

Biological Assessment of

Miller Street Wastewater Treatment Facility

Clay County

NPDES #FL0025151

Sampled May 1996

August 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: Miller Street WWTF
County: Clay County
NPDES Number: FL0025151
State Permit Expiration Date: 30 January 1997

Toxics Sampling Inspection (XSI)

Date Sampled: 6 May 1996

Results: Atrazine, detected in the effluent at 0.57 µg/L, is acutely toxic at a concentration of 1.2 µg/L, making its presence in the discharge a cause for concern. Effluent metals concentrations complied with Class III water quality standards.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 6 May 1996

Results: The sample of 100% effluent was not acutely toxic to the invertebrate, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi.*

Impact Bioassessment Inspection (IBI)

Date Sampled: 6 May 1996

Results: Quantitative measures of benthic macroinvertebrate community health indicated a depauperate fauna in this area of the St. Johns River, with no adverse effects associated with the discharge. Although the benthic community was predominantly composed of freshwater taxa, the presence of a few marine taxa suggests a constantly changing salinity regime in this area of the river, which produces conditions that are unfavorable for the establishment of either a strictly freshwater or marine biological community. Phytoplankton populations were relatively similar at each study site, and were typical of eutrophic conditions. Cyanophytes were the most abundant algal group at all three sites, followed by diatoms and chlorophytes. Chlorophyll *a* values ranged from 10.6 µg/L to 17.5 µg/L, which are higher than those found in approximately 70% to 90% of other estuaries.

Water Quality Inspection (WQI)

Date Sampled: 6 May 1996

Results: Dissolved oxygen of the effluent (4.3 mg/L) was in violation of the 5.0 mg/L minimum permit limit. Nutrients were relatively low in the effluent and in the receiving waters. Bioreactive forms of nitrogen were below quantitation limits at all receiving water sites. Total phosphorus at test site 1 (0.12 mg/L), which was somewhat elevated compared with the reference site (0.07 mg/L), was relatively average for a Florida estuary. Algal Growth Potential (AGP), which ranged between 7.0 mg dry wt/L and 8.5 mg dry wt/L, was slightly above the 5 mg dry wt/L "problem threshold".

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

Miller Street Wastewater Treatment Facility is located in Clay County, Florida (see maps in Appendix). Wastewater treatment at this 5.0 MGD facility includes an aerated surge tank, a bar screen and grit removal system, a pair of 2-million gallon aeration tanks, and three secondary clarifiers. The effluent is chlorinated for disinfection and dechlorinated prior to discharge. Effluent from the facility is routed by an 18 inch diameter pipe to the St. Johns River. The discharge is in approximately 10 feet of water, single port (upturned elbow). Distance from the facility property line to discharge point is approx. 7,858 feet (1.49 miles). Average flow from the facility has been 3.64 MGD.

Permit limits are as follows: $CBOD_5$ (17 mg/L as an annual average, 21.25 mg/L as a monthly average, 25.5 mg/L as a weekly average, and 34 mg/L maximum), TSS (20 mg/L as an annual average, 30 mg/L as a monthly average, 45 mg/L as a weekly average, and 60 mg/L maximum), TKN (30 mg/L as an annual average, 30 mg/L as a monthly average, 30 mg/L as a weekly average, and 30 mg/L maximum), dissolved oxygen (5.0 mg/L minimum), pH (6.0 to 8.5 SU), fecal coliforms (200 organisms/100 mL as an annual average and 800 organisms/100 mL maximum), and total residual chlorine (less than 0.01 mg/L maximum at discharge).

Quarterly monitoring at five sites in the St. Johns River near the outfall (within 500 feet) is required in the permit. Dissolved oxygen, pH, temperature, and conductivity are measured at three depths. A mid depth sample is analyzed for $CBOD_5$, TSS, NH_3, TKN, NO_2 NO_3, total phosphorus, fecal coliforms, and chlorine residual. Chlorophyll *a* is analyzed from a mid secchi depth sample.

Monthly operating report data indicate the facility has been consistently meeting permit limits.

Major characteristics of community structure of control and test sites.

	Reference Site	Test Site 1	Test Site 2
Macroinvertebrate Ponar			
Number of Taxa	11	12	6
Lake Condition Index	4	4	2
Florida Index	1	3	1
EPT Index	0	1	0
Shannon-Weaver Diversity	2.9	2.4	2.1
% Oligochaeta	0	37.8	35.8
% Diptera	19.4	9.6	17.9
% Gastropoda	32.3	36.8	41.8
% Amphipoda	6.5	2.4	0
% Pelecypoda	25.8	12.4	4.5
% Other	3.1	1.0	0
% Thoracica	12.9	0	0
% Predator/Carnivores	16.1	10.3	17.9
% Above-Surface Deposit Feeders	35.5	38.5	0
% Below Surface Deposit Feeders	0	37.8	35.8
% Scavengers	4.8	0	0
% Browser-grazers	4.8	0	0
% Suspension Feeders	38.7	12.9	4.5
% Scrapers	0	0	41.8
Phytoplankton Algae			
Number of Taxa	37	41	37
Shannon-Weaver Diversity	4.4	4.4	4.4
Chlorophyll a (µg/L)	17.5	10.6	12.3
Algal Density (#/mL)	2,918	3,479	2,142
% Cryptophyceae	4.2	0.6	0.5
% Chrysophyceae	0.7	0	0.5
% Dinophyceae	2.8	0.3	3.9
% Xanthophyceae	8.5	7.8	5.4
% Cyanophyceae	31.0	40.8	36.3
% Euglenophyceae	7.8	0.9	3.9
% Chlorophyceae	27.1	23.4	24.5
% Bacillariophyceae	17.6	26.0	25.0
Algal Growth Potential (mg dry wt/l)	7.0	7.5	8.5

Methods

The focus of this investigation was to determine the discharger's effects on the St. John's River. A comparison of biological community health was made between a ref-

erence site (located in the St. Johns River, south of Mandarin Point) and two test sites. Test site 1 was located in the St. Johns River, approximately 30 meters north of the point of discharge, and test site 2 was located approximately 30 meters south of the point of discharge. 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 replicate petite Ponar grabs. Phytoplankton populations were sampled via subsurface grabs. Algal Growth Potential tests, using *Selenastrum capricornutum* as the test organism, followed Miller *et al.* (1978).

