

Biological Assessment of

Milton Wastewater Treatment Plant

Santa Rosa County

NPDES #FL0021903

Sampled August 1994

February 1995

Biology Section
Division of Administrative and Technical Services

Comprehensive Quality Assurance Plan No. 870346G

Department of Environmental Protection
Results of Fifth Year Inspections

Discharger: Milton WWTP
County: Santa Rosa
NPDES Number: FL0021903
State Permit Expiration Date: 15 May, 1995

Toxics Sampling Inspection (XSI)

Date Sampled: 29 August, 1994

Results: No organic pollutants were detected in the effluent sample. The effluent silver concentration (0.11 µg/L), however, represented a violation of ambient standards for freshwaters, Rule 62-302.530(60) FAC.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 29 August, 1994

Results: The sample of effluent was not acutely toxic to the invertebrate, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi*.

Impact Bioassessment Inspection (IBI)

Date Sampled: 29 August 1994

Results: Quantitative measures of benthic macroinvertebrate community health indicated no negative effects from the discharge. Taxa richness, Shannon-Weaver diversity, the Florida Index, and the EPT Index generally showed improvement downstream of the discharge. *Stictochironomus* sp., a pollution sensitive species, was the dominant taxon at each station. Phytoplankton communities were virtually unchanged between the reference and test sites, also suggesting that the discharge was having no adverse effects.

Water Quality Inspection (WQI)

Date Sampled: 29 August, 1994

Results: Moderate orthophosphate enrichment at the test site could be attributed to the facility. Orthophosphate was undetected at the reference site but higher than the values found in 63% of typical Florida streams at the test site. While nitrate-nitrite was slightly higher at the reference site (2.2 mg/L) than at the test site (1.8 mg/L), the concentrations at both sites were higher than those found in 95% of other Florida stream systems. The nutrient enrichment at the reference site may be attributable to other sources (*i.e.*, urban or agricultural runoff), although the facility was a contributor to the enrichment seen at the test site. Algal growth potential was elevated at the test site (20.9 mg dry wt/L), where it was above the "problem threshold" of 5 mg dry wt/L (Raschke and Schultz 1987). In contrast, AGP was low at the reference site (0.1 mg dry wt/L). Total and fecal coliform bacteria were within standards in the effluent and at all study sites.

Introduction

The City of Milton WWTP is located in Santa Rosa County, Florida (see maps in Appendix). This facility is a 2.5 MGD capacity oxidation ditch/aeration basin wastewater treatment plant, with effluent discharge to the Class III Blackwater River. The disinfected effluent is dechlorinated and aerated before it is discharged into the lower tidal reach of the Blackwater River. Sludge is stabilized in two aerobic digestors and hauled to an approved private application field. The facility also has ten sludge drying beds, which are used as backup units.

Permit limits are as follows: flow (2.5 MGD annual average), pH (6.5-8.5 S.U.'s), chlorine residual (minimum of 1.0 mg/L for disinfection, maximum of 0.1 mg/L prior to discharge), BOD (15 mg/L annual average), TSS (20 mg/L annual average), and fecal coliform bacteria (200 organisms/100 mL maximum). Problems with the facility include thirteen sewer spills which have been recorded in the past two years and incorrect reporting of residual chlorine results. Otherwise, the plant has been operating satisfactorily.

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 the Blackwater River, approximately one half mile upstream of the discharge) and a test site (approximately 500 feet below the Milton WWTP outfall). A habitat assessment was performed *in situ* to establish comparability between sites. Supplemental physical/chemical data were also collected on the effluent and study sites. Acute screening toxicity bioassays, using *Ceriodaphnia dubia* and *Cyprinella leedsi* as test organisms, were performed on an effluent sample (Weber 1991). The effluent was analyzed for metals and for organic constituents (base neutral and acid extractables, and pesticide extractables). Additionally, nutrient analyses were performed on effluent, reference, and test sites. Methods used for all chemical analyses are on file at the Tallahassee DEP Chemistry Laboratory.

Benthic macroinvertebrate communities were evaluated at reference and test sites. Invertebrates were collected via three petite Ponar grabs per site (Ross 1990). Phy-

Major characteristics of community structure of control and test sites.

	Reference Site	Test Site
Macroinvertebrate Ponar		
Number of Taxa	11	24
Florida Index	1	10
Shannon-Weaver Diversity	2.9	4.3
EPT Index	0	2
% Diptera	54.9	43.5
% Amphipoda	9.9	15.3
% Oligochaeta	19.9	0
% Gastropoda	5.0	7.6
% Pelecypoda	5.0	5.1
% Decapoda	0	7.6
% Other	5.3	20.9
% Predators	6.5	21.6
% Above Surface Deposit Feeders	34.8	43.6
% Below Surface Deposit Feeders	20.6	0.1
% Suspension Feeders	9.9	8.1
% Scrapers	4.8	8.5
% Shredders	20.1	14.5
% Scavengers	3.3	3.6
Phytoplankton Algae		
Number of Taxa	12	11
Shannon-Weaver Diversity	3.0	3.0
Algal Density (#/L)	520.5	467.1
Chlorophyll a (µg/L)	1.4	1.6
% Blue-green	13.7	33.3
% Green	31.8	27.6
% Diatoms	54.5	33.3
% Other	0	5.8
Algal Growth Potential (mg dry wt/l)	0.1	20.8

