

Biological Assessment of

Bonifay Wastewater Treatment Plant

Holmes County

NPDES #FL0027731

Sampled October 1995

March 1996

Biology Section

Division of Administrative and Technical Services

Comprehensive Quality Assurance Plan No. 870346G

Department of Environmental Protection
Results of Fifth Year Inspections

Discharger:	Bonifay WWTP
County:	Holmes
NPDES Number:	FL0027731
State Permit Expiration Date:	30 September 1996

Toxics Sampling Inspection (XSI)

Date Sampled: 2 October 1995

Results: No organic pollutants were detected in the effluent. Effluent metals complied with Class III water quality standards.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 2 October 1995

Results: The effluent sample was not acutely toxic to the water flea, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi*.

Impact Bioassessment Inspection (IBI)

Date Sampled: 8 November 1995

Results: The macroinvertebrate communities of Camp Branch Creek were severely impaired. The Stream Condition Index for Florida (SCI) ranked both sites in the "severely degraded" category. The biological impairment at both sites may be mostly related to the poor water quality (elevated nutrients, potentially toxic levels of unionized ammonia). It is thought that urban stormwater, rather than the Bonifay WWTP, was primarily responsible for the observed degradation, which is interpreted to be a violation of Rule 62-302.530(48)(b) FAC, the standard prohibiting imbalances of aquatic fauna. The periphyton data suggest the discharge was not adversely affecting the algal community. Periphyton taxa richness, diversity, chlorophyll *a*, algal density, and the diatom to blue-green ratio were very similar at both sites. Several taxa abundant at both sites, such as *Gomphonema parvulum* and *Nitzschia palea*, are characteristic of nutrient enriched waters.

Water Quality Inspection (WQI)

Date Sampled: 2 October 1995

Results: The reference site dissolved oxygen value was below Class III water quality standards. Reference site concentrations of total phosphorus (0.86 mg/L), ammonia (5.3 mg/L), and TKN (6.4 mg/L) were higher than the values found in 92% to 95% of other Florida streams. The unionized ammonia concentrations of the effluent (0.05 mg/L), the reference site (0.13 mg/L), and the test site (0.04 mg/L), were all in violation of Rule 62-302.530(3) FAC. These results indicate that unusually elevated nutrients, and potentially acutely toxic levels of unionized ammonia, were present in Camp Branch, mostly from stormwater inputs. With the exception of nitrate-nitrite, the effluent actually reduced these nutrient concentrations. Algal Growth Potential (AGP) substantially exceeded the 5 mg dry wt/L "problem threshold" at both the reference site (142.2 mg dry wt/L) and the test site (98.2 mg dry wt/L). The effluent AGP was 73.3 mg dry wt/L.

Introduction

The City of Bonifay Wastewater Treatment Plant is located in Holmes County, Florida (see maps in Appendix). Treatment at this 1.4 MGD modified activated sludge domestic wastewater treatment facility consists of influent bar screening, flow equalization, biological processing in two sequencing batch reactors, sand filtration, chlorination, post aeration, and dechlorination. Effluent is discharged to the Class III Camp Branch, which flows into Holmes Creek.

State permit limits are as follows: flow (1.4 MGD as an annual average), pH (6.0 to 8.5 SU), dissolved oxygen (6.0 mg/L minimum), total residual chlorine (0.01 mg/L maximum), TKN (5.0 mg/L as an annual average), total phosphorus (3 mg/L as an annual average), CBOD (8 mg/L as an annual average), TSS (8 mg/L as an annual average), fecal coliforms (200 organisms/100 mL maximum) (see Facility Summary in Appendix). Additionally, annual toxicity bioassays are required.

The facility has been in compliance with permit limits for the past several years with the exception of one fecal coliform violation in March, 1994, when greater than 2,400 organisms/100 mL were found in the effluent, despite records of adequate chlorination. A DEP inspection in March, 1995, indicated that fecal coliforms were less than 10 organisms/100 mL.

Monthly operating reports for the City of Bonifay Wastewater Treatment Plant from January, 1995 through January, 1996 were also summarized. Over this period, monthly average flows ranged from 0.55 to 0.90 MGD with a median value of 0.65 MGD. Total nitrogen concentrations were 1.06 to 2.27 mg/L with a median value of 1.44 mg/L. Total phosphorus concentrations ranged between 0.38 and 2.60 mg/L with a median con-

Major characteristics of community structure of control and test sites.

	Reference Site	Test Site
Macroinvertebrate Qualitative		
Number of Taxa	18	9
Florida Index	1	3
SCI	11	9
EPT Index	0	0
% Contribution of Dominant Taxon	41.0	83.5
% Oligochaeta	9.6	4.1
% Diptera	72.3	91.7
% Odonata	2.4	0
% Gastropoda	13.3	0
% Other	2.4	0
% Predators	21.7	1.2
% Above Surface Deposit Feeders	30.1	46.7
% Below Surface Deposit Feeders	9.6	4.1
% Suspension Feeders	0	3.3
% Scrapers	13.3	0
% Shredders	24.1	44.6
Macroinvertebrate Hester-Dendy		
Number of Taxa	15	24
Florida Index	3	3
Shannon-Weaver Diversity	3.24	2.47
EPT Index	0	0
% Oligochaeta	3.9	7.6
% Diptera	82.3	19.5
% Gastropoda	11.8	14.3
% Platyhelminthes	2.0	56.9
% Predators	33.7	59.4
% Above Surface Deposit Feeders	29.0	9.4
% Below Surface Deposit Feeders	3.9	7.4
% Suspension Feeders	2.9	0.3
% Scrapers	11.8	14.3
% Shredders	8.8	9.0
Periphyton Algae		
Number of Taxa	30	36
Shannon-Weaver Diversity	3.91	3.83
Algal Density (#/sq. cm)	35,900	43,459
Chlorophyll a (mg/sq. m)	2.1	1.8
Diatom/Diatom + B-G Abundance Ratio	0.99	0.96
% Blue-green	0.7	4.0
% Green	5.7	7.9
% Diatoms	93.6	88.1
Algal Growth Potential (mg dry wt/l)	142.2	98.2

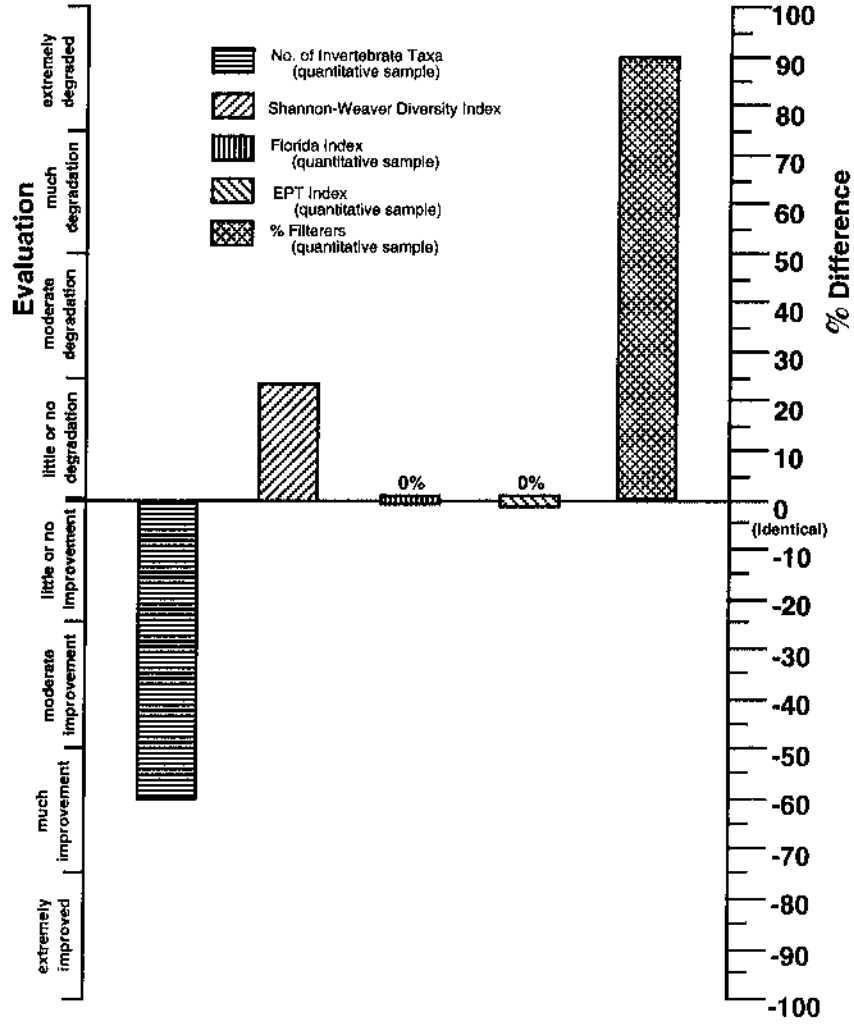
centration of 1.06 mg/L. Dissolved oxygen levels were above 7.0 mg/L and BOD's were less than 5.0 mg/L. Occasional measurements of TKN suggested that TKN represented approximately one-half of the total nitrogen.

