Florida
Department of Environmental Protection

Biological Assessment of

Continental Country Club WWTP

Sumter County

No NPDES #

Sampled May 1993

November 1993

Biology Section
Division of Technical Services

Department of Environmental Protection
Results of Fifth Year Inspections

Discharger: Continental Country Club WWTP
County: Sumter
NPDES Number:
State Permit Expiration Date: 31 August 1992

Toxics Sampling Inspection (XSI)

Date Sampled: 17 May 1993

Results: Atrazine (0.83 µg/L), was detected in the discharge. This is cause for concern, as atrazine is toxic to the shrimp, *Palaemonetes* sp., at concentrations as low as 1.2 µg/L (AQUIRE 1993). Iron (16 µg/L) was measured in the effluent, but this value is well within water quality standards.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 17 May 1993

Results: The effluent sample was not toxic to the water flea, *Ceriodaphnia dubia*, or to the fish, *Notropis leedsi*, exposed to the full strength sample.

Impact Bioassessment Inspection (IBI)

Date Sampled: 17 May 1993

Results: Measures of macroinvertebrate health indicated that the test site was grossly degraded. Taxa richness decreased from 55 taxa at the reference site to 3 taxa at the test site. Two of the three taxa found at the test site were well known pollution tolerant forms: *Chironomus* sp. and *Goeldichironomus carus*. Florida Index decreased from 13 points at the reference site to zero points at the test site, further indicating that polluted conditions prevailed downstream of the Continental Country Club discharge. The macroinvertebrate data demonstrate that the discharge was in violation of the standard prohibiting imbalances of aquatic flora or fauna (Rule 17-302.530(48)(b) FAC). Several periphyton measures of community health indicated degradation associated with the discharge. These included taxa richness decreases, reductions in the diatom to blue-green ratio, and substantial increases in the phaeophytin concentration from the control site to the test site. This is additional evidence that the discharge was in violation of Rule 17-302.530(48)(b) FAC, imbalances of aquatic flora or fauna.

Water Quality Inspection (WQI)

Date Sampled: 17 May 1993

Results: Very elevated phosphorus levels were associated with this discharge. Test site concentrations of ortho-phosphate (1.8 mg/L), total phosphorus (2.1 mg/L), and ammonia (0.66 mg/L) were higher than those in 95% of other Florida streams. In contrast, nutrient concentrations at the reference site were fairly average for a Florida stream. Algal growth potential increased from 7.0 mg dry wt/L at the reference site to 36.3 mg dry wt/L at the test site. AGP of the effluent was 14.8 mg dry wt/L. AGP values above 5 mg dry wt/L are often associated with excessive macrophyte growth, algal blooms, lowered D.O., and fish kills.

Introduction

The Continental Country Club WWTP is located near Wildwood, in Sumter County, Florida (see maps in Appendix). This is a 0.4 MGD Type II contact stabilization facility. The chlorinated effluent is discharged to a 110,000 ft^2 polishing pond which overflows to the Class III Chitty Chatty marsh, which drains into Lake Okahumpka. The average annual flow to the marsh is 0.118 MGD.

State permit limits for the effluent are as follows: BOD and TSS (annual average of 20 mg/L, monthly average of 30 mg/L, weekly average of 45 mg/L, maximum of 60 mg/L), pH (6 to 8.5), flow (0.4 MGD), nitrate (12 mg/L), and fecal coliforms (200 organisms/100mL).

There has been a history of problems with this facility. Based upon Monthly Operating Report data, there have been numerous permit violations for nitrate limits. Additionally, previous water quality studies performed by the facility on the receiving waters indicated violations of pH standards, unionized ammonia, biological integrity, and nutrient induced imbalances in aquatic flora.

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 in Chitty Chatty marsh approximately 0.5 miles east of the facility) and a test site (in Chitty Chatty marsh 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 *Notropis 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 effluent, reference, and test sites. Methods used for all chemical analyses are on file at the Tallahassee DEP Chemistry Laboratory.

Benthic macroinvertebrate communities were evaluated at reference and test sites. Invertebrates were collected from multiple substrates

Major characteristics of community structure of control and test sites.

	Reference Site	Test Site
Macroinvertebrate Qualitative		
Number of Taxa	55	3
Florida Index	13	0
% Contribution of Dominant Taxon	25.5	99.5
% Malacostraca	25.5	99.5
% Diptera	37.4	0.5
% Odonata	7.7	0
% Lepidoptera	5.3	0
% Hemiptera	11.4	0
% Ephemeroptera	3.7	0
% Other	9.0	0
% Predators/Carnivores	36.2	0
%Deposit feeders (above surface)/ Collector-Gatherers	22.5	50.4
% Deposit feeders (below surface)	1.34	0
% Suspension feeders/Collector-Filterers	0.45	0
% Scavengers	8.74	49.6
% Plant piercers	2.67	0
% Scrapers	8.02	0
% Shredders	20.0	0
% Parasites	.08	0
Periphyton Algae		
Number of Taxa	15	11
% Contribution of Dominant Taxon	67.9	31.9
Chlorophyll a (mg/sq. m)	10.4	7.0
Phaeophytin (mg/sq. m)	4.1	21.3
Diatom/Diatom + B-G Abundance Ratio	0.28	0.03
% Blue-green	7.1	41.9
% Green	13.4	56.9
% Chrysophyta	67.9	0
% Diatoms	2.7	1.2
% Euglenophyta	8.9	0
Algal Growth Potential (mg dry wt/l)	7.0	36.3

(*e.g.*, snags, leaf packs, vegetation) using 20 discrete dip net sweeps. Hester-Dendy multiplate samplers were incubated for 28 days (Ross 1990), but the samplers were partially dry upon retrieval, rendering these samples of limited use. Therefore, data from the dip net samples will be used in this report. 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* and phaeophytin were also determined for periphyton communities (Ross 1990). 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 in this report. Many of these, such as the number of taxa and chlorophyll *a* are well known. Others are briefly explained here. 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 (*i.e.*, many clean-water organisms are present). Excessive numerical dominance of a single type of organism (a high % contribution of dominant taxon) is usually associated with disturbance. 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. The determination of the Quantitative Stability Index (for taxonomic % composition) is a two step process. First, the relative proportions of major taxonomic groups are calculated for each site. Then, the lesser of the two percentages for each discrete taxonomic group is totaled. A QSI (for % composition) of 100% means that the two sites being compared are identical. This same type of procedure is used for calculating the QSI (for functional feeding groups).

