Florida
Department of Environmental Protection

Biological Assessment of

Cottondale Wastewater Treatment Plant

Jackson County

NPDES #FL0030058

Sampled September 1993

December 1993

Biology Section
Division of Technical Services

Department of Environmental Protection
Results of Fifth Year Inspections

Discharger: Cottondale WWTP
County: Jackson
NPDES Number: FL0030058
State Permit Expiration Date: June 10, 1994

Toxics Sampling Inspection (XSI)

Date Sampled: 7 September 1993

Results: No organic compounds or metals were detected at levels in violation of Class III Standards.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 7 September 1993

Results: The effluent from the Cottondale WWTP was toxic to the test organisms, *Ceriodaphnia dubia* and *Cyprinella leedsi*, violating Rules 17-302.530(62) FAC, 17-302.500(1)(d) FAC, and 17-4.244(3)(a) FAC. A high concentration of unionized ammonia in the effluent (0.16 mg/L) could account for most or all of the observed toxicity.

Impact Bioassessment Inspection (IBI)

Date Sampled: 7 September 1993

Results: Depressed taxa richness, low Florida Index, and domination by pollution-tolerant, nuisance species at the test site indicated violations of Rule 17-302.530(47) FAC, dominance of nuisance species and Rule 17-302.530(48)(b) FAC, imbalances of aquatic flora or fauna. The data also suggest that violations of the biological integrity criterion, Rule 17-302.560(7) FAC may be occurring due to the discharge. Probable causes for the observed problems at the test site include nutrient loading, organic enrichment (test site BOD was 7 mg/L), and ammonia toxicity (test site unionized ammonia was 0.59 mg/L). Decreases in algal taxa richness and the diatom to blue-green algae ratio indicated that the phytoplankton were negatively affected by the Cottondale WWTP effluent. Chlorophyll *a* was reduced at the test site, probably the result of the increased flow. Although the periphyton community would have been a better target population for assessment purposes, periphyton racks were not deployed due to the shallow stream depth.

Water Quality Inspection (WQI)

Date Sampled: 7 September 1993

Results: The bacterial levels upstream and downstream of the discharge constituted violations of Rules 17-302.530(6) FAC and 17-302.530(7) FAC. Effluent chlorine residual exceeded the facility's permit limit. Nutrients were extremely high in the effluent and at receiving water sites, particularly Total Kjeldahl Nitrogen, phosphorus compounds, and ammonia, present in concentrations considerably higher than those found in 95% of other Florida streams. The unionized ammonia was above known toxic levels in the effluent and at the two receiving water stations, in violation of Rule 17-302.530(3) FAC.

Introduction

The Town of Cottondale Wastewater Treatment Plant is located on Front Street in Cottondale, Jackson County, Florida (see map in Appendix). Effluent from this 0.125 MGD extended aeration facility, which formerly discharged into Caney Pond, now flows directly into a stormwater ditch which originates in an urban area east of SR 231. Discharge volume during this survey was 0.09 MGD.

Permit limits for the plant are as follows: flow (0.125 MGD maximum), pH (6-8.5 S.U.), total residual chlorine (0.5 mg/L for disinfection, 0.01 mg/L maximum in discharge), dissolved oxygen (5.0 mg/L minimum), BOD_5 (10 mg/L maximum as an annual average), TSS (10 mg/L maximum as an annual average), total phosphorus (6.0 mg/L maximum as an annual average), total nitrogen (13.5 mg/L maximum as an annual average), and fecal coliforms (200 organisms/100 mL maximum).

There has been a history of problems with this facility. A May 4, 1990, application for an operating permit was denied for the following reasons: 1) exceeding the total nitrogen limit of 13.5 mg/L; 2) exceeding the chlorine residual of 0.01 mg/L; 3) not providing adequate assurance that the plant could meet the dissolved oxygen standard of 5.0 mg/L; and 4) an insufficient number of operator visits to the plant. In April, 1992, the effluent was acutely toxic to the water flea, *Ceriodaphnia dubia*. According to the January 1993 Monthly Operating Report, the facility's monthly average daily flow (0.1469 MGD) exceeded its permit-

Major characteristics of community structure of control and test sites.

	Control Site	Test Site
Macroinvertebrate Qualitative		
Number of Taxa	10	12
Florida Index	0	0
% Contribution of Dominant Taxon	53.9	43.6
% Oligochaeta	19.7	25.7
% Diptera	69.7	66.3
% Odonata	1.3	2
% Coleoptera	1.3	2
% Other	6.5	4
% Predators/Carnivores	4.6	3.8
% Deposit feeders (above surface)/ Collector-Gatherers	62.5	44.3
% Deposit feeders (below surface)	19.7	26.0
% Suspension feeders/ Collector-Filterers	1.3	0
% Browser-grazers	0	0
% Scavengers	1.3	0.5
% Plant piercers	0	0
% Scrapers	0	2.5
% Shredders	10.5	22.8
Macroinvertebrate Ponar		
Number of Taxa	22	6
Florida Index	11	1
Shannon-Weaver Diversity	3.9	1.9
% Oligochaeta	27.6	47.1
% Diptera	70.7	51.5
% Gastropoda	1.7	1.5
% Predators/Carnivores	17.2	0.5
% Deposit feeders (above surface)/ Collector-Gatherers	36.2	42.4
% Deposit feeders (below surface)	27.8	47.1
% Suspension feeders/ Collector-Filterers	2.5	0
% Scrapers	1.7	1.4
% Shredders	14.5	8.6
Phytoplankton Algae		
Number of Taxa	10	5
% Contribution of Dominant Taxon	34.6	28.6
Chlorophyll a (µg/L)	4.45	0.73
Diatom/Diatom + B-G Abundance Ratio	0.77	0.43
% Blue-green	19.2	57.1
% Green	7.7	0
% Diatoms	65.4	42.9
% Euglenophyta	3.9	0
% Cryptophyta	3.9	0
Algal Growth Potential (mg dry wt/L)	409.9	362.0

ted capacity. Other problems have also been documented, such as clogged clarifier weirs and sewage spills from the collection system.

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 just upstream of the facility in an unnamed stormwater ditch) and a test site (located in the same ditch downstream of the discharge) (see map in Appendix). A habitat assessment was performed *in situ* to establish comparability between sites. Supplemental physical/chemical data were also collected on the effluent and study sites. Acute screening toxicity bioassays, using *Ceriodaphnia dubia* and *Cyprinella leedsi* as test organisms, were performed on the 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 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 the reference and test sites. Invertebrates were collected from multiple substrates (*e.g.*, snags, leaf packs, vegetation) using discrete dip net sweeps. Due to the shallowness of the ditch (not enough depth for Hester-Dendy samplers), additional invertebrate collections were accomplished using petite Ponar grabs. Phytoplankton was sampled at both reference and test sites via sub-surface grab samples. Chlorophyll *a* was also determined for phytoplankton communities (Ross 1990). Bacterial populations were analyzed for total and fecal coliforms following the methods of APHA (1989). Algal Growth Potential tests, using *Selenastrum capricornutum* as the test organism, followed Miller *et al.* (1978).

