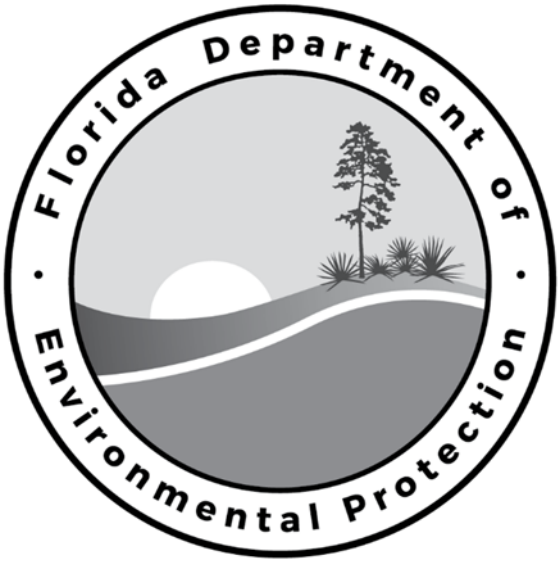


Biological Assessment of

Sam O. Purdom Electric Generating Station

Wakulla County

NPDES # FL0025526

Sampled May 4, 2015

February 2016

Biology Program

FDEP Laboratory

Division of Environmental Assessment and Restoration

FDEP Laboratory Quality Manual

NELAC Certification No. E31780

CONTENTS

Facility Overview

Methods

Results

Conclusion

Literature Cited

Tables

Table 1. Effluent limits, Class III Freshwater Criteria, field parameters, and analytical water chemistry data

Table 2. Effluent limits, Class III Freshwater Criteria and analytical metals data

Table 3. Measured and predicted freshwater algal growth potential (AGP)

Appendices

Appendix A. Map of facility

Appendix B. Facility Summary

Appendix C. Explanation of measurements

Appendix D. Chain of Custody

Appendix E. Physical/Chemical and Habitat Assessment field sheets

Appendix F. Chemical analyses of effluent and receiving water

EPA End Sheet

Facility Overview

The Sam O. Purdom Generating Station is an electric generating plant that intermittently discharges into the St. Marks River, a Class III Fresh Water (see map Appendix A). The permitted capacity of the wastewater system is 61.92 million gallons per day (MGD). Cooling tower makeup water from Unit 8 (the combined cycle unit) consists of reclaimed water from the City of St. Marks domestic wastewater treatment plant, industrial wastewater from the St. Marks Powder, Inc. facility, river water from the St. Marks River, and low volume wastes (LVW) from Unit 8. Unit 8 cooling tower blowdown normally discharges to a zero liquid discharge (ZLD) system. During ZLD system repair/maintenance, cooling tower blowdown is discharged at internal outfall I-002 (monitoring location OUI-2). The facility draws water from the St. Marks River at a rate of 30.96 MGD for augmentation of the cooling tower blowdown at external outfall D-001 (monitoring location EFF-1) for a combined flow of approximately 32.26 MGD during discharge events. The flow reported during this survey was 208 gallons per minute through I-002 on May 4, 2015, the day of sampling (discharge occurred from May 3-8, and again May 13-15, 2015). The facility discharged once in the year preceding this sampling event, June 14-18, 2014, with an average daily flow of 211 gallons per minute through I-002.

Biological assessments are prepared by FDEP staff to provide information for review of NPDES permit renewal applications. Biological assessments, in conjunction with other information concerning the subject facility and its receiving-water body, are used to determine appropriate permit conditions.

See the Facility Summary (Appendix B) for a description of the facility and summary of permit limits.

Methods

The purpose of this investigation was to determine the discharge's effects on the biota of the receiving waters. Chemical and biological comparisons were made between a Test Site (located in St. Marks River beginning 150 m downstream of the point of discharge and ending 50m downstream of the point of discharge) and a Control Site (located in the St. Marks River beginning 490 m upstream of the point of discharge and ending 590 m upstream of the point of discharge). Effluent samples were taken as grab samples from monitoring locations OUI-2 and EFF-1. Monitoring location OUI-2 is located where the effluent leaves the pipe and enters a mixing box at the beginning of the effluent canal, and monitoring location EFF-1 is located further downstream in the discharge canal, after the effluent is diluted with pumped river water. Samples were collected on May 4, 2015, on the second day of this discharge event.

All field and laboratory methods followed FDEP Standard Operating Procedures (see http://www.dep.state.fl.us/labs/library/lab_sops.htm and http://www.dep.state.fl.us/water/sas/sop/sops.htm for details) and met DEP quality assurance/quality control standards (see http://www.dep.state.fl.us/water/sas/qa/index.htm). Explanations of specific methods and measurements can be found in Appendix C.

The following were involved in this investigation: Cheryl Swanson, Ryan Coker, Mike Heyn, Todd Risk, Cassidy Reichert, Blake Spencer, and Robert Wiwi of FDEP Laboratory in Tallahassee. The report was reviewed by District representatives and the Point Source Studies Review Committee (Mike Tanski, Andrew Tintle, and Jennifer Walters).

Results

Physical and Chemical Parameters (See Table 1 and Appendices C, D, E, and F)

- Habitat Assessment scores were lower at the Test Site (75) compared to the Control Site (125), which places the Test Site in the Marginal category and the Control Site in the Optimal category. The Test Site was artificially channelized along the left bank and had much less available substrate than the Control Site. The Test Site is also partially dredged for shipping. It is the site of a large concrete seawall and endures barge action (see inlet for barge docking on the facility map, Appendix A).
- The pH (Standard Units), specific conductance (µmhos/cm), and dissolved oxygen (mg/L and % saturation) of the EFF-1 effluent, Control Site, and Test Site complied with Class III Freshwater Quality Criteria (62-302.530, F.A.C.) and/or effluent permit limits. Specific conductance of the OUI-2 effluent was nearly four times the value detected in the EFF-1 effluent sample.

Organic Constituents (See Table 1 and Appendix F)

- No organic constituents were detected in the effluent.
- No organic constituents were detected in the field blank.

Nutrients (See Table 1 and Appendix F)

- At the time of sampling, the river was predominantly freshwater, so freshwater Numeric Nutrient Criteria (NNC) for the Panhandle West Nutrient Watershed Region may apply. Administrative Order No. AO-030-TL, issued October, 27, 2015, states that the NNC thresholds must be met within 48 months of issuance. The NNC threshold for Total Nitrogen (1.03 mg/L) was exceeded in the EFF-1 effluent sample (10.2 mg/L). The NNC threshold for Total Phosphorus (0.18 mg/L) was not exceeded in the EFF-1 effluent sample (0.07 mg/L). The NNC do not apply to the internal outfall OUI-2 samples, in which the detected total nitrogen (975 mg/L) and total phosphorus: (2.5 mg/L) were both detected in much higher amounts than in the EFF-1 sample. Because the NNC threshold is expressed as an annual geometric mean, not a single sample result, compliance could be determined with additional sampling events.
- Total nitrogen trends were dictated by the amounts of nitrate+nitrite detected in the samples. Nitrate+nitrite detected in the OUI-2 effluent sample was two orders of magnitude higher than the amount detected in the EFF-1 effluent grab sample. Nitrate + nitrite detected in the EFF-1 sample was two orders of magnitude higher than what was detected in the Test Site sample, which was 1.5 times higher than the amount detected in the Control Site sample.
- Total phosphorus detected in the OUI-2 effluent sample was thirty-five times higher than the amount detected in the EFF-1 effluent sample. Total phosphorus in the EFF-1 sample was 1.5 times higher than the amounts detected in either the Test or Control Site samples.
- Total ammonia, total Kjeldahl nitrogen, and organic nitrogen amounts detected in the OUI-2 effluent grab sample were also an order of magnitude higher than those detected in the EFF-1 sample. The amounts of each in the effluent EFF-1 sample were approximately double the amounts detected in either the Test or Control Site samples.
- No nutrients were detected in the field blank.

Analytical Water Chemistry (See Table 1 and Appendix F)

- Total residual chlorine (TRC; mg/L) was not detected in an EFF-1 sample using a Hach kit in the FDEP laboratory (Q-qualifier, sample held beyond normal holding time).

Metals (See Table 2 and Appendix F)

- All metals detected in the EFF-1 effluent grab samples were present at levels that complied with effluent permit limits and Class III Freshwater Quality Criteria (62-302.530, F. A. C.).
- Sampling for metals was not scheduled for OUI-2.
- Calcium was detected in the field blank and magnesium was detected in the field blank between the MDL and PQL.

Algal Growth Potential (See Table 3 and Appendix F)

- Raschke and Shultz (1987) determined that AGP values above 5.0 mg dry weight/L, which represents a "problem" threshold for fresh receiving waters, imply nutrient enrichment. The AGP value of the EFF-1 effluent sample using the freshwater species, *Pseudokirchneriella subcapitata,* was approximately 11 times greater than the problem threshold value. The analytical chemistry suggests that the EFF-1 effluent is phosphorus-limited. The AGP values of the Test and Control Sites were only slightly above the problem threshold value. The analytical chemistry suggests that both sites are nitrogen-limited.

Bioassessment

Macroinvertebrates

- No macroinvertebrates were collected because of the tidal influence in this section of the St. Marks River.

Periphyton (See Appendix E)

- The Rapid Periphyton Surveys (RPS) conducted at the Test Site showed no evidence of algal imbalance in comparison with the RPS conducted at the Control Site.
- A Linear Vegetation Survey (LVS) was conducted for NNC determination in the future, and lists of plant life found along the Test and Control Sites have been generated (see Appendix E).

Conclusion

Nutrient levels in the Test and Control Site samples were low compared to the high values of phosphorus and nitrate + nitrite detected in the OUI-2 and EFF-1 effluent samples. However, the amount of nitrate + nitrite in the Test Site sample was 1.5 times higher than the amount detected in the Control Site sample. The AGP values of the Test and Control Sites were also low compared to the high AGP of the effluent EFF-1 sample. This suggests that the effluent may have the potential to contribute nutrients to the receiving waters, but those effects were not seen during this sampling event. Downstream effects are unlikely and if they occur, may be difficult to detect because of infrequent effluent discharge events and barge action in the Test Site that could break up algal mats, periphyton, etc.

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USEPA. 2000. Nutrient Criteria Technical Guidance Manual – River and Streams. EPA-822-B-00-002.

Table 1. Effluent limits, Class III Freshwater Criteria, field parameters, and analytical water chemistry data

Sam O. Purdom Generating Station	Units	Class III Criteria	Effluent OUI-2 Permit Limits	Effluent OUI-2	Effluent EFF-1 Permit Limits	Effluent EFF-1	Test Site	Control Site
Field Parameters								
Sample Depth	m	-	-	0.25	-	-	0.25	0.25
Temperature	C	-	-	19.9	≤ 35	19.5	20.4	20.3
pH	SU	6.0 - 8.5	-	7.4	-	7.4	7.8	7.7
Specific Conductance	µmhos/cm	≤ 1,275	-	2250	-	578	259	261
Salinity	ppth	-	-	1 c	-	0.3 c	0.14 c	0.14 c
Dissolved Oxygen	% saturation	34	-	87.9	-	74.7	74.5	74.5
Dissolved Oxygen	mg/L	-	-	8.0	-	6.9	6.7	6.7
Organic Constituents								
Sucralose	µg/L	-	-	-	-	0.10	0.010 U	0.010 U
Nutrients and Analytical Water Chemistry data								
Ortho-phosphate	mg P/L	-	-	-	-	0.046	0.035	0.036
Total Phosphorus	mg P/L	-	-	2.5	-	0.070	0.048	0.048
Total Ammonia	mg N/L	-	-	0.97	-	0.017	0.008	0.007
Un-ionized Ammonia (calculated salinity)	mg N/L	≤ 0.02 s	-	< 0.02 c	-	< 0.02 c	< 0.02 c	< 0.02 c
Nitrate and Nitrite	mg N/L	-	-	960	-	9.5	0.098	0.062
Total Kjeldahl Nitrogen	mg N/L	-	Report	15 I	-	0.65 J [1]	0.23	0.28
Organic Nitrogen	mg N/L	-	-	14 c	-	0.63 c	0.22 c	0.27 c
Total Nitrogen	mg N/L	-	Report	975 c	-	10.2 c	0.33 c	0.34 c
Total Organic Carbon	mg C/L	-	-	-	-	6.9 A	6.1	6.1
Chlorophyll a - Corrected	µg/L	-	-	-	-	1.6 I	1.3 I	0.86 I
Phaeophytin	µg/L	-	-	-	-	0.71 I	0.42 I	0.61 I
CBOD, 5 day, N - inhibited	mg/L	-	-	-	-	1.7 I	1.2 I	0.77 I
Hardness	mg/L	-	-	-	Report	155 c	132 c	132 c
Total Residual Chlorine	mg/L	≤ 0.01	-	-	≤ 0.01	≤ 0.03 Q [2]	-	-
Total Suspended Solids	mg/L	-	100.0	-	-	4 I	3 I	2 I
Turbidity	NTU	< 29 t	-	-	-	1.8	1.5 A	1.4
Color (true)	PCU	-	-	-	-	57	58 A	58
Alkalinity	mg CaCO3/L	≥ 20	-	-	-	114 A	106 A	106
Chloride	mg Cl/L	-	-	-	-	49 A	6.9 A	6.4
Fluoride	mg F/L	≤ 10.0	-	-	-	0.14	0.13	0.13
Sulfate	mg SO4/L	-	-	-	-	47 A	7.3 A	7.2
Oils and Greases	mg/L	≤ 5.0	-	-	-	0.78 U	0.73 U	0.72 U

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.

c - Value is calculated

s - Single sample

t - Shall not exceed 29 NTUs above background

A - Value reported is the mean of two or more determinations

I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

J - Estimated value

U - Material analyzed for but not detected; value reported is the method detection limit

Q - Sample held beyond normal holding time

1 - Quality Control failure(s) observed

2 – Measurement taken in the FDEP Laboratory.