A biological assessment conducted in March, 1993, concluded the biota of the receiving water stream were degraded both upstream of, and downstream from, the discharge. Potential causes for the degradation seen at the upstream site included water quality problems associated with urban runoff (*e.g.*, turbidity, BOD, oil and grease, scouring). The somewhat less hospitable conditions downstream of the discharge were thought to be caused by these same factors, and perhaps, by an intermittent problem related to the effluent.

Methods

The focus of this investigation was to determine the discharger's effects on the receiving waters. A comparison of biological community health was made in Camp Branch, between a reference site (located 50 meters upstream of the discharge) and a test site (located 100 meters downstream of the discharge). A habitat assessment was performed *in situ* to establish comparability between sites. Supplemental physical/chemical data were also collected on the effluent and study sites. Acute screening toxicity bioassays, using *Ceriodaphnia dubia* and *Cyprinella leedsi* as test organisms, were performed on an effluent sample (Weber 1991). The effluent was analyzed for metals and for organic constituents (base neutral and acid extractables). Additionally, nutrient analyses were performed on effluent, reference, and test sites. Methods used for all chemical analyses are on file at the Tallahassee DEP Chemistry Laboratory.

Benthic macroinvertebrate communities were evaluated at reference and test sites. Invertebrates were collected from multiple substrates (*e.g.*, snags, leaf packs, vegetation) using discrete dip net sweeps. Additional invertebrate sampling was performed using Hester-Dendy multiplate samplers which were incubated for 28 days (Ross 1990). Periphyton was sampled at both reference and test sites by incubating glass microscope slides in a standard periphytometer for 28 days (Ross 1990). Chlorophyll *a* was also determined for periphyton communities (Ross 1990). Algal Growth Potential tests, using *Selenastrum capricornutum* as the test organism, followed Miller *et al.* (1978).



Effect of discharge on the benthic macroinvertebrate community.

Explanation of Measurements of Community Health

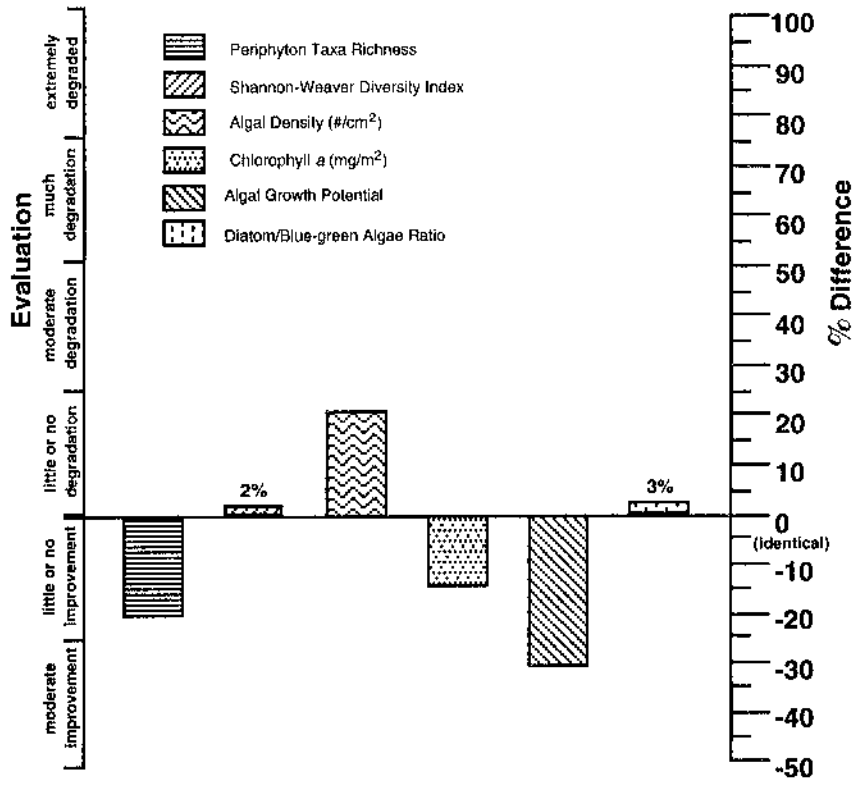
Several different measurements of macroinvertebrate and algal community health have been employed to determine the effects of the discharge. These are briefly discussed here.

Taxa richness: Stress tends to reduce the number of different types of organisms present in a system, although moderate nutrient enrichment may sometimes be correlated with increased algal taxa richness.

Shannon-Weaver diversity: This index is specified in the Florida Administrative Code as a measure of biological integrity. Low diversity scores are undesirable. They represent conditions where only a few organisms are abundant, to the exclusion of other taxa. Excessive numerical dominance of a single type of organism (a high % contribution of the dominant taxon) is a related measure which is also associated with disturbance.

Numbers of pollution sensitive taxa: Some organisms become rare or absent as the intensity or duration of disturbance increases. For example, the Florida Index assigns points to stream-dwelling macroinvertebrates based on their sensitivity to pollution (see Ross 1990). A site with a high Florida Index score is considered healthy. Species sensitivity data from other sources, such as Hulbert (1990), Hudson *et al.* (1990), Lenat (1993), Farrell (1992), Chang *et al.* (1992), and Whitmore (1989), are used as appropriate.

Ephemeroptera/Plecoptera/Trichoptera Index: This index is the sum of the number of EPT taxa present. Higher EPT values are associated with healthier systems.



Effect of discharge on the algal community.

Community structure: Substantial shifts in proportions of major groups of organisms, compared to reference conditions, may indicate degradation. In marine systems, an increase in the % tubificid oligochaetes, a decrease in the % pelecypods, and a decrease in the number of polychaete taxa are all considered indicators of disturbance (Engel *et al.* 1994).

Algal biomass: High algal biomass (algal density or chlorophyll *a*) implies nutrient stress. A decreased diatom to blue-green algae ratio (calculated by dividing the number of individuals in the Bacillariophyta by the number of individuals in the Bacillariophyta + Cyanophyta) is often indicative of nutrient enriched conditions in flowing streams.

Trophic composition/feeding guilds: Disturbance can shift the feeding strategies of invertebrates. In Florida for example, pollution may be responsible for reducing the numbers of filter-feeders (FDEP 1994) and shredders (EA Engineering 1994).

The Stream Condition Index for Florida (SCI) is a composite macroinvertebrate metric (EA Engineering 1994). The SCI assigns points to a variety of parameters, depending on how closely each parameter approaches an expected reference condition (see SCI calculation table in Appendix).

For graphical purposes, the percent differences between the reference and test sites involving the number of taxa, the diversity index, the Florida Index, the EPT Index, the diatom to blue-green algae ratio, and the % filter-feeders are measured as the reference site mi-

nus test site divided by the reference site. The percent differences between sites involving algal density, chlorophyll *a*, and algal growth potential are measured as the test site minus reference site divided by the reference site.

The following personnel were involved in this investigation: Glenn Butts, Steven Kelly, and Laurence Donelan (DEP Northwest District), Lyn Burton, Marshall Faircloth, Russel Frydenborg, Joy Jackson, Kathleen Lurding, Tina Mikulski, Elizabeth Miller, Urania Quintana, Bart Richard, Landon Ross, Todd Space, Lisa Tamburello, David Whiting, Vicki Whiting, and Greg Wynn (Tallahassee Biology Laboratory). The report was reviewed by the Point Source Studies Review Committee, consisting of Wayne Magley, Jan Mandrup-Poulsen, and Michael Tanski, as well as District representatives.

Results and Discussion

Habitat quality was poor at both receiving water sites, although habitat slightly improved between the reference site (with 30 points) and the test site (with 45 points). Some physical/chemical measures indicated that conditions were worse at the reference site. For example, dissolved oxygen was below Class III water quality standards at the reference site (3.7 mg/L), but complied with standards at the test site (7.1 mg/L). The Total Suspended Solids present at the reference site (9 mg/L) was higher than that of the test site (5 mg/L). Biological Oxygen Demand was also higher at the reference site (with 6.0 mg/L) compared to the test site (with 2.2 mg/L). Water temperature was somewhat lower at the reference site (24.0 °C) than at the test site (27.3° C). The pH values (7.6 SU at the reference site, 7.5 SU at the test site) were very similar at the two sample sites, as was specific conductance (442 µmhos/cm and 431 µmhos/cm at the reference and test sites, respectively).

