

Biological Assessment of

Quincy Wastewater Treatment Plant

Gadsden County

NPDES #FL0029033

Sampled November 1995

March 1996

Biology Section

Division of Administrative and Technical Services

Comprehensive Quality Assurance Plan No. 870346G

Department of Environmental Protection
Results of Fifth Year Inspections

Discharger: The City of Quincy WWTP
County Gadsden
NPDES Number: FL0029033
NPDES Permit Expiration Date: 30 September 1996

Toxics Sampling Inspection (XSI)

Date Sampled: 6 November 1995

Results: Of the three organic pollutants found in the Quincy WWTP effluent, diazinon (0.15 µg/L), was present in an acutely toxic concentration, and probably caused or contributed to the toxicity observed in the *Ceriodaphnia dubia* bioassay. The effluent copper (17 µg/L) and silver (0.1 µg/L) concentrations exceeded Class III standards of 5.9 µg/L (hardness-based) and 0.07 µg/L, respectively (violations of Rules 62-302.530(24) and 62-302.530(60) FAC). None of the other metals exceeded Class III standards.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 6 November 1995

Results: The full strength effluent sample was acutely toxic to the invertebrate, *Ceriodaphnia dubia,* killing all test organisms within 48 hours (a violation of Rules 62-302.500(1)(d) and 62-4.244(3)(a) FAC). The effluent was not toxic to the fish, *Cyprinella leedsi.*

Impact Bioassessment Inspection (IBI)

Date Sampled: 6 November 1995

Results: The Stream Condition Index (SCI) ranked the reference site as "unimpaired", but placed the test site in the "severe degradation" category. The macroinvertebrate results, in conjunction with the nutrient measurements, indicate the discharge was causing an imbalance of aquatic fauna, prohibited by Rule 62-302.530(48)(b) FAC. The Quincy Creek test site was dominated by four pollution tolerant organisms, indicating the facility was causing a dominance of nuisance species, a violation of Rule 62-302.530(47) FAC. Increases in periphyton density and chlorophyll *a* at the test site were probably the result of two factors: nutrient enrichment from the discharge and increased sunlight penetration associated with the open tree canopy at the test site.

Water Quality Inspection (WQI)

Date Sampled: 6 November 1995

Results: The test site fecal coliform value (1,200 organisms/100 mL) exceeded Class III water quality standards, a violation of Rule 62-302.530(6) FAC. Total coliform counts at the reference site (2,800 organisms/100 mL) and at the test site (7,700 organisms/100 mL) both violated Class III standards (Rule 62-302.530(7) FAC). The facility caused total phosphorus and nitrate-nitrite enrichment of Quincy Creek. Effluent total phosphorus was 0.96 mg/L and the nitrate-nitrite was 4.1 mg/L. The test site total phosphorus level was higher those that found in approximately 88% of other Florida streams, and the nitrate-nitrite level of the test site greatly exceeded those found in 95% of other Florida streams.

Introduction

The City of Quincy Wastewater Treatment Plant, located in Gadsden County, Florida, is a 1.5 MGD contact stabilization domestic wastewater facility (see maps in Appendix). Treatment includes influent grit separation, primary clarification, aeration, secondary clarification, and chlorination for disinfection with subsequent dechlorination. Sludge is processed via aerobic digestion and dewatering on drying beds prior to transport to Gilbert Farms for use in land application, or to the Quincy-Byrd landfill for disposal. Effluent is discharged through a 500 ft. pipe to a swampy portion of Quincy Creek, which flows into the Little River, and ultimately to Lake Talquin. Effluent flow during this survey (0.997 MGD) was similar to the facility's average flow for the previous year (0.978 MGD).

Permit limits for the plant include: flow (1.5 MGD maximum), pH (6-8.5 SU), CBOD and TSS (15 mg/L as an annual average), chlorine residual (maximum of 0.01 mg/L at discharge), TKN (10 mg/L as an annual average), dissolved oxygen (minimum of 5.0 mg/L), and fecal coliforms (200 organisms/100 mL maximum). Additionally, the permit requires monitoring of influent CBOD and TSS, as well as monitoring of effluent total nitrogen and total phosphorus. Toxicity bioassays are required to be conducted on a bimonthly basis.

This facility, which has had toxicity problems since 1988, has been placed under Administrative Orders to perform Toxicity Reduction Evaluation (TRE) testing. Since 1994, the effluent has been toxic in 7 out of 11 bioassays. In an attempt to reduce toxicity, landfill leachate is now receiving pre-treatment before entering the WWTP.

Results of a 1991 Bioassessment indicated effluent violations of silver, zinc, gamma-BHC (Lindane), acute toxicity, and coliform bacteria. Benthic macroinvertebrate and algal communities were found to be healthy downstream of the discharge. It should be noted, however, at that time access problems (extensive swamp) prevented the test site from being established near the discharge, and it was, consequently, located approximately 1.5 miles downstream.

Major characteristics of community structure of control and test sites.

	Reference Site	Test Site
Macroinvertebrate Qualitative		
Number of Taxa	32	30
Florida Index	22	4
Stream Condition Index (SCI)	23	11
EPT Index	6	1
% Contribution of Dominant Taxon	28.6	23.8
% Oligochaeta	1.9	33.0
% Coleoptera	22.9	0.3
% Trichoptera	1.0	0
% Ephemeroptera	8.6	2.5
% Diptera	50.5	56.5
% Gastropoda	0	3.4
% Pelecypoda	9.5	0.3
% Other	5.7	4.0
% Predators	7.6	7.3
% Above Surface Deposit Feeders	29.1	19.4
% Below Surface Deposit Feeders	1.9	33.0
% Suspension Feeders	16.7	2.3
% Scrapers	6.7	4.8
% Shredders	31.0	12.5
% Scavengers	1.9	0
% Unknown	1.9	20.7
Periphyton Algae		
Number of Taxa	16	43
Shannon-Weaver Diversity	2.3	3.9
Algal Density (#/sq. cm)	10,434	542,608
Chlorophyll a (mg/sq. m)	0.01 U	48.7
Diatom/Diatom + B-G Abundance Ratio	.31	.97
% Blue-green	65.2	2.7
% Green	5.8	7.2
% Diatoms	29.0	90.0
% Other	0	0
Algal Growth Potential (mg dry wt/l)	24.8	94.6

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 Quincy Creek upstream of the discharge, at the Highway 12 bridge crossing) and a test site (also located in Quincy Creek, immediately downstream of the discharge). Habitat assessment was performed *in situ* to establish comparability between sites. Supplemental physical/chemical data were also collected on the effluent and study sites. Acute screening toxicity bioassays, using *Ceriodaphnia dubia* and *Cyprinella leedsi* as test organisms, were performed on an effluent sample (Weber 1991). The effluent was analyzed for metals and for organic constituents (base neutral and acid extractables, and pesticide extractables). Additionally, nutrient analyses were performed on the effluent, the reference site, and the test site. Methods used for all chemical analyses are on file at the Tallahassee DEP Chemistry Laboratory.

