

# Compliance Monitoring Plan

For

Picayune Strand Restoration Project:  
Merritt, FAKA Union, & Miller Pump Stations

(PSRP)

AGENCY: Florida Department of Environmental Protection

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Water Quality Monitoring Section  
Water Quality Bureau, Water Resources Division South  
Florida Water Management District

SFWMD-FIELD-CMP-019-11

## Table of Contents

<b>1.0</b>	<b>Project Organization.....</b>	<b>3</b>
<b>2.0</b>	<b>Project Description.....</b>	<b>3</b>
2.1	Water Quality Performance Measures .....	3
<b>3.0</b>	<b>Geographic Location.....</b>	<b>4</b>
	Table 1: PSRP Surface Water Monitoring Sites and GPS Coordinates .....	4
<b>4.0</b>	<b>Sample Collection Procedures .....</b>	<b>4</b>
4.1	Monitoring and Field Testing .....	4
4.2	Field Quality Control and Sample Submission Requirements .....	4
	Table 2: PSRP Sampling Parameters and Frequencies .....	5
4.3	Hydrological Monitoring .....	5
	Figure 1: PSRP Site Location Map.....	6
5.0	Data Quality Objectives (DQOs) .....	7
5.1	Data Usage .....	7
5.2	Data Quality.....	7
5.3	Completeness Target .....	7
<b>6.0</b>	<b>Data and Records Management.....</b>	<b>7</b>
6.1	Contract Deliverables .....	8
6.2	Data and Record Storage .....	8
<b>7.0</b>	<b>Revisions and Modifications .....</b>	<b>8</b>
<b>8.0</b>	<b>References .....</b>	<b>9</b>
	<b>Appendix 1: Mercury and Other Toxicants Monitoring Plan .....</b>	<b>10</b>

## 1.0 Project Organization

The following documents define the procedures used by South Florida Water Management District (SFWMD or District) personnel to meet the Florida Department of Environmental Protection's (FDEP or Department) Quality Assurance (QA) Rule, Florida Administrative Code (F.A.C.) 62-160, and should be referred to for details on key personnel and relevant responsibilities.

- Overall project organization and responsibilities -
  - SFWMD Water Quality Bureau (WQB) Quality Management Plan (QMP).
- Field activity and data validation responsibilities -
  - SFWMD Water Quality Monitoring Section's (WQM) Quality Manual (QM), Field Sampling Manual (FSM), and applicable Standard Operating Procedures (SOP).
- Laboratory analysis and data validation responsibilities –
  - SFWMD Analytical Service's (AS) Chemistry Laboratory Quality Manual (CLQM) and applicable SOPs.

## 2.0 Project Description

The Picayune Strand Restoration Project (PSRP) will be completed in three phases with the Merritt Pump Station (S-488) coming online in July 2015, which initiated sampling beginning October 27, 2015 within the structure's intake basin (S488). The second phase was the construction of the Faka Union Pump Station (S-487), which was completed in September 2016; the final phase, the construction of the Miller Pump Station (S-486) was completed in June 2018.

In 2021 a partial plugging of the Faka Union Canal (northern 3.3. miles) will be completed making the operation of the pump station possible without the Southwest Protection Feature being completed. Consequently, routine sampling at S487 will be conducted upon authorization of operations of the S-487. Operations of the S-486 are not expected until completion of the Southwest Protection Feature and plugging of the Miller Canal, and therefore surface water sampling at S486 will not commence until operations of the S-486 are authorized. Samples and/or data are collected to satisfy the mandated monitoring requirements in accordance with the permit(s) to which this document is attached.

This plan details permit mandated monitoring requirements. Modifications to this sampling may be requested in response to any future design changes, and/or changes to project objectives. Monitoring reductions may also be requested to stations, frequencies, and/or analytes if monitoring demonstrates that specific parameters are not present or if found consistently in compliance with regulatory standards. This plan will be reviewed and/or modified as needed to reflect necessary changes. At a minimum, this plan will be reviewed when the permit is renewed. Compliance monitoring will continue for the life of the permit.

### 2.1 Water Quality Performance Measures

There are no specific water quality performance measures associated with the PSRP project; the project's intent is hydrologic improvement.

### 3.0 Geographic Location

PSRP is located within Collier County (Figure 1). Six (6) mandated monitoring station(s) will be sampled for this project. Station locations and descriptions are listed in Table 1 with locations also depicted in Figure 1.

**Table 1: PSRP Surface Water Monitoring Sites and GPS Coordinates**

Station	Latitude (ddmmss.sss)	Longitude (ddmmss.sss)	Description
TMBR37	255954.36	813553.35	TAMI1 - Tamiami Canal Bridge 37
TMBR49	255804.36	813208.08	TAMI2 - Tamiami Canal Bridge 49
FAKA	255737.82	813034.24	TAMI3 - Faka Union Canal at Weir #1
S488	260822.16	812929.79	Merritt Pump Station (S-488) Intake Basin
S487	260658.94	813115.65	Faka Union Pump Station (S-487) Intake Basin
S486	260713.43	813313.11	Miller Pump Station (S-486) Intake Basin

### 4.0 Sample Collection Procedures

All surface water quality samples are collected on the upstream side of all structures at a depth of 0.5 m unless vegetation and/or other conditions inhibit the collection of a representative sample upstream. Samples, including field testing and field quality control samples will be collected in accordance with the FDEP Quality Assurance Rule, 62-160 F.A.C. and the current version of the FSQM. Applicable sections of the FSQM include, but are not limited to, field sample collection procedures, decontamination procedures, field testing and quality control requirements. All water quality samples required for collection are depicted in Table 2.