For graphical purposes, the percent differences between the reference and test sites involving the number of taxa, Florida Index and the diatom to blue-green algae ratio are measured as the reference site minus test site divided by the reference site. The percent differences between sites involving the percent contribution of dominant taxon, 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: Pat Fricano, Jim Snitgen, and Kathy Hicks (DEP Southwest District) and Lyn Burton, Marshall Faircloth, Russel Frydenborg, Kathleen Lurding, Urania Quintana, Landon Ross, and Greg Wynn (Tallahassee Biology Laboratory). The report was reviewed by the Point Source Bioassessment Review Committee, consisting of Jan Mandrup-Poulsen, Wayne Magley, and Mike Tanski, as well as District representatives.

Results

Habitat quality was fairly similar between the reference site (with 43 points) and the test site (with 46 points). The test site was slightly more shallow (0.5 m deep) than the reference site (0.5 m to 1.5 m deep). Water velocity was low at both sites (0.05 m/sec). Half of the land near both sites was residential and the other half native forest. An anaerobic odor was detected in sediments from the reference site, while sewage and petroleum odors were noted in sediments from the test site. Aquatic vegetation was an important habitat at both sites, however, the reference site had more leaf packs present. While dissolved oxygen was somewhat low at the reference site (4.2 mg/L), it was considerably lower (1.9 mg/L) at the test site. Dissolved oxygen at both sites was below the Class III water quality standard (Rule 17-302.530(31) FAC). Water was near neutral in pH at both stations (7.1 at the reference site and 7.4 at the test site), but conductivity increased from 260 µmhos/cm (reference site) to 547 µmhos/cm (test site).

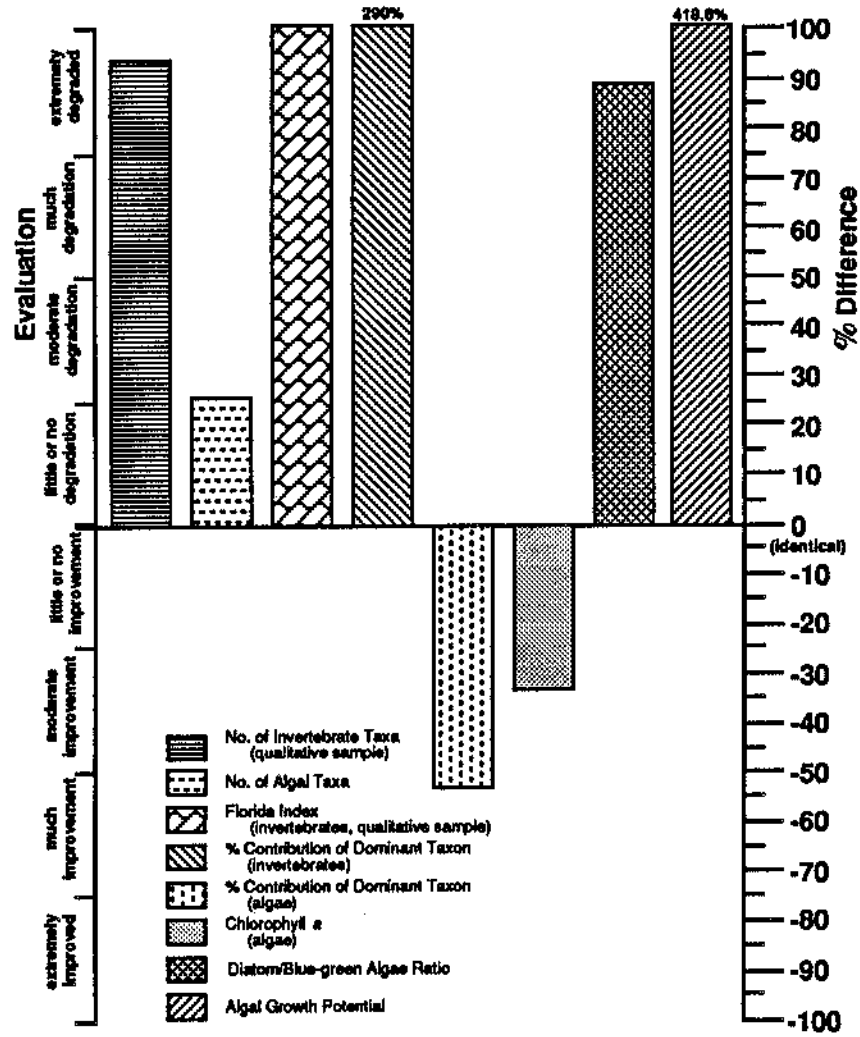
The effluent sample was not toxic to the water flea, *Ceriodaphnia dubia*, or to the fish, *Notropis leedsi*, exposed to the full strength sample.

An organic pollutant, atrazine (0.83 µg/L), was detected in the discharge. This is cause for concern, as atrazine is toxic to the shrimp, *Palaemonetes* sp., at concentrations as low as 1.2 µg/L (AQUIRE 1993).

Iron (16 µg/L) was measured in the effluent, but this value is well within water quality standards.

Fecal coliform bacteria measured in the effluent (45 organisms/100 ml), were within water quality standards.

Very elevated phosphorus levels were associated with this discharge. Test site concentrations of orthophosphate (1.8 mg/L) and total phosphorus (2.1 mg/L) were higher than those in 95% of other Florida streams



Effect of discharge on receiving stream
(measured as difference between control and test sites).

(see Table of Typical Water Quality Values in Appendix). In contrast, phosphorus concentrations at the reference site (*e.g.*, TP = 0.12 mg/L) were fairly average for a Florida stream. Although ammonia and nitrate-nitrite were undetected in the effluent, the test site concentrations were 0.66 mg/L and 0.12 mg/L, respectively. This ammonia level at the test site is also higher than 95% of other Florida streams. The elevated ammonia at the test site may be the result of a variable effluent quality, as in the past, very high nitrogen levels have been documented in the effluent.

Algal growth potential increased from 7.0 mg dry wt/L at the reference site to 36.3 mg dry wt/L at the test site. AGP of the effluent was 14.8 mg dry wt/L. AGP values above 5 mg dry wt/L are often associated with excessive macrophyte growth, algal blooms, lowered D.O., and fish kills (Raschke and Schultz 1987).

Measures of macroinvertebrate health indicated that the test site was grossly degraded. The figure on this page indicates the degree of difference between 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 site. The relative abundance of each individual taxon appears in the Appendix. The figure on p. 4 summarizes similarities between the sites. Smaller similarities (lower percentages) generally correspond with greater degradation.