Table 2. Effluent limits, Class III Freshwater Criteria and analytical metals data

Sam O. Purdom Generating Station	Units	Effluent EFF-1 Class III Criteria	Effluent EFF-1 Permit Limits	Effluent EFF-1	Test Site Class III Criteria	Test Site	Control Site Class III Criteria	Control Site	Field Blank
Aluminum	µg/L	-	-	76 I	-	65 I	-	89 I	60 U
Arsenic	µg/L	≤ 50	-	0.62 I	≤ 50	0.48 I	≤ 50	0.51 I	0.25 U
Cadmium	µg/L	≤ 0.374 b	-	0.050 U	≤ 0.333 b	0.050 U	≤ 0.332 b	0.050 U	0.050 U
Calcium	mg/L	-	-	44.3	-	40.6	-	40.4	0.50
Chromium, Total [g]	µg/L	≤ 123 b	-	0.62 I	≤ 108 b	0.51 I	≤ 108 b	2.3	0.30 U
Copper	µg/L	≤ 13.5 b	-	7.14	≤ 11.9 b	0.50 U	≤ 11.8 b	0.64 I	0.50 U
Iron	µg/L	≤ 1,000	≤ 1,000	200	≤ 1,000	210	≤ 1,000	220	30 U
Lead	µg/L	≤ 5.54 b	-	0.20 U	≤ 4.55 b	0.20 U	≤ 4.52 b	0.35 I	0.20 U
Magnesium	mg/L	-	-	10.7	-	7.55	-	7.48	0.084 I
Mercury	µg/L	-	≤ 0.012	0.0014	-	0.0014	-	0.0014	0.00010 U
Nickel	µg/L	≤ 75.4 b	-	1.63	≤ 66.2 b	0.25 U	≤ 65.8 b	1.72	0.25 U
Potassium	mg/L	-	-	7.5	-	0.69 I	-	0.65 I	0.30 U
Selenium	µg/L	≤ 5.0	-	0.27 I	≤ 5.0	0.20 U	≤ 5.0	0.20 U	0.20 U
Silver	µg/L	≤ 0.07	-	0.025 U	≤ 0.07	0.025 U	≤ 0.07	0.025 U	0.025 U
Sodium	mg/L	-	-	55.4	-	5.0	-	4.4	0.50 U
Zinc	µg/L	≤ 173 b	-	5.0 U	≤ 152 b	5.0 U	≤ 151 b	5.0 U	5.0 U

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.

b - Value is calculated based on hardness, (62-302.530(3))

g - Class III Freshwater Quality Criterion (62-302.530(19)(a), F.A.C.) is for chromium-III

I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

U - Material analyzed for but not detected; value reported is the method detection limit

Table 3. Measured and predicted algal growth potential (AGP; mg dry weight/L) for total soluble inorganic nitrogen (TSIN), ortho-phosphate (OP), total nitrogen (TN) and total phosphorus (TP) limitation and ratios of nitrogen to phosphorus

Sam O. Purdom Generating Station								
Location	**Test Species**	**AGP (measured)**	**Predicted AGP (TSIN) ± 20%**	**Predicted AGP (OP) ± 20%**	**Predicted AGP (TN) ± 20%**	**Predicted AGP (TP) ± 20%**	**Inorganic N:P ratio**	**Total N:P ratio**
Effluent EFF-1	*Pseudokirchneriella subcapitata*	55.3 A	not applicable [3]	19.8 ± 4	not applicable [3]	30.1 ± 6	206.9	145
Test Site	*Pseudokirchneriella subcapitata*	7.03	4 ± 0.8	not applicable [4]	12.5 ± 2.5	not applicable [4]	3	6.8
Control Site	*Pseudokirchneriella subcapitata*	6.77	2.6 ± 0.5	not applicable [4]	13 ± 2.6	not applicable [4]	1.9	7.1

Pseudokirchneriella subcapitata – Freshwater species

A - Value reported is the mean of two or more determinations

3 - Predictions not applicable to phosphorus-limited freshwaters

4 - Predictions not applicable to nitrogen-limited freshwaters

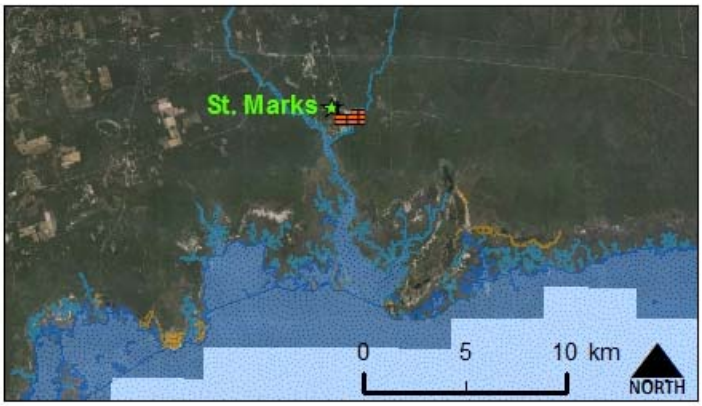
Appendix A

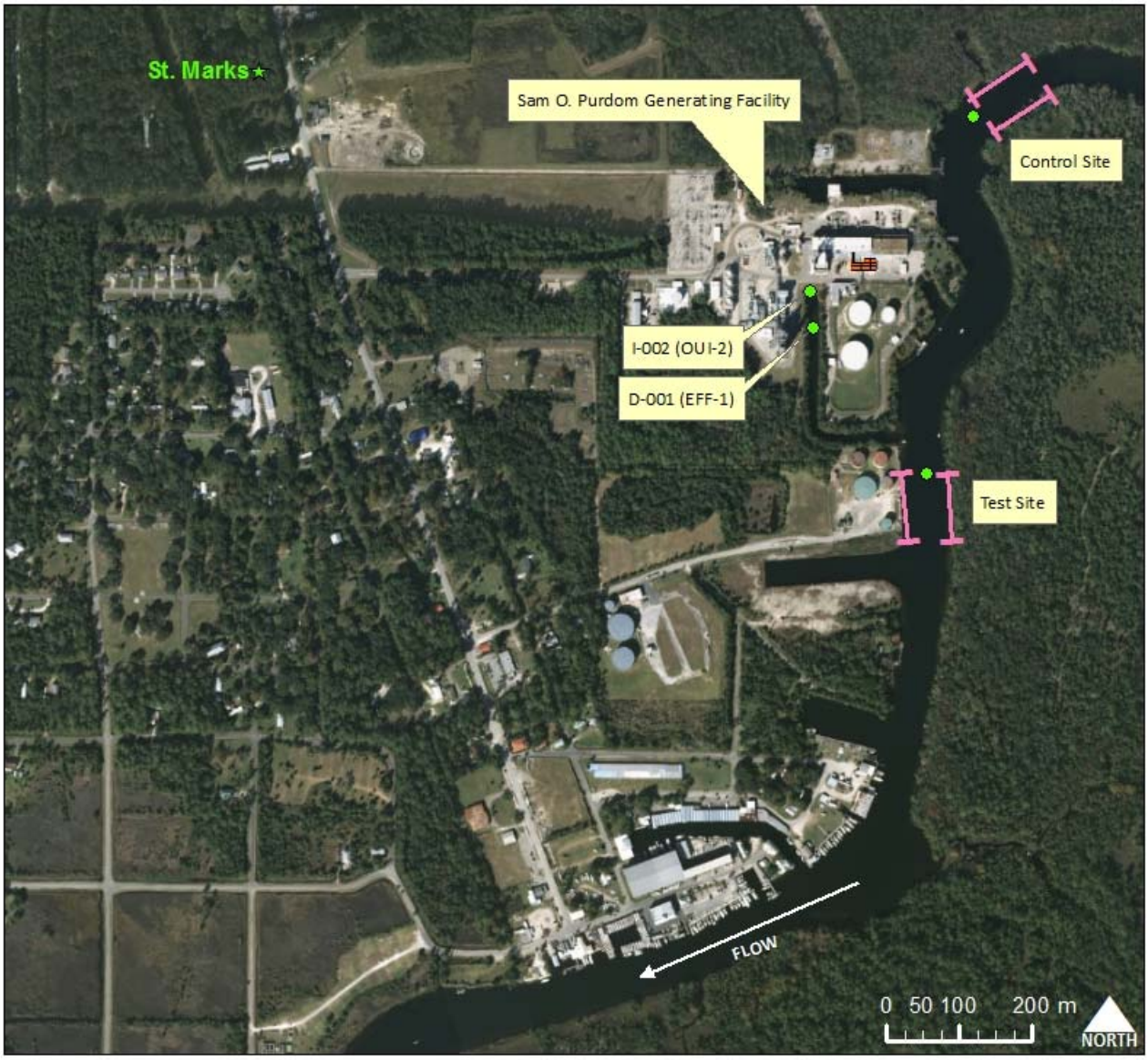
Map of Facility

Sam O. Purdom Generating Station

Fifth Year Bioassessment Sampling Locations







Appendix B

Facility Summary

State of Florida
Department of Environmental Protection
Facility Introduction & Summary

PART I: Information gathered prior to sampling event	
Prepared By: Shelley Alexander	**Contact Number:** 850-595-0677
Facility Name (as it appears on permit): Sam O. Purdom Generating Station	**Former Names:** NA
NPDES Permit Number: FL0025526	**Permit Expiration Date:** 05/13/2015
Physical Address: 667 Port Leon Drive	
District: NWD	**County:** Wakulla
Function of Facility: Electric generating plant	
Facility Type: IW	**Permitted Capacity (MGD):** 62.9
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): June 2014-June 2015: D-001= 32 MGD; INT-002=.3 MGD	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months):	
Description of type of Discharge: ☐ **Continuous** ☒ **Intermittent** ☐ **Seasonal** ☐ **Rainfall Dependent** ☐ **Other, please specify**	

Description of Permitted Outfall(s):

D-001(monitoring site EFF-1)-An existing 61.9 MGD maximum permitted discharge from Unit 7 to the discharge canal and thence to the St. Marks River, Class III Fresh Waters (WBID 793B). The point of discharge is located approximately at latitude 30 09 44 N, longitude 84 10 00 W. Centerline of the discharge canal at the catwalk approximately 175 ft. downstream from the end-of-pipe.

D-005-An existing 1.0 MGD maximum permitted discharge from combustion turbine Units GT-1 and GT-2 to the discharge canal and thence to the St. Marks River, Class III Freshwaters (WBID 793B). The point of discharge is located approximately at latitude 30 9 72.1 N, longitude 84 12 04 W.

I-002-An existing permitted discharge from Unit 8 into a concrete structure in which it mixes with OTCW from Unit 7 before entering the discharge canal (monitoring site OUI-2)-Sampling point for the Unit 8 cooling tower blowdown after discharge from Wastewater Tank No. 2 and before mixing with OTCW from Unit 7 in the concrete structure at the head of the discharge canal.

Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility):

The facility is an electric generating plant with a total nameplate rating of 318.6 megawatts (MW).The existing facility consists of one fossil-fueled steam electric generating unit (Unit 7), one combined cycle unit (Unit 8), two simple cycle combustion turbines (Units GT-1 and GT-2), and one auxiliary boiler. The maximum nameplate generating capacities for Unit 7, Unit 8 and combustion turbines are 44 MW, 250 MW, and 12.3 MW each, respectively. Unit 7 is fired by natural gas, No.2 fuel oil or on-specification used oil. Unit 8 and the combustion turbines are fired by natural gas or No. 2 fuel oil. The auxiliary boiler is natural-gas fired and is only used as a source of steam when either Unit 7 or Unit 8 is not operating.

Unit 7 has a condenser Once Through Cooling Water (OTCW) system that uses water from the St. Marks River, a Class III freshwater. Unit 8 has a cooling tower. The cooling tower blow down discharges to a zero liquid discharge (ZLD) system. During ZLD system repair/maintenance, Unit 8 cooling tower blow down comingles with the Unit 7 OTCW discharge through an internal outfall. Unit 8 cooling tower makeup water consists of reclaimed water from the City of St. Marks domestic wastewater treatment plant, industrial wastewater from the St. Marks Powder, Inc. facility, river water from the St. Marks River, and low volume wastes (LVW) from Units 7 and 8. LVW includes floor drains, boiler blowdown, demineralizer regeneration waste, laboratory wastes, and miscellaneous equipment washes. Each combustion turbine, Units GT-1 and GT-2, has an auxiliary equipment cooling water system that uses water from the St. Marks River.

Wastewater currently consists of blowdown from Unit 8 cooling tower when the ZLD system is offline for repair/maintenance, OTCW system from Unit 7, and once-through, non-contact auxiliary equipment cooling water from Units GT-1 and GT2. Unit 8 cooling tower water is treated by pH adjustment with sulfuric acid, mixing, sedimentation, and disinfection with sodium hypochlorite, and by the addition of scale and corrosion inhibitors. LVW is treated in an oil/water separator and then routed to the Unit 8 cooling tower for use as a makeup water.