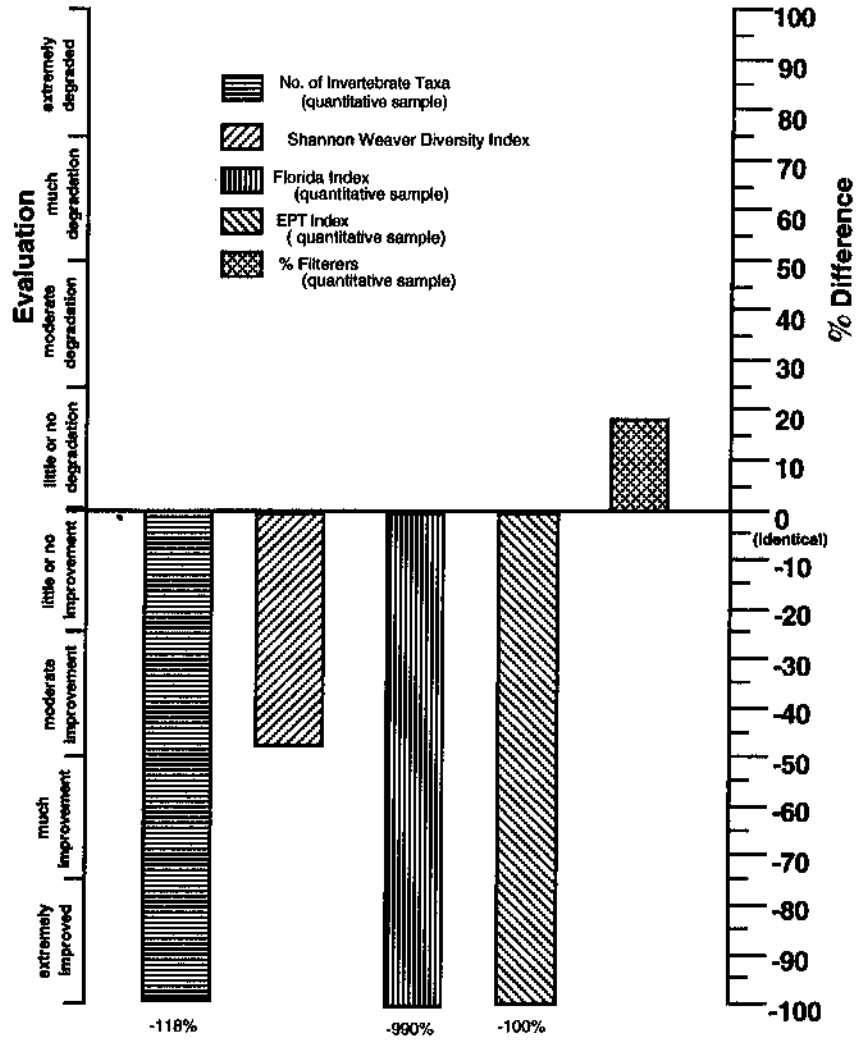
toplankton was sampled at both reference and test sites by subsurface grabs. Chlorophyll *a* was also determined for phytoplankton communities (Ross 1990). Bacterial populations were analyzed for total and fecal coliforms following the methods of APHA (1989). Algal Growth Potential tests, using *Selenastrum 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 to determine the effects of a discharge. These are briefly discussed here.

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

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



Effect of discharge on the benthic macroinvertebrate community.

Numbers of pollution sensitive taxa: Unpolluted sites have characteristic numbers and types of taxa which are sensitive to anthropogenic stress. These organisms become rare or absent as the intensity or duration of the disturbance increases. For example, the Florida Index assigns points to stream-dwelling macroinvertebrates based on their sensitivity to pollution (see Ross 1990). A site with a high Florida Index score is considered healthy (*e.g.*, around 20 or more in the Panhandle, around 15 or more in the Peninsula). Species sensitivity data from other sources, such as Hulbert (1990), Hudson *et al.* (1990), Lenat (1993), Farrell (1992), Chang *et al.* (1992), and Whitmore (1989), are used as appropriate.

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

Community structure: A system is generally considered degraded if a substantial shift in the proportions of the major taxonomic groups (*e.g.*, mayflies, riffle beetles, etc.) is observed when compared to a reference site. In marine systems, an increase in the % tubificid oligochaetes, a decrease in the % pelecypods, and a decrease in the number of polychaete taxa are all considered indicators of disturbance.

Algal biomass: The density of algal cells and the chlorophyll *a* concentration are used as estimators of biomass. A system has traditionally been considered nutrient stressed when biomass exceeds problem threshold levels, often resulting in visible algal blooms, nuisance scums, and low dissolved oxygen from the decomposition of the decaying algal tissue. A decreased diatom to blue-green algae ratio (calculated by dividing the number of individuals in the Bacillariophyta by the number of individuals in the Bacillariophyta + Cyanophyta) is often indicative of nutrient enriched conditions in flowing streams.

Trophic composition/feeding guilds: Undisturbed aquatic systems possess characteristic proportions of organisms using various functional feeding strategies, and human disturbance shifts these established feeding strategies. For example, pollution is known to reduce the numbers of filter-feeders and shredders.

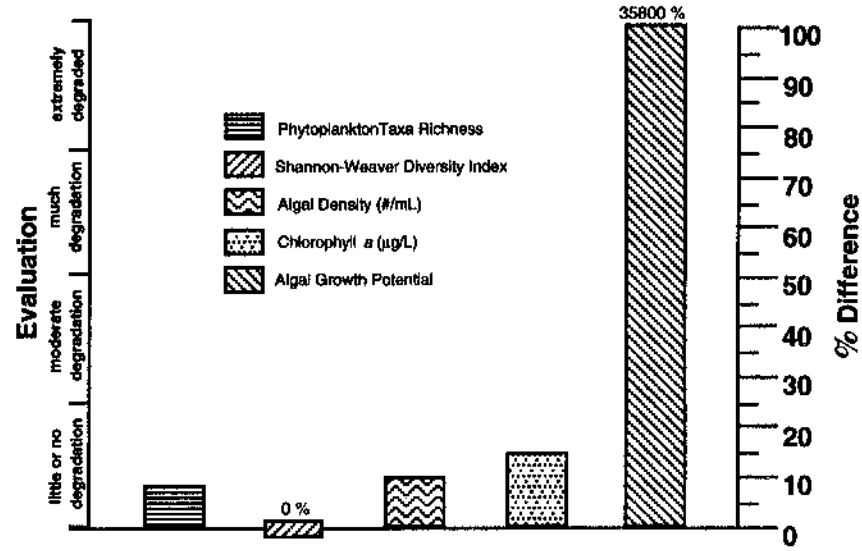
For graphical purposes, the percent differences between the reference and test sites involving the number of taxa, the diversity index, the Florida Index, the EPT Index, and the % filter-feeders, are measured as the reference site minus test site divided by the reference site. The percent differences 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, Barbara Ruth, and Martin Gawronski (DEP Northwest District) and Lyn Burton, Marshall Faircloth, Russel Frydenborg, Christy LeDuc, Kathleen Lurding, Elizabeth Miller, Urania Quintana, Landon Ross, David Whiting, Vicki Whiting, Greg Wynn, and David Young (Tallahassee Biology Laboratory). The report was reviewed by the Point Source Studies Review Committee, consisting of Wayne Magley, Jan Mandrup-Poulsen, and Michael Tanski, as well as District representatives.

Results and Discussion

The study area was situated in the Blackwater River, approximately two miles upstream of its confluence with Blackwater Bay. Habitat quality was similar at both sites with 69 points at the reference site and 62 points at the test site. Land use near the test site was predominantly industrial and commercial, while the reference site was mostly forested, with some pasture, residential, and commercial lands. The study sites were similar with respect to most physical/chemical parameters, such as pH (between 6.2 and 6.6 S.U.'s), temperature (between 25.4 and 26.2 °C), and dissolved oxygen (between 6.6 and 6.8 mg/L). Conductivity was higher at the test site (1490 µmhos/cm) than at the reference site (740 µmhos/cm). Substrate was similar at both sites, primarily composed of sand and organic debris. Flow was reported to be slightly better at the reference site, although water velocity was apparently not measured (see Physical/Chemical Data Characterization Sheets in Appendix).

