

Biological Assessment of

Florida State Hospital Wastewater Treatment Plant

Gadsden County

NPDES #FL0031402

Sampled October 1994

February 1995

Biology Section
Division of Administrative and Technical Services

Comprehensive Quality Assurance Plan No. 870346G

Department of Environmental Protection
Results of Fifth Year Inspections

Discharger: Florida State Hospital WWTP
County: Gadsden
NPDES Number: FL0031402
State Permit Expiration Date: July 16, 1995

Toxics Sampling Inspection (XSI)

Date Sampled: 10 October 1994

Results: No organic priority pollutants were found in the discharge. No metals were found in the discharge at levels above Class III standards.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 10 October 1994

Results: The sample of Florida State Hospital WWTP effluent was not toxic to the test organisms, *Cyprinella leedsi* and *Ceriodaphnia dubia*.

Impact Bioassessment Inspection (IBI)

Date Sampled: 10 October 1994

Results: Qualitative measures of benthic macroinvertebrate community health indicated that conditions were somewhat improved at the test site. Taxa richness, the Florida Index, and the EPT Index increased by 39%, 88%, and 25%, respectively, between the reference and test sites. Both sites scored 17 points on the Stream Invertebrate Index for Florida (SIIF), placing them in the "moderately impaired" category. These data suggest that the Florida State Hospital is not adversely affecting the benthic community health below the discharge, which is apparently already stressed for other reasons. No detrimental changes in the periphyton community were attributed to the discharge.

Water Quality Inspection (WQI)

Date Sampled: 10 October 1994

Results: The discharge, with 10 mg/L of nitrate-nitrite, appeared responsible for bioavailable nitrogen enrichment of the receiving waters. Nitrate-nitrite increased from 0.06 mg/L at the reference site to 0.36 mg/L at the test site, where it was higher than the values found in approximately 80% of other Florida streams. Concentrations of other nutrients in Mosquito Creek were fairly average. Algal growth potential (AGP) results were above the 5 mg dry wt/L "problem threshold" at both Mosquito Creek stations. The reference site AGP was 23.6 mg dry wt/L, while the test site AGP was 16.1 mg dry wt/L. The effluent AGP value was 80.6 mg dry wt/L. Effluent fecal coliforms (130 organisms/100 mL) and total coliforms (500 organisms/100 mL) were within permit limits and Class III standards. Similarly, fecal coliforms at the reference site (625 organisms/100 mL) and test site (350 organisms/100 mL) were within Class III standards. Total coliform bacteria levels exceeded Class III standards at the reference site (with 4600 organisms/100 mL) but not at the test site (with 2000 organisms/100 mL).

These fifth year inspections provide the necessary information to evaluate the facility's impact on its receiving waters and to provide the basis for specific condition recommendations for permit renewal.

Introduction

The Florida State Hospital wastewater treatment plant is located in Chattahoochee, Gadsden County, Florida (see map in Appendix). It is a 1.3 MGD activated sludge wastewater treatment plant with disposal to the Class III Mosquito Creek, a tributary of the Apalachicola River. Permit limits are as follows: BOD (20 mg/L maximum annual average), TSS (20 mg/L maximum annual average), total nitrogen (15 mg/L maximum annual average), flow (1.30 MGD maximum annual average), pH (6.0-8.5 S.U.'s), chlorine residual (0.5 mg/L minimum for disinfection, 0.01 mg/L maximum at discharge), dissolved oxygen (5.0 mg/L minimum) and fecal coliform bacteria (200 organisms/100 mL maximum). During the present survey, the mean flow was measured at 0.411 MGD.

There were no violations reported for this facility in the most recent annual review. The only problems on record include the failure to report chlorine residuals before and after dechlorination.

Methods

The focus of this investigation was to determine the discharger's effect on the receiving waters. A comparison of biological community health was made between a reference site (located upstream of the discharge in Mosquito Creek, at Highway 97, in Decatur County, Georgia) and a test site (located in Mosquito Creek approximately 50 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 from the facility (Weber 1991). The effluent was analyzed for metals and for organic constituents (base neutral and acid extractables, and pesticide extractables). Additionally, nutrient analyses were performed on the effluent sample, as well as on water from the reference and test sites. Methods used for all chemical analyses are on file at the Tallahassee DEP Chemistry Laboratory.

Major characteristics of community structure of control and test sites.

	Reference Site	Test Site
Macroinvertebrate Qualitative		
Number of Taxa	31	43
Florida Index	9	17
SIIF	17	17
EPT Index	4	5
% Contribution of Dominant Taxon	39	29
% Diptera	59	25.2
% Oligochaeta	15.0	38.2
% Amphipoda	0	6.1
% Coleoptera	11.0	3.8
% Ephemeroptera	9.0	4.6
% Decapoda	0	4.6
% Trichoptera	1.0	0.2
% Other	5.0	17.3
% Predators	24.5	24.8
% Above Surface Deposit Feeders	25.5	15.6
% Below Surface Deposit Feeders	15.0	38.2
% Suspension Feeders	6.0	5.7
% Scrapers	7.5	6.1
% Shredders	19	4.6
% Scavengers	0	4.6
% Plant Piercers	2.5	0.4
Periphyton Algae		
Number of Taxa	19	16
Shannon-Weaver Diversity	3.8	3.7
Algal Density (#/sq. cm)	163.9	151.5
Chlorophyll a (mg/sq. m)	1.15	1.47
Diatom/Diatom + B-G Abundance Ratio	0.55	1.0
% Blue-green	41.2	0
% Green	5.9	0
% Diatoms	50.0	98.0
% OtEuglenophytes	2.9	2.0
Algal Growth Potential (mg dry wt/l)	23.6	16.1

Benthic macroinvertebrate communities were evaluated at reference and test sites. Invertebrates were collected from multiple substrates (*e.g.*, snags, leaf packs, vegetation) using 20 discrete dip net sweeps. 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). Bacterial populations were analyzed for total and fecal coliforms following the methods of APHA (1989). Algal Growth Potential tests, using *Selenastrum capricornutum* as the test organism, followed Miller *et al.* (1978).