I-002
D-003
D-001
I-003
D-005
D-004
Google earth

List <u>current</u> Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under

PERMITTEE: City of Tallahassee
FACILITY: Sam O. Purdom Generating Station
PERMIT NUMBER: FL0025526-003 (Major)
EXPIRATION DATE: **May 13, 2015**

I. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

A. Surface Water Discharges

1. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge once-through non-contact cooling water from Outfall D-001 to St. Marks River. Such discharge shall be limited and monitored by the permittee as specified below and reported in accordance with Permit Condition I.C.3.:

			Effluent Limitations		Monitoring Requirements			
Parameter	Units	Max/ Min	Limit	Statistical Basis	Frequency of Analysis	Sample Type	Monitoring Site Number	Notes
Flow	MGD	Max Max	Report Report	Monthly Average Daily Maximum	Daily; 24 hours	Pump Logs	INT-1	
Temperature, Water	Deg F	Max Max	90 95	Daily Average Instantaneous Maximum	Continuous	Meter	EFF-1	
Chlorine, Total Residual	mg/L	Max	0.01 0.01	Monthly Average Daily Maximum	Weekly, when discharging	Grab	EFF-1	See I.A.4
Chromium, Trivalent Total Recoverable	ug/L	Max		Single Sample	Weekly, when discharging	Grab	EFF-1	See I.A.4, I.A.5
Copper, Total Recoverable	ug/L	Max		Single Sample	Weekly, when discharging	Grab	EFF-1	See I.A.4, I.A.5
Iron, Total Recoverable	mg/L	Max	1.0 1.0	Monthly Average Daily Maximum	Weekly, when discharging	Grab	EFF-1	See I.A.4
Mercury, Total Recoverable	ug/L	Max	0.012 0.012	Monthly Average Daily Maximum	Monthly, when discharging	Grab	EFF-1	See I.A.4, I.A.6
Zinc, Total Recoverable	ug/L	Max		Single Sample	Weekly, when discharging	Grab	EFF-1	See I.A.4, I.A.5
Hardness, Total (as CaCO3)	mg/L	Max	Report	Single Sample	Weekly, when discharging	Grab	EFF-1	See I.A.4, I.A.5
Chronic Whole Effluent Toxicity, 7-Day IC25 (Mysidopsis bahia/ Ceriodaphnia dubia)	percent	Min	100	Single Sample	Semi-annually	24-hr TPC	EFF-1	See I.A.4, I.A.10
Chronic Whole Effluent Toxicity, 7-Day IC25 (Menidia beryllina/ Pimephales promelas)	percent	Min	100	Single Sample	Semi-annually	24-hr TPC	EFF-1	See I.A.4, I.A.10

2. Effluent samples shall be taken at the monitoring site locations listed in Permit Condition I.A.1. and as described below:

Monitoring Site Number	Description of Monitoring Site

Florida Department of Environmental Protection Northwest District Office
Industrial Wastewater Program
160 Governmental Center
Pensacola, Florida 32501-5794

B. Internal Outfalls

1. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge Unit 8 cooling tower blowdown and low volume wastes consisting of boiler blowdown, regenerator wastes, laboratory wastes, floor drain wastewater, and miscellaneous wastestreams from I-002 to into a concrete structure in which it mixes with OTCW from Unit 7 before entering the discharge canal. Such discharge shall be limited and monitored by the permittee as specified below and reported in accordance with Permit Condition I.C.3.:

			Effluent Limitations		Monitoring Requirements			
Parameter	Units	Max/ Min	Limit	Statistical Basis	Frequency of Analysis	Sample Type	Monitoring Site Number	Notes
Flow	MGD	Max Max	Report Report	Monthly Average Daily Maximum	Daily, when discharging	Meter	OUI-2	
Solids, Total Suspended	mg/L	Max Max	30.0 100.0	Monthly Average Daily Maximum	Weekly, when discharging	Grab	OUI-2	
Chlorine, Free Available	mg/L	Max	0.2 0.5	Monthly Average Daily Maximum	Per application, when discharging	Multiple Grab	OUI-2	
Chromium, Trivalent Total Recoverable	ug/L	Max	200 200	Monthly Average Daily Maximum	Weekly, when discharging	Grab	OUI-2	
Copper, Total Recoverable	ug/L	Max	Report	Daily Maximum	Weekly, when discharging	Grab	OUI-2	
Zinc, Total Recoverable	ug/L	Max	1000 1000	Monthly Average Daily Maximum	Weekly, when discharging	Grab	OUI-2	
Nitrogen, Kjeldahl, Total (as N)	mg/L	Max	Report	Daily Maximum	Weekly, when discharging	Grab	OUI-2	
Nitrogen, Total	mg/L	Max	Report	Daily Maximum	Weekly, when discharging	Grab	OUI-2	
Nitrite plus Nitrate, Total 1 det. (as N)	mg/L	Max	Report	Daily Maximum	Weekly, when discharging	Grab	OUI-2	
Duration of Discharge	hr/yr[1]	Max	438	Annual Total	Monthly	Calculated	OUI-2	See I.B.5
126 priority pollutants	ug/L	Max Max	<MDL <MDL	Daily Maximum Monthly Average	Annually	Grab or Calculation	OUI-2	See I.B.6

[1] The units in which this parameter is reported on the Discharge Monitoring Report is in terms of hours, which shall mean the cumulative number of hours that blowdown from Unit 8 cooling tower has been discharged to the St. Marks River since January 1 of the current year.

PART I: Continued	
Receiving Waters: St. Marks River	**Classification (indicate whether fresh or marine):** Class III

Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.):

10. The permittee shall comply with the following requirements to evaluate chronic whole effluent toxicity of the discharge from outfall D-001.

    a. Effluent Limitation
       (1) In any routine follow-up test for chronic whole effluent toxicity, the 25 percent inhibition concentration (IC25) shall not be less than 100% effluent. [Rules 62-302.530(61) and (1)(b), F.A.C.]
       (2) For acute whole effluent toxicity, the 96-hour LC50 shall not be less than 100% effluent in any test. [Rules 62-302.500(1)(a)4. and 62-4.241(1)(a), F.A.C.]

    b. Monitoring Frequency
       (1) Routine toxicity tests shall be conducted once every six months during the first occurrence in each six month period of the Unit 8 cooling tower blowdown discharging to the St. Marks River and lasting for the duration of this permit.

    c. Sampling Requirements
       (1) For each routine test or additional follow-up test conducted, a total of three 24-hour composite samples of final effluent shall be collected and used in accordance with the sampling protocol discussed in EPA-821-R-02-014, Section 8.
       (2) The first sample shall be used to initiate the test. The remaining two samples shall be collected according to the protocol and used as renewal solutions on Day 3 (48 hours) and Day 5 (96 hours) of the test.
       (3) Samples for routine and additional follow-up tests shall not be collected on the same day.

    d. Test Requirements
       (1) Routine Tests: All routine tests shall be conducted using a control (0% effluent) and a minimum of five test dilutions: **100%**, **50%**, **25%**, **12.5%**, and **6.25%** final effluent.
       (2) The permittee shall conduct 7-day survival and growth chronic toxicity tests with a mysid shrimp, **Americamysis (Mysidopsis) bahia**, Method 1007.0, and an inland silverside, **Menidia beryllina**, Method 1006.0, concurrently. If the composite effluent sample salinity is less than 1 ppm, measured as conductivity, the permittee may conduct a daphnid, **Ceriodaphnia dubia**, Survival and Reproduction Test and a fathead minnow, **Pimephales promelas**, Larval Survival and Growth Test, concurrently. However, the permittee should consider whether the salinity of the composite effluent in the second or third sample will continue to be less than 1 ppm.
       (3) All test species, procedures and quality assurance criteria used shall be in accordance with **Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms**, 3rd Edition, EPA-821-R-02-014, if using saltwater species; and **Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms**, 4th Edition , EPA-821-R-02-013 if using freshwater species. Any deviation of the bioassay procedures outlined herein shall be submitted in writing to the Department for review and approval prior to use. In the event the above method is revised, the permittee shall conduct chronic toxicity testing in accordance with the revised method.

4) (a) If saltwater species are used, the control water and dilution water used shall be artificial sea salts as described in EPA-821-R-02-014, Section 7.2. The test salinity shall be determined as follows:
   1. For the **Americamysis bahia** bioassays, the effluent shall be adjusted to a salinity of 20 parts per thousand (ppt) with artificial sea salts. The salinity of the control/dilution water (0% effluent) shall be 20 ppt. If the salinity of the effluent is greater than 20 ppt, no salinity adjustment shall be made to the effluent and the test shall be run at the effluent salinity. The salinity of the control/dilution water shall match the salinity of the effluent.
   2. For the **Menidia beryllina** bioassays, if the effluent salinity is less than 5ppt, the salinity shall be adjusted to 5 ppt with artificial sea salts. The salinity of the control/dilution water (0% effluent) shall be 5 ppt. If the salinity of the effluent is greater than 5 ppt, no salinity adjustment shall be made to the effluent and the test shall be run at the effluent salinity. The salinity of the control/dilution water shall match the salinity of the effluent.
   3. If the salinity of the effluent requires adjustment, a salinity adjustment control should be prepared and included with each bioassay. The salinity adjustment control is intended to identify toxicity resulting from adjusting the effluent salinity with artificial sea salts. To prepare the salinity adjustment control, dilute the control/dilution water to the salinity of the effluent and adjust the salinity of the salinity adjustment control at the same time and to the same salinity that the salinity of the effluent is adjusted using the same artificial sea salts.

   (b) If freshwater species are used, the control water and dilution water shall be moderately hard water as described in EPA-821-R-02-013, Section 7.2.3.

e. Quality Assurance Requirements
   (1) A standard reference toxicant (SRT) quality assurance (QA) chronic toxicity test shall be conducted with each species used in the required toxicity tests either concurrently or initiated no more than 30 days before the date of each routine or additional follow-up test conducted. Additionally, the SRT test must be conducted concurrently if the test organisms are obtained from outside the test laboratory unless the test organism supplier provides control chart data from at least the last five monthly chronic toxicity tests using the same reference toxicant and test conditions. If the organism supplier provides the required SRT data, the organism supplier's SRT data and the test laboratory's monthly SRT-QA data shall be included in the reports for each companion routine or additional follow-up test required.

(2) If the mortality in the control (0% effluent) exceeds 20% for either species in any test or any test does not meet "test acceptability criteria", the test for that species (including the control) shall be invalidated and the test repeated. Test acceptability criteria for each species are defined in EPA-821-R-02-014, Section 14.12 (**Americamysis bahia**) and Section 13.12 (**Menidia beryllina**); and EPA-821-R-02-013, Section 13.12 (**Ceriodaphnia dubia**) and Section 11.11 (**Pimephales promelas**). The repeat test shall begin within 21 days after the last day of the invalid test.

(3) If 100% mortality occurs in all effluent concentrations for either species prior to the end of any test and the control mortality is less than 20% at that time, the test (including the control) for that species shall be terminated with the conclusion that the test fails and constitutes non-compliance.

(4) Routine and additional follow-up tests shall be evaluated for acceptability based on the observed dose-response relationship as required by EPA-821-R-02-014 or EPA-821-R-02-013, Section 10.2.6., and the evaluation shall be included with the bioassay laboratory reports.

Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.):

None

Facility Mixing Zone Details (if applicable): None

List Permit Violations (DMR data) and plant upsets that occurred at the plant within the last year:

Date	Parameter and Units	Limit	Result
N/A			

Describe previous FYI and WQBEL study:

Describe previous or current Enforcement Actions (including WLs):

None

Describe any violations or problems noted in previous inspection:

None

Discuss whether DMR trends within previous five years are improving or declining:

Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse):

PART II: Sampling Event Information	
Date(s) sample collected: May 4, 2015	**Sampler(s):** Cheryl Swanson, Ryan Coker, Blake Spencer, Mike Heyn, Cassidy Reichert
Temperature (Deg C): 19.9 (OUI-2) 19.5 (D-001)	**pH (SU):** 7.4 (OUI-2) 7.4 (D-001)
Dissolved Oxygen (mg/L): 7.95 (OUI-2) 6.85 (D-001)	**Conductivity (umhos/cm):** 2250 umhos (OUI-2) 578 umhos (D-001)
Total Residual Chlorine (mg/L):	**Total Residual Chlorine - after Disinfection (mg/L):** < 0.03 mg/L (measured in FDEP toxicity lab) (D-001)
Method of Chlorination: Sodium Hypochlorite	**Method of De-chlorination:**
Flow During Sample Collection for each outfall(MGD): 208 gpm	
Mean Flow for each outfall for previous 12 months based on sampling date (If samples are taken on more than one day, indicate Mean Flow for each day):	
Describe Discharge during Sampling Event: ☒ **Continuous** ☐ **Intermittent** ☐ **Seasonal** ☐ **Rainfall Dependent** ☐ **Other, please specify**	
Describe any conditions, difficulties or abnormal events that occurred during the sample collection and any other additional comments here:	

Appendix C

Explanation of Measurements

(1) Quality Assurance and Quality Control

FDEP's quality assurance requirements for analytical laboratories and field activities are codified in Chapter 62-160, F.A.C., Quality Assurance (QA Rule) and in internal Standard Operating Procedures (FDEP SOPs). Methods for all analyses are on file at the FDEP Central Laboratory in Tallahassee and may be viewed on the web at http://www.dep.state.fl.us/labs/library/lab_sops.htm and/or http://www.dep.state.fl.us/water/sas/qa/index.htm.

(2) Chemical Analyses of the Effluent

The effluent was analyzed for nutrients, metals, organic constituents (base, neutral, and acid extractables) and pesticides following FDEP SOPs. The results from these analyses were compared with Water Quality Criteria (62-302, F.A.C.) and facility permit limits.

(3) Toxicity Bioassays

Greater than 50% mortality in an acute toxicity test may constitute an exceedance of 62-302.500(1)a and/or facility permit limits. A 25% inhibition concentration (IC25) is the effluent concentration causing a 25% reduction in a biological response such as biomass or reproduction when compared to a control population. An IC25 of less than 100% in a chronic test may constitute exceedances of 62-302.530(20), 62-302.530(61) and/or facility permit limits. A no observed effect concentration (NOEC) less than 100% effluent in a chronic test may constitute an exceedance of 62-302.530(61) and/or facility permit limits. Standard reference toxicant (SRT) tests are conducted monthly to ensure quality in toxicity testing.

(4) Habitat Assessment

Habitat assessment is used to evaluate the physical structure and extent of disturbance in a waterbody. Eight aspects are ranked, with 20 possible points for each aspect (QA Rule SOP FT 3100). The Habitat Assessment score includes types and amounts of benthic substrates, water velocity, amount of sand or silt accumulation, extent of artificial channelization, bank stability, and riparian zone width and vegetation type. All scores are summed to yield an overall Habitat Assessment score. Habitat Assessment score ranges from 11-160 and overall habitat quality is assigned to one of four categories: Optimal (120-160 points), Suboptimal (80-119 points), Marginal (40-79 points), and Poor (11-39 points).

