

Biological Assessment of

Saufley Field Sewage Treatment Plant

Escambia County

NPDES #FL0021041

Sampled November 1995

April 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: Saufley Field STP
County: Escambia
NPDES Number: FL~~A010038~~ 0021041
State Permit Expiration Date: 15 August 1996

Toxics Sampling Inspection (XSI)

Date Sampled: 20 November 1995

Results: No organics were detected in the effluent. Metals did not exceed Class III water quality standards.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 20 November 1995

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

Impact Bioassessment Inspection (IBI)

Date Sampled: 21 November 1995

Results: Quantitative measures of benthic macroinvertebrate community health suggested the discharge was having no adverse effects on the receiving water community, which appeared to be more affected by the low salinity regime of northern Perdido Bay. Similarly, the facility did not appear to have an adverse effect on the receiving water algal communities. Algal density and chlorophyll *a* were well below problem levels.

Water Quality Inspection (WQI)

Date Sampled: 20 November 1995

Results: Fecal and total coliforms in the effluent, and at the receiving water stations, complied with permit limits and Class III water quality standards. Effluent ammonia (2.7 mg/L) and nitrate-nitrite (7.7 mg/L) levels were noteworthy. The ammonia concentration at both the reference and test sites exceeded the values found in 80% of other Florida estuaries. The nitrate-nitrite level at the test site was double that of the reference site, and both exceeded the values found in approximately 80% to 90% of other Florida estuaries. The algal growth potential (AGP) of the effluent was 61.5 mg dry wt/L, but both reference and test site AGP values were well below the "problem threshold" of 10 mg dry wt/L for marine waters.

These fifth year inspections provide the necessary information to evaluate the facility's impact on its receiving waters and to provide the basis for specific condition recommendations for permit renewal.

Introduction

The Saufley Field Sewage Treatment Plant is located in Escambia County, Florida (see maps in Appendix). Treatment at this 0.21 MGD facility consists of grit removal, primary clarification, trickling filtration, final clarification, sludge digestion, chlorination, and dechlorination. The effluent is discharged into a concrete lined drainage ditch that empties into the Class III Perdido Bay.

State permit limits for the effluent are as follows: carbonaceous BOD, TSS, and TKN (20 mg/L as an annual average), total residual chlorine (0.5 mg/L minimum for disinfection, 0.01 mg/L maximum at discharge), flow (0.21 MGD maximum), pH (6.0 - 8.5 SU), copper (15 µg/L), silver (0.05 µg/L), and fecal coliforms (200 organisms/100 mL maximum). Flow during the present survey was 0.068 MGD.

In the past two years, the facility has exceeded permit limits for fecal coliforms (on two occasions) and copper (on three occasions). During a previous survey, the effluent was toxic to *Ceriodaphnia dubia* and had elevated copper (31 µg/L) (FDER 1991).

Major characteristics of community structure of control and test sites.

	Reference Site	Test Site
Macroinvertebrate Ponar		
Number of Taxa	31	42
Shannon-Weaver Diversity	3.83	3.99
% Polychaeta	17.7	28.6
% Tubificid Oligochaeta	0.6	1.5
% Non-Tubificid Oligochaeta	0.7	10.5
% Diptera	7.8	26.9
% Amphipoda	18.6	8.9
% Cumacea	5.7	0.3
% Tanaidacea	8.6	0.3
% Nemertea	2.1	2.7
% Gastropoda	26.0	12.5
% Pelecypoda	11.0	5.8
% Predator/Carnivores	5.7	15.7
% Above-Surface Deposit Feeders	21.3	28.1
% Below Surface Deposit Feeders	1.1	11.7
% Scavengers	6.2	2.8
% Suspension Feeders	31.2	14.5
% Scrapers	26.0	12.5
% Browser-grazers	6.1	2.8
Phytoplankton Algae		
Number of Taxa	13	14
Shannon-Weaver Diversity	2.68	3.11
Chlorophyll a (µg/L)	0.5	0.4
Algal Density (#/mL)	945	431
% Blue-green	4.4	14.3
% Green	34.8	45.2
% Diatoms	44.6	31.0
Algal Growth Potential (mg dry wt/l)	0.9	0.8

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 Perdido Bay at Millview) and a test site (at the Saufley Field discharge) (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 *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 from three replicate petite Ponar grabs. Phytoplankton was sampled at both reference and test sites. Chlorophyll *a* was also determined for phytoplankton communities (Ross 1990). Algal Growth Potential tests, using *Selenastrum capricornutum* for the freshwater effluent, and *Dunaliella tertiolecta*

for the marine receiving water sites, followed Miller *et al.* (1978) and EPA (1974). Other parameters such as fecal and total coliforms, total suspended solids, and biochemical oxygen demand were also sampled.

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. Excessive 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.