Sampling will commence after the project is flooded following the operation of any pump stations (see Table 2). Surface water samples will be collected from all downstream sites and at those pump stations that have recorded flow.

#### 4.1 Monitoring and Field Testing

Field testing procedures follow the procedures and requirements found in the FSQM. Table 2 below describes the field parameters collected for this project.

#### 4.2 Field Quality Control and Sample Submission Requirements

Field quality control requirements shall follow the procedures found in the Field Quality Control Measurements and Requirements Section of the FSQM.

Samples are submitted to the laboratory on the same day as collection or via courier the following day. Samples are submitted according to the requirements outlined in the FSQM. If samples are submitted to a laboratory other than the District Lab, it must be approved by the District Lab.

**Table 2: PSRP Sampling Parameters and Frequencies**

Station	Sample Type	Frequency	Parameters ACODES
All Stations <sup>1, 2</sup>	Grab	Monthly if recorded flow (MRF), otherwise quarterly (Q)	Total Nitrogen (TN), Total Phosphorus (TPO4), Total Suspended Solids (TSS)
	In-situ Grab	MRF/Q	Dissolved Oxygen (DO), pH (PH), Specific Conductance (SCOND), Temperature (TEMP)
S488	Calculated	Daily	Flow
S487 S486	Stage Recorder	Daily	Stage

<sup>1</sup>Surface water samples will be collected if the pump station operates; sampling, triggered by recorded flow, will be done at each downstream station and at the pump station(s) where flow was recorded.

<sup>2</sup>S486 will not be monitored until the pump station is operational.

### 4.3 Hydrological Monitoring

Hydrological monitoring in the District follows all standard operating procedures (SOPs) for site installation, data collection, data processing and QA/QC established by the Infrastructure Management Bureau's SCADA (supervisory control and data acquisition) Instrumentation & Telemetry Section and Hydro Data Management Section. Flow is calculated using data collected from each station's head water, tail water, and pump operations. Stage levels (head and tail) and pump operations at all three pump stations are measured by telemetry.

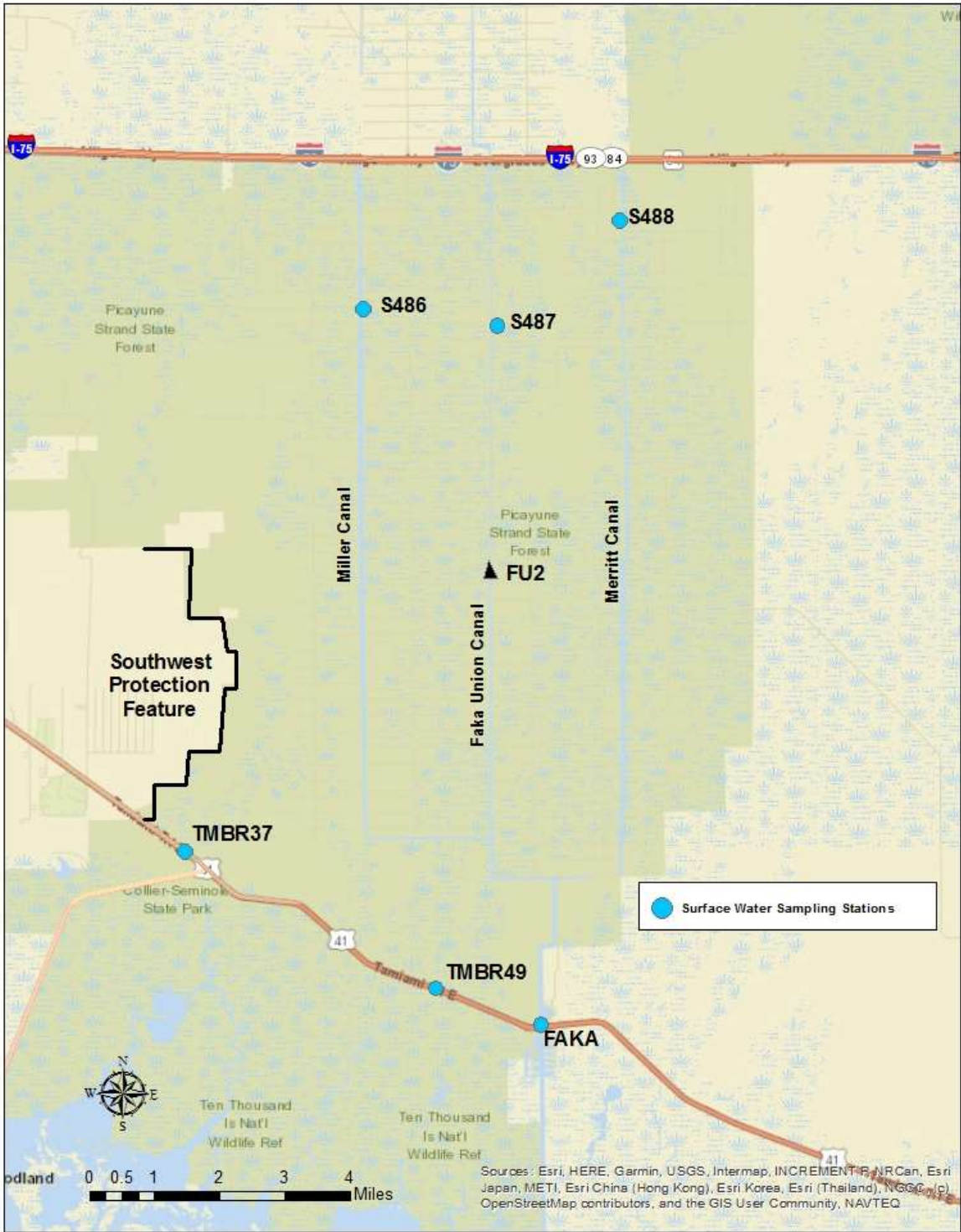


Figure 1: PSRP Site Location Map

## **5.0 Data Quality Objectives (DQOs)**

### **5.1 Data Usage**

The data from this project are compiled and reported in accordance with the conditions outlined in the permit or mandate.