The effluent sample was not acutely toxic to the water flea, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi*. No mortality occurred during the two 48 hour acute toxicity bioassays (see Appendix).

No organic pollutants were detected in the effluent. Of the metals analyzed for, only iron (47 µg/L) and zinc (25 µg/L) were detected in the effluent, and neither exceeded Class III water quality standards.

With the exception of nitrate-nitrite, nutrient concentrations in the discharge were substantially less than those found at the reference site, under the present sampling conditions. Reference site concentrations of ortho-phosphate (0.75 mg/L), total phosphorus (0.86 mg/L), ammonia (5.3 mg/L), and TKN (6.4 mg/L) were higher than the values found in 92% to 95% of other Florida streams (see Table of Typical Water Quality Parameters in Appendix). Although diluting this enriched water with the lower-nutrient effluent did reduce nutrients at the test site, the values found there still exceeded the levels found in approximately 85% to 95% of other Florida streams. The effluent, with a nitrate-nitrite concentration of 0.89 mg/L, contributed to an increase of nitrate-nitrite from 0.18 mg/L at the reference site to 0.76 mg/L at the test site. Additionally, the unionized ammonia concentrations of the effluent (0.05 mg/L), the reference site (0.13 mg/L), and the test site (0.04 mg/L), were all in violation of Rule 62-302.530(3) FAC. These results indicate that unusually elevated nutrients, and potentially acutely toxic levels of unionized ammonia, were present in this unnamed tributary of Camp Branch, most of which probably originated from stormwater inputs. With the exception of nitrate-nitrite, the effluent actually reduced these nutrient concentrations.

Algal Growth Potential (AGP) substantially exceeded the 5 mg dry wt/L "problem threshold" at both the reference site (142.2 mg dry wt/L) and the test site (98.2 mg dry wt/L) (Raschke and Schultz 1987). The effluent AGP was 73.3 mg dry wt/L. As seen in the nutrient results, under the present sampling conditions, the discharge actually reduced the AGP of the receiving waters.

Many measures of macroinvertebrate health indicated that the reference and test sites were both degraded. The figure on p. 2 indicates the degree of difference between the invertebrate populations of the reference and test sites. Larger differences (higher percentages) correspond with greater degrees of degradation. Negative values mean that the test site is better than the reference.

Hester-Dendy results indicated that both the reference and test sites were composed of pollution tolerant organisms. Both sites had extremely low values for the Florida Index (3 at the reference site, 3 at the test site) and the EPT Index (0 at both sites). Taxa richness at the reference site (15 taxa) was less than the test site value (24 taxa).

Conversely, Shannon-Weaver diversity decreased from 3.2 at the reference site to 2.5 at the test site, but this 21.9% reduction did not constitute a violation of the biological integrity criterion. On the graph, the percent of suspension feeders appears to be better at the reference site, but this is misleading, as the reference site had only 2.9% suspension feeders compared to 0.3% at the test site. These results indicate that the macroinvertebrate communities were impaired at both sites.

The dip net results also demonstrated that community health was significantly impaired at both sites. Taxa richness decreased between the reference site (18 taxa) and the test site (9 taxa). Again, Florida Index (1 at the reference site, 3 at the test site) and the EPT Index (0 at both sites) values were extremely low at both sites. The Stream Condition Index for Florida (SCI), with scores of 11 for the reference site and 9 for the test site, placed both sites in the "severely degraded" category. The biological impairment at both sites may be mostly related to the poor water quality (elevated nutrients, potentially toxic levels of unionized ammonia). It is thought that urban stormwater, rather than the Bonifay WWTP, was primarily responsible for the observed degradation, which is interpreted to be a violation of Rule 62-302.530(48)(b) FAC, the standard prohibiting imbalances of aquatic fauna. Other problems associated with urban stormwater (*e.g.*, sediment scouring/deposition, poor habitat quality) probably also contributed to the poor condition of the macroinvertebrate communities.

The figure on p. 3 represents changes in the periphyton algal community. As was noted with the macroinvertebrates, larger differences (that is, higher percentages) correspond with greater degrees of degradation. Periphyton taxa richness (30 taxa at the reference site, 36 taxa at the test site) and Shannon-Weaver diversity (3.9 at the reference site, 3.8 at the test site) were similar at both sites. Algal density was slightly higher at the test site, while chlorophyll *a* was slightly lower. The diatom to blue-green algae ratio was nearly the same at both sites. Several taxa abundant at both sites, such as *Gomphonema parvulum* and *Nitzschia palea*, are characteristic of nutrient enriched waters (Whitmore 1989). In summary, these data suggest the discharge was not adversely affecting the periphyton community.

Conclusions

The reference site dissolved oxygen value was below Class III water quality standards.

The effluent sample was not acutely toxic to the water flea, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi*.

No organic pollutants were detected in the effluent. Effluent metals complied with Class III water quality standards.

Under the present sampling conditions, nutrient concentrations in the discharge were generally substantially less than those found at the (stormwater affected) reference site. Reference site concentrations of ortho-phosphate (0.75 mg/L), total phosphorus (0.86 mg/L), ammonia (5.3 mg/L), and TKN (6.4 mg/L) were higher than the values found in 92% to 95% of other Florida streams. Although diluting this polluted water with the lower-nutrient effluent did reduce nutrients at the test site, the values found there still exceeded the levels found in approximately 85% to 95% of other Florida streams. The unionized ammonia concentrations of the effluent (0.05 mg/L), the reference site (a potentially acutely toxic 0.13 mg/L), and the test site 0.04 mg/L), were all in violation of Rule 62-302.530(3) FAC. These results indicate that unusually elevated nutrients, and potentially acutely toxic levels of unionized ammonia, were present Camp Branch, mostly from stormwater inputs. With the exception of nitrate-nitrite, the effluent actually reduced these nutrient concentrations.

Algal Growth Potential (AGP) substantially exceeded the 5 mg dry wt/L "problem threshold" at both the reference site (142.2 mg dry wt/L) and the test site (98.2 mg dry wt/L). The effluent AGP was 73.3 mg dry wt/L. As seen in the nutrient results, under the present sampling conditions, the discharge actually reduced the AGP of the receiving waters.

Most measures of macroinvertebrate health indicated that the fauna of Camp Branch Creek were severely impaired. Florida Index and the EPT Index values were extremely low at both sites. The Stream Condition Index for Florida (SCI), with scores of 11 for the reference site and 9 for the test site, placed both sites in the "severely degraded" category. The biological impairment at both sites may be mostly related to the poor water quality (elevated nutrients, poten-

tially toxic levels of unionized ammonia). It is thought that urban stormwater, rather than the Bonifay WWTP, was primarily responsible for the observed degradation, which is interpreted to be a violation of Rule 62-302.530(48)(b) FAC, the standard prohibiting imbalances of aquatic fauna. Other problems associated with urban stormwater (*e.g.*, sediment scouring/deposition, poor habitat quality) probably also contributed to the poor condition of the macroinvertebrate communities.

Periphyton taxa richness, diversity, chlorophyll *a*, algal density, and the diatom to blue-green ratio were very similar at both sites. Several taxa abundant at both sites, such as *Gomphonema parvulum* and *Nitzschia palea*, are characteristic of nutrient enriched waters (Whitmore 1989). In summary, these data suggest the discharge was not adversely affecting the periphyton community.

