

Biological Assessment of

East Milton Elementary School Wastewater Treatment Plant

Santa Rosa County

NPDES #FL0023841

Sampled January 1993

June 1993

Biology Section
Division of Technical Services

Department of Environmental Regulation

Results of Fifth Year Inspections

Discharger: East Milton Elementary School Wastewater Treatment Plant
County: Santa Rosa
NPDES Number: FL0023841
State Permit Expiration Date: 1 November 1993

Toxics Sampling Inspection (XSI)

Date Sampled: 25 January 1993

Results: No organic priority pollutants were detected in the effluent sample. Aluminum (113 µg/L), copper (42 µg/L), iron (690 µg/L), and zinc (224 µg/L) were found in the discharge above quantitation limit. At a hardness of 45 mg/L $CaCO_3$, the Class III standards for copper and zinc are 6.0 and 53.9 µg/L, respectively. The observed concentrations of these metals are in violation of Rules 17.302.560(14) FAC (copper) and 17.302.560(45) FAC (zinc).

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 25 January 1993

Results: Extremely toxic to the test animals, killing all organisms within 15 minutes. This toxicity could be attributed to the very low pH of the sample (3.4 SU's), as bioassays performed with pH adjusted effluent (to 7.6) resulted in only 40% mortality to *Ceriodaphnia dubia* at 24 hours and no toxicity to *Notropis leedsi*. The copper, zinc, and chlorine levels measured in the effluent could have contributed to the *C. dubia* mortality in the pH adjusted sample.

Impact Bioassessment Inspection (IBI)

Date Sampled: 25 January 1993

Results: Macroinvertebrate communities at the two study sites were relatively rich taxonomically and of high diversity, indicating healthy conditions. The taxa found at the two study sites were representative of normal estuarine populations. No evidence of disturbance associated with the discharge was apparent. Phytoplankton density and chlorophyll *a* were very low at both study sites, indicating oligotrophic conditions.

Water Quality Inspection (WQI)

Date Sampled: 25 January 1993

Results: The effluent had an extremely low pH (3.4 SU's) and high residual chlorine content (0.11 mg/L). These are violations of Rules 17-302.560 (32) FAC and 17-302.560 (13) FAC, as well as violations of the facility's permit. Total and fecal coliform bacteria exceeded Class III standards in the effluent, but were within the legal limits at receiving water stations. Nutrient concentrations were extremely high in the effluent: ortho-phosphate (4.7 mg/L), total phosphorus (4.5 mg/L), ammonia (3.4 mg/L), nitrate-nitrite (19 mg/L), and TKN (5.3 mg/L). However, nutrients were low or below detection limits at test and reference sites. The low volume, high-nutrient effluent was probably diluted enough by the receiving waters so that it did not contribute to enrichment effects. Algal growth potential was very reduced in the effluent, as well as the two study sites. Growth inhibition of *Selenastrum capricornutum* in the effluent was probably due to the low pH, but could have also been affected by the copper and zinc concentrations present.

Introduction

The East Milton Elementary School Wastewater Treatment Plant is owned and operated by the Santa Rosa County School Board. This facility, with a design capacity of 0.005 MGD, treats domestic waste with extended aeration, chlorination, and dechlorination. Effluent is discharged through approximately 6600 ft of 4 inch PVC pipe to the Blackwater River Delta, a tidally influenced area. Because the discharge is intermittent, effluent may be retained in the PVC pipe prior to entering the river.

Permit limits are as follows: flow (0.005 MGD), BOD and TSS (20 mg/L), pH (6.0 to 8.5), fecal coliform bacteria (maximum of 200 organisms/100 mL), and chlorine residual (maximum of 0.01 mg/L at discharge).

Former compliance inspections and Monthly Operating Report data indicated problems with low dissolved oxygen in May, 1984, and high fecal coliform counts in May, 1988, in the vicinity of the outfall, as well as some minor reporting and maintenance deficiencies. The school board plans to expand the facility over the next five years, to accommodate an anticipated enrollment increase.

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 at the mouth of the Blackwater River where influence from the facility should be minimal) and a test site (at the outfall, near the east bank of the river) (see maps in Appendix). A habitat assessment was performed in situ to establish comparability between sites. Supplemental physical/chemical data were also collected on the effluent and study sites. Acute screening toxicity bioassays, using *Ceriodaphnia dubia* and *Notropis leedsi* as test organisms, were performed on an effluent sample (Weber 1991). The effluent was analyzed for metals and for organic constituents (base neutral and acid extractables, and pesticide extractables). Additionally, nutrient analyses were performed on effluent, reference, and test sites. Methods used for all chemical analyses are on file at the Tallahassee DER Chemistry Laboratory.

Benthic macroinvertebrate communities were evaluated at reference and test sites. Invertebrates were collected via three Ponar grabs per site (Ross 1990). Phytoplankton was sampled at both reference and test sites through 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,

Major characteristics of community structure of control and test sites.

	Reference Site	Test Site
Macroinvertebrate Ponar		
Number of Taxa	24	25
Florida Index	4	3
Shannon-Weaver Diversity	3.61	3.77
% Malacostraca	51.7	36.6
% Polychaeta	14.1	28.2
% Diptera	17.1	19.2
% Decapoda	7.1	7.7
% Nemertina	2.4	5.1
% Other	7.7	3.0
% Predator/Carnivores	35.0	43.9
% Collector-Gatherer/Deposit Feeders	46.8	41.3
% Collector-Filterer/Suspension Feeders	2.6	2.2
% Scrapers	6.5	4.1
% Shredders	5.9	5.3
% Scavengers	3.2	3.2
Phytoplankton Algae		
Number of Taxa	10	7
% Contribution of Dominant Taxon	15.4	42.9
Chlorophyll a (µg/L)	Undetected	Undetected
Diatom/Diatom + B-G Abundance Ratio	0.78	1
% Blue-green	15.4	0
% Green	30.8	21.4
% Diatoms	53.8	78.6
Algal Growth Potential (mg dry wt/l)	0.20	0.28

using *Selenastrum capricornutum* as the test organism, followed Miller *et al.* (1978).