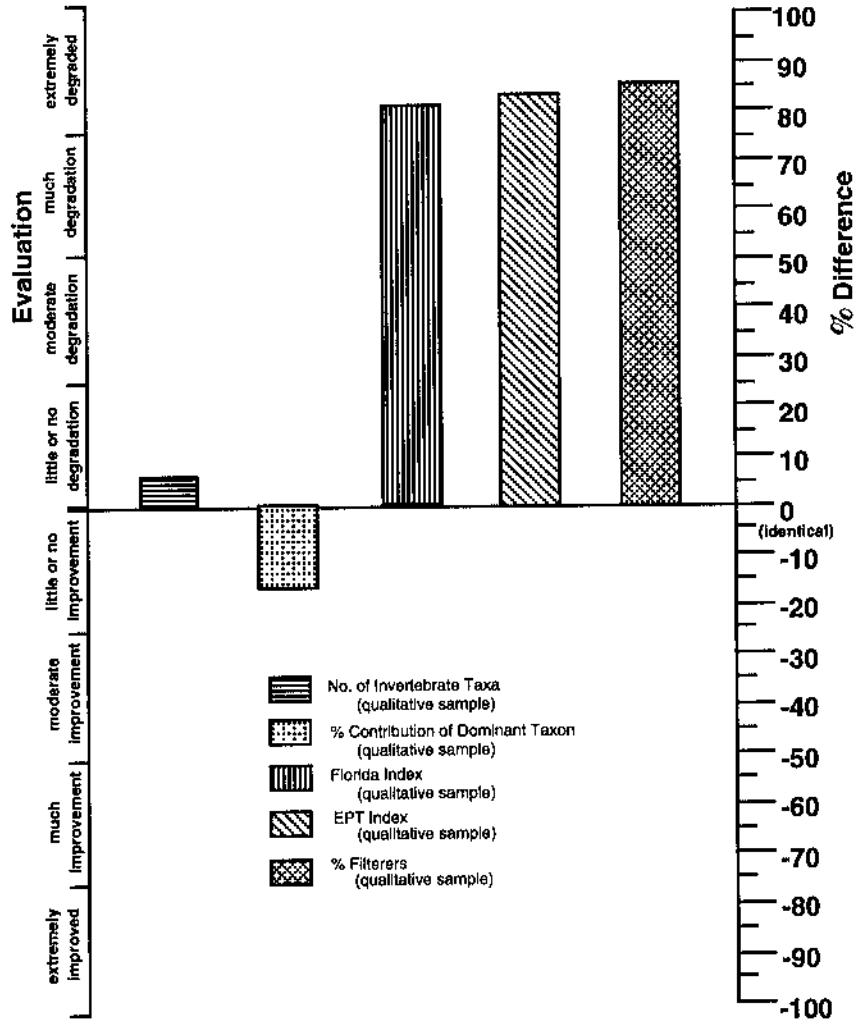
Benthic macroinvertebrate communities were evaluated at the reference and test sites. Invertebrates were collected from multiple substrates (*e.g.*, snags, leaf packs, vegetation) using 20 discrete dip net sweeps. Hester-Dendy artificial substrates, which were incubated for 28 days (Ross 1990), were deployed. Unfortunately, one Hester-Dendy sampler from the test site was lost, rendering this data set unusable for regulatory purposes. Consequently, the dip net data will be emphasized in this report. Periphyton was sampled at the reference and test sites by incubating glass microscope slides in a standard periphytometer for 28 days (Ross 1990). Chlorophyll *a* was also determined for periphyton communities (Ross 1990). Algal Growth Potential tests, using *Selenastrum capricornutum* as the test organism, followed Miller *et al.* (1978).

Explanation of Measurements of Community Health

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

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

Shannon-Weaver diversity: This index is specified in the Florida Administrative Code as a measure of biological integrity. Low diversity scores are undesirable. They represent conditions where only a few organisms are abundant, to the exclusion of other taxa. Ex-



Effect of discharge on the benthic macroinvertebrate community.

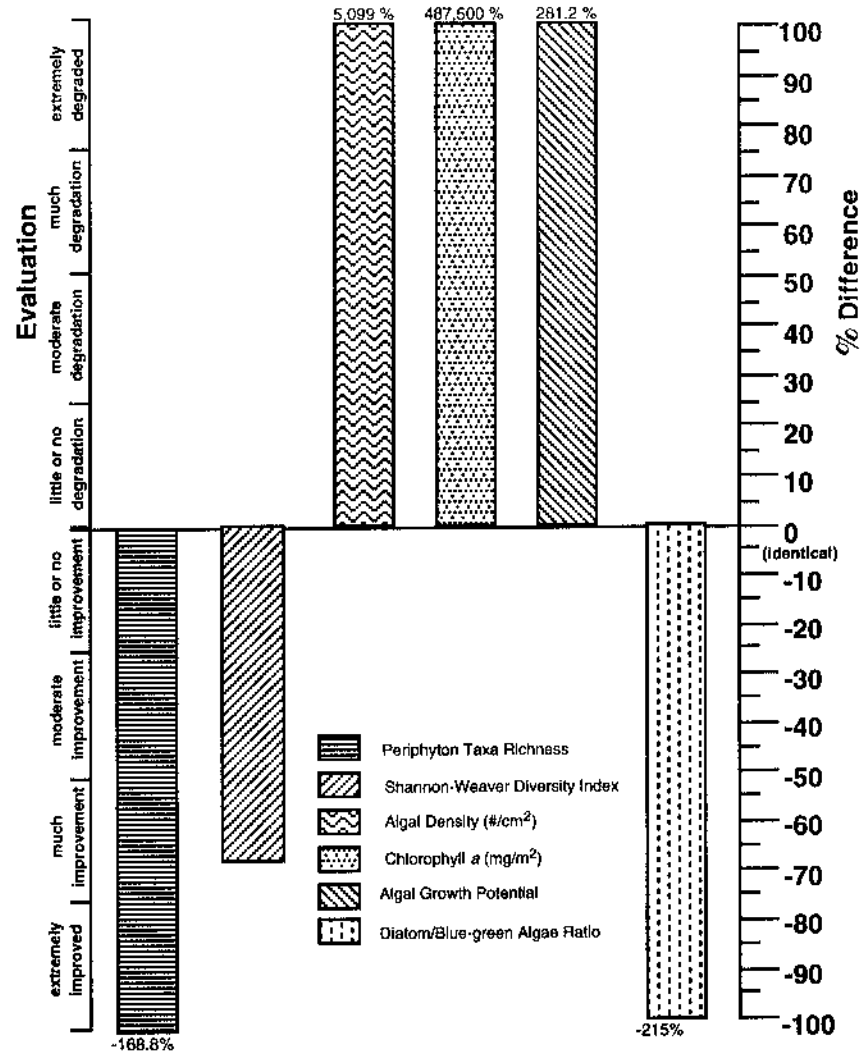
cessive numerical dominance of a single type of organism (a high % contribution of the dominant taxon) is a related measure which is also associated with disturbance.

