Biological Assessment of

Gulf Power Crist Electric Generating Plant

Escambia County

NPDES # FL0002275

Sampled April 11-12, 2010

October 2010

Biology Section

Bureau of Laboratories

Division of Environmental Assessment and Restoration

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CONTENTS

Summary

Facility Overview

Methods

Results and Discussion

Conclusion

Literature Cited

Tables

Table 1	Effluent limits, Class III Freshwater Criteria and chemical data
Table 2	Effluent limits, Class III Freshwater Criteria and metals data
Table 3	Measured and predicted algal growth potential (AGP)
Table 4	Periphyton composition - Qualitative
Table 5	Macroinvertebrate Hester-Dendy samples – Quantitative
Table 6	Macroinvertebrate dipnet samples - Qualitative

Appendices

Appendix A	Map of facility
Appendix B	Facility summary
Appendix C	Explanation of measurements
Appendix D	Chain of Custody
Appendix E	Chemical analyses of effluent and receiving water.
Appendix F	Physical/Chemical and Habitat Assessment field sheets
Appendix G-1	Qualitative periphyton – wet algal taxa list and number of algal units counted
Appendix G-2	Qualitative periphyton – diatom taxa list and number of diatom valves counted
Appendix H-1	Hester-Dendy macroinvertebrate samples: taxa list and average number of individuals per m2
Appendix H-2	Hester-Dendy macroinvertebrate samples: taxa list and total number of individuals counted
Appendix I-1	Dipnet sweep macroinvertebrate samples: collapsed taxa list and number of individuals counted by replicate
Appendix I-2	Dipnet sweep macroinvertebrate samples: taxa list and number of individuals counted
Appendix J	EPA End Sheet

Fifth Year Inspection Summary

The Fifth Year Inspection of the Gulf Power Crist Electric Generating Plant conducted April 12, 2010 produced the following notable results.

No organic constituents were detected in the effluent or at the Control and Test sites.

Iron exceeded the Class III Freshwater Quality Criterion (1,000 µg/L) (62-302.530(38) F.A.C.) and effluent permit limit (1,000 µg/L) for the effluent (1,490 µg/L). The Control Site (1,580 µg/L) and Test Site (1,380 µg/L) samples also exceeded the Class III Freshwater Quality Criterion (1,000 µg/L) (62-302.530(38) F.A.C.). Lead measured in the effluent sample (0.94 µg/L) exceeded the Class III criterion (62-302.530(39) F.A.C.) and effluent permit limit, but the level measured in the Test Site (0.67 µg/L) sample complied with the Class III criterion and was similar to the level at the Control Site (0.64 µg/L). The levels of copper and arsenic at the Test Site were more than double those at the Control Site and similar to the levels measured in the effluent, indicating some in-stream influence from the effluent, but the Test Site results did not exceed Class III Freshwater Quality Criteria.

General physical-chemical measurements for the effluent, Control Site, and Test Site were all within Class III Freshwater Quality Criteria and Effluent Limits. Slight increases in dissolved oxygen (mg/L), temperature (°C), and conductivity (µmhos/cm) at the Test Site compared to the Control Site are likely a result of the effluent. The Habitat Assessment scores for the Control Site (96) and the Test Site (92) were similar and place both sites in the Suboptimal category. Both sites had poor water velocity and sediment deposition. Algal Growth Potential (AGP) values of the effluent, Control Site, and Test Site samples were all above the “problem” threshold of 5.0 mg dry weight/L for freshwater (Raschke & Schultz, 1987), indicating nutrient enrichment of the Escambia River but not due to the effluent.

Periphyton samples at both the Control and Test Sites were dominated by diatoms with the dominant diatom being *Achnanthidium minutissimum*. Members of the genus Achnanthidium are known to inhabit well oxygenated waters (Kingston 2003). The number of macroinvertebrate individuals collected from quantitative Hester Dendy samplers was low and similar at the Control and Test Site. Shannon Weaver Diversity score calculated on samples with < 300 individuals have the potential for negative bias (lower diversity scores compared to sites with more individuals) (Lande 1996). Both sites were dominated by Dipterans, many of which are taxa tolerant to pollution and disturbance. The Control Site Hester Dendy had a greater percentage of Ephemeroptera taxa. The Stream Condition Index (SCI) scores were calculated using samples taken from dipnet sweeps and placed both the Control and Test Sites in Category 3. Based on these similar SCI scores, there is no indication that the effluent had a harmful effect on the macroinvertebrate communities. The Habitat Assessment and Physical/Chemical characterization suggests that the existing conditions in the Escambia River system may have had a greater impact on the biological state of the Test Site than the effluent.

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.

Facility Overview

The Gulf Power Company Crist Electric Generating Plant is a privately owned domestic electric generating station. The effluent is discharged through a canal with an underflow at Thompson's Bayou into the Escambia River, a Class III Fresh Water (see map Appendix A). The design flow of the wastewater system is 274 million gallons per day (MGD). The annual average daily flow for April 2009 to March 2010 was 180.43 MGD. The flow measured during this survey was 89.67 MGD (FDEP Northwest District sampling staff).

This facility is authorized to operate in compliance with Administrative Order AO015TL, issued due to a failure to meet ground water quality standard for arsenic. The intent of this report is to assess the effect of the discharge on surface water. See the Facility Summary (Appendix B) for a description of the facility, summary of permit limits, and administrative order (AO) and discharge monitoring report (DMR) information.

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 Control Site (located in the Escambia River beginning approximately 165 meters upstream of the discharge canal and extending to approximately 265 meters above the discharge canal) and a Test Site (located in the Escambia River beginning immediately below the discharge canal and continuing to 100 meters below the discharge canal). Effluent samples for all analyses were taken as grab samples from monitoring location D-010.

All field and laboratory biological methods followed Bureau of Laboratories and Biology Section Standard Operating Procedures (see http://www.floridadep.org/labs/sop/index.htm for details) and met DEP quality assurance/quality control standards (see http://www.floridadep.org/labs/qa/index.htm). Explanations of specific methods and measurements can be found in Appendix C.

The following were involved in this investigation: Frank Butera, Nathan Mulkey, and Rick Abad (FDEP Northwest District Office, Pensacola), and DEP Central Laboratory in Tallahassee. The report was reviewed by District representatives and the Point Source Studies Review Committee (Michael Tanski, Nancy Ross, and Cari Butler).

Results and Discussion

Organic Constituents (See Table 1 and Appendix E)

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

Metals (See Table 2 and Appendix E)

- Iron (1,490 µg/L) and lead (0.94 µg/L) detected in the effluent exceeded Class III Fresh Water Quality Criteria (62-302.530(38) & (39)) and effluent permit limits.
- Control Site iron (1,580 µg/L) and Test Site iron (1,380 µg/L) exceeded Class III Fresh Water Quality Criteria (62-302.530(38)).
- All other metals analyzed for this inspection complied with Class III Fresh Water Quality Criteria.
- No metals were detected in the field blank.

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

- Habitat Assessment scores were similar at the Control Site (96) and Test Site (92), which places both sites in the Suboptimal category. The Control Site had a slightly higher water velocity than did the Test Site but both velocities were relatively low. Both sites had low substrate diversity and substrate availability. Severe sand and silt smothering affected both sites. The riparian buffer zone width was less than 18 meters for the Control Site banks and

the Test Site left bank. Riparian zone vegetation quality for both banks of the Control Site and the Test Site had between 20%-30% disruption of the plant community.

- Dissolved oxygen (mg/L), pH (Standard Units), and specific conductance (µmhos/cm) of the effluent complied with Class III Fresh Water Quality Criteria (62-302.530 F.A.C.) and effluent permit limits.
- Chlorophyll *a* content estimates algal biomass, and high algal biomass implies nutrient stress (Stevenson and Bahls, 1999). Chlorophyll *a* was detected at similar low levels in the effluent and surface water sites.

Nutrients (See Table 1 and Appendix E)

- Ortho-phosphate levels detected at the Control and Test Site were approximately half the amount detected in the effluent.
- Total phosphorus, total ammonia, and nitrate and nitrite were present at similar levels at the effluent, Control Site and Test Site. Total Kjeldahl nitrogen, organic nitrogen and total nitrogen were detected in the effluent sample. Based on the available nutrient data and the similarity of values of the Control Site and Test Site, there was no detectable nutrient enrichment from the effluent at the Test Site.
- No nutrients were detected in the field blank. It should be noted that the nutrient sample field blank was not preserved in the field in accordance with DEP-SOP-001/01 FS. 1000 General Sampling Procedures and a laboratory non-conformance report were generated.

Algal Growth Potential (See Table 3 and Appendix E)

- Algal growth potential (AGP) is a measure of nutrients available for algal growth (Miller et al. 1978). Raschke and Shultz (1987) found that AGP values above 5.0 mg dry weight/L represent a “problem” threshold for fresh receiving waters, implying nutrient enrichment. The AGP value in the effluent sample (14.8 mg dry weight/L) using the freshwater species, *Pseudokirchneriella subcapitata,* was approximately 3 times greater than the “problem” threshold value.
- The Control Site AGP value (10.6 mg dry weight/L) was approximately 2 times greater than the “problem” threshold value, and the Test Site AGP Value (16.5 mg dry weight/L) was approximately 3 times higher. AGP values were similar in the effluent and the surface water sites.
- The analytical chemistry suggests that the effluent is co-limited by both nitrogen and phosphorus.
- The total nitrogen to phosphate ratio and predicted AGP for total nitrogen cannot be calculated for the Control Site and Test Site because the analysis for TKN, one of the parameters used in the calculation, was not performed due to test scheduling errors.

Bioassessment

Periphyton (See Table 4 and Appendices I-1 and I-2)

- Periphyton communities at both the Control and Test Sites consisted mostly of diatoms. The diatom community at both sites was dominated by the *Achnanthidium minutissimum.* Members of the genus Achnanthidium are also known to inhabit well oxygenated waters (Kingston 2003). The Control Site had 7% more green algae than did the Test Site. The Test Site had 16% more blue-green algae than the Control Site. There were no adverse effects apparent on the periphyton community in the Escambia River from the effluent.

Macroinvertebrates (See Tables 5 and 6 and Appendices J-1, J-2, K-1 and K-2)

- Quantitative macroinvertebrate data were collected from Hester Dendy samplers suspended in the water column 0.3-0.5 m deep at the Control and Test Sites. Only 161 and 183 individuals were collected at the Control and Test Site, respectively; so a robust measure of diversity could not be obtained. Shannon Weaver Diversity scores calculated on samples with < 300 individuals have the potential for negative bias (lower diversity scores compared to sites with more individuals) (Lande 1996). Both sites were dominated by individuals in the order Diptera, many of which are taxa tolerant to pollution and

disturbance. The Control Site sample had 21.1% Ephemeroptera taxa (pollution sensitive order) while the Test Site only had 8.2%. However, the Test Site had slightly more individuals (3.3%) in other pollution sensitive orders (Plecoptera and Tricoptera) than the Control Site (1.3%). Field staff recorded no rainfall four weeks prior to the sampling and that the water level had dropped 0.3m since the deployment of the Hester Dendy samplers. It was also noted that severe sand and silt smothering affected both the Control and Test Site. The low number of macroinvertebrates collected from the Hester Dendy samplers may have been the result of the lowered water level not fully inundating the samplers, possibly leaving them exposed for a short period of time, or some smothering of the samplers.

- Qualitative macroinvertebrate data from dipnet samples indicated a degraded macroinvertebrate community. The Stream Condition Index (SCI) scores placed both the Test Site and the Control Site in Category 3 (see Appendix C for an explanation of SCI Categories). However, the Test Site score (26A) was slightly better than the Control Site score (12A). Both sites had similar low numbers of sensitive taxa and Trichoptera. The percentage of suspension feeders and Tanytarsini individuals was similar at both sites. The Test Site had more Ephemeroptera and clinger taxa. Roughly two-thirds of the macroinvertebrates found at the Control Site were very tolerant individuals compared with the Test Site, which was approximately 50% very tolerant individuals; there were more members of the orders Amphipoda and Gastropoda collected at the Test Site than at the Control Site which accounts for this difference (see Appendix C for an explanation of how these SCI metrics typically respond to human disturbance). Overall, there were no negative effects on macroinvertebrates at the Test Site that were attributable to the effluent, as evident by the degraded community present at the Control Site. The adverse effects on the macroinvertebrate community at both the Control Site and Test Site were more likely attributable to low habitat availability, low substrate diversity, severe habitat smothering and low water velocity.

Conclusion

Iron (1,490 µg/L) and lead (0.94 µg/L) detected in the effluent exceeded Class III Fresh Water Quality Criteria (62-302.530(38) & (39)) and effluent permit limits. Iron measured at the Control (1,580 µg/L) and Test (1,380 µg/L) Sites also exceeded Class III Fresh Water Quality Criteria. While a lead exceedance was detected in the effluent, the Test Site sample did not exhibit elevated levels; Control Site and Test Site lead quantities were similar. The levels of arsenic and copper reported at the Test Site indicate influence by the effluent but did not exceed Class III Fresh Water Quality Criteria. AGP values were similar in the effluent and the surface water sites. Periphyton communities at both the Control and Test Sites consisted mostly of diatoms. The diatom community at both sites was dominated by the *Achnanthidium minutissimum*, which is found in highly oxygenated waters (Kingston 2003). Both the quantitative and qualitative macroinvertebrate samples show a community largely dominated by tolerant taxa which indicates a degraded biological condition. Too few individuals were collected on Hester Dendy samplers to provide a robust measure of diversity. Despite slight differences in community composition between the Test and Control Sites, the Stream Condition Index scores were low at both sites. The low Stream Condition Index scores are likely attributable to low habitat availability, low substrate diversity, severe habitat smothering and low water velocity. The similarities in macroinvertebrate and periphyton communities at the Control and Test Sites show the effluent is not negatively affecting downstream water.

Literature Cited

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Table 1. Effluent limits, Class III Freshwater Criteria and chemical data.