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Chemistry Summary Table for Bonifay WWTP	Effluent	Reference Site	Test Site
Organic Constituents (ug/L)			
None detected	None detected		
Metals (ug/L)			
Aluminum	100 U		
Arsenic	10 U		
Cadmium	0.08 U		
Copper	3 U		
Chromium	10 U		
Iron	47		
Lead	10 U		
Mercury	0.10 U		
Nickel	4 U		
Selenium	30 U		
Silver	0.05 U		
Zinc	25		
Nutrients (mg/L)			
Ortho-phosphate	0.52 A	0.75	0.56
Total phosphorus	0.56	0.86	0.59
Ammonia	0.87	5.3	1.5
Unionized Ammonia	0.05	0.13	0.04
Nitrate+Nitrite	0.89	0.18	0.76
TKN	1.5	6.4	2.3
General Phys-Chem Parameters			
Habitat Assessment		30	45
D.O. (mg/L)	8.7	3.7	7.1
pH (SU)	7.9	7.6	7.5
Conductivity(µmhos/cm)	420	442	431
Temperature (°C)	25.1	24.0	27.3
Total Suspended Solids (mg/L)		9	5
Biological Oxygen Demand, 5 day (mg/L)		6.0	2.2
Hardness (mg CaCO3)	112.8		
Algal Growth Potential (mg dry wt/L)	73.3	142.2	98.2
Toxicity			
Bioassay Fish-Dechlorinated	Not toxic		
Bioassay Invertebrate-Dechlorinated	Not toxic		

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

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

Typical Values for Selected Parameters in Florida Waters

Adapted from Joe Hand, FDER, personal communication, 1991
(data was collected between 1980 and 1989)

Percentile Distribution

Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%
STREAMS (1617 stations)											
Phytoplankton Chlorophyll *a*	0.22	0.52	0.94	1.60	3.02	4.63	6.72	9.87	14.68	27.35	48.70
Periphyton Chlorophyll *a*	0.31	0.43	0.77	1.04	2.16	2.94	6.45	10.51	17.00	39.51	60.85
H-D Diversity	0.84	2.12	2.48	2.74	2.88	3.09	3.25	3.40	3.52	3.76	3.90
Qualitative Taxa Richness	9.00	12.00	17.00	20.00	22.00	24.50	26.00	28.00	31.00	37.00	53.00
H-D Taxa Richness	6.00	6.50	9.00	11.50	13.00	15.00	17.00	21.50	26.00	29.00	32.00
TKN	0.30	0.39	0.56	0.73	0.87	1.00	1.11	1.26	1.49	1.93	2.80
Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60
NO2-NO3	0.01	0.01	0.03	0.05	0.07	0.10	0.14	0.20	0.32	0.64	1.05
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	0.74	1.51
Ortho Phosphate	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	0.59	1.37
Turbidity	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30
LAKES (477 stations)											
Phytoplankton Chlorophyll *a*	0.80	1.71	2.88	4.28	10.06	13.40	20.00	30.10	47.20	65.44	113.90
Dredge Diversity	0.71	0.97	1.43	1.74	1.98	2.12	2.21	2.59	2.85	3.15	3.17
Dredge Taxa Richness	3.00	5.00	6.50	7.00	9.00	10.00	11.00	13.00	15.00	17.00	21.00
TKN	0.36	0.49	0.67	0.83	1.08	1.26	1.40	1.51	1.68	2.11	3.46
NH3+NH4	0.01	0.02	0.02	0.03	0.04	0.06	0.08	0.12	0.15	0.21	0.28
NO2-NO3	0.00	0.00	0.01	0.01	0.01	0.02	0.04	0.05	0.10	0.14	0.23
Total Phosphorus	0.01	0.02	0.02	0.03	0.05	0.07	0.09	0.11	0.14	0.23	0.42
Ortho-Phosphate	0.00	0.01	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.21	0.32
Turbidity	1.00	1.25	1.55	2.05	2.75	4.50	6.45	9.60	14.10	26.00	40.00
ESTUARIES (690 stations)											
Phytoplankton Chlorophyll *a*	2.14	3.28	4.49	5.13	6.00	6.93	7.94	9.60	12.40	17.60	22.20
Dredge Diversity	1.34	1.53	1.91	2.28	2.56	2.90	3.15	3.59	4.01	4.53	4.98
Dredge Taxa Richness	4.00	6.00	9.00	11.00	15.00	18.50	25.00	35.00	41.00	62.00	90.00
TKN	0.26	0.34	0.42	0.50	0.59	0.69	0.76	0.82	0.95	1.30	1.49
NH3+NH4	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.09	0.13	0.22	0.28
NO2-NO3	0.00	0.00	0.01	0.01	0.01	0.02	0.03	0.05	0.08	0.17	0.23
Total Phosphorus	0.01	0.02	0.06	0.07	0.10	0.11	0.14	0.17	0.23	0.43	0.59
Ortho-Phosphate	0.01	0.02	0.03	0.04	0.04	0.05	0.07	0.09	0.12	0.21	0.44
Turbidity	3.50	4.00	4.50	5.05	5.40	5.60	6.30	6.80	8.00	11.40	11.75

Units:
Phytoplankton Chlorophyll *a* (ug/L), Periphyton Chlorophyll *a* (mg/m^2), Nutrients (mg/L), Turbidity (NTU), Taxa richness and diversity values are for macroinvertebrates

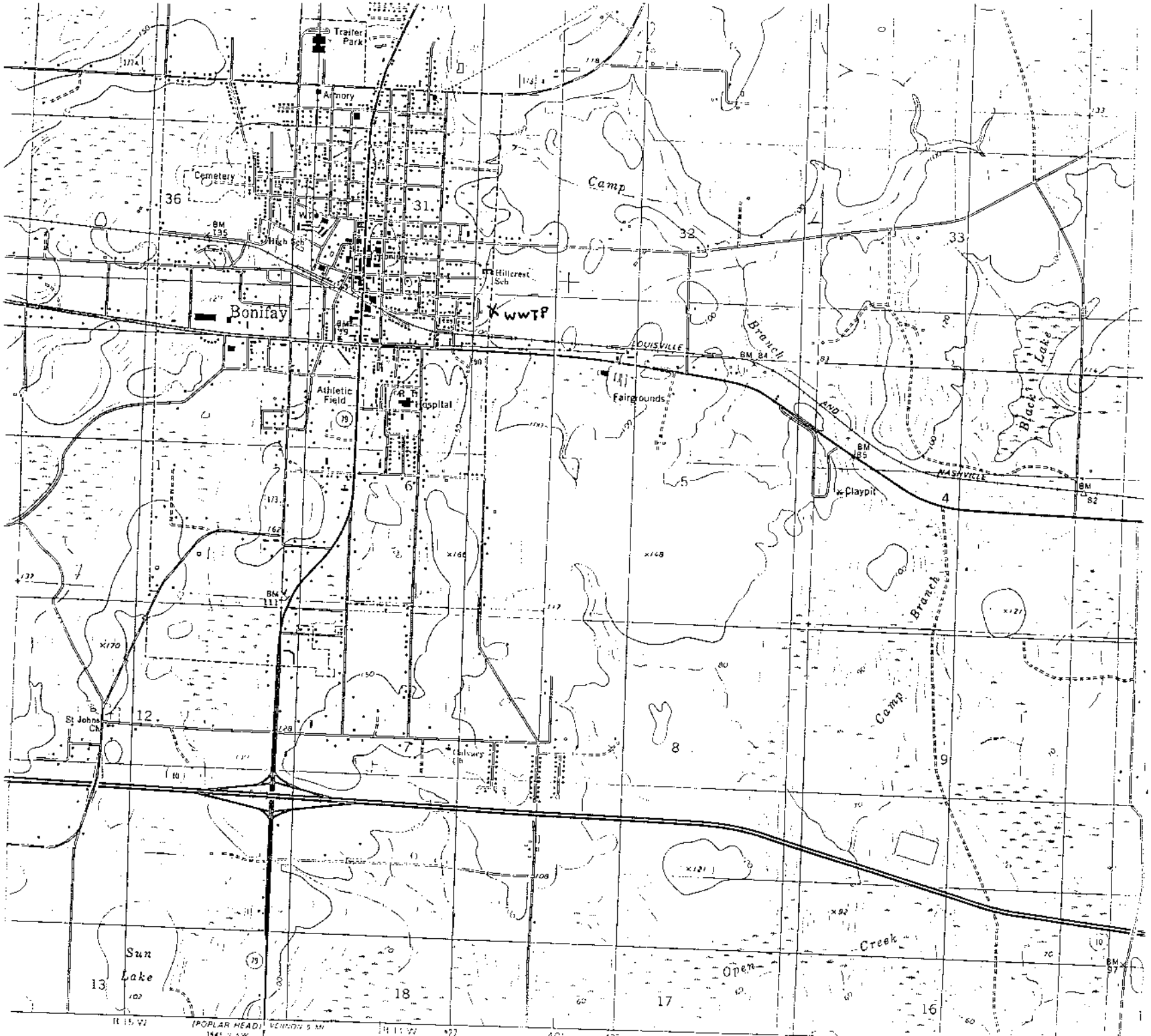
STREAM CONDITION INDEX (SCI)