Dip net sampling indicated that taxa richness was very good at the reference site (with 55 taxa), dramatically decreasing to 3 taxa at the test site (see species lists in Appendix). Species richness at the test site was substantially less than 95% of all other Florida streams, indicating extremely degraded conditions. Two of the three taxa found at the test site were well known pollution tolerant forms: *Chironomus* sp. and *Goeldichironomus carus*. The Florida Index at the reference site (with 13 points) was near the value expected from a healthy system in central Florida. The Florida Index decreased to zero points at the test site, further indicating that polluted conditions prevailed downstream of the Continental Country Club discharge.

Another indication of problems at the test site was the large increase (by 290%) in the percent contribution of the dominant taxon, when compared to the reference site. This is analogous to a substantial diversity decrease downstream of the discharge. Although the dominant taxon at the test site, *Hyalella azteca*, is not generally considered to be a pollution tolerant organism, it is sometimes very common in low dissolved oxygen situations (*e.g.*, sulfur springs such as Newport Springs in Wakulla County). The fact that *Hyalella azteca* was very abundant, to the exclusion of other forms, does suggest a perturbation. The Quantitative Stability Indices for % contribution (26%) and functional feeding groups

(31%) indicate large differences between the reference and test sites, clearly associated with biological degradation from the discharge. Taken as a whole, the macroinvertebrate data demonstrate that the discharge was in violation of the standard prohibiting imbalances of flora or fauna (Rule 17-302.530(48)(b) FAC).

A periphyton community shift was noted from the reference site (dominated by chrysophytes, chlorophytes, and euglenophytes) to the test site (dominated by greens and blue-green algae). Taxa richness decreased by 27% from the reference to the test site. The dominant taxon at the test site, *Oscillatoria* sp., is considered a nuisance form, and is very tolerant of organic enrichment. Although chlorophyll *a* (7.0 mg/m^2) was low at the test site, the phaeophytin level (the non-living fraction, or breakdown product) was unusually elevated (21.3 mg/m^2). This observation, coupled with the detection of the herbicide, atrazine, suggests a fairly recent episode of algal toxicity at the test site. The diatom/blue green ratio was reduced by 89% at the test site compared to the reference site. This was due to the large increase in cyanophytes (considered pollution tolerant) at the test site. The QSI for algal percent composition was extremely reduced, again indicating an abnormal algal population at the test site. This is further evidence that the discharge was in violation of Rule 17-302.530(48)(b) FAC, imbalances of flora or fauna.

Conclusions

Dissolved oxygen was somewhat low at the reference site (4.2 mg/L), but was considerably lower (1.9 mg/L) at the test site. Dissolved oxygen at both sites was below Class III water quality standards (Rule 17-302.530(31) FAC).

The full strength effluent sample was not toxic to the water flea, *Ceriodaphnia dubia*, or to the fish, *Notropis leedsi*.

Fecal coliform bacteria measured in the effluent (45 organisms/100 ml), were within water quality standards.

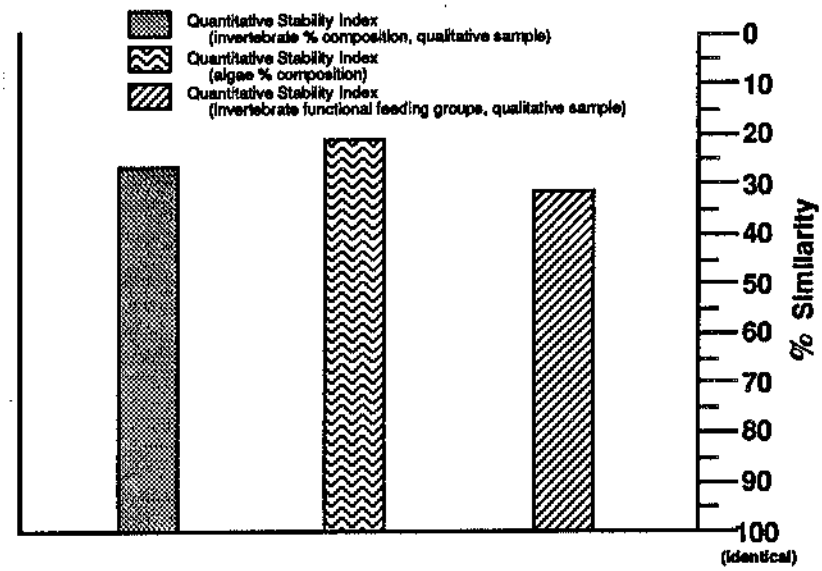
An organic pollutant, atrazine (0.83 µg/L), was detected in the discharge. This cause for concern, as atrazine is toxic to the shrimp, *Palaemonetes* sp., at concentrations as low as 1.2 µg/L (AQUIRE 1993).

Iron (16 µg/L) was measured in the effluent, but this value is well within water quality standards.

Very elevated phosphorus levels were associated with this discharge. Test site concentrations of orthophosphate (1.8 mg/L), total phosphorus (2.1 mg/L), and ammonia (0.66 mg/L) were higher than those in 95 % of all other Florida streams. In contrast, nutrient concentrations at the reference site were fairly average for a Florida stream.

Algal growth potential increased from 7.0 mg dry wt/L at the reference site to 36.3 mg dry wt/L at the test site. AGP of the effluent was 14.8 mg dry wt/L. AGP values above 5 mg dry wt/L are often associated with excessive macrophyte growth, algal blooms, lowered D.O., and fish kills (Raschke and Schultz 1987).

Measures of macroinvertebrate health indicated that the test site was grossly degraded. Taxa richness decreased from 55 taxa at the reference site to 3 taxa at the test site. Two of the three taxa found at the test site were well known pollution tolerant forms: *Chironomus* sp. and *Goeldichironomus carus*. Florida Index decreased from 13 points at the reference site to zero points at the test site, further indicating that polluted conditions prevailed downstream of the Continental Country Club discharge. The macroinvertebrate data clearly demonstrate that the discharge was in violation of the standard prohibiting imbalances of aquatic flora or fauna (Rule 17-302.566(29) FAC).



Effect of discharge on receiving stream
(measured as similarity between control and test sites).

Several periphyton measures of community health indicated degradation associated with the discharge. These included taxa richness decreases, reductions in the diatom to blue-green ratio, and substantial increases in the phaeophytin concentration from the control site to the test site. This is additional evidence that the discharge was in violation of Rule 17-302.566(29) FAC, imbalances of aquatic flora or fauna.

Literature Cited

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

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 p.