### **5.2 Data Quality**

All monitoring described herein shall meet the requirements conveyed in the FDEP's Quality Assurance Rule, 62-160 F.A.C. The District has adopted a uniform set of DQOs following criteria detailed within the "Analytical Methods and Default QA/QC Targets" table of the Chemistry Laboratory Quality Manual (CLQM).

The minimum DQOs for mercury and other toxicants, which are analyzed by contract laboratories, are covered by the list of FDEP established analytical methods, and corresponding method detection limits (MDLs) and practical quantification limits (PQLs), which is titled "Florida Department of Environmental Protection Table as Required By Rule 62-4.246(4) Testing Methods for Discharges to Surface Water" dated November 10, 2020.

The DQOs of the field-testing parameters for this project are covered by the table entitled Field Quality Assurance Objectives found in the field-testing section of the FSQM. This manual is updated regularly, and therefore, the most recent version of the FSQM details the specific field testing DQOs for this project at the time of sample collection.

Samples are analyzed according to the provisions within the FDEP Rule 62-160 F.A.C. and the District's CLQM. This manual is updated regularly, and therefore, the most recent version of the District's CLQM details DQOs for this project at the time of sample collection for each specific laboratory analysis. Data are qualified in accordance with the FSQM, CLQM and applicable data validation SOPs.

### **5.3 Completeness Target**

The completeness target (i.e., the number of samples successfully collected and analyzed) shall be set at 95% annually for this project. Sampling attempts shall be included in the completeness target. At times samples will not be able to be collected because of no flow or low water conditions, unsafe station conditions, equipment malfunction, site maintenance, tropical storms/hurricanes or other unforeseen problems that might affect sample collection and/or quality. If samples cannot be collected on an attempt, collectors shall document "no bottle" (NOB) to indicate an attempt was made and/or the sample could not be collected for the documented reasons.

## **6.0 Data and Records Management**

The District laboratory evaluates data in accordance with the data quality objectives stated in the District's FSQM and CLQM. All data submittals shall conform to existing District guidelines. **Contract laboratory data shall be submitted to the District in either the ADaPT format or another format as requested by the District.**



## 6.1 Contract Deliverables

There are no contract laboratory deliverables.

## 6.2 Data and Record Storage

After the data validation process, all data and records are maintained so that end users can retrieve and review information relative to a sampling event. Field records are maintained in accordance with the *Archive Records Storage and Retention* SOP (SFWMD-FIELD-SOP-022). All analytical data and specified metadata are sent to the DBHYDRO database for long-term storage and retrieval.

The District maintains both records of current and historical methodologies, and SOPs so that at any given time the conditions that were applied to a sampling event can be evaluated.

## 7.0 Revisions and Modifications

Date	Section	Change/Reason
01/08/2016	All	Added Faka Union Pump inflow basin (S487) as a sampling point; sampling will not occur at this site until the structure becomes operational.
05/04/2016	Appendix 1	Updated plan to reflect that FDEP concurrence to advance from Phase 1 – Tier 2 to Phase 2 – Tier 1 monitoring for mercury and other toxicants issued on April 28, 2016.
04/07/2017	Appendix 1	Updated plan to remove other toxicants as per FDEP concurrence issued on 4/7/2017. Format changed to comply with an agreement reached by FDEP and the District in 2011 regarding the use of compliance monitoring plans.
02/01/2019	All; Appendix 1	Updated to include the Miller Pump Station (S-486) as a sampling station (S486); Updated to conform with CGM 42.02 (effective date 8/29/2018) including Hg and other toxicant sampling associate with the Faka Union and Miller Pump Stations; removed the requirement to sample THg, MeHg, and sulfate from surface water stations (S488 and FAKA) associated with the Merritt Pump Station (S-488) with the concurrence of the FDEP received 01-30-2019.
01/08/2021	All, Figure 1, Appendix 1	Updated language to match the current CMP template; revised language to clarify that sampling will take place at S486, S487, and downstream stations if the pump stations operate despite the SWPR and canal plugging not being completed; the sediment station map was updated moving one Faka Union station in proximity to FU2 and eliminating one northern Miller station; clarification of where surface water and fish samples would be collected in association to the Miller and Faka Union Pump Stations was added.
07/13/2021	Appendix 1	Terminated mercury fish monitoring at the Merritt Pump Station (S488) with concurrence of the FDEP on 07/13/2021.



## 8.0 References

Florida Department of Environmental Protection. Quality Assurance Rule, 62-160 Florida Administrative Code (F.A.C.)

Florida Department of Environmental Protection. Florida Department of Environmental Protection Table as Required By Rule 62-4.246(4) Testing Methods for Discharges to Surface Water. November 10, 2020.

Florida Department of Environmental Protection. Florida Department of Environmental Protection Table as Required By Rule 62-4.246(4) Testing Methods for Discharges to Surface Water. April 25, 2006.