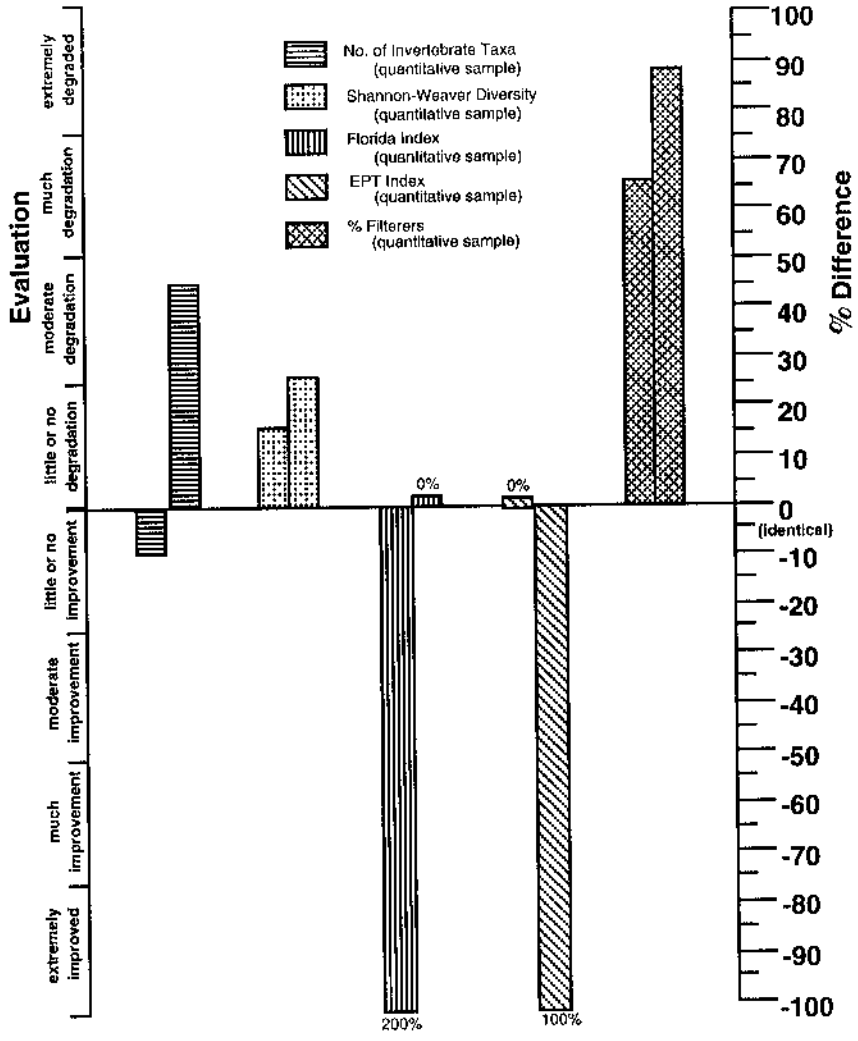
Explanation of Measurements of Community Health

Several different measurements of macroinvertebrate 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



Effect of discharge on the benthic macroinvertebrate community.

The left bar for each parameter shows differences between the reference site and test site 1. The right bar shows differences between the reference site and test site 2.

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.

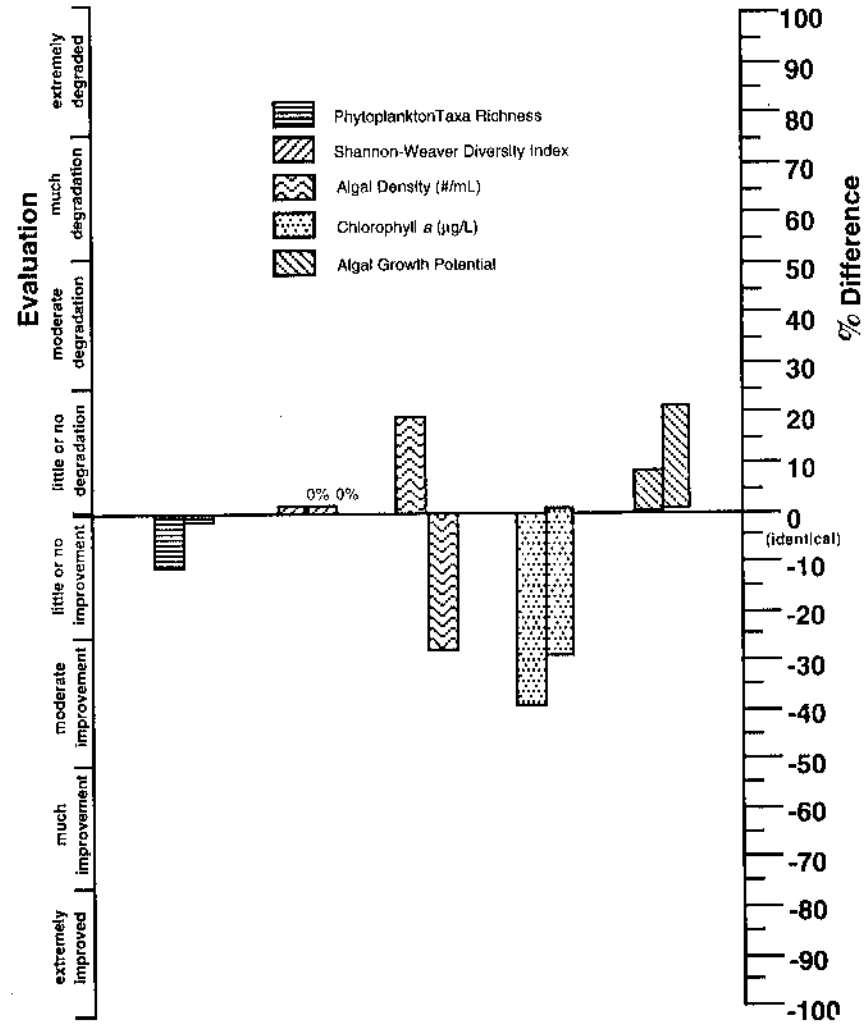
Community structure: Substantial shifts in proportions of major groups of organisms, compared to reference conditions, may indicate degradation. In marine systems, an increase in the % tubificid oligochaetes, a decrease in the % pelecypods, and a decrease in the number of polychaete taxa are all considered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

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

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



Effect of discharge on the algal community.