Reference Site

Calculation & Interpretation of the Stream Condition Index for Florida (SCI) (Draft 1994)									
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	**Panhandle (65, 75a)**					**Peninsula (75b, c, d)**			
	Value	5	3	1	Score	5	3	1	Score
Number of Taxa	18	≥ 31	16–30	0–15	3	≥ 27	14–26	0–13	
EPT Index	0	≥ 7	4–6	0–3	1		≥ 4	0–3	
% Contribution of Dominant Taxon	41		≤ 20	> 20	1		≤ 37	> 37	
Florida Index	1	≥ 18	9–17	0–8	1	≥ 7	4–6	0–3	
% Diptera	72		≤ 38	> 38	1		≤ 32	> 32	
% Suspension feeders/ Collector-Filterers	0	≥ 12	7–11	0–6	1	≥ 8	4–7	0–3	
% Shredders	24		≥ 10	0–9	3		≥ 13	0–12	
% Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 16	0–15	
# Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 4	0–3	
Total Score	**Panhandle**				11	**Peninsula**			
Interpretation of Score	**No Impairment**				**29-23**	**No Impairment**			**33-27**
	Moderate Impairment				**22-15**	**Moderate Impairment**			**26-17**
	Severe Degradation				**14-7**	**Severe Degradation**			**16-9**

Test Site

Calculation & Interpretation of the Stream Condition Index for Florida (SCI) (Draft 1994)									
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	**Panhandle (65, 75a)**					**Peninsula (75b, c, d)**			
	Value	5	3	1	Score	5	3	1	Score
Number of Taxa	9	≥ 31	16–30	0–15	1	≥ 27	14–26	0–13	
EPT Index	0	≥ 7	4–6	0–3	1		≥ 4	0–3	
% Contribution of Dominant Taxon	83		≤ 20	> 20	1		≤ 37	> 37	
Florida Index	3	≥ 18	9–17	0–8	1	≥ 7	4–6	0–3	
% Diptera	92		≤ 38	> 38	1		≤ 32	> 32	
% Suspension feeders/ Collector-Filterers	3	≥ 12	7–11	0–6	1	≥ 8	4–7	0–3	
% Shredders	45		≥ 10	0–9	3		≥ 13	0–12	
% Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 16	0–15	
# Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 4	0–3	
Total Score	**Panhandle**				9	**Peninsula**			
Interpretation of Score	**No Impairment**				**29-23**	**No Impairment**			**33-27**
	Moderate Impairment				**22-15**	**Moderate Impairment**			**26-17**
	Severe Degradation				**14-7**	**Severe Degradation**			**16-9**


Trailer Park
Armory
Cemetery
Camp
Bonifay
WWTP
Hillcrest Sch
High Sch
Athletic Field
Hospital
Fairgrounds
LOUISVILLE AND NASHVILLE
Claypit
Black Lake Branch
Camp Branch
St Johns Ch
Cemetery
Sun Lake
Open Creek
(POPLAR HEAD)
BM 135
BM 84
BM 85
BM 82
BM 111
BM 97
36
31
32
33
1
6
5
4
12
7
8
9
13
18
17
16



LEGEND

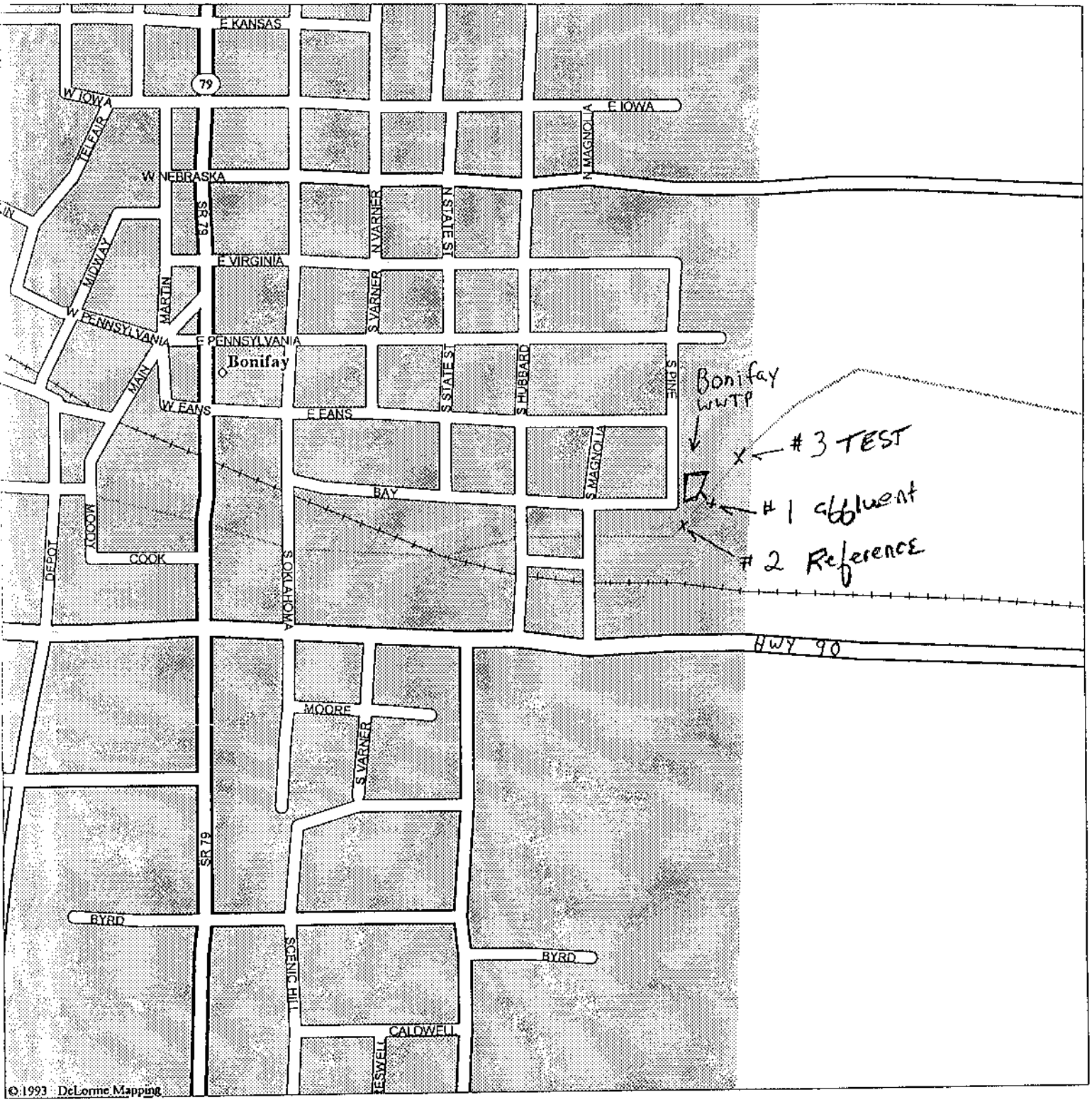
- Population Center
- State Route
- Town, Small City
- US Highway
- Street, Road
- Major Street/Road
- State Route
- US Highway
- Railroad
- River

Scale 1:15,625 (at center)

1000 Feet

500 Meters

Bonifay STP Area Camp Br.
Mag 15.00
Wed Sep 20 08:35:24 1995



LEGEND

- Population Center
- State Route
- Town, Small City
- Street, Road
- Major Street/Road
- State Route
- US Highway
- Railroad
- River

Scale 1:7,812 (at center)

500 Feet

200 Meters

Bonifay STP
Mag 16.00
Tue Oct 10 15:27:38 1995

Facility Summary

Facility Name: Bonifay, City of WWTF Date Summary Prepared: 09/18/95

Location map: 611 E. Bay Ave. Bonifay, FL 32425 (Map Attached) County: Holmes District: Northwest/10

NPDES Permit # FL0027731 expiration date: 09/30/96 State GMS # 1030M04317 expiration date: 12/05/96 Facility Type: **DOMESTIC**

Function of facility: The facility provides domestic wastewater treatment for the City of Bonifay.

Description of treatment process: A 1.4 MGD modified activated sludge WWTF utilizing influent bar screening, two Sequencing Batch Reactors, equalization, sand filtration, chlorination, post aeration, dechlorination, and effluent discharge to the Camp Branch Creek. The sludge is stored in four sand drying beds and transported to the Springhill landfill in Graceville.

Receiving waters: Camp Branch Creek (Tributary)

Flow Progression:
Camp Branch Creek--Holmes Creek--Choctawhatchee River

Classification: I II **III**
Class III: Propagation, recreation, maintenance of a healthy population of fish and wildlife

---

Design Flow: **1.4 MGD** Mean Flow: **0.912 MGD** Flow during survey: **0.652 MGD** (June 1995 MOR)

Discharge is: **Continuous** Intermittent Seasonal Rainfall dependent
Other (describe)
best time to sample is:

If facility has a mixing zone, give details (size, parameters, etc.)
The facility does not have a mixing zone.

List effluent limits (attach relevant paperwork): Major parameters listed. Complete listing attached.