No organic pollutants were detected in the effluent sample. Metals detected in the discharge included iron (33 µg/L), silver (0.11 µg/L) and zinc (45 µg/L). At the effluent



Effect of discharge on the algal community.

hardness of 34 mg $CaCO_3$/L, iron and zinc levels were within Class III standards. Although the silver measurement was below the practical quantitation limit, it was at least equal to the method detection limit (0.10 µg/L). Since the Class III freshwater standard for silver is 0.07 µg/L, the concentration found in the discharge represents a violation of Rule 62-302.530(60) FAC.

The sample of effluent was not toxic to the invertebrate, *Ceriodaphnia dubia,* or the fish, *Cyprinella leedsi* (Appendix).

Ortho-phosphate enrichment at the test site (0.13 mg/L, which is higher than the values found in 63% of typical Florida streams) could be attributed to the facility (which was discharging 0.25 mg/L), since ortho-phosphate was undetected at the reference site. Total phosphorus followed a similar pattern. Although the Milton effluent was relatively high in nitrate-nitrite (3.0 mg/L), it did not appear to cause additional enrichment of the receiving waters. While nitrate-nitrite was slightly higher at the reference site (2.2 mg/L) than at the test site (1.8 mg/L), the concentrations at both sites were higher than those found in 95% of other Florida streams (see Table of Typical Water Quality Values in Appendix). The nutrient enrichment at the reference site may be attributable to other sources (*i.e.*, urban or agricultural runoff), although the facility was a contributor to the enrichment seen at the test site.

Algal growth potential (AGP) was somewhat elevated in the effluent (15.0 mg dry wt/L). Test site AGP was 20.9 mg dry wt/L, greater than the "problem threshold" of 5 mg dry wt/L (Raschke and Schultz 1987). In contrast, AGP was very low at the reference site (0.1 mg dry wt/L).

Coliform bacteria levels were nearly undetected in the effluent (10 organisms/100 mL for both total and fecal). Total coliforms were well within standards at the study sites, 1100 and 1200 organisms/100 mL at the reference and test site, respectively. Similarly, fecal coliform bacteria were present at non-problem levels, 280 organisms/100 mL (reference site) and 100 organisms/100 mL (test site).

Quantitative measures of benthic macroinvertebrate community health indicated no negative effects from the discharge. However, the most appropriate sampling techniques were not used in this study. While Hester-Dendy artificial substrates or dip nets are the preferred method in flowing streams, Ponar sampling was performed in this investigation. 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 control.

In the Ponar samples, macroinvertebrate taxa richness (11 taxa at the reference site, 24 at the test site), Florida Index (1 at the reference, 10 at the test site), and EPT index (0 at the reference, 2 at the test site) generally showed improvement downstream of the discharge. Suspension feeders were roughly the same between sites (9.9 % of the population at the reference site, and 8.1% at the test site). Shannon-Weaver diversity was considerably higher at the test site (4.3) than at the reference site (2.9).

The invertebrate community structure was similar between the two sites. The reference site population consisted primarily of dipterans (54.9%), oligochaetes (19.9%), amphipods (9.9%), gastropods (5.0%), and pelecypods (5.0%). The test site was composed of dipterans (43.5%), amphipods (15.3%), gastropods (7.6%), decapods (7.6%), and pelecypods (5.1%). *Stictochironomus* sp., a pollution sensitive species, was the dominant taxon at each station.

The figure on p. 3 represents changes in the phytoplankton algal community. As was noted with the macroinvertebrates, larger differences (that is, higher percentages) correspond with greater degrees of degradation. Phytoplankton communities at the reference and test sites were very similar with regard to taxa richness (12 and 11 taxa, respectively), algal density (520.5 cells/mL and 467.0 cells/mL, respectively), and chlorophyll *a* (1.4 µg/L and 1.6 µg/L, respectively). The phytoplankton assemblage found in the reference site was dominated by diatoms (54.5% of the population), while cyanophytes (33.3%) and diatoms (33.3%) co-dominated at the test site. Overall, there was no evidence of negative effects caused by the discharge.

Conclusions

No organic pollutants were detected in the effluent sample. The effluent silver concentration, however, represented a violation of Rule 62-302.530(60) FAC.

The sample of effluent was not toxic to the invertebrate, *Ceri-*

odaphnia dubia, or the fish, *Cyprinella leedsi.*

Orthophosphate enrichment at the test site could be attributed to the facility, since no orthophosphate was detected at the reference site and it was higher than the values found in 63% of typical Florida streams at the test site. Nitrate-nitrite concentrations were elevated throughout the study area. The nutrient enrichment at the reference site may be attributable to other sources (*i.e.*, urban or agricultural runoff), although the facility was a contributor to the enrichment seen at the test site.

Algal growth potential (AGP) was somewhat elevated in the effluent, and exceeded the "problem threshold" of 5 mg dry wt/L at the test site. In contrast, AGP was very low at the reference site.

Total and fecal coliform bacteria levels were nearly undetected in the effluent. Total coliforms were well within standards at the study sites, 1100 and 1200 organisms/100 mL at the reference and test site, respectively. Similarly, fecal coliform bacteria were present at non-problem levels, 280 organisms/100 mL (reference site) and 100 organisms/100 mL (test site).

Quantitative measures of benthic macroinvertebrate community health indicated no negative effects from the discharge. Taxa richness, Shannon-Weaver diversity, the Florida Index, and the EPT index generally showed improvement downstream of the discharge. *Stictochironomus* sp., a pollution sensitive species, was the dominant taxon at each station.

Phytoplankton communities were virtually unchanged between the reference and test sites, also suggesting that the discharge was having no adverse effects.

Literature Cited

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

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

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

Farrell, D. H. 1992. A community based metric for marine benthos. Fla. Dept. Environ. Reg. SW Dist. Office. unpublished rept. 15 p.

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

Hulbert, J. L. 1990. A proposed lake condition index for Florida. North Amer. Benth. Soc. 38th Ann. Mtg., Blacksburg, VA, 11 p.