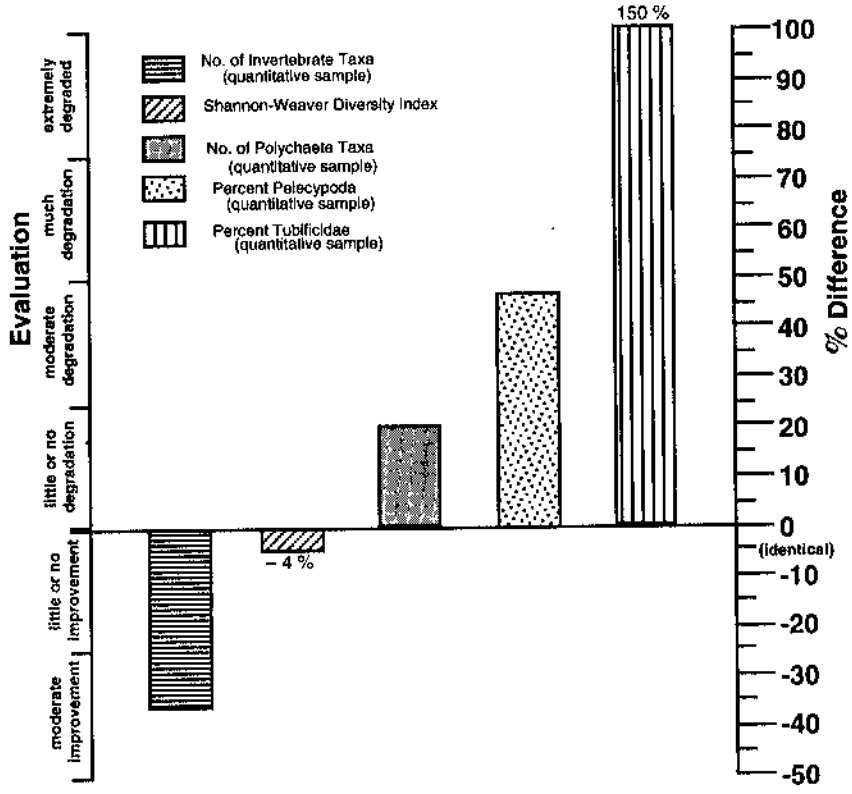
Numbers of pollution sensitive taxa: Some organisms become rare or absent as the intensity or duration of disturbance increases. For example, the Florida Index assigns points to stream-dwelling macroinvertebrates based on their sensitivity to pollution (see Ross 1990). A site with a high Florida Index score is considered healthy. 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.

Community structure: Substantial shifts in the 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 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).

For graphical purposes, the percent differences between the reference and test sites involving the number of taxa, the diversity index, the number of polychaete taxa, and the % pelecypods are measured as the reference site minus test site divided by the reference site. The percent differences between sites involving the % tubificids, algal density, chlorophyll *a*, and algal growth potential are measured as



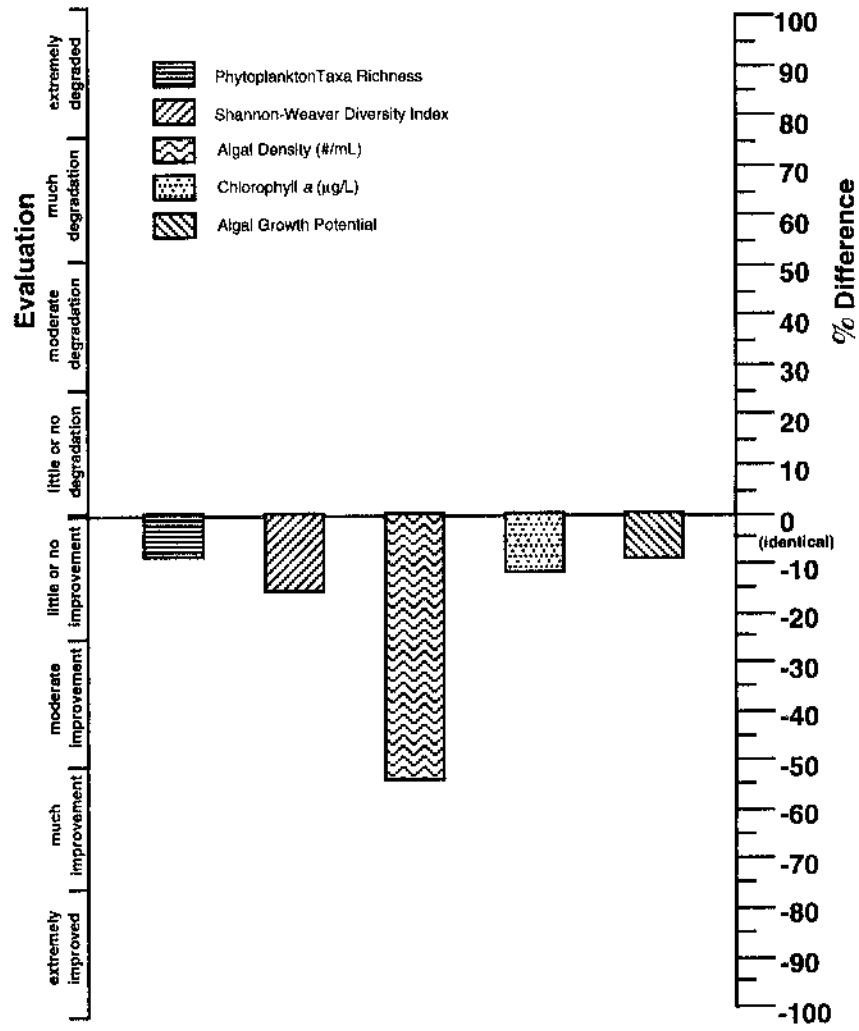
Effect of discharge on the benthic macroinvertebrate community.

the test site minus reference site divided by the reference site.