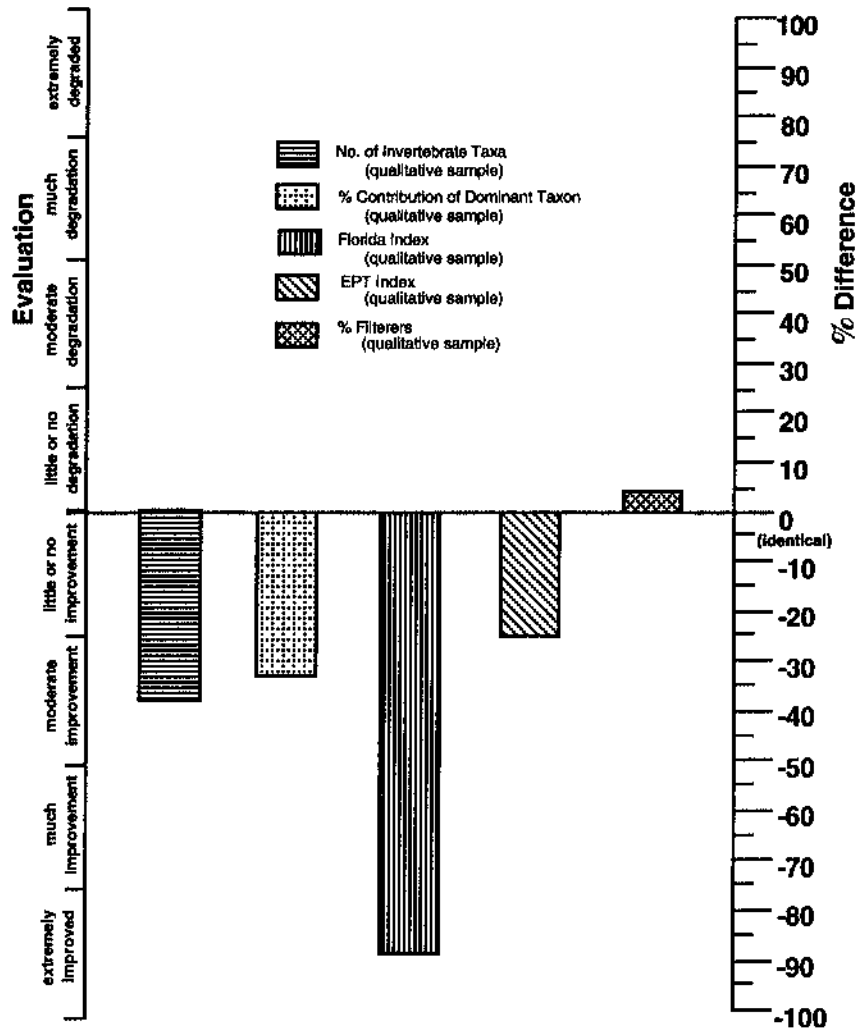
Explanation of Measurements of Community Health

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

Taxa richness: It is generally accepted that taxa richness is among the most robust measures of benthic community health. Anthropogenic stress has a tendency to reduce the number of different types of invertebrates present in a system. Algal taxa richness may increase with moderate nutrient enrichment, compared to an oligotrophic natural background, but become reduced with extreme nutrient enrichment or toxicity.

Shannon-Weaver diversity: This index is specified in the Florida Administrative Code as a measure of biological integrity. Low diversity scores are undesirable, in that they represent conditions where only a few organisms are abundant, to the exclusion of other taxa. Such scores may be associated with organic/nutrient enrichment and decreased dissolved oxygen. Excessive numerical dominance of a single type of organism (a high % contribution of the dominant taxon) is also associated with disturbance.

Numbers of pollution sensitive taxa: Unpolluted sites have characteristic numbers and types of taxa which are sensitive to anthropogenic stress. These organisms become rare or absent as the intensity or duration of the 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 (*e.g.*, around 20 or more in the Panhandle, around 15 or more in the Peninsula). 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.



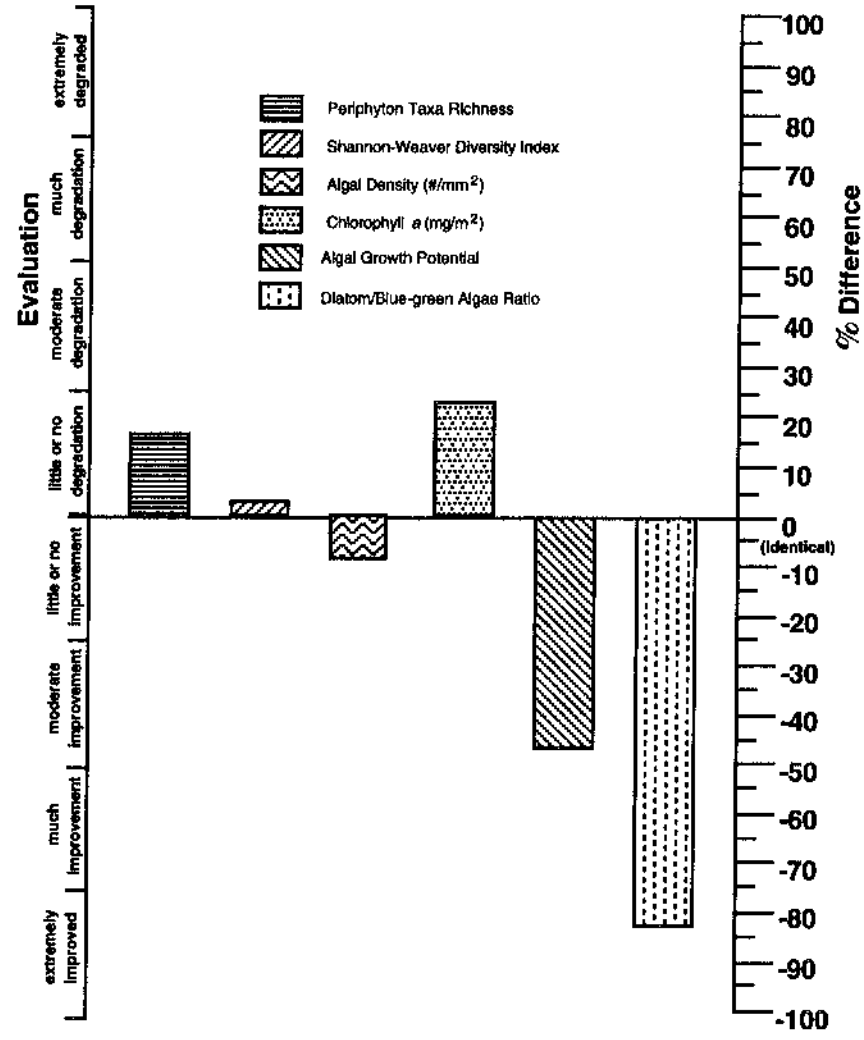
Effect of discharge on the benthic macroinvertebrate community.