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

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

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

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



Effect of discharge on the algal community.

nutrient enriched conditions in flowing streams.

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

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

For graphical purposes, the percent differences between the reference and test sites involving the number of taxa, the diversity index, the Florida Index, the EPT Index, and the % filter-feeders are measured as the reference site minus test site divided by the reference site. The percent differences between sites involving algal density, chlorophyll *a*, and algal growth potential are measured as the test site minus reference site divided by the reference site.

The following personnel were involved in this investigation:

Glenn Butts and Lisa Kelley (DEP Northwest District) and Lyn Burton, Russel Frydenborg, Joy Jackson, Kathleen Lurding, Elizabeth Miller, Urania Quintana, Bart Richard, Lisa Tamburello, Vicki Whiting, and Greg Wynn (Tallahassee Biology Laboratory). The report was reviewed by the Point Source Studies Review Committee, consisting of Wayne Magley, Jan Mandrup-Poulsen, and Michael Tanski, as well as District representatives.

Results and Discussion

Habitat quality, with 133 points at the reference site and 112 points at the test site, was optimal at both sampling stations. In-stream substrates at the reference site consisted of snags, roots, and leaf packs. Snags and aquatic vegetation were available at the test site. Quincy Creek was roughly 1.5 m deep at both sites. Water velocity, which was rapid at the reference site (0.8 m/sec), decreased to < 0.1 m/sec at the test site, resulting from the swampy conditions there. The tree canopy at the test site was considerably more open than that of the reference site, which was moderately shaded.

Some physical/chemical measurements at the test site, when compared to the reference site, indicated the influence of the discharge. For example, the test site sediments possessed an odor of sewage. Dissolved oxygen decreased from 8.8 mg/L at the reference site to 3.9 mg/L at the test site (which is below Class III water quality standards). Specific conductance increased from the reference site (55 µmhos/cm) to the test site (249 µmhos/cm). The effluent conductivity was 250 µmhos/cm. Water temperature increased from 16.3 °C at the reference site to 19.3 °C at the test site. The pH was similar at both sites (6.9 to 7.0 SU).

The full strength effluent sample was acutely toxic to the invertebrate, *Ceriodaphnia dubia,* killing all test organisms within 48 hours (a violation of Rules 62-302.500(1)(d) and 62-4.244(3)(a) FAC). The effluent was not toxic to the fish, *Cyprinella leedsi* (Appendix).

Organic pollutants found in the Quincy WWTP effluent included diazinon (0.15 µg/L), 2, 4, 6-trichlorophenol (1.8 mg/L), and hexazinone (0.2 g/L). Diazinon is acutely toxic to invertebrates at concentrations as low as 0.03 µg/L (AQUIRE 1991). The concentration of diazinon in the Quincy WWTP was high enough to have caused or contributed to the toxicity observed in the *C. dubia* bioassay. The other organic compounds in the effluent were at less than chronically toxic levels.

Copper (17 µg/L), zinc (42 µg/L) iron (75 µg/L) and silver (0.1 µg/L), were found in the effluent at concentrations above the practical quantitation limit. At an effluent hardness of 44 mg $CaCO_3$/L, the effluent copper concentration exceeded the Class III standard of 5.9 µg/L (a violation of Rule 62-302.530(24) FAC). The effluent silver concentration also exceeded its Class III limit of 0.07 µg/L (a violation of Rule 62-302.530(60) FAC). None of the other metals exceeded Class III standards.

Fecal coliform bacteria were measured to be 470 organisms/100 mL at the reference site and 1,200 organisms/100 mL at the test site. The test site value exceeded Class III water quality standards, a violation of Rule 62-302.530(6) FAC. Total coliform counts were 2,800 organisms/100 mL at the reference site and 7,700 organisms/100 mL at the test site. Both of these values violated Class III standards (Rule 62-302.530(7) FAC). Effluent levels of fecal coliforms (180 organisms/100 mL) and total coliforms (1,500 organisms/100 mL) were lower than receiving water values. The fecal coliform concentration was within it's permit limit, indicating that the facility was adequately disinfecting the discharge at the time of sampling. Since the test site coliform levels were much higher than those of the reference site, it seems probable the Quincy discharge is contributing to the observed increase, and suggests previous episodes of inadequate disinfection.

The facility was responsible for significantly enriching Quincy Creek with total phosphorus and nitrate-nitrite. For example, total phosphorus increased from 0.096 mg/L at the reference site to 0.63 mg/L at the test site. Effluent total phosphorus was 0.96 mg/L. Nitrate-nitrite increased from 0.34 mg/L at the reference site to 2.5 mg/L at the test site. Nitrate-nitrite of the discharge was 4.1 mg/L. While the test site total phosphorus level was higher than those found in approximately 88% of other Florida streams, the nitrate-nitrite level of the test site greatly exceeded those found in 95% of other Florida streams (see table of typical water quality values in Appendix). Data from the facility's Monthly Operating Reports indicate the values measured in this study are representative of median nutrient values from the past year. From January 1995 to January 1996, total nitrogen ranged from 0.88 – 9.8 mg/L

(median 4.7 mg/L), total phosphorus ranged from 0.66 – 1.43 mg/L (median 1.17 mg/L), and TKN ranged from 1.09 – 10.2 mg/L (median 2.57 mg/L).

Algal growth potential (AGP) increased from 24.8 mg dry wt/L at the reference site to 94.6 mg dry wt/L at the test site. Although both exceeded the 5 mg dry wt/L "problem threshold" of Raschke and Schultz (1987), the test site AGP clearly indicated the influence of the discharge. The effluent AGP was 193.9 mg dry wt/L. Elevated AGP at the reference site may be due to runoff from surrounding agricultural (tomato) fields.

Several qualitative measures of benthic macroinvertebrate community health indicated severe adverse effects associated with the discharge. The figure on p. 2 indicates the degree of difference between the invertebrate populations of the reference and test sites. Larger differences (that is, higher percentages) correspond with greater degrees of degradation. Negative values mean that the test site is better than the reference.