Chemistry summary table for Continental Country Club STP.

	Effluent	Control Site	Test Site
Organic Constituents (ug/L)			
Atrazine	0.83		
Metals (ug/L)			
Aluminum	100 U		
Arsenic	20 U		
Cadmium	0.08 U		
Copper	5 U		
Chromium	10 U		
Iron	16		
Lead	15 U		
Mercury	0.2 U		
Nickel	5 U		
Silver	0.25 U		
Zinc	5 U		
Nutrients (mg/L)			
Ortho-phosphate	1.8	0.073	1.8
Total phosphorus	1.7	0.12	2.1
Ammonia	0.02 U	0.027 T	0.66
Nitrate+Nitrite	0.02 U	0.02 U	0.12
TKN	0.84	1.6	2.2
Other Parameters			
Habitat Assessment		43	46
D.O. (mg/L)		4.2	1.9
pH (SU's)	9.0	7.1	7.4
Conductivity (µmhos/cm)	540	260	547
Temperature (°C)		28.6	23.7
AGP (mg dry wt/L)	14.8	7.0	36.3
TSS (mg/L)	14		
BOD (mg/L)	9		
Fecal Coliform (org/100ml)	45 J		
Bioassay Fish-Chlorinated	Not toxic		
Bioassay Invertebrate-Chlorinated	Not toxic		
Bioassay Fish-Dechlorinated	Not toxic		
Bioassay Invertebrate-Dechlorinated	Not toxic		

A - Value reported is the mean of two or more determinations
J - Estimated value
K - Actual value is known to be less than value given
L - Actual value is known to be greater than value given
N - Presumptive evidence of presence of material
O- Sampled, but analysis lost or not performed
Q - Sample held beyond normal holding time
U - Material analyzed for but not detected; value reported is the minimum detection limit
T- Value reported is less than the practical quantitation limit

Typical Values for Selected Parameters in Florida Waters

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

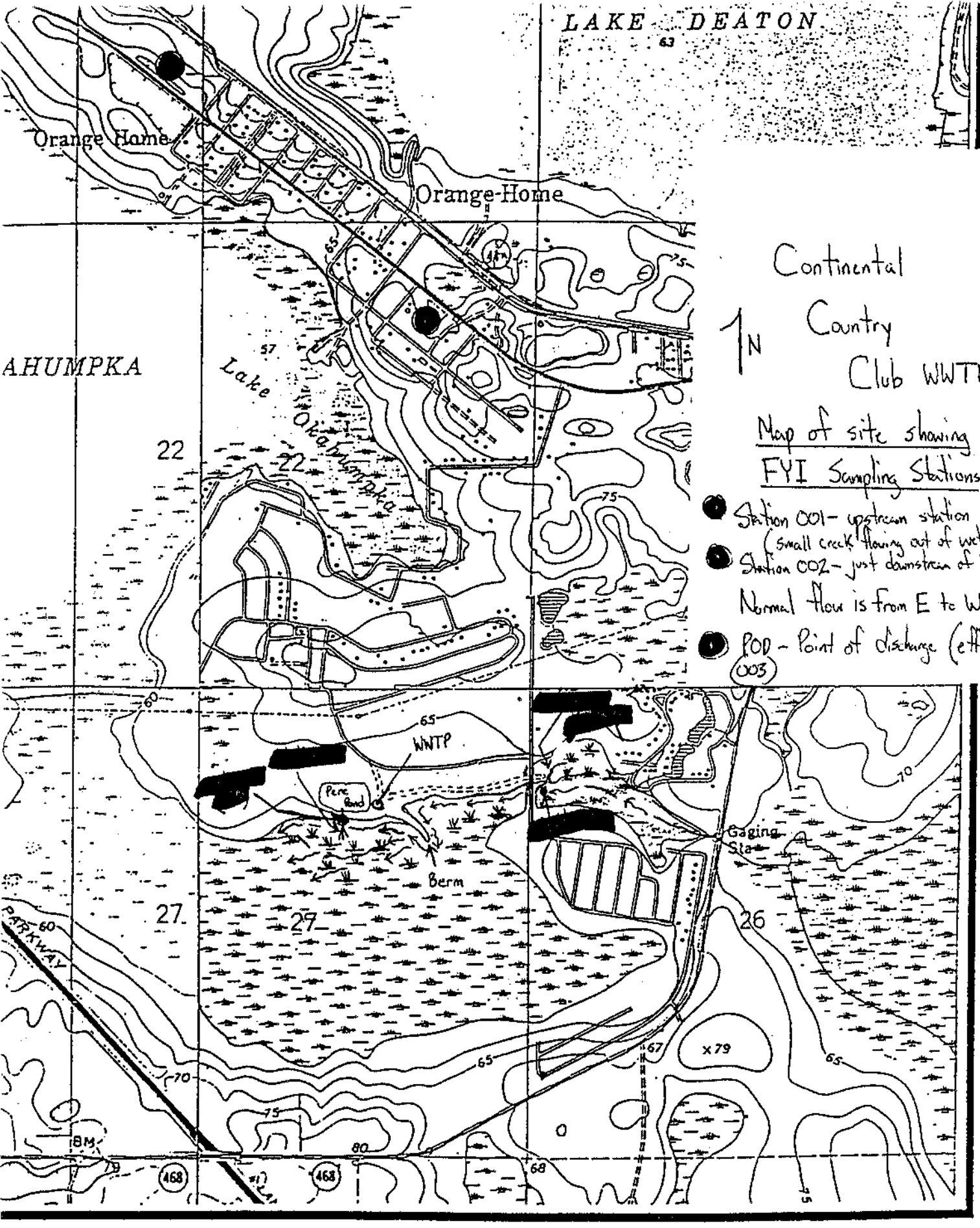
Percentile Distribution

Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%
STREAMS (1617 stations)											
Phytoplankton Chlorophyll *a*	0.22	0.52	0.94	1.60	3.02	4.63	6.72	9.87	14.68	27.35	48.70
Periphyton Chlorophyll *a*	0.31	0.43	0.77	1.04	2.16	2.94	6.45	10.51	17.00	39.51	60.85
H-D Diversity	0.84	2.12	2.48	2.74	2.88	3.09	3.25	3.40	3.52	3.76	3.90
Qualitative Taxa Richness	9.00	12.00	17.00	20.00	22.00	24.50	26.00	28.00	31.00	37.00	53.00
H-D Taxa Richness	6.00	6.50	9.00	11.50	13.00	15.00	17.00	21.50	26.00	29.00	32.00
TKN	0.30	0.39	0.56	0.73	0.87	1.00	1.11	1.26	1.49	1.93	2.80
Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60
NO2-NO3	0.01	0.01	0.03	0.05	0.07	0.10	0.14	0.20	0.32	0.64	1.05
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	0.74	1.51
Ortho 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


