213



Biological Assessment of

Wauchula Wastewater Treatment Plant

Hardee County

NPDES #FL0023949

Sampled April 1997

FILE COPY
DO NOT REMOVE

April 1998

Biology Section
Division of Administrative and Technical Services

Comprehensive Quality Assurance Plan No. 870346G

Department of Environmental Protection

Results of Fifth Year Inspections

Discharger:	City of Wauchula WWTP
County:	Hardee County
NPDES Number:	FL0023949
NPDES Permit Expiration Date:	31 March 2000

Toxics Sampling Inspection (XSI)

Date Sampled: 21 April 1997

Results: All metals and organic compounds detected in the effluent complied with Class III water quality standards.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 21 April 1997

Results: The effluent sample did not show toxicity to the water flea, *Ceriodaphnia dubia,* or to the fish, *Cyprinella leedsi.*

Impact Bioassessment Inspection (IBI)

Date Sampled: 21 April 1997

Results: The SCI and Shannon-Weaver diversity indicated the discharge was adversely affecting the receiving water community. The 70.5% decrease in diversity between the reference site and test site 1 was a violation of the biological integrity criterion, Rule 62-302.530(11)FAC. The test site 1 population was dominated by *Chironomus* sp., a well known pollution tolerant organism. The SCI score at the reference site (21 points) placed it in the lowest range of the "good" category, while the test site 1 value (17 points) and test site 2 value (19 points) placed them both into the "poor" category. Although habitat was a limiting factor at all sites, the lower SCI scores at the test sites, as well as the biological integrity violation at test site 1, indicate the effluent is having a negative effect on the receiving water biota. No major differences were noted in the receiving water periphyton communities. Periphyton chlorophyll *a* at both sites was higher than the values found in approximately 80% of other Florida streams. It is possible, however, that eutrophication effects may occur farther downstream in the Peace River, depending upon flow, light penetration, and the assimilative capacity of the system.

Water Quality Inspection (WQI)

Date Sampled: 21 April 1997

Results: Substantial nutrient enrichment, attributable to the discharge, was observed at the two test sites. For example, total phosphorus and nitrate-nitrite concentrations at the test sites were higher than those found in 95% of other Florida streams. Algal Growth Potential (AGP) exceeded the 5 mg dry wt/L "problem threshold" at all sites. The lower than anticipated AGP values in the effluent and at test site 1 suggest algal growth inhibition at those sites. Total and fecal coliform standards were violated at the reference site (Rule 62-302.530(6) FAC), and total coliform levels exceeded the legal limit at test sites 1 and 2 (Rule 62-302.530(7) FAC). Coliform values were very low in the effluent, suggesting some other source of contamination.

Introduction

The City of Wauchula Wastewater Treatment Plant is a facility located in Hardee County, Florida (see maps in Appendix). Wastewater is treated in a Type I, activated sludge, carousel oxidation ditch, and receives nitrification, chlorination, and subsequent dechlorination. The effluent from this 1.0 MGD facility discharges to an unnamed tributary, which flows eastward for approximately 0.5 miles to the Peace River.

State permit limits are as follows: flow (1.0 MGD as a three month average), pH (6.0-8.5 SU), dissolved oxygen (minimum of 6.0 mg/L), total suspended solids (20.0 mg/L as a monthly average, 45 mg/L as a weekly average), BOD (10 mg/L as a monthly average, 15 mg/L as a weekly average), chlorine (maximum of 0.01 mg/L at discharge), ammonia (2.0 mg/L as a monthly average, 3.0 mg/L as a weekly average), organic nitrogen (3.0 mg/L as a monthly average, 4.5 mg/L as a weekly average), and fecal coliforms (maximum of 200 counts/100 mL as an annual average). Additionally, acute toxicity tests are required to be performed on the effluent.

During the week of January, 1997, the weekly permit limit (3.0 mg/L) for total ammonia was exceeded, and on January 15, 1997, the Class III unionized ammonia standard (0.02 mg/L) was violated.

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 between a reference site (located upstream of the discharge in an unnamed tributary of the Peace River) and two test sites (see maps in Appendix). Test site 1 was in the same tributary immediately (approximately 20 m) downstream of the discharge and directly above the confluence of another unnamed tributary, and test site 2 was approximately 100 m downstream of the discharge, below the confluence of that tributary). Three additional stations were established, where samples for selected physical/chemical and microbiological analyses were collected. Test site 3 was located in the tributary entering the system between test sites 1 and 2 to evaluate its possible influence on the system. Test site 4 was established in the Peace River, approximately 50 m north of SR 636, and test site 5 was located roughly 60 m south of the area where the discharge tributary enters the river. A habitat assessment was performed *in situ* to establish comparability between sites. Supplemental physical/chemical data were also collected on the effluent and all 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, and pesticide extractables). Additionally, nutrient analyses were performed on the effluent and all study sites. Methods used for all chemical analyses are on file at the Tallahassee DEP Chemistry Laboratory.

Benthic macroinvertebrate communities were evaluated at the reference and test sites 1 and 2. Invertebrates were collected from multiple substrates (*e.g.*, snags, leaf packs, vegetation) using discrete dip net sweeps. Additional invertebrate collections were accomplished via Hester-Dendy multiplate samplers which were incubated for 28 days (Ross 1990). Periphyton was sampled via glass microscope slides. Chlorophyll *a* was determined for periphyton communities (Ross 1990). Algal Growth Potential tests, using *Selenastrum capricornutum* as the test organism, followed Miller *et al.* (1978). Microbiological analyses were performed on the effluent and all study sites according to APHA (1989).

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.

Habitat Assessment: Seven attributes known to have potential effects on the stream biota were evaluated and scored, with 20 possible points for each factor. Based on the sum of these individual scores, overall habitat quality is assigned to one of four categories: Optimal (105-140 points); Suboptimal (70-104 points); Marginal (35-69 points); and Poor (0-34 points).

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 Hudson *et al.* (1990), Lenat (1993), 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.

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 (Barbour *et al.* 1996). 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, 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: Andrea Grainger, Joe Squitieri, and James Fine (DEP Southwest District) and Lyn Burton, Jennifer Eichelberger, Marshall Faircloth, Russel Frydenborg, Joy Jackson, Kathleen Lurding, Elizabeth Miller, Urania Quintana, Lisa Tamburello, David Whiting, and Vicki Whiting (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 "marginal" at the reference site (with 57 points) and at test site 1 (45 points), improving to "suboptimal" at test site 2 (with 73 points). The sites were located in an unnamed tributary of the Peace River which receives urban runoff from the City of Wauchula. All three sites received low scores for bottom substrate availability, water velocity, artificial channelization, deposition, and bank stability. The reference site and test site 1 also received low scores in riparian buffer zone width and riparian zone vegetation quality.

With one exception, physical/chemical measurements were comparable at all six of the study sites (Table 1). Dissolved oxygen levels, ranging from 7.5 mg/L to 8.3 mg/L, complied with Class III standards. The pH ranged from 6.8 SU at test site 1 to 7.8 SU at test site 4. Temperature ranged from 17.5°C at test site 3 to 22.8°C at test site 1. Specific conductance in the stream appeared to be affected by the discharge, which had a value of 1,060 µmhos/cm. Conductivity increased from 407 µmhos/cm at the reference site to 1,018 µmhos/cm at test site 1 and 936 µmhos/cm at test site 2. This increase in conductivity at the test sites suggests that, at the time of sampling, the effluent was a major contributor to stream flow. This is also supported by the specific conductance value of 560 µmhos/cm measured at test site 3, which was established to examine the possible influence of this incoming tributary on the effluent receiving waters.

The effluent sample was not acutely toxic to the water flea, *Ce-*

Table 2. Effect of discharge on the algal community.