Explanation of Measurements of Community Health

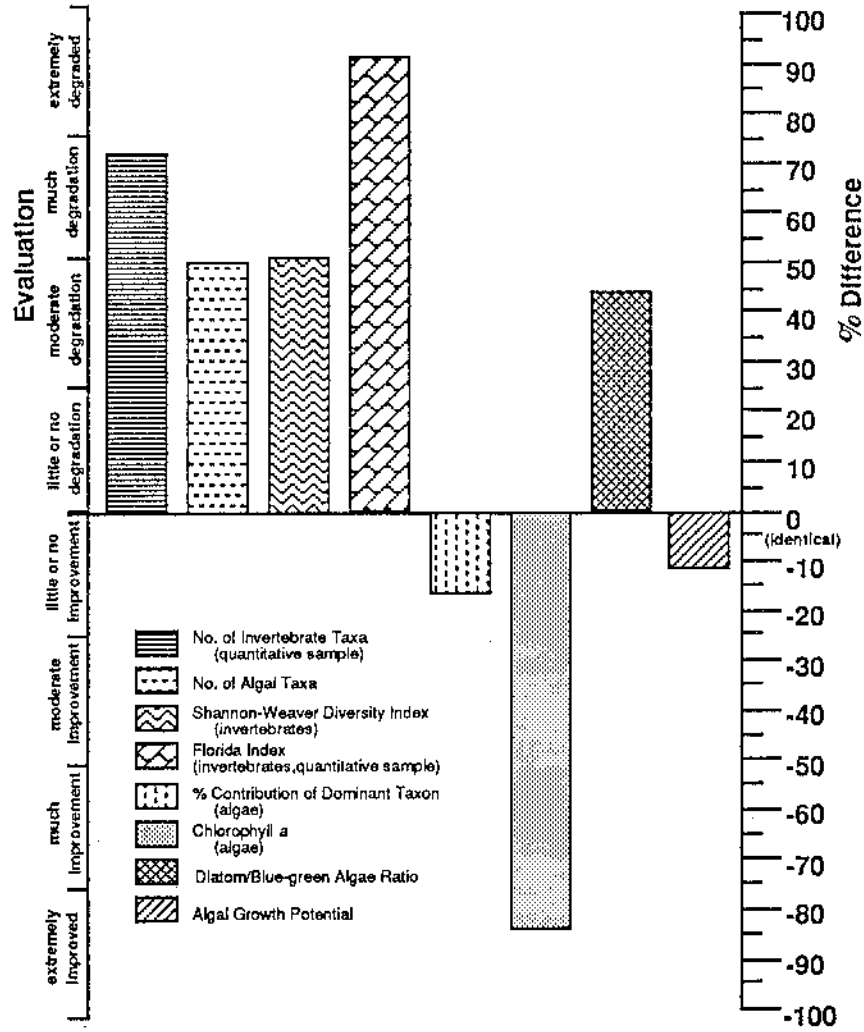
Several different measurements of macroinvertebrate and algal community health have been employed. Many of these, such as the number of taxa, Shannon-Weaver Diversity Index, and chlorophyll *a* are well known. Others are briefly explained here. The Florida Index assigns points to stream-dwelling macroinvertebrates 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 (% composition) of 100% means that the two sites being compared are identical. This same type of procedure is used for calculating the QSI (functional feeding groups).

For graphical purposes, the percent differences between the reference and test sites involving the number of taxa, the diversity index, 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: Glenn Butts and Karen McDonald (DEP Northwest District) and Chris Barge, Lyn Burton, Marshall Faircloth, Russel Frydenborg, Christy LeDuc, Kathy Lurding, Liz Miller, Urania Quintana, Landon Ross, Greg Wynn, and David Young (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 and Discussion

Habitat was an obvious limiting factor for biological success at the study sites, with habitat scores of 15 points and 29 points for reference and test sites, respectively (see Appen-



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

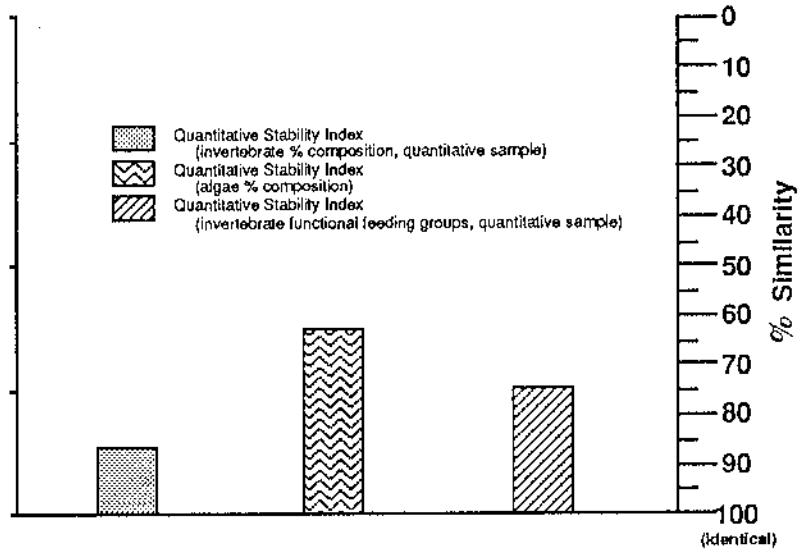
dix). Available substrates for macroinvertebrate colonization were limited at both stations. The banks at both channelized sites were eroded, but partially stabilized by vines and shrubs. The upstream site had essentially no flow, enabling a portion of the effluent to diffuse to the area, while water velocity at the test site (essentially all wastewater) was approximately 0.025 m/s. The pH at both sites was slightly alkaline (7.1 at reference; 7.7 at test), and conductivity was about the same at both stations (620 µmhos/cm and 600 µmhos/cm at reference and test sites, respectively). Dissolved oxygen was 5.1 mg/L at the reference site and 5.9 mg/L at the test site.

The effluent from the Cottondale WWTP was toxic to the test organisms, *Ceriodaphnia dubia* and *Cyprinella leedsi* (Appendix). Complete mortality to *Cyprinella leedsi* was observed in both the chlorinated and dechlorinated 48 hour static acute bioassays. Complete mortality to *Ceriodaphnia dubia* was also noted in the chlorinated effluent sample, while 70% of the water fleas died in the dechlorinated sample. These results indicate violations of Rules 17-302.530(62) FAC, 17-302.500(1)(d) FAC, and 17-4.244(3)(a) FAC. A high concentration of unionized ammonia in the effluent (0.16 mg/L) could account for most or all of the observed toxicity.