South Florida Water Management District. Chemistry Laboratory Quality Manual (CLQM), SFWMD-LAB-QM-2020 or most current effective version. Analytical Services Section, West Palm Beach, FL.

South Florida Water Management District. Field Quality Manual (QM), SFWMD-FIELD-QM-001. Water Quality Monitoring Section. West Palm Beach, FL.

South Florida Water Management District. Field Sampling Manual (FSM), SFWMD-FIELD-FSM-001. Water Quality Monitoring Section. West Palm Beach, FL.

South Florida Water Management District. Quality Management Plan, SFWMD-QA-QM-001. Water Quality Bureau, West Palm Beach, FL.

## Appendix 1: Mercury and Other Toxicants Monitoring Plan

Project PSRP

CERPRA Permit No. 0221670

## 1.0 Phase 1: Baseline Collection and Assessment

### 1.1 Phase 1 – Tier 1: Compilation and Review of Available Data

Sub-section omitted; reference CERP Guidance Memorandum (CGM) 42.02 *A Protocol for Monitoring Mercury and Other Toxicants* effective August 29, 2018 and subsequent revisions (hereafter referred to in this document as the “Protocol”) as needed.

### 1.2 Phase 1 - Tier 2: Initial Startup Monitoring Prior to Discharge

Phase 1 - Tier 2: Field Sampling for Initial Startup Monitoring Prior to Discharge for the Merritt Pump Station (Figure 1) was performed in the initial year of operations, 2015, with surface water collected on August 27; sediment collected September 10 and 17, and mosquitofish collected August 27 and September 22. Analyses of these samples established that the PSRP project met the mercury and other toxicants startup criteria as specified in Specific Condition 25 of CERPRA Permit No. 0221670 (see data summary provided in correspondence from J. Leslie, SFWMD dated March 30, 2016). The Florida Department of Environmental Protection issued concurrence on April 28, 2016 to transfer monitoring for the Merritt Pump Station, from Phase 1 – Tier 2: Initial Startup Monitoring Prior to Discharge to Phase 2 – Tier 1: Routine Monitoring During Stabilization Period.

Phase 1 -Tier 2 Startup Monitoring shall be initiated for the Faka Union (S-487) after it begins operating. The partial plugging of the northern 3.3. miles of Faka Union Canal will allow the Faka Union pump station to operate and sampling will begin following that construction.

The Miller (S-486) Pump Station is not anticipated to operate until the plugging of its canal and the completion of the Southwest Protection Feature (SWPF); scheduled for 2025.

#### 1.2.a Sediment

After downstream sediments have been saturated for at least one month by the operations of the Faka Union Pump Station following the partial plugging of the Faka Union Canal, sediment cores will be collected from two (2) representative locations downstream of the pump station and upstream of the FU2 Weir (Figure 1). Because the area downstream of the FU2 Weir is not expected to be inundated by only a partial plugging of the canal, the three (3) stations in this area will be sampled with the Miller Pump Station sediment stations after the canal plugging is completed. All sediment stations will be in proximity to SGT groundwater stations.

After downstream sediments have been saturated for at least one month by the operations of the Miller Pump Station and the plugging of the Miller Canal, sediment cores will be collected from five (5) representative locations

downstream of the pump station (Figure 1). The three (3) stations downstream of the FU2 Weir (Figure 1), expected to be inundated following the full plugging of the Faka Union Canal, will be sampled with the Miller sediment stations. All sediment stations will be in proximity to SGT groundwater.

At each location, a minimum of three cores (total number of cores will be determined by amount of sediment required for analysis) from the 0-to-4 cm horizon will be collected and composited as a single sediment sample.

To serve as baseline for future comparison, if conditions warrant follow-up sampling of sediments (i.e., if Tier 3 were triggered), sediment samples will be analyzed for total mercury (THg), methylmercury (MeHg), moisture content, total organic carbon (TOC), total sulfur (TS), total iron (TFe), and other toxicants as indicated in Table 1.

#### **1.2.b Fish Tissues**

Within 30 days of flooding by the operation of the Faka Union Pump Station, mosquitofish (*Gambusia* spp.) will be collected from the pool immediately upstream of the pump station, from a downstream station located in proximity of the FU2 weir (Figure 1), and from the FAKA station. The mosquitofish (minimum of 100) shall be physically composited into one, spatially averaged sample per upstream station and one per each downstream station.

Within 30 days of flooding by the operation of the Miller Pump Station, mosquitofish (*Gambusia* spp.) will be collected from the pool immediately upstream of the station and from the downstream stations, TMBR37 and TMBR49 (Figure 1). The mosquitofish (minimum of 100) shall be physically composited into one, spatially averaged sample per upstream station and one per each downstream station.

All mosquitofish samples will be analyzed for THg and other toxicants as indicated in Table 1. The data for the downstream station will serve as a baseline for any future evaluations of potential impacts to the receiving waters.

#### **1.2.c Water**

Surface water will be collected immediately upstream of the Faka Union Pump Station and at a downstream station in proximity to the FU2 weir. Samples will be analyzed for toxicants other than mercury as indicated in Table 1.

Surface water will be collected immediately upstream of the Miller Pump Station and at two (2) downstream stations (TMBR37 and TMBR49). Samples will be analyzed for toxicants other than mercury as indicated in Table 1.

Table 2 summarizes the monitoring requirements for Phase 1 - Tier 2: Initial Startup Monitoring Prior to Discharge.