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

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

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

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

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

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

Chemistry summary table for

Milton WWTP	Effluent	Reference Site	Test Site
Organic Constituents (ug/L)			
None detected			
Metals (ug/L)			
Aluminum	100 U		
Arsenic	10 U		
Cadmium	0.08 U		
Copper	5 U		
Chromium	10 U		
Iron	33 A		
Lead	10 U		
Mercury	0.10 U		
Nickel	5 U		
Silver	0.11 I		
Zinc	45 A		
Nutrients (mg/L)			
Ortho-phosphate	0.25	0.020 U	0.13
Total phosphorus	0.31	0.011	0.12
Ammonia	0.031 I	0.020 U	0.030 I
Nitrate+Nitrite	3.0	2.2	1.8
TKN	0.62	0.39	0.58
Other Parameters			
Habitat Assessment		69	62
D.O. (mg/L)	4.3	6.8	6.7
pH (SU's)	6.6	6.2	6.6
Conductivity (µmhos/cm)	250	740	1490
Temperature (°C)	27.5	25.4	26.2
AGP (mg dry wt/L)	15.0	0.1	20.8
BOD (mg/L)	1.8 Q	0.5 Q	1.4 Q
TSS (mg/L)	5	6.0	5.0
Hardness (mg/L as CaCO3)	34		
Bioassay Fish	not toxic		
Bioassay Invertebrate	not toxic		
Fecal coliform (org/100 mL)	10	280	100
Total coliform (org/100 mL)	10	1100	1200

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

I - Value report is less than the minimum quantification limit, and greater than or equal to the minimun detection limit.

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

Q - Sample held beyond normal holding time

Typical Values for Selected Parameters in Florida Waters

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

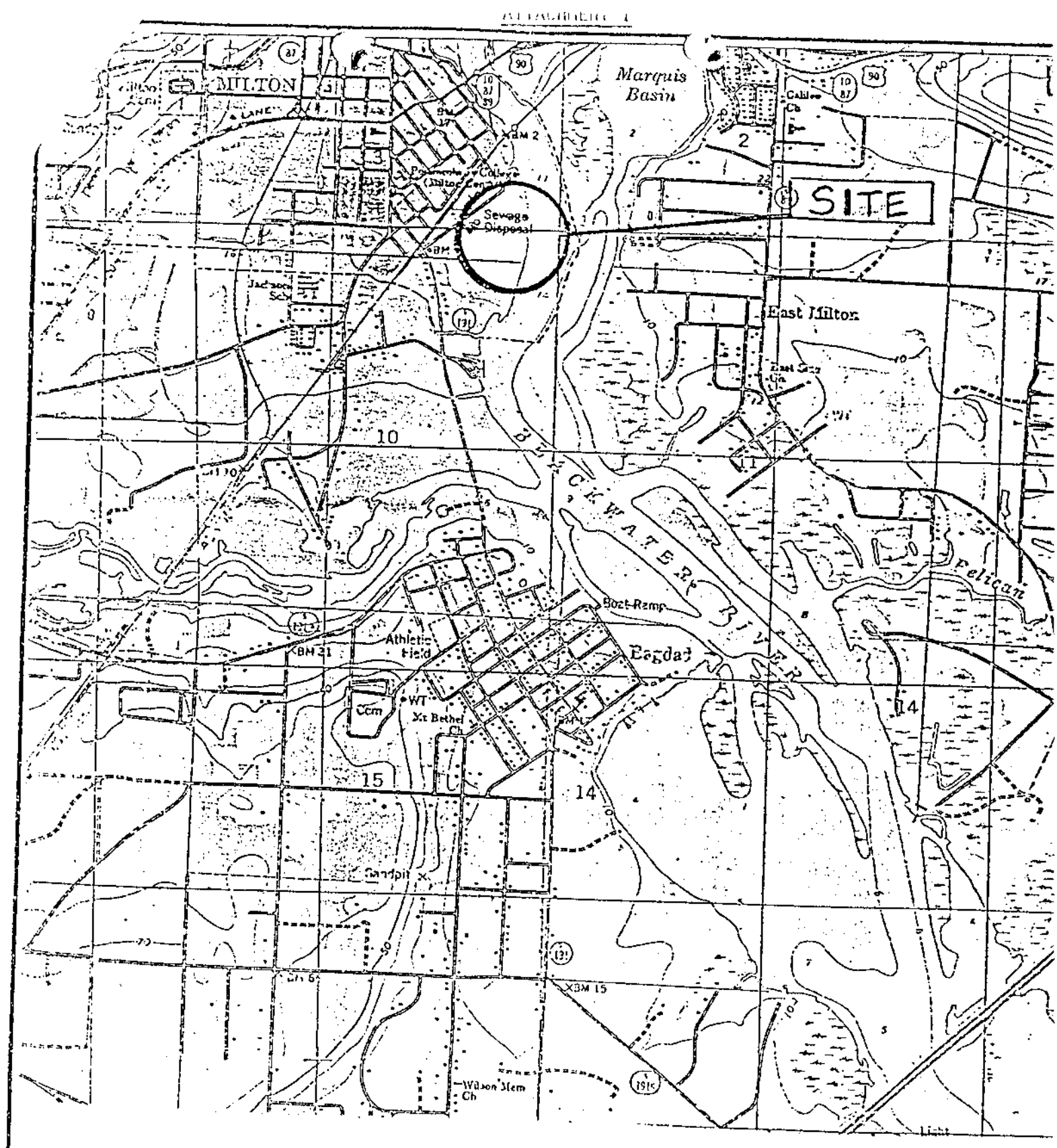
Percentile Distribution

Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%
STREAMS (1617 stations)											
Phytoplankton Chlorophyll *a*	0.22	0.52	0.94	1.60	3.02	4.63	6.72	9.87	14.68	27.35	48.70
Periphyton Chlorophyll *a*	0.31	0.43	0.77	1.04	2.16	2.94	6.45	10.51	17.00	39.51	60.85
H-D Diversity	0.84	2.12	2.48	2.74	2.88	3.09	3.25	3.40	3.52	3.76	3.90
Qualitative Taxa Richness	9.00	12.00	17.00	20.00	22.00	24.50	26.00	28.00	31.00	37.00	53.00
H-D Taxa Richness	6.00	6.50	9.00	11.50	13.00	15.00	17.00	21.50	26.00	29.00	32.00
TKN	0.30	0.39	0.56	0.73	0.87	1.00	1.11	1.26	1.49	1.93	2.80
Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60
NO2-NO3	0.01	0.01	0.03	0.05	0.07	0.10	0.14	0.20	0.32	0.64	1.05
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	0.74	1.51
Ortho Phosphorus	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	0.59	1.37
Turbidity	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30
LAKES (477 stations)											
Phytoplankton Chlorophyll *a*	0.80	1.71	2.88	4.28	10.06	13.40	20.00	30.10	47.20	65.44	113.90
Dredge Diversity	0.71	0.97	1.43	1.74	1.98	2.12	2.21	2.59	2.85	3.15	3.17
Dredge Taxa Richness	3.00	5.00	6.50	7.00	9.00	10.00	11.00	13.00	15.00	17.00	21.00
TKN	0.36	0.49	0.67	0.83	1.08	1.26	1.40	1.51	1.68	2.11	3.46
NH3+NH4	0.01	0.02	0.02	0.03	0.04	0.06	0.08	0.12	0.15	0.21	0.28
NO2-NO3	0.00	0.00	0.01	0.01	0.01	0.02	0.04	0.05	0.10	0.14	0.23
Total Phosphorus	0.01	0.02	0.02	0.03	0.05	0.07	0.09	0.11	0.14	0.23	0.42
Ortho-Phosphorus	0.00	0.01	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.21	0.32
Turbidity	1.00	1.25	1.55	2.05	2.75	4.50	6.45	9.60	14.10	26.00	40.00
ESTUARIES (690 stations)											
Phytoplankton Chlorophyll *a*	2.14	3.28	4.49	5.13	6.00	6.93	7.94	9.60	12.40	17.60	22.20
Dredge Diversity	1.34	1.53	1.91	2.28	2.56	2.90	3.15	3.59	4.01	4.53	4.98
Dredge Taxa Richness	4.00	6.00	9.00	11.00	15.00	18.50	25.00	35.00	41.00	62.00	90.00
TKN	0.26	0.34	0.42	0.50	0.59	0.69	0.76	0.82	0.95	1.30	1.49
NH3+NH4	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.09	0.13	0.22	0.28
NO2-NO3	0.00	0.00	0.01	0.01	0.01	0.02	0.03	0.05	0.08	0.17	0.23
Total Phosphorus	0.01	0.02	0.06	0.07	0.10	0.11	0.14	0.17	0.23	0.43	0.59
Ortho-Phosphorus	0.01	0.02	0.03	0.04	0.04	0.05	0.07	0.09	0.12	0.21	0.44
Turbidity	3.50	4.00	4.50	5.05	5.40	5.60	6.30	6.80	8.00	11.40	11.75