The organic compound 1,4-dichlorobenzene was detected in the effluent at levels below the quantitation limit (1.5 µg/L). This concentration of 1,4-dichlorobenzene is below those which are chronically toxic (EPA 1986). No metals were detected at levels which exceeded Class III water quality standards.

Nutrients were extremely high throughout the system, particularly total Kjeldahl nitrogen, phosphorus compounds, and ammonia (see chemistry summary table in Appendix). TKN was 17 mg/L in the effluent, 16 mg/L at the upstream site, and 15 mg/L at the downstream site. Reference and test site concentrations were approximately six times higher than those found in 95% of other Florida streams (see Table of Typical Water Quality Values in Appendix). The effluent total nitrogen (17.4 mg/L) was higher than the facility's annual average permit limit of 13.5 mg/L. Total phosphorus was 2.1 mg/L and 2.3 mg/L at reference and test sites, respectively, also higher than those found in 95% of other streams in the state. Ortho-phosphate levels were similarly elevated (1.8 mg/L and 2.2 mg/L at the reference and test sites, respectively). Ammonia was extraordinarily high in the effluent (18 mg/L), at the reference site (17 mg/L), and at the test site (16 mg/L). The unionized ammonia (0.16 mg/L, 0.19 mg/L, and 0.59 mg/L in effluent, reference site, and test site samples, respectively) was well above known toxic levels at all three stations. These unionized ammonia levels violated Rule 17-302.530(3) FAC. Nitrate-nitrite at the reference site was higher than 90% of all other streams in the state, while the 1.9 mg/L ni-

trate-nitrite level at the test site was higher than 95% of all other streams in the state. The unnaturally high nutrient concentrations measured at the reference site are probably due to the low flow conditions observed at the time of sampling. Without sufficient volume from upstream, the discharge would affect this normally "upstream" area of the ditch. The very elevated nutrient concentrations at the test site were clearly associated with the poor quality Cottondale WWTP effluent.



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

Algal growth potential (AGP) also demonstrated the severe nutrient enrichment present in this ditch. Reference site AGP was 409.9 mg dry wt/L, while the test site AGP was 362.0 mg dry wt/L. According to Raschke and Schultz (1987), at AGP levels above 5 mg dry wt/L, enrichment problems such as excessive algal growth and D.O. sags are likely to occur. Effluent AGP was also elevated, 61.7 mg dry wt/L at the Cottondale WWTP. The fact that the AGP was lower in the effluent than at the receiving water sites suggests either algal inhibition (toxicity in the effluent) or a temporally variable discharge quality.

Fecal and total coliforms in the Cottondale WWTP discharge were less than 10 organisms/100 mL and 170 organisms/100 mL, respectively. Fecal coliform bacteria counts were 800 organisms/100 mL at the reference site and 1,300 organisms/100 at the test site. Total coliform bacteria levels were 2,900 organisms/100 mL at the reference site and 12,000 organisms/100 mL at the test site. The bacterial levels upstream and downstream of the discharge constitute violations of Rules 17-302.530(6) FAC and 17-302.530(7) FAC. The differences in bacterial contamination between the effluent and the receiving water stations is probably the result of variability in chlorination. While 0.11 mg/L of total residual chlorine was present in the effluent sample (exceeding the facility's permit limit), it is possible that the discharge water in the hours previous to sample collection were not adequately chlorinated, resulting in the observed bacteria levels in the receiving waters.

Quantitative measures of benthic macroinvertebrate community health indicated that the stream was degraded throughout the study area, but to a greater extent downstream of the effluent (see table and figures). The figure on page 3 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. The figure on this page summarizes similarities between the sites. Smaller similarities (lower percentages) generally correspond with greater degradation.

Species richness was significantly decreased from the reference site to the test site, from 22 to 6 taxa (see taxa list in Appendix). Although the Florida Index was lower than expected at the reference site (with 11 taxa), only one pollution sensitive organism was recovered from the downstream site in Ponar samples (Florida Index = 1). Shannon-Weaver diversity was reduced by 51.3% from the reference site to the test site. This reduction in Ponar dredge diversity is analogous to the decrease that would have occurred had Hester-Dendy samplers been deployed. This is evidence that violations of the biological integrity criterion, Rule 17-302.560(7) FAC may be occurring due to the discharge. The otherwise

depauperate test site was dominated by *Chironomus* sp. and *Goeldichironomus holoprasinus*, both well-known pollution tolerant, nuisance species (Beck 1969, Hudson *et al.* 1990). This indicates violations of Rule 17-302.530(47) FAC, dominance of nuisance species and Rule 17-302.530(48)(b) FAC, imbalances of aquatic flora or fauna. Probable causes for the observed problems at the test site include nutrient loading, organic enrichment (test site BOD was 7 mg/L), and ammonia toxicity (test site unionized ammonia was 0.59 mg/L).

Some measures of phytoplankton community health indicated that the algae were negatively affected by the Cottondale WWTP effluent. For example, ten algal taxa were collected from the upstream site, while only five were found at the test site (a reduction of 50%). The diatom to blue-green algae ratio at the test site was decreased by 44.2% compared to the reference condition. Diatoms, especially *Navicula* sp., were most numerous at the reference site. Cyanophytes, including *Arthrospira* sp. dominated the test site, while the diatom, *Nitzschia* sp. was also common there. The percent contribution of the dominant taxon showed little difference between sites, whereas chlorophyll *a* was greatly reduced at the test site, probably the result of the increased flow. Although the periphyton community would have been a better target population for assessment purposes, periphyton racks were not deployed due to the shallow stream depth.

Conclusions

The effluent from the Cottondale WWTP was toxic to the test organisms, *Ceriodaphnia dubia* and *Cyprinella leedsi*, violating Rules 17-302.530(62) FAC, 17-302.500(1)(d) FAC, and 17-4.244(3)(a) FAC. A high concentration of unionized ammonia in the effluent (0.16 mg/L) could account for most or all of the observed toxicity.

No organic compounds or metals were detected at levels which exceeded Class III Water Quality Standards.

Nutrients were extremely high in the effluent and at receiving water sites, particularly TKN, phosphorus compounds, and ammonia. These were present in concentrations considerably higher than those found in 95% of other Florida streams. The unionized ammonia was well above known toxic levels at all three stations, in violation of Rule 17-302.530(3) FAC. The unnaturally high nutrient concentrations measured at the reference site are probably due to the low flow conditions observed at the time of sampling. Without sufficient volume from upstream, the discharge would affect this normally "upstream" area of the ditch. The very elevated nutrient concentrations at the test site were clearly associated with the poor quality Cottondale WWTP effluent.

