, and any nuisance conditions. Field measurements will include total depth, Secchi disk depth, and *in situ* measurements. Water temperature, dissolved oxygen, salinity, pH, and specific conductance will be measured *in situ* using a YSI multi-meter probe or similar instrument. No more that 12 hours before each sampling event, the sampling instrument will be calibrated following the manufactures calibration procedure for dissolved oxygen, pH, and conductivity. Following each sampling event, calibration verification checks will be performed to confirm that the measurement error was less than 1.0 percent for all parameters. Values from pre and post calibration will be recorded on the calibration capture sheet for each day of sampling (Appendix 2). Turbidity will be measured in the filed using a Hach Model 2100Q nephelometric turbidimeter. The turbidimeter's calibration will be verified in the field using Gelex secondary turbidity standards (0-10 NTU and 0-100 NTU).

3.2.2 Collection of Water Samples. Sample collection information, including sampling time, sampling depth, analytical parameters, sample container number, handling procedures, and quality assurance protocol, will be recorded on the ERS field data capture sheet at each station. Pre-cleaned containers with appropriate preservatives added will be provided by the approved, subcontracted laboratory. All sampling containers will be labeled on site with station name, sample identification number, and date and time of collection. Hand-grab water samples for laboratory analyses will be collected subsurface at a depth of the shallower of 0.5 feet or one-half the total depth at each station.

Pursuant to the CompQAP, field duplicate samples will be collected periodically along with the primary samples and will be submitted as blind duplicates to the subcontracted laboratory. Immediately following collection, all samples will be sealed and placed on ice. Chain-of-custody records for the samples will be initiated at the time of collection and kept with the samples at all times in the sealed sample coolers. The samples will be kept in the coolers throughout the process of delivery, and the coolers will be hand-delivered to the subcontract laboratory by ERS personnel.

3.2.3 Laboratory Analyses. Water chemistry and bacteriological parameters will be analyzed using U.S. Environmental Protection Agency (EPA) approved methods as identified on Table 1 (attached).

An FDEP-approved environmental water quality laboratory will be subcontracted by ERS to perform all water chemistry and bacteriological testing of the water samples collected at each station. The analytical method detection limit (MDL) for each parameter will be lower than its maximum contaminant level (MCL) based on State of Florida surface water quality criteria as specified in Chapter 62-302.530 of the Florida Administrative Code (FAC). Copies of the laboratory reports will be provided as appendices to the monitoring reports (see Reporting, below).

4.0 REPORTING

4.1 Report of Baseline Conditions

No baseline report will be provided. Project construction was initiated prior to implementation of the SWQMP. Baseline sampling and reporting is no longer feasible.

4.2 Quarterly Reports

Reports of quarterly monitoring events will be submitted to FDEP for review with 30 days of the receipt of laboratory results for each sampling event. Each report will present results for field measurements and laboratory analyses in tabular format with associated water quality criteria. Copies of original laboratory result reports and chain-of-custody forms will be included as report appendices. The report will provide a summary discussion addressing trends in parameter data, observed conditions that may have affected sample measurements or viability, and/or any deviations in scope or methods from those presented in this SWQMP with justification.