Units:

Phytoplankton Chlorophyll *a* (ug/L), Periphyton Chlorophyll *a* (mg/m^2), Nutrients (mg/L), Turbidity (NTU), Taxa richness and diversity values are for macroinvertebrates

ATTACHMENT 1



LOCATION MAP

0 1000' 2000' 4000'

1" = 2000'

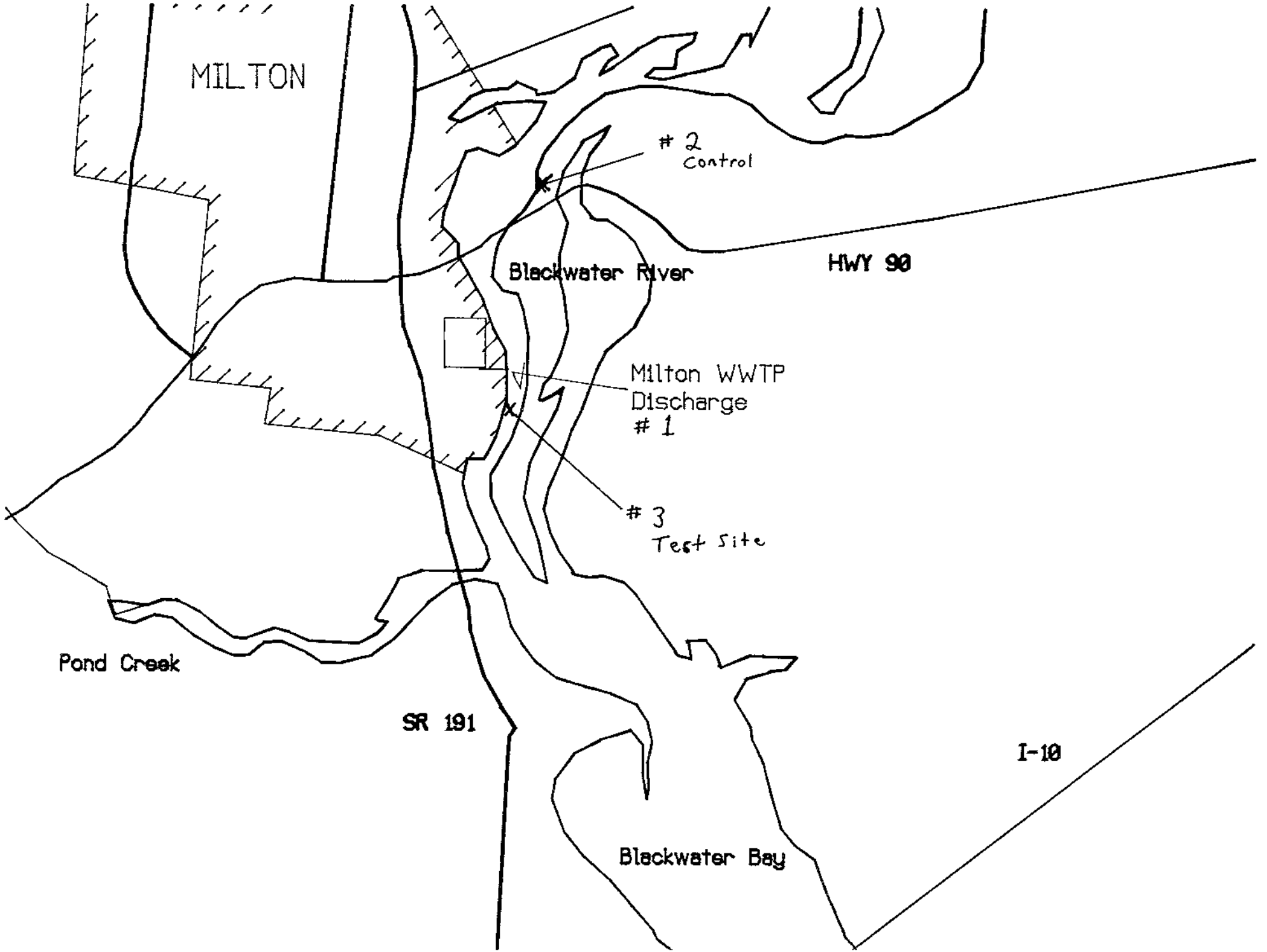
N

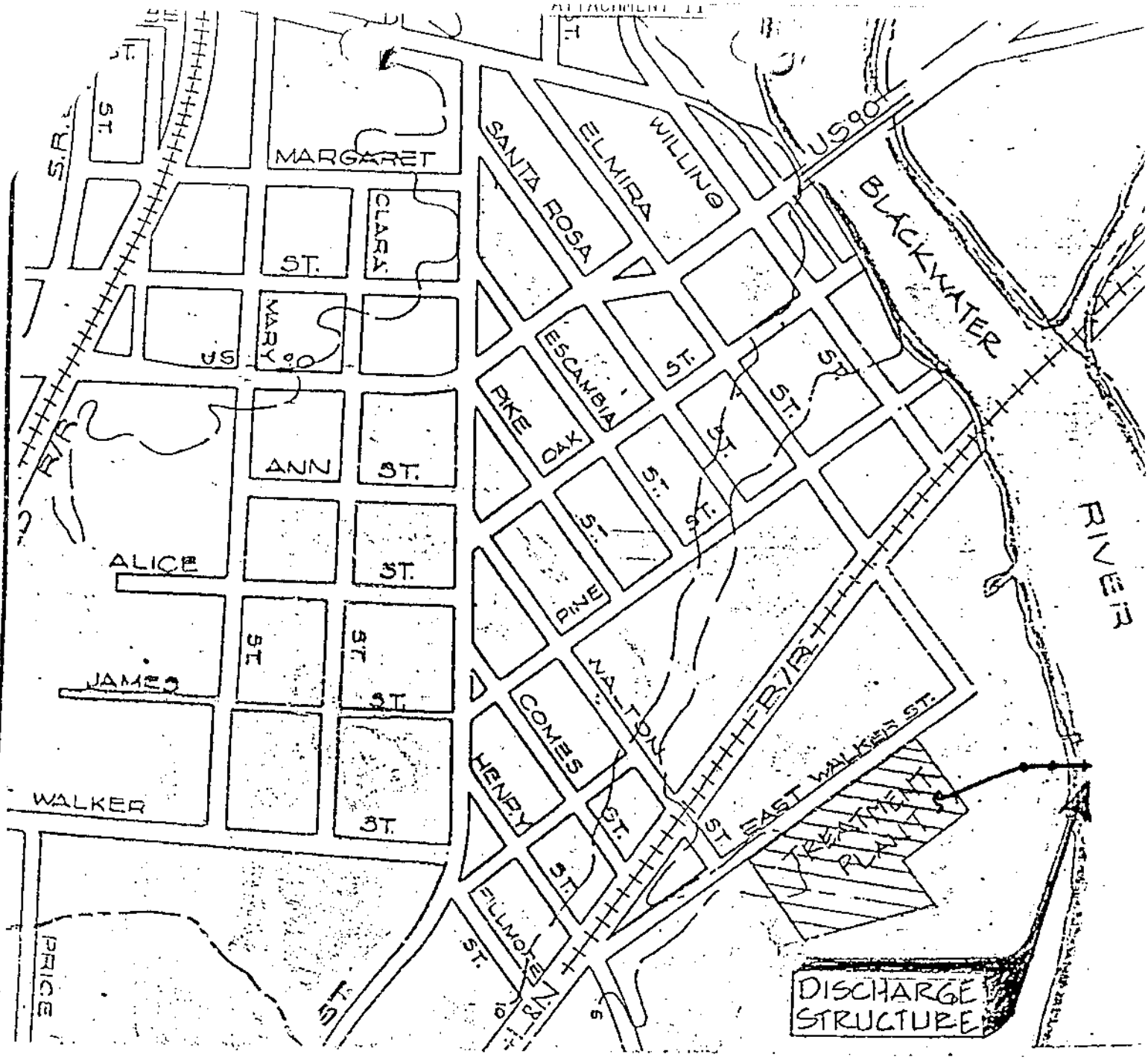
BASKERVILLE DONOVAN ENGINEERS, INC.

LAND SURVEYORS
LAND PLANNERS
PROFESSIONAL ENGINEERS
16 WEST ZARRAGOSSA ST. PENS[illegible]A, FL. 32501

PROJECT NO. 255

DATE 9-23-82 SHEET


MILTON
2
Control
Blackwater River
HWY 90
Milton WWTP
Discharge
1
3
Test Site
Pond Creek
SR 191
I-10
Blackwater Bay



VICINITY MAP

0 250' 500' 1000'

1" = 500'

N

BASKERVILLE DONOVAN ENGINEERS, INC.

LAND SURVEYORS
LAND PLANNERS
PROFESSIONAL ENGINEERS
16 WEST ZARRAGOSSA ST. PENSACOLA, FL. 32501

PROJECT NO. 255	
DATE 9-23-82	SHEET
INDEX	OF

Facility Summary

Facility Name:
CITY OF MILTON WWTP

Date Summary Prepared:
8/17/94

Location map:

County
SANTA ROSA

District
NW

NPDES Permit #FL0021903

State GMS #1057M02815

Facility Type: Ind.

expiration date

expiration date MAY 15,95

XDomX. Fed. Agric.

Function of facility: SEWAGE TREATMENT FOR CITY OF MILTON

Description of treatment process:2.5 MGD OXIDATION DITCH/AREATION BASIN WASTE WATER TREATMENT PLANT WITH EFFLUENT DISCHARGE TO BLACKWATER RIVER TO BLACKWATER BAY TO EAST BAY

Receiving waters:
BLACKWATER RIVER

Classification: I II III
CLASS III

Design Flow:	Mean Flow:	Flow during survey:
2.5 MGD	1.24	1.59