Explanation of Measurements of Community Health

Several different measurements of macroinvertebrate and algal community health have been employed in this report. Many of these, such as the number of taxa, Shannon-Weaver Diversity Index, and chlorophyll *a* are well known. Others are briefly explained here. The Florida Index assigns points to stream-dwelling macroinvertebrates based on their sensitivity to pollution (see Ross 1990). A site with a high Florida Index score is considered healthy (*i.e.*, many clean-water organisms are present). Excessive numerical dominance of a single type of organism (a high % contribution of dominant taxon) is usually associated with disturbance. A decreased diatom to blue-green algae ratio (calculated by dividing the number of individuals in the Bacillariophyta by the number of individuals in the Bacillariophyta + Cyanophyta) is often indicative of nutrient enriched conditions. The determination of the Quantitative Stability Index (for taxonomic % composition) is a two step process. First, the relative proportions of major taxonomic groups are calculated for each site. Then, the lesser of the two percentages for each discrete taxonomic group is totaled. A QSI (for % composition) of 100% means that the two sites being compared are identical. This same type of procedure is used for calculating the QSI (for functional feeding groups).

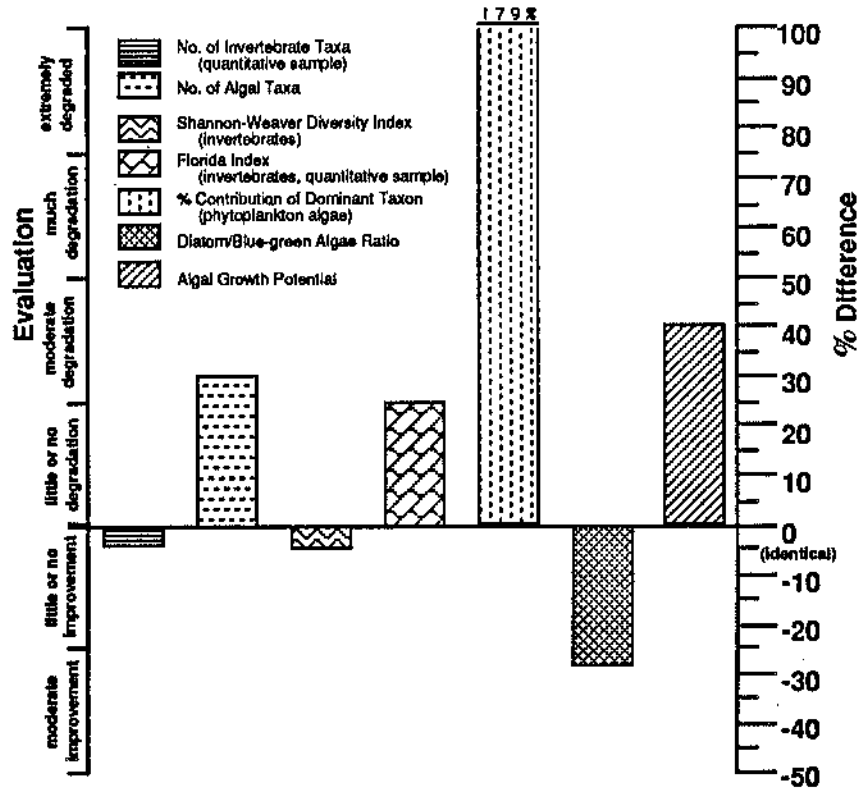
For graphical purposes, the percent differences between the reference and test sites involving the number of taxa, the diversity index, Florida Index and the diatom to blue-green algae ratio are measured as the reference site minus test site divided by the reference site. The percent differences between sites involving the percent contribution of dominant taxon, chlorophyll *a*, and algal growth potential are measured as the test site minus reference site divided by the reference site.

The following personnel were involved in this investigation: Glenn Butts and Charles Reyes (DER Northwest District) and Lyn Burton, Marshall Faircloth, Russel Frydenborg, Kathleen Lurding, Elizabeth Miller, Kim Pearce, Urania Quintana, and Greg Wynn (Tallahassee Biology Laboratory).

Results and Discussion

Problems with the effluent found during the present inspection included an extremely low effluent pH (3.4) and high residual chlorine content (0.11 mg/L). These are violations of Rules 17-302.560 (32) FAC and 17-302.560 (13) FAC, as well as violations of the facility's permit.

Habitat quality was similar at the two study areas, with the reference site scoring 68 points and the



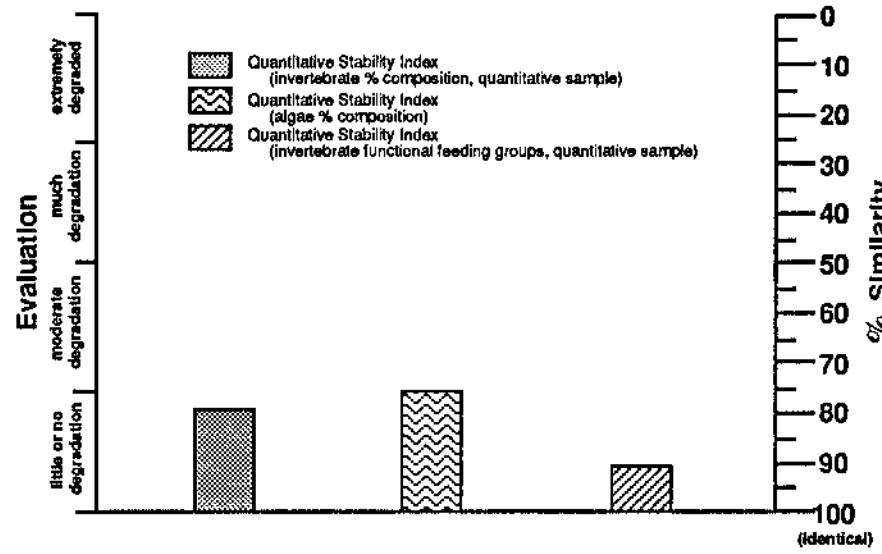
Effect of discharge on receiving stream
(measured as difference between control and test sites).