WILDWOOD
Pop. 2,665
COLEMAN
Pop. 1022
BUSHNELL
Pop. 983
SUMTERVILLE
LAKE PANASOFFKEE
LAKE PANASOFFKEE DELIMITED AREA
Est. Pop. 2,368
OXFORD
Lake Panasoffkee
Lake Okahumpka
Lake Deaton
Jumper Creek Swamp
Wildwood Interchange 480
Florida's Turnpike
SEABOARD SYSTEM RAILROAD
Bushnell Tower (Hdq.)
BUSHNELL FLYING "J" AIRPARK (PVT.)
Coleman Landing
Panacoochee Retreats
Orange Home
Adamsville
Bellangers
Bevilles Corner
Haywood Pond
Schoolhouse Pond
Sand Pond
Sawgrass Pond
Gator Pond
Moreland Park
Lake Miona
Cherry Lake
Long Hammock
Spring Hammock
Dog Fennel Prairie
Rock Prairie
Towns Prairie
Indian Prairie
Clark Prairie
Annie Marsh P.
Baptizing Hole
The Willows
South Bear Island
Soapstone Island
Burnt Island
Kettle Island
Jumper Island
Dolly Island
Dolly Lakes
Indian Field
Princess L.
Carlson
Pleasant Hill Ch.
Orange L.
Fish P.
Goose P.
Bamboo
Okahumpka Service Area
TO OKAHUMPKA
TO OCALA
COUNTY
River



ESBURG WEST, & WILDWOOD, FLORIDA

Sumter County

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

FACILITY SUMMARY

Facility Name: Continental Country Club WWTP		Date Summary Prepared: 5/14/93
Location (attach detailed map): SR 44 & SR 468 near Wildwood	County: Sumter	District: SOUTHWEST
Federal Permit # and expiration date:	State GMS # and 4060P02479 State expiration date: 8/31/92	Facility Type: Industrial Municipal Federal Agricultural Other (list): Private

Function of facility:
Domestic Wastewater Treatment

Description of treatment process: 0.4 MGD Type II Contact Stabilization sewage treatment plant with chlorinated effluent to a polishing pond of 110,078 square feet and overflow to the Chitty Chatty Marsh.

Receiving waters:	Classification: I II (III)	
Design Flow: 0.4	Mean Flow: Annual Average 0.118	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.):

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

Parameter	Limit (units)
BOD + Suspended Solids	20 Ann Aver (mg/L) 30 Monthly Aver 45 Weekly Aver 60 ONE Sample
Fecal Coliform	200 Ann Aver (#/100) 200 Month Aver
Nitrate	12 mg/L
Flow	0.4 MGD
pH	6.0 – 8.5 (std)

Describe special permit conditions and permit modifications:

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

(Facility)

Description of permitted outfall(s):
ONE Pipe, Not MANIFOLD. Several diagrams throughout file could be interpreted as "manifold".

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

8-91 16.1 Mg/L
10-91 23.9
12-91 13.2
1-92 22.2
2-92 22.0
9-92 12.1
(Within 10% on 7-91 11.8, 10-92 11.8)

Dec 20, 1991 - Report rec'd for spill on Dec 16, 1991 which discharged to Wetlands. Severe limitations to report. Inspection Dec 2, 1991 found CERTIFIED operator had not been on-site from Thanksgiving thru 12/2/91. Coverage by NON-CERT. operator

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

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

Additional information:

Staff contributing to this review (signature):

9/1/93	(Biologist)
5/14/93	(Inspector)
9/1/93	(Engineer)
9/1/93	(Compliance Manager)
9/1/93	(Biologist)
	( )

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		5-17-93	2:18	Chitty Chatty Marsh

REMARKS:	LOCATION:	FIELD ID/NAME:
Small green frog, wax myrtle, red maple, Salix cypress, Ilyrocotyle, Panicum sp.	Continental Country Club	Upstream 001

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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

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

Point-Source Pollution (list location and describe):

Estimated System Width (range, m): 5 - 7	Estimated System Depth (range, m): .5 - 1.5		yes
High Water Mark (m above bed): 3	Velocity (range, m/s): 0.05	Impounded ☐	
		Channelized ☑	

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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Riffles			
Leaf Packs	20	5		Sand	70	5	
Aquatic Vegetation	10	10		Mud/Muck/Silt	20	3	
Rock or Shell Rubble				Benthic leaf mats			
Undercut Banks/Roots				Other:			

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):	Hardness		Secchi (m):
Top								
Mid-depth		28.6	7.11	4.32	2.59.6	160		
Bottom								

System Type : Stream: ☑ (Sand Bottomed ☐ Sand Bot w/ Spring ☐ Swamp & Bog ☐ Calcareous ☐ Alluvial ☐ Misc. ☐) 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: Sunny, 88°F

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Jim Snitgen Kathy Hicks	Kathy A. Hicks Jim L. Snitgen	5-17-93

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		5-17-95	Noon	Chitty Chatty Marsh

REMARKS:	LOCATION:	FIELD ID/NAME:
Gambusia, Hydrocotyle, Red maple, cypress, Hygrophila, Elderberry, wax myrtle	Continental Country Club	Downstream CCC2

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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

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

Point-Source Pollution (list location and describe): None other than WWTP

Estimated System Width (range, m): 1 – 2	Estimated System Depth (range, m): 0 – 0.5M		yes
High Water Mark (m above bed): 0.5	Velocity (range, m/s): 0-0.05	Impounded ☐ / Channelized ☐	

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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Riffles			
Leaf Packs				Sand	10	1	visual
Aquatic Vegetation	30	10	visual	Mud/Muck/Silt	100	1	visual
Rock or Shell Rubble				Benthic leaf mats			
Undercut Banks/Roots				Other:			

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):			Secchi (m):
Top								
Mid-depth	.30	23.7	7.44	1.89	547			
Bottom								

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

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

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: Sunny, 80°F

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Jim Snitgen, Kathy Hicks	Kathy A. Hicks	5-17-95

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		5-17-93	Chitty Chatty Marsh

REMARKS:	LOCATION:	FIELD ID/NAME:
Changed from original Upstream station due to no flow.	Continental Country Club	Upstream OC1