#### **1.2.d Selection of Toxicants Other Than Mercury**

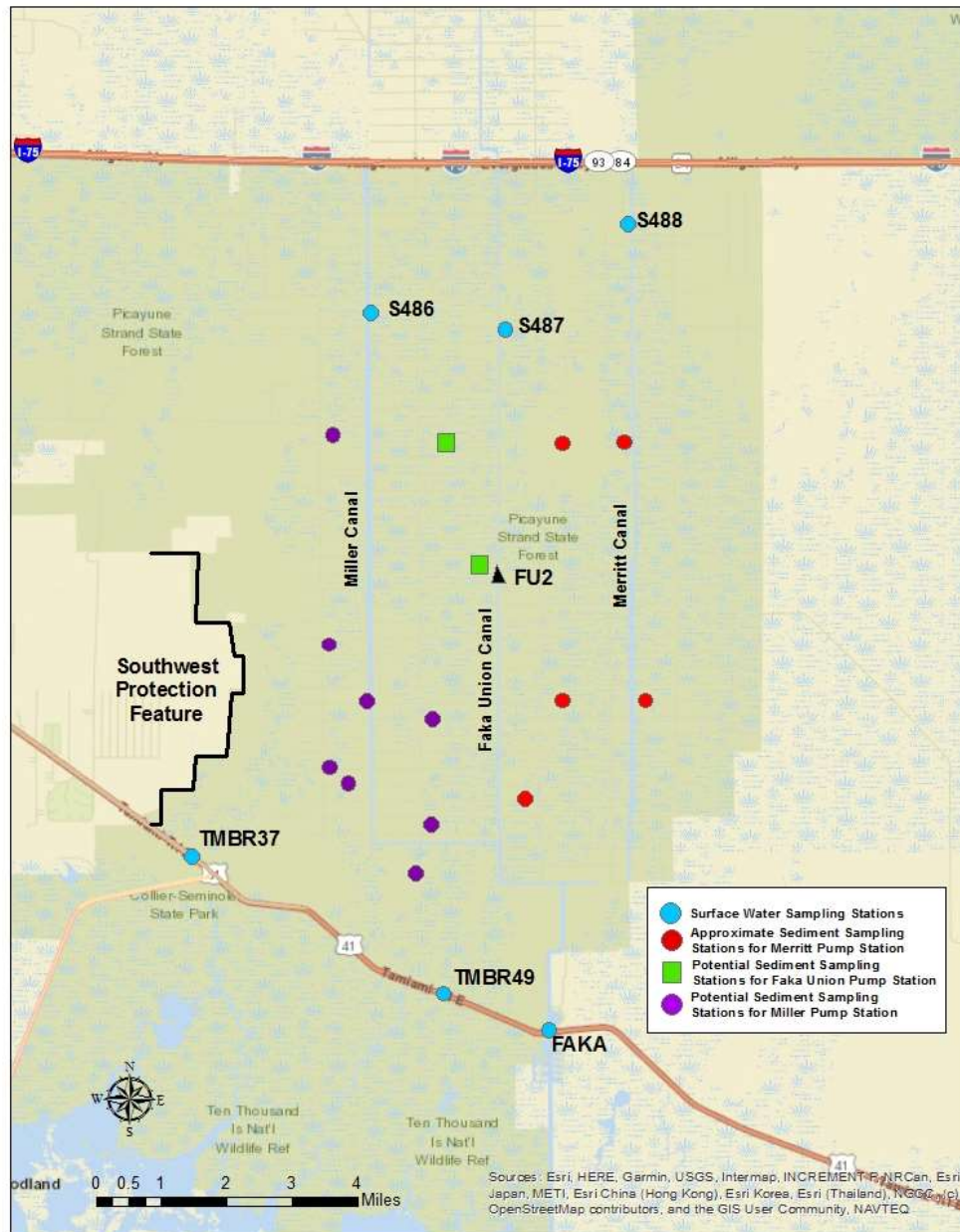
The following information sources have been reviewed for data regarding this project: **Phase I/II Environmental Site Assessment (ESA) and Ecological Risk Assessment, Southern Golden Gates Estates, Collier County, Florida (10582-154-024)**. Based on this review, the parameters identified in Table 1 will be analyzed in each of the specified matrices.

The District shall provide the Department with the results of these analyses as well as the appropriate action levels for comparison. If the following criteria are met, the District may initiate Phase 2 – Tier 1: Monitoring during Five-Year Stabilization and Routine Operational Period with concurrence of the Department:

- If sediment concentrations do not exceed a value reported in the ESA or a level that was determined to be critical in a site-specific risk assessment;
- If sediment concentrations do not exceed the appropriate sediment quality assessment guideline (SQAG) for sediment dwelling organisms (MacDonald Environmental Sciences Ltd. and USGS, 2003) and site-specific screening criteria do not exist;
- If mosquitofish mercury concentrations are below the 90% upper confidence level of the basin-wide average or below the 75th percentile concentration for the period of record for all basins (if basin-specific data are lacking);
- If mosquitofish tissue concentrations do not exceed recognized background tissue concentrations or benchmarks established in ecological risk assessments completed as part of the ESA;
- If water-column concentrations do not exceed a water quality standard (WQS) in Chapter 62-302, Florida Administrative Code (F.A.C.).