Gulf Power Crist	Class III Criteria	Effluent Limits	Effluent Grab	Control Site	Test Site
Organic Constituents (µg/L)					
None Detected	-	-	None Detected		
Nutrients (mg/L)					
Ortho-phosphate	-	-	0.012	0.006 I	0.007 I
Total Phosphorus	-	-	0.039	0.033	0.031
Total Ammonia	-	-	0.041	0.043	0.042
Un-ionized Ammonia	≤ 0.02 s	-	≤ 0.02 c	≤ 0.02 c	≤ 0.02 c
Nitrate and Nitrite	-	-	0.23 J	0.21	0.23
Total Kjeldahl Nitrogen	-	-	0.37	-	-
Organic Nitrogen	-	-	0.329 c	-	-
Total Nitrogen	-	-	0.6 c	-	-
General Physical and Chemical Parameters					
Habitat Assessment	-	-	-	96	92
Dissolved Oxygen (mg/L)	≥ 5.0	-	8.6	7.6	8.4
pH (SU)	6.0 - 8.5	6.0 - 8.5	7.2	6.9	6.8
Conductivity (µmhos/cm)	≤ 1,275	-	128	95	120
Temperature (°C)	-	≤ 34.4 c	23.9	19.2	22.7
Sample Depth (m)	-	-	0.15	0.15	0.15
Total Residual Oxidants (mg/L)	-	≤ 0.01	-	-	-
Chlorophyll *a* (µg/L) - Corrected	-	-	3.3	2.8	3.2
Phaeophytin (µg/L)	-	-	0.64 I	0.88 I	1 I
Oils and Greases (mg/L)	≤ 5.0	≤ 5.0 s	1.4 U	1.4 U	1.4 U
Alpha, Total (pCi/L)	≤ 15	≤ 15 p	0.9 U	1.1 U	1.6
Alpha-Counting Error (pCi/L)	-	-	0.5	0.7	0.9
Flow (MGD)	-	Report	180.43	-	-
Hardness (mg $CaCO_3$)	-	Report p	34.29 c	29.24 c	33.05 c

Value exceeds the Class III Water Quality Criteria or permit limits

c - Value is calculated

p - 24 hour flow proportioned composite

s - Single sample

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

Table 2. Effluent limits, Class III Freshwater Criteria and metals data. Class III Criteria based on hardness are presented individually for each site based on hardness at that site.

Gulf Power Crist	Effluent Class III Criteria	Effluent Limits	Effluent	Control Site Class III Criteria	Control Site	Test Site Class III Criteria	Test Site
Metals (µg/L unless otherwise noted)							
Aluminum	-	-	880	-	1010	-	630
Arsenic	≤ 50	≤ 50	1.82	≤ 50	0.6 I	≤ 50	1.36
Cadmium	≤ 0.1 b	≤ 0.1 b	0.03 U	≤ 0.11 b	0.03 U	≤ 0.12 b	0.03 U
Calcium (mg/L)	-	-	10.5	-	9.32	-	10.2
Chromium-III	≤ 35.9 b	≤ 11.0	1.2 I	≤ 31.48 b	1.2 I	≤ 34.80 b	0.75 I
Copper	≤ 3.7 b	≤ 3.7 b	2.5	≤ 3.26 b	0.88 I	≤ 3.62 b	2.05
Iron	≤ 1,000	≤ 1,000	1490	≤ 1,000	1580	≤ 1,000	1380
Lead	≤ 0.8 b	≤ 0.8 b	0.94	≤ 0.67 b	0.64 I	≤ 0.78 b	0.67 I
Magnesium (mg/L)	-	-	1.96	-	1.45	-	1.84
Mercury	≤ 0.012	≤ 0.012	0.12 U	≤ 0.012	0.12 U	≤ 0.012	0.12 U
Nickel	≤ 21.1 b	≤ 21.1 b	1.01	≤ 18.43 b	0.96 I	≤ 20.44 b	0.91 I
Selenium	≤ 5.0	≤ 5.0	0.39 I	≤ 5.0	0.2 U	≤ 5.0	0.3 I
Silver	≤ 0.07	-	0.025 U	≤ 0.07	0.025 U	≤ 0.07	0.025 U
Zinc	≤ 48.4 b	≤ 48.4 b	5 U	≤ 42.27 b	5 U	≤ 46.89 b	5 U

See Table 1 for calculated hardness.

Value exceeds the Class III Water Quality Criteria or permit limits

b - Value is calculated based on hardness

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

Table 3. Measured and predicted algal growth potential (AGP; mg dry weight/L) for total soluble inorganic nitrogen (TSIN), orthophosphate (OP), total nitrogen (TN) and total phosphorus (TP) limitation of the freshwater species *Pseudokirchneriella subcapitata* and ratios of nitrogen to phosphorus.

Gulf Power Crist							
Location	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	14.8	10.3 ± 2.1	5.2 ± 1.0	22.8 ± 4.6	16.8 ± 3.4	22.6	15.4
Control Site	10.6	9.6 ± 1.9	2.6 ± 0.5		14.2 ± 2.8	42.2	
Test Site	16.5	10.3 ± 2.1	3.0 ± 0.6		13.3 ± 2.7	38.9	

Table 4. Periphyton Composition - Qualitative.

Gulf Power Crist	Control Site	Test Site
Number of Wet Taxa	14	19
Number of Wet Algal Units Identified	301	300
Percent Dominant Wet Taxon	80.1	71.0
Dominant Wet Taxon Name	Bacillariophyta (Diatoms)	Bacillariophyta (Diatoms)
Number of Diatom Taxa	36	50
Number of Diatom Algal Units Identified	500	500
Percent Dominant Diatom Taxon	40.0	34.0
Dominant Diatom Taxon Name	*Achnanthidium minutissimum*	*Achnanthidium minutissimum*
Percentage Composition for Wet Algae		
Blue-green algae	11.3	27.3
Green algae	7.6	0.7
Diatoms	80.1	71.0
Euglenophytes	0.7	0.0

Table 5. Macroinvertebrate Hester-Dendy Samples - Quantitative.

Gulf Power Crist	Control Site	Test Site
Summary Statistics		
Shannon-Weaver Diversity	3.34*	3.73*
Number of Taxa	25	25
Number of EPT Taxa	4	4
Percent Dominant Taxon	30.9	25.5
Dominant Taxon Name	*Polypedilum illinoense* grp. (Diptera)	*Tanytarsus* sp. L Epler (Diptera)
Total Number of Individuals (counted)	161	183
Total Number of Individuals (#/m^2)	428	486
Community Composition: Percent of total		
Amphipoda	7.5	7.7
Diptera	70.1	68.4
Ephemeroptera	21.1	8.2
Gastropoda	0.0	12.6
Plecoptera	0.0	0.6
Trichoptera	1.3	2.7
Other	0.1	0.0
Functional Feeding Groups: Percent of total		
Browser-Grazers	0.6	3.0
Piercers	1.3	2.7
Predators	6.0	9.7
Scavengers	0.6	3.0
Scrapers	8.7	3.8
Shredders	18.1	4.6
Surface Deposit Feeders	56.0	43.4
Suspension Feeders	8.1	17.3
Unknown	0.6	12.6

* - Shannon Weaver Diversity scores calculated on samples with < 300 individuals have the potential for negative bias (lower diversity scores compared to sites with more individuals)(Lande 1996).

Table 6. Macroinvertebrate Dipnet Samples - Qualitative.

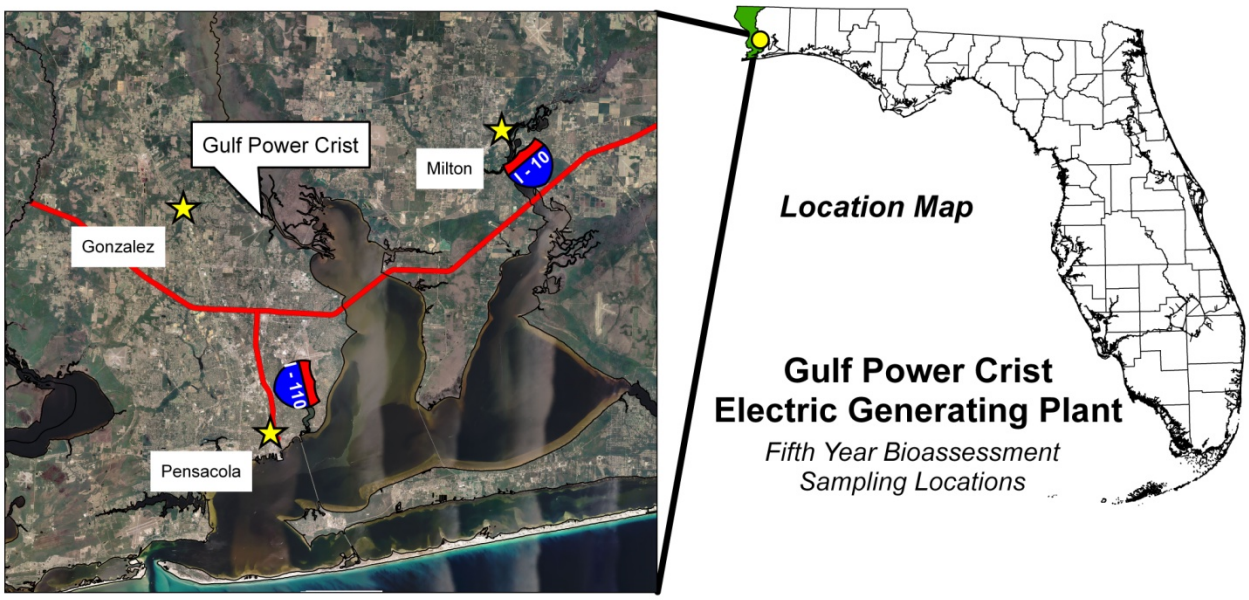
Gulf Power Crist FYI5	Control Site		Test Site	
Summary Statistics				
Stream Condition Index 2007 (value)	12 A		26 A	
Stream Condition Index 2007 (category) *	Category 3		Category 3	
Stream Condition Index Metrics	Rep 1	Rep 2	Rep 1	Rep 2
Number of Total Taxa	22	22	27	21
Number of Ephemeroptera Taxa	2	2	5	3
Number of Plecoptera	0	0	0	0
Number of Trichoptera Taxa	1	0	1	1
Number of Clinger Taxa	1	1	3	3
Number of Long-lived Taxa	0	0	0	1
Number of Sensitive Taxa	1	1	2	1
Percent of Dominant Taxon	63.9	54.9	24.1	28.4
Percent Suspension Feeders and Filterers	5.4	5.9	6.2	3.6
Percent of Tanytarsini Individuals	2.5	0.7	4.8	0.7
Percent of Very Tolerant Individuals	72.8	72.2	47.6	48.2
Total Number of Individuals	158	144	145	141
Community Composition: Percent of total				
Dominant Taxon Name	Polypedilum illinoense grp. (Diptera)	Polypedilum illinoense grp. (Diptera)	Polypedilum illinoense grp. (Diptera)	Polypedilum illinoense grp. (Diptera)
Acariformes	1.3	0.0	0.0	0.0
Amphipoda	7.0	7.6	20.0	17.7
Bivalvia	0.6	0.7	0.0	1.4
Coleoptera	0.0	0.7	0.0	0.0
Diptera	84.8	82.6	60.7	58.2
Ephemeroptera	2.5	1.4	6.9	6.4
Gastropoda	0.6	4.9	10.3	14.2
Isopoda	0.0	0.7	0.0	0.7
Odonata	0.0	0.0	1.4	0.0
Oligochaeta	1.9	1.4	0.0	0.0
Plecoptera	0.0	0.0	0.0	0.0
Trichoptera	0.6	0.0	0.7	1.4
Other	0.6	0.0	0.0	0.0
Functional Feeding Groups: Percent of total				
Browser-Grazers	0.6	0.0	0.0	1.4
Burrowing Deposit Feeders	1.9	1.4	0.0	0.0
Piercers	0.6	0.0	0.7	1.4
Predators	5.7	5.9	2.1	3.2
Scavengers	0.6	0.0	0.0	1.4
Scrapers	1.3	5.2	9.0	14.2
Shredders	36.4	36.5	25.2	23.8
Surface Deposit Feeders	47.5	45.1	40.3	31.9
Suspension Feeders	5.4	5.9	6.2	3.6
Unknown	0.0	0.0	16.6	19.2

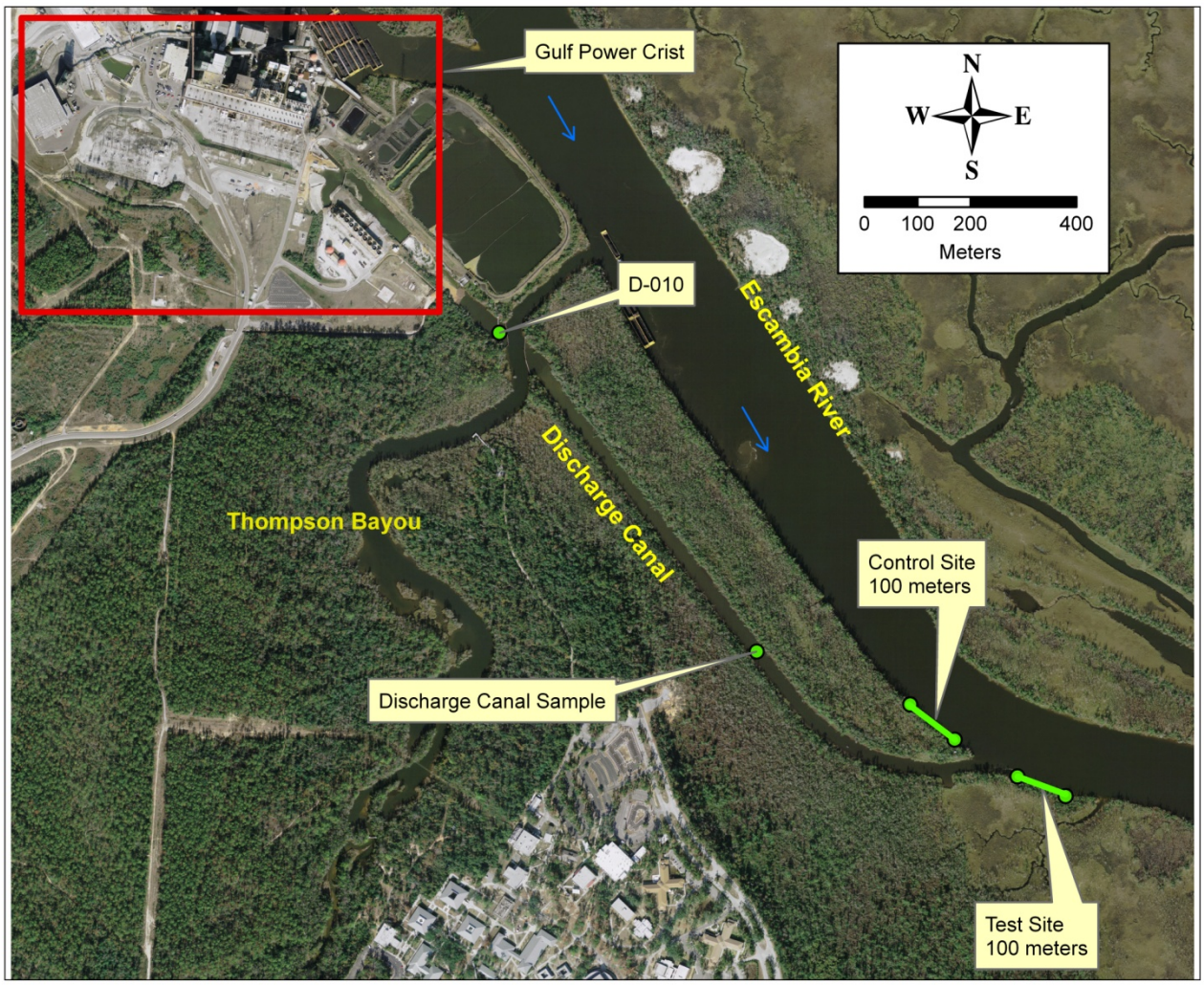
A - Value reported is the mean of two determinations

* SCI_2007 categories from Table LT 7200-2 of DEP-SOP-002/01 as referenced in Quality Assurance Rule (62-160 F.A.C.), December 3, 2008: Values 0 ≤ 34 are Category 3; Values 35 < 67 are Category 2; Values 68 ≤ 100 are Category 1

Appendix A

Map of Facility





Appendix B

Facility Summary

State of Florida
Department of Environmental Protection
Facility Introduction & Summary

PART I: Information gathered prior to sampling event	
Prepared By: Kim Allen	**Contact Number:** 595-8300 ext. 1185
Facility Name (as it appears on permit): Gulf Power Crist Electric Generating Plant	**Former Names:**
NPDES Permit Number: FL002275	**Permit Expiration Date:** 11/13/10
Physical Address: End of Pate Road, off Ten Mile Road	
District: NWD	**County:** Escambia
Function of Facility: Electric Generating Plant	
Facility Type: Power Plant	**Permitted Capacity (MGD):** 274 MGD max discharge
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): 180.43 mgd (4/1/09-3/31/10)	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months): N/A	
Description of type of Discharge: ☒ Continuous ☐ Intermittent ☐ Seasonal ☐ Rainfall Dependent ☐ Other, please specify	

Description of Sampling Location(s) - actual permit designation of permitted sampling point(s):

FLW-1 Flow from condenser inlets
FLW-2 Flow from immediately upstream of the underflow at Thompson's Bayou
INT-1 Condenser inlets
EFF-1 Immediately upstream of the underflow at Thompson's Bayou
FLW-3 Flow from ash pond discharge weir
EFF-2 Ash pond discharge weir
FLW-4 Flow from metal cleaning treatment pond
EFF-3 Metal cleaning treatment pond pump discharge
FLW-5 Flow from cooling tower blowdown line conveyance pipe
FLW-6 Flow of reclaimed and spent reclaimed water directed for reuse into the intake tunnel
OUI-5 Reclaimed water pipeline for makeup of Units 6 and 7 cooling towers
OUI-6 Reclaimed and spent reclaimed water prior to discharging into the intake tunnel

Description of Permitted Outfall(s):

Outfall D-010 (formerly 001), combined plant discharge.