test site receiving 64 (Appendix). A greater diversity of vegetation was noted at the reference site (*Juncus* and *Cladium*, as well as *Valisneria*). Although most habitat characteristics were typical of marine environments (salt marsh vegetation and tidal fluctuation), water was predominantly fresh. Specific conductance was 460 µmhos/cm and 620 µmhos/cm at reference and test sites, respectively. Both sites were well oxygenated, at 8.3 mg/L.

No organic priority pollutants were detected in the effluent sample. Metals found in the discharge above quantitation limit included aluminum (113 µg/L), copper (42 µg/L), iron (690 µg/L), and zinc (224 µg/L). At the measured hardness of 45 mg/L $CaCO_3$, the Class III standards for copper and zinc are 6.0 and 53.9 µg/L, respectively. Therefore, the observed concentrations of these metals are in violation of Rules 17.302.560(14) FAC (copper) and 17.302.560(45) FAC (zinc).

The sample of final effluent was extremely toxic to both test organisms, killing the *Ceriodaphnia dubia* and *Notropis leedsi* within 15 minutes (Appendix). This instant mortality was probably due to the effluent pH of 3.4, (in violation of the facility's permit as well as Class III Water Quality Standards). Additional bioassays were performed on a discharge sample that was adjusted to a pH of 7.6. These tests resulted in 40% mortality to *C. dubia* at 24 hours and none to *N. leedsi*. The copper, zinc, and chlorine levels measured in this sample may have contributed to the cladoceran mortality.

Total and fecal coliform bacteria were in excess of Class III standards in the effluent, at greater than 5000 organisms/100 mL and 1300 organisms/100 mL, respectively. Coliform bacteria were present, but within the legal limits, at the reference and test sites (see chemistry summary table).



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

Nutrient concentrations were extremely high in the effluent: orthophosphate (4.7 mg/L), total phosphorus (4.5 mg/L), ammonia (3.4 mg/L), nitrate-nitrite (19 mg/L), and TKN (5.3 mg/L). Apparently, dilution was fairly substantial in the receiving waters, since nutrients were either very low or undetected at the test site. The only nutrient compounds detected at either study site were nitrate-nitrite (0.18 mg/L at both reference and test sites) and TKN (0.27 mg/L and 0.28 mg/L at reference and test sites, respectively).

Algal growth potential at the two study sites was very low as well. Although the percent difference between the two values appears to indicate a moderate amount of degradation on the graph, both values were far below the problem threshold. Effluent AGP, at 0.006 mg dry wt/L, indicated that essentially no algal growth occurred during the 14 day test period. Although nutrients were present at levels that would normally generate a quite high AGP, the pH of the effluent was much lower than the range tolerated by test organism. The copper and zinc concentrations found in the effluent are another possible cause for the algal growth inhibition.

Benthic macroinvertebrate communities were made up of a mixture of freshwater and estuarine taxa. The figure on p. 2 indicates the degree of difference between the reference and test sites. Larger differences (that is, higher percentages) correspond with greater degrees of degradation. Negative values mean that the test site is better than the reference. The relative abundance of each individual taxon appears in the Appendix.

The reference site and the test site were similar with respect to several measurements of community health. The two study sites had relatively high taxa richness (*circa* 25 taxa) and diversity values (*circa* 3.7). These are above the average values for most Florida estuaries, indicating healthy conditions. Florida Index

scores reflected the marine influence in the area. Dominant taxa at both sites included organisms common in fairly undisturbed estuaries, such as *Rhithropanopeus harrisii, Grandidierella bonnieroides, Gammarus mucronatus,* and *Taphromysis bowmani.* No evidence of disturbance associated with the discharge was apparent.

The figure on p. 3 summarizes similarities between the sites. Smaller similarities (lower percentages) generally correspond with greater degradation. The Quantitative Stability Indices for percent composition and functional feeding groups also indicated little or no degradation of the test site compared to the reference.

Phytoplankton density was very low at both study stations (see species list in Appendix). Ten taxa were recovered from the reference site, and no particular organism was dominant. Seven taxa were identified from the test site, with the diatom *Eunotia* sp. (generally an indicator of oligotrophic conditions) comprising 42.9% of the population. Although the graph depicts the difference in percent contribution of dominant taxon as an indication of degraded conditions, this is an artifact of the very low algal densities found. The absolute numbers of *Eunotia sp.* (152 organisms per mL) are too low to be considered indicative of a eutrophication problem, as chlorophyll *a* was below detection limits at both reference and test sites.

Conclusions

The effluent had an extremely low pH (3.4 SU's) and high residual chlorine content (0.11 mg/L). These are violations of Rules 17-302.560 (32) FAC and 17-302.560 (13) FAC, as well as violations of the facility's permit. The effluent sample was extremely toxic to the test animals, killing all organisms within 15 minutes. This severe toxicity can be attributed to the extremely low pH of the sample (3.4), as bioassays performed with pH adjusted effluent (to 7.6 SU's) resulted in less mortality (40% of the *Ceriodaphnia dubia* died at 24 hours, while all *Notropis leedsi* lived).