Parameter	Frequency	Limit (units)
Flow	Continuous	1.4 MGD (max. annual) average
Chlorine Residual (after Dechlorination)	Hourly	0.01 mg/L (max.)
CBOD5	Weekly	8 mg/L (max. annual) average
Suspended Solids	Weekly	8 mg/L (max. annual) average
Total Nitrogen	Weekly	5 mg/L (max. annual) average
Total Phosphorus	Weekly	3 mg/L (max. annual) average
Dissolved Oxygen	Daily/7wk	6 mg/L (minimum)
Fecal Coliform	Weekly	200/#100mL (maximum)

List permit violations (from MOR data or other source) and plant upsets within past year:

The facility failed to conduct annual bioassays in accordance with Specific Condition #25 of FDEP Permit Number D030-204007. However, bioassays have been conducted in accordance with NPDES Permit # FL0027731.

06/21/95: Total Phosphorus Excursion, Weekly Sample Result of 4.91 mg/L

03/23/95: Fecal Coliform Violation, MCL Sample Result of >2400 #/100mL**

12/14/94: Total Phosphorus Excursion, Weekly Sample Result of 3.65 mg/L

12/21/94: TSS Excursion, Weekly Sample Result of 13 mg/L

Describe previous impact bioassessments, WQBEL's and previous or current enforcement actions:

Impact Bioassessments: The following bioassessments (7-day "EPA" chronic toxicity tests,) were not toxic to the test organisms.

09 May 95--16 May 95
29 Nov 94--06 Dec 94
16 Jun 94--23 Jun 94

02 Jun 94--09 Jun 94
10 May 94--17 May 94

An FDEP Fifth Year Survey performed by Glen Butts in March of 1993 revealed the following: (See Attachment I for complete results summary)

Toxics Sampling Inspection (**XSI**) "No organic pollutants were detected in the effluent or at the test site."

Compliance Biomonitoring Inspection (**CBI**) "The effluent sample was not toxic to the invertebrate Ceriodaphnia dubia or to the fish, Notropis leedsi."

Impact Bioassessment Inspection (**IBI**) See Attachment.

Water Quality Inspection (**WQI**) The analysis revealed a Class III water quality violation for fecal coliform with a result of 10,400/#100 mL. In addition, total phosphorus and ortho-phosphate levels were significantly higher than other Florida streams.

Previous Enforcement Actions: In August 1983, the facility was placed under a Consent Order for failing to comply with the conditions set forth in their TOP. In addition, the facility failed to address deficiencies in Warning Notices for TSS, BOD5, and fecal coliform. However, the facility has been in compliance for the past several years.

Discuss comparability of MOR results to past FDEP results and whether there are trends (improving, declining) in the data set:

**An FDEP inspection on 03/21/95 noted a fecal coliform result of <10/#100mL (The facility result of >2400/#100mL on 03/23/94 may have been a lab/sample error since proper levels of chlorination were documented.) All other FDEP inspection results appear to be consistent with MOR results.

Additional information: The facility was selected by the Northwest District Office as the 1995 Domestic Wastewater Plant of the Year. (Final approval for plant of the year has not been announced by the Tallahassee office.)

Staff contributing to this review (signature)

Glenn Butts — Biologist
Inspector
Engineer
Steven Kelly (Co-op) — Other
Other

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (v2)

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: FDEP NWD	STORET STATION NUMBER: 32.02.0030	DATE (M/D/Y): 09-21-95	RECEIVING BODY OF WATER: CAMP BRANCH
REMARKS: FLOW DEPENDS ON RAINFALL. OTHERWISE STAGNANT	LOCATION: 50 YARDS UPSTREAM FROM BONIFAY WWTP		FIELD ID/NAME: # 2

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Bottom Substrate/ Available Cover [5]	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs (partially decayed), undercut banks, rubble, or other stable habitat. 20 19 18 17 16	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable. 5 4 3 2 1
Water Velocity [5]	Max. observed: >0.25 m/sec. but < 2 m/sec 20 19 18 17 16	Max. observed; 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed; 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec 5 4 3 2 1
Artificial Channelization [3]	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Deposition [3]	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 16	20%-50% of habitats affected by sand or silt accumulation 15 14 13 12 11	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1
Bank Stability [5]	Stable. No evidence of erosion or bank failure. Little potential for future problems. 20 19 18 17 16	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 15 14 13 12 11	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 10 9 8 7 6	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 5 4 3 2 1
Riparian Buffer Zone Width [4]	Width of native vegetation (least buffered side) greater than 18 m 20 19 18 17 16	Width of native vegetation (least buffered side) 12 m to 18 m 15 14 13 12 11	Width of native vegetation 6 to 12 m, human activities still close to system 10 9 8 7 6	Less than 6 m of native buffer zone due to intensive human activities 5 4 3 2 1
Riparian Zone Vegetation Quality [5]	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 20 19 18 17 16	50% to 80% of riparian zone is vegetated, but one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 15 14 13 12 11	25% to 50% of riparian zone is vegetated, but one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 10 9 8 7 6	Less than 25% of streambank surfaces are vegetated. Poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 5 4 3 2 1

[ ] Add **5 points** if cross-sectional area of flow is estimated to be > one square meter during periods of normal flow.

30 **TOTAL SCORE**

Comments Low rainfall period during recon inspection. No flow observed, Stagnant. Stormwater ditch

ANALYSIS DATE:	ANALYST:	SIGNATURE:
09-21-95	Glenn Butts	Glenn Butts

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: 3810 / SUBMITTING AGENCY NAME: FDEP NWD	STORET STATION NUMBER: 32.02.0030	DATE (M/D/Y): 10-02-95	TIME: 1125	RECEIVING BODY OF WATER: CAMP BRANCH

REMARKS: SITE IS A STORM WATER DITCH	LOCATION: 45 meters UPSTREAM FROM BONIFAY WWTP	FIELD ID/NAME: # 2

RIPARIAN ZONE/INSTREAM FEATURES

Predominant Surrounding Land-Use (specify relative percent in each category):

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
			80	10		10

Local Watershed Erosion (check box): None ☐ Moderate ☐ Heavy ☒

Local Watershed NPS Pollution (check box): No evidence ☐ Some potential sources ☐ Obvious sources ☒

Point-Source Pollution (list location and describe): HEAVY STORMWATER RUNOFF FROM URBAN AREAS OF BONIFAY. SHORELINES OF CREEK ARE UNSTABLE

Estimated System Width (range, m): 2.0	Estimated System Depth (range, m): 0.3	yes
High Water Mark (m above bed): 3.0	Velocity (range, m/s): 0.15	Impounded ☐ Channelized ☒

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

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☐ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☒ MUSTY

Sediment Oils: Absent: ☐ Slight: ☐ Moderate: ☒ Profuse: ☐

Sediment Deposits: Sludge: ☐ Paper Fiber: ☐ Mud: ☐ Sand: ☒ Shell: ☐ Other: ☒ ROCKS

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	5			Riffles			
Leaf Packs				Sand	10		
Aquatic Vegetation	5			Mud/Muck/Silt			
Rock or Shell Rubble	60			Benthic leaf mats	5		
Undercut Banks/Roots	15			Other:			

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):	BOD	TSS	Secchi (m):
Top	0.3	24.03	7.56	3.67	442	6.0	9.0	
Mid-depth								
Bottom								

System Type : Stream: ☒ (Sand Bottomed ☐ Swamp & Bog ☐ Alluvial ☐ Sand Bot w/ Spring ☐ Calcareous ☐ Misc.) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐ _____

Water Odors (check box): Normal: ☐ Sewage: ☒ Petroleum: ☐ Chemical: ☐ Other: ☒ MUSTY

Water Surface Oils (check box): None: ☐ Sheen: ☒ Globs: ☐ Slick: ☐

Clarity (check box): Clear: ☐ Slightly turbid: ☐ Turbid: ☒ Opaque: ☐

Color (check box): Tannic: ☒ Green (algae): ☐ Clear: ☐ Other: ☐ _____

Weather Conditions: OVERCAST DAY WITH RAIN

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

SAMPLING TEAM: G. BUTTS & L. Donelan	SIGNATURE: Glenn Butts	DATE:

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (v2)

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: FDEP NWD	STORET STATION NUMBER: 32.02.0031	DATE (M/D/Y): 09-21-95	RECEIVING BODY OF WATER: CAMP BRANCH

REMARKS:	LOCATION:	FIELD ID/NAME:
TEST SITE	100 meters below Bonifay WWTP	# 3

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Bottom Substrate/ Available Cover [9]	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs (partially decayed), undercut banks, rubble, or other stable habitat. 20 19 18 17 16	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable. 5 4 3 2 1
Water Velocity [12]	Max. observed: >0.25 m/sec. but < 2 m/sec 20 19 18 17 16	Max. observed; 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed; 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec 5 4 3 2 1
Artificial Channelization [5]	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Deposition [5]	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 16	20%-50% of habitats affected by sand or silt accumulation 15 14 13 12 11	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1
Bank Stability [5]	Stable. No evidence of erosion or bank failure. Little potential for future problems. 20 19 18 17 16	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 15 14 13 12 11	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 10 9 8 7 6	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 5 4 3 2 1
Riparian Buffer Zone Width [4]	Width of native vegetation (least buffered side) greater than 18 m 20 19 18 17 16	Width of native vegetation (least buffered side) 12 m to 18 m 15 14 13 12 11	Width of native vegetation 6 to 12 m, human activities still close to system 10 9 8 7 6	Less than 6 m of native buffer zone due to intensive human activities 5 4 3 2 1
Riparian Zone Vegetation Quality [5]	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 20 19 18 17 16	50% to 80% of riparian zone is vegetated, but one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 15 14 13 12 11	25% to 50% of riparian zone is vegetated, but one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 10 9 8 7 6	Less than 25% of streambank surfaces are vegetated. Poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 5 4 3 2 1

[ ] Add **5 points** if cross-sectional area of flow is estimated to be > one square meter during periods of normal flow.