Internal Outfall I-150 (formerly outfall 003) treated metal cleaning wastewater from Ash Pond

Existing Outfall I-170 (formerly outfall 004) cooling tower blowdown when river water is used as makeup to the Ash Pond

Existing internal outfall I-1C0 (formerly Outfall 002) ash pond discharge to the discharge canal prior to D-010.

New internal outfall I-180 (ECUA reclaimed water and Units 6 and 7 cooling tower blowdown when ECUA reclaimed water is used as makeup "spent reclaimed water") to the intake tunnel for use as OTCW.

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

Non-process, once through cooling water from Units 1 through 5 discharges to the Escambia River, a Class III fresh water. All treated and untreated industrial process wastewater is discharged to the ash pond or via underground injection (permit number IW0085658). Wastewater streams that discharge to the ash pond include: ash sluice water, overflow from the bottom ash dewatering bins, neutralized demineralizer regeneration wastewater, cooling tower blowdown, boiler blowdown, floor drainage, auxiliary equipment cooling water and seal water, coal pile runoff , yard sump discharge, and treated metal cleaning wastewater. The wastewater streams listed above that have the potential to contain oil are first routed through the oil skimmer pond prior to discharge to the ash pond.

PART I: Continued										
List current Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under (Leave cell blank if not applicable)										
			Effluent Limitations				Monitoring Requirements			
Parameter	Units	Max/Min	Annual Average	Monthly Average	Weekly Average	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
D-010 (formerly D-001)										
Flow	Mgd						Daily	Calc	FLW-1 FLW-2	
Temperature (F), Water	Degrees F	94 (See I.A.5.					Continuous	Calc	EFF-1	
pH	(SU)	Min/max				6.0 min 8.5 max	Weekly	Grab	EFF-1	
Oxidants, Total Residual	Mg/L	Max				.01	Weekly	Multiple Grabs (See I.A.6)	EFF-1	
Time of Oxidant Discharge	Min/day/unit	Max				**120** (See Condition I.a.9)	Daily	Pump Logs	EFF-1	
Hardness, total (as CaCO3)	Mg/L					Report	Qtrly	24-hr time proportion composite	EFF-1	
Oil and Grease	Mg/L	Max				5.0	Qtrly	Grab	EFF-1	
Arsenic, Total Recoverable	Ug/L	Max				**50** (see I.A.7)	Qtrly	24-hr time proportion composite	EFF-1 INT-1	

Cadmium, Total Recoverable	Ug/L	max				See I.A.3 and I.A.7	Qtrly	24-hr time proportion composite	EFF-1 INT-1	
Chromium, Hexavalent Total Recoverable	Ug/L	Max				**11.0** (See 1A.7 and I.A.8)	Qtrly	24-hr time proportion composite	EFF-1 INT-1	
Copper, Total Recoverable	Ug/L	Max				See I.A.3 and I.A.7	Qtrly	24-hr time proportion composite	EFF-1 INT-1	
Iron, Total Recoverable	Mg/L	Max				**1.0** (See I.A.3 and I.A.7)	Qtrly	24-hr time proportion composite	EFF-1 INT-1	
Lead, Total Recoverable	Ug/L	Max				See .A.3 and I.A.7	Qtrly	24-hr time proportion composite	EFF-1 INT-1	
Mercury, Total Recoverable	Ug/L	Max				**.012** (see I.A.7.)	Qtrly	Grab	EFF-1 INT-1	
Nickel, Total Recoverable	Ug/L	Max				See I.A.3. and I.A.7	Annually	24-hr time proportion composite	EFF-1 INT-1	
Selenium, Total Recoverable	Ug/L	Max				**5.0** (See I.A.7)	Annually	24-hr time proportion composite	EFF-1 INT-1	
Zinc, Total Recoverable	Ug/L	Max				See I.A.3 and I.A.7	Qtrly	24-hr time proportion composite	EFF-1 INT-1	
Whole Effluent Toxicity						See I.A.4			EFF-1	

Alpha, Gross Particle Activity	PCI/L	Max				15	Qtrly	24-hr time proportion composite	EFF-1	
Radium 226 + Radium 228, Total	PCI/L	Max				5.0	Qtrly		EFF-1	

I.A.3.

3. The limit for Total Recoverable Cadmium, Copper, Lead, Nickel, and Zinc shall be calculated using the following equation:

   $Cd < e(0.7852[\ln H]-3.49)$
   $Cu < e(0.8545[\ln H]-1.702)$
   $Pb < e(1.273[\ln H]-4.705)$
   $Ni < e(0.846[\ln H]+0.0584)$
   $Zn < e(0.8473[\ln H]+0.884)$

   Total hardness shall be measured at the time of the effluent sample. The "ln H" means the natural logarithm of total hardness expressed as milligrams/Liter (mg/L) of CaCO3. This equation can only be applied for hardness in the range of 25 to 400 mg/L as CaCO3. If the total hardness is below 25 mg/L, the permittee shall use 25 mg/L for total hardness in the equation and if the hardness is above 400 mg/L, the permittee shall use 400 mg/L for total hardness in the equation.

   The measured effluent value shall be recorded on the DMR in the parameter row for Total Recoverable Cadmium, Copper, Lead, Nickel, and Zinc (effluent). The calculated effluent limit shall be recorded on the DMR in the parameter row for Total Recoverable Cadmium, Copper, Lead, Nickel, and Zinc (calculated limit). Compliance with the effluent limitation is determined by calculating the difference between the measured effluent value and the calculated effluent limit. The compliance value shall be recorded on the DMR in the parameter row for Total Recoverable Cadmium, Copper, Lead, Nickel, and Zinc (effluent minus calculated limit). If the compliance value is greater than 0.00, the permittee will be considered in violation of the limitation.

I.A.4 - Attached.

I.A.5.

5. Pursuant to I.A.1 the Maximum Daily Average temperature shall not exceed 94°F over a 24 hour period as measured at EFF-1. However, the Units 1-5 cooling tower shall be placed in full operation (defined as both booster pumps and all available fans, but not less than seven) as expeditiously as possible (but, in no case, no later than 45 minutes) after the discharge temperature exceeds 97.0°F as a 60 minute rolling average as measured at EFF-1(updated not less than every 15 minutes). The permittee shall maintain and operate the facilities so as to achieve compliance; however, failure to achieve compliance with this requirement does not constitute violation of this permit if due to mechanical malfunctions of pumps, fans, and/or other cooling tower components beyond the normal control of the permittee. Failure to have two booster pumps and all available fans (but not less than seven) when required shall be reported to the Department's Northwest District Office via telephone not later than the next business day and, in writing, within five business days of the occurrence. The reports shall provide all relevant information including, but not necessarily limited to, causes, temperatures, and period(s) of exceedance(s), plant loadings, unit(s) in operation, and remedial action taken.

I.A.6. Multiple grabs for Total Residual Oxidants shall consist of grab samples collected at approximately the beginning of the period of expected oxidant discharge and once every 15 minutes thereafter until the end of the period of expected oxidant discharge.

I.A.7. The actual limits for Arsenic, Cadmium, Chromium, Copper, Iron, Lead, Mercury, Nickel, Selenium, Zinc, Gross Alpha, and Radium shall be the water quality standard set forth in FAC 62-302.530 for Class III fresh waters (as provided in condition I.A.3), or the concentration of the intake cooling water, whichever is greater. If the Outfall D-010 composite sample exceeds the intake concentration (and the intake concentration exceeds the water quality standard), a minimum of five (5) additional subsamples shall be measured from the original intake and outfall composites and a "student's t-test" shall be run on these additional subsamples comparing discharge concentrations with the intake concentrations; unless the discharge concentration exceeds the intake concentration at the 95% confidence level, the facility shall be in compliance with the limitation.

I.A.8.The permittee may sample and analyze for total recoverable Chromium in lieu of Chromium IV; however, if the total recoverable chromium result exceeds 11.0 ug/L then the permittee shall resample and Chromium VI anlaysis shall be performed and reported.

PART I: Continued

Receiving Waters:	Classification (indicate whether fresh or marine):
Escambia River	Class III

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

Attached.

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

An Administrative Order (AO) was issued 11/16/05 because the facility could not meet the new arsenic ground water quality standard of 10 ug/L that became effective 1/1/05. The AO gave the facility time to evaluate the feasibility of engineering and hydrogeologic means for meeting the new standard or apply for relief. The facility submitted an evaluation report on 7/20/06 and based on the report, the Department granted relief from the standard on 10/20/06 for wells MWC-10, MWC-11 and MWC-12.

Facility Mixing Zone Details (if applicable):
N/A

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

Date	Parameter and Units	Limit	Result
		(Hardness-based)	
6/09	**Copper (ug/L)**	**3.14 ug/L (max)**	**5.40 ug/L**
12/09	**Copper (ug/L)**	**2.85 ug/L (max)**	**5.90 ug/L**
3/10	**Copper (ug/L)**	**2.85 ug/L (max)**	**5.90 ug/L**
6/10	**Copper (ug/L)**	**3.43 ug/L (max)**	**4.00 ug/L**

Describe previous FYI and WQBEL study:

The previous FYI was conducted in 1991. The 1991 report states that the facility was not found to have a deleterious effect on the receiving water body.

Describe previous or current Enforcement Actions (including WLs):

Warning Letter needed for Copper violations.

Describe any violations or problems noted in previous inspection:

Same as violations noted above.

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: 4/12/10	Sampler(s): Nathan Mulkey, Frank Butera, Rick Abad
Temperature (Deg C): 23.86	pH (SU): 7.22
Dissolved Oxygen (mg/L): 8.56	Conductivity (umhos/cm): 128
Total Residual Chlorine (mg/L):	Total Residual Chlorine - after Disinfection (mg/L):
Method of Chlorination:	Method of De-chlorination:
Flow During Sample Collection for each outfall(MGD):	
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:

Sample Point	Description of Monitoring Location
FLW-2	*Flow from immediately upstream of the underflow at Thompson's Bayou.*
INT-1	Condenser inlets.
EFF-1	Immediately upstream of the underflow at Thompson's Bayou.

3. The limit for Total Recoverable Cadmium, Copper, Lead, Nickel, and Zinc shall be calculated using the following equation:

   Cd < e(0.7852[lnH]-3.49)
   Cu < e(0.8545[lnH]-1.702)
   Pb < e(1.273[lnH]-4.705)
   Ni < e(0.846[lnH]+0.0584)
   Zn < e(0.8473[lnH]+0.884)

   Total hardness shall be measured at the time of the effluent sample. The "ln H" means the natural logarithm of total hardness expressed as milligrams/Liter (mg/L) of CaCO3. This equation can only be applied for hardness in the range of 25 to 400 mg/L as CaCO3. If the total hardness is below 25 mg/L, the permittee shall use 25 mg/L for total hardness in the equation and if the hardness is above 400 mg/L, the permittee shall use 400 mg/L for total hardness in the equation.

   The measured effluent value shall be recorded on the DMR in the parameter row for Total Recoverable Cadmium, Copper, Lead, Nickel, and Zinc (effluent). The calculated effluent limit shall be recorded on the DMR in the parameter row for Total Recoverable Cadmium, Copper, Lead, Nickel, and Zinc (calculated limit). Compliance with the effluent limitation is determined by calculating the difference between the measured effluent value and the calculated effluent limit. The compliance value shall be recorded on the DMR in the parameter row for Total Recoverable Cadmium, Copper, Lead, Nickel, and Zinc (effluent minus calculated limit). If the compliance value is greater than 0.00, the permittee will be considered in violation of the limitation.

4. ~~The permittee shall conduct toxicity testing once every five years prior to permit renewal for submittal with the renewal application as described below during the months of July or August to evaluate whole effluent toxicity of the discharge.~~

   The permittee shall comply with the following whole effluent toxicity requirements to evaluate acute whole effluent toxicity of the discharge from outfall D-010 when reclaimed water discharges exceed 72 hours.

   a. Effluent Limitation

   (1) Whole effluent acute toxicity shall not exceed in any routine or in any additional follow-up test an LC50 of less than 100% effluent. [Rules 62-302.200(1), 62-302.500(1)(a)4., and 62-4.244(3)(a), F.A.C.]

   b. Monitoring Frequency

   (1) Routine toxicity tests shall be conducted once every three months when discharging once-through cooling water containing reclaimed water for use in the Units 4 & 5.

   (2) Upon completion of four consecutive, valid routine tests that demonstrate compliance with the effluent limitation in 4.a.(1) above, the permittee may submit a written request to the Department for a reduction in monitoring frequency to once every six months. The request shall include a summary of the data and

the complete bioassay laboratory reports for each test used to demonstrate compliance. The Department shall act on the request within 45 days of receipt. Reductions in monitoring shall only become effective upon the Department's written confirmation that the facility has completed four consecutive valid routine tests that demonstrate compliance with the effluent limitation in 4.a.(1) above.