Ephemeroptera/Plecoptera/Trichoptera Index: To calculate the index, one simply sums the number of EPT taxa present at a station. Higher EPT scores (*e.g.*, 7 or more in the Panhandle, 4 or more in the Peninsula) are associated with healthier systems, while lower scores indicate stressed conditions.

Community structure: A system is generally considered degraded if a substantial shift in the proportions of the major taxonomic groups (*e.g.*, mayflies, riffle beetles, etc.) is observed when compared to a reference site. 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.

Algal biomass: The density of algal cells and the chlorophyll *a* concentration are used as estimators of biomass. A system has traditionally been considered nutrient stressed when biomass exceeds problem threshold levels, often resulting in visible algal blooms, nuisance scums, and low dissolved oxygen from the decomposition of the decaying algal tissue. 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: Undisturbed aquatic systems possess characteristic proportions of organisms using various functional feeding strategies, and human disturbance shifts these established feeding strategies. In Florida for example, pollution is known to reduce the numbers of filter-feeders and shredders.



Effect of discharge on the algal community.

The Stream Invertebrate Index for Florida (SIIF) is a composite metric which is based upon the macroinvertebrate communities found at Florida Eco-regional reference sites sampled with dip net sweeps (EA Engineering 1994). The SIIF assigns 5, 3, or 1 point(s) to a variety of invertebrate parameters, depending on how closely that parameter approaches the expected Eco-regional reference condition. Five points is the best score for metrics which are particularly strong at discriminating between healthy and impaired sites (see SIIF calculation table in Appendix). The following parameters are used in calculating the SIIF for the Panhandle: taxa richness, EPT Index, % contribution of the dominant taxa, % Diptera, Florida Index, % suspension feeders/filterers, and % shredders (EA Engineering 1994). In the Panhandle, 23-29 SIIF points indicates no impairment, 15-22 points indicates moderate impairment, and 7-14 points is clear evidence of severe degradation. In the Florida Peninsula, these same parameters, along with the number of crustacean and mollusk taxa and the % of crustacean and mollusk taxa, are used to calculate the SIIF. In the Peninsula, 27-33 SIIF points indicates no impairment, 17-26

points indicates moderate impairment, and 9-16 points is clear evidence of severe degradation. Although the SIIF is based on samples collected during the summer, similar relationships should apply in other seasons.

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 minus 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 and Martin Gawronski (DEP Northwest District), and Lyn Burton, Melva Campos, Marshall Faircloth, Russel Frydenborg, Christy LeDuc, Kathleen Lurding, Tina Mikulski, Ed Miller, Liz Miller, Urania Quintana, Landon Ross, Jennifer Sparapani, Jack Taylor, David Whiting, Vicki Whiting, Greg Wynn, and David Young. (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, with 97 points at the reference site and 98 points at the test site, was similar at both stations. Water velocity (0.25 m/sec) was the same at both sites and the pH was slightly acidic (6.5 at the reference, 6.6 at the test site). Specific conductance was also very similar at both sites (38 µmhos/cm at the reference site and 42 µmhos/cm the test site). Dissolved oxygen levels (7.0 mg/L at the reference site and 7.1 mg/L at the test site) were adequate to support aquatic life throughout the portions of the stream studied.

The sample of Florida State Hospital WWTP effluent was not toxic to the test organisms, *Cyprinella leedsi* and *Ceriodaphnia dubia* (Appendix).

No organic priority pollutants were found in the discharge. Of the metals analyzed for in the effluent, only iron (53 µg/L) and zinc (18 µg/L) were above practical quantitation limits. At the effluent hardness of 125 mg/L $CaCO_3$, these values were within Class III water quality standards. Metals analyses were also performed on samples from receiving water stations. Iron was detected at the reference site (1160 µg/L) and at the test site (1150 µg/L) at concentrations exceeding Class III standards.

Although some nutrient species were elevated in the effluent sample, they were within permit requirements. The discharge, with 10 mg/L of nitrate-nitrite, appeared responsible for bioavailable nitrogen enrichment of the receiving waters (see Chemistry Summary Table in Appendix). Nitrate-nitrite increased from 0.06 mg/L at the reference site to 0.36 mg/L at the test site. This test site concentration was higher than those found in approximately 80% of other Florida streams (see table of Typical Water Quality Parameters in Appendix). Concentrations of other nutrients in Mosquito Creek were fairly average. In 1990, nitrate-nitrite concentrations in the Florida State Hospital effluent were measured at 9.6 mg/L, resulting in elevated levels (0.6 mg/L) in Mosquito Creek (see Appendix).

Algal growth potential (AGP) results were above the 5 mg dry wt/L "problem threshold" at both Mosquito Creek stations (Raschke and Schultz 1987). The reference site AGP was 23.6 mg dry wt/L, while the test site AGP was 16.1 mg dry wt/L. The effluent AGP value was 80.6 mg dry wt/L.

Effluent fecal coliforms (130 organisms/100 mL) and total coliforms (500 organisms/100 mL) were within permit limits and Class III standards. Similarly, fecal coliforms at the reference site (625 organisms/100 mL) and test site (350 organisms/100 mL) were within Class III standards. Total coliform bacteria levels exceeded Class III standards at the reference site (with 4600 organisms/100 mL) but not at the test site (with 2000 organisms/100 mL). Because the holding time was exceeded for microbiological samples, the reference site total coliform value does not represent a violation.

Qualitative measures of benthic macroinvertebrate community health indicated that conditions were somewhat improved at the test site. The figure on p. 2 indi-

cates the degree of difference between the invertebrate populations of the reference and test sites. Larger differences (that is, higher percentages) correspond with greater degrees of degradation. Negative values mean that the test site is better than the reference.

In dip net samples, taxa richness, the Florida Index, and the EPT Index increased by 39%, 88%, and 25%, respectively, between the reference and test sites. The % contribution of the dominant taxon was 10% less at the test site, also indicating slight improvement. Both sites scored 17 points on the Stream Invertebrate Index for Florida (SIIF), placing them in the "moderately impaired" category. These data suggest that the Florida State Hospital is not adversely affecting the benthic community health below the discharge, which is apparently already stressed for other reasons.

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. Taxa richness was similar throughout the study area, with 19 taxa at the reference site and 16 taxa at the test site. Diversity was also similar, with 3.8 at the reference site and 3.7 at the test site. Community structure, however, was somewhat different between sites. The reference site was composed of diatoms (50.0%), cyanophytes (41.2%), chlorophytes (5.9%), and euglenophytes (2.9%). The test site consisted predominantly of diatoms (98.0%) with some euglenophytes (2.0%), but no cyanophytes or chlorophytes. Periphyton biomass (chlorophyll *a*) at the test site 1.5 mg/m^2) was very similar to that found at the reference site (1.2 mg/m^2).