No organic priority pollutants were detected in the effluent sample. Aluminum (113 µg/L), copper (42 µg/L), iron (690 µg/L), and zinc (224 µg/L) were found in the discharge above quantitation limits. At a hardness of 45 mg/L $CaCO_3$, the Class III standards for copper and zinc are 6.0 and 53.9 µg/L, respectively. The observed concentrations of these metals are in violation of Rules 17.302.560(14) FAC (copper) and 17.302.560(45) FAC (zinc).

Total and fecal coliform bacteria also exceeded Class III standards in the effluent, at greater than 5000 organisms/100 mL and 1300 organisms/100 mL, respectively. Coliform bacteria were also present at reference and test sites, but at concentrations within the legal limits.

Although nutrient concentrations were extremely high in the effluent, they were low or undetected at the test site. It is likely that the very low volume of nutrient-rich discharge was sufficiently diluted in the receiving waters to avoid detrimental enrichment effects.

Algal growth potential was very low in the effluent, as well as the two study sites. Even though nutrients were present in the effluent at levels that would normally support elevated algal growth, the pH was well below the tolerance range of the test organism. The copper and zinc concentrations found in the effluent are another possible cause for the apparent growth inhibition.

Macroinvertebrate communities at the two study sites were relatively rich taxonomically and of high diversity, indicating healthy conditions. The taxa found at the two study sites were representative of normal estuarine populations. No evidence of disturbance associated with the discharge was apparent.

Phytoplankton density and chlorophyll *a* was very low at both study sites, indicating oligotrophic conditions. The low volume, high-nutrient effluent was probably diluted enough by the receiving waters so that it did not contribute to enrichment 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.

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.

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

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

Chemistry summary table for

East Milton Elementary STP	Effluent	Reference Site	Test Site
Organic Constituents (ug/L)			
None Detected			
Metals (ug/L)			
Aluminum	113 A		
Antimony	15 U		
Arsenic	20 U		
Cadmium	0.29 T		
Copper	42 A		
Chromium	10 U		
Iron	680 A		
Lead	15 U		
Mercury	0.1 U		
Nickel	5 T		
Selenium	30 U		
Silver	0.1 U		
Zinc	224 A		
Nutrients (mg/L)			
Ortho-phosphate	4.7	0.02 U	0.02 U
Total phosphorus	4.5	0.02 U	0.02 U
Ammonia	3.4	0.02 U	0.02 U
Nitrate+Nitrite	19	0.18	0.18 A
TKN	5.3	0.27	0.28
Other Parameters			
Habitat Assessment		68	64
D.O. (mg/L)		8.3	8.3
pH (SU's)	3.29		
Conductivity (µmhos/cm)	475	460	620
Temperature (°C)	15.8	14.1	14.1
Hardness (mg CaCO3)	45		
Turbidity	6	7	7
TSS	9	5	5
BOD5	2.6	0.5 U	0.5 U
Algal Growth Potential (mg dry wt/L)	0.006	0.020	0.028
Bioassay Fish	100 % mortality in 15 minutes		
Bioassay Invertebrate	100 % mortality in 5 minutes		
Bioassay Fish-pH Adjusted	Not Toxic		
Bioassay Invertebrate-pH Adjusted	40% mortality at 24 hours		
Fecal coliform (org/100 ml)	1300	540	420
Total coliform (org/100 ml)	> 5000	680	570

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

T - Value reported is less than the practical quantitation limit

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

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Facility Name: EAST MILTON ELEM.		Date Summary Prepared: 02-23-93
Location (attach detailed map):	County: SANTA ROSA	District: NW DISTRICT
Federal Permit # FL0023841 and expiration date:	State GMS # and 1057C01111 State expiration date: 11-01-93	Facility Type: Industrial Municipal Federal Agricultural Other (list): SCHOOL

Function of facility: Treat domestic wastewater from an Elementary School.

Description of treatment process:
A 0.005 MGD extended aeration wastewater treatment facility with chlorination and dechlorination.

Receiving waters: Blackwater River		Classification: I II (III)
Design Flow: See attachment	Mean Flow: see attachment	Flow during survey: 0.003