	Reference Site	Test Site 1	Test Site 2
Macroinvertebrate Qualitative			
Number of Taxa	29	25	23
Florida Index	8	6	7
SCI	21	17	19
EPT Index	1	1	0
% Contribution of Dominant Taxon	23.3	55.9	21.0
% Oligochaeta	3.3	1.4	4.2
% Diptera	54.4	73.4	53.7
% Ephemeroptera	1.1	2.8	0
% Gastropoda	12.2	4.2	12.6
% Odonata	24.2	12.5	23.2
% Coleoptera	2.2	2.1	2.1
% Pelecypoda	0	2.1	3.2
% Other	2.6	1.5	1.0
% Predators	33.3	13.6	35.8
% Above Surface Deposit Feeders	30.0	39.2	28.4
% Below Surface Deposit Feeders	3.3	1.4	4.2
% Suspension Feeders	7.8	2.5	4.2
% Scrapers	7.8	7.0	13.7
% Shredders	11.7	31.5	13.68
Macroinvertebrate Hester-Dendy			
Number of Taxa	33	25	
Florida Index	12	14	
Shannon-Weaver Diversity	4.4	1.3	
EPT Index	0	1	
% Oligochaeta	1.9	0.1	
% Diptera	77.1	98.5	
% Decapoda	0.9	0	
% Trichoptera	0	1.0	
% Odonata	3.7	0.1	
% Gastropoda	12.0	0.2	
% Other	4.6	0.1	
% Predators	18.4	6.3	
% Above Surface Deposit Feeders	33.0	53.0	
% Below Surface Deposit Feeders	1.9	1.0	
% Suspension Feeders	14.8	0.1	
% Scrapers	13.4	0.2	
% Shredders	12.5	40.2	
Periphyton Algae			
Number of Taxa	20		16
Shannon-Weaver Diversity	2.7		2.0
Algal Density (#/sq. cm)	45401		49448
Chlorophyll a (mg/sq. m)	22.7		16.1
Diatom/Diatom + B-G Abundance Ratio	0.99		0.99
% Blue-green	1.4		0.2
% Green	1.9		1.7
% Diatoms	96.7		97.9
% Other	0		0.2
Algal Growth Potential (mg dry wt/l)	9.5	38.9	69.5

complies with Class III water quality standards.

Substantial nutrient enrichment, clearly attributable to the discharge, was observed at the two test sites. Total phosphorus increased from 0.044 mg/L at the reference site to 2.4 mg/L and 1.9 mg/L at test sites 1 and 2, respectively (Table 1). These test site levels were much higher than those found in 95% of other Florida streams (see Table of Typical Water Quality Parameters in Appendix). The Wauchula effluent, with a total phosphorus concentration of 2.5 mg/L, appeared to be the source. The nitrate-nitrite concentration increased from 0.85 mg/L at the reference site to 9.2 mg/L at test site 1 and 7.4 mg/L at test site 2. The test site concentrations, which substantially exceeded those found in 95% of Florida streams, were also due to the influence of the discharge, which had a nitrite/nitrate level of 10 mg/L. Note that nutrient concentrations observed at the tributary entering the system between the two test sites (station 3) were comparable to reference site and much lower than in the unnamed tributary but still high, indicating little or no influence on nutrient concentrations in the discharge stream.

Algal Growth Potential (AGP) exceeded the 5 mg dry wt/L "problem threshold" at the reference site (38.9 mg dry wt/L), test site 1 (17.6 mg dry wt/L), and test site 2 (69.5 mg dry wt/L) (Raschke and Schultz 1987). The lower than anticipated AGP values in the effluent (9.6 mg dry wt/L) and at test site 1 suggest algal growth inhibition at those sites. AGP at the supplemental sites (test sites 3, 4, and 5) was also substantially elevated (68.5, 41.0, and 58.6 mg dry wt/L, respectively).

Microbiological analyses indicated violations of the Class III water quality standard for total coliforms (Rule 62-302.530(7) FAC) at the reference site and test sites 1 and 2, with 3,040, 2,890, and 4,800 organisms/100 mL, respectively (Table 1). Fecal coliform standards were also violated at the reference site, at 2,800 organisms/100 mL (Rule 62-302.530(6) FAC). Total and fecal coliforms were low in the effluent and the supplemental study sites, suggesting some contamination source in the direct vicinity of the affected sites.

Some measures of macroinvertebrate community health indicated the discharge was adversely affecting the receiving water community. Figure 1 indicates 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 the test site is better than the reference site.

Because Hester-Dendy samplers were lost at test site 2, only results from the reference site and test site 1 will be presented. Taxa richness decreased from 33 taxa at the reference site to 25 taxa at test site 1 (Table 2). The Florida Index increased from 12 points at the reference site to 14 points at test site 1, and the EPT Index increased from zero (0) at the reference site to 1 at test site 1. Shannon-Weaver diversity, however, decreased dramatically, from 4.4 at the reference site to 1.3 at test site 1. This 70.5% decrease in diversity is a violation of the biological integrity criterion, Rule 62-302.530(11)FAC. The inordinately low diversity at test site 1 was due to the extreme abundance (3,641 organisms/m^2) of

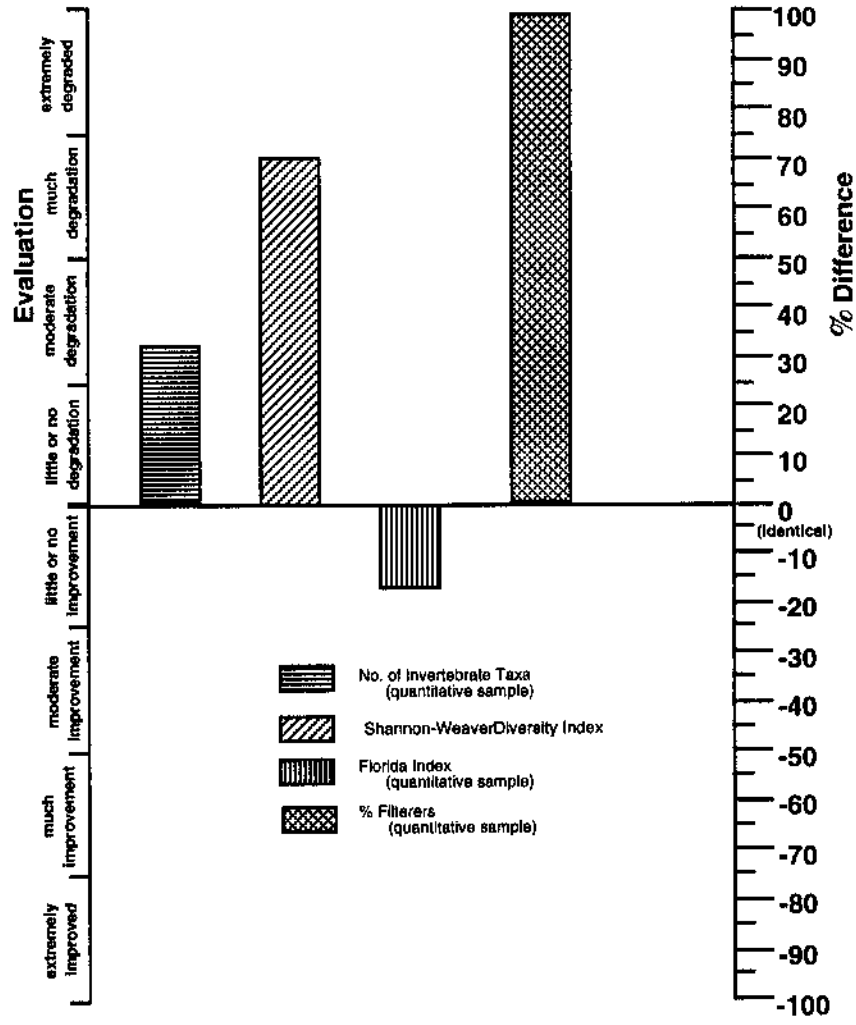


Figure 1: Effect of discharge on the benthic macroinvertebrate community.

The left bar for each parameter shows differences between the reference site and test site 1. The right bar shows differences between the reference site and test site 2.

Chironomus sp., a well known pollution tolerant organism. Filter-feeders made up 14.8 % of the reference site population, but were almost absent (0.1 %) at test site 1.

The results of dipnet sampling showed the test sites to be moderately worse than the reference site. There were slight decreases in taxa richness, the Florida Index, and the % filter-feeders between the reference site and the two test sites (Table 2). The Stream Condition Index (SCI) score at the reference site (21 points) placed it in the lowest range of the "good" category, while the test site 1 SCI value (17 points) and test 2 SCI value (19 points) placed them both into the "poor" category (see SCI calculation sheet in Appendix).

Figure 2 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 samplers were lost at test site 1, so only data from the reference site and test site 2 will be

presented. Periphyton taxa richness was higher at the reference site (with 20 taxa) than at test site 2 (16 taxa). Algal diversity was also higher at the reference site (2.7) than test site 2 (2.0). Periphyton density at the reference site (45,401 cells/cm^2) was slightly less than that found at test site 2 (49,448 cells cm^2); however, chlorophyll *a* was higher at the reference site (22.7 mg/m^2) than at test site 2 (16.1 mg/m^2). Note that periphyton chlorophyll *a* at both sites was higher than the values found in approximately 80% of other Florida streams.