Conclusions

The sample of Florida State Hospital WWTP effluent was not toxic to the test organisms, *Cyprinella leedsi* and *Ceriodaphnia dubia*.

No organic priority pollutants were found in the discharge. No metals were found in the discharge at levels above Class III standards.

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No detrimental changes in the periphyton community were attributed to the discharge.

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Chemistry summary table for

Florida State Hospital.	Effluent	Reference Site	Test Site
Organic Constituents (ug/L)			
	None detected		
Metals (ug/L)			
Aluminum	100 U	920	925
Arsenic	10 U	10 U	10 U
Cadmium	0.08 U	0.08 U	0.08 U
Chromium	10 U	10 U	10 U
Copper	8 I	3 U	3 U
Iron	53 A	1160	1150
Lead	10 U	10 U	10 U
Mercury	0.10 U	0.10 U	0.10 U
Nickel	4 U	4 U	4 U
Silver	0.05 U	0.05 U	0.05 U
Zinc	18	4 U	5 I
Nutrients (mg/L)			
Ortho-phosphate	3.8	0.04 I	0.04 I
Total phosphorus	3.9	0.07	0.06 A
Ammonia	0.03 I	0.02 U	0.02 U
Nitrate+Nitrite	10	0.06 A	0.36
TKN	0.72	0.35	0.31
Other Parameters			
Habitat Assessment		97	98
D.O. (mg/L)	6.3	7.0	7.1
pH (SU's)	7.3	6.5	6.6
Specific Conductance (µmhos/cm)	330	38	42
Temperature (°C)	25.8	23.2	23.2
Hardness (mg CaCO3)	125		
AGP (mg dry wt/L)	80.6	23.6	16.1
Bioassay Fish	Not toxic		
Bioassay Invertebrate	Not toxic		
Fecal coliform (org/100 mL)	130 Q	625 AQ	350 Q
Total coliform (org/100 mL)	500 Q	4600 AQ	2000 Q

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

I - Value reported is less than the minimum quantitation limit and greater than or equal to the minimum detection limit

J - Estimated value

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

Q - Sample held beyond normal holding time.

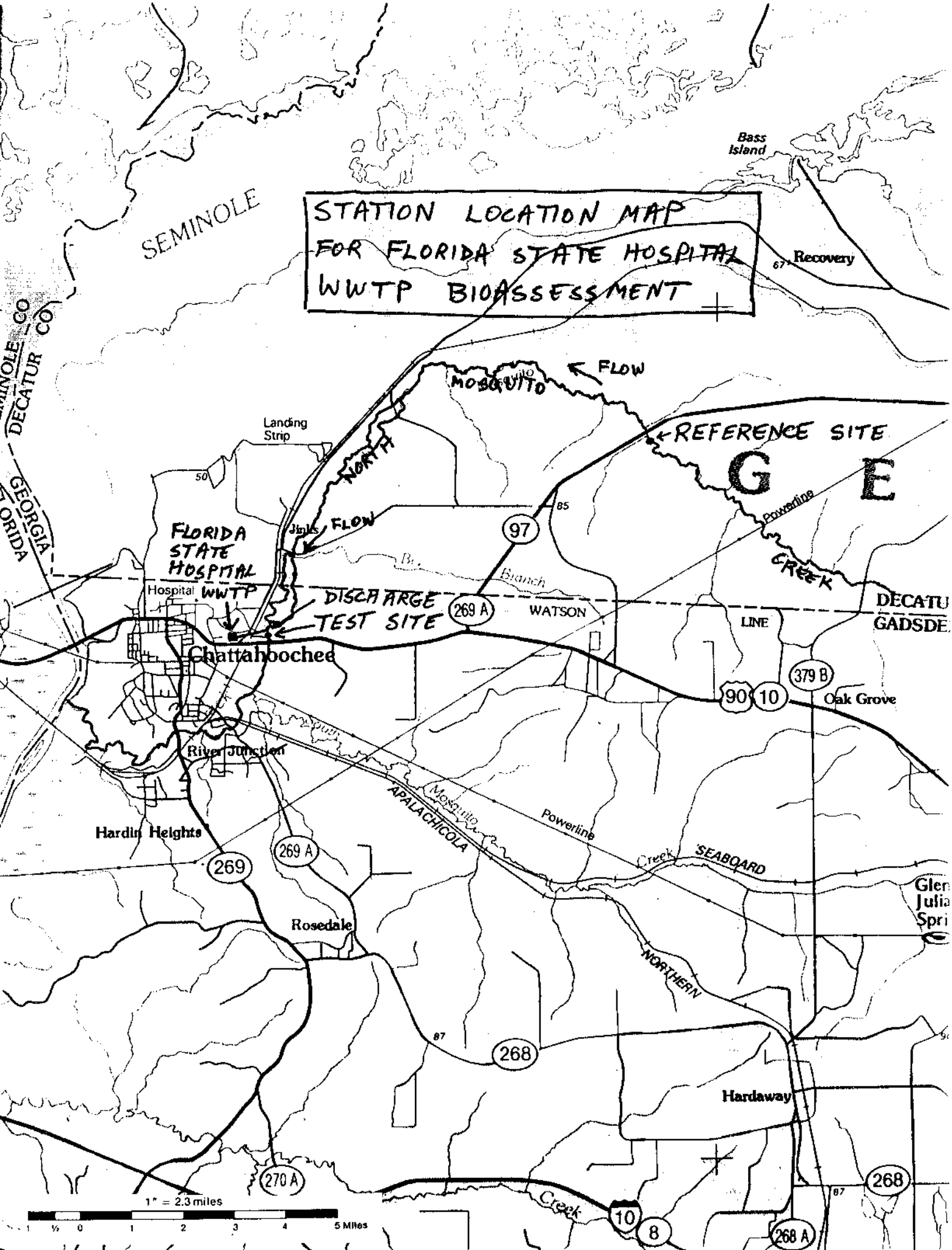
Typical Values for Selected Parameters in Florida Waters

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 Phosphorus	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-Phosphorus	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-Phosphorus	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