(3) If a test within the sequence of the four is deemed invalid based on the acceptance criteria in EPA-821-R-02-012, but is replaced by a repeat valid test initiated within 14 days after the last day of the invalid test, the invalid test will not be counted against the requirement for four consecutive valid tests for the purpose of evaluating the reduction of monitoring frequency.

c. Sampling Requirements

(1) Routine tests shall be conducted on four separate grab samples collected at evenly-spaced (6-hr) intervals over a 24-hour period. The four grab samples shall be used in eight bioassays (four bioassays for each species) and shall represent one test. If the duration of the discharge is less than 24-hours, the duration of discharge shall be documented on the chain of custody.

(2) For additional follow-up tests, the first test shall be conducted on four separate grab samples collected at evenly-spaced (6-hr) intervals over a 24-hour period. The four grab samples shall be used in four separate bioassays for each species that failed the routine test. The four grab samples represent one test. The second follow-up test shall be run on a single grab sample collected on the day and time when the greatest toxicity was identified in the routine or first additional follow-up test. Results for each additional follow-up test shall include the determination of LC50 values with 95% confidence limits.

d. Test Requirements

*(1) Routine Tests: All routine tests shall be conducted using a control (0% effluent) and a minimum of five dilutions: **100%, 75%, 50%, 25%,** and **12.5%** effluent.*

*(2) When the salinity of the effluent is less than 1.0 parts per million (ppm), measured as conductivity, the permittee shall conduct 96-hour acute static renewal multi-concentration toxicity tests using the daphnid, **Ceriodaphnia dubia**, and the bannerfin shiner, **Cyprinella leedsi**, concurrently. When the salinity of the discharge is greater than or equal to 1.0 ppm, measured as conductivity, the permittee shall conduct 96-hour acute static renewal toxicity tests using the mysid, **Americamysis (Mysidopsis) bahia**, and the inland silverside, **Menidia beryllina**, concurrently.*

*(3) All test species, procedures and quality assurance criteria used shall be in accordance with **Methods for Measuring Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms**, EPA-821-R-02-012. 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 acute toxicity testing in accordance with the revised method.*

(4) When Ceriodaphnia dubia and Cyprinella leedsi are the test species, the control water and dilution water shall be moderately hard water as described in EPA-821-R-02-012, Table 7. When Americamysis (Mysidopsis) bahia and Menidia beryllina are the test species, the control water and dilution water used shall be artificial seawater diluted to the test salinity as described in EPA-821-R-02-012, Section 7.2.4. The test salinity shall be determined as follows:

*(a) When the salinity of the effluent is between 1 and 7 parts per thousand (ppt), the following salinity adjustment shall be used. For the **Americamysis bahia** bioassays, the effluent and the control (0% effluent) shall be adjusted to a salinity of 7 ppt for the 100% effluent test using artificial sea salts. No salinity adjustment shall be done for the **Menidia beryllina** bioassay test. The salinity of the control/dilution water (0% effluent) shall match the test salinity of the effluent. A salinity adjustment control should be prepared and included with the **Americamysis bahia** bioassay. The salinity adjustment control is intended to identify toxicity resulting from adjusting the salinity of the effluent 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 to 7 ppt at the same time that the salinity of the effluent is adjusted to 7 ppt, using the same artificial sea salts.

(b) When the salinity of the effluent is greater than 7 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 (0% effluent) shall match the test salinity of the effluent.

e. Quality Assurance Requirements

(1) A standard reference toxicant (SRT) quality assurance (QA) acute 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 acute toxicity tests using the same reference toxicant and test conditons. 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 10% for either species in any test, the test for that species (including the control) shall be invalidated and the test repeated. The repeat test shall begin within 14 days after the last day of the invalid test.

(3) If 100% mortality occurs in all effluent concentrations prior to the end of any test and the control mortality is less than 10% at that time, the test (including the control) shall be terminated with the conclusion that the test fails and constitutes non-compliance.

(4) Additional follow-up tests shall be evaluated for acceptability based on the concentration-response relationship, as required by EPA-821-R-02-012, Section 12.2.6.2., and included with the bioassay laboratory reports.

f. Reporting Requirements

(1) Results from all required tests shall be reported on the Discharge Monitoring Report (DMR) as follows:

(a) Routine Test Results: If an LC50 >100% effluent occurs in all four separate grab sample bioassays for the test species, ">100%" shall be entered on the DMR for that test species. If in any of the four separate grab sample bioassays for the test species an LC50 <100% effluent occurs, the lowest calculated LC50 effluent concentration shall be entered on the DMR for that test species.

(b) Additional Follow-up Test Results: For each additional test required, the calculated LC50 value shall be entered on the DMR for that test species and the 95% confidence limits.

(2) A bioassay laboratory report for the routine test shall be prepared according to EPA-821-R-02-012, Section 12, Report Preparation and Test Review, and mailed to the Department at the address below within 30 days after the last day of the test.

(3) For additional follow-up tests, a single bioassay laboratory report shall be prepared according to EPA-821-R-02-012, Section 12, and mailed within 30 days after the last day of the second valid additional follow-up test.

(4) Data for invalid tests shall be included in the bioassay laboratory report for the repeat test.

(5) The same bioassay data shall not be reported as the results of more than one test.

(6) All bioassay laboratory reports shall be sent to:

Florida Department of Environmental Protection
Industrial Wastewater Section, Mail Station 3545
Bob Martinez Center 2600 Blair Stone Road
Tallahassee, Florida 32399-2400

g. Test Failures

(1) A test fails when the test results do not meet the limits in 4.a.(1).

(2) Additional Follow-up Tests:

(a) If a routine test does not meet the acute toxicity limitation in 4.a.(1) above, the permittee shall notify the Department at the address above within 21 days after the last day of the failed routine test and conduct two additional follow-up tests on each species that failed the test in accordance with 4.d.

(b) The first test shall be initiated within 28 days after the last day of the failed routine test. The remaining additional follow-up tests shall be conducted weekly thereafter until a total of two valid additional follow-up tests are completed. The additional follow-up test samples must be collected when the discharge contains reclaimed water. It may be necessary to wait until the next discharge of reclaimed water to collect the additional follow-up test samples.

(c) The first additional follow-up test shall be conducted using a control (0% effluent) and a minimum of five dilutions: 100%, 75%, 50%, 25%, and 12.5% effluent. The permittee may modify the dilution series in the second additional follow-up test to more accurately bracket the toxicity such that at least two dilutions above and two dilutions below the target concentration and a control (0% effluent) are run. All test results shall be statistically analyzed according to the Appendices in EPA-821-R-02-012.

(3) In the event of three valid test failures (whether routine or additional follow-up tests) within a 12-month period, the permittee shall notify the Department within 21 days after the last day of the third test failure.

(a) The permittee shall submit a plan for correction of the effluent toxicity within 60 days after the last day of the third test failure.

(b) The Department shall review and approve the plan before initiation.

(c) The plan shall be initiated within 30 days following the Department's written approval of the plan.

(d) Progress reports shall be submitted quarterly to the Department at the address above.

(e) During the implementation of the plan, the permittee shall conduct quarterly routine whole effluent toxicity tests in accordance with 4.d. Additional follow-up tests are not required while the plan is in progress. Following completion or termination of the plan, the frequency of monitoring for routine and additional follow-up tests shall return to the schedule established in 4.b.(1). If a routine test is invalid according to the acceptance criteria in EPA-821-R-02-012, a repeat test shall be initiated within 14 days after the last day of the invalid routine test.

(f) Upon completion of four consecutive, valid routine tests that demonstrate compliance with the effluent limitation in 4.a.(1) above, the permittee may submit a written request to the Department to terminate the plan. The plan shall be terminated upon written verification by the Department that the facility has passed at least four consecutive valid routine whole effluent toxicity tests. If a test within the sequence of the four is deemed invalid, but is replaced by a repeat valid test initiated within 14 days after the last day of the invalid test, the invalid test will not be counted against the requirement for four consecutive valid tests for the purpose of terminating the plan.

(4) The additional follow-up testing and the plan do not preclude the Department taking enforcement action for whole effluent toxicity permit limit violations.

~~(1) Mortality of less than or equal to 20% in the 100% effluent concentration in any "routine" test shall constitute compliance with these permit conditions Rule 62-302.200(1), Rule 62-302.500(1)(a)4 and Rule 62-4.244(3)(a), F.A.C.~~

~~(2) Mortality of less than or equal to 20% in a 100% effluent in any "routine" test or in any additional follow-up test shall constitute compliance with Rule 62-302.200(1), Rule 62-302.500(1)(a)4 and Rule 62-4.244(3)(a), F.A.C.~~

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.floridadep.org/labs/sop/index.htm and/or http://www.floridadep.org/labs/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. Exceedances of Water Quality Criteria may constitute violations of specific provisions of Chapter 62-302 (F.A.C.) and/ or facility permit limits.

(3) Toxicity Bioassays

Greater than 50% mortality in an acute toxicity test may constitute an exceedence of 62-302.500(1)a and/or a violation of facility permit limits. An inhibition concentration greater than 25% in a chronic test may constitute exceedences of 62-302.530(20), 62-302.530(61) and/or a violation of facility permit limits. Standard reference toxicant (SRT) tests are conducted monthly to ensure quality in toxicity testing.

(4) Bacteriological Testing

High levels of fecal coliform bacteria may constitute an exceedence of 62-302.530(6) and/or a violation of facility permit limits.

(5) 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).

(6) 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 exceedences 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 ± 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 exceedence of 62-302.530(61) F.A.C.

(7) Algal Phytoplankton and Periphyton Assemblages

Qualitative periphyton is sampled by taking subsamples of algae from natural substrates throughout the sample reach. Phytoplankton were sampled from the water column using a 1 L grab sample. Periphyton were subsampled and identified to the lowest practical level, usually species. Wet taxa and diatoms are identified separately. In the wet taxa analysis, soft algae are identified to the lowest practical level, and diatoms are identified only to order level (diatom). In the diatom analysis, diatoms are identified to the lowest practical level.

Chlorophyll *a* Content: Chlorophyll *a* content is an estimate of algal biomass . High algal biomass implies nutrient stress (Stevenson and Bahls 1999) and may be constituting exceedences 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..

Algal Density: Algal density is estimated as number of natural units/ml for phytoplankton samples. Although algal density of a single site is highly variable and depends on a number of factors, comparison of algal density at a control site to algal density at a related test site gives a partial comparison of algal biomass at the two sites (Stevenson and Smol 2003).

Taxa richness: Taxa richness is the number of distinct algal taxa present in a sample. Extreme nutrient enrichment tends to reduce the number of different types of algae present in a sample because a few tolerant taxa tend to reproduce rapidly and constitute the majority of the cells present. However, moderate nutrient enrichment of nutrient poor waters may sometimes be correlated with increased algal taxa richness (Stevenson and Bahls 1999) as the algal community begins to respond to the increased input of nutrients.

Community Composition: Shifts in relative proportions of major groups of algae downstream of a point source, compared to upstream, control conditions, may indicate negative effects of a discharge (Stevenson and Bahls 1999) and may constitute exceedences of 62-302.530(46) F.A.C., 62-302.530(47)(a) F.A.C., 62-302.530(47)(b) F.A.C. and/or 62-302.530(61) F.A.C.

(8) Benthic Macroinvertebrate Assemblages

Benthic macroinvertebrates were collected using two methods. Quantitative samples were collected from Hester-Dendy multi-plate samplers incubated for 28 days. Qualitative collections are made using 20 dipnet sweeps (QA Rule SOP FS7420). Benthic macroinvertebrates were sorted and identified to the lowest practical taxonomic level, usually species.

Taxa richness: Taxa richness is the number of distinct macroinvertebrate taxa present in a sample. Stress, habitat destruction and pollution tend to reduce the number of different types of organisms present (Karr and Chu 1998). Decreases in taxa richness related to a facility's effluent may constitute exceedences of 62-302.530(46) F.A.C., 62-302.530(47)(a) F.A.C., 62-302.530(47)(b) F.A.C. and/or 62-302.530(61) F.A.C..

Percent Contribution of Dominant Taxon: Percent contribution of the dominant taxon is calculated by dividing the number of individuals in the most abundant taxa by the total number of individuals counted. Percent contribution of the dominant taxon tends to increase with increasing perturbation (Plafkin *et al*., 1989). Increases in the percent contribution of the dominant taxon related to a facility's effluent may constitute exceedences 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..

Community Composition: Shifts in proportions of major groups of organisms downstream of a point source, compared to upstream, control conditions, may indicate negative effects of a discharge (Fore et. al. 2007, Karr and Chu 1998). Shifts in community composition related to a facility's effluent may constitute exceedences of 62-302.530(46) F.A.C., 62-302.530(47)(a) F.A.C., 62-302.530(47)(b) F.A.C. and/or 62-302.530(61) F.A.C..

Functional Feeding Groups: Environmental degradation may differentially affect groups of invertebrates based on how the group feeds (e.g. predators, deposit feeders, etc.). In Florida, pollution may be responsible for reducing the numbers of filter feeders and shredders (Fore et. al. 2007). Changes in the proportions of functional feeding groups related to a facility's effluent may constitute exceedences of 62-302.530(46) F.A.C., 62-302.530(47)(a) F.A.C., 62-302.530(47)(b) F.A.C. and/or 62-302.530(61) F.A.C..

Shannon-Weaver Diversity Index: This index is specified in the Florida Administrative Code 62-302 as a measure of biological integrity. Low diversity scores are undesirable. Where diversity is low, only a few taxa are abundant as compared to an area where many taxa are present in equitable abundance among taxa (Magurran 1988). A difference of 25% in Shannon-Weaver diversity between results from Hester-Dendy multiplate samplers incubated for 28 days at test and control sites constitute exceedences of 62-302.530(10) F.A.C..

The Stream Condition Index (SCI): The SCI is a composite macroinvertebrate metric developed for Florida (Fore et. al. 2007). This Index was revised in 2007 using data from qualitative dipnet samples. The SCI now assigns points to ten parameters; depending on how closely each parameter approaches an expected value (QA Rule SOP LT 7200). Points are assigned according to in which bioregion (Panhandle, Northeast, or Peninsula) the sampling location exists -and summed to yield a final SCI score (range 0-100). Included in the calculation of SCI are taxa richness, number of Ephemeroptera taxa, number of Trichoptera taxa, percent contribution of the dominant taxon, number of sensitive taxa, number of clinger taxa, number of long-lived taxa, percent contribution of Tanytarsini, percent contribution of very tolerant, and the percent contribution of suspension and filter feeders. As human disturbance increases, it is expected that taxa richness, the number of Ephemeroptera taxa, Trichoptera taxa, sensitive taxa, clinger taxa, long-lived taxa, and the percent contribution of Tanytarsini and suspension and filter feeders will decrease while percent contribution of dominant taxon, and percent contribution of very tolerant taxa will increase.