(5) Algal Growth Potential (AGP)

The algal growth potential (AGP) value is the peak growth of the alga within that 14-day period, recorded as mg dry weight/L. Raschke and Shultz (1987) found that an AGP above 5.0 mg dry weight/L represents a “problem” threshold for fresh receiving waters, implying nutrient enrichment. High AGP values may constitute exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a), F.A.C. and/or 62-302.530(47)(b), F.A.C..

The concentration of nutrients in a water sample may be used to calculate the expected yield of AGP under the assumption that other required nutrients (e.g. silicon, micronutrients) are present in excess (Miller *et al*. 1978). The expected amount of production is calculated as 38 times the total soluble inorganic nitrogen (nitrate and nitrite plus ammonia) under nitrogen limitation or 430 times the ortho-phosphate (OP) concentration under phosphorus limitation with an error of $\pm$ 20%. When the ratio of nitrogen to phosphorus (N: P) is less than 10:1, nitrogen limitation of algal production is likely. When the N: P ratio is 20:1 or greater, phosphorus limitation is likely (USEPA 2000). For ratios in-between, co-limitation may occur. Production of lower biomass than expected may be evidence of growth inhibition related to toxic compounds present in the water sample tested and may constitute an exceedance of 62-302.530(61), F.A.C.

(6) Rapid Periphyton Survey

Rapid Periphyton Survey (RPS) is a rapid method to quantify the extent and abundance of attached algae (periphyton) in a stream or river. A total of 99 points are assessed within a 100m area of sampling reach, 9 equidistant points along 11 cross-section transects spaced 10 m apart, If greater than 20% of sampled points have algal lengths greater than 6mm, a sample is collected and the autecological information associated with the dominant algae is evaluated (see FDEP SOP FS 7230 Rapid Periphyton Survey). This method could be used to determine floral health associated with Chapter 62-302.531, F.A.C..

(7) Linear Vegetation Survey

Linear Vegetation Survey (LVS) is a rapid screening tool for ecological condition, by determining how closely a site’s flora resembles that of an undisturbed condition. When the total area of macrophytes equals or exceeds two square meters within the wetted area of the 100 m

sampling reach, macrophyte taxonomic names are recorded (FDEP SOP FS 7320 Stream and River Linear Vegetation Survey (LVS) Method). This method could be used to determine floral health associated with Chapter 62-302.531, F.A.C..

(8) Definition of Qualifiers

A - Value reported is the mean of two or more determinations

B - Results based on colony counts outside the acceptable range.

I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

J - Estimated value

K - Actual value is known to be less than value given

L - Actual value is known to be greater than value given

N - Presumptive evidence of presence of material.

O - Sampled, but analysis lost or not performed.

Q - Sample held beyond normal holding time.

T - Value reported is less than the criterion of detection.

U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.

V - Analyte was detected in both sample and method blank.

X - Too few individuals to calculate SCI value.

Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate

Z - Colonies were too numerous to count (TNTC)

Appendix D

Chain of Custody

Florida Department of Environmental Protection

Event ID *

Central Laboratory Sample Submittal Form

Request Number: RQ-2015-05-04-77
FYI Sam O Purdom Gen Station Sampling Inspection

Requester: Adrienne E. Pennington
Field Report Prepared By:

Customer: NW-DIST
Project ID: FYI5
PMAS: 1143

Collected By: Cheryl Swanson, Ryan Coker
Sampling Agency: FDEP
Send Final Report To: Cheryl Swanson/ Frank Wall

Lab ID *	Location	Collection (comp begin or grab) Eastern Central	Composite end Eastern Central	Bottle Group(s)**
	Sam O. Purdom	☐ Comp ☒ Grab Date 5/4/15 Time 0835	Date Time	E
	Field ID: OUI-2	Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L): 7.95	Storet Station Number:
	Matrix (include type e.g. Salt, Fresh, etc): Fresh	Temp (C): 19.9	pH: 7.4	Sample Depth: ☒ m ☐ ft: Ø
			☐ Salinity (PPTh) ☒ Sp Conductance (umho/cm): 2250	NPDES Number:
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments: H_2SO_4 Lot # 5086050 exp. 3/27/16 ; flow 208 gpm	

Lab ID *	Location	Collection (comp begin or grab) Eastern Central	Composite end Eastern Central	Bottle Group(s)**
	Sam O. Purdom	☐ Comp ☒ Grab Date 5/4/15 Time 0850	Date Time	D
	Field ID: Field Blank	Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L): —	Storet Station Number:
	Matrix (include type e.g. Salt, Fresh, etc): DI water	Temp (C): —	pH: —	Sample Depth: ☐ m ☐ ft: —
			☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm): —	NPDES Number:
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments: no time on bottles, use submittal	

Lab ID *	Location	Collection (comp begin or grab) Eastern Central	Composite end Eastern Central	Bottle Group(s)**
	Sam O. Purdom	☐ Comp ☒ Grab Date 5/4/15 Time 0907	Date Time	A
	Field ID: Effluent - D001	Tot Res Chlorine (mg/L): @ 1330 → ~~20~~ < 0.03 *LAB	Diss Oxygen (mg/L): 6.85	Storet Station Number:
	Matrix (include type e.g. Salt, Fresh, etc): Fresh	Temp (C): 19.5	pH: 7.4	Sample Depth: ☐ m ☐ ft: 578
			☐ Salinity (PPTh) ☒ Sp Conductance (umho/cm):	NPDES Number:
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments: ~~flow~~ no time on bottles, use submittal ; surface was ~25ft below catwalk	

Lab ID *	Location	Collection (comp begin or grab) Eastern Central	Composite end Eastern Central	Bottle Group(s)**
		☐ Comp ☐ Grab Date Time	Date Time	
	Field ID	Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L):	Storet Station Number:
	Matrix (include type e.g. Salt, Fresh, etc):	Temp (C):	pH:	Sample Depth: ☐ m ☐ ft:
			☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm):	NPDES Number:
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments:	

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
Cheryl Swanson	5/4/15 1149	hand	[illegible]	5-4-15 11:49				

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2015-05-04-77
FYI Sam O Purdom Gen Station Sampling Inspection

Requester: Adrienne E. Pennington
Field Report Prepared By: [illegible]

Customer: NW-DIST
Project ID: FYI5
PMAS: 1143

Collected By: TR, mrl, CTR
Send Final Report To: Cheryl Swanson/ Frank Wall
Sampling Agency: FDEP

Lab ID *	Location / Field ID	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Latitude	Longitude	Comp / Grab	Collection (comp begin or grab) Eastern Central: Date Time	Composite end Eastern Central: Date Time	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	Sample Depth m / ft	Salinity (PPTh) / Sp Conductance (umho/cm)	NPDES Number	Comments	Bottle Group(s)**
	Sam O. Purdom / Control Site		30.39	7.74	30° 09 885 dd/dms	84° 11.860 dd/dms	☐ Comp ☒ Grab	5/4/15 Time 9:20			6.73		.35 m / ☐ ft	261 Sp Conductance			B
	Sam O. Purdom / Test Site		30.36	7.75	30° 09.620 dd/dms	84° 11.899 dd/dms	☐ Comp ☒ Grab	5/4/15 Time 10:00			6.72		☒ m / ☐ ft	259 Sp Conductance			B
					dd/dms	dd/dms	☐ Comp ☐ Grab	Time	Time				m / ft	Sp Conductance			
					dd/dms	dd/dms	☐ Comp ☐ Grab	Time	Time				m / ft	Sp Conductance			

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
[illegible]	5/4/15 18:19	Hand	[illegible]	5-4-15 12:19				

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Appendix E

Physical/Chemical and Habitat Assessment field sheets

DEP-SOP-001/01: Form FD 9000-3 (9/19/12)

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD SHEET

SAMPLE ID _____ ORG ID _____ LATITUDE SEE NOTES

COUNTY Wakulla STORET # _____ LONGITUDE _____

DATE 5/4/15 TIME 10:00 SAMPLING AGENCY FDEP

SITE NAME Purdom Test

FIELD ID/NAME _____ RECEIVING BODY OF WATER _____

RIPARIAN ZONE / STREAM FEATURES

PREDOMINANT LAND-USE IN WATERSHED (specify relative percent in each category) :

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industry	Other (Specify)

Landscape Development Intensity Index (LDI)

Local Watershed Erosion (select one) : ☐ None ☐ Slight ☐ Moderate ☐ Heavy

Local Watershed NPS Pollution : ☐ No evidence ☐ Slight ☐ Moderate ☐ Heavy

Width of Riparian Vegetation (m) on Each Buffer Side

Left Bank : 0 Right Bank : >18

Hydrologic Modification Score (per FT 3101)

High Water Mark: 1.25 (m) + 3.5 (above present water level) = 4.75 (present depth) (above bed)

Artificially Impounded ☐ Yes ☒ No

Typical Width (m) Depth (m)/Velocity (m/sec) Transect

50 m wide

_____ m/s .17 m/s _____ m/s

_____ m deep 3.5 m deep _____ m deep

Artificially Channelized : ☐ No ☐ Mostly recovered, more sinuous ☒ Some recovery ☐ Recent, severe

Canopy Cover % ☒ Open ☐ Lightly Shaded (11-45%) ☐ Heavily Shaded ☐ Moderate Shaded (46-80%)

SEDIMENT / SUBSTRATE

Sediment Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Sediment Odors ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ Other (Specify) :

Smothering of Substrates

Sand Smothering: None ☒ Slight ☐ Moderate ☐ Severe ☐

Silt Smothering: None ☐ Slight ☐ Moderate ☒ Severe ☐

Algae Smothering: None ☐ Slight ☒ Moderate ☐ Severe ☐

SUBSTRATE TYPE

Assessment Tool: ☐ SCI ☒ RPS ☐ LVS ☐ LCI ☐ BioRecon

	% Coverage	INVERT # Times Sampled	PERI # Times Sampled
Woody Debris (Snags)	<1		
Undercut Banks / Roots			
Leaf Packs or Mat			
Aquatic Vegetation	<5		
Rock or Shell Rubble..			
Sand.....			
Mud / Muck / Silt			
Other			
Other			

ABUNDANCE

	Absent	Rare	Common	Abundant
Periphyton:	☐	☐	☐	☒
Fish:	☐	☐	☐	☒
Aquatic Plants:	☐	☐	☐	☒
Iron/Sulfur Bacteria:	☒	☐	☐	☐

WATER QUALITY

	Depth (M)	Temp. (°C)	pH (SU)	D.O. (MG/L)	D.O. (%)	Cond. (UMHO/CM)	Salinity (PPT)	SECCHI (M)
Top :	.25	20.36	7.75	6.72	74.6	359	.18	~1m
Mid:	2m	20.34	7.71	6.70	74.1	263		☐ VOB
Bottom	3.4m	20.31	7.71	6.56	72.6	358	.17	SITE DEPTH

Meter ID: #7 — SITE DEPTH: 3.5

Water Odors Normal ☒ Petroleum ☐ Sewage ☐ Chemical ☐ Other ☐

Water Surface Oils Normal ☒ Sheen ☐ Globs ☐ Slick ☐ Other ☐

Water Sample Taken? ☒ Yes ☐ No

Sample Preserved? ☐ Yes ☐ No

Lot Number:_____ Exp:_____

Color Tannic ☒ Green (Algae) ☐ Clear ☐ Other (Specify) ☐

Algae Sample Taken? ☐ Yes ☒ No

Sample Preserved? ☐ Yes ☐ No

Lot Number:_____ Exp:_____

Clarity Clear ☒ Slightly Turbid ☐ Turbid ☐ Opaque ☐

System Type: Stream ☒ Lake ☐ Wetland ☐ Estuary ☐ Other(Specify) ☐ _____

WEATHER CONDITIONS / NOTES:

N 30° 09.620
W 84° 11.899

SUNNY WARM

☐ The antecedent hydrologic conditions have been met to my best knowledge.

SAMPLING TEAM TR, MH, CR

SIGNATURE : _____

DATE : 5/4/15

DEP-SOP-001/01: Form FD 9000-3 (9/19/12)

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD SHEET

SAMPLE ID _____ ORG ID _____ LATITUDE 30 09.846 84 11.86 W

COUNTY Wakulla STORET # _____ LONGITUDE see notes

DATE 05/04/15 TIME 09:20 SAMPLING AGENCY FDEP

SITE NAME Purdom Control

FIELD ID/NAME _____ RECEIVING BODY OF WATER _____

RIPARIAN ZONE / STREAM FEATURES

PREDOMINANT LAND-USE IN WATERSHED (specify relative percent in each category) :

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industry	Other (Specify)

Landscape Development Intensity Index (LDI): _____

Local Watershed Erosion (select one) : ☐ None ☐ Slight ☐ Moderate ☐ Heavy

Local Watershed NPS Pollution : ☐ No evidence ☐ Slight ☐ Moderate ☐ Heavy

Width of Riparian Vegetation (m) on Each Buffer Side — Left Bank : >18 Right Bank : >18

Hydrologic Modification Score (per FT 3101): _____

High Water Mark: 1.25 (m) + 3m (above present water level) = 4.25 (present depth) (above bed)

Artificially Impounded ☐ Yes ☒ No

Typical Width (m) Depth (m)/Velocity (m/sec) Transect

50 m wide

m/s	.17 m/s	m/s
m deep	3.0 m deep	m deep

Artificially Channelized : ☒ No ☐ Some recovery ☐ Mostly recovered, more sinuous ☐ Recent, severe

Canopy Cover % ☒ Open ☐ Lightly Shaded (11-45%) ☐ Heavily Shaded ☐ Moderate Shaded (46-80%)

SEDIMENT / SUBSTRATE

Sediment Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Sediment Odors ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ Other (Specify) :

Smothering of Substrates

	None	Slight	Moderate	Severe
Sand Smothering:	☒	☐	☐	☐
Silt Smothering:	☐	☐	☒	☐
Algae Smothering:	☐	☒	☐	☐

SUBSTRATE TYPE

Assessment Tool: ☐ SCI ☒ RPS ☐ LVS ☐ LCI ☐ BioRecon

	% Coverage	INVERT # Times Sampled	PERI # Times Sampled
Woody Debris (Snags)	<5		
Undercut Banks / Roots			
Leaf Packs or Mat			
Aquatic Vegetation	>12		
Rock or Shell Rubble..			
Sand.....			
Mud / Muck / Silt			
Other			
Other			

WATER QUALITY

	Depth (M)	Temp. (°C)	pH (SU)	D.O. (MG/L)	D.O. (%)	Cond. (UMHO/CM)	Salinity (PPT)
Top :	.35	20.29	7.74	6.73	74.4	261	.12
Mid:	2m	20.27	7.73	6.67	73.8	258	
Bottom	3.5	20.27	7.73	6.66	73.7	257	

Meter ID: #7

SECCHI (M): ~1m ☐ VOB

SITE DEPTH: 3m

Water Odors Normal ☒ Petroleum ☐ Sewage ☐ Chemical ☐ Other ☐

Water Surface Oils Normal ☒ Sheen ☐ Globs ☐ Slick ☐ Other ☐

Water Sample Taken? ☒ Yes ☐ No

Sample Preserved? ☐ Yes ☐ No

Lot Number:_____ Exp:_____

Color Tannic ☒ Green (Algae) ☐ Clear ☐ Other (Specify) ☐

Algae Sample Taken? ☐ Yes ☒ No

Sample Preserved? ☐ Yes ☐ No

Lot Number:_____ Exp:_____

Clarity Clear ☒ Slightly Turbid ☐ Turbid ☐ Opaque ☐

ABUNDANCE

	Absent	Rare	Common	Abundant
Periphyton:	☐	☐	☐	☒
Fish:	☐	☐	☐	☒
Aquatic Plants:	☐	☐	☐	☐
Iron/Sulfur Bacteria:	☒	☐	☐	☐

System Type: Stream ☒ Lake ☐ Wetland ☐ Estuary ☐ Other(Specify) ☐ _____

WEATHER CONDITIONS / NOTES:

Warm, Sunny

N 30° 09 885
W 84° 11, 860

☐ The antecedent hydrologic conditions have been met to my best knowledge.