Although taxa richness at the reference site (with 32 taxa) was similar to that of the test site (which had 30 taxa), the pollution sensitive taxa found at the reference site were almost exclusively replaced by pollution tolerant taxa at the test site. This was evident by the negative changes in other measures of community health. For example, the Florida Index decreased from 22 (a healthy score) at the reference site to an abnormally low value of 4 at the test site. The EPT Index decreased from 6 at the reference site to only 1 at the test site. An unusual lack of filter feeders (2.3 % of the total population) at the test site demonstrated the trophic relationships (food web patterns) were disrupted there. The Stream Condition Index (SCI), which summarizes the health of stream biota, ranked the reference site (with SCI 23 points) as "unimpaired", but placed the test site (with 11 SCI points) in the "severe degradation" category. These results, in conjunction with the nutrient measurements, clearly indicate the discharge was causing an imbalance of aquatic fauna, prohibited by Rule 62-302.530(48)(b) FAC.

The Quincy Creek test site was dominated (69.4% of the total population) by four pollution tolerant organisms, including the midges, *Chironomus* sp. and *Goeldichironomus holoprasinus,* and the oligochaetes, *Dero trifida*, and *Limnodrilus hoffmeisteri*. The abundance of these pollution tolerant taxa, described by Beck and Beck (1969) or Brinkhurst (1986) as nuisance species or characteristic of polluted areas, indicates the facility was causing a dominance of nuisance species, a violation of Rule 62-302.530(47) FAC. The adverse effects seen in the biological communities in Quincy Creek are in response to several factors, including somewhat depressed dissolved oxygen, an acutely toxic discharge (diazinon, etc.), and nutrient enrichment with subsequent eutrophication effects.

The figure on p. 3 represents changes in the periphyton algal community. As was noted with the macroinvertebrates, larger differences (that is, higher percentages) correspond with greater degrees of degradation. Periphyton taxa richness, diversity, and the blue-green to diatom ratio were actually higher at the test site, compared with the reference site. Algal density and chlorophyll *a*, however, increased by 5,099% and 487,500%, respectively, between the reference and test site. These changes are probably the result of two factors: nutrient enrichment from the discharge and increased sunlight penetration associated with the open tree canopy at the test site.

Conclusions

Dissolved oxygen decreased from 8.8 mg/L at the reference site to 3.9 mg/L at the test site (which is below Class III water quality standards).

The full strength effluent sample was acutely toxic to the invertebrate, *Ceriodaphnia dubia,* killing all test organisms within 48 hours (a violation of Rules 62-302.500(1)(d) and 62-4.244(3)(a) FAC). The effluent was not toxic to the fish, *Cyprinella leedsi.*

Of the three organic pollutants found in the Quincy WWTP effluent, diazinon (0.15 µg/L), was present in an acutely toxic concentration, and probably caused or contributed to the toxicity observed in the *C. dubia* bioassay. The other organic compounds in the effluent were at less than chronically toxic levels.

The effluent copper concentration (17 µg/L) exceeded the (hardness-based) Class III standard of 5.9 µg/L (a violation of Rule 62-302.530(24) FAC). The effluent silver concentration (0.1 µg/L) also exceeded its Class III limit of 0.07 µg/L (a violation of Rule 62-302.530(60) FAC). None of the other metals exceeded Class III standards.

The test site fecal coliform value (1,200 organisms/100 mL) exceeded Class III water quality standards, a violation of Rule 62-302.530(6) FAC. Total coliform counts at the reference site (2,800 organisms/100 mL) and at the test site (7,700 organisms/100 mL) both exceeded Class III standards (Rule 62-302.530(7) FAC). Effluent levels of fecal coliforms (180 organisms/100 mL) and total coliforms (1,500 organisms/100 mL) were lower than receiving water values, indicating that the facility was adequately disinfecting the discharge at the time of sampling. Since the test site coliform levels were much higher than those of the reference site, it seems probable the Quincy discharge is contributing to the observed increase, and suggests previous episodes of inadequate disinfection.

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Algal growth potential (AGP) increased from 24.8 mg dry wt/L at the reference site to 94.6 mg dry wt/L at the test site. Although both exceeded the 5 mg dry wt/L "problem threshold", the test site AGP clearly indicated the influence of the discharge. The effluent AGP was 193.9 mg dry wt/L. Elevated AGP at the reference site may be due to runoff from surrounding agricultural (tomato) fields.

Several qualitative measures of benthic macroinvertebrate community health indicated severe adverse effects associated with the discharge. For example, the Florida Index decreased from 22 (a healthy score) at the reference site to an abnormally low value of 4 at the test site. The EPT Index decreased from 6 at the reference site to only 1 at the test site. An unusual lack of filter feeders (2.3 % of the total population) at the test site demonstrated the trophic relationships (food web patterns) were disrupted there. The Stream Condition Index (SCI) ranked the reference site (with SCI 23 points) as "unimpaired", but placed the test site (with 11 SCI points) in the "severe degradation" category. These results, in conjunction with the nutrient measurements, clearly indicate the discharge was causing an imbalance of aquatic fauna, prohibited by Rule 62-302.530(48)(b) FAC.

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Periphyton taxa richness, diversity, and the blue-green to diatom ratio were actually higher at the test site, compared with the reference site. Algal density and chlorophyll *a*, however, increased by 5,099% and 487,500%, respectively, between the reference and test site. These changes are probably the result of two factors: nutrient enrichment from the discharge and increased sunlight penetration associated with the open tree canopy at the test site.

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Chemistry Summary Table for City of Quincy WWTP.

	Effluent	Reference Site	Test Site
Organic Constituents (ug/L)			
Diazinon	0.15 T		
2,4,6-Trichlorophenol	1.8 I		
Hexazinone	0.2 T		
Metals (ug/L)			
Arsenic	10 U		
Cadmium	.094 I		
Calcium	13.6 A		
Copper	17 A		
Chromium	10 U		
Iron	75 A		
Lead	10 U		
Mercury	0.10 U		
Nickel	4 U		
Selenium	30 U		
Silver	0.1 A		
Zinc	42 A		
Nutrients (mg/L)			
Ortho-phosphate		0.038 I	0.48 A
Total phosphorus	.96 A	0.096 A	0.63
Ammonia	0.099 A	0.064	0.082
Nitrate+Nitrite	4.1	0.34	2.5 A
TKN	1.3 A	0.37 A	0.95
General Phys-Chem Parameters			
Habitat Assessment		133	112
D.O. (mg/L)	6.9	8.8	3.9
pH (SU)	6.9	7.0	6.9
Conductivity (µmhos/cm)	250	55	249
Hardness (mg CaCO3/L)	44		
Temperature (°C)	18.0	16.3	19.3
Total Suspended Solids (mg/L)	2		
Biological Oxygen Demand, 5 day (mg/L)	1.5 J		
Algal Growth Potential (mg dry wt/L)	193.9	24.8	94.6
Toxicity			
Bioassay Fish	Not toxic		
Bioassay Invertebrate	Toxic		
Microbiological Communities (org/100 mL)			
Fecal coliform	180	470	1,200
Total coliform	1,500	2,800	7,700
Escherichia coli	92	500	620