The left bar for each parameter shows differences between the reference site and test site 1. The right bar shows differences between the reference site and test site 2.

The following personnel were involved in this investigation: Tim McKelvey and Ruth Bouman (DEP Northeast District) and Marshall Faircloth, Russel Frydenborg, Joy Jackson, Kathleen Lurding, Tina Mikulski, Elizabeth Miller, Urania Quintana, Lisa Tamburello, Landon Ross, David Whiting, and Vicki Whiting. (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 a low salinity portion of the St. John's River, however, waters were predominantly fresh during this investigation. Numerous pollution sources are present in this area, which is subject to tidally induced flow reversals. Habitat quality was slightly better at the reference site (with 58 points) than at either test site (both sites scored 42 points). The available benthic substrates at the three sites were mainly shell and silt/muck.

Water quality at the three sites was very similar with respect to the physical/chemical parameters measured. For example, water temperature ranged from 26.1° C to 26.2° C while pH ranged from 6.8 SU to 7.2 SU. Dissolved oxygen was 7.7 mg/L at the reference site, 7.3 mg/L at test site 1, and 7.2 mg/L at test site 2. Effluent dissolved oxygen (4.3 mg/L) was in violation of the 5.0 mg/L minimum permit limit. Conductivity was similar throughout the study area, ranging from 660 µmhos/cm to 669 µmhos/cm. Turbidity was lowest at test site 1 (9.8 NTU), intermediate at test site 2 (11.0 NTU), and highest at the reference site (18.1 NTU). Secchi depth ranged from 0.8 m to 1.0 m.

The only organic compound detected in the effluent was atrazine (0.57 µg/L). Atrazine is acutely toxic to the shrimp, *Palaemonetes kadiakensis*, at a concentration of 1.2 µg/L (AQUIRE 1991). Since the effluent level of atrazine was approximately one half of the LC_{50}, this is cause for concern. Iron (59 µg/L) and zinc (39 µg/L) were also detected in the effluent sample. Concentrations of these metals complied with Class III water quality standards. The sample of 100% effluent was not acutely toxic to the invertebrate, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi* (Appendix).

Nutrients were relatively low in the effluent and typical of an estuarine system in the receiving waters. Nitrate-nitrite was less than the minimum quantitation limit in the effluent and at the three St. Johns River sites. The discharge, with 1.7 mg/L of total phosphorus, contributed to minor increases in phosphorus at the test sites (ranging from 0.10 to 0.12 mg/L) compared with the reference site (0.07 mg/L). Ammonia, measured to be 0.63 mg/L in the effluent, was undetected at all three receiving water sites.

Algal Growth Potential (AGP) was 7.0 mg dry wt/L at the reference site, 7.5 mg dry wt/L at test site 1, and 8.5 mg dry wt/L at test site 2. AGP at all three sites was somewhat above the 5 mg dry wt/L "problem threshold" (Raschke and Schultz 1987).

Quantitative measures of benthic macroinvertebrate community health indicated a depauperate fauna in this area of the St. Johns River, with no adverse effects associated with the discharge. The Figure on p. 2 indicates the degree of difference between the invertebrate populations of the reference and test sites. Larger differences (that is, higher percentages) correspond with greater degrees of degradation. Negative values mean the test site is better than the reference site.

Although the benthic community was predominantly composed of freshwater taxa, the presence of a few marine taxa suggests a constantly changing salinity regime in this area of the river, which produces conditions that are unfavorable for the establishment of either a strictly freshwater or marine biota. The reference site consisted mostly of gastropods (32.3 %) and pelecypods (25.8 %), along with dipterans (19.4 %) and barnacles (12.9 %). Gastropods and oligochaetes were most abundant at the test sites. Several taxa which were present at the reference site are most often found in saltwater, including the barnacle, *Balanus* sp., the isopod, *Cyathura polita*, and the amphipod, *Monoculodes* sp. These taxa were absent from both test sites.

Macroinvertebrate taxa richness was relatively depressed throughout the study area, with 12 taxa at test site 1, 11 taxa at the reference site, and 6 taxa at test site 2. Shannon-Weaver diversity was highest at the reference site (2.9), intermediate at the test site 1 (2.4), and lowest at test site 2 (2.1). The 27.5% decrease in diversity seen at test site 2 (compared with the reference site) was largely due to the dominance of hydrobiid gastropods, which are not considered to be nuisance species or indicators of pollution. Although the Florida Index and the EPT Index scores were very low at all three sites, test site values were either similar to, or better than, the reference site scores. The highly variable salinity regime in this vicinity of the St. Johns River, as well as the pres-

ence of other potential pollution inputs, make it difficult to determine the source(s) of stress on the invertebrate community. In summary, the discharge did not appear to have an adverse effect on the macroinvertebrate community.

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 populations were relatively similar at each study site. Phytoplankton taxa richness ranged from 37 taxa (at the reference site and test site 2) to 41 taxa (at test site 1). Shannon-Weaver diversity was identical (4.4) at all three sites. Cyanophytes were the most abundant algal group at all three sites, followed by diatoms and chlorophytes. Algal density ranged from 2,142 organisms/mL at test site 2 to, 3,479 organisms/mL at test site 1. Chlorophyll *a* was highest at the reference site (17.5 µg/L), intermediate at test site 2 (12.3 µg/L), and lowest at test site 1 (10.6 µg/L). These chlorophyll *a* values are higher than those found in approximately 70% to 90% of other estuaries.