SAMPLING TEAM TR, MH, CR

SIGNATURE : _____

DATE : 5/4/15

DEP-SOP-001/01: Form FD 9000-5

STATE OF FLORIDA, DEPARTMENT OF ENVIRONMENTAL PROTECTION

STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (MM/DD/YY): 5/4/15	RECEIVING BODY OF WATER:

REMARKS:	COUNTY: Wakulla	LOCATION: Random Test	FIELD ID/NAME:

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** 6	Four or more major productive habitats present [snags, tree roots, aquatic vegetation, leaf packs (partially decayed), rock] 20 19 18 17 16	Three major productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags) 15 14 13 12 11	Two major productive habitats present. Less than desirable habitat, frequently disturbed or removed 10 9 8 7 (6)	One or less major productive habitat. Lack of habitat is obvious, substrates unstable or smothered 5 4 3 2 1
Substrate Availability 2	Greater than 30% major productive habitat present at site 20 19 18 17 16	16% to 30% major productive habitat, by aerial extent 15 14 13 12 11	6% to 15% major productive habitat 10 9 8 7 6	Less than 5% major productive habitat 5 4 3 (2) 1
Water Velocity 13	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec ≥0.33 0.31 0.29 0.27 >0.25 20 19 18 17 16	Max. observed at typical transect: >0.1 to 0.25 m/sec 0.25 0.21 0.17 0.13 >0.1 15 14 (13) 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 0.1 0.09 0.07 0.06 0.05 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec; or spate occurring: > 1 m/sec <0.05 0.04 0.03 0.01 <0.01 5 4 3 2 1
Habitat Smothering 12 Primary Score 33	Adequate number of stable pools (1-2 per 12 times width) and <25% of habitats affected by sand, silt, or algae. 20 19 18 17 16	Adequate number of stable pools (1-2 per 12 times width) and >25% of habitats affected by sand, silt, or algae. 15 14 13 (12) 11	Does not have required number of stable pools (1-2 per 12 x width) and/or has shallow pools (<2 x prevailing depth). 10 9 8 7 6	Stable pools are absent. Most habitats affected by sand, silt, or algae accumulation. 5 4 3 2 1
Secondary Habitat Components **Artificial Channelization** 10	Expected sinuosity given the stream width. No evidence of dredging or artificial straight-ening. No spoil banks. (20) 19 18 17 16	Good sinuosity within old chan-nelized area. Evidence of dredging in the past (>25 yrs) but mostly recovered. 15 14 13 12 11	Straightened with trapezoidal cross section, but has a small degree of sinuosity developed within channelized area. (10) 9 8 7 6	Straightened or engineered by dredging, has trapezoidal or box cut cross section, lacks required pools. May have spoil banks. 5 4 3 2 (1)
Bank Stability Right Bank 8 Left Bank 2	Bankfull > 60% of bank height. Slope of bank ≤ 60° from bankful to top of bank. Bankfull is within or above the root zone with few raw, eroded areas. 10 9	Only meets 2 of the 3 requirements for optimal bank stability. (8) 7 6	Only meets 1 of the 3 requirements for optimal bank stability. 5 4	Bankfull < 60% of bank height. Slope of bank > 60°. Bankfull is below the root zone with raw, eroded areas. 3 (2) 1
Riparian Buffer Zone Width Right Bank 10 Left Bank 1	Width of vegetation greater than 18 m (10) 9	Width of vegetation >12 to 18m 8 7 6	Width of vegetation 6 to 12 m. human activities close to system 5 4	Less than 6 m of buffer zone due to intensive human activities 3 2 (1)
Riparian Zone Vegetation Quality Right Bank 10 Left Bank 1 Secondary Score 42	Over 80% of riparian surfaces consist of normal, expected plant community for given sunlight & habitat conditions (e.g., native plants; tree, shrub, and forbs represented, if appropriate). Minimal disturbance. (10) 9	>50% to 80% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Some disruption in community observed. 8 7 6	25% to 50% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Disruption obvious. 5 4	Less than 25% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). 3 2 (1)

75 **TOTAL SCORE**

Date: 5/4/15	Analyst: Todd Estes	Signature: Todd Estes

Form FD 9000-5 Revision Date: December 19, 2011

DEP-SOP-001/01: Form FD 9000-5

STATE OF FLORIDA, DEPARTMENT OF ENVIRONMENTAL PROTECTION

STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (MM/DD/YY): 05/04/15	RECEIVING BODY OF WATER:
REMARKS:	COUNTY: Wakulla	LOCATION: Purdom (control)	FIELD ID/NAME:

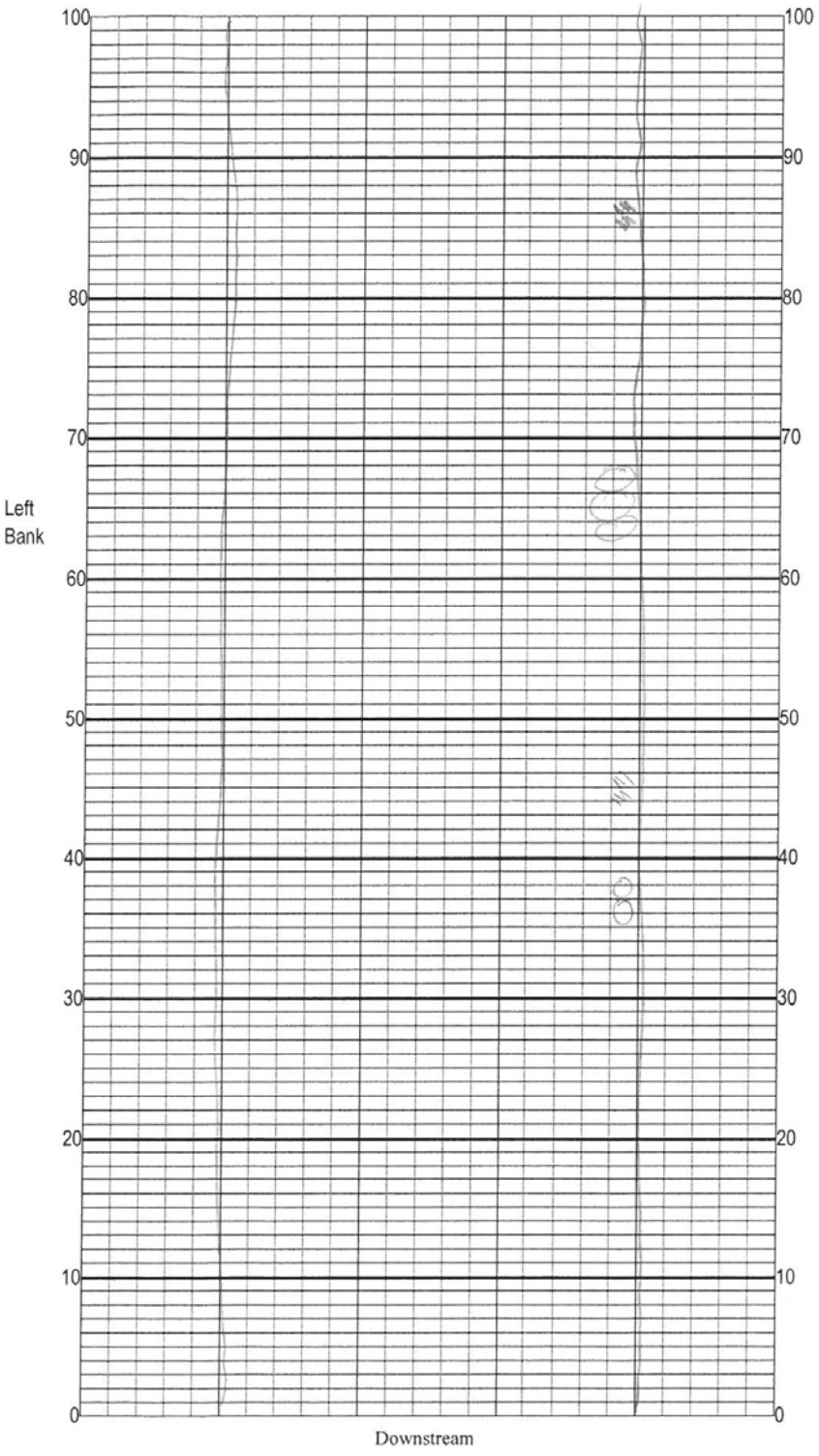
Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** 9	Four or more major productive habitats present [snags, tree roots, aquatic vegetation, leaf packs (partially decayed), rock] 20 19 18 17 16	Three major productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags) 15 14 13 12 11	Two major productive habitats present. Less than desirable habitat, frequently disturbed or removed 10 (9) 8 7 6	One or less major productive habitat. Lack of habitat is obvious, substrates unstable or smothered 5 4 3 2 1
Substrate Availability 11	Greater than 30% major productive habitat present at site 20 19 18 17 16	16% to 30% major productive habitat, by aerial extent 15 14 13 12 (11)	6% to 15% major productive habitat 10 9 8 7 6	Less than 5% major productive habitat 5 4 3 2 1
Water Velocity 13	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec ≥0.33 0.31 0.29 0.27 >0.25 20 19 18 17 16	Max. observed at typical transect: >0.1 to 0.25 m/sec 0.25 0.21 0.17 0.13 >0.1 15 14 (13) 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 0.1 0.09 0.07 0.06 0.05 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec; or spate occurring: > 1 m/sec <0.05 0.04 0.03 0.01 <0.01 5 4 3 2 1
Habitat Smothering 12 Primary Score 45	Adequate number of stable pools (1-2 per 12 times width) and <25% of habitats affected by sand, silt, or algae. 20 19 18 17 16	Adequate number of stable pools (1-2 per 12 times width) and >25% of habitats affected by sand, silt, or algae. 15 14 13 (12) 11	Does not have required number of stable pools (1-2 per 12 x width) and/or has shallow pools (<2 x prevailing depth). 10 9 8 7 6	Stable pools are absent. Most habitats affected by sand, silt, or algae accumulation. 5 4 3 2 1
Secondary Habitat Components **Artificial Channelization** 20	Expected sinuosity given the stream width. No evidence of dredging or artificial straight-ening. No spoil banks. (20) 19 18 17 16	Good sinuosity within old chan-nelized area. Evidence of dredging in the past (>25 yrs) but mostly recovered. 15 14 13 12 11	Straightened with trapezoidal cross section, but has a small degree of sinuosity developed within channelized area. 10 9 8 7 6	Straightened or engineered by dredging, has trapezoidal or box cut cross section, lacks required pools. May have spoil banks. 5 4 3 2 1
Bank Stability Right Bank 10 Left Bank 10	Bankfull > 60% of bank height. Slope of bank ≤ 60° from bankful to top of bank. Bankfull is within or above the root zone with few raw, eroded areas. (10) 9	Only meets 2 of the 3 requirements for optimal bank stability. 8 7 6	Only meets 1 of the 3 requirements for optimal bank stability. 5 4	Bankfull < 60% of bank height. Slope of bank > 60°. Bankfull is below the root zone with raw, eroded areas. 3 2 1
Riparian Buffer Zone Width Right Bank 10 Left Bank 10	Width of vegetation greater than 18 m (10) 9	Width of vegetation >12 to 18m 8 7 6	Width of vegetation 6 to 12 m. human activities close to system 5 4	Less than 6 m of buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 10 Left Bank 10 Secondary Score 80	Over 80% of riparian surfaces consist of normal, expected plant community for given sunlight & habitat conditions (e.g., native plants; tree, shrub, and forbs represented, if appropriate). Minimal disturbance. (10) 9	>50% to 80% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Some disruption in community observed. 8 7 6	25% to 50% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Disruption obvious. 5 4	Less than 25% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). 3 2 1

125 **TOTAL SCORE**

Date: 5/4/15	Analyst: TR TODD TRASK	Signature: TODD T

Form FD 9000-5 Revision Date: December 19, 2011

DEP-SOP-001/01 Form FD 9000-4
Stream/River Habitat Sketch Sheet



Location: Purdom Test

Date: 5/4/15

Sampler: IR, MH, CR

100 m: Lattitude _____
Longitude _____

0 m: Lattitude _____
Longitude _____

Substrates: Code key, draw proportionate habitat abundance. %

- [ ] Snags _____
- [ ] Roots/undercut banks _____
- [ ] Leaf Packs (or mats) _____
- [ ] Aquatic Macrophytes _____
- [ ] _____ _____
- [ ] _____ _____
- [ ] Pools total # observed = _____ # range expected = _____

Average width _____ m
Average depth _____ m

Velocity measured at _____ meter mark.