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

therefore, the best time to sample is: MAY

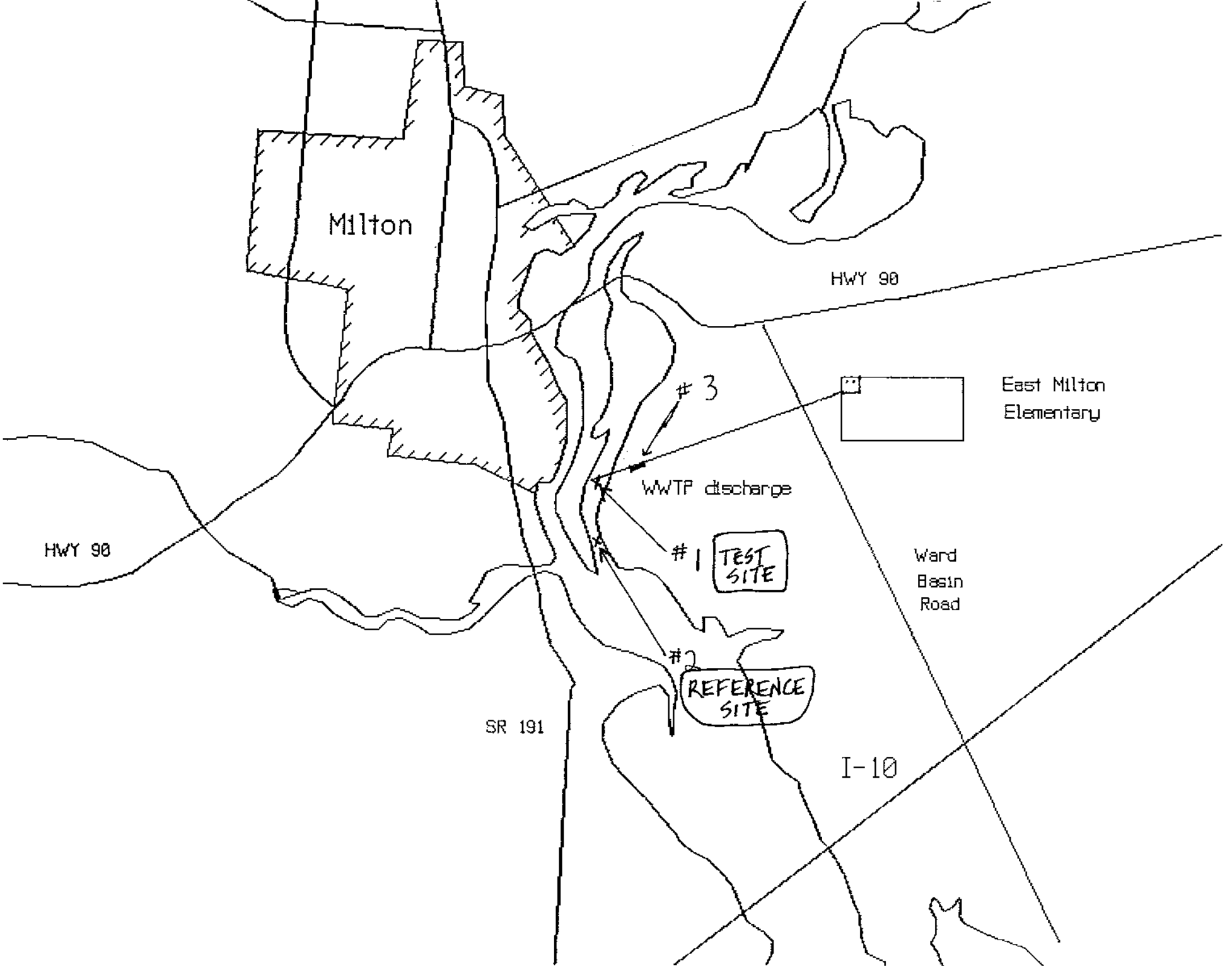
If facility has a mixing zone, give details (size, parameters affected, etc.):

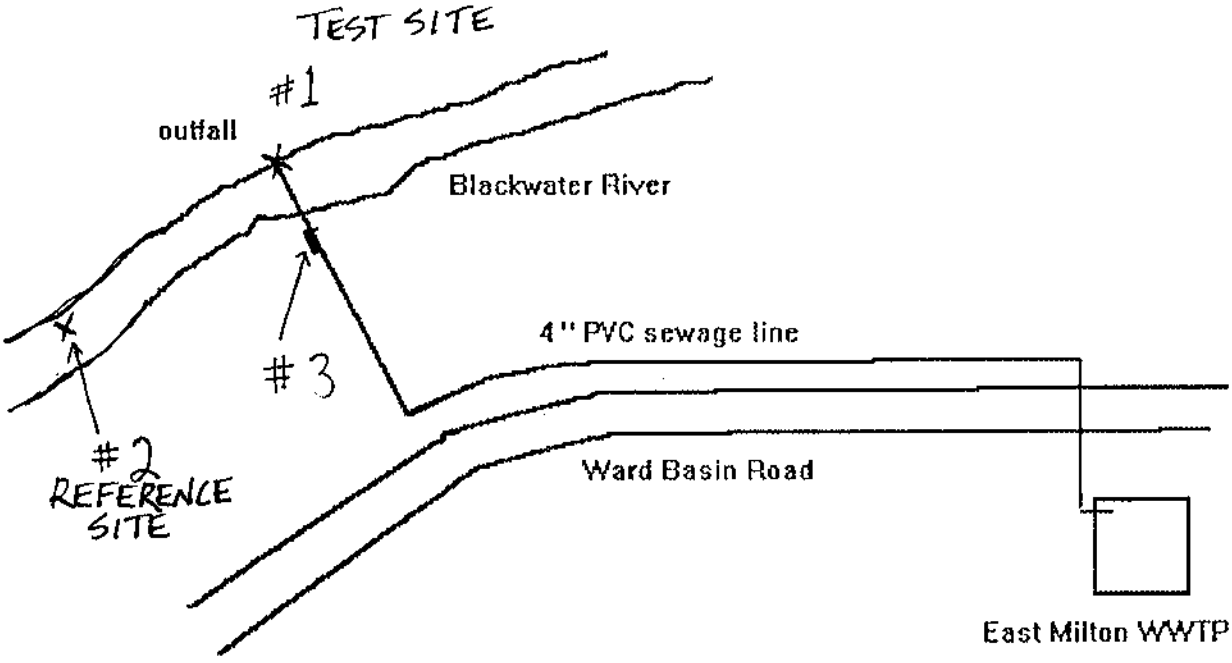
No Mixing Zone

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

Parameter	Limit (units)
Flow Max Mo Ave	0.005 MGD
pH	6.0 - 8.5
Chlorine	0.01 mg/L
BOD 5	20 mg/L
TSS	20 mg/L
Fecal Coliform	200 / 100 mL Max
Dissolved oxygen	5 mg/L min

Describe special permit conditions and permit modifications:


Milton
HWY 90
East Milton
Elementary
3
WWTP discharge
HWY 90
#1 TEST SITE
Ward
Basin
Road
#2
REFERENCE SITE
SR 191
I-10


TEST SITE
#1
outfall
Blackwater River
#3
4" PVC sewage line
#2
REFERENCE
SITE
Ward Basin Road
East Milton WWTP

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

SUBMITTING AGENCY CODE: 8010 SUBMITTING AGENCY NAME: NW DISTRICT	STORET STATION NUMBER: 33.03.00A1	DATE (M/D/Y): 01-25-93	RECEIVING BODY OF WATER: MOUTH OF BLACK-WATER RIVER