The following personnel were involved in this investigation: Glen Butts and Lisa Kelley (DEP Northwest District) and Lyn Burton, Marshall Faircloth, Russel Frydenborg, Joy Jackson, Kathleen Lurding, Tina Mikulski, Elizabeth Miller, Urania Quintana, Bart Richard, Todd Space, Lisa Tamburello, David Whiting, 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 at the reference site (with 53 points) was higher than at the test site (with 38 points). Both sample sites were 0.7 meters deep, with sediments consisting mainly of sand and silt. Water at the reference site was very turbid, with a Secchi depth of 0.1 m, while water at the test site was visibly less turbid, with a Secchi depth of greater than 0.7 m. Dissolved oxygen was adequate to support aquatic life at both stations, 9.9 mg/L at the reference site and 9.0 mg/L at the test site. Specific conductance, temperature, and pH measurements were similar at both sites (see Chemistry Summary Table). Note that the specific conductance in Perdido Bay during this sampling event was equivalent to approximately 0.6 ppt to 0.7 ppt salinity.



Effect of discharge on the algal community.

The effluent was not acutely toxic to the cladoceran, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi* (Appendix).

No organic constituents were detected in the effluent. Metals found in the effluent at levels above quantification limits included aluminum (322 µg/L) and iron (23 µg/L). The effluent was in compliance Class III metals water quality standards.

Total coliform bacteria were undetected in the effluent, and fecal coliforms numbered 100 organisms/100 mL, complying with permit limits. Fecal coliforms were similarly low at both the reference site (30 organisms/100 mL) and the test site (10 organisms/100 mL). The number of total coliforms at the reference site (1,000 organisms/100 mL) was higher than that found at the test site (60 organisms/100 mL).

The concentration of total phosphorus (0.07 mg/L) was relatively low, as were those in the receiving waters. Effluent ammonia (2.7 mg/L) and nitrate-nitrite (7.7 mg/L) levels were noteworthy. The ammonia concentration at both the reference and test sites was 0.1 mg/L, which exceeds the values found in 80% of other Florida estuaries. The nitrate-nitrite level at the test site (0.2 mg/L) was double that of the reference site (0.1 mg/L), and both

exceeded the values found in approximately 80% to 90% of other Florida estuaries (see Table of Typical Water Quality Values in Appendix).

Both the reference and test site Algal Growth Potential (AGP) (0.9 and 0.8 mg dry wt/L, respectively) values were below the 10 mg dry wt/L "problem threshold" for marine waters (Ron Raschke, USEPA, personal communication). The AGP of the effluent was 61.5 mg dry wt/L.

Quantitative measures of benthic macroinvertebrate community health suggested the discharge was having no adverse effects on the receiving water community. 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 the test site is better than the reference.

Macroinvertebrate taxa richness increased from 31 taxa at the reference site to 42 taxa at the test site. Similarly, Shannon-Weaver diversity increased from 3.8 at the reference site to 4.0 at the test site. The number of polychaete taxa was very similar at both stations, with 5 taxa at the reference site and 4 taxa at the test site. The % Pelecypoda (a measure reported by Engle *et al.* (1994) to decrease in polluted situations) was lower at the test site, with 11% pelecypods at the reference site and 6% pelecypods at the test site. Tubificid worms were uncommon at both sites, with 0.6% at the reference site and 1.5% at the test site. Note that the absolute values at the study sites with respect to the % Pelecypoda and the % Tubificidae parameters are not as striking as they appear on the graph. As would be expected from the very low salinities, there was a high percentage of freshwater taxa at the reference site (37% freshwater taxa) and at the test site (56% freshwater taxa). Because of the low salinities, conditions were unfavorable for the development of a strictly marine or freshwater invertebrate assemblage. Consequently, many organisms found at both receiving water stations were stress-tolerant species. However, some pollution sensitive taxa, such as the cumacean, *Cyclaspis pustulata,* and the possum shrimp, *Mysidopsis bahia,* were found at both sites (Farrell 1992). The results suggest the discharge was not having a negative impact on the macroinvertebrate community of Perdido Bay, which appeared to be more influenced by the low salinity regime.

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 taxa richness was very similar at both sites, with 13 taxa at the reference site and 14 taxa at the test site. Algal diversity was higher at the test site (3.1) than at the reference site (2.7). Diatoms were the most abundant algal group at the reference site, while chlorophytes were dominant at the test site. Algal density (less than 1,000 cells/mL) and chlorophyll *a* concentrations (less than or equal to 0.5 µg/L) were very low at both sites, suggesting there were no algal biomass problems in northern Perdido Bay. Overall, the facility did not appear to have an adverse effect on the receiving water algal communities.

Conclusions

No organics were detected in the effluent. Metals did not exceed Class III water quality standards.

The effluent was not acutely toxic to the cladoceran, *Ceriodaphnia dubia,* or to the fish, *Cyprinella leedsi.*

Fecal and total coliforms in the effluent, and at the receiving water stations complied with permit limits and Class III water quality standards.

Effluent ammonia (2.7 mg/L) and nitrate-nitrite (7.7 mg/L) levels were noteworthy. The ammonia concentration at both the reference and test sites exceeded the values found in 80% of other Florida estuaries. The nitrate-nitrite level at the test site was double that of the reference site, and both exceeded the values found in approximately 80% to 90% of other Florida estuaries.

The algal growth potential (AGP) of the effluent was 61.5 mg dry wt/L, but both reference and test site AGP values were well below the "problem threshold" of 10 mg dry wt/L for marine waters.

Quantitative measures of benthic macroinvertebrate community health suggested the discharge was having no adverse effects on the receiving water community, which appeared to be more affected by the low salinity regime of northern Perdido Bay.