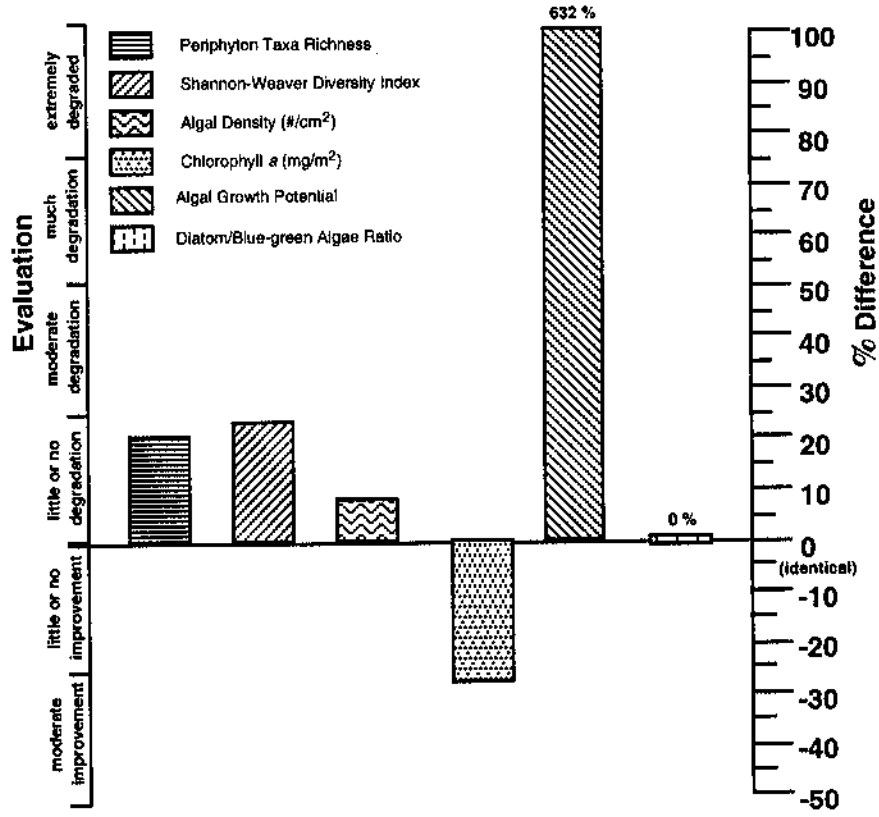


Figure 2: Effect of discharge on the algal community.

The left bar for each parameter shows differences between the reference site and test site 1. The right bar shows differences between the reference site and test site 2.

Conclusions

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

All metals and organic compounds detected in the effluent complied with Class III water quality standards.

Substantial nutrient enrichment, attributable to the discharge, was observed at the two test sites. For example, total phosphorus and nitrate-nitrite concentrations at the test sites were higher than those found in 95% of other Florida streams.

Algal Growth Potential (AGP) exceeded the 5 mg dry wt/L "problem threshold" at all sites. The lower than anticipated AGP values in the effluent and at test site 1 suggest algal growth inhibition at those sites.

Total coliform standards were violated at the reference site and at test sites 1 and 2 (Rule 62-302.530(7) FAC), and fecal coliforms exceeded the standard at the reference site (Rule 62-302.530(6) FAC). Total and fecal coliforms were low in the effluent and the supplemental study sites, suggesting some contamination source in the direct vicinity of the affected sites.

Both the Stream Condition Index (SCI) and Shannon-Weaver diversity indicated the discharge was adversely affecting the receiving water community. The 70.5% decrease in diversity between the reference site and test site 1 was a violation of the biological integrity criterion, Rule 62-302.530(11)FAC. The test site 1 population was dominated by *Chironomus* sp., a well known pollution tolerant organism. The Stream Condition Index (SCI) score at the reference site (21 points) placed it in the lowest range of the "good" category, while the test site 1 SCI value (17 points) and test 2 SCI value (19 points) placed them both into the "poor" category. Although habitat was a limiting factor at all sites, the lower SCI scores at the test sites, as well as the biological integrity violation at test site 1, indicate the effluent is having a negative effect on the receiving water biota.

No major differences were noted in the receiving water periphyton communities. Periphyton chlorophyll *a* at both sites was higher than the values found in approximately 80% of other Florida streams. It is possible, however,

that areas downstream in the Peace River with longer water retention times may be affected by the nutrient loading from this tributary.

Literature Cited

American Public Health Assoc., American Water Works Assoc., and Water Pollution Control Federation. 1989. Standard Methods for the Examination of Water and Wastewater, 17th ed. New York, N.Y. 1268 p.

Aquatic Toxicity Information Retrieval Data Base (AQUIRE). 1991. U.S. EPA Environmental Research Laboratory, Duluth, Mn.

Barbour, M. T., J. Gerritsen, and J. S. White. 1996. Development of the Stream Condition Index for Florida. Prepared for the Fla. Dept. Environ. Protection. 105 p.

Chang, S., F. W. Steimle, R. N. Reid, S. A. Fromm, V. S. Zdanowicz, and R. A. Pikanowski. 1992. Association of benthic macrofauna with habitat types and quality in the New York Bight. Mar. Ecol. Prog. Ser. 89: 237-251.

EA Engineering, Science, and Technology and Tetra Tech, Inc. 1994. Bioassessment for the nonpoint source program (draft). Prepared for the Fla. Dept. Environ. Protection. Unpaginated.

Engle, V. D., J. K. Summers, and G. R. Gaston. 1994. A benthic index of environmental condition of Gulf of Mexico estuaries. Estuaries 17(2): 372-384.

FDEP. 1994. Lake bioassessments for the determination of nonpoint source impairment in Florida. Fla. Dept. Environ. Prot. Biology Section, Tallahassee, Fla. 73 p.

Hudson, P. L., D. R. Lenat, B. A. Caldwell, and D. Smith. 1990. Chironomidae of the Southeastern United States: A checklist of species and notes on biology, distribution, and habitat. U. S. Fish Wildl. Serv., Fish. Wildl. Res. 7. 46 pp.

Lenat, D. R. 1993. A biotic index for the southeastern United States: derivation and list of tolerance values, with criteria for assigning water-quality ratings. J. N. Am. Benthol. Soc. 12(3): 270-290.

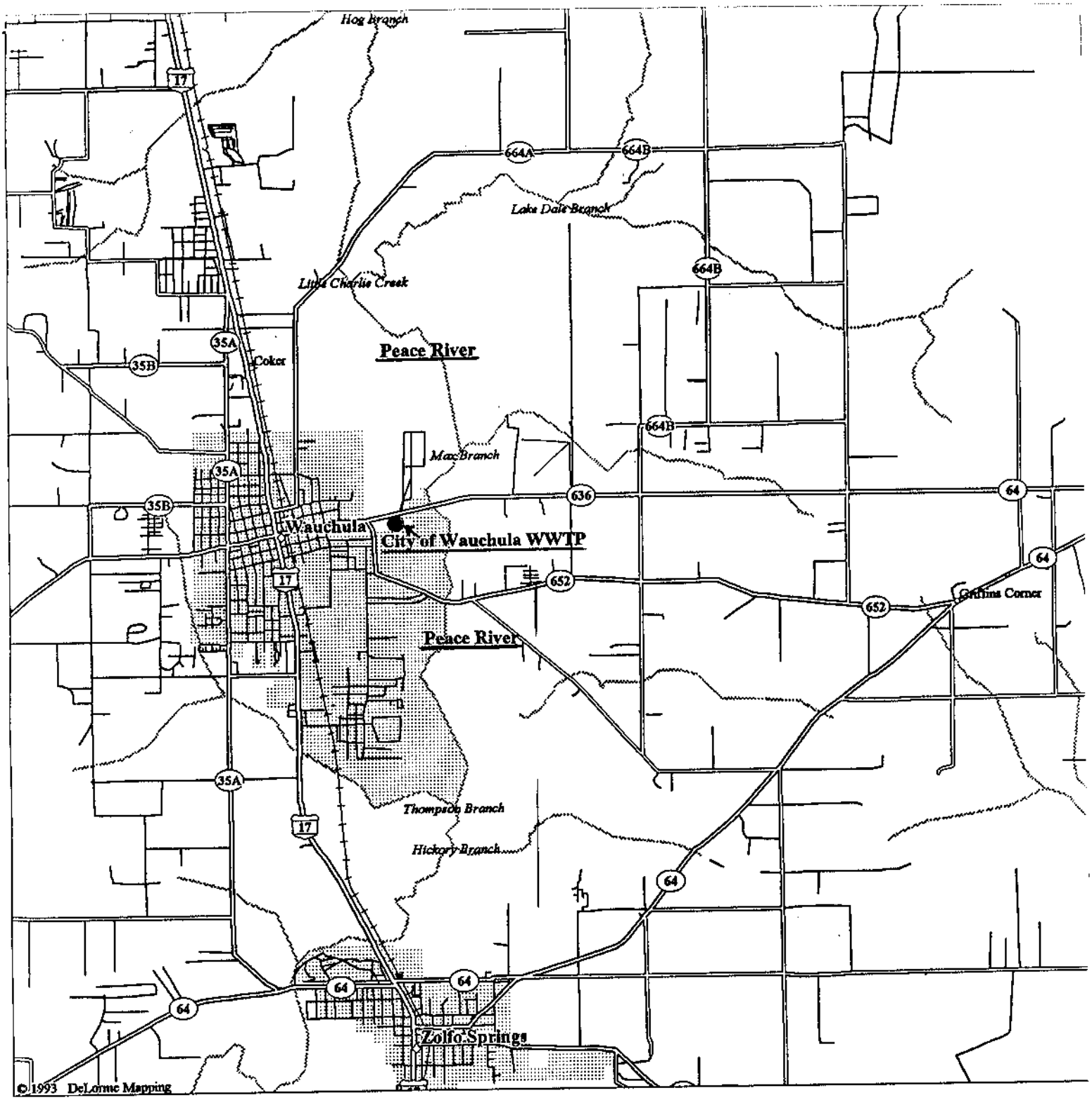
Miller, W. E., T. E. Maloney, and J. C. Greene. 1978. The *Selenastrum capricornutum* Printz algal assay bottle test. U. S. Environ. Prot. Agency, EPA-600/9-78-018. 126 p.