Conclusions

Dissolved oxygen of the effluent (4.3 mg/L) was in violation of the 5.0 mg/L minimum permit limit.

Atrazine, detected in the effluent at 0.57 µg/L, is acutely toxic at a concentration of 1.2 µg/L, making its presence in the discharge a cause for concern. Effluent metals concentrations complied with Class III water quality standards.

The sample of 100% effluent was not acutely toxic to the invertebrate, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi*.

Nutrients were relatively low in the effluent and typical of an estuarine system in the receiving waters. The discharge, with 1.7 mg/L of total phosphorus, contributed to minor increases in phosphorus at the test sites. Effluent ammonia was 0.63 mg/L, but was undetected at all three receiving water sites.

Algal Growth Potential (AGP), which ranged between 7.0 mg dry wt/L and 8.5 mg dry wt/L, was slightly above the 5 mg dry wt/L "problem threshold" (Raschke and Schultz 1987).

Quantitative measures of benthic macroinvertebrate community health indicated a depauperate fauna in this area of the St. Johns River, with no adverse effects associated with the discharge. Although the benthic community was predominantly composed of freshwater taxa, the presence of a few marine taxa suggests a constantly changing salinity regime in this area of the river, which produces conditions that are unfavorable for the establishment of either a strictly freshwater or marine biological community.

Phytoplankton populations were relatively similar at each study site, and were typical of eutrophic conditions. Cyanophytes were the most abundant algal group at all three sites, followed by diatoms and chlorophytes. Chlorophyll *a* values ranged from 10.6 µg/L to 17.5 µg/L, which are higher than those found in approximately 70% to 90% of other estuaries.

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Chemistry summary table for Miller Street WWTP, collected 6 May 1996.	Effluent	Reference Site	Test Site 1	Test Site 2
Organic Constituents (ug/L)				
Atrazine	0.57			
Metals (ug/L)				
Aluminum	100 U			
Arsenic	10 U			
Cadmium	0.080 U			
Chromium	10 U			
Copper	3 U			
Iron	59			
Lead	10 U			
Mercury	0.10 U			
Nickel	4 U			
Selenium	30 U			
Silver	0.050 U			
Zinc	39 A			
Nutrients (mg/L)				
Ortho-phosphate	1.7 A	0.032	0.072 A	0.064
Total phosphorus	1.7	0.070	0.12	0.099
Unionized Ammonia	0.002			
Ammonia	0.63 A	0.020 U	0.020 U	0.020 U
Nitrate+Nitrite	0.026 I	0.022 I	0.037 I	0.029 I
TKN	1.5	0.91	0.96	0.88
General Phys-Chem Parameters				
Habitat Assessment		58	42	42
D. O. (mg/L)	4.3	7.7	7.3	7.2
pH (SU)	6.7	7.2	6.8	7.1
Specific Conductance (µmhos/cm)	516	660	669	662
Temperature (°C)	26.2	26.1	26.2	26.1
Total Suspended Solids (mg/L)	1	5	5	4
Carbonaceous BOD5 (mg/L)	2	2 U	2 U	2 U
Turbidity (NTU)		18.1	9.8	11.0
Hardness (mg CaCO3)	119.8			
Algal Growth Potential (mg dry wt/L)	37.5	7.0	7.5	8.5
Toxicity				
Bioassay Fish-Dechlorinated	No Mortality			
Bioassay Invertebrate-Dechlorinated	No Mortality			

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

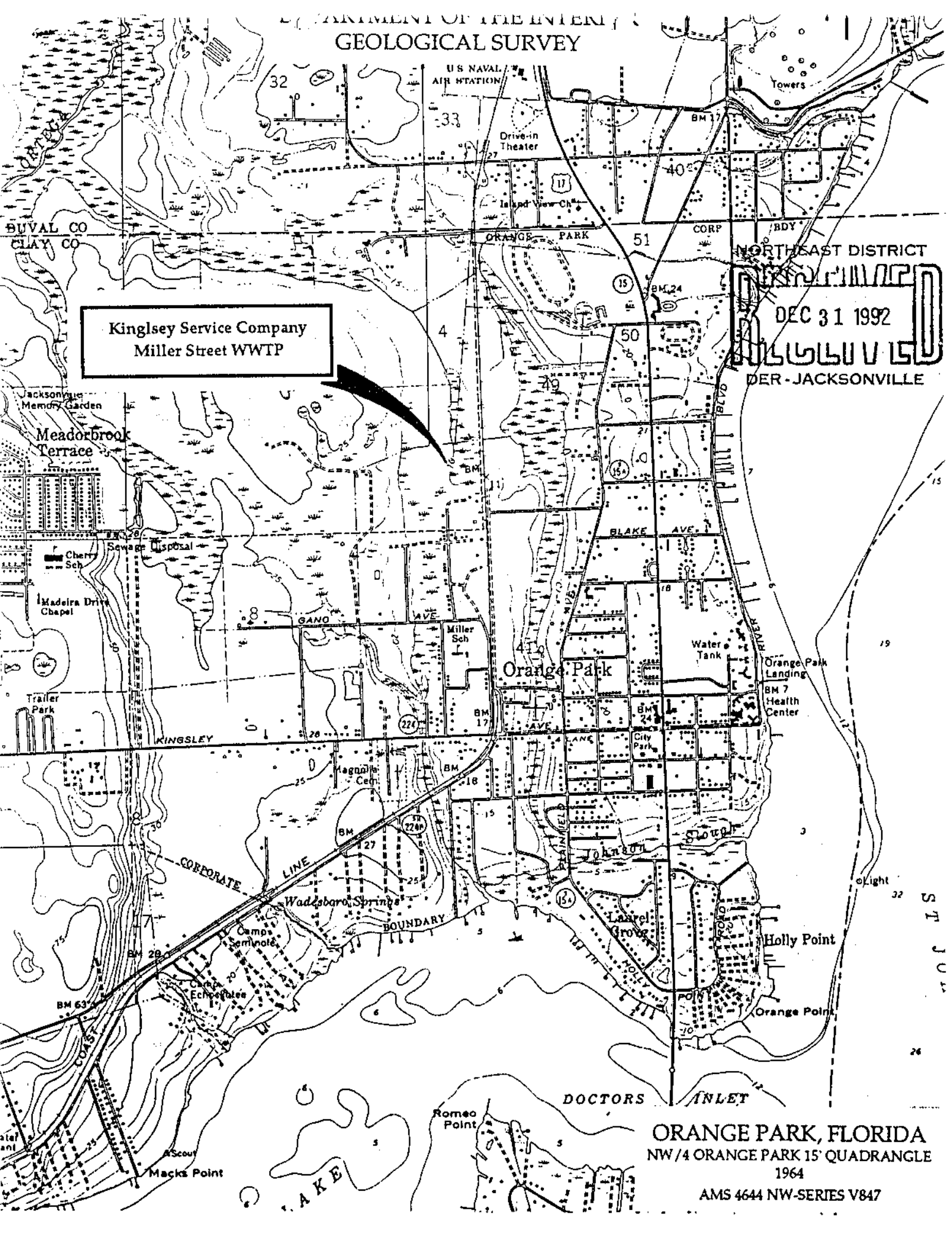
Adapted from Joe Hand, FDER, personal communication, 1991
(data was collected between 1980 and 1989)