Similarly, the facility did not appear to have an adverse effect on the receiving water algal communities. Algal density and chlorophyll *a* were well below problem levels.

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.

Environmental Protection Agency. 1974. Marine algal assay procedure: Bottle test. Nat'l Environ. Res. Center, Office of Res. and Dev., U.S. EPA, Corvallis, Oregon. 43 p.

Engle, V. D., J. K. Summers, and G. R. Gaston. 1994. A benthic index of environmental condition of Gulf of Mexico estuaries. Estuaries 17(2): 372-384.

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

FDEP. 1994. Lake bioassessments for the determination of nonpoint source impairment in Florida. Fla. Dept. Environ. Prot. Biology Section, Tallahassee, Fla. 33 p.

FDER. 1991. Bioassessment of Saufley Field Sewage Treatment Plant. Fla. Dept. Environ. Reg. Biology Section, Tallahassee, Fla. 73 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 Saufley Field STP.	Effluent	Reference Site	Test Site
Organic Constituents (ug/L)			
	None detected		
Metals (ug/L)			
Aluminum	322 A		
Arsenic	10 U		
Cadmium	0.098 I		
Copper	6 I		
Chromium	10 U		
Iron	23 A		
Lead	10 U		
Mercury	0.1 U		
Nickel	4 U		
Selenium	30 U		
Silver	0.05 U		
Zinc	10 I		
Nutrients (mg/L)			
Ortho-phosphate	0.03 I	0.02 U	0.02 U
Total phosphorus	0.07 A	0.03 I	0.02 I
Unionized ammonia	0.01		
Ammonia	2.7 A	0.1	0.1
Nitrate+Nitrite	7.7 A	0.1	0.2
TKN	3.3 A	0.5	0.5
General Phys-Chem Parameters			
Habitat Assessment		53	38
D.O. (mg/L)	7.0	9.9	9.0
pH (SU)	7.0	7.5	7.4
Conductivity (µmhos/cm)	581	1355	1018
Temperature (°C)	21.2	18.9	19.7
Total Suspended Solids (mg/L)	5 U	5 U	5 U
CBOD, 5 day (mg/L)	1.9	0.5 U	0.6
Turbidity (NTU)	3	6	9
Color (PCU)	0	80	60
Hardness (mg CaCO3)	44.4	120	100
Algal Growth Potential (mg dry wt/L)	61.5	0.9	0.8
Toxicity			
Bioassay Fish-Dechlorinated	Not toxic		
Bioassay Invertebrate-Dechlorinated	Not toxic		
Microbiological Communities (org/100 mL)			
Fecal coliform	100	30	10
Total coliform	10 U	1000	60

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

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

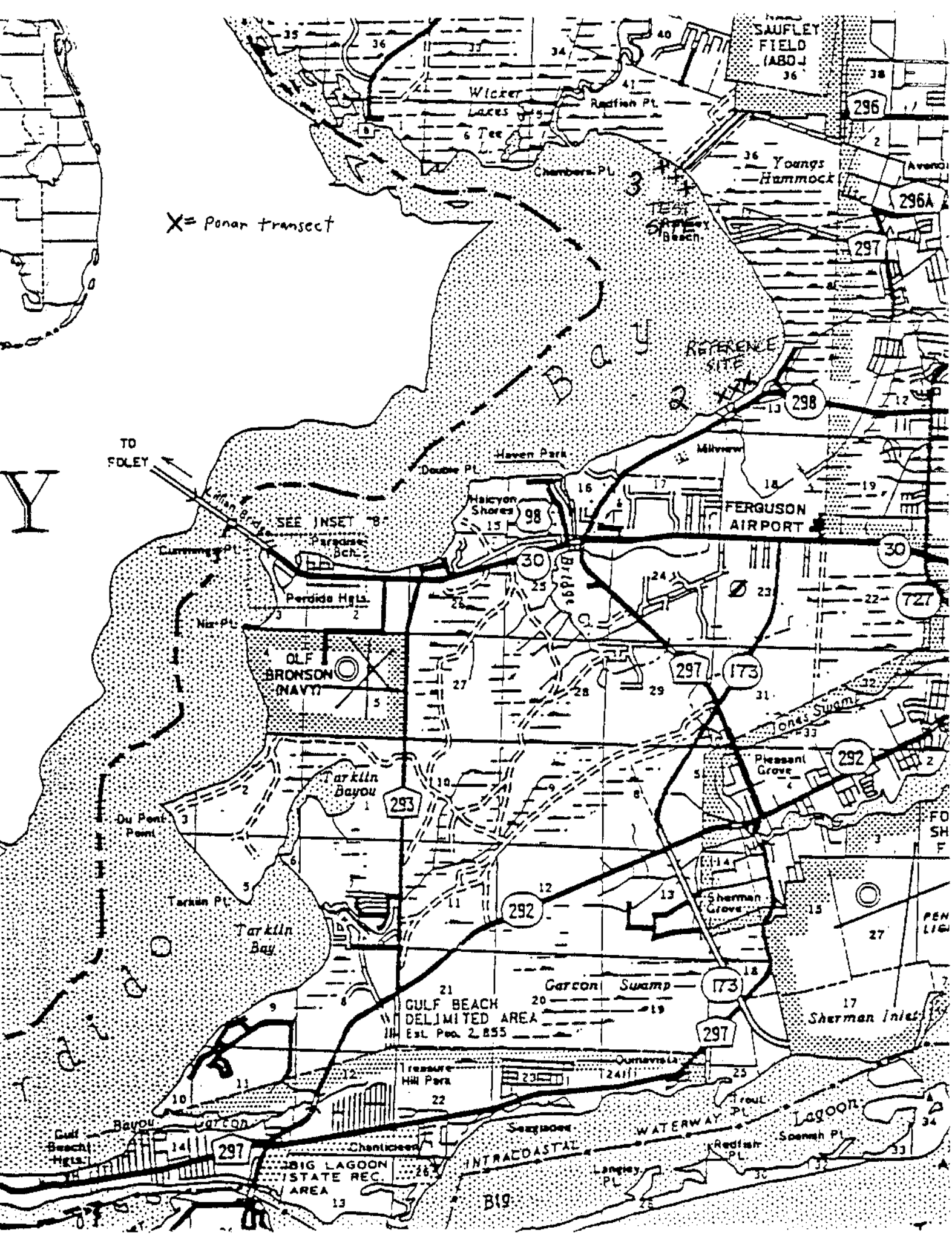
Typical Values for Selected Parameters in Florida Waters