Raschke, R. L. and D. A. Schultz. 1987. The use of the algal growth potential test for data assessment. J. Wat. Poll. Cont. Fed. 59(4): 222-227.

Ross, L. T. 1990. Methods for aquatic biology. Fla. Dept. Environ. Reg. Tech. Ser. 10(1): 1-47.

Weber, C. I. 1991. Methods for measuring the acute toxicity of effluents to freshwater and marine organisms. 4th edition. EPA/600/4-90/027. U. S. EPA, Cincinnati, Ohio. 216 pp.

Whitmore, T. J. 1989. Florida diatom assemblages as indicators of trophic state and pH. Limnol. Oceanogr. 34(5): 882-895.



LEGEND

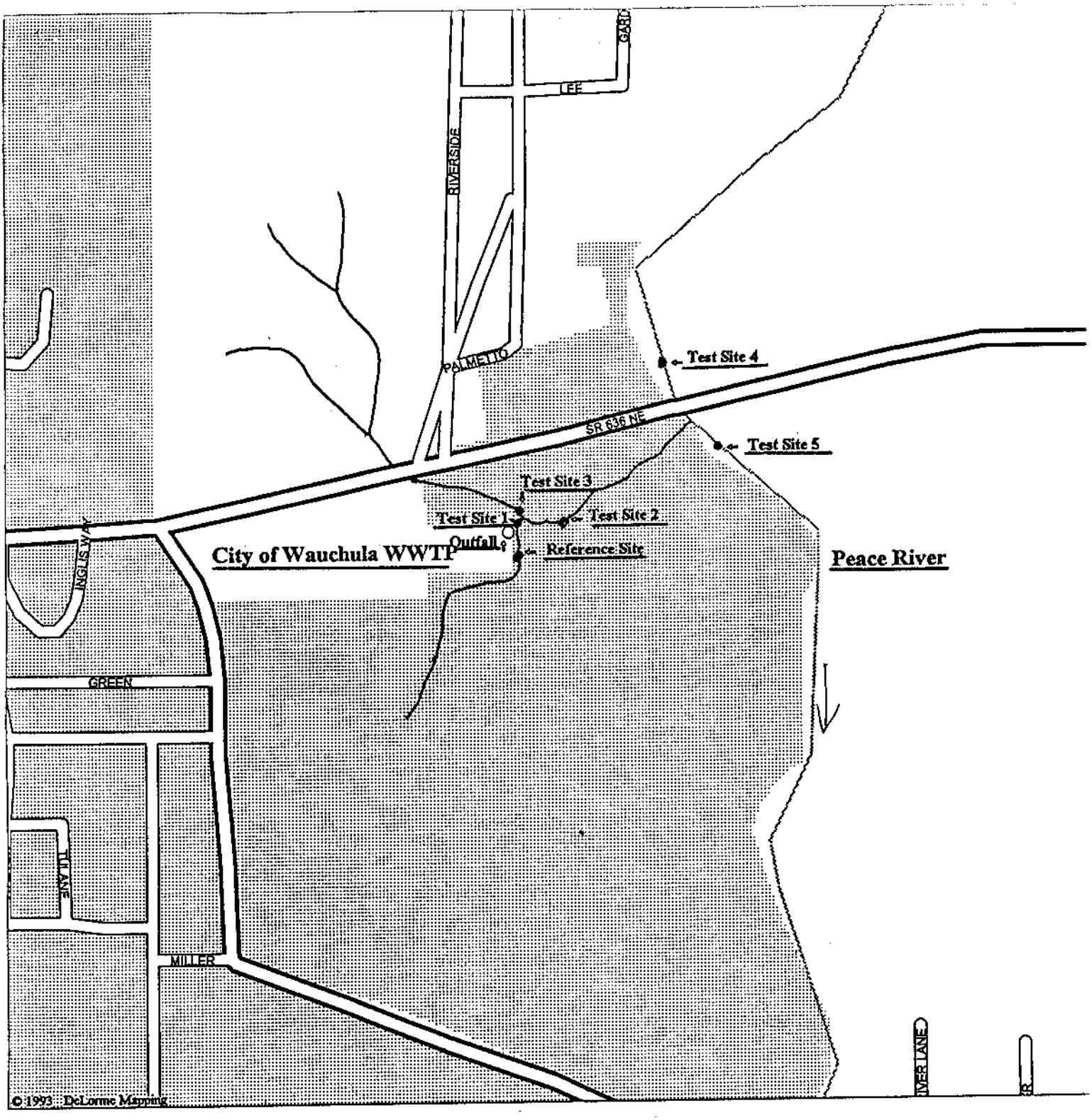
- Population Center
- State Route
- Geo Feature
- Town, Small City
- US Highway
- Street, Road
- Major Street/Road
- State Route
- US Highway
- Railroad
- River
- Airfield

Scale 1:62,500 (at center)

1 Miles

2 KM

Mag 13.00
Thu Apr 24 14:16:18 1997



LEGEND

- Population Center
- Street, Road
- State Route
- Railroad
- River

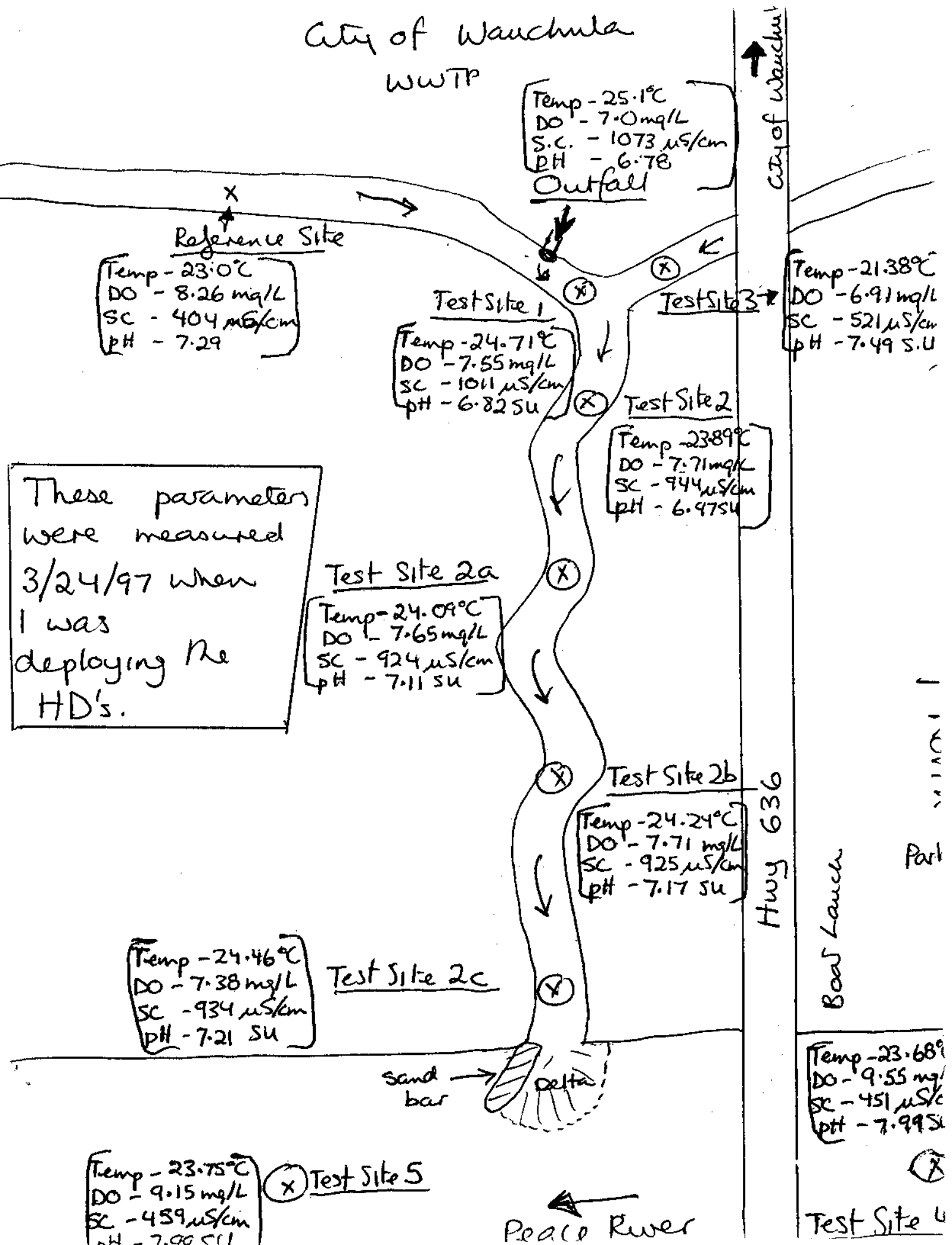
Scale 1:7,812 (at center)