Algal growth potential was considerably higher than the 5 mg dry wt/L "problem threshold" in the effluent, and at the reference and test sites, also demonstrating the severe nutrient enrichment present in this ditch.

The bacterial levels upstream and downstream of the discharge constituted violations of Rules 17-302.530(6) FAC and 17-302.530(7) FAC.

Quantitative measures of benthic macroinvertebrate community health indicated that the stream was degraded throughout the study area, but to a greater extent downstream of the discharge. Depressed taxa richness, low Florida Index, and domination by pollution tolerant, nuisance species at the test site indicated violations of Rule 17-302.530(47) FAC, dominance of nuisance species and Rule 17-302.530(48)(b) FAC, imbalances of aquatic flora or fauna. The data also suggest that violations of the biological integrity criterion, Rule 17-302.560(7) FAC may be occurring due to the discharge. Probable causes for the observed problems at the test site include nutrient loading, organic enrichment (test site BOD was 7 mg/L), and ammonia toxicity (test site unionized ammonia was 0.59 mg/L).

Decreases in taxa richness and the diatom to blue-green algae ratio indicated that the phytoplankton were negatively affected by the Cottondale WWTP effluent. Chlorophyll *a* was reduced at the test site, probably the result of the increased flow. Although the periphyton community would have been a better target population for assessment purposes, periphyton racks were not deployed due to the shallow stream depth.

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Chemistry summary table for

Cottondale WWTP	Effluent	Reference Site	Test Site
Organic Constituents (ug/L)			
1,4–Dichlorobenzene	1.5 T		
Metals (ug/L)			
Aluminum	166 I		
Antimony	15 U		
Arsenic	20 U		
Cadmium	0.12 I		
Copper	5 U		
Chromium	10 U		
Iron	88.9		
Lead	15 U		
Mercury	0.1 U		
Nickel	5 U		
Selenium	30 U		
Silver	0.05 U		
Zinc	73		
Nutrients (mg/L)			
Ortho-phosphate	2.4	1.8 A	2.2
Total phosphorus	2.4	2.1	2.3
Unionized ammonia	0.16	0.19	0.59
Ammonia	18	17	16
Nitrate+Nitrite	0.38	0.82	1.9
TKN	17	16	15
Other Parameters			
Habitat Assessment		15	29
D.O. (mg/L)	4.8	5.1	5.9
pH (SU's)	7.1	7.1	7.7
Conductivity (µmhos/cm)	630	620	600
Temperature (°C)	25.6	28.5	26.4
Hardness (mg CaCO3)	163		
TSS (mg/L)	5 U	17	5 U
Bioassay Fish-Chlorinated	toxic		
Bioassay Invertebrate-Chlorinated	toxic		
Bioassay Fish-Dechlorinated	toxic		
Bioassay Invertebrate-Dechlorinated	toxic		
Fecal coliform (org/100 mL)	10 U	800 Q	1,300 Q
Total coliform (org/100 mL)	170 Q	2,900 Q	12,000 Q
Turbidity NTU	7	17	5
BOD (mg/L)	4.3	6 J	7 J
Algal Growth Potential (mg dry wt/L)	61.7	409.9	362.0

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

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

J - Estimated value

Q - Sample held beyond normal holding time

T - Value reported is less than the criterion of detection

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

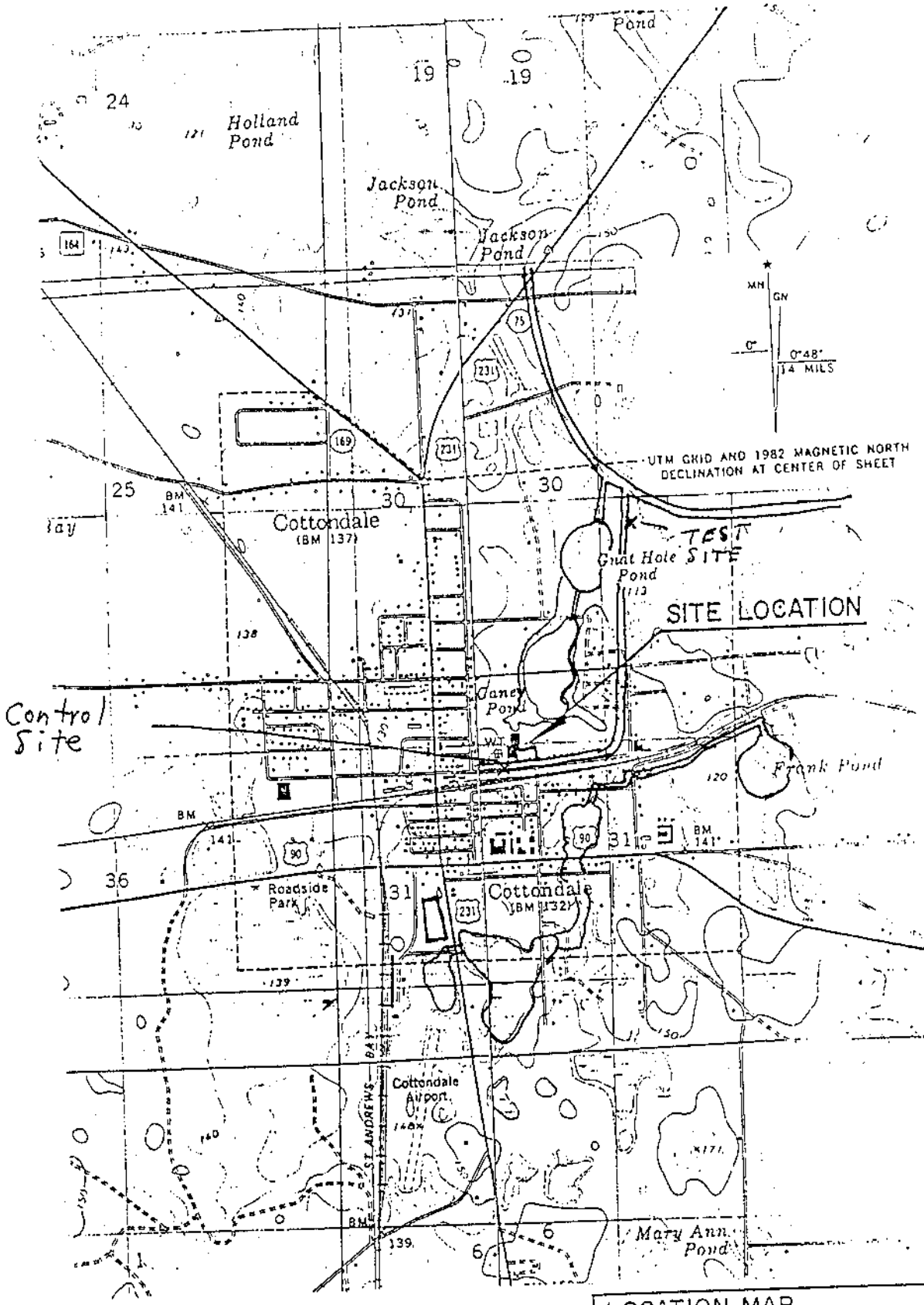
Typical Values for Selected Parameters in Florida Waters