If concentrations in any of the samples exceed one of the above referenced action levels, the District shall immediately (within 14 days of receiving quality assured data from the laboratory) collect a sample(s) to confirm the exceedance(s). In addition, the District shall consult with the Department to determine the most appropriate course of action and obtain authorization to initiate flow-through operation. At a minimum, the course of action will include implementation of Phase 2 - Tier 2: Expanded Monitoring and Risk Assessment by the District during initial flow-through operations (e.g. collection of monthly mosquitofish within the project and at the downstream station). Additional details on expanded monitoring are provided in the *Protocol*. When results of expanded monitoring demonstrate concentrations in each cell have decreased to acceptable levels

(below action levels referenced above) and the concentrations at the downstream station are not significantly elevated above baseline levels, the District shall notify the Department and request that the monitoring proceed to Phase 2 – Tier 1: Monitoring during Five-Year Stabilization and Routine Operational Period.



**Figure 1: Upstream and downstream sampling station locations.**

Startup sediment samples will be collected downstream of S-486 and S-487 as they become operational; startup sampling for S-488 has been completed. Downstream fish and surface water samples for S-487 will be collected in proximity to the FU2 weir.

**Table 1: Parameter List of Toxicants other than Mercury to be Analyzed by Matrix**

Analyte	Sediment	Fish Tissue	Surface Water
chlordan	✓		✓
cis-chlordan		✓	
trans-chlordan		✓	
o,p'-DDD		✓	
p,p'-DDD	✓	✓	✓
o,p'-DDE		✓	
p,p'-DDE	✓	✓	✓
o,p'-DDT		✓	
p,p'-DDT	✓	✓	✓
dieldrin	✓	✓	✓
cis-nonachlor		✓	
trans-nonachlor		✓	

**Table 2. Initial Start-up Monitoring Prior to Discharge**

Matrix	Location	Collection Method	Frequency	Parameter
Sediment	2 stations downstream of S487; 8 stations downstream of S486	Sediment Core	One-time	chlordan, p,p'-DDD, p,p'-DDE, p,p'-DDT, dieldrin, THg, MeHg, moisture content, TOC, TS, and TFe
Mosquitofish	S486, TMBR37 & TMBR49 S487, FU2 <sup>1</sup> & FAKA	Net or Trap	One-time	cis-chlordan, trans-chlordan, o,p'-DDD, p,p'-DDD, o,p'-DDE, p,p'-DDE, o,p'-DDT, p,p'-DDT, dieldrin, cis-nonachlor, trans-nonachlor, THg
Surface Water	S486, TMBR37 & TMBR49 S487 & FU2 <sup>1</sup>	Grab	One-time	chlordan, p,p'-DDD, p,p'-DDE, p,p'-DDT, dieldrin

<sup>1</sup>The downstream station for fish and surface water associated with the Faka Union Pump Station will be in proximity of the FU2 weir.

## 2.0 Monitoring During Five-Year Stabilization and Routine Operational Period

Mercury and other toxicant sampling for the Merritt Pump Station entered this Phase in 2016 (see above). Faka Union and Miller Pump Stations' Phase 2 sampling will follow Startup collection and a concurrence from the Department. Sampling at each pump station shall follow the protocol outlined below.



**2.1 Phase 2 - Tier 1: Monitoring During Stabilization and Routine Operational Period**

Routine Monitoring During Stabilization Period sampling was performed for the Merritt Pump Station December 2, 2015 through September 26, 2016. A review of data analyzed from these samples indicated that levels of toxicants other than mercury were below levels of concern. Based on the *Protocol Assessment: Justification to Terminate Other Toxicants Monitoring for Picayune Strand Restoration Project Merritt Pump Station Operations Project* dated March 17, 2017, the Department concurred with the termination of other toxicants monitoring April 7, 2017. Based on the *Protocol Assessment: Justification of Change in Mercury Monitoring for the Picayune Strand Restoration Project Merritt Pump Station* dated July 12, 2021, the Department concurred with the termination of mercury fish monitoring at the Merritt Pump Station (S-488) on July 13, 2021.

Routine Monitoring During Stabilization Period sampling for Faka Union Pump Station and the Miller Pump Station will occur independently after they begin operations. Data from these samples will be reviewed and analyzed and reports like the *Protocol Assessment: Justification to Terminate Other Toxicants Monitoring for Picayune Strand Restoration Project Merritt Pump Station Operations Project* will be developed and submitted to the Department.

**2.1.a Soil or Sediment**

Soil or sediment will not be collected under Phase 2 - Tier 1 monitoring.

**2.1.b Fish Tissue**

Samples of fish from multiple trophic levels will be collected from the Faka Union and Miller Pump Stations and their associated downstream station(s) (Figure 1). Samples will continue to be collected from FAKA during the interim operational phases of the project, and to detect any changes downstream of the project. Specifically, mosquitofish collections will be made in a similar fashion as Phase 1 – Tier 2 sampling, continuing quarterly for a period of five years from the pools upstream of the pump stations and at associated downstream stations.

On an annual frequency, bluegill (*Lepomis macrochirus*) (n=5) shall be collected and individually analyzed as whole fish. Because this project contains habitat expected to support largemouth bass (*Micropterus salmoides*), they will also be collected (n=5) and a fillet from each analyzed. For the reasons discussed in the *Protocol*, collections shall target bluegill ranging in size from 102 to 178 mm (i.e., 4 to 7 inches) and largemouth bass ranging in size from 307 to 385 mm (i.e., 12 to 15 inches); however, other leptomids (first priority being given to spotted sunfish, *Lepomis punctatus*) or sizes are to be collected if efforts fail to locate targeted fish. These samples will be analyzed for THg.