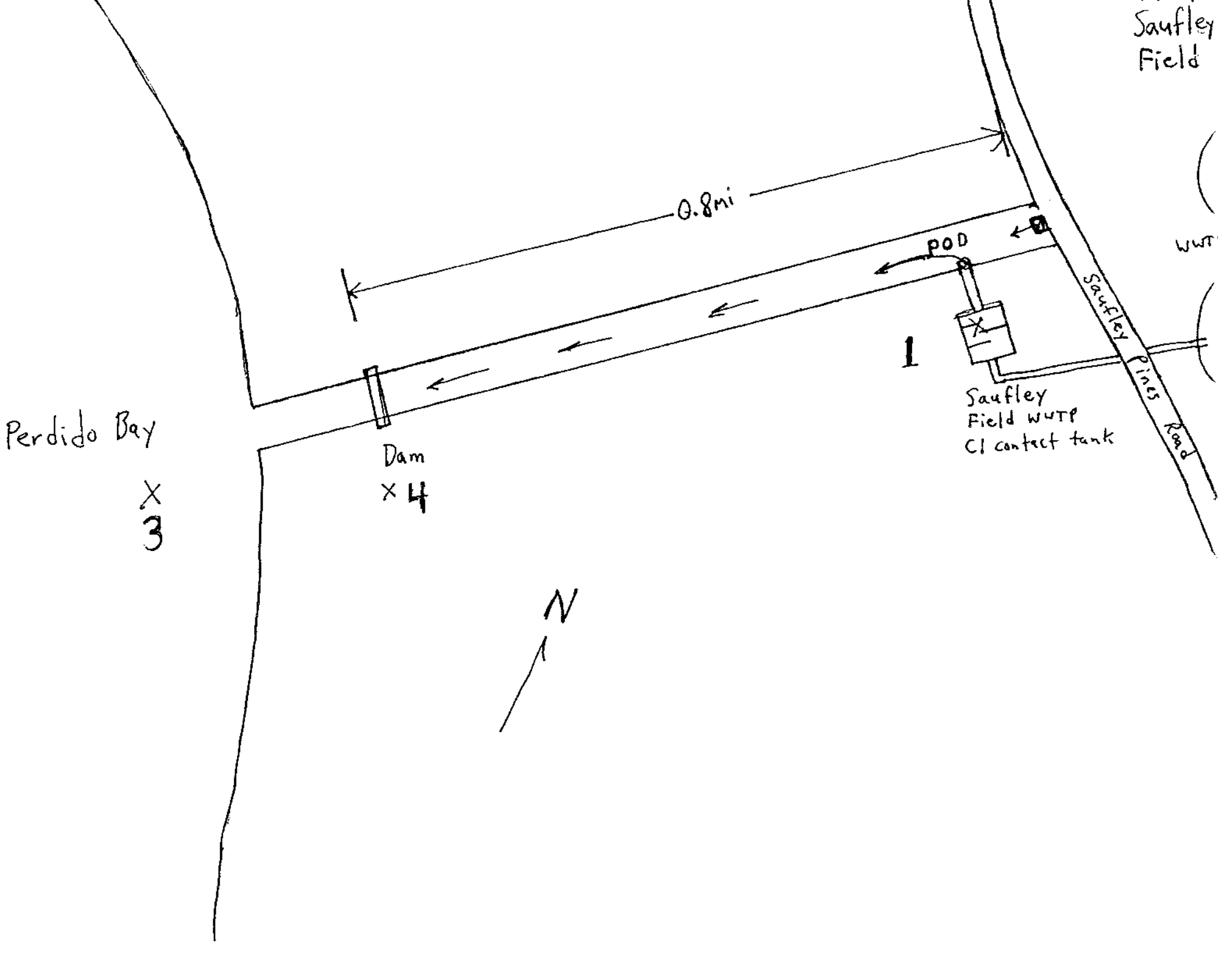
Adapted from Joe Hand, FDER, personal communication, 1991
(data was collected between 1980 and 1989)

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 Phosphate	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-Phosphate	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-Phosphate	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