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

T - Value reported is less than the criterion of detection

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

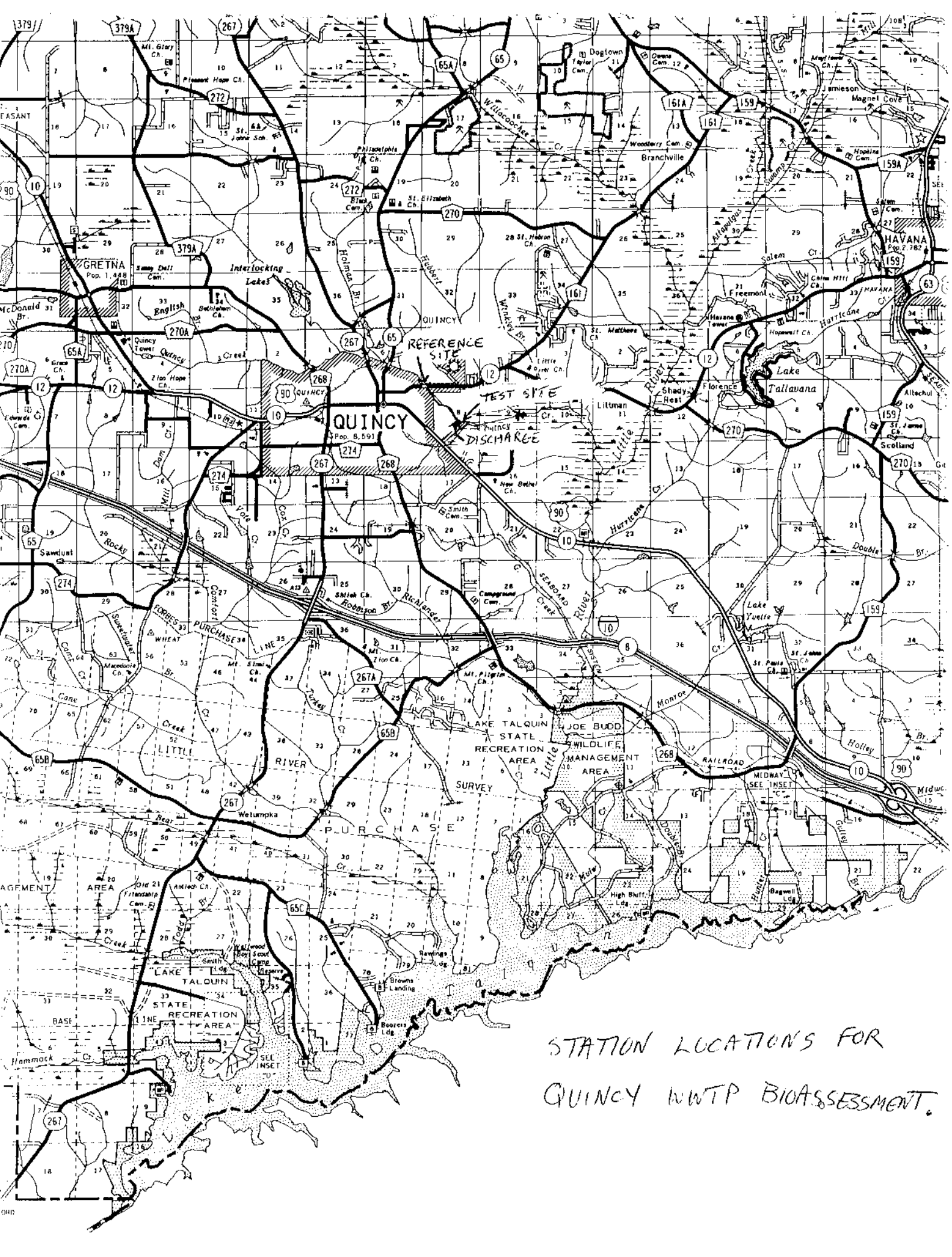
Typical Values for Selected Parameters in Florida Waters

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



STATION LOCATIONS FOR QUINCY WWTP BIOASSESSMENT.

QUINCY WWTP BIOASSESSMENT STATION MAP.

STATE OF FLORIDA



Facility Summary

Facility Name: City of Quincy WWTP **Date Summary Prepared:** 1/16/96

Location map: 300 North G.F. & A. Drive
Quincy, FL
Lat. 30° 35' 02"
Long. 84° 33' 14"

County Gadsden
District 10/Northwest

NPDES Permit # FL0029033 **State GMS #** 1020M00212 **Facility Type:** Domestic
expiration date 09/30/96
Permit # FL0029033 combines NPDES permit FL0029033 (Section I) and the conditions and complaince schedules previously embodied in State temporary operating permit DT20236954 (Section II).

Function of facility: The facility is a municipal wastewater treatment plant serving the residents of the City of Quincy.

Description of treatment process: A 1.5 MGD contact stabilization WWTP utilizing influent grit separation, primary clarifier, aeration, secondary clarifiers, chlorination, and dechlorination. Sludge is processed by aerobic digesters, drying beds and then transported to either Gilbert Farms for use in land application or to Quincy Byrd landfill.

Receiving waters: Quincy creek, Little River to Lake Talquin
Classification: III

Design Flow: 1.5 MGD **Mean Flow:** 0.978 MGD (Nov.94-Oct.95) **Flow during survey:** 0.997 MGD (Oct.95)

Discharge is: Continuous

If facility has a mixing zone, give details (size, parameters, etc.)
The facility has no mixing zone

List effluent limits (attach relevant paperwork):

Parameter	Frequency	Limit (units)
Flow	Continuous	1.5 MGD (max. mo. avg. daily flow)
pH-Eff	daily 7/wk	6.0 min. 8.5 max.
Chlorine	daily 7/wk	0.01 mg/L (max.)
Dissolved oxygen	daily 7/wk	5.0 mg/L (min.)
CBOD5-Inf	every 2 weeks	n/a
CBOD5-Eff	every 2 weeks	15 mg/l (max.annual avg.)
TSS-Inf	every 2 weeks	n/a
TSS-Eff	every 2 weeks	15 mg/l (max.annual avg.)
Total N	every 2 weeks	n/a

TKN	every 2 weeks	10.0 mg/l (max.annual avg.)
Total P	every 2 weeks	n/a
fecal coliform	monthly	200/100 ml (max.)