5.0 REEVALUATION

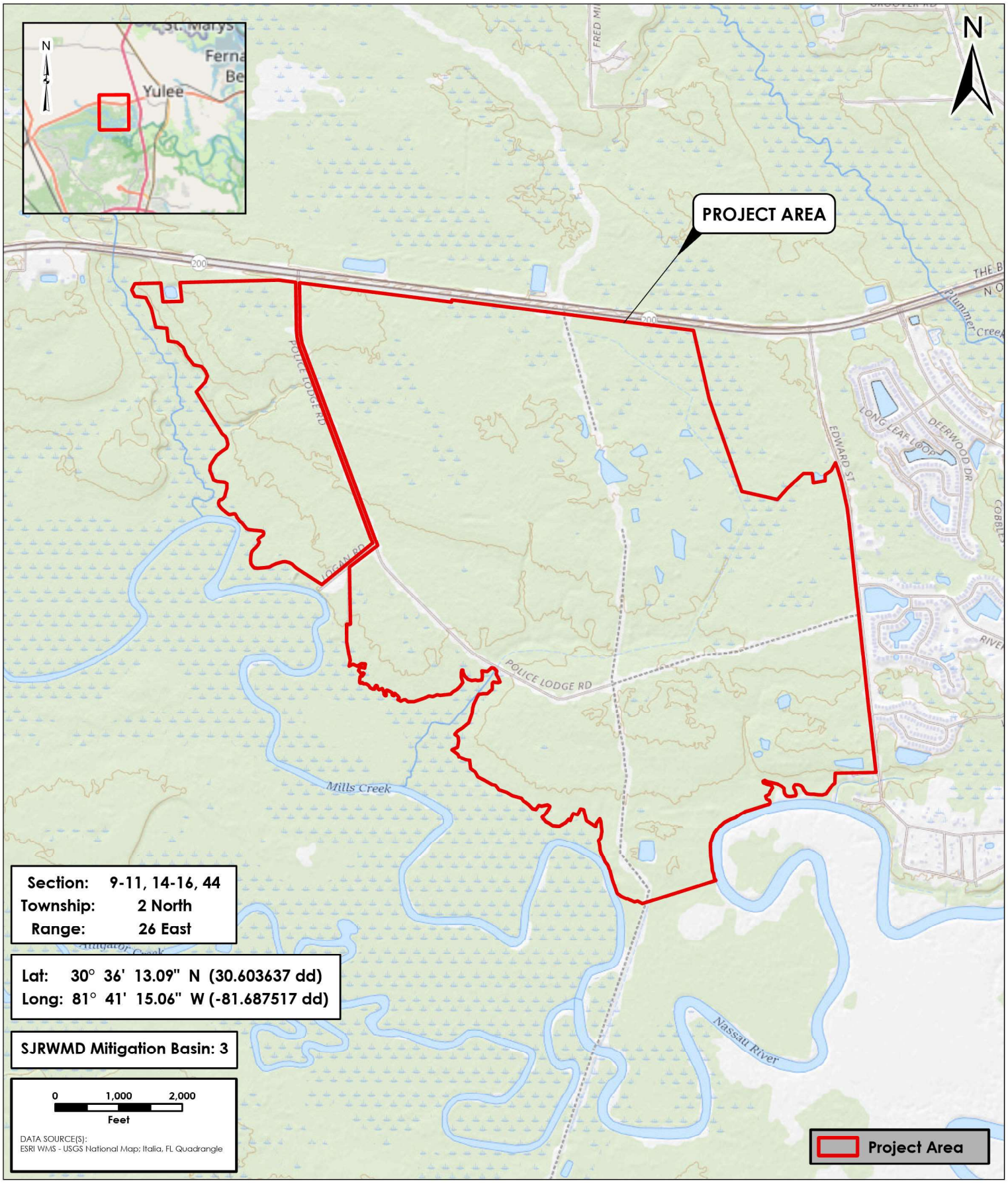
After completion of the storm water management system and every five years, unless otherwise agreed upon by FDEP and the Developer, the SWQMP shall be reviewed and evaluated pursuant to Chapter 62-302 FAC. Sampling methods, locations, parameters, and frequency shall be evaluated, and modified if necessary or appropriate. Reevaluation may occur sooner than five years at the request of either the Developer or FDEP with consent of the other party.

Table 1. Water quality parameters and analytical methods of construction-phase water quality monitoring at Tributary DRI.

Parameter	Units	Method
Field (*In-Situ*) Measurements		
Temperature	°C	EPA 170.0
pH	std. units	EPA 150.1
Dissolved Oxygen (DO)	mg/l	EPA 360.1
Specific Conductance	µmhos/cm	EPA 120.1
Salinity	ppt	EPA 2520-B
Flow	cm/sec	EPA SOP
Secchi Disk Transparency	Feet	EPA SOP
Physical Properties		
Color	CU	SM 2120 B
Total Hardness as $CaCO_3$	mg/l	EPA 6010
Total Dissolved Solids (TDS)	mg/l	SM 2540 C
Total Suspended Solids (TSS)	mg/l	SM 2540 D
Inorganic Anions		
Alkalinity	mg/l	SM 2320 B
Total Phosphorus	mg/l	EPA 365.4
Nitrate/Nitrite	mg/l	EPA 300.0
Total Kjeldahl Nitrogen (TKN)	mg/l	EPA 351.2
Organics		
Biochemical Oxygen Demand	mg/l	SM 5210 B
Bacteria		
Fecal Coliform (FC) Bacteria	# /100 ml	Coliert-18 QT

APPENDIX 1

Exhibit 1. Location Map
Exhibit 2. Sampling Station Map



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USGS Topographic Map

Tributary WQ Plan

Nassau County, Florida

SES Project No:	2P001.1032.0001.20
ERS Project No:	23007
Date:	Jan 2023
Drawn By:	DF
Reviewed By:	DL
Approved By:	PP
EXHIBIT NUMBER	1

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Monitoring Stations

Tributary WQ Plan

Nassau County, Florida

SES Project No:	2P001.1032.0001.20
ERS Project No:	23007
Date:	Jan 2023
Drawn By:	DF
Reviewed By:	DL
Approved By:	PP
EXHIBIT NUMBER	2

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APPENDIX 2

ERS Field Data Capture Sheet
Calibration Capture Sheet

Project

WQ Station: _____

Personnel: _____

SES Environmental Resource Solutions LLC

Date: _____

Time: _____

Field Conditions

Air Temp: _____ ° C

Cloud Cover: _____ %

Windspeed: _____ MPH

Wind Direction: _____

Rainfall (past 24 hr): _____ in.