Scores are broken into three categories (1, 2, and 3). Sites in Category 1 are described as having higher diversity than Category 2 sites, particularly for Ephemeroptera and Trichoptera. A Category 1 site may have several more clinger and sensitive taxa, a higher proportion of Tanytarsini, and a lower percent of a dominant taxon than a site in Category 2. The site will also have a very small percentage of very tolerant individuals, if any.

Sites in Category 2 are described as having an average of 30 species with several different taxa of Ephemeroptera and Trichoptera. A Category 2 site also has several different long-lived taxa and, on average, 5 clinger and 6 sensitive taxa. There is a slight increase in dominance by a single taxon relative to sites in Category 1. Very tolerant taxa represent a small percentage of individuals but are noticeably increased as compared to sites in Category 1.

Sites in Category 3 are described as having a notable loss in taxonomic diversity, and Ephemeroptera, Trichoptera, long-lived, clinger and sensitive taxa are uncommon or rare. Filter feeders are reduced by at least 50%. The site is dominated by a tolerant taxon, and very tolerant individuals represent a large proportion of the individuals collected.

SCI 2007 categories are from Table LT 7200-2 of DEP-SOP-002/01 as referenced in Draft Quality Assurance Rule (62-160 F.A.C.), December 3, 2008. A decrease in ordinal SCI score from the Control to the Test site may be evidence of degradation related to a facility's effluent. An SCI score in Category 3, if it is shown to be related to a facility's effluent, may constitute exceedences of 62-302.530(46) F.A.C., 62-302.530(47)(a) F.A.C., 62-302.530(47)(b) F.A.C. and/or a violation of 62-302.530(61).

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Request Number: RQ-2010-02-15-15
Gulf Power - Crist

Event ID *

Requester: Jennifer Paris
Field Report Prepared By: N. Milby
Collected By: Nathan Milby / Rich Abel / Frank Baker
Send Final Report To David Morres
Sampling Agency: FDEP

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

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Gulf Power Crist Escambia R.	☐ Comp ☒ Grab	Date 4/12/10 Time 0830 Central		
	Field ID: Control	Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L): 7.62	Storet Station Number:	B+C
	Matrix (Include type e.g. Salt, Fresh, etc): Fresh	Temp (C): 19.18	pH: 6.94	Sample Depth: 0.15 ☒ m ☐ ft	Salinity (PPTh) ☐ / Sp Conductance (umho/cm) ☒: 95	NPDES Number:
	Latitude o ' " .	Longitude o ' " .	Comments:		

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Gulf Power Crist Escambia R.	☐ Comp ☒ Grab	Date 04-13-10 Time 0930 Central		
	Field ID: Test	Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L): 8.42	Storet Station Number:	B+C
	Matrix (Include type e.g. Salt, Fresh, etc): Fresh	Temp (C): 22.74	pH: 6.81	Sample Depth: 0.15 ☐ m ☐ ft	Salinity (PPTh) ☐ / Sp Conductance (umho/cm) ☒: 120	NPDES Number:
	Latitude o ' " .	Longitude o ' " .	Comments: Quad Periphyton will be shipped separately w/inverts		

* 04-13-10 - From Bottles

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Gulf Power Crist	☐ Comp ☒ Grab	Date 4/12/10 Time 1300 Central		
	Field ID: Effluent	Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L): 8.56	Storet Station Number:	A
	Matrix (Include type e.g. Salt, Fresh, etc):	Temp (C): 23.86	pH: 7.22	Sample Depth: 0.15 ☐ m ☐ ft	Salinity (PPTh) ☐ / Sp Conductance (umho/cm) ☒: 128	NPDES Number:
	Latitude o ' " .	Longitude o ' " .	Comments: Composites samples were Radium, Metals, + Alpha		

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	~~Effluent~~ Gulf Power Crist	☒ Comp ☐ Grab	Date 4/11/10 Time 1300 Central	Date 4/12/10 Time 1300 Central	
	Field ID: Effluent	Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L):	Storet Station Number:	A
	Matrix (Include type e.g. Salt, Fresh, etc):	Temp (C):	pH:	Sample Depth: ☐ m ☐ ft	Salinity (PPTh) ☐ / Sp Conductance (umho/cm) ☐:	NPDES Number:
	Latitude o ' " .	Longitude o ' " .	Comments: Composite samples were Radium, Metals, + Alpha		

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	4/12/10	Fed Ex	Tahmoures Ebrahimi	04-13-10 9:30				

* 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

Request Number: RQ-2010-02-15-15
Gulf Power - Crist

Event ID *

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

Requester: Jennifer Paris
Collected By: Rick Black / Frank Butler
Sampling Agency: FDEP

Field Report Prepared By: N. Maltby
Send Final Report To David Morres

Lab ID *	Location			☐ Comp ☒ Grab	Collection (begin) Date	Time	Eastern Central	Collection (end) Date	Time	Eastern Central	Bottle Group(s)**
	Gulf Power Crist				4/12/10	1360					D
	Field ID: Blank			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 o ' " .	Longitude o ' " .		Comments							

Lab ID *	Location			☐ Comp ☐ Grab	Collection (begin) Date	Time	Eastern Central	Collection (end) Date	Time	Eastern Central	Bottle Group(s)**
	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 o ' " .	Longitude o ' " .		Comments							

Lab ID *	Location			☐ Comp ☐ Grab	Collection (begin) Date	Time	Eastern Central	Collection (end) Date	Time	Eastern Central	Bottle Group(s)**
	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 o ' " .	Longitude o ' " .		Comments							

Lab ID *	Location			☐ Comp ☐ Grab	Collection (begin) Date	Time	Eastern Central	Collection (end) Date	Time	Eastern Central	Bottle Group(s)**
	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 o ' " .	Longitude o ' " .		Comments							

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
			Tahmooresi	04-13-10 9:30				

Ebrahim:

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Appendix E

Chemical analysis of effluent and receiving water

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units	MDL	PQL
4/12/2010 14:00	Effluent	AGP/LN	Algal Growth Potential	14.8		mg DryWt/L	0.3	0.9
4/12/2010 14:00	Effluent	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	3.3		ug/L	0.55	1.7
4/12/2010 14:00	Effluent	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.64	I	ug/L	0.4	1.2
4/12/2010 14:00	Effluent	Metals	Nickel	1.01		ug/L	0.25	1
4/12/2010 14:00	Effluent	Metals	Selenium	0.39	I	ug/L	0.2	0.8
4/12/2010 14:00	Effluent	Metals	Mercury	0.12	U	ug/L	0.12	0.5
4/12/2010 14:00	Effluent	Metals	Chromium	1.2	I	ug/L	0.3	1.2
4/12/2010 14:00	Effluent	Metals	Calcium	10.5		mg/L	0.075	0.3
4/12/2010 14:00	Effluent	Metals	Aluminum	880		ug/L	60	240
4/12/2010 14:00	Effluent	Metals	Silver	0.025	U	ug/L	0.025	0.1
4/12/2010 14:00	Effluent	Metals	Zinc	5	U	ug/L	5	20
4/12/2010 14:00	Effluent	Metals	Magnesium	1.96		mg/L	0.04	0.16
4/12/2010 14:00	Effluent	Metals	Sodium	10.7		mg/L	0.5	2
4/12/2010 14:00	Effluent	Metals	Iron	1490		ug/L	30	120
4/12/2010 14:00	Effluent	Metals	Copper	2.5		ug/L	0.5	1
4/12/2010 14:00	Effluent	Metals	Arsenic	1.82		ug/L	0.25	1
4/12/2010 14:00	Effluent	Metals	Cadmium	0.03	U	ug/L	0.03	0.12
4/12/2010 14:00	Effluent	Metals	Lead	0.94		ug/L	0.2	0.8
4/12/2010 14:00	Effluent	Nutrients	Kjeldahl Nitrogen	0.37		mg N/L	0.08	0.2
4/12/2010 14:00	Effluent	Nutrients	O-Phosphate-P	0.012		mg P/L	0.004	0.01
4/12/2010 14:00	Effluent	Nutrients	Total-P	0.039		mg P/L	0.004	0.01
4/12/2010 14:00	Effluent	Nutrients	NO2NO3-N	0.23	J	mg N/L	0.004	0.01
4/12/2010 14:00	Effluent	Nutrients	Ammonia-N	0.041		mg N/L	0.01	0.02
4/12/2010 14:00	Effluent	Overflow	Alpha-Counting Error	0.5		pCi/L		
4/12/2010 14:00	Effluent	Overflow	Alpha, Total	0.9	U	pCi/L		
4/12/2010 14:00	Effluent	Overflow	Oil and Grease	1.4	U	mg/L	1.4	5
4/12/2010 14:00	Effluent	Pesticides	Chlorpyrifos Ethyl	0.051	U	ug/L	0.051	0.2
4/12/2010 14:00	Effluent	Pesticides	Chlorpyrifos Methyl	0.1	U	ug/L	0.1	0.4
4/12/2010 14:00	Effluent	Pesticides	Diazinon	0.051	U	ug/L	0.051	0.2
4/12/2010 14:00	Effluent	Pesticides	Ethion	0.051	U	ug/L	0.051	0.2
4/12/2010 14:00	Effluent	Pesticides	Metalaxyl	0.26	U	ug/L	0.26	1
4/12/2010 14:00	Effluent	Pesticides	Metolachlor	0.51	U	ug/L	0.51	2
4/12/2010 14:00	Effluent	Pesticides	Phorate	0.051	U	ug/L	0.051	0.2
4/12/2010 14:00	Effluent	Pesticides	Endosulfan II	0.021	U	ug/L	0.021	0.084
4/12/2010 14:00	Effluent	Pesticides	Gamma-BHC	0.01	U	ug/L	0.01	0.04
4/12/2010 14:00	Effluent	Pesticides	Fonofos	0.1	U	ug/L	0.1	0.4
4/12/2010 14:00	Effluent	Pesticides	Alpha-BHC	0.01	U	ug/L	0.01	0.04
4/12/2010 14:00	Effluent	Pesticides	Chlordane	0.21	U	ug/L	0.21	0.84

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units	MDL	PQL
4/12/2010 14:00	Effluent	Pesticides	DDT-p,p'	0.031	U	ug/L	0.031	0.12
4/12/2010 14:00	Effluent	Pesticides	Heptachlor	0.01	U	ug/L	0.01	0.04
4/12/2010 14:00	Effluent	Pesticides	Alachlor	0.62	U	ug/L	0.62	2.5
4/12/2010 14:00	Effluent	Pesticides	Atrazine	0.051	U	ug/L	0.051	0.2
4/12/2010 14:00	Effluent	Pesticides	Bromacil	0.21	U	ug/L	0.21	0.84
4/12/2010 14:00	Effluent	Pesticides	Butylate	0.21	U	ug/L	0.21	0.84
4/12/2010 14:00	Effluent	Pesticides	Malathion	0.15	U	ug/L	0.15	0.6
4/12/2010 14:00	Effluent	Pesticides	Metribuzin	0.1	U	ug/L	0.1	0.4
4/12/2010 14:00	Effluent	Pesticides	Heptachlor Epoxide	0.021	UJ	ug/L	0.021	0.084
4/12/2010 14:00	Effluent	Pesticides	Hexazinone	0.1	U	ug/L	0.1	0.4
4/12/2010 14:00	Effluent	Pesticides	Norflurazon	0.15	U	ug/L	0.15	0.6
4/12/2010 14:00	Effluent	Pesticides	Simazine	0.051	U	ug/L	0.051	0.2
4/12/2010 14:00	Effluent	Pesticides	Naled	0.82	UJ	ug/L	0.82	3.3
4/12/2010 14:00	Effluent	Pesticides	Prometryn	0.15	U	ug/L	0.15	0.6
4/12/2010 14:00	Effluent	Pesticides	Endosulfan I	0.021	U	ug/L	0.021	0.084
4/12/2010 14:00	Effluent	Pesticides	Toxaphene	0.77	U	ug/L	0.77	3.1
4/12/2010 14:00	Effluent	Pesticides	Mevinphos	0.21	U	ug/L	0.21	0.84
4/12/2010 14:00	Effluent	Pesticides	DDD-p,p'	0.021	U	ug/L	0.021	0.084
4/12/2010 14:00	Effluent	Pesticides	Delta-BHC	0.01	U	ug/L	0.01	0.04
4/12/2010 14:00	Effluent	Pesticides	Dieldrin	0.021	U	ug/L	0.021	0.084
4/12/2010 14:00	Effluent	Pesticides	Endosulfan Sulfate	0.021	U	ug/L	0.021	0.084
4/12/2010 14:00	Effluent	Pesticides	Azinphos Methyl	0.21	U	ug/L	0.21	0.84
4/12/2010 14:00	Effluent	Pesticides	Aldrin	0.01	U	ug/L	0.01	0.04
4/12/2010 14:00	Effluent	Pesticides	DDE-p,p'	0.021	U	ug/L	0.021	0.084
4/12/2010 14:00	Effluent	Pesticides	Ametryn	0.051	U	ug/L	0.051	0.2
4/12/2010 14:00	Effluent	Pesticides	Ethoprop	0.1	U	ug/L	0.1	0.4
4/12/2010 14:00	Effluent	Pesticides	Fenamiphos	0.21	U	ug/L	0.21	0.84
4/12/2010 14:00	Effluent	Pesticides	Parathion Ethyl	0.15	U	ug/L	0.15	0.6
4/12/2010 14:00	Effluent	Pesticides	Parathion Methyl	0.1	U	ug/L	0.1	0.4
4/12/2010 14:00	Effluent	Pesticides	Beta-BHC	0.01	U	ug/L	0.01	0.04
4/12/2010 14:00	Effluent	Pesticides	Endrin	0.051	U	ug/L	0.051	0.2
4/12/2010 14:00	Effluent	Pesticides	Endrin Aldehyde	0.021	U	ug/L	0.021	0.084
4/12/2010 14:00	Effluent	Pesticides	Methoxychlor	0.051	UJ	ug/L	0.051	0.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	2-Chloronaphthalene	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	N-Nitrosodimethylamine	2.1	U	ug/L	2.1	8.4
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Acenaphthylene	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Benzidine	110	U	ug/L	110	420
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Benzo(a)pyrene	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	16	U	ug/L	16	63
4/12/2010 14:00	Effluent	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3.2	U	ug/L	3.2	13
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Chrysene	1.1	U	ug/L	1.1	4.2