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

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

List effluent limits (attach relevant paperwork):

Parameter	Limit (units)
FLOW	2.5 MGD MAX.ANNUAL AVG.
pH	6.5-8.5 STU
CHLORINE RESIDUAL	MIN. 1.0 MG/L MAX. 0.01 MG/L
BOD5	15 MG/L
TSS	20 MG/L
FECAL	200/#100 ML

List permit violations (from MOR data or other source) and plant upsets within past year: SEWER SPILLS: IN 93 - 6/23, 8/2, 8/16, 9/16, 10/22, 11/19, 12/25
IN 94 - 2/17, 5/4, 5/23, 5/26, 7/13, 7/22
JUNE - OCTOBER: MINIMUM CHLORINE RESIDUAL BEFORE DECHLORINATION WAS NOT REPORTED CORRECTLY ON FRONT PAGE OF THE MONTHLY OPERATING REPORTS

Describe previous impact bioassessments, WQBEL's and previous or current enforcement actions: BIOASSESMENTS -OCT. 8, 93 0% MORTALITY FOR CREIODAPHNIA DUBIA(CD), PIMEPHALES PROMELAS(FM) AND DAPHNIA PULEX(DP). DEC.18, 92 0-20% MORTALITY FOR CD, 0-5% MORTALITY FOR FM AND 0-90% MORTALITY FOR DP. JUN.20, 92 0% MORTALITY FOR CD, 0-15% MORTALITY FOR DP, 0% MORTALITY FOR FM. NO PREVIOUS OR CURRENT ENFORCEMENT ACTIONS ON FILE.

Discuss comparability of MOR results to past FDER results and whether there are trends (improving, declining) in the data set:
THE PLANT OPERATES BETWEEN 40 AND 50% OF DESIGN CAPACITY AND ALL REPORTED PARAMETERS ARE WITHIN PERMIT REQUIREMENTS. NO DECLINING OR IMPROVING TRENDS ARE SHOWN BY MONTHLY OPERATING REPORT REVIEV, IN SHORT THE PLANT SEEMS TO OPERATE WELL.
THE DATA COLLECTED BY DEP INSPECTORS CORRESPONDS WITH THAT SUBMITTED BY MILTON WWTP.