STATION LOCATION MAP
FOR FLORIDA STATE HOSPITAL
WWTP BIOASSESSMENT
SEMINOLE
DECATUR CO
GEORGIA
FLORIDA
Bass Island
Recovery
FLOW
MOSQUITO
REFERENCE SITE
Landing Strip
NORTH
FLORIDA STATE HOSPITAL
Hospital WWTP
DISCHARGE TEST SITE
Jinks
FLOW
Powerline
Creek
Branch
97
269 A
WATSON
LINE
DECATU
GADSDE
Chattahoochee
379 B
90
10
Oak Grove
River Junction
APALACHICOLA
Mosquito
Powerline
Creek
SEABOARD
Hardin Heights
269
269 A
Rosedale
NORTHERN
87
268
Hardaway
270 A
Creek
10
8
268 A
268
1" = 2.3 miles
1 ½ 0 1 2 3 4 5 Miles

From: BUTTS_G (""PNS1::A1::BUTTS_G""@MRGATE@DER@DER@DERPS@MRGATE@DERPS)
Date: 10/11/1994 08:53:46
To: 1 FRYDENBORG_R
Cc:
Subj: Fl St Hosp Summary

From: NAME: Glenn Butts PEN
FUNC: Northwest District Office
TEL: 904/444-8380 <BUTTS_G@A1@PNS1>
To: NAME: Russell Frydenborg TAL <FRYDENBORG_R @ A1 @ DER>
CC: NAME: Kathleen Lurding TAL <LURDING_K @ A1 @ DER>

Here is the Florida State Hospital facility summary.
GLB

From: NAME: Martin Gawronski PEN
FUNC: Northwest District Office
TEL: 904/693-8380 <GAWRONSKI_M@A1@PNS1>
Date: 11-Oct-1994
Posted-date: 11-Oct-1994
Precedence: 1
Subject: FACILITY SUMMARY
To: NAME: Glenn Butts PEN <BUTTS_G@A1@PNS1>

Author: Glenn Butts PEN
Date: 21-Apr-1993
Posted-date: 11-Oct-1994
Subject: FACILITY SUMMARY

Facility Summary

Facility Name: FLORIDA STATE HOSPITAL WWTP
Date Summary Prepared: 10/5/1994

Location map: County GADSDEN | District N.W.

NPDES Permit #FL0031402 State GMS #1020S27430
Facility Type: DOMESTIC
expiration date expiration date JUL 16, 95 XDomX. Fed. Agric.

Function of facility: SEWAGE TREATMENT FOR FLORIDA STATE HOSPITAL

Description of treatment process: A 1.3 MGD ACTIVATED SLUDGE WASTEWATER TREATMENT PLANT WITH DISPOSAL TO SURFACE WATER

Receiving waters: MOSQUITO CREEK TO APALACHICOLA RIVER
Classification: I II III CLASS III

Design Flow:	Mean Flow:	Flow during survey:
1.30 MGD	.411 MGD	.441 MGD

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

If facility has a mixing zone, give details (size, parameters, etc.)
NO MIXING ZONE INDICATED BY THE PERMIT

List effluent limits (attach relevant paperwork):

Parameter	Limit (units)
FLOW	1.30 MGD (MAX.ANNUAL AVG.)
pH	6.0 - 8.5 STU
CHLORINE RESIDUAL	MIN. 0.5 MG/L MAX. 0.01 MG/L
BOD5	20 MG/L (MAX. ANNUAL AVG.)
TSS	20 MG/L (MAX. ANNUAL AVG.)
FECAL	200/#100 ML
TOTAL N	15 MG/L (MAX. ANNUAL AVG.)
DO	5 MG/L MIN.

List permit violations (from MOR data or other source) and plant upsets within past year: NO MOR VIOLATIONS FOUND DURING ANNUAL REVIEW

THE OPERATOR DID NOT REPORT ALL REQUIRED PARAMETERS ON THE FRONT PAGE OF MONTHLY OPERATING REPORTS. (PROBLEM AREAS INCLUDE CHLORINE RESIDUALS BEFORE AND AFTER DECHLORINATION)

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

FEBRUARY 94 BIOASSAY (SAMPLED 12/6/93)
- 48-HOUR STATIC ACUTE SCREENING TOXICITY BIOASSAYS INDICATED NO TOXICITY (NO MORTALITY TO Creiodaphnia dubia OR Cyprinella leedsi)

NO PREVIOUS OR CURRENT ENFORCEMENT ACTIONS ON FILE.

Discuss comparability of MOR results to past FDER results and whether there are trends (improving, declining) in the data set:
THE PLANT OPERATES BETWEEN 27 AND 36% OF DESIGN CAPACITY AND ALL REPORTED PARAMETERS FOR 1993 and 1994 ARE WITHIN PERMIT REQUIREMENTS. THERE ARE NO IMPROVING OR DECLINING TRENDS IN THE DATA SUBMITTED TO FDEP. DATA COLLECTED BY DEP INSPECTORS CORRESPONDS WITH THAT SUBMITTED BY FLORIDA STATE HOSPITAL WWTP.

Additional information:

Staff contributing to this review (signature)

Glenn Butts — Biologist
Inspector
Engineer
Martin Gawronski — Other

Facility Summary

Facility Name:
FLORIDA STATE HOSPITAL WWTP

Date Summary Prepared:
10/5/1994

Location map: County GADSDEN

District N.W.

NPDES Permit #FL0031402 State GMS #1020S27430
Facility Type: DOMESTIC
expiration date expiration date JUL 16, 95 XDomX. Fed. Agric.

Function of facility: SEWAGE TREATMENT FOR FLORIDA STATE HOSPITAL

Description of treatment process: A 1.3 MGD ACTIVATED SLUDGE WASTEWATER TREATMENT PLANT WITH DISPOSAL TO SURFACE WATER

Receiving waters: MOSQUITO CREEK TO APALACHICOLA RIVER

Classification: I II III
CLASS III

Design Flow:	Mean Flow:	Flow during survey:
1.30 MGD	.411 MGD	.441 MGD

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

If facility has a mixing zone, give details (size, parameters, etc.)
NO MIXING ZONE INDICATED BY THE PERMIT

List effluent limits (attach relevant paperwork):

Parameter	Limit (units)
FLOW	1.30 MGD (MAX.ANNUAL AVG.)
pH	6.0 - 8.5 STU
CHLORINE RESIDUAL	MIN. 0.5 MG/L MAX. 0.01 MG/L
BOD5	20 MG/L (MAX. ANNUAL AVG.)
TSS	20 MG/L (MAX. ANNUAL AVG.)
FECAL	200/#100 ML
TOTAL N	15 MG/L (MAX. ANNUAL AVG.)
DO	5 MG/L MIN.