REMARKS:	LOCATION: BELOW OUTFALL NEAR BLACKWATER BAY.	FIELD ID/NAME: # 2 REFERENCE
CONTROL SITE		

Habitat Parameter score	Excellent	Good	Fair	Poor
Littoral Alterations 8	None—Unaltered shoreline. **9-10 points**	Mostly natural shoreline, but with occasional riprap. **6-8 points**	Shoreline consisting mostly of riprap and vertical seawalls. **3-5 points**	Shoreline consisting almost entirely of vertical seawalls. **0-2 points**
Community Types Observed 30	At least four communities observed from the following list: mangrove swamp, marsh, oyster bar, grass bed, reef, saltern, natural beach, or tidal creek. **38-50 points**	Two or three communities observed from those listed. **26-37 points**	One community observed from those listed. **13-25 points**	No communities observed from those listed. **0-12 points**
Tidal Fluctuation 3	>0.75 m. **4-5 points**	0.5 - 0.75 m. **3 points**	0.25 - 0.5 m. **2 points**	<0.25 m. **0-1 point**
Freshwater Discharges/ Alterations 6	Only natural runoff.. **9-10 points**	Mostly natural runoff, but with a few, small stormwater sources. **6-8 points**	Considerable stormwater discharge from local roads, parking lots, etc. **3-5 points**	Extensive manmade discharges, especially from canals draining large tracts of land. **0-2 points**
Flow and Wave Action 9	Light to moderate wave action present except under the harshest weather conditions. Flow unrestricted by manmade structures. **9-10 points**	—	—	Heavy wave action sometimes present even during average weather conditions, or flow restricted by manmade structures so that velocities are very high. **0-2 points**
Sediment Type 12	Combination of sand, gravel, and shell. **12-15 points**	Primarily sand, with small areas of mud. **8-11 points**	Mixture of sand and mud, or well-aerated mud only. **4-7 points**	Anaerobic mud. **0-3 points**

TOTAL SCORE 68

COMMENTS: Salt marsh vegetation mostly Juncus, Cladium, Grass beds consisting of Valisneria americana throughout area

ANALYSIS DATE: 01-25-93	ANALYST: G.L. Butts	SIGNATURE: Glenn L. Butts

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

SUBMITTING AGENCY CODE: 3010 SUBMITTING AGENCY NAME: NW DISTRICT	STORET STATION NUMBER: 33.03.0035	DATE (M/D/Y): 01-25-93	RECEIVING BODY OF WATER: NEAR MOUTH OF BLACKWATER RIVER

REMARKS:	LOCATION: EAST BANK OF BLACK-WATER RIVER AT OUTFALL	FIELD ID/NAME:
TEST SITE		# 1

Habitat Parameter score	Excellent	Good	Fair	Poor
Littoral Alterations 8	None—Unaltered shoreline. **9-10 points**	Mostly natural shoreline, but with occasional riprap. **6-8 points**	Shoreline consisting mostly of riprap and vertical seawalls. **3-5 points**	Shoreline consisting almost entirely of vertical seawalls. **0-2 points**
Community Types Observed 30	At least four communities observed from the following list: mangrove swamp, marsh, oyster bar, grass bed, reef, saltern, natural beach, or tidal creek. **38-50 points**	Two or three communities observed from those listed. **26-37 points**	One community observed from those listed. **13-25 points**	No communities observed from those listed. **0-12 points**
Tidal Fluctuation 3	>0.75 m. **4-5 points**	0.5 - 0.75 m. **3 points**	0.25 - 0.5 m. **2 points**	<0.25 m. **0-1 point**
Freshwater Discharges/ Alterations 5	Only natural runoff.. **9-10 points**	Mostly natural runoff, but with a few, small stormwater sources. **6-8 points**	Considerable stormwater discharge from local roads, parking lots, etc. **3-5 points**	Extensive manmade discharges, especially from canals draining large tracts of land. **0-2 points**
Flow and Wave Action 9	Light to moderate wave action present except under the harshest weather conditions. Flow unrestricted by manmade structures. **9-10 points**	———	———	Heavy wave action sometimes present even during average weather conditions, or flow restricted by manmade structures so that velocities are very high. **0-2 points**
Sediment Type 9	Combination of sand, gravel, and shell. **12-15 points**	Primarily sand, with small areas of mud. **8-11 points**	Mixture of sand and mud, or well-aerated mud only. **4-7 points**	Anaerobic mud. **0-3 points**

TOTAL SCORE 64

COMMENTS: Salt marsh vegetation, Valisneria beds, slightly more organic bottom with depth

ANALYSIS DATE:	ANALYST:	SIGNATURE:
01-25-93	G.L. BUTTS	Glenn L. 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: 33.03.00A1	DATE (M/D/Y): 01-25-93	TIME 1130	RECEIVING BODY OF WATER: MOUTH OF BLACKWATER RIVER

REMARKS: BLACKWATER RIVER DELTA	LOCATION: BELOW OUTFALL NEAR BLACKWATER BAY	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)
				10		90

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

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

Point-Source Pollution (list location and describe): MINIMAL INFLUENCE FROM EAST MILTON WWTP, RUNOFF FROM COVE PUB & RESTAURANT, FISHING BOATS

Estimated System Width (range, m):	Estimated System Depth (range, m): 3.0	yes
High Water Mark (m above bed): 1.5 ft	Velocity (range, m/s):	Impounded ☐ Channelized ☐

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

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☐ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☒ H_2S

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

Sediment Deposits: Sludge: ☐ Paper Fiber: ☐ Mud: ☐ Sand: ☒ Shell: ☒ Other: ☒ Fine organics

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

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):	TSS	TURB	Secchi (m):
Top	0.5	14.1		8.3	460	5	7	0.6
Mid-depth								
Bottom								