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units	MDL	PQL
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Dibenzo(a,h)anthracene	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Diethyl phthalate	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Fluorene	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Hexachlorobutadiene	3.2	U	ug/L	3.2	13
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Isophorone	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Nitrobenzene	2.1	U	ug/L	2.1	8.4
4/12/2010 14:00	Effluent	Priority Organic Pollutants	2,4-Dinitrophenol	16	U	ug/L	16	63
4/12/2010 14:00	Effluent	Priority Organic Pollutants	2,6-Dinitrotoluene	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	2-Chlorophenol	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Butyl benzyl phthalate	5.3	U	ug/L	5.3	21
4/12/2010 14:00	Effluent	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3.2	U	ug/L	3.2	13
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Phenol	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	2,4-Dichlorophenol	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2.1	U	ug/L	2.1	8.4
4/12/2010 14:00	Effluent	Priority Organic Pollutants	4-Nitrophenol	16	U	ug/L	16	63
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Benzo(g,h,i)perylene	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Di-n-octyl phthalate	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Dimethyl phthalate	11	U	ug/L	11	42
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Fluoranthene	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Hexachlorobenzene	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Hexachloroethane	3.2	U	ug/L	3.2	13
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Pentachlorophenol	3.2	U	ug/L	3.2	13
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Phenanthrene	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	2,4-Dimethylphenol	11	U	ug/L	11	42
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3.2	U	ug/L	3.2	13
4/12/2010 14:00	Effluent	Priority Organic Pollutants	2,4-Dinitrotoluene	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Benzo(a)anthracene	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Benzo(b)fluoranthene	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Benzo(k)fluoranthene	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Di-n-butyl phthalate	5.3	U	ug/L	5.3	21
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Hexachlorocyclopentadiene	3.2	UJ	ug/L	3.2	13
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Pyrene	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	2-Nitrophenol	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	3,3'-Dichlorobenzidine	42	U	ug/L	42	170
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Acenaphthene	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2.1	U	ug/L	2.1	8.4
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Naphthalene	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	2,4,6-Trichlorophenol	1.1	U	ug/L	1.1	4.2

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units	MDL	PQL
4/12/2010 14:00	Effluent	Priority Organic Pollutants	Anthracene	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Priority Organic Pollutants	4-Chloro-3-methylphenol	1.1	U	ug/L	1.1	4.2
4/12/2010 14:00	Effluent	Field Parameter	pH	7.22				
4/12/2010 14:00	Effluent	Field Parameter	Sample Depth	0.15		m		
4/12/2010 14:00	Effluent	Field Parameter	Dissolved Oxygen	8.56		mg/L		
4/12/2010 14:00	Effluent	Field Parameter	Temperature	23.86		C		
4/12/2010 14:00	Effluent	Field Parameter	Specific Conductance	128		umhos/cm		
4/12/2010 9:30	Control	AGP/LN	Algal Growth Potential	10.6		mg DryWt/L	0.3	0.9
4/12/2010 9:30	Control	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	2.8		ug/L	0.55	1.7
4/12/2010 9:30	Control	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.88	I	ug/L	0.4	1.2
4/12/2010 9:30	Control	Metals	Chromium	1.2	I	ug/L	0.3	1.2
4/12/2010 9:30	Control	Metals	Cadmium	0.03	U	ug/L	0.03	0.12
4/12/2010 9:30	Control	Metals	Zinc	5	U	ug/L	5	20
4/12/2010 9:30	Control	Metals	Silver	0.025	U	ug/L	0.025	0.1
4/12/2010 9:30	Control	Metals	Selenium	0.2	U	ug/L	0.2	0.8
4/12/2010 9:30	Control	Metals	Nickel	0.96	I	ug/L	0.25	1
4/12/2010 9:30	Control	Metals	Arsenic	0.6	I	ug/L	0.25	1
4/12/2010 9:30	Control	Metals	Iron	1580		ug/L	30	120
4/12/2010 9:30	Control	Metals	Aluminum	1010		ug/L	60	240
4/12/2010 9:30	Control	Metals	Mercury	0.12	U	ug/L	0.12	0.5
4/12/2010 9:30	Control	Metals	Lead	0.64	I	ug/L	0.2	0.8
4/12/2010 9:30	Control	Metals	Copper	0.88	I	ug/L	0.5	1
4/12/2010 9:30	Control	Metals	Magnesium	1.45		mg/L	0.04	0.16
4/12/2010 9:30	Control	Metals	Sodium	6.4		mg/L	0.5	2
4/12/2010 9:30	Control	Metals	Calcium	9.32		mg/L	0.075	0.3
4/12/2010 9:30	Control	Nutrients	Total-P	0.033		mg P/L	0.004	0.01
4/12/2010 9:30	Control	Nutrients	O-Phosphate-P	0.006	I	mg P/L	0.004	0.01
4/12/2010 9:30	Control	Nutrients	Ammonia-N	0.043		mg N/L	0.01	0.02
4/12/2010 9:30	Control	Nutrients	NO2NO3-N	0.21		mg N/L	0.004	0.01
4/12/2010 9:30	Control	Overflow	Oil and Grease	1.4	U	mg/L	1.4	5
4/12/2010 9:30	Control	Overflow	Alpha-Counting Error	0.7		pCi/L		
4/12/2010 9:30	Control	Overflow	Alpha, Total	1.1	U	pCi/L		
4/12/2010 9:30	Control	Field Parameter	Sample Depth	0.15		m		
4/12/2010 9:30	Control	Field Parameter	Dissolved Oxygen	7.62		mg/L		
4/12/2010 9:30	Control	Field Parameter	Temperature	19.18		C		
4/12/2010 9:30	Control	Field Parameter	Specific Conductance	95		umhos/cm		
4/12/2010 9:30	Control	Field Parameter	pH	6.94				
4/12/2010 9:30	Control	Field Parameter	Temperature	19.18		C		
4/12/2010 9:30	Control	Field Parameter	Sample Depth	0.15		m		
4/12/2010 10:30	Test	AGP/LN	Algal Growth Potential	16.5		mg DryWt/L	0.3	0.9
4/12/2010 10:30	Test	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	3.2		ug/L	0.55	1.7
4/12/2010 10:30	Test	Chlorophyll/Grain Size/BOD	Phaeophytin-a	1	I	ug/L	0.4	1.2

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units	MDL	PQL
4/12/2010 10:30	Test	Metals	Silver	0.025	U	ug/L	0.025	0.1
4/12/2010 10:30	Test	Metals	Chromium	0.75	I	ug/L	0.3	1.2
4/12/2010 10:30	Test	Metals	Sodium	9.8		mg/L	0.5	2
4/12/2010 10:30	Test	Metals	Selenium	0.3	I	ug/L	0.2	0.8
4/12/2010 10:30	Test	Metals	Iron	1380		ug/L	30	120
4/12/2010 10:30	Test	Metals	Mercury	0.12	U	ug/L	0.12	0.5
4/12/2010 10:30	Test	Metals	Copper	2.05		ug/L	0.5	1
4/12/2010 10:30	Test	Metals	Arsenic	1.36		ug/L	0.25	1
4/12/2010 10:30	Test	Metals	Aluminum	630		ug/L	60	240
4/12/2010 10:30	Test	Metals	Magnesium	1.84		mg/L	0.04	0.16
4/12/2010 10:30	Test	Metals	Cadmium	0.03	U	ug/L	0.03	0.12
4/12/2010 10:30	Test	Metals	Lead	0.67	I	ug/L	0.2	0.8
4/12/2010 10:30	Test	Metals	Nickel	0.91	I	ug/L	0.25	1
4/12/2010 10:30	Test	Metals	Calcium	10.2		mg/L	0.075	0.3
4/12/2010 10:30	Test	Metals	Zinc	5	U	ug/L	5	20
4/12/2010 10:30	Test	Nutrients	Ammonia-N	0.042		mg N/L	0.01	0.02
4/12/2010 10:30	Test	Nutrients	NO2NO3-N	0.23		mg N/L	0.004	0.01
4/12/2010 10:30	Test	Nutrients	O-Phosphate-P	0.007	I	mg P/L	0.004	0.01
4/12/2010 10:30	Test	Nutrients	Total-P	0.031		mg P/L	0.004	0.01
4/12/2010 10:30	Test	Overflow	Alpha, Total	1.6		pCi/L		
4/12/2010 10:30	Test	Overflow	Oil and Grease	1.4	U	mg/L	1.4	5
4/12/2010 10:30	Test	Overflow	Alpha-Counting Error	0.9		pCi/L		
4/12/2010 10:30	Test	Field Parameter	Specific Conductance	120		umhos/cm		
4/12/2010 10:30	Test	Field Parameter	pH	6.81				
4/12/2010 10:30	Test	Field Parameter	Sample Depth	0.15		m		
4/12/2010 10:30	Test	Field Parameter	Temperature	22.74		C		
4/12/2010 10:30	Test	Field Parameter	Dissolved Oxygen	8.42		mg/L		

Appendix F

Physical/Chemical and Habitat Assessment field sheets

DEP-SOP-001/01: Form FD 9000-3

PHYSICAL/CHEMICAL CHARACTERIZATION ELECTRONIC FIELD SHEET ELFS

SAMPLE ID: 6782 ORG ID: 21FLPNS
COUNTY: Escambia STORET #: 33020036
DATE: 4-12-2010 TIME: 09:30 CST

Latitude: 30 (degrees) 33 (minutes) 16.28 (seconds) Longitude: 87 (degrees) 12 (minutes) 37.05 (seconds)

SITE NAME: Escambia R. Gulf Power Control SAMPLE COMPLETE ?
FIELD ID/NAME: RECEIVING BODY OF WATER: Pt Cola Bay

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)
X	X	X	X	X	X	X	

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: 15 Right Bank: 718

High Water Mark: 1.0 (m) + Two feet (above present water level) (present depth) = (above bed)

Artificially Impounded ☐ Yes ☒ No

Typical Width (m) Depth (m)/Velocity (m/sec) Transect
Left Bank 100m 180 m wide
.06 m/s .05 m/s .05 m/s
m deep m deep 1.0 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):

Sediment Deposition ☐ Sludge Sand Smothering: None Slight Moderate (Severe) Silt Smothering: None Slight Moderate (Severe) ☐ Other (Specify):

SUBSTRATE TYPE
Assessment Tool: ☒ SCI ☐ BioRecon ☒ Hester Dendy ☐ LCI ☐ LVI

	% Coverage	INVERT # Times Sampled	PERI # Times Sampled
Woody Debris (Snags)	2.4	7	4
Undercut Banks / Roots	0.2	3	2
Leaf Packs or Mat			
Aquatic Vegetation	1.0	7	3
Rock or Shell Rubble			
Sand		2	1
Mud / Muck / Silt		1	
Other			
Other			

WATER QUALITY

	Depth (M)	Temp. (°C)	pH (SU)	D.O. (MG/L)	Cond. (UMHO/CM)	Salinity (PPT)	SECCHI (M)
Top:	0.19	19.18	6.94	7.62	~~228~~	.11	.
Mid-Depth:	1.62	19.17	6.93	7.6	~~228~~		☐ VOB
Bottom:	3.79	19.13	6.96	7.57	~~228~~		

Cond 95 95 95

Water Surface Oils: ☐ None ☐ Sheen ☒ Globs ☐ Slick

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

Water Sample Taken ? ☒ Yes ☐ No

Algae Sample Taken ? ☒ Yes ☐ No

SYSTEM TYPE ☒ Stream ☐ Lake ☐ Wetland ☐ Estuary ☐ Other (Specify):

Clarity ☐ Clear ☐ Slightly Turbid ☒ Turbid ☐ Opaque

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

WEATHER CONDITIONS / NOTES: Clear, Sunny. No rain 3 weeks
YSI post verified

ABUNDANCE

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

☒ The antecedent hydrologic conditions have been met to my best knowledge.
Water samples preserved ? ☒ Yes ☒ pH<2 ☐ No Algae samples preserved ? ☐ Yes ☐ No

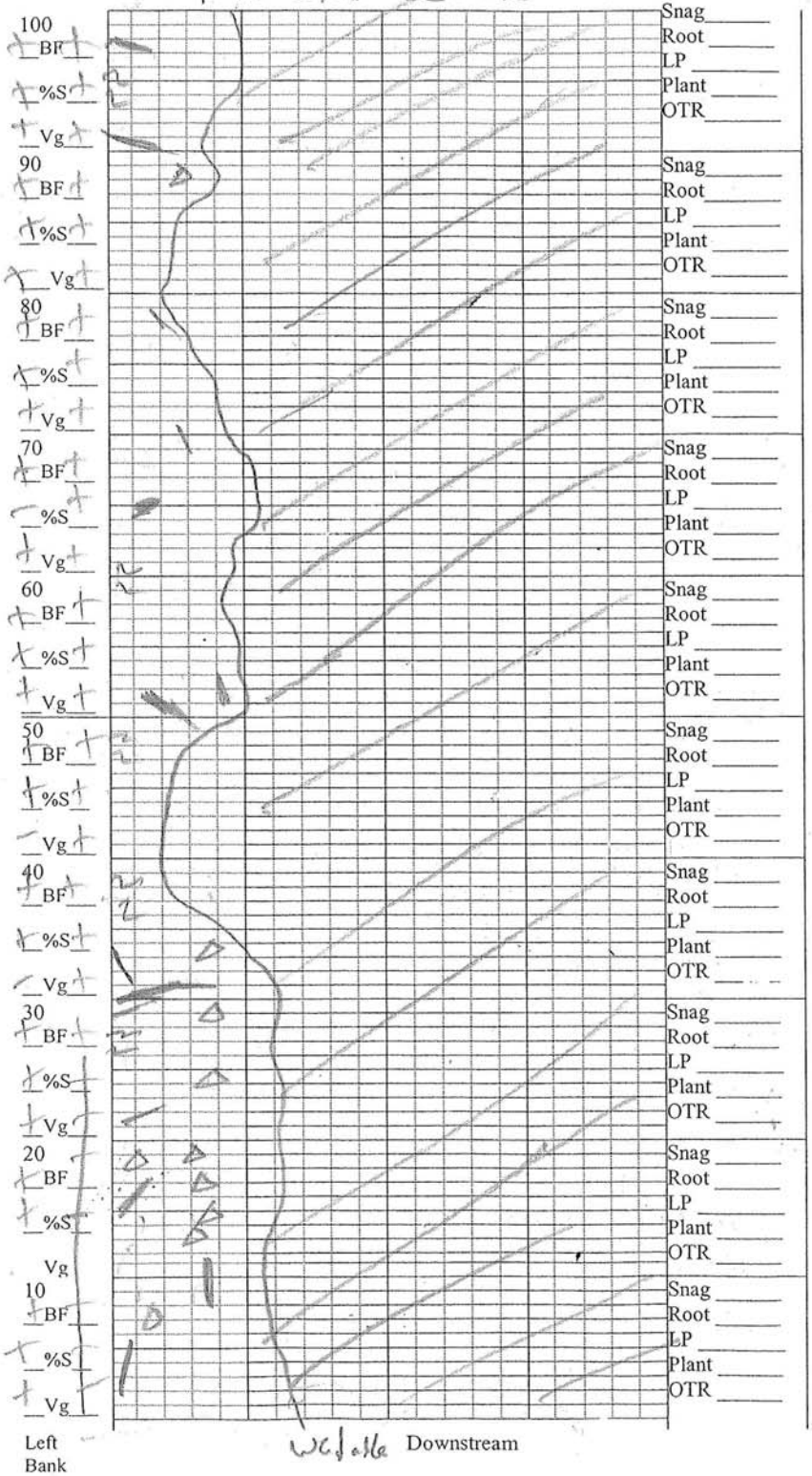
SAMPLING TEAM: K Butera, N. Mulkey, R. Abud SIGNATURE: DATE: 4-12-2010

Revision Date: September 5, 2008

Escambia R. @ Gulf Power Control Site 330260036

Stream/River Habitat Sketch Sheet, Form FD 9000-4 (June 1, 2001)_
Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).