500 Feet

200 Meters

Mag 16.00
Thu Apr 24 15:10:28 1997

Fig title


City of Wauchula
WWTP
Temp - 25.1°C
DO - 7.0 mg/L
S.C. - 1073 µS/cm
pH - 6.78
Outfall
City of Wauchula
Reference Site
Temp - 23.0°C
DO - 8.26 mg/L
SC - 404 mS/cm
pH - 7.29
Test Site 1
Temp - 24.71°C
DO - 7.55 mg/L
SC - 1011 µS/cm
pH - 6.82 SU
Test Site 3
Temp - 21.38°C
DO - 6.91 mg/L
SC - 521 µS/cm
pH - 7.49 S.U
Test Site 2
Temp - 23.89°C
DO - 7.71 mg/L
SC - 944 µS/cm
pH - 6.97 SU
These parameters were measured 3/24/97 when I was deploying the HD's.
Test Site 2a
Temp - 24.09°C
DO - 7.65 mg/L
SC - 924 µS/cm
pH - 7.11 SU
Test Site 2b
Temp - 24.24°C
DO - 7.71 mg/L
SC - 925 µS/cm
pH - 7.17 SU
Hwy 636
Boat Launch
Temp - 24.46°C
DO - 7.38 mg/L
SC - 934 µS/cm
pH - 7.21 SU
Test Site 2c
sand bar
delta
Temp - 23.68°
DO - 9.55 mg/
SC - 451 µS/c
pH - 7.99 S
Temp - 23.75°C
DO - 9.15 mg/L
SC - 459 µS/cm
Test Site 5
Peace River
Test Site 4

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Facility Name: City of Wauchula		Date Summary Prepared: 3/26/97
Location (attach detailed map):	County: Hardee	District: SW District
Federal Permit # FL0023949 and expiration date:	State GMS # and 4025M00323 State expiration date: 10/20/96	Facility Type: Industrial (Municipal) Federal Agricultural Other (list):

Function of facility: Domestic wastewater treatment and disposal plant.

Description of treatment process: A 1.0 MGD oxidation ditch followed by chlorination/dechlorination and aeration prior to discharge to a tributary of the Peace River.

Receiving waters: Drainage ditch which flows into Peace River	Classification: I II (III)	
Design Flow: 1.0	Mean Flow: ~~0.459~~ 0.598 MGD	Flow during survey:

Discharge is: (Continuous) Intermittent Seasonal Rainfall dependent
Other (describe)

therefore, the best time to sample is:

If facility has a mixing zone, give details (size, parameters affected, etc.):

No

List effluent limits (if necessary, attach relevant paperwork):

Describe special permit conditions and permit modifications:

Parameter	Unit	Minimum	Maximum	Type Sample	Frequency
BOD	mg/L	0	10.0 monthly avg. 15.0 weekly avg.	8 hr. composite	Weekly
TSS	mg/L		20.0 monthly avg. 45.0 weekly avg.	8 hr. composite	Weekly
Dissolved Oxygen	mg/L	6.0		grab	Weekly
Organic Nitrogen	mg/L	0	3.0 monthly avg. 4.5 weekly avg.	8 hr. composite	Weekly
NH3-N	mg/L	0	2.0 monthly avg. 3.0 weekly avg.	8 hr. composite	Weekly
Fecal coliform	#/100	0	200 Annual Average	grab	Weekly
Permitted Capacity (daily flow)	mgd	.000	(1.0 3-MA*)	meter	Continuous
pH	std un	6.00	8.50	grab	Continuous
Cl_2 (after deCl_2)	mg/L	0.0	0.01	grab	Continuous

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

City of Wauchula
(Facility)

Description of permitted outfall(s):
Effluent is discharged from the WWTP via a pipeline 1000 ft long into a drainage ditch that flows into the Peace River.

List permit violations (from MOR data or other source) and plant upsets that occurred within past year: A review of the last year (2/96 - 1/97) reveals an unionized ammonia violation of 0.06 mg/L on 1/15/97 (limit 0.02 mg/L) and a weekly limit violation for the week of 1/13 for Ammonia Nitrogen, with a value of 3.74 mg/L (limit is 3.0 mg/L). See attached data summary.
. No ambient monitoring was conducted by the City, as required by permit.

Describe previous impact bioassessments, WQBEL's, and previous or current enforcement actions:
An FYI-5 was conducted 1/8/96, however, due to the Peace River back flowing into the drainage ditch, the results for the reference and test sites have been disregarded. This FYI-5 did indicate high levels of diazinon in the effluent, the acute toxicity was a failure for C. dubia, and unionized ammonia was in violation of surface water standards.

Discuss comparability of MOR results to past DER results and whether there are trends (improving, declining) in the data set:
The CSI conducted as part of the above FYI found high Ammonia (3.6 mg/L) and high chlorine residuals (0.32 and 0.1 mg/L).

Additional information:

Staff contributing to this review (signature):

Andrea Frantz	(Biologist)
Joe Sciortino	(Inspector)
	(Engineer)
	( )
	( )
	( )

Memorandum

Florida Department of
Environmental Protection

FACILITY OVERVIEW

Facility: City of Wauchula Permit No.: FL0023949

County: Hardee GMS ID No.: 25/100323

Limit:	1.0	10 monthly	20 monthly	3	2	200		
Month/Year Storet #	**Flow** 050053	**CBOD** 050084	**TSS** 900146	**ON** / **NO_3** 000620	**NH_3-N**	**F.C.** 031616	**Other** DO/rec/rec	Unionized ammonia
1/97	.474	2.08	3.9	1.59	1.54*	2.0	✓	.06 1/15
12/96	.477	2.24	4.9	1.21	0.15	2.0	✓	.01
11	.501	1.85	4.1	0.99	0.11	2.0	✓	.01
10	.616	1.56	2.84	1.0	0.06	2.0	✓	.01
9	.608	1.0	3.25	1.0	0.06	2.0	✓	.01
8	.652	1.14	3.23	1.1	0.05	2.0	✓	.01
7	.559	1.15	3.14	1.11	0.09	2.0	✓	.01
6	.655	1.63	3.13	1.02	0.04	2.0	✓	.01
5	.636	1.31	3.45	1.1	0.04	2.0	✓	.01
4	.647	1.93	4.26	1.08	0.05	2.0	✓	.01
3	.666	2.27	2.93	1.04	0.92	2.0	✓	.01
2	.683	2.32	4.68	1.13	1.17	2.0	✓	.02
Total								
Average	0.598							

Comments:

* week of 1/13, 3.74 for NH_3-N ; limit is 3.0

Reviewed By: J Guiter

Date: 3/31/97

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-06)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	25020135	4/21/97	1240	Unnamed tributary of Peace River

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Sunny + clear, weather	Hardee	City of Wauchula west	Reference Site

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
40		10		40		10	

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

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

Width of riparian vegetation (m) on least buffered side: 3 — *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

High Water Mark: 1 (m above present water level) + 0.16 (present depth in m) = 1.16 (m above bed)

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect: 2 m wide

0.09 m/s	0.09 m/s	0.09 m/s
0.16 m deep	0.16 m deep	0.16 m deep

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) / severe Silt smothering: none / slight / moderate / severe Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	10	2	net	Sand	50	6	net
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble	20	6	net	Other:			
Undercut banks/Roots	20	6	net	*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)~~:	Salinity		Secchi (m):
Top								
Mid-depth	0.08	20.47	7.12	8.22	407	0.2		VCB
Bottom								

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: Some pools are present.