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

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

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

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

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

Weather Conditions: COLD, WINDY

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

SAMPLING TEAM:	SIGNATURE:	DATE:
G.L BUTTS, C. REYES	Glenn Butts	1-25-93

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: 8070 / SUBMITTING AGENCY NAME: NW DISTRICT	STORET STATION NUMBER: 33.03.0035	DATE (M/D/Y): 01-25-93	TIME: 1045	RECEIVING BODY OF WATER: MOUTH OF BLACKWATER RIVER

REMARKS:	LOCATION: EAST BANK OF BLACK-WATER RIVER AT OUTFALL	FIELD ID/NAME: # 1

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
				10		90

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

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

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

Estimated System Width (range, m):	Estimated System Depth (range, m):	yes
High Water Mark (m above bed):	Velocity (range, m/s):	Impounded ☐ Channelized ☐

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

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☐ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☒ H_2S

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

Sediment Deposits: Sludge: ☐ Paper Fiber: ☐ Mud: ☒ Sand: ☒ Shell: ☐ Other: ☒ Fine organics

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

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):	TSS	TURB	Secchi (m):
Top	0.5	14.1		8.3	620	5	7	0.6
Mid-depth								
Bottom								

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

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

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

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

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

Weather Conditions: COLD, WINDY

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

SAMPLING TEAM:	SIGNATURE:	DATE:
G.L. BUTTS, C. REYES	Glenn Butts	1-25-93

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: East Milton Elementary
Location:
County: Santa Rosa
Contact/District: Glenn Butts / NW
NPDES Permit #: FL00 23841 **Outfall #:** 001
verified 1-25-93 KF
lims 48568 93 JAN 26 13

Sample Collection: Date 1-25-93 Time 13:30
Test Beginning: Date 1-26-93 Time 13:30
Test Ending: Date 1-28-93 Time 13:00
Organism Batch #: _____ **Diluent Batch #:** _____
Organism Age: < 24 hrs

Test Organism: Ceriodaphnia Dubia

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

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
0 hr	7.0 @ 7.0 10.0 @ 10.0	21.6 @ 21.7	8.6 @ 22.5	~~970~~ 970 @ 1,000 @ 23.3 9650 @ 10,000
24 hr	7.0 @ 7.0 10.0 @ 10.0	21.6 @ 21.7	8.6 @ 22.5	970 @ 1,000 @ 23.2 9700 @ 10,000
48 hr	7.0 @ 7.0 10.0 @ 10.0	21.8 @ 21.7	8.5 @ 22.1	965 @ 1,000 @ 23.3 9700 @ 10,000

Test Number: 1 of 2 + sample

Remarks: 100% effluent pH 3.4 adjusted with NaOH to 7.6.
* 100% of the organisms dead after 5 mins. Test terminated w/ UNADJUSTED SAMPLE MF 1-27-93

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temperature (°C) 0	24	48	D.O. (mg/L) 0	24	48	Cond. (mmhos/cm) Cond. (µmhos/cm) 0	24	48
Control	A	5	5	5	8.3		8.3	~~21.5~~		22.9	~~7.1~~		7.2	155		220
Control	B	5	5	5			8.3				~~7.1~~		7.2			180
Control	C	5	5	4			8.3						7.2			180
Control	D	5	5	5			8.3						7.2			175
100%	A	5	*		~~7.8~~	—	—	22.1	—	—	6.8	—	—	395	—	—
100%	B	5	*													
100%	C	5	*													
100%	D	5	*													
100%	A	5	2	2	7.5		7.5	25.2		23.1	6.1		7.2	420		430
100%	B	5	4	4			7.5						7.2			445
100%	C	5	2	2			7.5						7.2			440
100%	D	5	4	4	TR 1-26-93 7.5			* TR 1-26-93			TR 1-26-93		7.2			450
					*3.5 recorded wrong #.			*22.0 recorded wrong #			*7.0 recorded wrong #					
Measured/Loaded by:		TR	TR	TR	TM		MF	TM		MF	TM		MF	TM		MF
Recorded by:		TR	TR	TR	TR		TR	TR		TR	TR		TR	TR		TR

Investigators' Signatures

Robin Rader
Marshall Faircloth
Tina Mikulski
Kim Pearce
Reviewer

	Salt Water/ Well Water	Water Quality Parameters: 20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			0.1	DR 100	G-B
Lab Total Residual Cl2:	.02	.01	.06	DR 100	TR
Alkalinity:	120	70	—	Hach	TM
Hardness:	120	90	45	Hach	TM
Total Ammonia:	0.0	0.0	1.56	Orion	MF

Cl_2 Blank: _____ Ammonia Meter Slope: -56.7 Ammonia Blank: 0.0 Sample Salinity: _____ ppt

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: East Milton Elem.
Location:
County: Santa Rosa
Contact/District: Glenn Butts / NW
NPDES Permit #: FL00 23841 **Outfall #:** 001
verified 1-29-93 KP
GMS 48568 93 JAN 26 13

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

Test Number: 2 of 2

Remarks: 100% effluent sample pH 3.4 adjusted with NaOH to 7.6.
*100% of the organisms dead after 15 mins. Test ~~cancelled~~ KP 1-27-93 terminated w/UNADJUSTED SAMPLE.