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 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


GEOLOGICAL SURVEY
Kinglsey Service Company
Miller Street WWTP
RECEIVED
DEC 31 1992
DER - JACKSONVILLE
NORTHEAST DISTRICT
DUVAL CO
CLAY CO
ORANGE PARK
Meadorbrook Terrace
Jacksonville Memory Garden
Sewage Disposal
Cherry Sch
Madeira Drive Chapel
Trailer Park
KINGSLEY
GANO AVE
Miller Sch
Orange Park
BLAKE AVE
Water Tank
Orange Park Landing
BM 7 Health Center
City Park
Magnolia Cem
CORPORATE LINE
Wadesboro Springs
BOUNDARY
Camp Seminole
Camp Echopalaca
BM 63
BM 29
COAST
Macks Point
Laurel Grove
Holly Point
Orange Point
DOCTORS INLET
Romeo Point
ORANGE PARK, FLORIDA
NW/4 ORANGE PARK 15' QUADRANGLE
1964
AMS 4644 NW-SERIES V847


MILLER STREET WWTP
FYI'S SAMPLING SITES
TEST SITE #1 (2003050Z)
P.O.D. (900' FROM WEST BANK)
TEST SITE #2 (2003050Z)
REFERENCE SITE (2003050Z)
Beauclerc Bluff
Plummers Cove
Plummers Pt.
Orange Park
Orange Park Ldg
Johnson Slough
Orange Pt.
Doctors Inlet
Mandarin Pt
Mandarin Community Center
JULINGTON CREEK
OLD BULL BAY
Marsh
FIXED BRIDGES HOR CL 150 FT VERT CL 65 FT
FIXED BRIDGES HOR CL 50 FT VERT CL 37 FT
FIXED BRIDGE HOR CL 44 FT VERT CL 15 FT OVHD PWR CAB AUTH CL 40 FT
TANK
Platforms
Piling
Subm pile
Dols PA
Piles PA
Trees
Stumps
Fish weir
Cable Area

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

FACILITY SUMMARY

Facility Name: Clay County Miller Street WWTF	Prepared by: Jon Dinges Date: 5-6-96	
Location (attach detailed map): Attached	County Clay	District NED
Federal Permit # FL0025151 and expiration date: 9-30-98	State GMS # and 3110044764 State expiration date: 1-30-97	Facility Type: Industrial (Municipal) Federal Agricultural Other (list): County Owned

Function of facility: Treatment of domestic wastewater

Description of treatment process:
The facility is composed of an aerated surge tank, a bar screen and grit removal system, two 2.0 million gallon aeration tanks, and three secondary clarifiers. The effluent is chlorinated and dechlorinated prior to discharge.

Receiving waters: St. Johns River	Classification: III
Design Flow: 5.0 MGD	Actual Mean Flow: 3.64 MGD

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

therefore, the best time to sample is: Anytime

If facility has a mixing zone, give details (size, parameters affected, etc.): No mixing zone.

List effluent limits: (from state permit only)

Parameter	Limit (units)			
	5.0 MGD annual avg.			
	Annual	Monthly	Weekly	Max.
CBOD5 (mg/L)	17	21.25	25.5	34
TSS (mg/L)	20	30	45	60
TKN (mg/L)	30	30	30	30
Dissolved Oxygen (mg/L)	5.0 minimum			
pH (std. units)	6.0 - 8.5			
Total Chlorine Residual (mg/L)	<0.01 max in discharge			
Fecal Coliform (no./100 mL)	200 annual avg./800 max.			

Describe special permit conditions and permit modifications:

Toxicity testing: 96 hour acute static using C. dubia and N. leedsi.

Permit revised in January, 1996 to allow for operation of a lime stabilization facility for sludge.

Miller Street WWTF
(Facility)

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

FACILITY SUMMARY

Description of permitted outfall(s):
A 5.0 MGD annual average daily flow (AADF) permitted capacity discharge to the St. Johns River. The outfall is submerged 8 feet deep.

List permit violations (from MOR data or other source) and plant upsets that occurred within past year: None. Plant has shown good performance.

Describe previous impact bioassessments, WQBEL's, and previous or current enforcement actions:
None found in files.

Discuss comparability of MOR results to past DER results and whether there are trends (improving, declining) in the data set: The data set shows no obvious trends. The plant has been consistently meeting limits.