If, after one year of monitoring, sufficient data are collected to demonstrate that conditions at the pump stations and downstream stations are equivalent, collection of large-bodied fish can be reduced to one pump station and one downstream station, with concurrence of the Department. If stations are shown to differ in terms of average concentration in mosquitofish, large-bodied fish from the stations with the highest observed concentration may be sampled and results assessed as “worst case”. Mosquitofish collections would continue from all stations and the limited spatial sampling of large-bodied fish within the project is to revert to include formerly sampled stations if Phase 2 - Tier 2: Expanded Monitoring and Risk Assessment is triggered or if mosquitofish demonstrate significantly altered spatial patterns in mercury biomagnification.

Table 3 summarizes the monitoring requirements for Phase 2 - Tier 1: Monitoring during Five-Year Stabilization and Routine Operational Period.

#### **2.1.c Water**

The *Protocol* action criterion for evaluating THg in surface water was applied to assess whether Phase 2 – Tier 1 surface water data collected for the Merritt Pump Station between May 12, 2016 and July 24, 2018 exceeded the Florida Class III water quality standard in Chapter 62-302, Florida Administrative Code. Results demonstrated that none of the data exceeded the Florida Class III THg water quality standard of 12 ng/L. Based on this surface water evaluation, FDEP issued concurrence to terminate surface water monitoring for THg, MeHg, and sulfate at water monitoring stations (S488 and FAKA) associated with the Merritt Pump Station (S-488) on 01/30/2019.

For the Faka Union and Miller Pump Stations an unfiltered surface water sample (n = 1) will be collected on a quarterly frequency in accordance with Chapter 62-160, F.A.C., at each pump’s upstream pool and at the downstream station(s) associated with each pump (Figure 1). These samples will be analyzed for THg, MeHg, and sulfate (the latter not to be duplicative if listed as a parameter under routine monitoring described elsewhere in the general monitoring plan).

Surface water data will be evaluated against state water quality standards in Chapter 62-302, F.A.C. If, after one year of monitoring, concentrations do not exceed state water quality standards, surface water monitoring will be discontinued with concurrence of the Department.

**TABLE 3: PHASE 2 – TIER 1: Routine Monitoring During 5-Year Stabilization and Routine Operational Period**

Matrix	Station	Collection Method	Frequency	Parameter
Mosquitofish	FAKA S487 & FU2 <sup>2</sup> S486, TMBR37 & TMBR49	Net or Trap	Quarterly	THg
Sunfish and Bass (n = 5 each)	FAKA S487 & FU2 <sup>2</sup> S486, TMBR37 & TMBR49	Electro-shock or Hook and Line	Annually	THg
Surface Water <sup>1</sup>	S487 & FU2 <sup>2</sup> S486, TMBR37 & TMBR49	Grab	Quarterly	THg, MeHg, Sulfate

<sup>1</sup>Phase 2 – Tier 1 surface water sampling was terminated for S488 & FAKA with concurrence of the Department on January 30, 2019.

<sup>2</sup>The downstream station for fish and surface water associated with the Faka Union Pump Station will be in proximity of the FU2 weir.

### Assessment

To detect and minimize any adverse effects as early as possible (and to provide a basis for identifying adaptive management options, if deemed necessary), the results of this monitoring will be assessed based on the criteria and time table described under Phase 2 - Tier 1 in the *Protocol* as approved at the time of the assessment. Monitoring results will be provided to the Department in accordance with the reporting requirements identified in Section 3.

Based on these assessments, if monitoring reveals anomalous conditions as described under Phase 2 - Tier 2: Expanded Monitoring and Risk Assessment, the District shall expand monitoring and undertake all necessary steps under Phase 2 – Tier 2.

## **2.2 Tier 2 – Tier 2: Expanded Monitoring and Risk Assessment**

In accordance with the *Protocol*, if Tier 1 data exceed the action levels identified under Phase 2 – Tier 2 Expanded Monitoring and Risk Assessment, the District shall notify the Department and, after obtaining the Department's concurrence, shall expand monitoring and undertake all necessary steps consistent with the *Protocol*.

Phase 2 - Tier 2 is triggered if one of the following action levels is exceeded:

- If annual average THg levels in a given fish species become elevated to the point of exceeding the 90 percent upper confidence level of the basin-wide average, or if basin-specific data are lacking, exceeding the 75th percentile concentration for the period of record for all basins.
- If annual average THg levels in a given fish species increase progressively over time (probability factor .1).

- If a WQS in Chapter 62-302, F.A.C., is exceeded.

The following steps will be taken if any action level of Phase 2 - Tier 2 is triggered:

- Step 1: Notify permitting authority.
- Step 2: Resample media (e.g., water or fish) that triggered Tier 2.

If results of Step 2 (i.e., resampling of media that triggered Tier 2) demonstrate that the anomalous condition was an isolated event, the permitting authority will be notified that the project will revert and continue Phase 2 - Tier 1 monitoring. Alternatively, if results of Step 2 reveal the anomalous condition was not an isolated event, proceed to Step 3.

- Step 3: Expand the monitoring program as follows:
  - Increase frequency of mosquitofish collection from quarterly to monthly.
  - To further define the spatial extent of the problem, collect multiple mosquitofish composites from the downstream station exhibiting anomalous conditions.
  - If Tier 2 was triggered by tissue THg levels in large-bodied fish, increase sample size of large-bodied fish to 20, i.e., 20 each of sunfish (collect various species and sizes) and/or bass (collect various sizes and extract otolith from bass for age determination).
  - If Tier 2 was triggered by exceedance of a WQS, increase the frequency of surface water collection to monthly (reducing temporal interpretation), or as appropriate for hydraulic retention time, if necessary.