Habitat Parameter / score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover — 18	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs, undercut banks, rubble, or other stable habitat. **23-30 points**	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. **16-22 points**	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat. **8-15 points**	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious. **0-7 points**
Water Velocity — 3	Max. observed: >0.3 m/sec. but < 1 m/sec **23-30 points**	Max. observed; 0.1 to 0.3 m/sec **16-22 points**	Max. observed; 0.05 to 0.1 m/sec **8-15 points**	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec **0-7 points**
Artificial Channel/ Flow Alteration — 3	No artificial channelization. Little activity (impervious surface) in watershed which would cause scouring during spates. **12-15 points**	—	—	Artificially channelized, or scouring present during spates because of excess impervious surface in watershed. **0-3 points**
Bank Stability — 7	Stable. No evidence of erosion or bank failure. Little potential for future problems. **9-10 points**	Moderately stable. Infrequent or small areas of erosion, mostly healed over. **6-8 points**	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. **3-5 points**	Unstable. Many raw, eroded areas. Obvious bank sloughing. **0-2 points**
Riparian Zone Vegetation Quality — 7	Over 80% of streambank surfaces consist of native plants, classified as: bottomland hardwoods, understory shrubs, or non-woody macrophytes. **9-10 points**	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. **6-8 points**	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. **3-5 points**	Less than 25% of streambank surfaces are vegetated. Poor plant community (e.g. grass monoculture) present. **0-2 points**

Adjustments		TOTAL SCORE
5	Add **5 points** if cross-sectional area of flow is estimated to be greater than one square meter during periods of normal flow.	43

COMMENTS: red maple,

ANALYSIS DATE:	ANALYST:	SIGNATURE:
5-17-93	Kathy Hicks Jim Snitgen	Kathryn A. Hicks James L. Snitgen

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		5-17-93	Chitty Chatty Marsh.

REMARKS:	LOCATION:	FIELD ID/NAME:
Gambusia, hydrocotyle, red maple, Hygrophyla, Cypress, Elderberry, wax myrtle	Continental Country Club	Downstream 002

Habitat Parameter / score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover — 16	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs, undercut banks, rubble, or other stable habitat. **23-30 points**	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. **16-22 points**	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat. **8-15 points**	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious. **0-7 points**
Water Velocity — 2	Max. observed: >0.3 m/sec. but < 1 m/sec **23-30 points**	Max. observed; 0.1 to 0.3 m/sec **16-22 points**	Max. observed; 0.05 to 0.1 m/sec **8-15 points**	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec **0-7 points**
Artificial Channel/ Flow Alteration — 10	No artificial channelization. Little activity (impervious surface) in watershed which would cause scouring during spates. **12-15 points**	—	—	Artificially channelized, or scouring present during spates because of excess impervious surface in watershed. **0-3 points**
Bank Stability — 9	Stable. No evidence of erosion or bank failure. Little potential for future problems. **9-10 points**	Moderately stable. Infrequent or small areas of erosion, mostly healed over. **6-8 points**	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. **3-5 points**	Unstable. Many raw, eroded areas. Obvious bank sloughing. **0-2 points**
Riparian Zone Vegetation Quality — 9	Over 80% of streambank surfaces consist of native plants, classified as: bottomland hardwoods, understory shrubs, or non-woody macrophytes. **9-10 points**	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. **6-8 points**	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. **3-5 points**	Less than 25% of streambank surfaces are vegetated. Poor plant community (e.g. grass monoculture) present. **0-2 points**

Adjustments		TOTAL SCORE
—	Add **5 points** if cross-sectional area of flow is estimated to be greater than one square meter during periods of normal flow.	44

COMMENTS:

ANALYSIS DATE:	ANALYST:	SIGNATURE:
5-17-93	Jim Snitgen Kathy Hicks	Kathryn A. Hicks

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Continental Country Club
Location: Continental Country Club
County: Sumter
Contact/District: Kathy Hicks / SW District
NPDES Permit #: FL00 Outfall #:
93 11 MAY 18 14 55395

Sample Collection: Date 5/17/93 Time 11:22
Test Beginning: Date 5/18/93 Time 1400
Test Ending: Date 5/20/93 Time 13:30
Organism Batch #: 21 Diluent Batch #: Well
Organism Age: 16 days
Test Organism: Notropis Leedsi *TR wrong organism

Test Type: Screening | Definitive
Static | Static Renewal | Flow-through
Test Number: 42 of 24 KP 9/21/94 INCLUDES DECHLOR
Remarks:

Cl -

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
0 hr	7.0 @ 7.0 9.0 @ 9.0	23.4 @ 23.5	8.4 @ 23.5	975 @ 1,000 9830 @ 10,000 @23.9
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.7 @ 23.8	8.4 @ 23.6	985 @ 1,000 9930 @ 10,000 @24.4
48 hr	7.0 @ 7.0 9.0 @ 9.0	24.8 @ 24.8	8.4 @ 24.5	985 @ 1,000 9900 @ 10,000 @24.8

Conc.	Chamber #	Number Live 0	Number Live 24	Number Live 48	pH 0	pH 24	pH 48	Temperature (°C) 0	Temperature (°C) 24	Temperature (°C) 48	D.O. (mg/L) 0	D.O. (mg/L) 24	D.O. (mg/L) 48	Cond. (mmhos/cm) Cond. (µmhos/cm) 0	Cond. 24	Cond. 48
Control A	74	5	5	5	7.9	8.2	8.3	23.5	23.5	23.9	8.0	7.6	7.7	245	240	245
control B	26	5	5	5	7.9	8.2	8.2				8.0	7.6	7.6	240	245	245
100% A	164	5	5	5	9.0	8.8	8.6	25.1	23.8	24.0	8.0	7.1	7.7	540	520	525
00% B	682	5	5	5	9.0	8.8	8.6				7.9	7.1	7.6	540	520	525
Measured/Loaded by:		TM	TR	TM	TM	TR	TM	TM	TR	TM	TM	TR	TM	TM	TR	TM
Recorded by:		TM	TR	TM	TR	TM	TR	TR	TM	TR	TR	TM	TR	TR	TM	TR

Investigators' Signatures

Robin C. Raden

Tina Mikulski

Water Quality Parameters	Salt Water/ Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:					
Lab Total Residual Cl2:	<0.03	<0.03	.125	DR-100	TR
Alkalinity:	125	70	155	Hach	TR
Hardness:	125	80	145	Hach	TR
Total Ammonia:					
	Ammonia		Ammonia		Sample