Additional information:

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FDEP-NED	STORET STATION NUMBER: 20030504	DATE (M/D/Y): 5-6-96	TIME: 1345	RECEIVING BODY OF WATER: ST. JOHNS RIVER

REMARKS:	LOCATION: 900-1000 FT. FROM EAST ~~OF~~ BANK OF ST. JOHNS RIVER, SOUTH OF MANDARIN POINT.	FIELD ID/NAME: REFERENCE 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: 1-3m

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)

width: 2.5 - 3.0 miles
depth: 1-20'
velocity: tidally influenced

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

Artificially Impounded ☐ yes

High Water Mark (m above bed): 1m

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			
Leaf Packs or Mats				Mud/Muck/Silt	90	2	PONAR
Aquatic Vegetation				Other: Shell	10	1	PONAR
Rock or Shell Rubble				Other:			
Shorezone (Roots/Veg.)				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (FT.):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):	TURBIDITY		Secchi (m):
Top	0							
Mid-depth	4.0	26.14	7.19	7.69	1660 / 0.3ppt.	18.1		1.0 m
Bottom	7.5 FT.							

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:
SUNNY, HOT @ 90°F IS°, breeze from S.E. @ 5-10

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

NOT OBSERVED

SAMPLING TEAM:	SIGNATURE:	DATE:
TIM McKELVEY RUTH BOUMAN	Tim McKelvey Ruth Bouman	

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

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FDEP-NED	STORET STATION NUMBER: 20030504	DATE (M/D/Y): 5-6-96	RECEIVING BODY OF WATER: ST. JOHNS RIVER

REMARKS:	LOCATION: 900 - 1000 FT. FROM EAST BANK OF ST. JOHNS RIVER. SOUTH OF MANDARIN POINT.	FIELD ID/NAME: REFERENCE SITE

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations: 5	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: 26	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: 9	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. 8-10 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: 58

9 shell

COMMENTS:

ANALYSIS DATE: 5-6-96	ANALYST: McKelvey / Bowman	SIGNATURE: Tim McKelvey, Robt. Bowman

DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FDEP-NED	STORET STATION NUMBER: 20030502	DATE (M/D/Y): 5-6-96	TIME: 1115	RECEIVING BODY OF WATER: ST. JOHNS RIVER

REMARKS:	LOCATION: 900-1000 FT. FROM WEST BANK OF ST. JOHN'S RIVER, 100 FT NORTH OF POD	FIELD ID/NAME: TEST SITE #1

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: 1m

List & map dominant vegetation on back

Artificially Channelized ☑ no ☐ ☐ ☐ (recent, severe / some recovery / mostly recovered, more sinuous)

Artificially Impounded ☐ yes

High Water Mark (m above ~~bed~~ SURFACE): 1m

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

width: 2.5 - 3.0 miles
depth: 1 - 20'
velocity: tidally influenced

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)				Riffles			
Leaf Packs or Mats				Sand			
Aquatic Vegetation				Mud/Muck/Silt/SHELL	100	3	PONAR
Rock or Shell Rubble				Other:			
Undercut Banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (~~m~~ FT.):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):	TURBIDITY		Secchi (m):
Top	0							
Mid-depth	5 FT.	26.17	6.84	7.34	669µ/.03ppt	9.82 NTU		0.8
Bottom	10 FT.							

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:
SUNNY, HOT @ 90°F ± 5, breeze from S.E. @ 5-10

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

NOT OBSERVED

SAMPLING TEAM:	SIGNATURE:	DATE:
TIM McKELVEY RUTH BOUMAN	Tim McKelvey Ruth Bouman	5-6-96

DEPARTMENT OF ENVIRONMENTAL REGULATION

MARINE BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: EDER-NED	STORET STATION NUMBER: 20030502	DATE (M/D/Y): 5-6-96	RECEIVING BODY OF WATER: ST. JOHNS RIVER

REMARKS:	LOCATION: 900-1000 FT. FROM WEST BANK OF ST. JOHNS RIVER, 100 FT. NORTH OF POD.	FIELD ID NAME: TEST SITE #1

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations: 7	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: 13	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: 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: 6	Combination of sand, gravel, and shell. 12-15 points	Primarily sand, with small areas of mud. 6-11 points	Mixture of sand and ✓ mud, or well-aerated mud only. 4-7 points	Anaerobic mud. 0-3 points

some shell

TOTAL SCORE: 42

COMMENTS:

ANALYSIS DATE:	ANALYST:	SIGNATURE:
5-6-96	McKELVEY / BOUMAN	Tim McKelvey Ruth Bouman

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FDEP-NED	STORET STATION NUMBER: 20030503	DATE (M/D/Y): 5-6-96	TIME: 1200	RECEIVING BODY OF WATER: ST. JOHN'S RIVER

REMARKS:	LOCATION: 900-1000 FT FROM WEST BANK OF ST. JOHNS RIVER. 100 FT. SOUTH OF POD.	FIELD ID/NAME: TEST SITE #2

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*

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

High Water Mark (m above bed):

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

width: 2.5-3.0 mile
depth: 1-20'
VELOCITY: tidally influenced

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			
Leaf Packs or Mats				Mud/Muck/Silt/Shell	100	3	PONAR
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Shorezone (Roots/Veg.)				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (~~m~~) FT.	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):	TURBIDITY		Secchi (m):
Top	0							1.0
Mid-depth	5.0 FT	26.14	7.12	7.23	662 / 0.3ppt	11.0		
Bottom	10.2 FT.							