Step 3 will also include notification to the Department that anomalous conditions are continuing. The Department and the District may then develop an adaptive management plan using the data generated from the expanded monitoring program. This plan will evaluate the potential risks from continued operation under existing conditions (i.e., through a risk assessment for appropriate ecological receptors). If risk under existing operational conditions is deemed acceptable, then project monitoring would continue under a modified Tier 2 scheme to monitor exposure. On the other hand, if risk under existing operational conditions is deemed unacceptable, then the adaptive management plan would then proceed to determine potential remedial actions to (1) reduce exposure and risk (e.g., signage for human health concerns<sup>1</sup>, reduce fish populations, reduce forage

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<sup>1</sup> Note that assessment of potential human health impacts and corrective actions (i.e., signage) will require the involvement of the Florida Department of Health)

habitat suitability) and (2) affect mercury biogeochemistry to reduce net methylation (e.g., modify hydroperiod, stage, or water quality).

In developing this adaptive management plan, the Department may conduct a publicly noticed workshop to solicit comments from the District, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, National Park Service, Florida Fish and Wildlife Conservation Commission, and other interested persons.

The next step would then be to carry out such remedial or corrective action. If the remedial or corrective action is demonstrated to be successful, then the project would revert to Tier 1 monitoring. Alternatively, if monitoring data indicate that the remedial action was unsuccessful in reducing fish tissue concentrations, the Department and the District would then initiate a peer-reviewed, scientific assessment of the benefits and risks of the project.

### **2.3 Termination of Monitoring After Year 5**

If data collected under Phase 2 have not exceeded action criteria by Year 5, with concurrence of the Department, project-specific monitoring will be discontinued, and future assessments will be based on regional monitoring.

### **3.0 Annual Mercury Monitoring Report**

The District shall notify the Department immediately if monitoring data indicate that any of the action levels are exceeded. In addition, the District shall submit an annual report to be incorporated into the SFER and submitted to the Department no later than March 1<sup>st</sup> of each year. The annual report shall summarize the most recent results of the monitoring as defined above and compares them with the cumulative results from previous years. This report shall also evaluate assessment performance measures (i.e., action levels) outlined above.

### **4.0 Adaptive Management Strategy**

It is the intent that this monitoring plan will be carried out within the context of an adaptive management strategy that will allow for appropriate changes based on new, better understanding of mercury cycling, fate and transport as conveyed in the guidance contained in the *Protocol*.

## 5.0 History of Progression through Monitoring Phases and Tiers

Milestone – Merritt Pump Station	Date(s) of Collection or Concurrence
Phase 1 – Tier 2: Initial Startup Monitoring Prior to Discharge	08/27/15 – 09/22/15
FDEP Concurrence to Advance to Phase 2 – Tier 1	04/28/16
FDEP Concurrence to Terminate Other Toxicants Monitoring	04/07/17
Phase 2 – Tier 1: Monitoring During Stabilization and Routine Operational Period	12/02/15 – 10/07/20
FDEP Concurrence to Terminate Mercury Surface Water Monitoring	01/30/19
FDEP Concurrence to Transition from CGM 42.01 to CGM 42.02	01/30/19
FDEP Concurrence to Reduce Large-bodied Fish to One Interior Operable Unit	N/A
FDEP Concurrence to Terminate Mercury Monitoring at S488	07/13/21

Milestone – Faka Pump Station	Date(s) of Collection or Concurrence
Phase 1 – Tier 2: Initial Startup Monitoring Prior to Discharge	MM/DD/YY – MM/DD/YY
FDEP Concurrence to Advance to Phase 2 – Tier 1	MM/DD/YY
Phase 2 – Tier 1: Monitoring During Stabilization and Routine Operational Period	MM/DD/YY – MM/DD/YY
FDEP Concurrence to Terminate Mercury Surface Water Monitoring	MM/DD/YY
FDEP Concurrence to Reduce Large-bodied Fish to One Interior Operable Unit	MM/DD/YY
FDEP Concurrence to Terminate All Project-specific Mercury Monitoring	MM/DD/YY

Milestone – Miller Pump Station	Date(s) of Collection or Concurrence
Phase 1 – Tier 2: Initial Startup Monitoring Prior to Discharge	MM/DD/YY – MM/DD/YY
FDEP Concurrence to Advance to Phase 2 – Tier 1	MM/DD/YY
Phase 2 – Tier 1: Monitoring During Stabilization and Routine Operational Period	MM/DD/YY – MM/DD/YY
FDEP Concurrence to Terminate Mercury Surface Water Monitoring	MM/DD/YY
FDEP Concurrence to Reduce Large-bodied Fish to One Interior Operable Unit	MM/DD/YY
FDEP Concurrence to Terminate All Project-specific Mercury Monitoring	MM/DD/YY

### References:

MacDonald Environmental Sciences, Ltd. and USGS. 2003. *Development and Evaluation of Numerical Sediment Quality Assessment Guidelines for Florida Inland Waters*. Prepared by MacDonald Environmental Sciences, Ltd and United States Geological Survey and submitted to Florida Department of Environmental Protection, Tallahassee, FL.

USACE and SFWMD. 2018. *CERP Guidance Memorandum 42.02: Screening Process for Mercury and Other Toxicants*. United States Army Corps of Engineers, Jacksonville, FL, and South Florida Water Management District, West Palm Beach, FL.

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