List permit violations (from MOR data or other source) and plant upsets within past year: NO MOR VIOLATIONS FOUND DURING ANNUAL REVIEW

THE OPERATOR DID NOT REPORT ALL REQUIRED PARAMETERS ON THE FRONT PAGE OF MONTHLY OPERATING REPORTS. (PROBLEM AREAS INCLUDE CHLORINE RESIDUALS BEFORE AND AFTER DECHLORINATION)

Describe previous impact bioassessments, WQBEL's and previous or current

TOXICITY (NO MORTALITY TO Creiodaphnia dubia OR Cyprinella leedsi)

NO PREVIOUS OR CURRENT ENFORCEMENT ACTIONS ON FILE.

Discuss comparability of MOR results to past FDER results and whether there are trends (improving, declining) in the data set:
THE PLANT OPERATES BETWEEN 27 AND 36% OF DESIGN CAPACITY AND ALL REPORTED PARAMETERS FOR 1993 and 1994 ARE WITHIN PERMIT REQUIREMENTS. THERE ARE NO IMPROVING OR DECLINING TRENDS IN THE DATA SUBMITTED TO FDEP. DATA COLLECTED BY DEP INSPECTORS CORRESPONDS WITH THAT SUBMITTED BY FLORIDA STATE HOSPITAL WWTP.

Additional information:

Staff contributing to this review (signature)

Glenn Butts Biologist
Inspector
Engineer
Martin Gawronski Other
Other

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		10/10	10.36	Mosquito CK

REMARKS:	LOCATION:	FIELD ID/NAME:
evidence of stream flooding East of Burns Bay at least 20m on each side	Mosquito Creek upstream at Hwy 97	Ref. Mosquito CK

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
99							1 Hwy

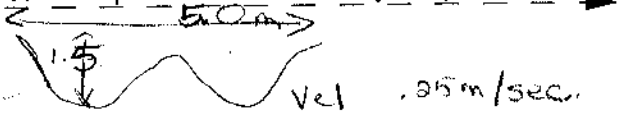
Local Watershed Erosion (check box): None ☐ Slight ☐ Moderate ☐ Heavy ☑

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

Width of riparian vegetation (m) on least buffered side: >100

List & map dominant vegetation on back

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect (draw cross-section & provide at least 3 velocity & depth values)



Artificially Channelized ☑ no ☐ recent, severe ☐ some recovery ☐ mostly recovered, more sinuous

Artificially Impounded ☐ yes

High Water Mark (m above bed): 1.0

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

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☑ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☑ Other: ☐ slight

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

Sediment Deposition: Sludge: ☐ Sand smothering: none ☐ slight ☐ moderate ☐ severe Silt smothering: none ☐ slight ☐ moderate ☐ severe Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	8	3		Sand	80	1	
Leaf Packs or Mats	2	5		Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut Banks/Roots	8	7		***Draw aerial view sketch of habitats found in 100 m section***			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	1	23.2	6.48	7.03	38			
Mid-depth								
Bottom	1.5							

System Type : Stream: ☑ (1st - 2nd order ☐ 3rd - 4th order ☐ 5th - 6th order ☐ 7th order or greater) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

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

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/Notes:
Partly Cloudy approx 78°
Cond Std 115 µmho/cm @ 23.5°C
pH 7.01 & 4.00 @ calib.

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Christy LePuy, Liz Miller, Lyn Burton	Lyn Burton	10/10/01

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		10/10/94	

REMARKS:	LOCATION:	FIELD ID/NAME:
	Fla State Hosp. upstream, mosquito ck at Hwy 97	Ref. mosquito ck

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Bottom Substrate/ Available Cover [15]	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 [19]	Max. observed: >0.25 m/sec. but < 2 m/sec (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 [20]	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 [8]	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 [20]	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 [10]	Over 80% of streambank surfaces consist of native plants, including trees understory shrubs, or non-woody macrophytes. Plants growing naturally. 20 19 18 17 16	50% to 80% of riparian zone is vegetated, but one class of plants 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 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

97 **TOTAL SCORE**

ANALYSIS DATE:	ANALYST:	SIGNATURE:
10/10/94	L. Burton	Lyn Burton

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		10/10	12.35	

REMARKS:	LOCATION:	FIELD ID/NAME:
Stream was at least 20 m out of its Banks Presently	dn stream of STP Mosquito Ck. Chat.	Test Mosquito Ck.

RIPARIAN ZONE/INSTREAM FEATURES

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

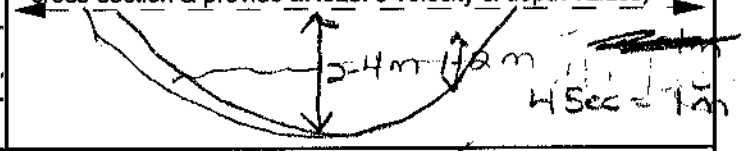
Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
75				20	5 Bldg		

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

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

Width of riparian vegetation (m) on least buffered side: ***List & map dominant vegetation on back***

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect (draw cross-section & provide at least 3 velocity & depth values)



Artificially Channelized ☐ no? ☐ recent, severe ☐ some recovery ☐ mostly recovered, more sinuous

Artificially Impounded ☑ yes

High Water Mark (m above bed): 1-2m

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

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☑ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☐

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

Sediment Deposition: Sludge: ☐ Sand smothering: none slight moderate (circled) severe Silt smothering: none slight moderate severe Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	9	3		Riffles			
Leaf Packs or Mats	1	2		Sand	80	1	
Aquatic Vegetation				Mud/Muck/Silt			
Rock or Shell Rubble				Other:			
Undercut Banks/Roots	10	10		***Draw aerial view sketch of habitats found in 100 m section***			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	2-4m		6.16 3	~~meter~~	42.0	1		
Mid-depth		23.8		~~meter~~ on				
Bottom				7.05				

System Type : Stream: ☑ (1st - 2nd order / 3rd - 4th order / 5th - 6th order / 7th order or greater) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

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

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/Notes:
78-80 °C Slight Rain - misty occasional. Slight

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Liz Miller, Christy LeDuc Lyn Burton	Lyn Burton	10/10/94

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y): 10/10/94	RECEIVING BODY OF WATER:

REMARKS:	LOCATION: Test Site - Fla St. Hwy Mosquito Ck. downstream DS STP.	FIELD ID/NAME: Mosquito Ck Test Site