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:
Sunny, Hot 90°F±5°
breezy from S.E. @ 5-10

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

NOT OBSERVED

SAMPLING TEAM: TIM McKELVEY RUTH BOUMAN

SIGNATURE: Tim McKelvey Ruth Bouman

DATE: 5-6-96

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

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FDER - NED	STORET STATION NUMBER: 20030503	DATE (M/D/Y): 5-6-96	RECEIVING BODY OF WATER: ST. JOHNS RIVER

REMARKS:	LOCATION: 900-1000 FT. FROM WEST BANK OF ST. JOHNS RIVER. 100 FT. SOUTH OF POD.	FIELD ID/NAME: TEST SITE #2

Habitat Parameter / SCORE	Excellent	Good	Fair	Poor
Littoral Alterations 7	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 13	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 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 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 42

COMMENTS:

ANALYSIS DATE: 5-6-96	ANALYST: McKelvey / Bowmer	SIGNATURE: Tim McKelvey Ruth Bowmer

Tides-Orange Park Landing, Orange Park

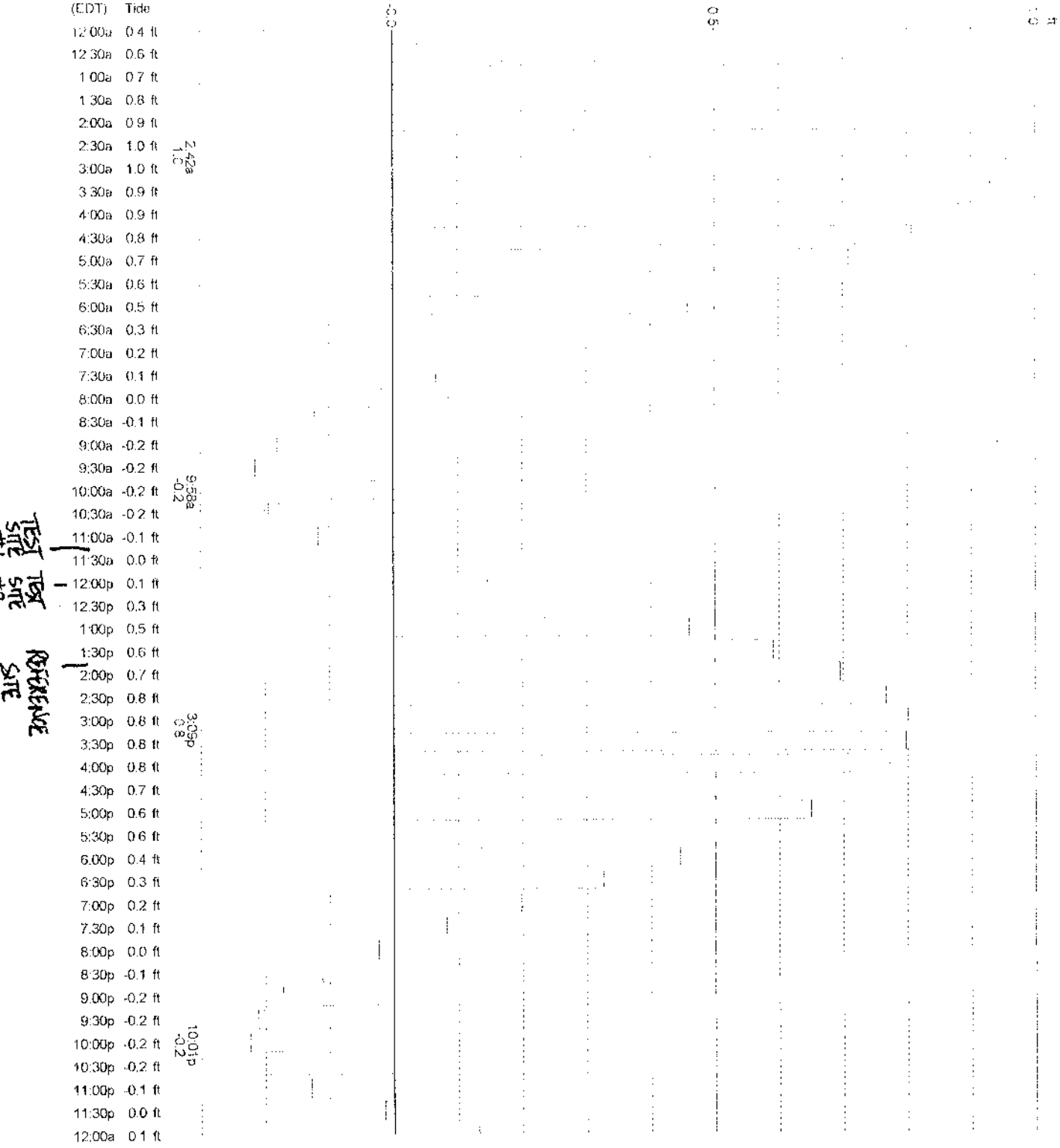
based on Mayport, Florida (NOAA)
30° 10.01' N 81° 41.07' W

Monday, May 6, 1996

Average Tides
Mean Range: 0.7 ft
MHHW: 0.9 ft
Mean Tide: 0.5 ft

Daily Highs & Lows
2:42a 1.0 ft High
9:58a -0.2 ft Low
3:05p 0.8 ft High
10:01p -0.2 ft Low

(EDT)	Tide
12:00a	0.4 ft
12:30a	0.6 ft
1:00a	0.7 ft
1:30a	0.8 ft
2:00a	0.9 ft
2:30a	1.0 ft
3:00a	1.0 ft
3:30a	0.9 ft
4:00a	0.9 ft
4:30a	0.8 ft
5:00a	0.7 ft
5:30a	0.6 ft
6:00a	0.5 ft
6:30a	0.3 ft
7:00a	0.2 ft
7:30a	0.1 ft
8:00a	0.0 ft
8:30a	-0.1 ft
9:00a	-0.2 ft
9:30a	-0.2 ft
10:00a	-0.2 ft
10:30a	-0.2 ft
11:00a	-0.1 ft
11:30a	0.0 ft
12:00p	0.1 ft
12:30p	0.3 ft
1:00p	0.5 ft
1:30p	0.6 ft
2:00p	0.7 ft
2:30p	0.8 ft
3:00p	0.8 ft
3:30p	0.8 ft
4:00p	0.8 ft
4:30p	0.7 ft
5:00p	0.6 ft
5:30p	0.6 ft
6:00p	0.4 ft
6:30p	0.3 ft
7:00p	0.2 ft
7:30p	0.1 ft
8:00p	0.0 ft
8:30p	-0.1 ft
9:00p	-0.2 ft
9:30p	-0.2 ft
10:00p	-0.2 ft
10:30p	-0.2 ft
11:00p	-0.1 ft
11:30p	0.0 ft
12:00a	0.1 ft