Comments Flow is proportional to WWTP discharge

[46] **TOTAL SCORE**

ANALYSIS DATE:	ANALYST:	SIGNATURE:
09-21-95	Glenn Butts	Glenn Butts

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: FDEP NWD	STORET STATION NUMBER: 32.02.0031	DATE (M/D/Y): 10-02-95	TIME: 1100	RECEIVING BODY OF WATER: CAMP BRANCH

REMARKS:	LOCATION: 100 Meters BELOW BONIFAY WWTP	FIELD ID/NAME: # 3
TEST SITE		

RIPARIAN ZONE/INSTREAM FEATURES

Predominant Surrounding Land-Use (specify relative percent in each category):

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
15	20		15	50		

Local Watershed Erosion (check box): None ☐ Moderate ☐ Heavy ☒

Local Watershed NPS Pollution (check box): No evidence ☐ Some potential sources ☐ Obvious sources ☒

Point-Source Pollution (list location and describe): BONIFAY WWTP DISCHARGE

Estimated System Width (range, m): 3.0	Estimated System Depth (range, m): 0.5	yes
High Water Mark (m above bed): 3.0	Velocity (range, m/s): 0.30	Impounded ☐ Channelized ☒

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

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☐ Sewage: ☒ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☒ MUSTY

Sediment Oils: Absent: ☐ Slight: ☒ Moderate: ☐ Profuse: ☐

Sediment Deposits: Sludge: ☐ Paper Fiber: ☐ Mud: ☐ Sand: ☒ Shell: ☐ Other: ☐

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	5			Riffles			
Leaf Packs	5			Sand	50		
Aquatic Vegetation	20			Mud/Muck/Silt			
Rock or Shell Rubble	5			Benthic leaf mats	5		
Undercut Banks/Roots	10			Other:			

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):	BOD	TSS	Secchi (m):
Top	0.3	27.39	7.54	7.13	431	2.2	5	
Mid-depth								
Bottom								

System Type : Stream: ☒ (Sand Bottomed ☐ Swamp & Bog ☐ Alluvial ☐ Sand Bot w/ Spring ☐ Calcareous ☐ Misc) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

Water Odors (check box): Normal: ☐ Sewage: ☒ Petroleum: ☐ Chemical: ☐ Other: ☒ MUSTY

Water Surface Oils (check box): None: ☒ Sheen: ☐ Globs: ☐ Slick: ☐

Clarity (check box): Clear: ☐ Slightly turbid: ☐ Turbid: ☒ Opaque: ☐

Color (check box): Tannic: ☒ Green (algae): ☐ Clear: ☐ Other: ☐

Weather Conditions: OVERCAST WITH RAIN

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

SAMPLING TEAM: G. BUTTS & L. DONELAN	SIGNATURE: Glenn Butts	DATE:

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Bonifay STP
County: Holmes
Contact / District: Glenn Curtis / Northwest
NPDES Permit #: FL0027731
LIMS Sample #: 118909 LIMS Job #: 95-DCT-03-13
sample log 10/6/95

Sample Collection: Date 10/2/95 Time
Test Beginning: Date 10/3/95 Time 1145
Test Ending: Date 10-5-95 Time 1145
Organism Batch #: 47 Diluent Batch #: 40
Organism Age: 42hrs
Test Organism: Ceriodaphnia dubia

Test Type: Screening | Definitive
Static | Static Renewal | Flow-through
Test Number: 1 of 2
Remarks:

Instrument Calibrations:	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	23.6 @ 23.7	8.4 @ 23.8 °C	106.0 @ 102.3 98.3 @ 101.3 @ 24.6 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.4 @ 23.4	8.3 @ 24.9 °C	107.9 @ 102.3 99.6 @ 101.3 @ 24.1 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	25.0 @ 25.1	8.3 @ 24.6 °C	106.9 @ 102.3 99.8 @ 101.3 @ 24.6 °C

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	24 h	48 h
CTL	A	5	5	5	8.2		8.2	23.7		24.5	7.8		7.8	175		185
CTL	B	5	5	5			8.2			24.4			7.8			185
CTL	C	5	5	5			8.2			24.3			7.8			185
CTL	D	5	5	5			8.2			24.2			7.8			180
100%	A	5	5	5	8.0	8.6	8.6	24.3		24.3	7.8		7.8	420		450
100%	B	5	5	5		*Ran Straight 10/5/95	8.6			24.3			7.8			430
100%	C	5	5	5			8.6			24.1			7.9			430
100%	D	5	5	5			8.6			23.9			7.9			435
Measured/Loaded by:		MF	DW	MF	TR		MF	TR		MF	TR		MF	TR		MF
Recorded by:		TM	DW	MF	DR		MF	DR		MF	DR		MF	DR		MF

Investigators' Signatures

Tina Mikulski
Tobin G. Rader
Marshall Faircloth
Diane L. Ross

reviewer

form updated 5/05/95

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			—	—	—
Lab Total Residual Cl2 (mg/L):	—	<0.03	<0.03	CR100	TR
Alkalinity (mg/L as $CaCO_3$):	—	75	135	Hach	TM
Hardness (mg/L as $CaCO_3$):	—	80	125	Hach	TM
Total ammonia (mg/L as N):	—	<0.017	0.661	Orion	MF

Ammonia Meter #98136 Ammonia Meter Slope: -55.0 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Bonifay
County: Holmes
Contact / District: Glenn Butts / Northwest
NPDES Permit #: FL0027731
LIMS Sample #: 118909 LIMS Job #: 95-Oct-05-13 (Accession Number) 10/6/95 (Sampling Date)

Sample Collection: Date 10-2-95 Time
Test Beginning: Date 10-3-95 Time 1205
Test Ending: Date 10-5-95 Time 1205
Organism Batch #: 37 Diluent Batch #: HCW2
Organism Age: 12 days
Test Organism: Cyprinella leedsi

Test Type: ~~Screening~~ | Definitive
Static | Static Renewal | Flow-through

Test Number: 2 of 2

Remarks:

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	23.6 @ 23.7	8.4 @ 23.8 °C	104.0 @ 102.3 998 @ 1013 @ 24.6 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.4 @ 23.4	8.3 @ 24.9 °C	107.9 @ 102.3 996 @ 1013 @ 24.1 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	25.0 @ 25.1	8.3 @ 24.6 °C	106.9 @ 102.3 998 @ 1013 @ 24.6 °C

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	24 h	48 h
CTL A	132	5	5	5	7.9	8.3	8.4	25.7	23.5	23.7	7.9	7.8	7.9	250	250	255
CTL B	883	5	5	5	7.9	8.3	8.4	25.0	23.4	23.7	7.9	7.8	7.9	250	250	250
CTL C	603	5	5	5	7.9	8.3	8.4	25.0	23.4	23.6	7.9	7.9	7.9	250	250	245
CTL D	304	5	5	5	7.9	8.3	8.4	25.0	23.5	23.4	7.9	8.0	8.0	250	250	245
100% A	45	5	5	5	7.9	8.3	8.4	25.1	23.6	23.7	7.8	7.4	7.8	440	420	430
100% B	380	5	5	5	7.9	8.3	8.4	25.1	23.5	23.7	7.8	7.8	7.8	440	425	430
100% C	44	5	5	5	7.9	8.3	8.4	25.1	23.5	23.7	7.8	7.8	7.8	440	430	430
100% D	500	5	5	5	7.9	8.3	8.4	25.1	23.5	23.5	7.7	7.8	7.7	440	430	430
Measured/Loaded by:		MF	AL	MF	TR	DW	DW/MF	TR	DW	MF	TR	DW	MF	TR	DW	MF
Recorded by:		TM	AL	MF	DR	VW	VW/JN	DR	DW	JN	DR	VW	JN	DR	VW	JN