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Bottom Substrate/ Available Cover 15	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 19	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 20	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~~ 9	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 20	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 11	Over 80% of streambank surfaces consist of native plants, including trees understory shrubs, or non-woody macrophytes. Plants growing naturally. 20 19 18 17 16	50% to 80% of riparian zone is vegetated, but one class of plants 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 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

98 ~~104~~ **TOTAL SCORE**

ANALYSIS DATE:	ANALYST:	SIGNATURE:
10/10/94	Lyn Burton	Lyn Burton

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Florida State Hospital
County: Gadsden
Contact / District: Glenn Butts / NW
NPDES Permit #: FL00
LIMS Sample #: 91247 **LIMS Job #:** 94-OCT-11-07-01

Sample Collection: Date 10/10/94 Time 1128
Test Beginning: Date 10/11/94 Time 0930
Test Ending: Date 10/13/94 Time 1000
Organism Batch #: 39 **Diluent Batch #:** 39
Organism Age: <24 hrs
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	22.6@22.7	8.5@23.2°C	100.3@98.6 / 1018@1047@23.7°C
24 hr	7.0@7.0 / 9.0@9.0	22.6@22.7	8.5@23.2°C	101@98.6 / 1014@1047@23.6°C
48 hr	7.0@7.0 / 9.0@9.0	22.6@22.7	8.6@22.6°C	99.7@98.6 / 1017@1047@23.6°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	UNCORRECTED 24 h	UNCORRECTED 48 h
Control A	A	5	5	5	8.2		8.4	22.8		23.8	8.3		8.0	1160		190
Control B	B	5	5	5			8.4			23.9			8.0			180
Control C	C	5	5	5			8.4			23.9			8.0			185
Control D	D	5	5	5			8.4			24.0			8.0			185
100% A	A	5	5	5	7.4		8.4	22.6		24.0	8.0		7.9	3160		380
100% B	B	5	5	5			8.4			24.0			8.0			380
100% C	C	5	5	5			8.4			24.0			8.0			385
100% D	D	5	5	5			8.4			24.0			8.0			395
Recorded by:		TM	TM	TR	JS		TR	JS		TR	JS		TR	JS		TR
Measured/Loaded by:		JHS	ME	TM	TM		TM	TM		TM	TM		TM	TM		TM

Investigators' Signatures

Tina M. Kubalik
Jennifer Sparapani
Marshall Faircloth
Robin C. Raden
Reviewer

Water Quality Parameters

	Salt Water: Well Water	Salt Water: 20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			—	—	—
Lab Total Residual Cl2 (mg/L):	.003	<0.03	~~.0085~~	DR-ICE	TM
Alkalinity (mg/L as $CaCO_3$):	120	80	85	HACH	JRS
Hardness (mg/L as $CaCO_3$):	125	85	95	HACH	JRS
Total ammonia (mg/L as N):	<0.017	<0.017	<0.017	orion	TM

Ammonia Meter #98136 Meter Slope: -55.3 Ammonia Blank: <0.017 Control Salinity: ( ) ppt Sample Salinity: ( ) ppt

form updated 10/05/94

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Florida State Hospital
County: Gadsden
Contact / District: Glenn Butts / Northwest
NPDES Permit #: FL00
LIMS Sample #: 91247 **LIMS Job #:** 94-OCT-11-07-01

Sample Collection: Date 10/10/94 Time 1128
Test Beginning: Date 10/11/94 Time 0930
Test Ending: Date 10/13/94 Time 1000
Organism Batch #: 41 **Diluent Batch #:** well
Organism Age: 11 days old
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	22.6 @ 22.7	8.5 @ 23.2 °C	100.3 @ 98.6 / 1018 @ 1047 @ 23.7 °C
24 hr	7.0 @ 7.0 / 9.0 @ 9.0	22.6 @ 22.7	8.5 @ 23.2 °C	101 @ 98.6 / 1014 @ 1047 @ 23.6 °C
48 hr	7.0 @ 7.0 / 9.0 @ 9.0	22.6 @ 22.7	8.6 @ 22.6 °C	99.7 @ 98.6 / 1017 @ 1047 @ 23.6 °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
Control A	174	5	5	5	7.9	8.3	8.5	23.3	22.6	22.2	8.1	8.4	8.4	245	245	245
Control B	38	5	5	5	7.9	8.3	8.5			22.2	8.1	8.4	8.4	245	240	245
Control C	366	5	5	5	7.9	8.3	8.5			22.2	8.1	8.4	8.4	245	240	245
Control D	287	5	5	5	7.9	8.3	8.5			22.4	8.1	8.5	8.4	245	245	245
100% A	11	5	5	5	7.4	7.9	8.2	22.5	22.6	22.2	7.7	8.3	8.3	370	370	375
100% B	380	5	5	5	7.4	7.9	8.2			22.1	7.7	8.2	8.3	370	370	375
100% C	333	5	5	5	7.4	7.9	8.2			22.1	7.7	8.3	8.3	370	370	375
100% D	43	5	5	5	7.4	7.9	8.2			22.4	7.7	8.3	8.2	370	375	375
Recorded by:		TM	TM	TR	JS	MF	TR	JS	MF		JS	MF		JS	MF	TR
Measured/Loaded by:		TM	TM	TM	TM	TM	TM	TM	TM		TM	TM		TM	TM	TM

Investigators' Signatures

Tina M. Kubala
Jennifer Spacapan
Marshall Stimpert
Tobin G. Rader
Reviewer

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	<0.03	DR-100	TM
Alkalinity (mg/L as $CaCO_3$):	120	80	85	HACH	JAS
Hardness (mg/L as $CaCO_3$):	125	85	95	HACH	JAS
Total ammonia (mg/L as N):	<0.017	<0.017	<0.017	orion	TM

Ammonia Meter #98136 Meter Slope: -55.3 Ammonia Blank: <0.017 Control Salinity: ( ) ppt Sample Salinity: ( ) ppt

form updated 10/05/94

Reference

Calculation and Interpretation of the Stream Invertebrate Index for Florida (SIIF) (Draft Version 1994)								
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Panhandle (65, 75a)				Peninsula (75b, c, d)			
	5	3	1	Score	5	3	1	Score
Number of Taxa	≥ 31	16–30	0–15	5	≥ 27	14–26	0–13	
EPT Index	≥ 7	4–6	0–3	3		≥ 4	0–3	
% Contribution of Dominant Taxon		≤ 20	> 20	1		≤ 37	> 37	
Florida Index	≥ 18	9–17	0–8	3	≥ 7	4–6	0–3	
% Diptera		≤ 38	> 38	1		≤ 32	> 32	
% Suspension feeders/ Collector-Filterers	≥ 12	7–11	0–6	1	≥ 8	4–7	0–3	
% Shredders		≥ 10	0–9	3		≥ 13	0–12	
% Crustacean/Mollusks (Peninsula only)	–	–	–			≥ 16	0–15	
# Crustacean/Mollusks (Peninsula only)	–	–	–			≥ 4	0–3	
Total Score	Panhandle			17	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