Permit (DT20-236954) requires 96 hour static renewal bioassays bimonthly. Once the facility demonstrates no effluent toxicity peaks and no diurnal toxicity variation the bimonthly frequency may be changed to once every 6 months.

List permit violations (from MOR data or other source) and plant upsets within the past year:
Toxicity problems have existed with Quincy's WWTP since 1988. (See attachment)

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

12/21/94 EPA Administrative Order 95-007: Requires TRE's to be performed according to protocol. Monthly toxicity testing on multi-concentration samples. Full compliance by Aug. 1995. This Administrative Order was placed in inactive status on Aug. 30, 1995 due to full compliance.

02/03/94 Warning letter NWDW 20-1257: Requested Quincy to update their pretreatment program and to provide evidence of enforcement of the program. This is a result of a biological kill which caused the facility to go out of compliance for approximately two weeks during Dec. 1993.

05/03/90 EPA Administrative Order 90-055: Requiring Quincy to perform TRE/TIE testing and that Quincy's effluent be in compliance with permit toxicity limits by 3/31/92.

Bioassessments:

06/30/95-07/04/95: not toxic
04/18/95-04/25/95: not toxic
03/28/95-04/04/95: toxic to Ceriodaphnia dubia before chlorination
03/28/95-04/04/95: toxic to Ceriodaphnia dubia after dechlorination
03/01/95-03/08/95: toxic to Ceriodaphnia dubia
2/22/95: toxic to Ceriodaphnia dubia
01/24/95-01/28/95: not toxic
01/17/95-01/21/95: not toxic
01/10/95-01/14/95: toxic to Ceriodaphnia dubia
01/10/95-01/17/95: toxic
12/17/94-12/19/94: toxic
Confirmatory test for 12/94: 2 were not toxic, 1 was toxic

The toxicity problem has improved as a result of operational changes. Landfill leachate is now receiving pre-treatment before entering the WWTP.

Discuss comparability of MOR results to past FDEP results and whether there are trends (improving, declining) in the data set: No FDEP testing. No comparison can be made.

Additional information:

Staff contributing to this review (signature)

Biologist

Inspector

Engineer

Lisa Kelley Co-Op — Other

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		[illegible]	10 30	

REMARKS:	LOCATION:	FIELD ID/NAME:
	Gunnery STP	[illegible]

RIPARIAN ZONE/INSTREAM FEATURES

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

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

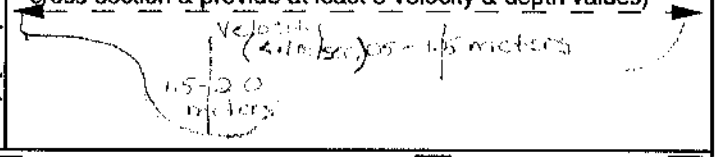
Local Watershed Erosion (check box): None [X] Slight [ ] Moderate [ ] Heavy [ ]

Local Watershed NPS Pollution (check box): No evidence [X] Some potential sources [ ] Obvious sources [ ]

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

List & map dominant vegetation on back

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



Artificially Channelized [X] no [ ] [ ] [ ]
Artificially Impounded [ ] yes — recent, severe / some recovery / mostly recovered, more sinuous

High Water Mark (m above bed): 1.0

Canopy Cover % : Open : [X] Lightly Shaded (11-45%): [ ] Moderately Shaded (46-80%): [ ] Heavily Shaded: [ ]

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: [ ] Sewage: [X] Petroleum: [ ] Chemical: [ ] Anaerobic: [X] Other: [ ] _____

Sediment Oils: Absent: [X] Slight: [ ] Moderate: [ ] Profuse: [ ]

Sediment Deposition: Sludge: [X] Sand smothering: (none) slight moderate severe Silt smothering: none (slight) moderate severe Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	5	9		Sand	80	2	
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation	15	9		Other:			
Rock or Shell Rubble				Other:			
Undercut Banks/Roots				***Draw aerial view sketch of habitats found in 100 m section***			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.5 - 1.5	19.3	6.9	3.9	24 ppt			—
Mid-depth								
Bottom								

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

Water Odors (check box): Normal: [X] Sewage: [ ] Petroleum: [ ] Chemical: [ ] Other: [ ] _____

Water Surface Oils (check box): None: [X] Sheen: [ ] Globs: [ ] Slick: [ ]

Clarity (check box): Clear: [ ] Slightly turbid: [X] Turbid: [ ] Opaque: [ ]

Color (check box): Tannic: [ ] Green (algae): [X] SLIGHT Clear: [X] Other: [ ] _____

Weather Conditions/Notes:

CLOUDY, 17°C, NO BREEZE

Abundance:	Absent	Rare	Common	Abundant
Periphyton	[ ]	[ ]	[X]	[ ]
Fish	[ ]	[ ]	[X]	[ ]
Aquatic Macrophytes	[ ]	[ ]	[ ]	[X]
Iron/sulfur Bacteria	[X]	[ ]	[ ]	[ ]

SAMPLING TEAM:	SIGNATURE:	DATE:

2.78 DEPTH

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		11/6/95	1:00	Quincy Creek

REMARKS:	LOCATION:	FIELD ID/NAME:
	Quincy STP	Quincy STP

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
60				30			10

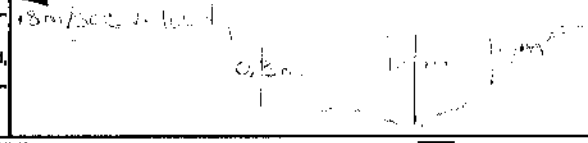
Local Watershed Erosion (check box): None ☒ Slight ☐ Moderate ☐ Heavy ☐

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

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

List & map dominant vegetation on back

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



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

Artificially Impounded ☐ yes

High Water Mark (m above bed): 1.0

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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	6	6		Sand	85	2	
Leaf Packs or Mats	3	6		Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut Banks/Roots	6	6		***Draw aerial view sketch of habitats found in 100 m section***			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	1.0	16.3	7.0	5.5	55			—
Mid-depth								
Bottom								

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

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

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

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

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

Weather Conditions/Notes:

CLOUDY, 17°C, SLIGHT DRIZZLE

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

SAMPLING TEAM:	SIGNATURE:	DATE:
JJ, LB, BR	[signature]	11/6/95

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		11/6/95	Quincy Creek

REMARKS:	LOCATION:	FIELD ID/NAME:
	Quincy STP	Quincy Ref.