Additional information:

Staff contributing to this review (signature)

Glenn L. Butts — Biologist
Inspector
Engineer
Martha A. Gawronski OPS — Other
Other

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

SUBMITTING AGENCY CODE: 8010 SUBMITTING AGENCY NAME: NW DISTRICT	STORET STATION NUMBER: 33.03.0011	DATE (M/D/Y): 08-19-94	RECEIVING BODY OF WATER: BLACKWATER RIVER

REMARKS:	LOCATION: CONTROL SITE, NORTH OF HWY 90	FIELD ID/NAME: # 2

Habitat Parameter score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover 22	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 10	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 14	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 10	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 5	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 69

COMMENTS: SLIGHTLY BETTER FLOW, STILL TIDAL INFLUENCED; VERY SIMILAR HABITAT AS FOUND AT TEST SITE. ONLY LEAF PACKS ON SNAGS ARE MISSING AT BOTH SITES.

ANALYSIS DATE:	ANALYST: G. BUTTS	SIGNATURE: Glenn Butts

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

SUBMITTING AGENCY CODE: 8010 SUBMITTING AGENCY NAME: NW DISTRICT	STORET STATION NUMBER: 33.03.0013	DATE (M/D/Y): 08-19-94	RECEIVING BODY OF WATER: BLACKWATER RIVER

REMARKS:	LOCATION: TEST SITE, SOUTH OF MILTON OUTFALL	FIELD ID/NAME: # 3

Habitat Parameter score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover 22	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 8	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 12	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 10	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 5	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 62

COMMENTS: BANK BERMED AT OUTFALL AND BARGE TERMINAL AREA, VERY STABLE BANKS. TIDAL AREA FLOW DEPENDS ON TIDE CYCLE

ANALYSIS DATE:	ANALYST:	SIGNATURE:
08-19-94	G. 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: 33.03.0011	DATE (M/DY): 08-19-94	TIME: 1030	RECEIVING BODY OF WATER: BLACKWATER RIVER

REMARKS: 3 grab / 3 replicate Ponars in available habitat	LOCATION: CONTROL SITE, NORTH OF HWY 90	FIELD ID/NAME: # 2

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
60	20		10	10		

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

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

Point-Source Pollution (list location and describe): NONE OBSERVED

Estimated System Width (range, m): 120	Estimated System Depth (range, m): 0.1-4.0	yes
High Water Mark (m above bed): 1.5	Velocity (range, m/s):	Impounded [ ] Channelized [ ]

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

SEDIMENT/SUBSTRATE

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

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

Sediment Deposits: Sludge: [ ] Paper Fiber: [ ] Mud: [ ] Sand: [X] Shell: [ ] Other: [X] organic debris

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	10		PONAR	Riffles			
Leaf Packs				Sand	30		PONAR
Aquatic Vegetation	30		PONAR	Mud/Muck/Silt	20		PONAR
Rock or Shell Rubble				Benthic leaf mats	10		PONAR
Undercut Banks/Roots				Other: No Rip Rap			

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):	SAL		Secchi (m):
Top	0.1	25.44	6.18	6.77	740	0.4		0.9
Mid-depth								
Bottom								

System Type: Stream: [X] (Sand Bottomed, Sand Bot w/ Spring, Swamp & Bog, Calcareous, Alluvial, Misc.) 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: [X] Green (algae): [ ] Clear: [ ] Other: [ ] _____

Weather Conditions:

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

SAMPLING TEAM: Glenn Butts / Barbara Ruth	SIGNATURE: Glenn Butts	DATE: 08-19-94

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: 33.03.0013	DATE (M/D/Y): 08-19-94	TIME: 1010	RECEIVING BODY OF WATER: BLACKWATER RIVER

REMARKS: 3 grab / 3 replicate Ponars in available habitats	LOCATION: TEST SITE, SOUTH OF MILTON OUTFALL	FIELD ID/NAME: # 3

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
			10	40	50	

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

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

Point-Source Pollution (list location and describe): MILTON WWTP DISCHARGE

Estimated System Width (range, m): 240	Estimated System Depth (range, m): 0.1-4.0	yes
High Water Mark (m above bed): 1-5	Velocity (range, m/s):	Impounded [ ] Channelized [ ]

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

SEDIMENT/SUBSTRATE

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

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

Sediment Deposits: Sludge: [ ] Paper Fiber: [ ] Mud: [ ] Sand: [X] Shell: [ ] Other: [X] organic debris

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	10		PONAR	Riffles			
Leaf Packs				Sand	20		PONAR
Aquatic Vegetation	50		PONAR	Mud/Muck/Silt	10		PONAR
Rock or Shell Rubble				Benthic leaf mats	5		PONAR
Undercut Banks/Roots				Other: Rip Rap	5		PONAR

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):	SAL		Secchi (m):
Top	0.1	26.21	6.59	6.65	1490	0.8		0.8
Mid-depth								
Bottom								

System Type: Stream: [X] (Sand Bottomed, Sand Bot w/ Spring, Swamp & Bog, Calcareous, Alluvial, Misc.) 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: [X] Green (algae): [ ] Clear: [ ] Other: [ ] _____

Weather Conditions:

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

SAMPLING TEAM: Glenn Butts / Barbara Ruth	SIGNATURE: Glenn Butts	DATE: 08-19-94

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Milton STP
County: Santa Rosa
Contact / District: Glenn Battis / NW
NPDES Permit #: FL00 21903
LIMS Sample #: 87400 **LIMS Job #:** 94-AUG-30-46-01

Sample Collection: Date 08/29/94 Time 0835
Test Beginning: Date 08/30/94 Time 1335
Test Ending: Date 09/01/94 Time 1340
Organism Batch #: 32 **Diluent Batch #:** 33
Organism Age: < 24 hr
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	23.7 @ 23.8	8.3 @ 24.3 °C	1047 @ 1011
	9.0 @ 9.0			1011 @ 1017 @ 24.5 °C
24 hr	7.0 @ 7.0	24.1 @ 24.0	8.2 @ 24.7 °C	1052 @ 1011
	9.0 @ 9.0			1045 @ 1047 @ 24.5 °C
48 hr	7.0 @ 7.0	23.8 @ 24.0	8.4 @ 23.9 °C	1006 @ 1011
	9.0 @ 9.0			1045 @ 1047 @ 24.6 °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	A	5	5	5	8.3	8.4		23.4		23.7	8.3		8.3	175		185
Control B	B	5	5	5		8.4				23.3			8.7			210
Control C	C	5	5	5		8.4				23.2			8.7			190
Control D	D	5	5	5		8.4				23.3			8.7			180
100% A	A	5	5	5	7.4		8.1	23.5		23.6	8.0		8.6	235		280
100% B	B	5	5	5			8.1			23.6			8.6			250
100% C	C	5	5	5			8.1			23.4			8.6			255
100% D	D	5	5	5			8.1			23.3			8.6			255
					* - recorded 48 hr											
					; ~ 24 hr slash			TM								
Measured/Loaded by:		TM	MF	TM	MF	TM	MF	MF		MF	MF		MF	MF		MF
Recorded by:		TM	TR	TM	DW	TR	TM	DW		TM	DW		TM	DW		TM