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Andrea Granger	Andrea Granger	4-21-97

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:
		4/21/97	unnamed tributary of Peace River

REMARKS:	LOCATION:	FIELD ID/NAME:
Sunny, clear weather	City of Wauchula WTP	Reference Site

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Bottom Substrate/ Available Cover **18**	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 **9**	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 **8**	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 **4**	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 **3**	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 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: Though banks were very steep, I could climb ~~ma~~ but they were very unsta

57 ~~67~~ **TOTAL SCORE**

ANALYSIS DATE:	ANALYST:	SIGNATURE:
4/21/97	Andrea Granger	Andrea Granger

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		4/21/97	1120	Unnamed tributary of Peace River

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Sunny, clear weather.	Hardee	City of Wauchula WWTP	Test Site 1

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
40		10		40		10	

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

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

Width of riparian vegetation (m) on least buffered side: 2

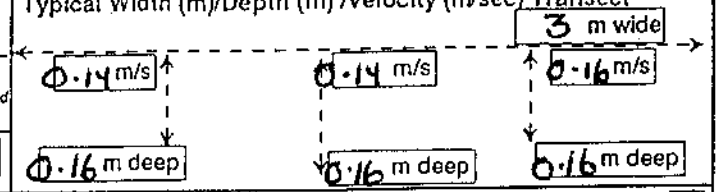
List & map dominant vegetation on back

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

Artificially Impounded ☐ yes

High Water Mark: 2 m (m above present water level) + 0.16 (present depth in m) = 2.16 (m above bed)

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



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 severe) Silt smothering: none slight moderate severe Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	5	3	net	Sand	60	7	net
Leaf Packs or Mats	5	3	net	Mud/Muck/Silt			
Aquatic Vegetation	30	7	net	Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*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)~~:	Salinity		Secchi (m):
Top								
Mid-depth	0.08	22.8	6.84	8.27	1.018	0.5		VOR.
Bottom								

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: Banks on north side were high (3m) and extremely steep. Trees were toppling over. Sand was building up on south bank.

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Andrea Grainger	Andrea Grainger	4-21-97

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:
		4/21/97	Unnamed tributary of Peace River

REMARKS:	LOCATION:	FIELD ID/NAME:
	City of Wauchula WWTP	Test Site 1

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 **11**	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 **1**	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. AG 5 4 3 **2** 1
Riparian Buffer Zone Width **2**	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 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.

45 **TOTAL SCORE**

Comments: Severe erosion of banks + sand smothering

ANALYSIS DATE:	ANALYST:	SIGNATURE:
4/21/97	Andrea Granger	Andrea Granger

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	25020139	4/21/97	1040	unnamed tributary to Peace River

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Sunny, few clouds	Hardee	City of Wauchula WWTP	Test Site 2

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
40		10		40		10	

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

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

Width of riparian vegetation (m) on least buffered side: 718m

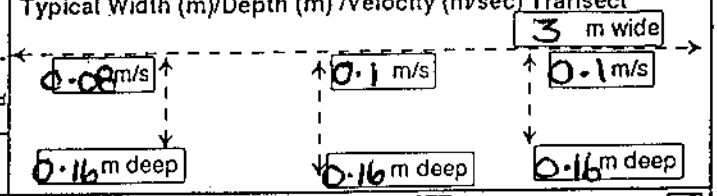
List & map dominant vegetation on back

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

Artificially Impounded ☐ yes

High Water Mark: 2 (m above present water level) + 0.16 (present depth in m) = 2.16 (m above bed)

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



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 severe Silt smothering: none slight moderate severe Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	10	3	net	Sand	45	5	net
Leaf Packs or Mats	5	2	net	Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble	20	5	net	Other:			
Undercut banks/Roots	20	5	net	*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)~~:	Salinity		Secchi (m):
Top								
Mid-depth	0.08	21.77	6.91	8.15	936	0.5		VOB
Bottom								

System Type : Stream: 2 (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:
The banks were 1V:0H. Extremely steep. Atleast 3 meters high and not possible to climb.

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Andrea Grainger	Andrea Grainger	4/21/97

The HD at this site was buried by sand/this includes the creek

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:
	25020139	4/21/97	Unnamed tributary to Peace River

REMARKS:	LOCATION:	FIELD ID/NAME:
	City of Wauchula WWTP	Test Site 2

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Bottom Substrate/ Available Cover **17**	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 **10**	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 **2**	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 **18**	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.

73 TOTAL SCORE

Comments: There is a sand bar and delta in the Peace River at the point the tributary converges with the river.

ANALYSIS DATE:	ANALYST:	SIGNATURE:
4-21-97	Andrea Grainger	Andrea Grainger

Extreme sand erosion. The HD was totally covered by sand. There were lots of rocks, planks, branches in the tributary. The banks were extremely steep due to severe erosion. Trees falling into tributary

Typical Values for Selected Parameters in Florida Waters

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

Parameter	Percentile Distribution 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

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Wauchula WWTP
County: Hardee
Contact / District: Andrea Grainger / Southwest
FDEP Permit #: FL0023949
LIMS Sample #: 176260 LIMS Job #: 97-APR-22-13
4-25-97MF
sample log:

Sample Collection: Date 4-21-97 Time 12:00
Test Beginning: Date 4-22-97 Time 1430
Test Ending: Date 4-24-97 Time 1430
Organism Batch #: 28 Diluent Batch #: well H2O
Organism Age: 12 days
Test Organism: Cyprinella leedsi

Test Type: (Screening) Definitive
(Static) Static Renewal | Flow-through
Temperature range: room ~~24°C-26°C~~ 24.0-26.0°C
incubator 24.4°C-25.6°C
Test Number: 2 of 2
Remarks: D = dead, M = missing

A. corrected temp to nearest 0.1°C MF 5/15/97

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	24.6 @ 24.6	8.2 @ 25.2 °C	102.8 @ 103.2 980 @ 1001 @ 25.0 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.3 @ 23.2	8.6 @ 22.8 °C	104.5 @ 103.2 958 @ 1001 @ 23.2°C
48 hr	7.0 @ 7.0 9.0 @ 9.0	22.8 @ 22.8	8.2 @ 25.1 °C	107.1 @ 103.6 987 @ 1001 @ 25.0 °C

Conc.	Chamber #	Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm)		
		0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Ctl A	A1	5	5	5	7.9	8.4	8.5	24.7	25.5	25.7	7.8	7.5	7.7	255	260	265
Ctl B	A2	5	5	5	7.9	8.4	8.5	24.6	25.3	25.5	7.8	7.5	7.8	255	260	270
Ctl C	A3	5	5	5	7.9	8.4	8.5	24.6	24.7	25.0	7.8	7.7	8.0	255	260	270
Ctl D	A4	5	5	5	7.9	8.4	8.5	24.6	25.2	25.7	7.8	7.6	7.9	255	260	270
100% A	A5	5	5	5	7.2	8.0	8.2	24.9	25.2	25.5	8.2	7.4	7.6	1115	1150	1185
100% B	A6	5	5	5	7.2	8.0	8.2	25.2	25.6	25.5	8.3	7.4	7.6	1115	1150	1165
100% C	A7	5	5	5	7.2	8.0	8.2	25.2	25.6	25.7	8.3	7.2	7.6	1120	1150	1185
100% D	A8	5	5	5	7.2	7.9	8.2	25.1	25.6	25.7	8.3	7.2	7.6	1115	1140	1160
Measured/Loaded by:		KR	ND	MF	MF	ND	MF	MF	ND	MF	MF	ND	MF	MF	ND	MF
Recorded by:		ND	ND	MF	JS	KR	ND	JS	KR	ND	JS	KR	ND	JS	KR	ND

Investigators' Signatures

Water Quality Parameters

	Salt Water (Well Water)	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			N.T measured		
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03	<0.03	DR100	KR
Alkalinity (mg/L as $CaCO_3$):	115	70	95	Hach	ND / KR
Hardness (mg/L as $CaCO_3$):	130	90	365	Hach	ND / KR
Total ammonia (mg/L as N):	<0.017	<0.017	<0.017	Orion	MF

Ammonia Meter #98136 Meter Slope: -55.9
Ammonia Blank: <0.017
Control Salinity: 0 ppt
Sample Salinity: 0 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Wauchula WWTP
County: Hardee
Contact / District: Andrea Grainger/Southwest
NPDES Permit #: FL00 23949
LIMS Sample #: 176260 LIMS Job #: 97-APR-22-13
sample log: 4-25-97 mf