X= Ponar transect
Bay
3
2
1
REFERENCE SITE
TEST SITE
SAUFLEY FIELD (ABDN)
Wicker Lakes
Redfish Pt.
Chambers Pt.
Youngs Hammock
Avenue
296
296A
297
298
TO PENSACOLEY
Lillian Bridge
SEE INSET "B"
Paradise Beach
Cummings Pt.
Perdido Hgts.
Nix Pt.
Double Pt.
Haven Park
Halcyon Shores
98
FERGUSON AIRPORT
30
727
173
292
293
GULF BRONSON (NAVY)
Tarklin Bayou
Du Pont Point
Tarklin Bay
Jones Swamp
Pleasant Grove
Sherman Grove
Garcon Swamp
GULF BEACH DELIMITED AREA
Est. Pop. 2,855
Sherman Inlet
Quietwater Pt.
Treasure Hill Para
Gulf Beach Hgts.
Garcon Bayou
Chanticleer
BIG LAGOON STATE REC. AREA
Seagrapes
INTRACOASTAL WATERWAY
Trout Pt.
Lagoon
Redfish Pt.
Spanish Pt.
Langley Pt.
Big


Saufley Field
0.8mi
POD
1
Saufley Pines Road
Saufley Field WWTP Cl contact tank
Dam
× 4
Perdido Bay
X 3
N

Facility Summary

Facility Name: Saufley Field

Date Summary Prepared: 11/16/95

Location map: Navy Public Works Center
Naval Air Station
Pensacola, FL 32508-5303

County: Escambia

District: Northwest/10

NPDES Permit # FL0021041
expiration date: 6/8/89

State GMS # 1017F43087
expiration date: 8/15/96

Facility Type:
Domestic

Function of facility: The facility provides domestic wastewater treatment for the Saufley Field Naval Air Station.

Description of treatment process: A 0.21MGD trickling WWTF utilizing grit chamber, primary clarifier, trickling filter, final clarifier, chlorination, sludge disestor, and sludge drying beds. Sludges are disposed of at Sherman Field under an approved Agricultural Reuse Plan.

Receiving waters:
Concrete lined drainage ditch to Perdido Bay.

Classification: I II **III**
Class III: Propagation, recreation, maintenance of a healthy population of fish and wildlife.

Design Flow: **0.21MGD**

Mean Flow: **0.06766MGD**

Flow during survey: **0.06856 MGD** (June 1995, MOR)

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

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	Daily (6/wk)	0.21 MGD (max. annual avg.)
pH-Eff	Daily (6/wk)	6.0(min) 8.5(max)
Chlorine Residual (after contact)	Daily (6/wk)	0.5 mg/l (min.)
Dechlorination Residual	Daily (6/wk)	0.01 mg/l (max)
CBOD5-Inf	Every 2 weeks	N/A
CBOD5-Eff	Every 2 weeks	20 mg/l (max. annual avg.)
Suspended soilds-Inf	every 2 weeks	N/A

Suspended soilds-Eff	every 2 weeks	20 mg/l (max. annual avg.)
TKN	monthly	20 mg/l (max.)
Copper	Every 6 months	0.015 mg/l (max.)
Silver	Every 6 months	0.05 up/l (max.)
Fecal Coliform	Every 2 weeks	200/100 mo (max.)

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

07-Apr-95	Fecal Coliform	Sample result of >200.0. Monthly average did not exceed permit limit.
22-Sep-94	Fecal Coliform	Sample result of 232.0. Monthly average did not exceed permit limit.
02-Feb-95	Copper Violation	Sample result of 0.016 mg/l
18-Aug-94	Copper Violation	Sample result of 0.020 mg/l

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

Impact Bioassessments: The following bioassessments were not toxic to the test organisms.

17 Feb 94--21 Feb 94
26 Feb 93--02 Mar 93

A FDEP Fifth Year Survey performed by Glen Butts in October of 1991 revealed the following: (See attachment I for complete results summary)

Toxics Sampling Inspection (**XSI**) "Effluent contained copper (31 ug/l), an aromatic compound (est. 120 ug/l) and an aliphatic compound (16 ug/l)."

Compliance Biomonitoring Inspection (**CBI**) "Toxic to Ceriodaphnia dubia, not toxic to Pimephales promelas."

Impact Bioassessment Inspection (**IBI**) See Attachment.

Water Quality Inspection (**WQI**) "Nitrate-nitrite and total phosphorus in the effluent are contributing to abundant growth of algae below the point of discharge, but nutrient concentrations do not seem to be a problem where the discharge enters Waters of the State."

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

Additional information: Staff contributing to this review (signature)

Glenn Butts	Biologist
	Inspector
	Engineer
Lisa Kelley (Co-op)	Other
	Other

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: FDEP NW DIST	STORET STATION NUMBER: 33.01.00 C6	DATE (M/D/Y): 11-20-95	TIME: 1125	RECEIVING BODY OF WATER: Perdido Bay PNS

REMARKS:	LOCATION: Section C at Millview	FIELD ID/NAME: # 2 control site

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)
				100			

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: | ***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 ☐ ☐ ☐
Artificially Impounded ☐ yes — recent, severe | some recovery | mostly recovered, more sinuous

High Water Mark (m above bed):

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)				Sand	50		
Leaf Packs or Mats				Mud/Muck/Silt	15		
Aquatic Vegetation				Other: Coarse Sand	10		
Rock or Shell Rubble	25			Other:			
Shorezone (Roots/Veg.)							