Investigators' Signatures

Reviewer

Water Quality Parameters	Salt Water: Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			<0.02	—	DB
Lab Total Residual Cl2:	<0.03	<0.03	<0.03	DR-100	TM
Alkalinity:	125	75	55	Hach	TM
Hardness:	120	85	40	Hach	TM
Total Ammonia:	<0.017	0.08	0.190	orion	MF

Ammonia Meter #98136 Ammonia Meter Slope: -58.4 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

form updated 4/27/94

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Milton STP
County: SANTA ROSA
Contact / District: Glenn Botts / NW
NPDES Permit #: FL0021903
LIMS Sample #: 87400 LIMS Job #: 94-AUG-30-46401

Sample Collection: Date 08/29/94 Time 0835
Test Beginning: Date 08/30/94 Time 1335
Test Ending: Date 09/01/94 Time 1350
Organism Batch #: 35 Diluent Batch #: well
Organism Age: 11 days
Test Organism: Cyprinodon variegatus

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 7.0 @ 9.0	23.7 @ 23.8	8.3 @ 24.3 °C	104.7 @ 101.1 1041 @ 1047 @ 24.5 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	24.1 @ 24.0	8.2 @ 24.7 °C	105.2 @ 101.1 1045 @ 1047 @ 24.5 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	23.8 @ 24.0	8.4 @ 23.9 °C	106.0 @ 101.1 1045 @ 1047 @ 24.6 °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	378	5	4	4	7.8	8.3	8.5	23.8	23.3	23.5	8.3	8.6	8.4	245	245	250
Control B	57	5	5	5	7.8	8.3	8.5			23.4	8.4	8.6	8.5	245	245	250
100% A	79	5	5	5	7.0	7.5	7.7	23.7	23.3	23.4	~~8.7~~ MEO 7.7	8.4	8.5	245	245	250
100% B	891	5	5	5	7.0	7.5	7.7			23.4	7.7	8.4	8.3	245	250	255
											*S/30/94 Received out of Order QW					
Measured/Loaded by:		MF	TM	TM	MF	TM	MF	MF	TM	MF	MF	TM	MF	MF	TM	MF
Recorded by:		TM	TR	TM	QW	TR	TM	QW	TR	TM	QW	TR	TM	QW	TR	TM

Investigators' Signatures

David Whitley
Tina Mikulski
Marshall Faircloth
Robin Rice
Reviewer

form updated 4/27/94

Salt Water: (Well Water) | 20% Min Water

Water Quality Parameters					
	Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			<0.02	~	GB
Lab Total Residual Cl2:	<0.03	<0.03	<0.03	DR-100	TM
Alkalinity:	125	75	55	Hach	TM
Hardness:	120	85	40	Hach	TM
Total Ammonia:	<0.017	0.08	0.190	Orion	MF

Ammonia Meter #98136 Ammonia Meter Slope: -58.4 Ammonia Blank: <0.017 Control Salinity: ( ) ppt Sample Salinity: ( ) ppt

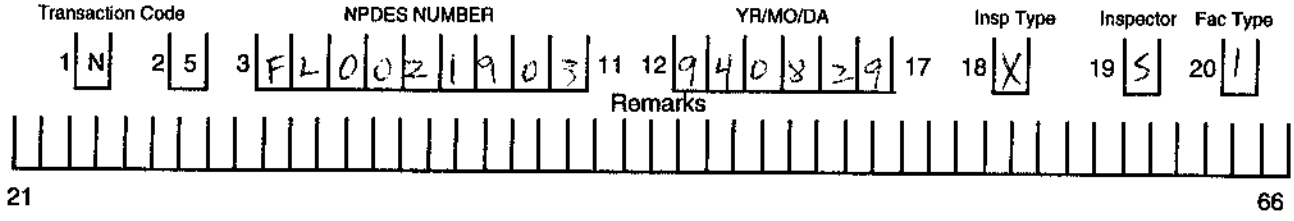
Benthic macroinvertebrate taxa list for Milton WWTP, collected via Ponar grab samples in the Blackwater River, on 29 August, 1994. Densities, in number/m^2, represent the mean of three replicates.

	Reference Site	Test Site
Amphipoda		
Gammarus sp.	–	37
Hyalella azteca	25	37
Decapoda		
Rhithropanopeus harrisii	–	37
Diptera		
Ablabesmyia mallochi	–	12
Ablabesmyia rhamphe grp.	–	12
Chironomus sp.	–	37
Clinotanypus sp.	–	12
Coelotanypus sp.	12	–
Cricotopus/Orthocladius grp. sp.	–	12
Paralauterborniella nigrohalteralis	–	12
Polypedilum halterale grp.	12	12
Procladius sp.	–	12
Pseudochironomus sp.	–	12
Stictochironomus sp.	75	50
Tanytarsus sp. L Epler	25	–
Tribelos fuscicorne	12	–
Tribelos jucundum	–	25
Ephemeroptera		
Hexagenia bilineata	–	12
Gastropoda		
Littoridinops sp.	12	25
Neritina reclivata	–	12
Isopoda		
Cyathura polita	–	25
Mysidacea		
Bowmaniella sp.	–	12
Nemertea		
Undetermined Nemertea	–	12
Odonata		
Ischnura sp.	–	12
Oligochaeta		
Eclipidrilus sp.	50	–
Pelecypoda		
Tellina sp.	12	25
Plecoptera		
Undetermined Plecoptera	–	12
Polychaeta		
Amphicteis gunneris	12	–
Capitella sp.	12	–
Undetermined Nereidae	–	12

Phytoplankton taxa list and densities (#/mL) for MiltonWWTP, collected via subsurface grabs in the Blackwater River on 29 August, 1994.

	Reference Site	Test Site
Bacillariophyta		
Achnanthes sp.	–	26
Cocconeis sp.	1	–
Cyclotella sp.	24	–
Eunotia sp.	1	–
Frustulia sp.	47	26
Navicula sp.	24	26
Nitzschia sp.	71	26
Rhizosolenia sp.	24	–
Synedra sp.	95	–
Unidentified pennate diatom	–	52
Chlorophyta		
Ankistrodesmus sp.	47	–
Chlamydomonas sp.	–	78
Scenedesmus sp.	118	52
Cyanophyta		
Dactylococcopsis sp.	47	104
Gloeocapsa sp.	24	–
Gloeothece sp.	–	26
Lyngbya sp.	–	26
Euglenophyta		
Euglena sp.	–	26

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



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