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Continental Country Club
Location: Continental Country Club
County: Sumter
Contact/District: Kathy Hicks /SW District
NPDES Permit #: FL00 93111A9 1F14 **Outfall #:** 55595

Sample Collection: Date 5/17/93 Time 11:22
Test Beginning: Date 5/18/93 Time ~~2400~~ 1400 KTR
Test Ending: Date 5/20/93 Time 13:30 wrong time
Organism Batch #: 21 **Diluent Batch #:** Well
Organism Age: 16 days
Test Organism: Notropis leedsi

Test Type: (Screening) Definitive
(Static) Static Renewal | Flow-through

Test Number: 2 of ~~2~~ 4 KP 5/21/93 INCLUDES CHLOR'D

Remarks:

DeCl

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
0 hr	7.0 @ 7.0 9.0 @ 9.0	23.4 @ 23.5	8.4 @ 23.5	975 @ 1,000 9830 @ 10,000 @ 23.9
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.7 @ 23.8	8.4 @ 23.6	985 @ 1,000 9930 @ 10,000 @ 24.4
48 hr	7.0 @ 7.0 9.0 @ 9.0	24.8 @ 24.8	8.4 @ 24.5	985 @ 1,000 9900 @ 10,000 @ 24.8

Conc.	Chamber #	Number Live 0	Number Live 24	Number Live 48	pH 0	pH 24	pH 48	Temperature (°C) 0	Temperature (°C) 24	Temperature (°C) 48	D.O. (mg/L) 0	D.O. (mg/L) 24	D.O. (mg/L) 48	Cond. (mmhos/cm) Cond. (µmhos/cm) 0	Cond. 24	Cond. 48
Control A	366	5	5	5	7.8	8.0	8.2	23.2	23.5	23.6	8.0	7.6	7.9	245	250	250
Control B	210	5	5	5	7.8	8.0	8.2				8.0	7.6	8.0	240	245	245
100% A	348	5	5	5	9.0	8.7	8.5	25.1	23.5	23.7	7.9	7.3	7.6	535	515	525
100% B	76	5	5	5	9.0	8.7	8.5				7.9	7.3	7.5	535	515	525
Measured/Loaded by:		TM	TR	TM	TM	TR	TM	TM	TR	TM	TM	TR	TM	TM	TR	TM
Recorded by:		TM	TR	TM	TR	TM	TR	TR	TM	TR	TR	TM	TR	TR	TM	TR

Investigators' Signatures

Tobin C. Rader

Tina Mikulski

Reviewer

Water Quality Parameters	Salt Water/ Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:					
Lab Total Residual Cl2:	<0.03	<0.03	<0.03	DR-100	TR
Alkalinity:	125	70	155	Hach	TR
Hardness:	125	80	145	Hach	TR
Total Ammonia:					

	Ammonia	Ammonia	Sample
Cl Blank:			ppt

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Continental Country Club
Location: Continental Country Club
County: Sumter
Contact/District: Kathy Hicks / SW District
NPDES Permit #: FL00 (13 MAY 1994 35315) **Outfall #:**

Sample Collection: Date 5/17/93 Time 11:22
Test Beginning: Date 5/18/93 Time 1400
Test Ending: Date 5/20/93 Time 13:10
Organism Batch #: 23 **Diluent Batch #:**
Organism Age: < 24 hrs
Test Organism: Ceriodaphnia Dubia

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

Test Number: 3X of 4 KP 9/21/93 INCLUDES DECHLOR

Remarks:

Cl⁻

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
0 hr	7.0 @ 7.0	23.4 @ 23.5	8.4 @ 23.5	975 @ 1,000 (@23.9)
	9.0 @ 9.0			9830 @ 10,000
24 hr	7.0 @ 7.0	23.7 @ 23.8	8.4 @ 23.6	985 @ 1,000 (@24.4)
	9.0 @ 9.0			9930 @ 10,000
48 hr	7.0 @ 7.0	24.8 @ 24.8	8.4 @ 24.5	985 @ 1,000 (@24.8)
	9.0 @ 9.0			9900 @ 10,000

Conc.	Chamber #	Number Live 0	Number Live 24	Number Live 48	pH 0	pH 24	pH 48	Temperature (°C) 0	Temperature (°C) 24	Temperature (°C) 48	D.O. (mg/L) 0	D.O. (mg/L) 24	D.O. (mg/L) 48	Cond. (mmhos/cm) Cond. (µmhos/cm) 0	Cond. 24	Cond. 48
Control	A	5	4	4	8.2		8.2	23.6		24.0	7.9		7.8	180		170
Control	B	5	4	~~4~~			8.2						7.7			175
Control	C	5	5	5			8.2						7.8			175
Control	D	5	5	5			8.2						7.8			180
100%	A	5	5	5	9.0		8.7	24.1		24.2	8.0		7.9	490		490
100%	B	5	5	3			8.7						7.9			525
100%	C	5	5	5			8.7						7.9			525
100%	D	5	5	5			8.7						7.9			505
Measured/Loaded by:		TR	TR	TR	TM		TM	TM		TM	TM		TM	TM		TM
Recorded by:		TM	TR	TR	TR		TR	TR		TR	TR		TR	TR		TR

Investigators' Signatures

Tobin C. Rader

Tina Mikulski

Reviewer

form updated 10/20/92

* Recorded Wrong ## TR

	Salt Water/ Well Water	Water Quality Parameters: 20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:					
Lab Total Residual Cl2:	<0.03	<0.03	.125	DR-100	TR
Alkalinity:	125	70	155	Hach	TR
Hardness:	125	80	145	Hach	TR
Total Ammonia:	<0.017	<0.017	0.017	Orion	MF

Cl_2 Blank: _____ Ammonia Meter Slope: -55.2 Ammonia Blank: 20.017 Sample Salinity: _____ ppt

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Continental Country Club
Location: Continental Country Club
County: Sumter
Contact/District: Kathy Hicks / SW District
NPDES Permit #: FL00 **Outfall #:**

Sample Collection: Date 5/17/93 Time 11:22
Test Beginning: Date 5/18/93 Time 2100 1400 ✱TR wrong time
Test Ending: Date 5/20/93 Time 13:30
Organism Batch #: 23 **Diluent Batch #:**
Organism Age: < 24hrs
Test Organism: Ceriodaphnia Dubia