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):	Sal ppt		Secchi (m):
Top	0.5	18.86	7.53	9.94	1355	0.7		0.1
Mid-depth								
Bottom	0.7							

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, High Temp 70°F

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Glenn Butts	Glenn Butts	11-29

DEPARTMENT OF ENVIRONMENTAL REGULATION

MARINE BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: FDEP NW DIST	STORET STATION NUMBER: 33.01.0006	DATE (M/D/Y): 11-21-95	RECEIVING BODY OF WATER: PERDIDO BAY

REMARKS:	LOCATION: SECTION C, BACKGROUND AT MILLVIEW	FIELD ID/NAME: # 2

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: 25	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: 2	>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: 5	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: 7	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 53

COMMENTS:

ANALYSIS DATE: 11-21-95	ANALYST: G. BUTTS	SIGNATURE: Glenn Butts

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: FDEP NW DIST	STORET STATION NUMBER: 33.01.00A5	DATE (M/D/Y): 11-22-95	TIME: 1100	RECEIVING BODY OF WATER: Perdido Bay

REMARKS:	LOCATION: Near Saufley Field / Discharge Ditch	FIELD ID/NAME: #3 Test Site

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)
		25		25			50

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: ***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 ☐ ☐ ☐
Artificially Impounded ☐ yes — recent, severe / some recovery / mostly recovered, more sinuous

High Water Mark (m above bed):

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)				Sand	75		
Leaf Packs or Mats				Mud/Muck/Silt	5		
Aquatic Vegetation				Other: Coarse Sand	5		
Rock or Shell Rubble	15			Other:			
Shorezone (Roots/Veg.)				*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):	SAL ppt		Secchi (m):
Top	0.5	19.73	7.39	8.98	1018	0.5		>0.7
Mid-depth								
Bottom	0.7							

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, High Temp 70 °F

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Glenn Butts	Glenn Butts	11-22-95

DEPARTMENT OF ENVIRONMENTAL REGULATION

MARINE BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: FDEP NW DIST	STORET STATION NUMBER: 33.01.00A5	DATE (M/DY): 11-21-95	RECEIVING BODY OF WATER: PERDIDO BAY

REMARKS: PONAR TRANSECT ACROSS SAUFLEY DITCH	LOCATION: NEAR SAUFLEY FIELD DISCHARGE PITCH	FIELD ID/NAME: # 3 Test 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 15	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 2	>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 2	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 5	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 6	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 38

COMMENTS:

ANALYSIS DATE: 11-21-95	ANALYST: G. BUTTS	SIGNATURE: Glenn Butts

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Saufley Field
County: Escambia
Contact / District: Glenn Butts / NW
NPDES Permit #: FL0021041
LIMS Sample #: 12.3190 **LIMS Job #:** 95- Nov 21-15
sampled by 11-29-95

Sample Collection: Date 11/20/95 Time 0925
Test Beginning: Date 11/21/95 Time 1130
Test Ending: Date 11/23/95 Time 1140
Organism Batch #: ~~52~~ **Diluent Batch #:** 46
Organism Age: 54 * <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	22.7 @ 22.8	8.4 @ 23.8 °C	1408 @ 1413 990 @ 1013 @ 23.3 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	21.3 @ 21.4	8.5 @ 23.4 °C	1380 @ 1413 957 @ 1013 @ 23.5 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	22.4 @ 22.5	9.2 @ 21.9 °C	1375 @ 1413 963 @ 1013 @ 23.6 °C

* mislabled batch JN 12.13.95

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 24 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 48 h
Control	A	5	5	5	8.0		8.0	22.9		24.5	7.4		7.8	165		180
Control	B	5	5	5			8.0			24.8			7.8			185
Control	C	5	5	5			8.0			24.9			7.6			190
Control	D	5	5	5			8.0			24.9			7.6			185
100%	A	5	5	5	7.1		8.3	24.2		24.9	6.8		7.6	560		580
100%	B	5	5	5			8.3			24.9			7.6			595
100%	C	5	5	5			8.3			24.9			7.5			595
100%	D	5	5	5			8.3			25.2			7.5			600
Measured/Loaded by:		TM	TM	TM	TR		TM	TR		TM	TR		TM	TR		TM
Recorded by:		TR	TM	TM	TR		TM	TR		TM	TR		TM	TR		TM

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	DR-100	TR
Alkalinity (mg/L as $CaCO_3$):	—	70	105	Hach	TR
Hardness (mg/L as $CaCO_3$):	—	80	50	Hach	TR
Total ammonia (mg/L as N):	—	<0.017	2.13	Orion	JN

Ammonia Meter #98136 Ammonia Meter Slope: -57.4 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Sawfley Field
County: Escambia
Contact / District: Glenn Butts / NWD
NPDES Permit #: FL0002104
LIMS Sample #: 123190 **LIMS Job #:** 95-NOV-21-18
Sample Log 11-29-95

Sample Collection: Date 11/20/95 Time 0925
Test Beginning: Date 11/21/95 Time 1130
Test Ending: Date 11/25/95 Time 1140
Organism Batch #: ~~70~~ **Diluent Batch #:** well
Organism Age: 1 to 1 1 days
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	22.7 @ 22.8	8.4 @ 23.8 °C	140.8 @ 141.3 990 @ 1013 @ 23.3 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	21.3 @ 21.4	8.5 @ 23.4 °C	138.0 @ 141.3 957 @ 1013 @ 22.5 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	22.4 @ 22.5	8.7 @ 21.9 °C	1375 @ 1413 963 @ 1013 @ 22.6 °C