Sampling Event: ☐ "Wet" ☐ "Dry"

Flow Speed:	Water Color:	Water Surface:	Nuisance Conditions:
Fast	Clear	Clear	
Moderate	Tannic	Oily Sheen	
Slow	Algal	Slick	
Not Visible	Other:	Algal Scum	

Water Odors:	Water Clarity:
Normal	Clear
Sewage	Slightly Turbid
Petroleum	Turbid
Chemical	Opaque

Hach 2100P Turbidimeter

Calibration Verification: ☐ 0-10 NTU ☐ 0-100 NTU

Turbidity: _____ NTU

Field Measurements

Measurement Time: _____

Total Depth: _____ ft

Secchi Depth: _____ ft

In situ Depth: _____ ft

Flow: _____ cm/sec

HydroLab Quanta-G

Water Temp: _____ °C Calibrated meter @ _____

pH: _____ std. Units

pH calibration:
☐ 7.00 & 4.00 Standards
☐ 7.00 & 10.0 Standards

Cond: _____ µmhos/cm

Salinity: _____ ppt

Cond calibration:
☐ 0.005 M KCl (718 µmhos/cm)
☐ 0.01 M KCl (1,413 µmhos/cm)

DO: _____ mg/L

DO: _____ % Sat'n

☐ DO calibrated in Air (100% sat'n)

Water Sampling

Sampling Time: _____

Sampling Depth: _____ ft

Sampling Equipment:
☐ Hand Grab
☐ Kemmerer Sampler
☐ Other: _____

Composite Sample? _____

Sample Parameters	Containers:
BOD	1,000 ml HDPE (unpreserved)
Color, Alkalinity, TDS, TSS	500 ml HDPE (unpreserved)
TKN, NO_x, TP	500 ml HDPE (H_2SO_4)
Hardness	250 ml HDPE (HNO_3)
TC, FC (bacteria)	Bacterial Vial (Na-thiosulfate)

Other: _____ _____

QA/QC Samples:

☐ Field Duplicate (blind)
☐ Equipment Rinse
☐ Travel Blank

Samples on Ice? _____

Chain-of-Custody _____

Laboratories: _____

Additional Notes/Field Observations/Equipment Maintenance:

Signature: _____

Time: _____

SES Environmental Resource Solutions LLC

Project	Personnel: _____ Location: _____	Date:_____ _____	Start Time: _____ Finish Time: _____

Conductivity

Rinse 3 Times with DI Water_____
Fill with Conductivity Solution Equal to _____mS/cm
Date Received: _____
Lot No: _____
Expiration Date: _____
Reading: _____ mS/cm
Adjusted Reading ____ to _____mS/cm
Rinse 3 Times with DI Water_____
Filled with Conductivity Solution Equal to _____. Reading _____

Dissolved Oxygen %

Rinsed 3 Times with DI Water _____
Filled with DI Water, Water Level Equal to O-ring _____
Blotted Membrane _____
Covered Calibration Cup with Cup Cover _____
Barometric Pressure: _____ mmHg
% DO: _____ Sat.

pH

Rinsed 3 Times with DI Water _____
Filled with pH Solution Equal to 7.00
Date Received: _____
Lot No: _____
Expiraton Date: _____
Reading: _____
Adjusted Reading _____ to pH: _____
Rinsed 3 Times with DI Water _____
Filled with pH Solution Equal to 4.00 (fresh) or 10.00 (marine)
Date Received: _____
Lot No: _____
Expiration Date : _____
Reading: _____
Adjusted Reading _____ to pH: _____
Filled with pH Solution Equal to 7.00. Reading: _____

Post Sampling Calibration Check Date: _____
Start Time: _____ Finish Time: _____
Filled With Conductivity Solution Equal: _____mS/cm Reading: _____mS/cm
Filled With pH Solution Equal: _____ Reading: _____
Filled With DI Water: Temperature Reading: _____C DO Reading: _____mg/l