WQ & chemistry taken at _____ meter mark.

Habitat Smothering:
Note areas (on map) where sand or silt is smothering substrates, limiting habitability.

Bank Stability:
Note areas (on map) with unstable, eroding banks.

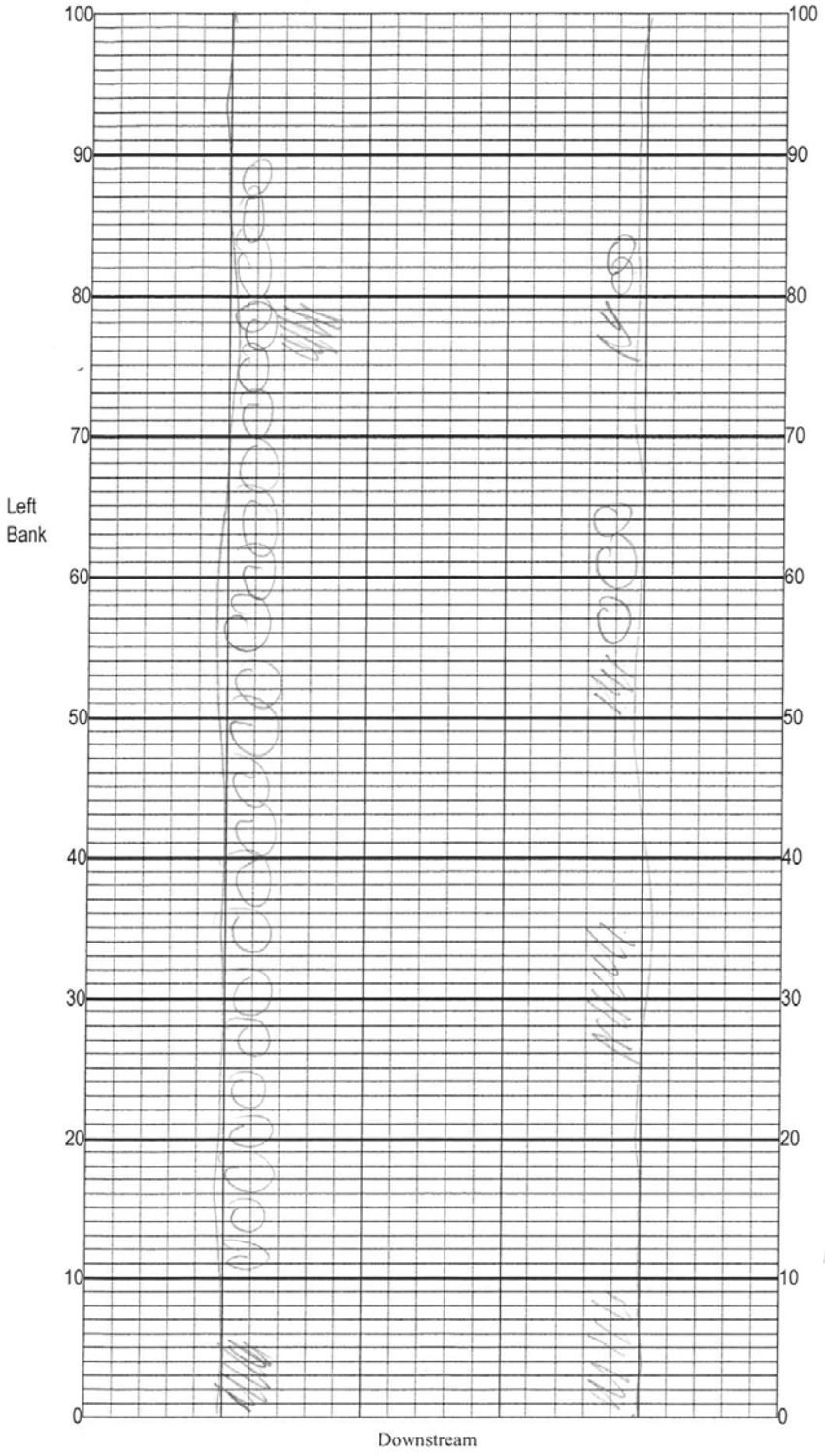
Riparian Buffer Width:
Note areas (on map) where natural vegetation is altered or eliminated.

Plants observed / other notes:

Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).

Revision Date: June 2, 2011

DEP-SOP-001/01 Form FD 9000-4
Stream/River Habitat Sketch Sheet



Location: Purdom Control

Date: 5/4/15

Sampler: TR, MH, CR

100 m: Lattitude _____
Longitude _____

0 m: Lattitude _____
Longitude _____

Substrates: Code key, draw proportionate habitat abundance. %

- [x] Snags _____
- [ ] Roots/undercut banks _____
- [ ] Leaf Packs (or mats) _____
- [x] Aquatic Macrophytes _____
- [ ] _____ _____
- [ ] _____ _____
- [ ] Pools total # observed = _____ # range expected = _____

Average width 50 m
Average depth _____ m

Velocity measured at _____ meter mark.

WQ & chemistry taken at _____ meter mark.

Habitat Smothering:
Note areas (on map) where sand or silt is smothering substrates, limiting habitability.

Bank Stability:
Note areas (on map) with unstable, eroding banks.

Riparian Buffer Width:
Note areas (on map) where natural vegetation is altered or eliminated.

Plants observed / other notes:

1500
ad

Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).

Revision Date: June 2, 2011

Form FD 9000-25 **FDEP Rapid Periphyton Survey (DEP SOP FS 7230)** Revised 6/12/12

Site: Purdom Rd. TEST | County: WAKULLA | Date: 5/14/15 | Investigators: TK, MH, CR

Transect (m)	Point 1=right 9=left	Algal Thickness Rank (N - 6)	Canopy Cover
0	1	N	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	2	
	9	2	
10	1	N	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	2	
	9	2	
20	1	N	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	2	
	9	2	
30	1	N	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	2	
	9	2	
40	1	N	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	2	
	9	2	
50	1	N	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	2	
	9	2	
60	1	N	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	2	
	9	2	
70	1	N	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	2	
	9	2	
80	1	N	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	2	
	9	2	
90	1	N	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	2	
	9	2	
100	1	N	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	2	
	9	2	

# points ranked 4-6	0
total points assessed	10
% points ranked 4-6	0

Secchi depth: ~ 1 m

Check accompanying data collected at same site/date.	
Algal mat sample	
Habitat Assessment	/
Linear Veg. Survey	/
SCI/Biorecon (circle 1)	
Water sample	/
RQ:	

Algal Thickness Rank	
N	rough, no algae; slimy; algae to 1 mm
3	>1mm - 6 mm
4	>6 - 20 mm
5	>20 mm - 10 cm
6	>10 cm

Record "N" for points deeper than the Secchi depth; algae are presumed absent. Record "X" for points shallower than Secchi depth for which substrate cannot be seen or reached with the hand. Note if thickness estimated for deep points which can be seen but not reached.

Record canopy cover as the number of small densiometer quadrants (out of 96) that HAVE canopy cover. Measure facing upstream at point 4, 5, or 6.

Collect an algal mat sample following DEP SOP FS 7240 if the percentage of total sampled points with a thickness rank of 4, 5, or 6 is >20%.

Form FD 9000-25 **FDEP Rapid Periphyton Survey (DEP SOP FS 7230)** Revised 6/12/12

Site: Purdom Control | County: Wakulla | Date: 5/4/15 | Investigators: TR, MH, CR

Transect (m)	Point 1=right 9=left	Algal Thickness Rank (N - 6)	Canopy Cover
0	1	2	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	4	
	9	N	
10	1	2	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	4	
	9	4	
20	1	2	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	4	
	9	4	
30	1	2	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	4	
	9	4	
40	1	2	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	4	
	9	4	
50	1	2	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	4	
	9	4	
60	1	2	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	4	
	9	4	
70	1	2	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	2	
	9	4	
80	1	2	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	2	
	9	4	
90	1	2	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	2	
	9	2	
100	1	2	
	2	2	
	3	2	
	4	2	
	5	2	0%
	6	2	
	7	2	
	8	2	
	9	4	

# points ranked 4-6	16
total points assessed	99
% points ranked 4-6	16

Secchi depth: ~1 m

Check accompanying data collected at same site/date.	
Algal mat sample	
Habitat Assessment	✓
Linear Veg. Survey	✓
SCI/Biorecon (circle 1)	
Water sample	✓
RQ:	

Algal Thickness Rank	
N	rough, no algae; slimy; algae to 1 mm
3	>1mm - 6 mm
4	>6 - 20 mm
5	>20 mm - 10 cm
6	>10 cm

Record "N" for points deeper than the Secchi depth; algae are presumed absent. Record "X" for points shallower than Secchi depth for which substrate cannot be seen or reached with the hand. Note if thickness estimated for deep points which can be seen but not reached.

Record canopy cover as the number of small densiometer quadrants (out of 96) that HAVE canopy cover. Measure facing upstream at point 4, 5, or 6.

Collect an algal mat sample following DEP SOP FS 7240 if the percentage of total sampled points with a thickness rank of 4, 5, or 6 is >20%.

Form FD 9000-32 **FDEP Linear Stream Vegetation Survey (DEP SOP FS 7320)** Revised 2_22_13

Waterbody: St. Marks River (Sam Purdom) Test Site | Date: 5/7/15 | County: Wakulla | Storet Number:

Analyst: Blake Spencer | Signature:

Comments:

Instructions: Note taxa growing in the water with a checkmark if present, "D" if dominant, and "C" if codominant (dominance only if 1 m^2 of taxa present). Note in the boxes below if no dominant are selected, and note total macrophyte abundance rank for each section. Only the most common taxa are listed, so use blank spaces for additional taxa names.

HERBACEOUS SPECIES	Meter Mark 0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	Specimen collected (check)
Alternanthera philoxeroides											
Bacopa caroliniana											
Bacopa monneri											
Bidens mitis											
Boehmeria cylindrica											
Centella asiatica											
Ceratophyllum demersum											
Chara											
Cicuta maculata											
Cladium jamaicense	D										
Colocasia esculenta											
Crinum americanum											
Diodia virginiana											
Eichhornia crassipes Not Enough To Assign Dominance									X		
Eleocharis (wispy viviparous)											
Hydrilla verticillata											
Hydrocotle											
Hygrophila polysperma											
Hymenocallis											
Lachnanthes caroliniana											
Landoltia punctata											
Lemna											
Limnophila sessiflora											
Ludwigia leptocarpa											
Ludwigia palustris											
Ludwigia peruviana											
Ludwigia repens											
Luziola fluitans											
If no Dominant or Co-Dominant were selected, indicate with an "X"											
Indicate % cover macrophytes per section											
0-5% Macrophyte Coverage		X	X	X	X	X	X	X	X	X	
>5 and ≤10% Macrophyte Coverage	X										
>10 and ≤25% Macrophyte Coverage											
>25 and ≤50% Macrophyte Coverage											
> 50% Macrophyte Coverage											

HERBACEOUS SPECIES	Meter Mark 0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	Specimen collected (check)
Micranthemum glomeratum											
Micranthemum umbrosum											
Myriophyllum aquaticum											
Najas guadelupensis											
Nuphar luteum											
Orontium aquaticum											
Panicum hemitomon											
Panicum repens											
Panicum rigidulum											
Pistia stratioides											
Polygonum glabra											
Polygonum hydropiperoides											
Polygonum punctatum											
Pontedaria cordata											
Potamogeton illinoensis											
Ruellia simplex											
Sacciolepis striata											
Sagittaria kurziana											
Sagittaria lancifolia	X										
Sagittaria latifolia											
Salvinia minima											
Samolus parviflora											
Saururus cernuus											
Typha	X										
Vallisneria americana											
Zizania aquatica											

Form FD 9000-32 **FDEP Linear Stream Vegetation Survey (DEP SOP FS 7320)** Revised 2_22_13

Waterbody: St. Marks River (Sam Purdom) Control Site | Date: 5/7/15 | County: Wakulla | Storet Number:

Analyst: Blake Spencer | Signature:

Comments:

Instructions: Note taxa growing in the water with a checkmark if present, "D" if dominant, and "C" if codominant (dominance only if 1 m^2 of taxa present). Note in the boxes below if no dominant are selected, and note total macrophyte abundance rank for each section. Only the most common taxa are listed, so use blank spaces for additional taxa names.