93 MAY 18 14 55345

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

Test Number: 1 of ~~24~~ LP 9/24/93

Remarks: INCLUDES CHLOR'D

need to add to lims

DeCl⁻

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
0 hr	7.0 @ 7.0 9.0 @ 9.0	23.4 @ 23.5	8.4 @ 23.5	975 @ 1,000 @ 23.9 9830 @ 10,000
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.7 @ 23.8	8.4 @ 23.6	985 @ 1,000 9930 @ 10,000 @ 24.4
48 hr	7.0 @ 7.0 8 9.0 @ 9.0	@ 24.8	8.4 @ 24.5	985 @ 1,000 9900 @ 10,000 @ 24.8

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temperature (°C) 0	24	48	D.O. (mg/L) 0	24	48	Cond. (mmhos/cm) Cond. (µmhos/cm) 0	24	48
Control	A	5	5	5	8.1		8.1	23.4		23.6	8.0		8.0	190		175
Control	B	5	5	4			8.1						8.0			180
Control	C	5	5	5			8.1						8.0			180
Control	D	5	4	4			8.2						8.0			175
100%	A	5	5	5	9.0		8.6	23.5		23.8	7.9		8.0	475		505
100%	B	5	4	4			8.6						8.0			505
100%	C	5	5	5			8.6						8.1			520
100%	D	5	5	5			8.6						8.1			520
Measured/Loaded by:		TR	TR	TR	TM		TM	TM		TM	TM		TM	TM		TM
Recorded by:		TM	TR	TR	TR		TR	TR		TR	TR		TR	TR		TR

Investigators' Signatures

Tobin C. Rader

Tina Mikulski

Reviewer

Water Quality Parameters	Salt Water/ Well Water	20% Mln Water	Sample	Method	Measured by
Field Total Residual Cl2:					
Lab Total Residual Cl2:	<0.03	<0.03	<0.03	DR-100	TR
Alkalinity:	125	70	155	Hach	TR
Hardness:	125	80	145	Hach	TR
Total Ammonia:					

Cl_2 Blank: _____ Ammonia Meter Slope: _____ Ammonia Blank: _____ Sample Salinity: _____ ppt

Taxa list for Continental Country Club WWTP, collected via 20 dip net sweeps in Chitty Chatty Marsh, above and below the discharge, on 17 May 1993.

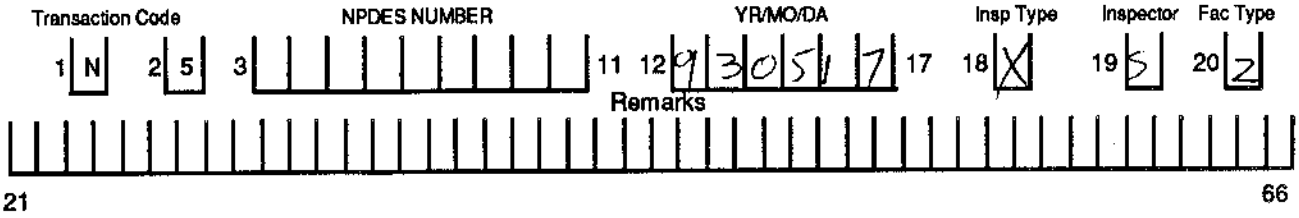
	Reference Site	Test Site
Acarina		
Arrenurus sp.	3	–
Undetermined Oribatidae	1	–
Undetermined Acarina	3	–
Coleoptera		
Hydrocanthus oblongatus	1	–
Malacostraca		
Palaemonetes paludosus	2	–
Diptera		
Ablabesmyia peleensis	1	–
Ablabesmyia sp.	2	–
Atherix sp.	1	–
Chaoborus sp.	2	–
Undetermined Chironomidae	4	–
Chironomus sp.	6	2
Corynoneura sp.	1	–
Culicoides sp.	1	–
Einfeldia natchitocheae	1	–
Endochironomus nigricans	2	–
Goeldichironomus amazonicus	1	–
Goeldichironomus carus	–	3
Labrundinia neopilosella	1	–
Larsia berneri	3	–
Larsia decolorata	4	–
Monopelopia boliekae	3	–
Odontomesa sp.	6	–
Parachironomus schneideri	1	–
Polypedilum halterale grp.	1	–
Polypedilum illinoense	46	–
Polypedilum trigonus	2	–
Paramerina sp.	6	–
Procladius sp.	1	–
Pseudochironomus sp.	15	–
Paratanytarsus sp. B Epler	2	–
Undetermined dipteran pupae	1	–
Tanytarsus sp. F Epler	19	–
Tipula sp.	5	–
Tanypus carinatus	1	–
Zavreliella marmorata	2	–
Ephemeroptera		
Caenis diminuta	13	–
Callibaetis floridanus	1	–
Gastropoda		
Undetermined Ancylidae	2	–
Micromenetus dilatus	10	–
Physella sp.	4	–
Hemiptera		

Belostoma sp.	2	–
Mesovelia sp.	10	–
Microvelia sp.	6	–
Neoplea sp.	7	–
Ranatra sp.	2	–
Undetermined Hemiptera	16	–
Lepidoptera		
Parapoynx sp.	1	–
Undetermined Pyralidae	19	–
Malacostraca		
Hyalella azteca	96	1103
Odonata		
Enallagma pollutum	4	–
Erythemis simplicicollis	2	–
Ischnura posita	21	–
Pachydiplax longipennis	2	–
Oligochaeta		
Aulodrilus pigueti	4	–
Limnodrilus hoffmeisteri	1	–
Trichoptera		
Orthotrichia sp.	3	–

Phytoplankton taxa list and densities (#/mL) for Continental Country Club STP, collected via subsurface grabs in Chitty Chatty Marsh, on 17 May, 1993.

	Reference Site	Test Site
Diatoms		
Achnanthes sp.	25	–
Cyclotella sp.	–	223
Nitzschia sp.	25	–
Unidentified pennate diatom	25	–
Chlorophyta		
Ankistrodesmus sp.	–	725
Chlamydomonas sp.	50	–
Cosmarium sp.	25	–
Gloeocystis sp.	25	112
Golenkinia sp.	–	5,854
Kirchneriella sp.	–	390
Scenedesmus sp.	25	335
Schroederia sp.	–	2,565
Tetraedron sp.	25	558
Unknown chlorophyte flagellate	224	–
Chrysophyta		
Synura sp.	1,893	–
Cyanophyta		
Anabaena sp.	25	–
Chroococcus sp.	174	502
Dactylococcopsis sp.	–	1,338
Oscillatoria sp.	–	5,910
Euglenophyta		
Euglena sp.	50	–
Phacus sp.	125	–
Trachelomonas sp.	75	–
Total	2,791	18,512

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)