Sample Collection: Date 4-21-97 Time 12:00
Test Beginning: Date 4-22-97 Time 1430
Test Ending: Date 4-24-97 Time 1430
Organism Batch #: 17 Diluent Batch #: 15
Organism Age: < 24 hrs.
Test Organism: Ceriodaphnia dubia

Test Type: Screening | Definitive
Static | Static Renewal | Flow-through
Temperature range: room 24°C - 25°C 240-260
incubator 24.4°C - 25.6°C
Test Number: 1 of 2
Remarks: D = dead, M = missing

A. Correction to Nearest 0.1°C MF 5/15/97

Instrument Calibrations: pH | Temperature °C | D.O. mg/L | Conductivity µmhos/cm

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
	meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0	24.6 @ 24.6	8.2 @ 25.2 °C	102.9 @ 103.2
	9.0 @ 9.0			980 @ 1001 @ 25.0
24 hr	7.0 @ 7.0	23.3 @ 23.2	8.6 @ 23.8 °C	104.5 @ 103.2
	9.0 @ 9.0			958 @ 1001 @ 23.3
48 hr	7.0 @ 7.0	22.8 @ 22.8	8.2 @ 25.1 °C	107.1 @ 103.6
	9.0 @ 9.0			987 @ 1001 @ 25.0

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
C+l A	A	5	5	5	8.3		8.3	24.4		24.4	8.0		7.8	170		180
C+l B	B	5	5	5			8.3			24.5			7.8			180
C+l C	C	5	5	5			8.3			24.5			7.8			180
C+l D	D	5	5	5			8.3			24.4			7.8			185
100% A	A	5	5	5	7.2		8.4	24.7		24.5	8.0		7.8	1060		1050
100% B	B	5	5	5			8.4			24.6			7.8			1050
100% C	C	5	5	5			8.4			24.6			7.8			1100
100% D	D	5	5	5			8.4			24.6			7.7			1150
Measured/Loaded by:		KR	ND	MF	MF		MF	MF		MF	MF		MF	MF		MF
Recorded by:		ND	ND	MF	JS		ND	JS		ND	JS		ND	JS		ND

Investigators' Signatures

Julie Harper
Kelli Kalstrom
Marshall Faircloth
AJ Wolfe

Salt Water | Water Quality Parameters

	Well Water	20% Min Water	Sample	Method	Measure
Field Total Residual Cl2 (mg/L):			Not Measured		
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03	<0.03	DR 100	KR
Alkalinity (mg/L as $CaCO_3$):	115	70	95	Hach	ND
Hardness (mg/L as $CaCO_3$):	130	90	365	Hach	ND
Total ammonia (mg/L as N):	<0.017	<0.017	<0.017	Orion	MF

Ammonia : Ammonia | Ammonia Control
Meter #98136 Meter Slope: -55.9 Blank: <0.017 Salinity: 0 ppt Sample Salinity:

Ref

Winter Index Period: Stream Condition Index for Florida (SCI) (April 1996)													
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	Panhandle				Peninsula				Northeast			
		5	3	1	Score	5	3	1	Score	5	3	1	Score
Total Number of Taxa		≥27	26-14	<14		≥ 27	26-14	<14	5	≥18	17-9	<9	
EPT Index		≥6	5-3	<3		≥ 4	3-2	<2	1	-	≥3	<3	
# Chironomid Taxa		≥9	8-5	<5		≥9	8-5	<5	5	≥4	3-2	<2	
% Contribution of Dominant Taxon		≤25	26-62	>62		≤30	31-65	>65	5	≤37	38-69	>69	
% Diptera		-	≤60	>60		-	≤52	>52	1	-	≤67	>67	
Florida Index		≥ 13	12-7	<7		≥10	9-5	<5	3	≥ 6	5-3	<3	
% Suspension feeders/Filterers		≥ 13	12-7	<7		≥15	14-8	<8	1	≥ 25	25-13	<13	
Total Score		Panhandle				Peninsula			21	Northeast			
Interpretation of Score		Excellent			27-33	Excellent			27-33	Excellent			26-31
		Good			21-26	Good			21-26	Good			20-25
		Poor			14-20	Poor			14-20	Poor			14-19
		Severely Degraded			7-13	Severely Degraded			7-13	Severely Degraded			7-13

Test 1

Winter Index Period: Stream Condition Index for Florida (SCI) (April 1996)													
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	Panhandle				Peninsula				Northeast			
		5	3	1	Score	5	3	1	Score	5	3	1	Score
Total Number of Taxa		≥27	26-14	<14		≥ 27	26-14	<14	3	≥18	17-9	<9	3
EPT Index		≥6	5-3	<3		≥ 4	3-2	<2	1	-	≥3	<3	
# Chironomid Taxa		≥9	8-5	<5		≥9	8-5	<5	5	≥4	3-2	<2	
% Contribution of Dominant Taxon		≤25	26-62	>62		≤30	31-65	>65	3	≤37	38-69	>69	
% Diptera		-	≤60	>60		-	≤52	>52	1	-	≤67	>67	
Florida Index		≥ 13	12-7	<7		≥10	9-5	<5	3	≥ 6	5-3	<3	
% Suspension feeders/Filterers		≥ 13	12-7	<7		≥15	14-8	<8	1	≥ 25	25-13	<13	
Total Score		Panhandle				Peninsula			17	Northeast			
Interpretation of Score		Excellent			27-33	Excellent			27-33	Excellent			26-31
		Good			21-26	Good			21-26	Good			20-25
		Poor			14-20	Poor			14-20	Poor			14-19
		Severely Degraded			7-13	Severely Degraded			7-13	Severely Degraded			7-13

Test 2

Winter Index Period: Stream Condition Index for Florida (SCI) (April 1996)													
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	Panhandle				Peninsula				Northeast			
		5	3	1	Score	5	3	1	Score	5	3	1	Score
Total Number of Taxa		≥27	26-14	<14		≥ 27	26-14	<14	3	≥18	17-9	<9	
EPT Index		≥6	5-3	<3		≥ 4	3-2	<2	1	-	≥3	<3	
# Chironomid Taxa		≥9	8-5	<5		≥9	8-5	<5	5	≥4	3-2	<2	
% Contribution of Dominant Taxon		≤25	26-62	>62		≤30	31-65	>65	5	≤37	38-69	>69	
% Diptera		-	≤60	>60		-	≤52	>52	1	-	≤67	>67	
Florida Index		≥ 13	12-7	<7		≥10	9-5	<5	3	≥ 6	5-3	<3	
% Suspension feeders/Filterers		≥ 13	12-7	<7		≥15	14-8	<8	1	≥ 25	25-13	<13	
Total Score		Panhandle				Peninsula			19	Northeast			
Interpretation of Score		Excellent			27-33	Excellent			27-33	Excellent			26-31
		Good			21-26	Good			21-26	Good			20-25
		Poor			14-20	Poor			14-20	Poor			14-19
		Severely Degraded			7-13	Severely Degraded			7-13	Severely Degraded			7-13

Winter Index Period: Stream Condition Index for Florida (SCI) (April 1996)													
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	Panhandle				Peninsula				Northeast			
		5	3	1	Score	5	3	1	Score	5	3	1	Score
Total Number of Taxa		≥27	26-14	<14		≥ 27	26-14	<14		≥18	17-9	<9	
EPT Index		≥6	5-3	<3		≥ 4	3-2	<2		-	≥3	<3	
# Chironomid Taxa		≥9	8-5	<5		≥9	8-5	<5		≥4	3-2	<2	
% Contribution of Dominant Taxon		≤25	26-62	>62		≤30	31-65	>65		≤37	38-69	>69	
% Diptera		-	≤60	>60		-	≤52	>52		-	≤67	>67	
Florida Index		≥ 13	12-7	<7		≥10	9-5	<5		≥ 6	5-3	<3	
% Suspension feeders/Filterers		≥ 13	12-7	<7		≥15	14-8	<8		≥ 25	25-13	<13	
Total Score		Panhandle				Peninsula				Northeast			
Interpretation of Score		Excellent			27-33	Excellent			27-33	Excellent			26-31
		Good			21-26	Good			21-26	Good			20-25
		Poor			14-20	Poor			14-20	Poor			14-19
		Severely Degraded			7-13	Severely Degraded			7-13	Severely Degraded			7-13

Benthic macroinvertebrate taxa list and densities (#/m^2) for City of Wauchula Wastewater Treatment Plant collected via Hester Dendy samplers in an unnamed tributary of the Peace River.