HERBACEOUS SPECIES	Meter Mark 0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	Specimen collected (check)
Alternanthera philoxeroides											
Bacopa caroliniana											
Bacopa monneri											
Bidens mitis											
Boehmeria cylindrica											
Centella asiatica											
Ceratophyllum demersum											
Chara											
Cicuta maculata											
Cladium jamaicense							D	D	D	D	
Colocasia esculenta											
Crinum americanum											
Diodia virginiana											
Eichhornia crassipes Not Enough to Assign Dominance		X									
Eleocharis (wispy viviparous)											
Hydrilla verticillata											
Hydrocotle											
Hygrophila polysperma											
Hymenocallis											
Lachnanthes caroliniana											
Landoltia punctata											
Lemna											
Limnophila sessiflora											
Ludwigia leptocarpa											
Ludwigia palustris											
Ludwigia peruviana											
Ludwigia repens											
Luziola fluitans											
If no Dominant or Co-Dominant were selected, indicate with an "X"											
Indicate % cover macrophytes per section											
0-5% Macrophyte Coverage	X	X	X	X	X						
>5 and ≤10% Macrophyte Coverage						X	X	X	X	X	
>10 and ≤25% Macrophyte Coverage											
>25 and ≤50% Macrophyte Coverage											
> 50% Macrophyte Coverage											

HERBACEOUS SPECIES	Meter Mark 0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	Specimen collected (check)
Micranthemum glomeratum											
Micranthemum umbrosum											
Myriophyllum aquaticum											
Najas guadelupensis											
Nuphar luteum											
Orontium aquaticum											
Panicum hemitomon											
Panicum repens											
Panicum rigidulum											
Pistia stratioides											
Polygonum glabra											
Polygonum hydropiperoides											
Polygonum punctatum											
Pontedaria cordata											
Potamogeton illinoensis											
Ruellia simplex											
Sacciolepis striata											
Sagittaria kurziana											
Sagittaria lancifolia								X	X	X	
Sagittaria latifolia											
Salvinia minima											
Samolus parviflora											
Saururus cernuus											
Typha								X	X	X	
Vallisneria americana										X	
Zizania aquatica											
Magnolia virginiana						X					
Myriophyllum spicatum						D	D				

Appendix F

Chemical analysis of effluent and receiving water

Date Sampled	UDL	SCH Group	Component	Result	Units	MDL	PQL
05/04/15 9:07	Effluent D-001	AGP/LN	Algal Growth Potential	55.3 A	mg DryWt/L	0.3	0.9
05/04/15 9:07	Effluent D-001	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.7 I	mg/L	0.2	2
05/04/15 9:07	Effluent D-001	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.71 I	ug/L	0.4	1.2
05/04/15 9:07	Effluent D-001	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	1.6 I	ug/L	0.55	1.7
05/04/15 9:07	Effluent D-001	Metals	Sodium	55.4	mg/L	0.5	2
05/04/15 9:07	Effluent D-001	Metals	Aluminum	76 I	ug/L	60	240
05/04/15 9:07	Effluent D-001	Metals	Calcium	44.3	mg/L	0.075	0.3
05/04/15 9:07	Effluent D-001	Metals	Cadmium	0.050 U	ug/L	0.05	0.2
05/04/15 9:07	Effluent D-001	Metals	Selenium	0.27 I	ug/L	0.2	0.8
05/04/15 9:07	Effluent D-001	Metals	Hardness	155	mg/L	0.35	1.4
05/04/15 9:07	Effluent D-001	Metals	Chromium	0.62 I	ug/L	0.3	1.2
05/04/15 9:07	Effluent D-001	Metals	Zinc	5.0 U	ug/L	5	20
05/04/15 9:07	Effluent D-001	Metals	Arsenic	0.62 I	ug/L	0.25	1
05/04/15 9:07	Effluent D-001	Metals	Lead	0.20 U	ug/L	0.2	0.8
05/04/15 9:07	Effluent D-001	Metals	Copper	7.14	ug/L	0.5	1
05/04/15 9:07	Effluent D-001	Metals	Nickel	1.63	ug/L	0.25	1
05/04/15 9:07	Effluent D-001	Metals	Silver	0.025 U	ug/L	0.025	0.1
05/04/15 9:07	Effluent D-001	Metals	Mercury	1.4	ng/L	0.1	0.4
05/04/15 9:07	Effluent D-001	Metals	Magnesium	10.7	mg/L	0.04	0.16
05/04/15 9:07	Effluent D-001	Metals	Potassium	7.5	mg/L	0.3	1.2
05/04/15 9:07	Effluent D-001	Metals	Iron	200	ug/L	30	120
05/04/15 9:07	Effluent D-001	Nutrients	Chloride	49 A	mg Cl/L	2	5
05/04/15 9:07	Effluent D-001	Nutrients	NO2NO3-N	9.5	mg N/L	0.2	0.5
05/04/15 9:07	Effluent D-001	Nutrients	Organic Carbon	6.9 A	mg C/L	1	2
05/04/15 9:07	Effluent D-001	Nutrients	TSS	4 I	mg/L	2	10
05/04/15 9:07	Effluent D-001	Nutrients	Total-P	0.070	mg P/L	0.005	0.05
05/04/15 9:07	Effluent D-001	Nutrients	Ammonia-N	0.017	mg N/L	0.002	0.005
05/04/15 9:07	Effluent D-001	Nutrients	O-Phosphate-P	0.046	mg P/L	0.008	0.02
05/04/15 9:07	Effluent D-001	Nutrients	Turbidity	1.8	NTU	0.1	0.1
05/04/15 9:07	Effluent D-001	Nutrients	Alkalinity	114 A	mg CaCO3/L	0.65	2.5
05/04/15 9:07	Effluent D-001	Nutrients	Color (true)	57	PCU	2.5	6
05/04/15 9:07	Effluent D-001	Nutrients	Fluoride	0.14	mg F/L	0.035	0.1
05/04/15 9:07	Effluent D-001	Nutrients	Kjeldahl Nitrogen	0.65 J	mg N/L	0.16	0.4
05/04/15 9:07	Effluent D-001	Nutrients	Sulfate	47 A	mg SO4/L	2	5

Date Sampled	UDL	SCH Group	Component	Result	Units	MDL	PQL
05/04/15 9:07	Effluent D-001	Overflow	HEM	0.78 U	mg/L	0.78	2.8
05/04/15 9:07	Effluent D-001	Pesticides	Ethoprop	0.0050 U	ug/L	0.005	0.02
05/04/15 9:07	Effluent D-001	Pesticides	Prometryn	0.020 U	ug/L	0.02	0.08
05/04/15 9:07	Effluent D-001	Pesticides	Azinphos Methyl	0.020 UJ	ug/L	0.02	0.08
05/04/15 9:07	Effluent D-001	Pesticides	Butylate	0.020 U	ug/L	0.02	0.08
05/04/15 9:07	Effluent D-001	Pesticides	Chlorpyrifos Methyl	0.010 U	ug/L	0.01	0.04
05/04/15 9:07	Effluent D-001	Pesticides	Ethion	0.010 UJ	ug/L	0.01	0.04
05/04/15 9:07	Effluent D-001	Pesticides	Metolachlor	0.060 U	ug/L	0.06	0.24
05/04/15 9:07	Effluent D-001	Pesticides	Prometon	0.020 U	ug/L	0.02	0.08
05/04/15 9:07	Effluent D-001	Pesticides	Demeton	0.024 U	ug/L	0.024	0.096
05/04/15 9:07	Effluent D-001	Pesticides	Parathion Ethyl	0.020 U	ug/L	0.02	0.08
05/04/15 9:07	Effluent D-001	Pesticides	Atrazine Desisopropyl	0.010 UJ	ug/L	0.01	0.04
05/04/15 9:07	Effluent D-001	Pesticides	Sucralose	0.10	ug/L	0.01	0.05
05/04/15 9:07	Effluent D-001	Pesticides	Metribuzin	0.020 U	ug/L	0.02	0.08
05/04/15 9:07	Effluent D-001	Pesticides	Metalaxyl	0.040 U	ug/L	0.04	0.16
05/04/15 9:07	Effluent D-001	Pesticides	Hexazinone	0.030 UJ	ug/L	0.03	0.12
05/04/15 9:07	Effluent D-001	Pesticides	Alachlor	0.060 U	ug/L	0.06	0.24
05/04/15 9:07	Effluent D-001	Pesticides	Fenamiphos	0.030 U	ug/L	0.03	0.12
05/04/15 9:07	Effluent D-001	Pesticides	Malathion	0.010 U	ug/L	0.01	0.04
05/04/15 9:07	Effluent D-001	Pesticides	Simazine	0.010 U	ug/L	0.01	0.04
05/04/15 9:07	Effluent D-001	Pesticides	Ametryn	0.010 U	ug/L	0.01	0.04
05/04/15 9:07	Effluent D-001	Pesticides	Bromacil	0.040 U	ug/L	0.04	0.16
05/04/15 9:07	Effluent D-001	Pesticides	Chlorpyrifos Ethyl	0.010 U	ug/L	0.01	0.04
05/04/15 9:07	Effluent D-001	Pesticides	Mevinphos	0.010 UJ	ug/L	0.01	0.04
05/04/15 9:07	Effluent D-001	Pesticides	Atrazine	0.010 U	ug/L	0.01	0.04
05/04/15 9:07	Effluent D-001	Pesticides	Atrazine Desethyl	0.010 U	ug/L	0.01	0.04
05/04/15 9:07	Effluent D-001	Pesticides	Fonofos	0.010 U	ug/L	0.01	0.04
05/04/15 9:07	Effluent D-001	Pesticides	Norflurazon	0.030 U	ug/L	0.03	0.12
05/04/15 9:07	Effluent D-001	Pesticides	Phorate	0.0050 UJ	ug/L	0.005	0.02
05/04/15 9:07	Effluent D-001	Pesticides	Diazinon	0.010 U	ug/L	0.01	0.04
05/04/15 9:07	Effluent D-001	Pesticides	Disulfoton	0.0050 U	ug/L	0.005	0.02
05/04/15 9:07	Effluent D-001	Pesticides	Naled	0.040 U	ug/L	0.04	0.16
05/04/15 9:07	Effluent D-001	Pesticides	Parathion Methyl	0.010 U	ug/L	0.01	0.04
05/04/15 9:07	Effluent D-001	Priority Organic Pollutants	1,4-Dioxane	0.020 U	ug/L	0.02	0.1
05/04/15 9:07	Effluent D-001	Nutrients	Specific Conductance	578	umhos/cm		
05/04/15 9:07	Effluent D-001	Nutrients	pH	7.4			
05/04/15 9:07	Effluent D-001	Nutrients	Temperature	19.5	C		
05/04/15 9:07	Effluent D-001	Nutrients	Dissolved Oxygen	6.85	mg/L		

Date Sampled	UDL	SCH Group	Component	Result	Units	MDL	PQL
05/04/15 9:07	Effluent D-001	Nutrients	Total Residual Chlorine	0.03 Q	mg/L		
05/04/15 8:35	Effluent OUI-2	Nutrients	Kjeldahl Nitrogen	15 I	mg N/L	8	20
05/04/15 8:35	Effluent OUI-2	Nutrients	NO2NO3-N	960	mg N/L	8	20
05/04/15 8:35	Effluent OUI-2	Nutrients	Ammonia-N	0.97	mg N/L	0.02	0.05
05/04/15 8:35	Effluent OUI-2	Nutrients	Total-P	2.5	mg P/L	0.025	0.25
05/04/15 8:35	Effluent OUI-2	Nutrients	Sample Depth	0	m		
05/04/15 8:35	Effluent OUI-2	Nutrients	Specific Conductance	2250	umhos/cm		
05/04/15 8:35	Effluent OUI-2	Nutrients	Dissolved Oxygen	7.95	mg/L		
05/04/15 8:35	Effluent OUI-2	Nutrients	pH	7.4			
05/04/15 8:35	Effluent OUI-2	Nutrients	Temperature	19.9	C		
05/04/15 10:00	Test Site	AGP/LN	Algal Growth Potential	7.03	mg DryWt/L	0.3	0.9
05/04/15 10:00	Test Site	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.42 I	ug/L	0.4	1.2
05/04/15 10:00	Test Site	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.2 I	mg/L	0.2	2
05/04/15 10:00	Test Site	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	1.3 I	ug/L	0.55	1.7
05/04/15 10:00	Test Site	Metals	Magnesium	7.55	mg/L	0.04	0.16
05/04/15 10:00	Test Site	Metals	Aluminum	65 I	ug/L	60	240
05/04/15 10:00	Test Site	Metals	Iron	210	ug/L	30	120
05/04/15 10:00	Test Site	Metals	Lead	0.20 U	ug/L	0.2	0.8
05/04/15 10:00	Test Site	Metals	Hardness	133	mg/L	0.35	1.4
05/04/15 10:00	Test Site	Metals	Mercury	1.4	ng/L	0.1	0.4
05/04/15 10:00	Test Site	Metals	Sodium	5.0	mg/L	0.5	2
05/04/15 10:00	Test Site	Metals	Arsenic	0.48 I	ug/L	0.25	1
05/04/15 10:00	Test Site	Metals	Selenium	0.20 U	ug/L	0.2	0.8
05/04/15 10:00	Test Site	Metals	Potassium	0.69 I	mg/L	0.3	1.2
05/04/15 10:00	Test Site	Metals	Chromium	0.51 I	ug/L	0.3	1.2
05/04/15 10:00	Test Site	Metals	Silver	0.025 U	ug/L	0.025	0.1
05/04/15 10:00	Test Site	Metals	Copper	0.50 U	ug/L	0.5	1
05/04/15 10:00	Test Site	Metals	Cadmium	0.050 U	ug/L	0.05	0.2
05/04/15 10:00	Test Site	Metals	Nickel	0.25 U	ug/L	0.25	1
05/04/15 10:00	Test Site	Metals	Calcium	40.6	mg/L	0.075	0.3
05/04/15 10:00	Test Site	Metals	Zinc	5.0 U	ug/L	5	20
05/04/15 10:00	Test Site	Nutrients	NO2NO3-N	0.098	mg N/L	0.004	0.01
05/04/15 10:00	Test Site	Nutrients	TSS	3 I	mg/L	2	10
05/04/15 10:00	Test Site	Nutrients	Chloride	6.9 A	mg Cl/L	0.2	0.5
05/04/15 10:00	Test Site	Nutrients	Alkalinity	106 A	mg CaCO3/L	0.65	2.5
05/04/15 10:00	Test Site	Nutrients	Organic Carbon	6.1	mg C/L	0.5	1
05/04/15 10:00	Test Site	Nutrients	Fluoride	0.13	mg F/L	0.035	0.1
05/04/15 10:00	Test Site	Nutrients	Ammonia-N	0.008	mg N/L	0.002	0.005