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	24 h	48 h
Control A	85	5	5	5	7.7	8.2	8.2	23.6	22.6	22.7	7.6	7.8	7.9	245	240	245
Control B	142	5	5	5	7.7	8.2	8.2	24.0	22.5	22.5	7.6	7.8	7.8	245	240	240
Control C	308	5	5	5	7.7	8.2	8.2	24.1	22.5	22.4	7.5	7.7	7.9	245	240	240
Control D	10	5	5	5	7.7	8.2	8.2	24.5	22.9	22.6	7.6	7.9	8.0	250	240	240
100% A	348	5	5	5	7.1	7.8	8.0	24.9	22.7	22.5	7.1	7.7	7.7	585	565	570
100% B	209	5	5	5	7.1	7.8	8.0	25.0	22.5	22.4	7.1	7.7	7.6	585	565	570
100% C	476	5	5	5	7.1	7.8	8.0	25.0	22.5	22.4	7.1	7.7	7.7	585	565	570
100% D	28	5	5	5	7.1	7.7	8.0	25.1	22.7	22.7	7.0	7.7	7.8	585	565	570
Measured/Loaded by:		TR	TM	TM	TR	JN	TM	TR	JN	TM	TR	JN	TM	TR	JN	TM
Recorded by:		TR	TM	TM	TR	DW	TM	TR	DW	TM	TR	DW	TM	TR	DW	TM

Investigators' Signatures

Salt Water: Well Water / 20% Min Water

Water Quality Parameters		Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):				
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03	DR-100	TR
Alkalinity (mg/L as $CaCO_3$):	120	105	Hach	TR
Hardness (mg/L as $CaCO_3$):	125	50	Hach	TR
Total ammonia (mg/L as N):	<0.017	2.13	0.1402	JN

Ammonia Meter #98136 Ammonia Meter Slope: -57.4 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

reviewer

form updated 5/05/95

Benthic macroinvertebrate taxa list for Saufley Field STP, collected via Ponar grab samples in Perdido Bay on 21 November 1995. Densities, in number/m^2, represent the mean of three replicates.

	Reference Site	Test Site
Amphipoda		
Corophium simile	185	130
Gammarus sp.	–	194
Grandidierella bonnieroides	227	23
Hyalella azteca	9	9
Aoridae	120	19
Collembola		
Isotomurus palustris	–	5
Cumacea		
Almyracuma proximoculi	65	5
Cyclaspis pustulata	102	9
Decapoda		
Callinectes sapidus	5	–
Rhithropanopeus harrisii	–	23
Diptera		
Apedilum elachista	–	9
Chironomus sp.	79	486
Cryptochironomus sp.	5	23
Dicrotendipes sp.	51	5
Dicrotendipes lobus	56	23
Dicrotendipes modestus	9	79
Dicrotendipes neomodestus	5	–
Goeldichironomus devineyae	–	5
Goeldichironomus holoprasinus	–	28
Palpomyia/Bezzia grp.	–	46
Polypedilum convictum grp.	–	9
Polypedilum illinoense	–	370
Procladius sp.	–	9
Tanytarsus sp.	–	19
Tanytarsus sp. G Epler	–	28
Chironomidae	23	–
Gastropoda		
Littoridinops sp.	42	97
Littoridinops monroensis	56	227
Neritina reclivata	171	204
Hydrobiidae	486	–
Hirudinea		
Erpobdella punctata	5	9
Isopoda		
Cassidinidea ovalis	5	5
Edotea montosa	9	–
Mysidacea		
Mysidopsis bahia	9	9

Nemertea		
Unknown nemertean	60	116
Odonata		
Enallagma sp.	–	19
Oligochaeta		
Haber speciosus	–	5
Limnodrilus hoffmeisteri	19	60
Nais communis	5	366
Pristina aequiseta	–	9
Pristina leidyi	–	5
Enchytraeidae	9	56
Pelecypoda		
Rangia cuneata	319	245
Polychaeta		
Boccardia sp.	315	9
Hobsonia florida	14	32
Laeonereis culveri	176	843
Nereis sp.	5	–
Nereis succinea	5	–
Streblospio benedicti	–	218
Nereidae	–	88
Spionidae	–	23
Tanaidacea		
Hargeria rapax	250	14
Thoracica		
Balanus sp.	5	14
Unknown thoracican	5	–
Trichoptera		
Hydroptila sp.	–	9

Phytoplankton taxa list and densities (#/mL) for Saufley Field STP, collected via subsurface grabs in Perdido Bay on 21 Novmber 1995.

	Reference Site	Test Site
Bacillariophyceae		
Achnanthes sp.	21	–
Cyclotella sp.	–	31
Navicula sp.	41	51
Nitzschia sp.	82	21
Pennales	277	31
Chlorophyceae		
Chlamydomonas sp.	298	154
Chlorella sp.	10	–
Chlorococcum sp.	10	–
Closterium sp.	10	10
Scenedesmus sp.	–	21
Spermatozoopsis sp.	10	10
Tetraedron sp.	–	10
Cryptophyceae		
Chroomonas sp.	134	21
Cryptomonas sp.	10	10
Cyanophyceae		
Anabaena sp.	–	21
Aphanocapsa sp.	21	10
Aphanothece sp.	–	10
Chroococcus sp.	10	–
Dactylococcopsis sp.	10	–
Oscillatoria sp.	–	21

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 FL0021041	11 12	95/11/20	17	18 X	19 S	20 4

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 FL0021041	11 12	95/11/20	17	18 B	19 S	20 4

Remarks

21 66