4-12-24 LD FBuhr



Substrates: Code key, draw proportionate habitat abundance.

- Snags 12/500 = 2.4%
- S Roots/undercut banks 1/500 = 0.2%
- O Leaf Packs (or mats)
- Δ Macrophytes 5/500 = 1%
- _____
- _____
- _____

Velocity:
Note where velocity measures were taken. 100m

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

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

Riparian Buffer Width:
Note areas (on map) where natural vegetation is altered or eliminated. 18 18+

Plants observed/other notes:

canal HD
bottom 1.839 m
24.39 C
8.37 DO
116 SpC
0.05 sal
7.42 pH

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

STATE OF FLORIDA, DEPARTMENT OF ENVIRONMENTAL PROTECTION

STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

Sample ID 67882

SUBMITTING AGENCY CODE: 21 FLPNS SUBMITTING AGENCY NAME: FL DEP-NWD	STORET STATION NUMBER: 33020036	DATE (MM/DD/YY): 4-12-10	RECEIVING BODY OF WATER: Perdido Bay
REMARKS:	COUNTY: Escambia	LOCATION: Escambia River @ Gulf Power Control	FIELD ID/NAME:

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** 6	Four or more productive habitats present [snags, tree roots, aquatic vegetation, leaf packs (partially decayed), rock] 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags) 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed 10 9 8 7 (6)	One or less productive habitat. Lack of habitat is obvious, substrates unstable or smothered 5 4 3 2 1
Substrate Availability 4	Greater than 30% productive habitat present at site 20 19 18 17 16	16% to 30% productive habitat, by aerial extent 15 14 13 12 11	6% to 15% productive habitat 10 9 8 7 (6)	Less than 5% productive habitat 5 (4) 3 2 1
Water Velocity 5	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: >0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec; or spate occurring: > 1 m/sec (5) 4 3 2 1
Habitat Smothering 11 Primary Score 26	Adequate number of pools (1-2 per 12 times width) and <25% of habitats affected by sand or silt accumulation. 20 19 18 17 16	Adequate number of pools (1-2 per 12 times width) and >25% of habitats affected by sand or silt accumulation. 15 (14) 13 12 (11)	Does not have required number of pools (1-2 per 12 times width) and/or has shallow pools (<2 times prevailing depth). 10 9 8 7 6	Pools are absent. Most habitats affected by sand or silt accumulation. 5 4 3 2 1
Secondary Habitat Components **Artificial Channelization** 19	Good sinuosity. No evidence of dredging or artificial straightening. No spoil banks. Diversity of depths. 20 (19) 18 17 16	Good sinuosity within old channelized area and a diversity of depths. Evidence of dredging in the past (>10 yrs) but mostly recovered. 15 14 13 12 11	Some sinuosity developed within channelized area or some diversity of depth, but typically no pools (>2 times prevailing depth) present. 10 9 8 7 6	Straightened with spoil banks. Box-cut, monotypic depth. 5 4 3 2 1
Bank Stability Right Bank 9 Left Bank 9	Bankfull > 60% of bank height. Slope of bank ≤ 60°. 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 8 Left Bank 9	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 still 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 8 Left Bank 8 Secondary Score 17	Over 80% of riparian surfaces consist of normal, expected plant community for given sunlight & habitat conditions (e.g., native plants, trees, understory shrubs, or non-woody macrophytes). 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

96 **TOTAL SCORE**

Date: 4/12/2010	Analyst: FButera, N Mulkey, R Mead	Signature:

Form FD 9000-5 Revision Date: June 6, 2008

DEP-SOP-001/01: Form FD 9000-3 ELFS

PHYSICAL/CHEMICAL CHARACTERIZATION ELECTRONIC FIELD SHEET

SAMPLE ID: 67881 ORG ID: 21FLPNS Trimble
COUNTY: Escambia STORET #: 334920161
DATE: 4-12-2010 TIME: 09:30 CST
Latitude: DDDP 2.52 — 30 (degrees) 33 (minutes) 13 (seconds)
Longitude: 87 (degrees) 12 (minutes) 29.10 (seconds)
SITE NAME: Escambia R.C Gulf Power Test site SAMPLE COMPLETE ? _____
FIELD ID/NAME: Gulf Power Test RECEIVING BODY OF WATER: Pensacola Bay

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)
✓	✓	✓	✓	✓	✓	✓	

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: 16 Right Bank: 718

High Water Mark: 1.0 (m) + 7 (above present water level) = _____ (present depth) (above bed)

Artificially Impounded ☐ Yes ☒ No

Typical Width (m) Depth (m)/Velocity (m/sec) Transect
Left Bank 1.22m 3180 m wide

.05 m/s	m/s Too Deep	m/s Too Deep
.7 m deep	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):

Sediment Deposition ☐ Sludge Sand Smothering: None Slight Moderate (Severe) Silt Smothering: None Slight Moderate (Severe) ☐ Other (Specify):

SUBSTRATE TYPE
Assessment Tool: ☒ SCI ☐ BioRecon
☒ Hester-Dendy ☐ LCI ☐ LVI

	% Coverage	INVERT # Times Sampled	PERI # Times Sampled
Woody Debris (Snags)		7	4
Undercut Banks / Roots		3	2
Leaf Packs or Mat		1	
Aquatic Vegetation		7	3
Rock or Shell Rubble			
Sand		2	1
Mud / Muck / Silt			
Other			
Other			

WATER QUALITY

	Depth (M)	Temp. (°C)	pH (SU)	D.O. (MG/L)	Cond. (UMHO/CM)	Salinity (PPT)	SECCHI (M)
Top:	0.196	22.74	6.81	8.42	124	0.06	0.5
Mid-Depth:	3.507	19.31	6.95	7.60	97	0.04	☐ VOB
Bottom:	6.748	19.30	7.10	7.63	96	0.04	

Water Surface Oils: ☒ None ☐ Sheen ☐ Globs ☐ Slick

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

Water Sample Taken ? ☒ Yes ☐ No
Algae Sample Taken ? ☒ Yes ☐ No (Quantitative Periphyton)

SYSTEM TYPE ☒ Stream ☐ Lake ☐ Wetland ☐ Estuary ☐ Other (Specify):

Clarity ☐ Clear ☐ Slightly Turbid ☒ Turbid ☐ Opaque

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

WEATHER CONDITIONS / NOTES: Clear Sunny, No rain 3-4 weeks. H2O level down 0.3m since H-D deployment (1 month) YSI Post verified. Shadowed by Gulf Power & Mac-Tec (?), (Gainesville) all day.

☒ The antecedent hydrologic conditions have been met to my best knowledge.
Water samples preserved ? ☒ Yes ☒ pH<2 ☐ No Algae samples preserved ? ☒ Yes ☐ No

ABUNDANCE

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

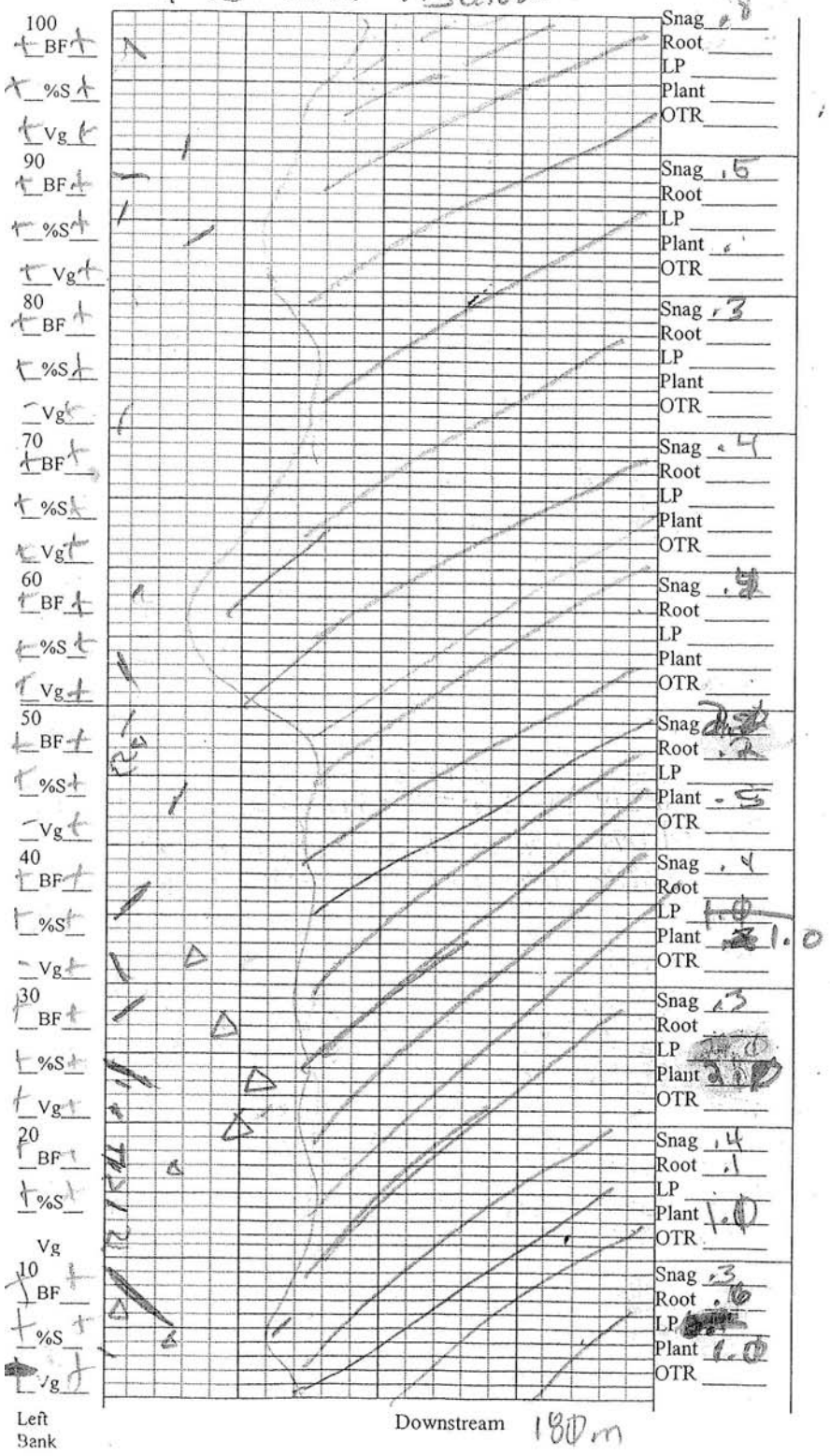
SAMPLING TEAM: Frank Butera, N. Mulkey, R. Abad SIGNATURE: Frank Butera DATE: 4-12-2010

Revision Date: September 5, 2008

Stream/River Habitat Sketch Sheet, Form FD 9000-4 (June 1, 2001)
Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).

5/30/2016

4-12-2016 FButon



Substrates: Code key, draw proportionate habitat abundance.

- Snags 6/100 = 1.0%
- Roots/undercut banks 1.9/100 = 0.3%
- Leaf Packs (or mats) N/A
- Macrophytes 5.5/100 = 0.8%

Velocity:
Note where velocity measures were taken. 100m

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

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

Riparian Buffer Width:
Note areas (on map) where natural vegetation is altered or eliminated. 18, 18+

Plants observed/other notes:

Pontederia Cordata
Viburnum (high)
Sawgrass
Sasa
Cypress
Vitis
Tarpon
Wax Myrtle
Black Gum

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

STATE OF FLORIDA, DEPARTMENT OF ENVIRONMENTAL PROTECTION

STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

Sample ID 67881

SUBMITTING AGENCY CODE: 21 FL PNS SUBMITTING AGENCY NAME: FL DEP NWD	STORET STATION NUMBER: 33020161	DATE (MM/DD/YY): 4-12-2010	RECEIVING BODY OF WATER: P-cola Bay
REMARKS:	COUNTY: Escambia	LOCATION: Escambia R. @ Gulf Power Test Site	FIELD ID/NAME:

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** 6	Four or more productive habitats present [snags, tree roots, aquatic vegetation, leaf packs (partially decayed), rock] 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags) 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed 10 9 8 7 (6)	One or less productive habitat. Lack of habitat is obvious, substrates unstable or smothered 5 4 3 2 1
Substrate Availability 2	Greater than 30% productive habitat present at site 20 19 18 17 16	16% to 30% productive habitat, by aerial extent 15 14 13 12 11	6% to 15% productive habitat 10 9 8 7 6	Less than 5% productive habitat 5 4 3 (2) 1
Water Velocity 1	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: >0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec; or spate occurring: > 1 m/sec 5 4 3 2 (1)
Habitat Smothering 11 Primary Score 24	Adequate number of pools (1-2 per 12 times width) and <25% of habitats affected by sand or silt accumulation. 20 19 18 17 16	Adequate number of pools (1-2 per 12 times width) and >25% of habitats affected by sand or silt accumulation. 15 14 13 12 (11)	Does not have required number of pools (1-2 per 12 times width) and/or has shallow pools (<2 times prevailing depth). 10 9 8 7 6	Pools are absent. Most habitats affected by sand or silt accumulation. 5 4 3 2 1
Secondary Habitat Components **Artificial Channelization** 19	Good sinuosity. No evidence of dredging or artificial straight-ening. No spoil banks. Diversity of depths. 20 (19) 18 17 16	Good sinuosity within old chan-nelized area and a diversity of depths. Evidence of dredging in the past (>10 yrs) but mostly recovered. 15 14 13 12 11	Some sinuosity developed within channelized area or some diversity of depth, but typically no pools (>2 times prevailing depth) present. 10 9 8 7 6	Straightened with spoil banks. Box-cut, monotypic depth. 5 4 3 2 1
Bank Stability Right Bank 10 Left Bank 9	Bankfull > 60% of bank height. Slope of bank ≤ 60°. 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 8	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 still 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 8 Left Bank 8 Secondary Score 72	Over 80% of riparian surfaces consist of normal, expected plant community for given sunlight & habitat conditions (e.g., native plants, trees, understory shrubs, or non-woody macrophytes). 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

92 **TOTAL SCORE**

Date: 4-12-2010	Analyst: F. Butera	Signature: Frank Butera

Form FD 9000-5 Revision Date: June 6, 2008

Appendix G-1

Wet ID taxa list and number of algal units counted to a target of 300 natural units for qualitative natural periphyton collections made from Crist Electric Generating Plant on 04/12/10.