Date Sampled	UDL	SCH Group	Component	Result	Units	MDL	PQL
05/04/15 10:00	Test Site	Nutrients	Total-P	0.048	mg P/L	0.002	0.005
05/04/15 10:00	Test Site	Nutrients	Color (true)	58 A	PCU	2.5	6
05/04/15 10:00	Test Site	Nutrients	Sulfate	7.3 A	mg SO4/L	0.2	0.5
05/04/15 10:00	Test Site	Nutrients	O-Phosphate-P	0.035	mg P/L	0.004	0.01
05/04/15 10:00	Test Site	Nutrients	Turbidity	1.5 A	NTU	0.1	0.1
05/04/15 10:00	Test Site	Nutrients	Kjeldahl Nitrogen	0.23	mg N/L	0.08	0.2
05/04/15 10:00	Test Site	Overflow	HEM	0.73 U	mg/L	0.73	2.6
05/04/15 10:00	Test Site	Pesticides	Sucralose	0.010 U	ug/L	0.01	0.05
05/04/15 10:00	Test Site	Priority Organic Pollutants	1,4-Dioxane	0.020 UY	ug/L	0.02	0.1
05/04/15 10:00	Test Site	Nutrients	pH	7.75			
05/04/15 10:00	Test Site	Nutrients	Dissolved Oxygen	6.72	mg/L		
05/04/15 10:00	Test Site	Nutrients	Specific Conductance	259	umhos/cm		
05/04/15 10:00	Test Site	Nutrients	Temperature	20.36	C		
05/04/15 10:00	Test Site	Nutrients	Sample Depth	.25	m		
05/04/15 9:20	Control Site	AGP/LN	Algal Growth Potential	6.77	mg DryWt/L	0.3	0.9
05/04/15 9:20	Control Site	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	0.77 I	mg/L	0.2	2
05/04/15 9:20	Control Site	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	0.86 I	ug/L	0.55	1.7
05/04/15 9:20	Control Site	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.61 I	ug/L	0.4	1.2
05/04/15 9:20	Control Site	Metals	Iron	220	ug/L	30	120
05/04/15 9:20	Control Site	Metals	Calcium	40.4	mg/L	0.075	0.3
05/04/15 9:20	Control Site	Metals	Magnesium	7.48	mg/L	0.04	0.16
05/04/15 9:20	Control Site	Metals	Lead	0.35 I	ug/L	0.2	0.8
05/04/15 9:20	Control Site	Metals	Arsenic	0.51 I	ug/L	0.25	1
05/04/15 9:20	Control Site	Metals	Potassium	0.65 I	mg/L	0.3	1.2
05/04/15 9:20	Control Site	Metals	Hardness	132	mg/L	0.35	1.4
05/04/15 9:20	Control Site	Metals	Nickel	1.72	ug/L	0.25	1
05/04/15 9:20	Control Site	Metals	Selenium	0.20 U	ug/L	0.2	0.8
05/04/15 9:20	Control Site	Metals	Cadmium	0.050 U	ug/L	0.05	0.2
05/04/15 9:20	Control Site	Metals	Zinc	5.0 U	ug/L	5	20
05/04/15 9:20	Control Site	Metals	Chromium	2.3	ug/L	0.3	1.2
05/04/15 9:20	Control Site	Metals	Aluminum	89 I	ug/L	60	240
05/04/15 9:20	Control Site	Metals	Silver	0.025 U	ug/L	0.025	0.1
05/04/15 9:20	Control Site	Metals	Copper	0.64 I	ug/L	0.5	1
05/04/15 9:20	Control Site	Metals	Mercury	1.4	ng/L	0.1	0.4
05/04/15 9:20	Control Site	Metals	Sodium	4.4	mg/L	0.5	2
05/04/15 9:20	Control Site	Nutrients	Color (true)	58	PCU	2.5	6
05/04/15 9:20	Control Site	Nutrients	Organic Carbon	6.1	mg C/L	0.5	1
05/04/15 9:20	Control Site	Nutrients	Kjeldahl Nitrogen	0.28	mg N/L	0.08	0.2

Date Sampled	UDL	SCH Group	Component	Result	Units	MDL	PQL
05/04/15 9:20	Control Site	Nutrients	TSS	2 I	mg/L	2	10
05/04/15 9:20	Control Site	Nutrients	Total-P	0.048	mg P/L	0.002	0.005
05/04/15 9:20	Control Site	Nutrients	O-Phosphate-P	0.036	mg P/L	0.004	0.01
05/04/15 9:20	Control Site	Nutrients	Chloride	6.4	mg Cl/L	0.2	0.5
05/04/15 9:20	Control Site	Nutrients	Alkalinity	106	mg CaCO3/L	0.65	2.5
05/04/15 9:20	Control Site	Nutrients	Sulfate	7.2	mg SO4/L	0.2	0.5
05/04/15 9:20	Control Site	Nutrients	Turbidity	1.4	NTU	0.1	0.1
05/04/15 9:20	Control Site	Nutrients	Fluoride	0.13	mg F/L	0.035	0.1
05/04/15 9:20	Control Site	Nutrients	Ammonia-N	0.007	mg N/L	0.002	0.005
05/04/15 9:20	Control Site	Nutrients	NO2NO3-N	0.062	mg N/L	0.004	0.01
05/04/15 9:20	Control Site	Overflow	HEM	0.72 U	mg/L	0.72	2.6
05/04/15 9:20	Control Site	Pesticides	Sucralose	0.010 U	ug/L	0.01	0.05
05/04/15 9:20	Control Site	Priority Organic Pollutants	1,4-Dioxane	0.020 UY	ug/L	0.02	0.1
05/04/15 9:20	Control Site	Nutrients	Sample Depth	.25	m		
05/04/15 9:20	Control Site	Nutrients	pH	7.74			
05/04/15 9:20	Control Site	Nutrients	Dissolved Oxygen	6.73	mg/L		
05/04/15 9:20	Control Site	Nutrients	Temperature	20.29	C		
05/04/15 9:20	Control Site	Nutrients	Specific Conductance	261	umhos/cm		
05/04/15 8:50	Field Blank	Metals	Nickel	0.25 U	ug/L	0.25	1
05/04/15 8:50	Field Blank	Metals	Chromium	0.30 U	ug/L	0.3	1.2
05/04/15 8:50	Field Blank	Metals	Iron	30 U	ug/L	30	120
05/04/15 8:50	Field Blank	Metals	Arsenic	0.25 U	ug/L	0.25	1
05/04/15 8:50	Field Blank	Metals	Aluminum	60 U	ug/L	60	240
05/04/15 8:50	Field Blank	Metals	Magnesium	0.084 I	mg/L	0.04	0.16
05/04/15 8:50	Field Blank	Metals	Sodium	0.50 U	mg/L	0.5	2
05/04/15 8:50	Field Blank	Metals	Zinc	5.0 U	ug/L	5	20
05/04/15 8:50	Field Blank	Metals	Mercury	0.10 U	ng/L	0.1	0.4
05/04/15 8:50	Field Blank	Metals	Potassium	0.30 U	mg/L	0.3	1.2
05/04/15 8:50	Field Blank	Metals	Cadmium	0.050 U	ug/L	0.05	0.2
05/04/15 8:50	Field Blank	Metals	Silver	0.025 U	ug/L	0.025	0.1
05/04/15 8:50	Field Blank	Metals	Copper	0.50 U	ug/L	0.5	1
05/04/15 8:50	Field Blank	Metals	Calcium	0.50	mg/L	0.075	0.3
05/04/15 8:50	Field Blank	Metals	Lead	0.20 U	ug/L	0.2	0.8
05/04/15 8:50	Field Blank	Metals	Hardness	1.6	mg/L	0.35	1.4
05/04/15 8:50	Field Blank	Metals	Selenium	0.20 U	ug/L	0.2	0.8
05/04/15 8:50	Field Blank	Nutrients	NO2NO3-N	0.004 U	mg N/L	0.004	0.01
05/04/15 8:50	Field Blank	Nutrients	Sulfate	0.20 U	mg SO4/L	0.2	0.5
05/04/15 8:50	Field Blank	Nutrients	Turbidity	0.10 U	NTU	0.1	0.1

Date Sampled	UDL	SCH Group	Component	Result	Units	MDL	PQL
05/04/15 8:50	Field Blank	Nutrients	Total-P	0.002 U	mg P/L	0.002	0.005
05/04/15 8:50	Field Blank	Nutrients	Chloride	0.20 U	mg Cl/L	0.2	0.5
05/04/15 8:50	Field Blank	Nutrients	Kjeldahl Nitrogen	0.080 U	mg N/L	0.08	0.2
05/04/15 8:50	Field Blank	Nutrients	Fluoride	0.035 U	mg F/L	0.035	0.1
05/04/15 8:50	Field Blank	Nutrients	Organic Carbon	0.50 U	mg C/L	0.5	1
05/04/15 8:50	Field Blank	Nutrients	Color (true)	2.5 U	PCU	2.5	6
05/04/15 8:50	Field Blank	Nutrients	Alkalinity	1.2 I	mg CaCO3/L	0.65	2.5
05/04/15 8:50	Field Blank	Nutrients	Ammonia-N	0.002 U	mg N/L	0.002	0.005
05/04/15 8:50	Field Blank	Nutrients	O-Phosphate-P	0.004 U	mg P/L	0.004	0.01
05/04/15 8:50	Field Blank	Overflow	HEM	0.85 U	mg/L	0.85	3
05/04/15 8:50	Field Blank	Pesticides	Sucralose	0.010 U	ug/L	0.01	0.05
05/04/15 8:50	Field Blank	Pesticides	Norflurazon	0.029 U	ug/L	0.029	0.12
05/04/15 8:50	Field Blank	Pesticides	Alachlor	0.059 U	ug/L	0.059	0.23
05/04/15 8:50	Field Blank	Pesticides	Chlorpyrifos Methyl	0.0098 U	ug/L	0.0098	0.039
05/04/15 8:50	Field Blank	Pesticides	Fonofos	0.0098 U	ug/L	0.0098	0.039
05/04/15 8:50	Field Blank	Pesticides	Disulfoton	0.0049 U	ug/L	0.0049	0.02
05/04/15 8:50	Field Blank	Pesticides	Malathion	0.0098 U	ug/L	0.0098	0.039
05/04/15 8:50	Field Blank	Pesticides	Diazinon	0.0098 U	ug/L	0.0098	0.039
05/04/15 8:50	Field Blank	Pesticides	Atrazine	0.0098 U	ug/L	0.0098	0.039
05/04/15 8:50	Field Blank	Pesticides	Ametryn	0.0098 U	ug/L	0.0098	0.039
05/04/15 8:50	Field Blank	Pesticides	Mevinphos	0.0098 UJ	ug/L	0.0098	0.039
05/04/15 8:50	Field Blank	Pesticides	Metribuzin	0.020 U	ug/L	0.02	0.078
05/04/15 8:50	Field Blank	Pesticides	Fenamiphos	0.029 U	ug/L	0.029	0.12
05/04/15 8:50	Field Blank	Pesticides	Ethion	0.0098 UJ	ug/L	0.0098	0.039
05/04/15 8:50	Field Blank	Pesticides	Atrazine Desethyl	0.0098 U	ug/L	0.0098	0.039
05/04/15 8:50	Field Blank	Pesticides	Naled	0.039 U	ug/L	0.039	0.16
05/04/15 8:50	Field Blank	Pesticides	Parathion Ethyl	0.020 U	ug/L	0.02	0.078
05/04/15 8:50	Field Blank	Pesticides	Parathion Methyl	0.0098 U	ug/L	0.0098	0.039
05/04/15 8:50	Field Blank	Pesticides	Bromacil	0.039 U	ug/L	0.039	0.16
05/04/15 8:50	Field Blank	Pesticides	Metolachlor	0.059 U	ug/L	0.059	0.23
05/04/15 8:50	Field Blank	Pesticides	Prometryn	0.020 U	ug/L	0.02	0.078
05/04/15 8:50	Field Blank	Pesticides	Atrazine Desisopropyl	0.0098 UJ	ug/L	0.0098	0.039
05/04/15 8:50	Field Blank	Pesticides	Butylate	0.020 U	ug/L	0.02	0.078
05/04/15 8:50	Field Blank	Pesticides	Ethoprop	0.0049 U	ug/L	0.0049	0.02
05/04/15 8:50	Field Blank	Pesticides	Phorate	0.0049 UJ	ug/L	0.0049	0.02
05/04/15 8:50	Field Blank	Pesticides	Simazine	0.0098 U	ug/L	0.0098	0.039
05/04/15 8:50	Field Blank	Pesticides	Chlorpyrifos Ethyl	0.0098 U	ug/L	0.0098	0.039
05/04/15 8:50	Field Blank	Pesticides	Demeton	0.023 U	ug/L	0.023	0.094

Date Sampled	UDL	SCH Group	Component	Result	Units	MDL	PQL
05/04/15 8:50	Field Blank	Pesticides	Hexazinone	0.029 UJ	ug/L	0.029	0.12
05/04/15 8:50	Field Blank	Pesticides	Metalaxyl	0.039 U	ug/L	0.039	0.16
05/04/15 8:50	Field Blank	Pesticides	Prometon	0.020 U	ug/L	0.02	0.078
05/04/15 8:50	Field Blank	Pesticides	Azinphos Methyl	0.020 UJ	ug/L	0.02	0.078
05/04/15 8:50	Field Blank	Priority Organic Pollutants	1,4-Dioxane	0.020 U	ug/L	0.02	0.1

The Priority Pollutants Analysis of the Sam O. Purdom Generating Station effluent sampled on May 5, 2015, NPDES #FL0025526

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)

Transaction Code		NPDES NUMBER										YR/MO/DA						Insp Type	Inspector	Fac Type
1	N	2	5	3	F	L	0	0	2	5	5	2	6	11	12	1	5	0	5	0	4	# X	# S	# 1

Remarks

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Biological Analyses of the Sam O. Purdom Generating Station effluent sampled on May 5, 2015, NPDES #FL0025526

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)

Transaction Code		NPDES NUMBER										YR/MO/DA						Insp Type	Inspector	Fac Type
1	N	2	5	3	F	L	0	0	2	5	5	2	6	11	12	1	5	0	5	0	4	# S	# S	# 1

Remarks

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