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

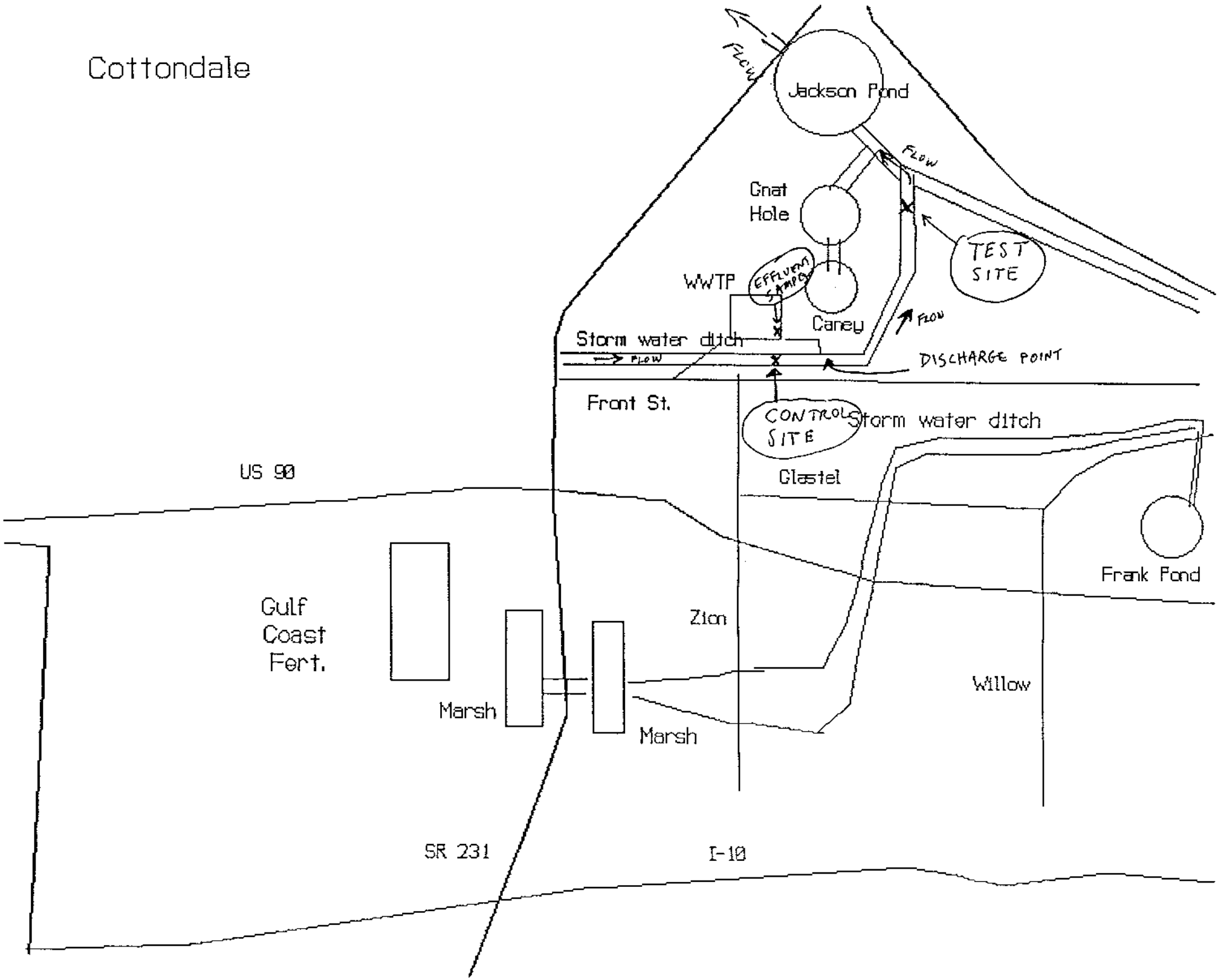
Percentile Distribution

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



LOCATION MAP
FROM U.S. GEOLOGICAL SURVEY MAPS,
1982, COTTONDALE STP
COTTONDALE, JACKSON, FLORIDA
FEBRUARY 15, 1988 PG. 1 OF 1


Cottondale
Flow
Jackson Pond
Flow
Gnat Hole
TEST SITE
WWTP
EFFLUENT SAMPLER
Caney
Flow
Storm water ditch
Flow
DISCHARGE POINT
Front St.
CONTROL SITE
Storm water ditch
US 90
Glastel
Frank Pond
Gulf Coast Fert.
Zion
Willow
Marsh
Marsh
SR 231
I-10

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Facility Name: City of Cottondale	Date Summary Prepared: 9/23/93	
Location (attach detailed map): Front Street	County: Jackson	District: Northwest
Federal Permit # FL0030058 and expiration date:	State GMS # and 1032M0478 State expiration date: June 10, 1994	Facility Type: Industrial (Municipal) Federal Agricultural Other (list):

Function of facility: Operate a 0.125 MGD oxidation ditch (extended aeration) Wastewater Treatment Plant with effluent discharge to a polishing pond to Caney Pond. * See Note

Description of treatment process:
Wastewater treatment by extended aeration. Effluent discharge to a polishing pond to Caney Pond. Sludge treated and disposed by anaerobic digester - sludge drying beds. Dewatered sludge should be transported and disposed of at an approved landfill or disposal site.

Receiving waters: a polishing pond to Caney Pond	Classification: I II (III)	
Design Flow: .125 MGD	Mean Flow:	Flow during survey: 90,000 GPD

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.):
X N/A

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

Parameter	Limit (units)
Flow	0.125 MGD (max. mo. avg.)
pH - Effluent	min - 6.0 max. 8.5
Chlorine Residual After Contact	min. - 0.5 mg/L
Chlorine Residual Discharge	max. - 0.01 mg/L
Dissolved Oxygen	min. - 5.0 mg/L
BOD5	10 mg/L (max. annual avg.)
Suspended Solids	10 mg/L (max. annual avg.)
Total P	6.0 mg/L (max. annual avg.)
Total N	13.5 mg/L (max. annual avg.)
Fecal Coliform	200/100 ml (max.)