	Control Site	Test Site
Bacillariophyta		
Bacillariophyta	241	213
Chlorophyceae		
Ankistrodesmus falcatus	1	1
Apatococcus lobatus	12	-
Characium pringsheimii	1	-
Chlorella sp.	1	-
Chlorococcum humicola	2	-
Microspora tumidula	4	-
Oocystis sp.	-	1
Scenedesmus quadricauda	2	-
Cyanophyceae		
Calothrix sp.	-	1
Chamaesiphon sp.	-	1
Cyanobium parvum	-	3
Jaaginema sp.	11	10
Jaaginema gracile	-	5
Jaaginema subtilissimum	-	1
Microcoleus sp.	-	1
Phormidium aerugineo-caeruleum	-	3
Planktolyngbya sp.	-	13
Planktolyngbya brevicellularis	7	21
Planktolyngbya limnetica	-	7
Planktothrix agardhii	-	7
Pseudanabaena sp.	3	-
Rhabdoderma lineare	-	2
Schizothrix calcicola	2	1
Synechocystis sp.	11	6
Euglenophyceae		
Trachelomonas sp.	2	-
Rhodophyceae		
Caloglossa ogasawaerensis	-	1
Thorea sp.	1	-
Xanthophyceae		
Bumilleriopsis brevis	-	2

Appendix G-2

Diatom taxa list and number of valves counted to a target of 500 valves for qualitative periphyton collected from Crist Electric Generating Plant on 04/12/10.

	Control Site	Test Site
Bacillariophyceae		
Achnanthidium sp.	-	52
Achnanthidium jackii	-	3
Achnanthidium microcephalum	-	15
Achnanthidium minutissimum	200	170
Achnanthidium minutissimum scoticum	7	-
Amphipleura pellucida	2	2
Amphora sp.	1	-
Brachysira brebissonii	-	1
Cavinula jaernefeltii	-	1
Cocconeis sp.	1	3
Cocconeis fluviatilis	-	4
Cocconeis placentula	-	13
Cocconeis scutellum	42	-
Cymbella tumida	1	-
Cymbellaceae	4	4
Denticula subtiles	-	1
Diploneis sp.	-	1
Encyonema evergladianum	2	-
Encyonema minutum	-	13
Encyonema neogracile	-	2
Encyonema silesiacum	22	-
Encyonopsis cesatii	-	1
Encyonopsis microcephala	-	8
Encyonopsis subminuta	1	-
Eunotia sp.	12	18
Eunotia bilunaris	3	7
Eunotia incisa	25	-
Eunotia pectinalis	7	-
Fallacia sp.	-	1
Frustulia sp.	1	-
Gomphonema sp.	23	27
Gomphonema parvulum	84	3
Hippodonta capitata	-	2
Kobayasiella sp.	1	-
Mastogloia smithii	1	-
Navicula sp.	6	6
Navicula cryptocephala	-	2
Navicula cryptotenella	1	-
Navicula erifuga	-	2
Navicula germainii	4	6
Navicula heimansioides	-	2
Navicula rhynchocephala	4	-

Appendix G-2 cont'd

	Control Site	Test Site
Naviculaceae	-	1
Nitzschia sp.	16	21
Nitzschia acicularis	2	-
Nitzschia clausii	1	4
Nitzschia filiformis	1	3
Nitzschia liebethruthii	-	6
Nitzschia palea	-	6
Planothidium sp.	1	4
Planothidium delicatulum	-	10
Planothidium rostratum	2	-
Sellaphora pupula	-	1
Stauroneis sp.	1	-
Surirella sp.	1	-
Undetermined Bacillariophyceae	-	4
Coscinodiscophyceae		
Cyclotella sp.	-	2
Cyclotella meneghiniana	-	1
Undetermined Coscinodiscophyceae	2	-
Fragilariophyceae		
Ctenophora pulchella	-	8
Fragilaria sp.	-	2
Fragilaria capucina	9	6
Fragilaria capucina gracilis	-	7
Fragilaria capucina rumpens	8	-
Fragilariaceae	-	17
Opephora olsenii	-	1
Staurosira construens venter	-	7
Staurosirella pinnata	1	6
Synedra nana	-	2
Tabularia fasciculata	-	11

Appendix H-1

Benthic macroinvertebrates collapsed taxa list and density (average number of individuals/m^2 rounded to the nearest individual, n = 3 samples) from Hester-Dendy artificial substrates incubated for 28 days upstream and downstream of the Crist Electric Generating Plant and collected on 04/12/10. See SOP LT 7100 sect. 4.2.1 for method on collapsing taxa.

	Control Site	Test Site
Arthropoda		
Crustacea		
Amphipoda		
Crangonyx sp.	13	3
Gammarus sp.	5	29
Hyalella azteca	11	6
Monocorophium sp.	3	-
Insecta		
Diptera		
Ablabesmyia mallochi	6	11
Ablabesmyia rhamphe grp.	3	25
Chironomus sp.	3	-
Corynoneura sp.	20	17
Cricotopus bicinctus	-	6
Cricotopus or *orthocladius* sp.	3	-
Cricotopus sylvestris grp.	3	3
Dicrotendipes sp.	3	-
Dicrotendipes neomodestus	-	31
Labrundinia pilosella	12	25
Parakiefferiella sp.	23	-
Parakiefferiella sp. B Epler	-	42
Polypedilum fallax	6	3
Polypedilum illinoense grp.	132	6
Polypedilum trigonus	-	6
Polypedilum tritum	3	18
Tanytarsus sp. A Epler	-	8
Tanytarsus sp. L Epler	66	124
Tanytarsus sp. M Epler	-	6
Thienemanniella lobapodema	3	-
Thienemanniella xena	9	-
Thienemannimyia grp.	3	-
Tribelos jucundum	3	-
Unniella multivirga	-	3
Ephemeroptera		
Maccaffertium sp.	72	-
Maccaffertium mexicanum integrum	-	37
Plauditus sp.	16	-
Procloeon sp.	-	3
Pseudocloeon propinquum	3	-

Appendix H-1 cont'd

	Control Site	Test Site
Plecoptera		
Perlesta placida complex	-	3
Trichoptera		
Hydroptila sp.	5	13
Mollusca		
Gastropoda		
Hydrobiidae	-	3
Neritina usnea	-	58

Appendix H-2

Benthic macroinvertebrates taxa list and counts (number of individuals counted) collected from Hester-Dendy artificial substrates (n= 3 samples) incubated upstream and downstream of the Crist Electric Generating Plant for 28 days and collected on 04/12/10.

	Control Site	Test Site
Arthropoda		
Crustacea		
Amphipoda		
Crangonyx sp.	5	1
Gammarus sp.	2	10
Hyalella azteca	4	2
Monocorophium sp.	1	-
Undetermined Amphipoda	-	1
Insecta		
Diptera		
Ablabesmyia mallochi	2	4
Ablabesmyia rhamphe grp.	1	9
Chironomidae	9	5
Chironomus sp.	1	-
Corynoneura sp.	7	6
Cricotopus bicinctus	-	2
Cricotopus or *orthocladius* sp.	1	-
Cricotopus sylvestris grp.	1	1
Dicrotendipes sp.	1	10
Dicrotendipes neomodestus	-	1
Heptageniidae	11	-
Labrundinia pilosella	4	9
Parakiefferiella sp.	8	5
Parakiefferiella sp. B Epler	-	10
Polypedilum sp.	-	1
Polypedilum fallax	2	1
Polypedilum illinoense grp.	46	2
Polypedilum trigonus	-	2
Polypedilum tritum	1	6
Tanytarsus sp.	1	-
Tanytarsus sp. A Epler	-	3
Tanytarsus sp. L Epler	22	45
Tanytarsus sp. M Epler	-	2
Thienemanniella lobapodema	1	-
Thienemanniella xena	3	-
Thienemannimyia grp.	1	-
Tribelos jucundum	1	-
Unniella multivirga	-	1

Appendix H-2 cont'd

	Control Site	Test Site
Ephemeroptera		
Maccaffertium sp.	16	-
Maccaffertium mexicanum integrum	-	14
Plauditus sp.	5	-
Procloeon sp.	-	1
Pseudocloeon propinquum	1	-
Baetidae	1	-
Plecoptera		
Perlesta placida complex	-	1
Trichoptera		
Hydroptila sp.	2	5
Mollusca		
Gastropoda		
Hydrobiidae	-	1
Neritina usnea	-	22

Appendix I-1

Qualitative benthic macroinvertebrate collapsed taxa list and number of individuals counted from 20-discrete-dipnet sweeps conducted upstream and downstream of the Crist Electric Generating Plant on 04/12/10. See SOP LT 7100 sect. 4.2.1 for method on collapsing taxa.

	Control Site		Test Site	
	Rep 1	**Rep 2**	**Rep 1**	**Rep 2**
Annelida				
Hirudinea				
Glossiphoniidae	1	-	-	-
Oligochaeta				
Enchytraeidae	-	1	-	-
Stylaria lacustris	3	-	-	-
Tubificidae	-	1	-	-
Arthropoda				
Arachnida				
Acariformes				
Neumania sp.	1	-	-	-
Piona sp.	1	-	-	-
Crustacea				
Amphipoda				
Gammarus sp.	2	-	-	4
Hyalella azteca	9	11	29	21
Isopoda				
Cassidinidea ovalis	-	1	-	1
Insecta				
Coleoptera				
Dryopidae	-	1	-	-
Diptera				
Ablabesmyia mallochi	-	-	-	1
Ablabesmyia rhamphe grp.	2	-	-	-
Ceratopogonidae	-	-	-	2
Chironomus sp.	-	-	1	-
Corynoneura sp.	2	-	-	-
Cricotopus absurdus	-	-	21	26
Cricotopus bicinctus	2	10	3	-
Cricotopus/orthocladius sp.	3	1	6	4
Cricotopus santa fe Epler	-	-	1	-
Dicrotendipes modestus	2	4	5	-
Dicrotendipes neomodestus	9	10	3	2
Labrundinia sp.	-	-	1	3
Labrundinia pilosella	4	8	-	-
Nanocladius sp.	-	-	1	-
Palpomyia/bezzia grp.	2	1	-	-
Parakiefferiella sp.	3	4	-	-
Parakiefferiella sp. F Epler	-	-	2	2
Polypedilum illinoense grp.	101	79	35	40
Polypedilum tritum	-	1	-	-

Appendix I-1 cont'd

	Control Site		Test Site	
	Rep 1	**Rep 2**	**Rep 1**	**Rep 2**
Rheotanytarsus exiguus grp.	-	-	3	1
Simulium sp.	-	-	-	1
Tanytarsus sp. L Epler	4	1	3	-
Tanytarsus sp. T Epler	-	-	1	-
Thienemanniella sp.	-	-	1	-
Tribelos fuscicornis	-	-	1	-
Ephemeroptera				
Acentrella sp.	-	-	2	1
Acerpenna pygmaea	2	-	2	-
Maccaffertium smithae	-	1	-	-
Pseudocloeon sp.	2	1	-	-
Pseudocloeon frondale	-	-	2	3
Pseudocloeon propinquum	-	-	3	5
Stenacron sp.	-	-	1	-
Odonata				
Enallagma sp.	-	-	2	-
Trichoptera				
Hydroptila sp.	1	-	1	2
Mollusca				
Bivalvia				
Undetermined Bivalvia	1	1	-	-
Unionidae	-	-	-	2
Gastropoda				
Ancylidae	-	-	1	2
Hydrobiidae	1	1	6	4
Neritina reclivata	-	4	8	14
Physa sp.	-	1	-	-
Pseudosuccinea columella	-	1	-	-

Appendix I-2

Qualitative benthic macroinvertebrate taxa list and number of individuals counted from 20-discrete-dipnet sweeps conducted upstream and downstream of Crist Electric Generating Plant on 04/12/10.

	Control Site		Test Site	
	Rep 1	Rep 2	Rep 1	Rep 2
Annelida				
Hirudinea				
Glossiphoniidae	1	-	-	-
Oligochaeta				
Enchytraeidae	-	1	-	-
Stylaria lacustris	3	-	-	-
Tubificidae	-	1	-	-
Arthropoda				
Arachnida				
Acariformes				
Neumania sp.	1	-	-	-
Piona sp.	1	-	-	-
Crustacea				
Amphipoda				
Gammarus sp.	2	-	-	4
Hyalella azteca	9	11	29	21
Isopoda				
Cassidinidea ovalis	-	1	-	1
Insecta				
Coleoptera				
Dryopidae	-	1	-	-
Diptera				
Ablabesmyia sp.	1	-	-	-
Ablabesmyia mallochi	-	-	-	1
Ablabesmyia rhamphe grp.	1	-	-	-
Chironomidae	5	2	5	1
Chironomus sp.	-	-	1	-
Corynoneura sp.	2	-	-	-
Cricotopus sp.	1	7	-	-
Cricotopus absurdus	-	-	20	26
Cricotopus bicinctus	1	3	3	-
Cricotopus or *Orthocladius* sp.	3	1	6	4
Cricotopus santa fe Epler	-	-	1	-
Dicrotendipes sp.	6	-	1	1
Dicrotendipes modestus	1	4	4	-
Dicrotendipes neomodestus	4	10	3	1
Labrundinia sp.	-	-	1	3
Labrundinia pilosella	4	8	-	-
Nanocladius sp.	-	-	1	-
Palpomyia/Bezzia grp.	2	1	-	-
Parakiefferiella sp.	3	4	-	-
Parakiefferiella sp. F Epler	-	-	2	2

Appendix I-2 cont'd

	Control Site		Test Site	
	Rep 1	**Rep 2**	**Rep 1**	**Rep 2**
Polypedilum illinoense grp.	96	77	31	39
Polypedilum tritum	-	1	-	-
Rheotanytarsus exiguus grp.	-	-	3	1
Simulium sp.	-	-	-	1
Tanytarsus sp. L Epler	4	1	3	-
Tanytarsus sp. T Epler	-	-	1	-
Thienemanniella sp.	-	-	1	-
Tribelos fuscicornis	-	-	1	-
Ceratopogonidae	-	-	-	2
Ephemeroptera				
Acentrella sp.	-	-	1	1
Acerpenna pygmaea	1	-	1	-
Maccaffertium smithae	-	1	-	-
Pseudocloeon sp.	1	1	-	-
Pseudocloeon frondale	-	-	1	3
Pseudocloeon propinquum	-	-	3	4
Stenacron sp.	-	-	1	-
Baetidae	2	-	3	1
Odonata				
Enallagma sp.	-	-	2	-
Trichoptera				
Hydroptila sp.	1	-	1	2
Mollusca				
Bivalvia				
Undetermined Bivalvia	1	1	-	1
Unionidae	-	-	-	1
Gastropoda				
Ancylidae	-	-	1	2
Hydrobiidae	1	1	6	4
Neritina reclivata	-	4	8	14
Physa sp.	-	1	-	-
Pseudosuccinea columella	-	1	-	-

Appendix J.

EPA Endsheet

The Priority Pollutants Analysis of the Gulf Power Co. Crist Generating Plant effluent sampled on April 12, 2010, NPDES #FL0002275

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	0	2	2	7	5	11	12	1	0	0	4	1	2	# **X**	# **S**	# 2

Remarks

#

Biological Analyses of the Gulf Power Co. Crist Generating Plant effluent sampled on April 12, 2010, NPDES #FL0002275

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	0	2	2	7	5	11	12	1	0	0	4	1	2	# **S**	# **S**	# 2

Remarks

#