	Reference Site	Test Site
Oligochaeta		
Dero trifida	2	–
Limnodrilus hoffmeisteri	2	2
Nais communis	–	2
Gastropoda		
Hebetancylus excentricus	2	–
Micromenetus sp.	8	–
Physella sp	4	6
Ancylidae	12	4
Pelecypoda		
Pisidiidae	2	–
Amphipoda		
Hyalella azteca	–	2
Decapoda		
Procambarus sp.	2	–
Odonata		
Argia sp.	8	14
Argia apicalis	–	2
Argia fumipennis	–	2
Boyeria vinosa	4	4
Enallagma cardenium	–	24
Ischnura sp.	2	6
Libellulidae	2	–
Zygoptera	4	–
Odonata	2	–
Trichoptera		
Hydropsychidae	–	2
Diptera		
Ablabesmyia mallochi	6	4
Atrichopogon sp.	–	2
Chironomus sp.	50	3641
Cricotopus bicinctus	–	40
Cryptochironomus sp.	6	–
Dasyhelea sp.	2	–
Dicrotendipes modestus	10	4
Dicrotendipes simpsoni	2	–
Goeldichironomus sp.	10	4
Goeldichironomus fluctuans	2	–
Goeldichironomus holoprasinus	–	4
Hemerodromia sp.	2	343

Kiefferulus sp.	2	–
Labrundinia sp.	2	–
Labrundinia neopilosella	2	–
Limonia sp.	–	4
Palpomyia/Bezzia grp.	–	4
Parametriocnemus sp.	–	16
Pentaneura inconspicua	–	22
Phaenopsectra punctipes grp.	4	–
Polypedilum illinoense grp.	–	12
Polypedilum tritum	2	–
Stenochironomus sp.	2	–
Tanytarsus sp.	20	–
Tanytarsus sp. F Epler	4	–
Tanytarsus sp. S Epler	2	–
Tanytarsus sp. U Epler	6	–
Tanytarsus sp.C Epler	2	–
Tanytarsus sp.G Epler	2	–
Tanytarsus sp.T Epler	6	–
Tanytarsus sp.V Epler	6	–
Thienemanniella sp.	2	393
Tribelos sp.	2	–
Chironomidae	4	44
Psychodidae	–	2
Tipulidae	–	2

Benthic macroinvertebrate taxa list for Wauchula Wastewater Treatment Plant, collected via 20 discrete dip net sweep samples in an unnamed tributary of the Peace River, on 21 April,1997.

	Reference Site	Test Site 1	Test Site 2
Oligochaeta			
Eclipidrilus sp.	–	–	2
Eclipidrilus palustris	–	–	1
Limnodrilus hoffmeisteri	2	–	1
Littoridinops monroensis	–	–	3
Nais communis	–	1	–
Nais pardalis	1	–	–
Pristinella sima	–	1	–
Ancylidae			
Ferrissia hendersoni	3	5	–
Ancylidae	–	–	5
Gastropoda			
Micromenetus sp.	–	1	–
Micromenetus dilatatus	–	–	2
Micromenetus dilatatus avus	5	–	–
Physella sp.	3	–	2
Pelecypoda			
Corbicula fluminea	–	2	–
Pisidiidae	–	1	3
Amphipoda			
Hyalella azteca	1	–	–
Ephemeroptera			
Caenis sp.	–	4	–
Callibaetis sp.	1	–	–
Odonata			
Argia sp.	17	4	20
Calopteryx sp.	–	–	2
Enallagma sp.	–	3	–
Enallagma cardenium	2	2	–
Coenagrionidae	4	9	–
Coleoptera			
Dineutus sp.	1	–	–
Dubiraphia sp.	–	2	1
Microcylloepus pusillus	–	1	–
Stenelmis sp.	–	–	1
Hydrophilidae	1	–	–
Lepidoptera			
Lepidoptera –	2	1	
Diptera			
Atrichopogon sp.	–	1	–
Chironomus sp.	7	80	15
Cricotopus bicinctus	3	–	–

Cricotopus bicinctus grp.	–	1	–
Cricotopus or orthocladius	1	–	–
Cryptochironomus sp.	3	–	1
Dicrotendipes modestus	1	–	–
Dicrotendipes neomodestus	1	–	2
Goeldichironomus holoprasinus	–	1	–
Goeldichironomus sp.	–	1	1
Hemerodromia sp.	2	–	16
Palpomyia/Bezzia grp.	2	3	3
Paracladopelma nereis	–	–	1
Parametriocnemus sp.	2	4	–
Paratanytarsus sp	3	–	–
Paratanytarsus sp. A (Epler)	1	–	–
Phaenopsectra punctipes grp.	2	1	–
Polypedilum sp.	2	–	–
Polypedilum fallax	–	–	1
Polypedilum illinoense grp.	5	1	1
Polypedilum scalaenum grp.	–	4	4
Polypedilum trigonum	–	–	1
Stenochironomus sp.	1	–	–
Tanytarsus sp.	1	–	–
Tanytarsus sp. C (Epler)	1	1	–
Tanytarsus sp. T (Epler)	1	–	–
Tanytarsus sp. U (Epler)	3	–	–
Tanytarsus sp. V (Epler)	2	–	–
Thienemanniella sp.	2	1	–
Tribelos sp.	–	1	–
Ceratopogonidae	2	–	–
Chironomidae	1	5	–
Diptera	–	–	5

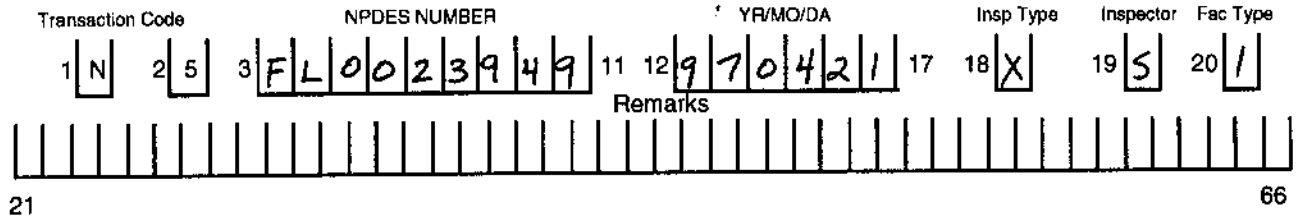
Periphyton taxa list and densities (#/cm^2) for facility, collected via glass microscope slides in receiving water, on 21 April, 1997.

	Reference Site	Test Site
Cyanophyceae		
Anabaena	3485	–
Chroococcus	871	96
Oscillatoria	1742	–
Bacillarophyceae		
Achnanthes	20,908	192
Achnanthes exigua	104,542	958
Achnanthes hauckiana	12,197	1917
Achnanthes hustedtii	–	3067
Achnanthes lanceolata	45,302	–
Achnanthes linearis	174,237	–
Achnanthes microcephala	10,454	–
Amphora	3485	–
Bacillaria paradoxa	1742	–
Capartogramma crucicula	1742	192
Cocconeis placentula	22,651	21,562
Eunotia	–	18,591
Gomphonema	3485	–
Gomphonema parvulum	3485	–
Navicula cryptocephala	1742	–
Navicula decussis	1742	192
Navicula exigua	1742	–
Nitzschia	3485	575
Nitzschia amphibia	–	192
Nitzschia fonticola	12,197	192
Nitzschia palea	5227	383
Pennales	5227	383
Chlorophyceae		
Characium	2614	96
Chlorococcum	–	287
Chrysophyceae		
Chroomonas	–	96
Stigeoclonium	6098	287
Trochiscia	–	192

Phytoplankton taxa list and densities (#/mL) for Wauchula Wastewater Treatment Plant, collected via subsurface grabs in an unnamed tributary of the Peace River, on 21April, 1997.

	Reference Site	Test Site 1	Test Site 2
Cyanophyceae			
Chroococcus sp.	–	–	6
Gloeocapsa sp.	–	8	–
Synechococcus sp.	–	–	6
Rhabdoderma sp.	–	–	12
Lyngbya sp.	8	–	–
Oscillatoria sp.	12	40	18
Bacillariophyceae			
Melosira sp.	–	–	12
Cyclotella	–	4	62
Pennales sp.	4	16	25
Achnanthes sp.	12	12	43
Cocconeis sp.	8	–	–
Naviculaceae	–	–	18
Navicula sp.	–	4	43
Gomphonema sp.	4	–	18
Nitzschia sp.	49	28	18
Chlorophyceae			
Chlorophyceae	29	12	6
*Carteria*sp.	8	–	–
Chlamydomonas sp.	8	4	–
Chlorococcum sp.	–	–	6
Oocystaceae	–	28	–
Scenedesmus sp.	–	12	6
Gloeocystis sp.	–	–	6
*Mougeotia*sp.	–	4	–
Oedogonium sp.	–	16	–
Palmella sp.	–	36	25
Elakatothrix sp.	–	–	6
Trachelomonas sp.	–	–	6
Cryptophyceae			
Chroomonas sp.	21	–	6
Cryptomonas sp.	37	–	6

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)