Calculation and Interpretation of the Stream Invertebrate Index for Florida (SIIF) (Draft Version 1994)								
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Panhandle (65, 75a)				Peninsula (75b, c, d)			
	5	3	1	Score	5	3	1	Score
Number of Taxa	≥ 31	16–30	0–15	5	≥ 27	14–26	0–13	
EPT Index	≥ 7	4–6	0–3	3		≥ 4	0–3	
% Contribution of Dominant Taxon		≤ 20	> 20	1		≤ 37	> 37	
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% Suspension feeders/ Collector-Filterers	≥ 12	7–11	0–6	1	≥ 8	4–7	0–3	
% Shredders		≥ 10	0–9	1		≥ 13	0–12	
% Crustacean/Mollusks (Peninsula only)	–	–	–			≥ 16	0–15	
# Crustacean/Mollusks (Peninsula only)	–	–	–			≥ 4	0–3	
Total Score	Panhandle			17	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 taxa list for Florida State Hospital WWTP collected via 20 dipnet sweeps in Mosquito Creek, Gadsden County, on 10 October 1994.

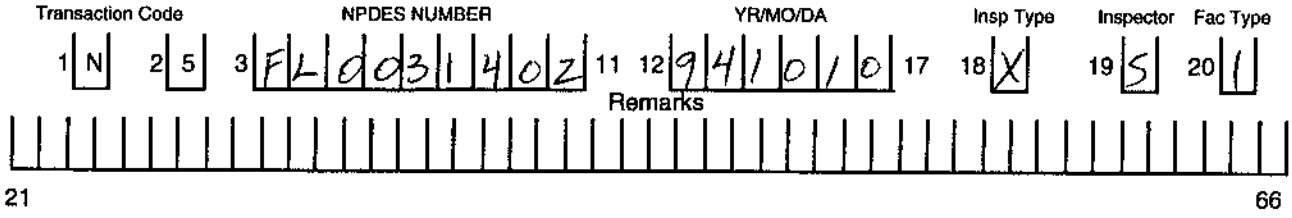
	Reference Site	Test Site
Acarina		
Lebertia sp.	–	4
Mideopsis sp.	–	4
Neumania sp.	–	4
Undetermined Oribatidae	10	–
Amphipoda		
Hyalella azteca	–	32
Coleoptera		
Ancyronyx variagata	10	–
Berosus sp.	–	4
Copelatus caelalipennis	5	–
Ectopria sp.	5	–
Ectopria nervosa	–	4
Macronychus glabratus	5	8
Microcylloepus pusillus	5	–
Scirtes sp.	25	–
Stenelmis sinuata	–	4
Decapoda		
Palaemonetes paludosus	–	24
Diptera		
Ablabesmyia mallochi	–	16
Conchapelopia sp.	5	–
Hemerodromia sp.	–	4
Labrundinia johannseni	–	4
Labrundinia pilosella	–	16
Mesosmittia sp.	5	–
Palpomyia grp. sp.	5	8
Paramerina sp.	5	4
Parametriocnemus sp.	5	–
Pentaneura inconspicua	–	4
Polypedilum sp.	10	–
Polypedilum convictum grp.	5	–
Polypedilum fallax grp.	5	–
Polypedilum illinoense	195	48
Rheocricotopus robacki	10	–
Rheotanytarsus distinctissimus grp.	5	–
Rheotanytarsus exiguus grp.	–	4
Simulium sp.	20	12
Tanytarsus sp. S Epler	–	4
Tipula sp.	15	–
Undetermined Tabanidae	5	–
Undetermined Tipulidae	–	8

Ephemeroptera		
Acerpenna pygmaeus	15	–
Baetis propinquus	–	4
Caenis sp.	5	12
Stenonema smithae	25	–
Tricorythodes albilineatus	–	4
Undetermined Leptophlebiidae	–	4
Gastropoda		
Hebetancyclus excentricus	–	4
Micromenetus dilatatus	–	4
Physella sp.	–	4
Hemiptera		
Belostoma lutarium	5	–
Hydrometra sp.	5	–
Mesovelia sp.	5	–
Microvelia sp.	–	4
Microvelia sp. 2	–	4
Odonata		
Ischnura sp.	–	8
Macromia taeniolata	–	24
Oligochaeta		
Aulodrilus pigueti	–	4
Dero trifida	–	4
Eclipidrilus palustris	–	8
Limnodrilus hoffmeisteri	5	152
Lumbriculus inconstans	–	4
Nais behningi	10	–
Pristina longiseta	–	4
Pristina synclites	10	–
Slavina sp.	–	4
Undetermined Enchytraeidae	50	20
Pelecypoda		
Byssanodonta cubensis	–	4
Undetermined Sphaeriidae	–	8
Platyhelminthes		
Dugesia tigrina	–	8
Trichoptera		
Cheumatopsyche sp.	5	–
Oecetis cinerascens	–	8

Periphyton taxa list and densities (#/cm²) for Florida State Hospital WWTP collected via glass microscope slides in Mosquito Creek, Gadsden County on 10 October, 1994.

	Reference Site	Test Site
Bacillariophyta		
Achnanthes lanceolata v. dubia	–	24
Cocconeis placentula	–	10
Cyclotella meneghiniana	5	10
Cymbella minuta	–	3
Eunotia curvata	5	3
Eunotia naegelii	5	–
Eunotia pectinalis	5	10
Frustulia rhomboides	19	3
Gomphonema parvulum	5	7
Navicula capitata	5	–
Navicula minima	5	14
Navicula pupula	5	3
Navicula rhynchocephala	5	–
Navicula viridula	5	3
Nitzschia amphibia	–	3
Nitzschia palea	5	14
Nitzschia romana	–	3
Stauroneis obtusa	10	–
Tabellaria fenestrata	–	17
Unidentified pennate diatom	–	17
Chlorophyta		
Cosmarium sp.	5	–
Selenastrum sp.	5	–
Cyanophyta		
Lyngbya sp.	14	–
Oscillatoria sp.	10	–
Phormidium sp.	43	–
Euglenophyta		
Euglena sp.	–	3
Trachelomonas sp.	5	–

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



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