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

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

Comments

[133] **TOTAL SCORE**

ANALYSIS DATE:	ANALYST:	SIGNATURE:
11/6/95	JJ, LB, BR	

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		11/6/95	Quincy Creek

REMARKS:	LOCATION:	FIELD ID/NAME:
	Quincy WTP	Quincy test

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

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

[112] **TOTAL SCORE**

Comments

ANALYSIS DATE:	ANALYST:	SIGNATURE:
11/6/95	JJ, LB, BR	Jay A Jackson

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Quincy STP
County: Gadsden
Contact / District: R. Frydenborg / NW
NPDES Permit #: FL00
LIMS Sample #: 121950 **LIMS Job #:** 95-NOV-0610
sample log 11-28-95

Sample Collection: Date 11-6-95 Time
Test Beginning: Date 11-7-95 Time 10:30
Test Ending: Date 11-9-95 Time 1030
Organism Batch #: 60 **Diluent Batch #:** well
Organism Age: 11 days old
Test Organism: Cyprinella leedsi

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

Test Number: 2 of 2

Remarks:

Instrument Calibrations:	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	23.1 @ 23.1	8.3 @ 24.4 °C	109.3 @ 102.3 998 @ 1013 @ 23.8 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	21.8 @ 21.9	8.7 @ 22.1 °C	107.9 @ 102.3 996 @ 1013 @ 22.7 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	21.8 @ 21.9	8.7 @ 22.1 °C	107.9 @ 102.3 996 @ 1013 @ 22.7 °C

Conc.	Chamber #	Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm)		
		0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Control A	57	5	5	5	7.7	8.1	8.2	24.2	22.5	22.0	7.6	7.8	8.3	250	245	245
Control B	414	5	5	5	7.7	8.1	8.2	24.2	22.4	21.9	7.6	7.7	8.3	250	245	245
Control C	506	5	5	5	7.7	8.1	8.2	24.2	22.3	21.9	7.6	7.8	8.3	250	245	245
Control D	504	5	5	5	7.7	8.1	8.2	24.3	22.3	22.2	7.7	7.8	8.3	250	245	250
100% A	58	5	5	5	7.0	7.8	8.0	23.7	22.5	22.1	7.1	7.8	8.2	375	370	375
100% B	309	5	5	5	7.0	7.7	8.0	23.7	22.4	22.0	7.1	7.7	8.1	375	370	370
100% C	25	5	5	5	7.0	7.7	7.9	23.7	22.4	22.0	7.1	7.7	8.2	375	370	375
100% D	45	5	5	5	7.0	7.7	7.9	23.7	22.3	22.3	7.1	7.7	8.2	375	370	375
Measured/Loaded by:		TM	TM	MF	TM	MF	MF	TM	MF	MF	TM	MF	MF	TM	MF	MF
Recorded by:		TR	TM	MF	TR	JN	TR	TR	JN	TR	TR	JN	TR	TR	JN	TR

Investigators' Signatures

Reviewer

form updated 5/05/95

Water Quality Parameters

	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):					
Lab Total Residual Cl2 (mg/L):	<0.03	—	<0.03	DR100	TR
Alkalinity (mg/L as $CaCO_3$):	120	—	60	HACH	DR
Hardness (mg/L as $CaCO_3$):	130	—	50	HACH	DR
Total ammonia (mg/L as N):	<0.017		<0.017	ORION	JN

Ammonia Meter #98136 Ammonia Meter Slope: -57.2 Ammonia Blank: <0.017 Control Salinity: ppt Sample Salinity: ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Quincy STP
County: Gadsden
Contact / District: R. Frydenborg / NW
NPDES Permit #: FL00
LIMS Sample #: 121950 **LIMS Job #:** 95-NOV-0610
sample log 11-28-95

Sample Collection: Date 11-6-95 Time
Test Beginning: Date 11-7-95 Time 1030
Test Ending: Date 11-9-95 Time 1030
Organism Batch #: 52 **Diluent Batch #:** 44
Organism Age: < 24 hrs

Test Organism: Ceriodaphnia dubia

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

Test Number: 1 of 2

Remarks:

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	23.1 @ 23.1	8.3 @ 24.4 °C	107.3 @ 102.3 998 @ 1013 @ 23.8 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	21.8 @ 21.9	8.7 @ 22.1 °C	107.9 @ 102.3 996 @ 1013 @ 22.7 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	21.8 @ 21.9	8.7 @ 22.1 °C	107.9 @ 102.3 996 @ 1013 @ 22.7 °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	8.0		8.1	23.3		23.0	8.0		7.9	175		215
Control	B	5	5	5			8.1			23.0			7.9			195
Control	C	5	5	5			8.1			23.0			7.9			195
Control	D	5	5	5			8.1			22.9			7.9			190
100%	A	5	*4 2	0	7.1		8.1	23.3		23.3	7.2		8.0	365		370
100%	B	5	*5 2	0			8.1			23.3			7.9			380
100%	C	5	*3 3	0			8.0			23.3			7.9			375
100%	D	5	*3 2	0			8.0			23.1			7.9			395
			* Note SRT extra in place of Quincy Data JMF 11/10/95													
Measured/Loaded by:		TM	mf	MF	TM		MF	TM		MF	TM		MF	TM		MF
Recorded by:		TR	MF	MF	TR		TR	TR		TR	TR		TR	TR		TR

Investigators' Signatures

	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):					
Lab Total Residual Cl2 (mg/L):	—	<0.03	<0.03	DR100	TR
Alkalinity (mg/L as $CaCO_3$)	~~120~~ *	75	60	HACH	DR
Hardness (mg/L as $CaCO_3$)	~~130~~ *	90	50	HACH	DR
Total ammonia (mg/L as N)		<0.017	<0.017	ORION	JN

Ammonia Ammonia Ammonia Control Sample

Stream Condition Index for Florida (SCI)

Reference Site

Calculation & Interpretation of the Stream Condition Index for Florida (SCI) (Draft 1994)										
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	**Value**	**Panhandle (65, 75a)**				**Peninsula (75b, c, d)**				
		5	3	1	**Score**	5	3	1	**Score**
Number of Taxa	32	≥ 31	16–30	0–15	5	≥ 27	14–26	0–13	
EPT Index	6	≥ 7	4–6	0–3	3		≥ 4	0–3	
% Contribution of Dominant Taxon	28.6		≤ 20	> 20	1		≤ 27	> 27	
Florida Index	22	≥ 18	9–17	0–8	5	≥ 7	4–6	0–3	
% Diptera	50.5		≤ 38	> 38	1		≤ 32	> 32	
% Suspension feeders/ Collector-Filterers	16.7	≥ 12	7–11	0–6	5	≥ 8	4–7	0–3	
% Shredders	31		≥ 10	0–9	3		≥ 13	0–12	
% Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 16	0–15	
# Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 4	0–3	
Total Score		**Panhandle**			23	**Peninsula**			
Interpretation of Score		**No Impairment**			**29-23**	**No Impairment**			**33-27**
		Moderate Impairment			**22-15**	**Moderate Impairment**			**26-17**
		Severe Degradation			**14-7**	**Severe Degradation**			**16-9**