Sample Collection: Date 1-25-93 Time 13:30
Test Beginning: Date 1-26-93 Time 12:30
Test Ending: Date 1-28-93 Time 13:00
Organism Batch #: _____ **Diluent Batch #:** WELL
Organism Age: 12 days
Test Organism: Notropis leedsi

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
0 hr	7.0 @ 7.0 10.0 @ 10.0	21.6 @ 21.7	8.6 @ 22.5	970 @ 1,000 9650 @ 10,000 @ 23.3
24 hr	7.0 @ 7.0 10.0 @ 10.0	21.6 @ 21.7	8.6 @ 22.5	970 @ 1,000 9700 @ 10,000 @ 23.2
48 hr	7.0 @ 7.0 10.0 @ 10.0	21.8 @ 21.7	8.5 @ 22.1	965 @ 1,000 9700 @ 10,000 @ 23.3

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temperature (°C) 0	24	48	D.O. (mg/L) 0	24	48	Cond. (mmhos/cm) Cond. (µmhos/cm) 0	24	48
Control	26	5	5	5	7.8	8.2	8.4	21.5	21.5	21.8	7.1	7.3	7.4	235	235	240
Control	88	5	5	5	7.9	8.2	8.4				7.1	7.3	7.4	235	235	240
100%	4	5	*	—	3.4	—	—	23.2	—	—	6.8	—	—	480	—	—
100%	28	5	*	—	3.4	—	—		—	—	6.8	—	—	485	—	—
100%	190	5	5	5	7.5	7.1	7.3	27.0	21.7	21.8	5.9	6.1	7.4	475	435	450
100%	366	5	5	5	7.5	7.1	7.3				5.9	6.1	7.3	480	440	455
Measured/Loaded by:		TM	TR	TR	TM	TR	MF	TM	TR	MF	TM	TR	MF	TM	TR	MF
Recorded by:		TR	TR	TR	TR	TR	TR	TR	TR	TR	TR	TR	TR	TR	TR	TR

(pH adjusted to 7.6)

Investigators' Signatures
Tobin Rader
Kim Pearce
Reviewer

	Salt Water/ Well Water	Water Quality Parameters: pH-adjusted SAMPLE / 20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			0.1	DR/700 Rpt 11/21/93	GB
Lab Total Residual Cl2:	.02	.01	.06	DR 10C	TR
Alkalinity:	120	—	—	Hach	TM
Hardness:	120	50	45	Hach	TM
Total Ammonia:	0.0	0.0	1.56	orion	MF

Cl_2 Blank: _____ Ammonia Meter Slope: -56.7 Ammonia Blank: 0.0 Sample Salinity: _____ ppt

form updated 10/20/92

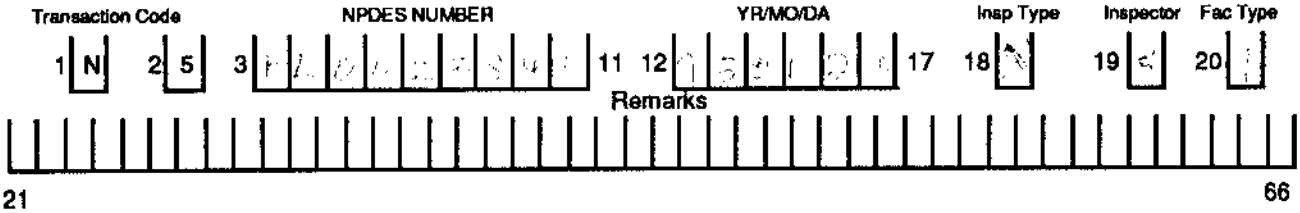
Phytoplankton taxa list for East Milton Elementary STP, collected via subsurface grabs in the Blackwater River, on 25 January, 1993. Densities are in number/mL.

	Reference Site	Test Site
Diatoms		
Achnanthes sp.	26	25
Anomoeoneis sp.	26	–
Cocconeis sp.	–	51
Diploneis sp.	26	–
Eunotia sp.	–	152
Nitzschia sp.	52	25
Surirella sp.	–	25
Synedra sp.	52	–
Chlorophyta		
Ankistrodesmus sp.	26	–
Chlamydomonas sp.	26	–
Unknown chlorophyte flagellate	26	25
Scenedesmus sp.	26	51
Cyanophyta		
Chroococcus sp.	52	–

Benthic macroinvertebrate taxa list for East Milton Elementary STP, collected via Ponar grab samples in the Blackwater River, on 25 January, 1993. Densities, in number/m^2, represent the mean of three replicates.

	Reference Site	Test Site
Coleoptera		
Stenelmis sp.	–	12.5
Decapoda		
Callinectes sapidus	37.4	–
Rhithropanopeus harrisii	112.3	149.7
Diptera		
Ablabesmyia rhamphe grp.	25.0	–
Coelotanypus sp.	25.0	25.0
Dicrotendipes modestus	12.5	37.4
D. neomodestus	–	25.0
Djalmabatista pulcher	12.5	–
Palpomyia grp.	25.0	25.0
Polypedilum halterale grp.	187.1	124.8
Procladius sp.	37.4	87.3
Tanytarsus sp. C Epler	–	12.5
Tanytarsus sp. G Epler	12.5	12.5
Tanytarsus sp. L Epler	25.0	12.5
Tribelos jucundum ?	–	12.5
Gastropoda		
Neritina reclivata	87.3	12.5
Lepidoptera		
Undetermined Pyralidae	25.0	12.5
Malacostraca		
Amphipoda		
Gammarus mucronatus	311.9	249.5
Grandidierella bonnieroides	386.7	386.7
Isopoda		
Cyathura polita	25.0	25.0
Mysidacea		
Taphromysis bowmani	374.3	49.9
Nemertina		
Undetermined nemertean sp.	49.9	99.8
Odonata		
Enallagma sp.	12.5	–
E. cardenium	–	12.5
Oligochaeta		
Undetermined oligochaete sp.	–	12.5
Pelecypoda		
Pisidium sp.	12.5	–
Polymesoda caroliniana	25.0	–
Polychaeta		
Hobsonia florida	12.5	224.6
Laeonereis culveri	249.5	112.3
Lumbrineris tenuis	–	199.6
Neanthes succinea	37.4	12.5

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)