Describe special permit conditions and permit modifications:

Cottendale
(Facility)

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Description of permitted outfall(s):

List permit violations (from MOR data or other source) and plant upsets that occurred within past year: An inspection of the Cottendale wastewater treatment facility was conducted on February 23, 1993. According to the inspector's comments 1) the clarifier weirs needed cleaning - there was too much algae growth. 2) all screening collected should be placed in containers with lid for sanitary purposes. The inspector found the plant to operating in a satisfactory manner at the time of the inspection.

A complaint of a sewage spill was received on August 12, 1993 by the D.E.P. According to a City of Cottendale employee, Florida Asphalt was working on Highway 231 and broke the main sewer line at an earlier date. The office was contacted on August 12, 1993 and informed that cleanup was under control. 4TH had been applied and area was to be limed.

According to January 1993's Monthly Operating Report, Cottendale WWTP monthly average daily flow exceeded its permitted capacity (i.e. reported - .1469 ; permitted capacity = .125). >Reasons for exceeding limit are in a letter in Facility's File.

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

x Past NW District bioassessment's have found impact in Caney and Gnat Hole Pond's. High nutrients and chlorophyll have been recorded in the past.

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

In reference to February's MOR data from Cottendale WWTP and the inspection's data results from February 23, 1993's inspection, the Facility's data was reflective of the MOR data.

Additional information:

* Discharge to Caney Pond is per old permit. Present discharge is into a drainage ditch. Caney Pond has become a marsh.

Staff contributing to this review (signature):

Glenn Butts	(Biologist)
	(Inspector)
	(Engineer)
Karen L. McDonald	(ESI-Tampa)
	( )
	( )

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: NW DISTRICT	STORET STATION NUMBER:	DATE (M/D/Y): 09-09-93	TIME: 0935	RECEIVING BODY OF WATER: COTTONDALE DITCH

REMARKS:	LOCATION:	FIELD ID/NAME:
TEST SITE	DOWNSTREAM OF WWTP AT STREAM GAUGE	#3 TEST SITE

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
25	10	5	50	10		

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

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

Point-Source Pollution (list location and describe): COTTONDALE WWTP, URBAN RUNOFF

Estimated System Width (range, m): 3.2	Estimated System Depth (range, m): 0.3		yes
High Water Mark (m above bed): 3.0	Velocity (range, m/s): 0.025	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 ☐ SLIGHT

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)	2			Riffles			
Leaf Packs	2			Sand	77		
Aquatic Vegetation				Mud/Muck/Silt	5		
Rock or Shell Rubble	2			Benthic leaf mats			
Undercut Banks/Roots	2			Other:			

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):			Secchi (m):
Top		26.4	7.7	5.9	600			
Mid-depth								
Bottom								

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

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

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

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

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

Weather Conditions: OVERCAST, LIGHT RAIN

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

SAMPLING TEAM:	SIGNATURE:	DATE:
G.L. BUTTS	Glenn Butts	9-8-93

percentages modified as per phone contact with GB

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

SUBMITTING AGENCY CODE: 8210 SUBMITTING AGENCY NAME: NW DISTRICT	STORET STATION NUMBER:	DATE (M/D/Y): 09-08-93	RECEIVING BODY OF WATER: COTTONDALE DITCH

REMARKS: TEST SITE	LOCATION: DOWNSTREAM OF CULVERT AT STREAM GUAGE	FIELD ID/NAME: #3 TEST SITE

Habitat Parameter score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover 10	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 5	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 3	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 8	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	Add 5 points if cross-sectional area of flow is estimated to be greater than one square meter during periods of normal flow.	TOTAL SCORE
[illegible]		29

COMMENTS: STORMWATER DITCH THAT DRAINS COTTONDALE NORTH OF RR AND EAST OF SR 231

ANALYSIS DATE:	ANALYST:	SIGNATURE:
09-08-93	G.L. BUTTS	Glenn Butts

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: NW DISTRICT	STORET STATION NUMBER:	DATE (M/D/Y): 09-08-93	TIME: 1020	RECEIVING BODY OF WATER: COTTONDALE DITCH

REMARKS:	LOCATION: ABOVE WWTP	FIELD ID/NAME: # 2 REFERENCE SITE
CONTROL SITE		

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
5	5		70	20		

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): 1.0	Estimated System Depth (range, m): 0.1	yes	
High Water Mark (m above bed): 3.0	Velocity (range, m/s): <0.025	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)	1			Riffles			
Leaf Packs	1			Sand	85		
Aquatic Vegetation				Mud/Muck/Silt	10		
Rock or Shell Rubble	1			Benthic leaf mats	1		
Undercut Banks/Roots	1			Other:			

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):			Secchi (m):
Top		28.5	7.1	5.1	620			
Mid-depth								
Bottom								

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

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: OVERCAST, LIGHT RAIN

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

SAMPLING TEAM: G.L. BUTTS	SIGNATURE: Glenn Butts	DATE: 9-8-93

percentages modified as per phone instruct

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

SUBMITTING AGENCY CODE: 8070 / SUBMITTING AGENCY NAME: NW DISTRICT	STORET STATION NUMBER:	DATE (M/D/Y): 09-08-93	RECEIVING BODY OF WATER: COTTONDALE DITCH

REMARKS: CONTROL SITE	LOCATION: ABOVE WWTP	FIELD ID/NAME: #2 REFERENCE SITE

Habitat Parameter / score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover — 5	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 — 1	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 — 2	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 — 5	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	Add 5 points if cross-sectional area of flow is estimated to be greater than one square meter during periods of normal flow.	TOTAL SCORE
[illegible]		15

COMMENTS: URBAN RUNOFF EVIDENT, THIS IS A STORMWATER DITCH, MORNING GLORY VINES, POINSETTA'S ABUNDANT, Smartweed IN DITCH, Polygonum sp

ANALYSIS DATE: 09-08-93	ANALYST: G.L. BUTTS	SIGNATURE: Glenn Butts

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: CITY OF COTTONDALE WWTP
Location:
County: JACKSON
Contact/District: GLEN BUTTS NW
NPDES Permit #: FL00 30058 Outfall #: 001
LIMS 61718 93SEP08-23

Sample Collection: Date 9-7-93 Time 0930
Test Beginning: Date 9-8-93 Time 1255
Test Ending: Date 9-10-93 Time 1430
Organism Batch #: 108 Diluent Batch #: 22
Organism Age: ≤ 24 HRS
Test Organism: CERIODAPHNIA DUBIA

Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through
Test Number: 1 of 4

Remarks:
DECHLORINATED IN LAB

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	24.1 @ 24.1	8.3 @ 24.1	1009 @ 1,000 9780 @ 10,000 @ 24.6 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.9 @ 24.0	8.3 @ 24.3	1010 @ 1,000 9800 @ 10,000 @ 24.5 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	24.5 @ 24.5	8.3 @ 24.4	1008 @ 1,000 9770 @ 10,000 @ ___ °C

		Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm)		
Conc.	Chamber #	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
control	A	5	5	5	8.3		8.4	23.3		24.4	8.0		8.7	170		210
control	B	5	5	5			8.4			24.3			8.8			215
control	C	5	5	5			8.4			24.3			8.7			190
control	D	5	5	5			8.4	18	24.0	24.3			8.8			200
100%	A	5	5	4	7.8		8.6	23.3		24.5	7.0		8.6	590		600
100%	B	5	5	2			8.6			24.6			8.5			595
100%	C	5	5	0			8.6			24.6			8.5			590
100%	D	5	5	0			8.6			24.1			8.7			590
Measured/Loaded by:		ME	TR	MT	MF	TM	MF	MF	TM	MF	MF	TM	MF	MF	TM	ME
Recorded by:		KP	TR	MT	KP	TR	KP	KP	TR	KP	KP	TR	KP	KP	TR	KP

Investigators' Signatures

Kippy Pearce
Robin C. Rader
Marshall Finkbeiner

Reviewer

form updated 7/8/93

	Salt Water/ (Well Water)	20% Min Water	Sample	Method	Measured by
	Water Quality Parameters				
Field Total Residual Cl2:			NOT	MEASURED	
Lab Total Residual Cl2:	<0.03	<0.03	.04	DR100	KP
Alkalinity:	132	53	240	Hach	KP
Hardness:	141	93	177	Hach	KP
Total Ammonia:	<0.01	<0.01	13.4		MF

Ammonia Meter #98136 Ammonia Meter Slope: 53.1 Ammonia Blank: <0.01 Control Salinity: 0 ppt Sample Salinity: 0 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: COTTONDALE WWTP
Location:
County: JACKSON
Contact/District: GLEN RUTTS NW
NPDES Permit #: FL00 30025[illegible] Outfall #: 001

Sample Collection: Date 9-7-93 Time 0930
Test Beginning: Date 9-8-93 Time 1330
Test Ending: Date 9-10-93 Time 1430
Organism Batch #: 36 Diluent Batch #: WELL
Organism Age: 11 DAYS
Test Organism: CYPRINELLA LEEDSI

61718 93-SEP-08-23

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

Test Number: 2 of 4

Remarks:
DECHLORINATED IN LAB

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	24.1 @ 24.1	8.3 @ 24.7	1009 @ 1,000 9780 @ 10,000 @ 24.6 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.9 @ 24.0	8.3 @ 24.3	1010 @ 1,000 9800 @ 10,000 @ 24.5 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	24.5 @ 24.5	8.3 @ 24.4	1008 @ 1,000 9770 @ 10,000 @ 24.5 °C

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	24 h	48 h
control	20	5	5	5	7.9	8.2	8.3	23.6	24.1	24.2	8.0	7.9	8.8	245	250	250
control	74	5	5	5	7.9	8.2	8.3			24.1	7.9	7.9	8.7	245	250	250
100%	9	5	3	3	7.9	8.1	8.2	23.1	24.0	23.9	8.6	7.3	7.1	645	625	620
100%	183	5	5	5	7.9	8.1	8.2	24.7		23.8	8.6	7.3	7.0	645	630	630
											KP					
											5.8					
											5.9					
											entered					
											Green Cove					
											data KP					
											9/15/93					
											temp + D.O.					
								Jun 20	24.0				8.7			
								Jun 74	23.9				8.6			
								Green Cove #3								
								24 hr 48 hr			KP	9/10/93				
Measured/Loaded by:		TR	TM	MF	MF	TM	MF	MF	TM	MF	MF	TM	MF	MF	TM	MF
Recorded by:		KP	TM	MF	KP	TR	KP	KP	TR	KP	KP	TR	KP	KP	TR	KP

Investigators' Signatures

Kim Pearce
Tobin C. Rader
Brad Fincher

Reviewer

Water Quality Parameters	Salt Water/ Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			NOT	MEASURED	
Lab Total Residual Cl2:	<0.03	<0.03	.04	DR100	KP
Alkalinity:	132	53	240	Hach	KP
Hardness:	141	93	177	Hach	KP
Total Ammonia:	[illegible]	[illegible]	1.34	[illegible]	MF

Ammonia Meter #98136 Ammonia Meter Slope: [illegible] Ammonia Blank: [illegible] Control Salinity: 0 ppt Sample Salinity: 0 ppt

form updated 7/8/93

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: COTTONDALE C.W.T.P.
Location:
County: JACKSON
Contact/District: GLENN BUTTS
NPDES Permit #: FL00 30058 Outfall #: 001

Sample Collection: Date 9-7-93 Time 0930
Test Beginning: Date 9-8-93 Time 1255
Test Ending: Date 9-10-93 Time 1430
Organism Batch #: 108 Diluent Batch #: 92
Organism Age: 4-24 HRS
Test Organism: CERIODAPHNIA DUBIA

61718 95-3EP-08-23

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

Test Number: 3 of 4

Remarks:
CHLORINATED ALIQUOT

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	24.1 @ 24.1	8.8 @ 24.7	1009 @ 1,000 9780 @ 10,000 @ 24.6 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.9 @ 24.0	8.3 @ 24.3	1010 @ 1,000 9800 @ 10,000 @ 24.5 °C
48 hr	7.0 @ 7.0 9.0 @ ___	___ @ ___	___ @ ___	___ @ 1,000 ___ @ 10,000 @ ___ °C

Conc.	Chamber #	Number Live 0 hr	24 h	48 h	pH 0 hr	24 h	48 h	Temperature (°C) 0 hr	24 h	48 h	D.O. (mg/L) 0 hr	24 h	48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	24 h	48 h
control	A	5	5	5	8.2		8.4	23.3		24.4	5.0		8.7	172		210
control	B	5	5	5			8.4			24.3			8.8			215
control	C	5	5	5			8.4			24.3			8.7			190
control	D	5	5	5			8.4			24.0			9.8			200
100%	A	5	1	0	7.8		5.6	23.9		24.8	6.8		8.5	610		600
100%	B	5	0	0			5.6			24.9			8.2			590
100%	C	5	1	0			8.6			24.9			8.5			585
100%	D	5	0	0			8.6			24.3			8.7			590
Measured/Loaded by:		MF		MF	MF		MF	MF		MF	MF		MF	MF		MF
Recorded by:		KP		KP	KP		KP	KP		KP	KP		KP	KP		KP

Investigators' Signatures

Reviewer

	Salt Water/ Well Water	Water Quality Parameters 20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			NOT	MEASURED	
Lab Total Residual Cl2:	<0.03	<0.03	0.11	DPD	KP
Alkalinity:	132	53	240	Hach	KP
Hardness:	141	93	177	Hach	KP
Total Ammonia:	<0.07	<0.07	1.54	Hach	MF