Test Site

Calculation & Interpretation of the Stream Condition Index for Florida (SCI) (Draft 1994)										
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	**Value**	**Panhandle (65, 75a)**				**Peninsula (75b, c, d)**				
		5	3	1	**Score**	5	3	1	**Score**
Number of Taxa	30	≥ 31	16–30	0–15	3	≥ 27	14–26	0–13	
EPT Index	1	≥ 7	4–6	0–3	1		≥ 4	0–3	
% Contribution of Dominant Taxon	23.8		≤ 20	> 20	1		≤ 27	> 27	
Florida Index	4	≥ 18	9–17	0–8	1	≥ 7	4–6	0–3	
% Diptera	56.5		≤ 38	> 38	1		≤ 32	> 32	
% Suspension feeders/ Collector-Filterers	2.3	≥ 12	7–11	0–6	1	≥ 8	4–7	0–3	
% Shredders	12.5		≥ 10	0–9	3		≥ 13	0–12	
% Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 16	0–15	
# Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 4	0–3	
Total Score		**Panhandle**			11	**Peninsula**			
Interpretation of Score		**No Impairment**			**29-23**	**No Impairment**			**33-27**
		Moderate Impairment			**22-15**	**Moderate Impairment**			**26-17**
		Severe Degradation			**14-7**	**Severe Degradation**			**16-9**

Periphyton taxa list and densities (#/cm^2) for Quincy WWTP, collected via glass microscope slides in Quincy Creek, on 6 November, 1995.

	Reference Site	Test Site
Cyanophyceae		
Anabaena sp.	–	8166
Aphanocapsa sp.	6654	–
Chroococcus sp.	–	907
Lyngbya sp.	151	907
Oscillatoria sp.	–	4537
Chrysophyceae		
Centritractis sp.	–	907
Bacillariophyceae		
Achnanthes exigua	454	71682
Achnanthes lanceolata	–	907
Achnanthes lapponica	–	1815
Achnanthes linearis	–	64423
Anomoeneis vitrea	–	907
Capartogramma crucicula	–	907
Cyclotella meneghiniana	–	2722
Eunotia sp.	151	4537
Eunotia pectinalis	151	907
Gomphonema sp.	–	9074
Gomphonema affine	–	8166
Gomphonema gracile	–	4537
Gomphonema grunowii	302	55350
Gomphonema parvulum	302	29036
Gomphonema sphaerophorum	–	1815
Gomphonema subclavatum	–	907
Gomphonema turris	–	907
Navicula arvensis	–	2722
Navicula capitata hungarica	151	–
Navicula cocconeiformis	–	6352
Navicula confervacea	302	18147
Navicula exigua capitata	–	907
Navicula minima	302	109792
Navicula pupula	–	5444
Navicula radiosa	–	3629
Navicula viridula	454	9074
Nitzschia fonticola	–	907
Nitzschia linearis	–	9074
Nitzschia palea	302	27221
Nitzschia sublinearis	–	1815
Synedra ulna	151	5444
Pennales	–	29036

Chlorophyceae		
Ankistrodesmus sp.	–	5444
Characium sp.	151	19055
Chlamydomonas sp.	–	907
Chlorococcum sp.	151	1815
Cosmarium sp.	–	907
Desmatractum sp.	–	907
Gloeocystis sp.	–	907
Oedogonium sp.	–	4537
Scenedesmus sp.	151	2722
Stigeoclonium sp.	–	1815
Tetraedron sp.	151	–

Benthic macroinvertebrate taxa list for Quincy WWTP, collected via 20 discrete dip net sweeps in Quincy Creek, on 6 November, 1995.

	Reference Site	Test Site
Oligochaeta		
Bratislavia unidentata	–	6
Dero lodeni	–	2
Dero pectinata	–	16
Dero trifida	–	68
Limnodrilus hoffmeisteri	2	15
Gastropoda		
Micromenetus dilatatus	–	7
Physella sp.	–	3
Planorbella duryi	–	1
Pelecypoda		
Corbicula fluminea	1	–
Pisidiidae	9	–
Undetermined Pelecypoda	–	1
Decapoda		
Palaemonetes paludosus	3	–
Procambarus sp.	1	–
Collembola		
Undetermined Collembola	–	1
Ephemeroptera		
Baetis sp.	3	–
Baetis propinquus	1	–
Caenis sp.	–	8
Hexagenia sp.	1	–
Stenonema sp.	1	–
Stenonema exiguum	1	–
Stenonema smithae	1	–
Leptophlebiidae	1	–
Odonata		
Argia sp.	1	–
Ischnura sp.	–	9
Libellulidae	–	3
Acarina		
Sperchopsis tessellatus	3	–
Coleoptera		
Ancyronyx variegatus	4	–
Cyphon sp.	2	–
Macronychus glabratus	1	–
Prionocyphon sp.	–	1
Scirtes sp.	13	–
Stenelmis sp.	1	–
Trichoptera		
Cheumatopsyche sp.	1	–

Lepidoptera		
Pyralidae	1	–
Diptera		
Ablabesmyia mallochi	2	2
Chironomus sp.	2	77
Cladopelma sp.	–	2
Corynoneura sp. B Epler	1	–
Corynoneura taris	1	–
Culicoides sp.	–	2
Dicrotendipes modestus	–	2
Dicrotendipes simpsoni	–	2
Einfeldia sp.	–	2
Glyptotendipes sp. F Epler	–	2
Goeldichironomus fluctuans	1	–
Goeldichironomus holoprasinus	–	65
Helopelopia sp.	1	–
Larsia decolorata	1	–
Odontomyia sp.	–	2
Palpomyia/Bezzia grp.	–	2
Paratanytarsus sp.	–	7
Polypedilum convictum grp.	2	–
Polypedilum illinoense grp.	30	2
Procladius sp.	–	3
Rheocricotopus robacki	3	–
Rheotanytarsus exiguus grp.	2	–
Simulium sp.	4	–
Tanytarsus sp.	–	2
Tanytarsus sp. T Epler	1	–
Zavreliella marmorata	–	2
Chironomidae	2	7

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 FL0029033 11	12 951106 17	18 X	19 5	20 1

Remarks

21 66

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 FL0029033 11	12 951106 17	18 B	19 5	20 1

Remarks

21 66