Investigators' Signatures

Tyna Mikulski
Robin C. Radke
Marshall Faircloth
Vicki Whaley
reviewer

form updated 5/05/95

Salt Water / Well Water

Water Quality Parameters	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):		—	—	—
Lab Total Residual Cl2 (mg/L):	—	<0.03	DR-180	TR
Alkalinity (mg/L as $CaCO_3$):	—	135	Hach	TM
Hardness (mg/L as $CaCO_3$):	—	125	Hach	TM
Total ammonia (mg/L as N):	—	0.661	Orion	MF

Ammonia Meter #98136 Ammonia Meter Slope: -55.0 Ammonia Blank: <0.017

Control Salinity: 0 ppt Sample Salinity: 0 ppt

STREAM CONDITION INDEX (SCI)

BONIFAY WWTP - CAMP BRANCH

Reference Site

Calculation & Interpretation of the Stream Condition Index for Florida (SCI) (Draft 1994)									
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	**Panhandle (65, 75a)**					**Peninsula (75b, c, d)**			
	Value	5	3	1	Score	5	3	1	Score
Number of Taxa	18	≥ 31	16–30	0–15	3	≥ 27	14–26	0–13	
EPT Index	0	≥ 7	4–6	0–3	1		≥ 4	0–3	
% Contribution of Dominant Taxon	41		≤ 20	> 20	1		≤ 37	> 37	
Florida Index	1	≥ 18	9–17	0–8	1	≥ 7	4–6	0–3	
% Diptera	72		≤ 38	> 38	1		≤ 32	> 32	
% Suspension feeders/ Collector-Filterers	0	≥ 12	7–11	0–6	1	≥ 8	4–7	0–3	
% Shredders	24		≥ 10	0–9	3		≥ 13	0–12	
% Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 16	0–15	
# Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 4	0–3	
Total Score	**Panhandle**				11	**Peninsula**			
Interpretation of Score	**No Impairment**				**29-23**	**No Impairment**			**33-27**
	Moderate Impairment				**22-15**	**Moderate Impairment**			**26-17**
	Severe Degradation				**14-7**	**Severe Degradation**			**16-9**

Test Site

Calculation & Interpretation of the Stream Condition Index for Florida (SCI) (Draft 1994)									
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	**Panhandle (65, 75a)**					**Peninsula (75b, c, d)**			
	Value	5	3	1	Score	5	3	1	Score
Number of Taxa	9	≥ 31	16–30	0–15	1	≥ 27	14–26	0–13	
EPT Index	0	≥ 7	4–6	0–3	1		≥ 4	0–3	
% Contribution of Dominant Taxon	83		≤ 20	> 20	1		≤ 37	> 37	
Florida Index	3	≥ 18	9–17	0–8	1	≥ 7	4–6	0–3	
% Diptera	92		≤ 38	> 38	1		≤ 32	> 32	
% Suspension feeders/ Collector-Filterers	3	≥ 12	7–11	0–6	1	≥ 8	4–7	0–3	
% Shredders	45		≥ 10	0–9	3		≥ 13	0–12	
% Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 16	0–15	
# Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 4	0–3	
Total Score	**Panhandle**				9	**Peninsula**			
Interpretation of Score	**No Impairment**				**29-23**	**No Impairment**			**33-27**
	Moderate Impairment				**22-15**	**Moderate Impairment**			**26-17**
	Severe Degradation				**14-7**	**Severe Degradation**			**16-9**

Benthic macroinvertebrate taxa list for Bonifay WWTP, collected by Hester-Dendy samplers in Camp Branch on November 8, 1995. Taxa densities are given in number/m^2.

	Reference Site	Test Site
Platyhelminthes		
Dugesia sp.	2	583
Nemertea		
Prostoma rubrum	–	2
Oligochaeta		
Aulodrilus pigueti	–	2
Bratislavia unidentata	–	8
Dero pectinata	–	4
Dero trifida	2	4
Limnodrilus hoffmeisteri	–	12
Pristina aequiseta	–	32
Pristinella jenkinae	–	8
Slavina appendiculata	2	–
Enchytraeidae	–	6
Hirudinea		
Helobdella triserialis	–	2
Gastropoda		
Gastropoda	4	20
Micromenetus floridensis	–	46
Micromenetus sp.	2	–
Physella sp.	4	81
Ancylidae	2	–
Pelecypoda		
Pisidiidae	–	2
Odonata		
Enallagma sp.	–	4
Ischnura posita	–	10
Diptera		
Ablabesmyia mallochi	24	2
Ablabesmyia rhamphe grp.	2	–
Apedilum elachista	2	–
Chironomus sp.	14	69
Conchapelopia sp.	14	–
Dicrotendipes modestus	–	2
Glyptotendipes sp.	2	2
Glyptotendipes sp. F Epler	2	79
Goeldichironomus holoprasinus	10	–
Polypedilum convictum grp.	–	4
Polypedilum illinoense	–	26
Polypedilum tritum	–	4
Tanytarsus sp. E Epler	2	–
Tanytarsus sp. T Epler	4	–
Thienemannimyia grp.	–	2
Chironomidae	8	10

Benthic macroinvertebrate taxa list for Bonifay WWTP, collected by 20 discrete dip-net sweeps in Camp Branch on October 11, 1995.

	Reference Site	Test Site
Oligochaeta		
Dero trifida	–	2
Eclipidrilus sp.	1	–
Limnodrilus hoffmeisteri	7	3
Gastropoda		
Micromenetus dilatatus	8	–
Physella sp.	2	–
Gastropoda	1	–
Pelecypoda		
Pisidiidae	–	4
Decapoda		
Cambaridae	2	–
Odonata		
Ischnura sp.	–	1
Libellula vibrans	1	–
Pachydiplax longipennis	1	–
Diptera		
Ablabesmyia mallochi	–	1
Chironomus sp.	33	101
Conchapelopia sp.	2	–
Cryptochironomus sp.	1	–
Glyptotendipes sp.	1	–
Larsia berneri	2	–
Natarsia sp.	5	–
Odontomyia sp.	1	–
Polypedilum sp.	1	2
Polypedilum illinoense	2	1
Polypedilum scalaenum grp.	2	–
Polypedilum sp. A Epler	–	4
Psychoda sp.	4	2
Thienemannimyia grp.	1	–
Chironomidae	4	–
Diptera	1	–

Periphyton taxa list for Bonifay WWTP, collected in Camp Branch on 8 November, 1995. Abundances are expressed as numbers/cm^2.

	Reference Site	Test Site
Cyanophyceae		
Anabaena sp.	–	574
Aphanocapsa sp.	256	191
Chroococcus sp.	–	191
Lyngbya sp.	–	383
Oscillatoria sp.	–	383
Bacillariophyceae		
Achnanthes exigua	7437	12253
Achnanthes hustedtii	769	–
Achnanthes lanceolata dubia	513	191
Achnanthes linearis	1795	383
Amphora sp.	256	–
Caloneis sp.	–	574
Capartogramma crucicula	256	–
Cocconeis placentula	–	191
Cymbella minuta	1539	191
Eunotia sp.	2308	4212
Eunotia pectinalis	256	1532
Eunotia vanheurcki	–	191
Gomphonema sp.	256	–
Gomphonema affine	256	766
Gomphonema parvulum	6667	4595
Navicula capitata	256	–
Navicula decussis	769	191
Navicula exigua	256	191
Navicula hambergi	256	–
Navicula minima	769	383
Navicula pupula	1539	–
Navicula radiosa	1026	2297
Navicula rhynchocephala	513	–
Navicula viridula	–	574
Nitzschia amphibia	1026	1532
Nitzschia fonticola	256	1723
Nitzschia linearis	–	574
Nitzschia palea	3590	2489
Pinnularia acrosphaeria	256	–
Stauroneis kriegeri	–	191
Stauroneis smithi	256	–
Surirella sp.	256	383
Synedra ulna	256	1340
Pennales	–	1340
Chlorophyceae		
Characium sp.	–	766
Chlamydomonas sp.	513	191

Chlorella sp.	256	–
Chlorococcum sp.	–	957
Crucigenia sp.	–	383
Dispora sp.	–	191
Gloeocystis sp.	–	191
Oedogonium sp.	–	383
Scenedesmus sp.	256	–
Schroederia sp.	–	191
Uronema sp.	1026	191

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 FL0027731 11	12 951002 17	18 X	19 S	20 1

Remarks

21 66

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 FL0027731 11	12 951002 17	18 B	19 S	20 1

Remarks

21 66