Ammonia Meter #98136 Ammonia Meter Slope: -57 Ammonia Blank: -0.02 Control Salinity: 0 ppt Sample Salinity: 0 ppt

form updated 7/8/93

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: COTTONDALE WWTP
Location:
County: JACKSON
Contact/District: GLENN BUTTS
NPDES Permit #: FL00 30055 Outfall #: 001

Sample Collection: Date 9-7-93 Time 0930
Test Beginning: Date 9-8-93 Time 1330
Test Ending: Date 9-10-93 Time 1430
Organism Batch #: 36 Diluent Batch #: WELL
Organism Age: 11 DAYS
Test Organism: CYPRINELLA LEEDSI

6171 93-SEP-CB-23

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

Test Number: 4 of 4

Remarks:
CHLORINATED ALIQUOT

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
	meter # 7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0	24.1 @ 24.1	8.3 @ 24.7	1009 @ 1,000
	9.0 @ 9.0			9730 @ 10,000 @ 24.6°C
24 hr	7.0 @ 7.0	23.9 @ 24.0	8.3 @ 24.5	1010 @ 1,000
	9.0 @ 9.0			9800 @ 10,000 @ 24.5°C
48 hr	7.0 @ 7.0	24.5 @ 24.5	8.3 @ 24.4	1008 @ 1,000
	9.0 @ 9.0			9770 @ 10,000 @ 24.5°C

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	24 h	48 h
control	20	5	5	5	7.9	8.2	8.3	23.1	24.1	24.4	8.0	7.9	8.8	250	250	250
control	14	5	5	5	7.9	8.2	8.3			24.3	7.9	7.9	8.7	245	250	250
100%	19	5	3	3	7.6	8.1	8.3	24.2	24.1	24.3	8.1	7.3	7.5	640	620	615
100%	4	5	5	5	7.6	8.2	8.3			KP	6.1	7.3	7.4	635	625	615
								jan 20		24.0						
								jan 14		23.9						
								jan 19		23.9				entered		
								jan 4		23.8				C. dubia		
														readings		
								quick-Corsen						KP	9/8/93	
								Core # above								
								@ 45 h KP		9/10/93		jan 20		245		
												jan 14		245		
												jan 19		635		
												jan 4		635		
Measured/Loaded by:		TR	TR	TR	MF	TM	MF	MF	TM	MF	MF	TM	MF	MF	TM	MF
Recorded by:		KP	TM	TM	KP	TR	KP	KP	TR	KP	KP	TR	KP	KP	TR	KP

Investigators' Signatures

Kim Pearce
Tobie C. Rader
Mandy Hamlett

Reviewer

form updated 7/8/93

Water Quality Parameters	Salt Water/ Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			NOT	MEASURED	
Lab Total Residual Cl2:	<0.03	<0.03	0.11	DR100	KP
Alkalinity:	132	83	240	Hach	KP
Hardness:	141	93	177	Hach	KP
Total Ammonia:	<0.07	<0.07	1.34	Hach	mf

Ammonia Meter #98136 Ammonia Meter Slope: -52.1 Ammonia Blank: <0.07 Control Salinity: 0 ppt Sample Salinity: 0 ppt

Benthic macroinvertebrate taxa list for Cottondale WWTP, collected via Ponar grab samples in an unnamed stormwater ditch, on 7 September, 1993. Densities, in number/m^2, represent the mean of three replicates.

	Reference Site	Test Site
Diptera		
Ablabesmyia mallochi	62	–
Ablabesmyia rhamphe grp.	37	–
Chironomus sp.	50	137
Conchapelopia sp.	12	–
Goeldichironomus holoprasinus	50	287
Microtendipes rydalensis grp.	12	–
Pentaneura inconspicua	12	–
Polypedilum convictum grp.	12	–
Polypedilum fallax grp.	37	–
Polypedilum halterale grp.	12	–
Polypedilum illinoense	25	12
Polypedilum tritum	62	–
Stenochironomus sp.	62	–
Stelechomyia perpulchra	12	–
Stempellinella sp.	12	–
Tanytarsus sp. D Epler	12	–
Tribelos atrum	12	–
Tribelos jucundum	12	–
Gastropoda		
Physella sp.	12	12
Oligochaeta		
Eclipidrilus sp.	–	37
Limnodrilus hoffmeisteri	162	362
Nais simplex	12	–
Undetermined enchytraeid	25	–
Total	716	847

Benthic macroinvertebrate taxa list for Cottondale WWTP, collected via 20 discrete dip net sweeps in an unnamed stormwater ditch, on 7 September, 1993.

	Reference Site	Test Site
Coleoptera		
Dibolocelus ovatus	–	1
Hydrocanthus sp.	1	–
Pelonomus obscurus	–	1
Diptera		
Chironomus sp.	12	44
Goeldichironomus holoprasinus	41	21
Odontomyia sp.	–	1
Polypedilum tritum	–	1
Gastropoda		
Physella sp.	–	2
Hemiptera		
Undetermined belostomatid	1	1
Lepidoptera		
Undetermined lepidopteran	2	–
Malacostraca		
Procambarus sp.	2	1
Odonata		
Libellula vibrans	–	2
Orthemis ferruginea	1	–
Oligochaeta		
Eclipidrilus sp.	5	–
Limnodrilus hoffmeisteri	10	12
Undetermined enchytraeid	–	14
Pelecypoda		
Sphaerium or *Musculium* sp.	1	–
Total	76	101

Phytoplankton taxa list and densities (#/mL) for Cottondale WWTP, collected via subsurface grabs in an unnamed stormwater ditch, on 7 September, 1993.

	Reference Site	Test Site
Diatoms		
Navicula sp.	387	43
Neidium sp.	172	–
Nitzschia sp.	172	86
Chlorophyta		
Chlamydomonas sp.	43	–
Closterium sp.	43	–
Cryptophyta		
Unknown cryptophyte	43	–
Cyanophyta		
Arthrospira sp.	–	86
Chroococcus sp.	43	–
Lyngbya sp.	43	43
Oscillatoria sp.	129	43
Euglenophyta		
Euglena sp.	43	–
Total	1118	301

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

1	2	3	11	12	17	18	19	20
Transaction Code		NPDES NUMBER		YR/MO/DA		Insp Type	Inspector	Fac Type
N	5	FL0030058		090793		X	S	1

Remarks

21 66

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

1	2	3	11	12	17	18	19	20
Transaction Code		NPDES NUMBER		YR/MO/DA		Insp Type	Inspector	Fac Type
N	5	FL0030058		090793		B	S	1

Remarks

21 66