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FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Miller
County: Clay
Contact / District: Tim McKelvey / Northeast
NPDES Permit #: FL0025151
LIMS Sample #: 138304 LIMS Job #: 96-May-07.06

Sample Collection: Date 5-6-96 Time 1515
Test Beginning: Date 5-7-96 Time 1300
Test Ending: Date 5-9-96 Time 1345
Organism Batch #: 31 Diluent Batch #: well
Organism Age: 12 days old
Test Organism: Cyprinella leedsi

Test Type: Screening | Definitive
Static | Static Renewal | Flow-through
Test Number: 2 of 2
Remarks:

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	23.6 @ 23.6	8.1 @ 26.2 °C	109.8 @ 105.4 9630 @ 9809 @ 25.3 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	24.0 @ 24.1	8.2 @ 25.5 °C	106.9 @ 105.4 1022 @ 1025 @ 25.0 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	23.8 @ 23.9	8.1 @ 26.0 °C	106.4 @ 105.4 1049 @ 1025 @ 25.1 °C

Conc.	Chamber #	Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm)		
		0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Ctrl	A - 380	5	5	5	7.9	8.2	8.2	25.4	24.8	24.5	7.8	7.8	7.7	255	250	250
Ctrl	B - 136	5	5	5	7.9	8.2	8.2	25.4	24.7	24.4	7.8	7.8	7.7	255	250	250
Ctrl	C - 705	5	5	5	7.9	8.2	8.2	25.4	24.6	24.3	7.8	7.7	7.7	255	250	250
Ctrl	D - 26	5	5	5	7.9	8.2	8.2	25.4	24.6	24.3	7.8	7.7	7.7	255	250	250
100%	A - 119	5	5	5	7.1	7.8	8.0	25.2	24.6	24.4	5.8	7.6	7.7	530	530	530
100%	B 309	5	5	5	7.1	7.8	8.0	25.0	24.6	24.4	5.9	7.5	7.5	525	525	525
100%	C 414	5	5	5	7.1	7.8	8.0	24.9	24.6	24.4	5.9	7.4	7.4	525	525	525
100%	D 775	5	5	5	7.1	7.8	8.0	24.9	24.5	24.2	5.9	7.3	7.4	525	525	525
Measured/Loaded by:		tm	MF	MF	MF	JF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF
Recorded by:		MF	MF	MF	VM	JN	JN	VM	JN	JN	LM	JN	JN	LM	JN	JN

Investigators' Signatures

Marshall Faircloth

Tina M. Kuldau

Reviewer

form updated 5/05/95

Salt Water: Well Water | 20% Min Water

Water Quality Parameters

		Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):		0.03	—	Ruth Bowman
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03	DPD	DB
Alkalinity (mg/L as $CaCO_3$):	125	120	HACH	DB
Hardness (mg/L as $CaCO_3$):	120	125	HACH	DB
Total ammonia (mg/L as N):	<0.017	0.128	Orion	JN

Ammonia Meter #98136 Ammonia Meter Slope: -57.3 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Miller Street WWTP
County: Clay
Contact / District: Tim McKelvey / Northeast
NPDES Permit #: FL0025151
LIMS Sample #: 138304 LIMS Job #: 96-May-07-26

Sample Collection: Date 5-6-96 Time 1515
Test Beginning: Date 5.7.96 Time 1300
Test Ending: Date 5/9/96 Time 1345
Organism Batch #: 21 Diluent Batch #: 21
Organism Age: <24hours
Test Organism: Ceriodaphnia dubia

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

Test Number: 1 of 2

Remarks:

Instrument Calibrations:	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	23.6 @ 23.6	8.1 @ 26.2 °C	109.8 @ 105.4 1018 @ 1025 @ 25.3 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	24.0 @ 24.1	8.2 @ 25.5 °C	106.9 @ 105.4 1022 @ 1025 @ 25.0 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	23.8 @ 23.9	8.1 @ 26.0 °C	106.4 @ 105.4 1019 @ 1025 @ 25.1 °C

Conc.	Chamber #	Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm)		
		0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Ctrl	A	5	5	5	7.9		8.2	24.7		24.8	7.6		7.5	180		200
Ctrl	B	5	5	5			8.2			24.7			7.5			195
Ctrl	C	5	5	5			8.2			24.7			7.7			190
Ctrl	D	5	5	5			8.2			24.6			7.7			190
100%	A	5	5	5	7.0		8.4	25.0		24.6	6.4		7.8	505		530
100%	B	5	5	5			8.4			24.5			7.7			550
100%	C	5	5	5			8.4			24.4			7.8			540
100%	D	5	5	5			8.4			24.3			7.8			535
Measured/Loaded by:		MF	MF	MF	MF		MF	MF		MF	MF		MF	MF		MF
Recorded by:		MF	MF	MF	LM		JN	LM		JN	LM		JN	LM		JN

Investigators' Signatures

Marshall Faircloth

Tina McKelvey

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):			0.03	—	Ruth Bowman
Lab Total Residual Cl2 (mg/L):		<0.03	<0.03	DRIEL	DB
Alkalinity (mg/L as $CaCO_3$):		86	120	Hach	DB
Hardness (mg/L as $CaCO_3$):		90	125	Hach	DB
Total ammonia (mg/L as N):		<0.017	0.128	ORION	JN

Ammonia Meter #98136 Meter Slope: -57.3 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

Benthic macroinvertebrate taxa list for Miller Street WWTF, collected via Ponar grab samples in the St. Johns River, on 6 May, 1996. Densities, in number/m^2, represent the mean of three replicates.

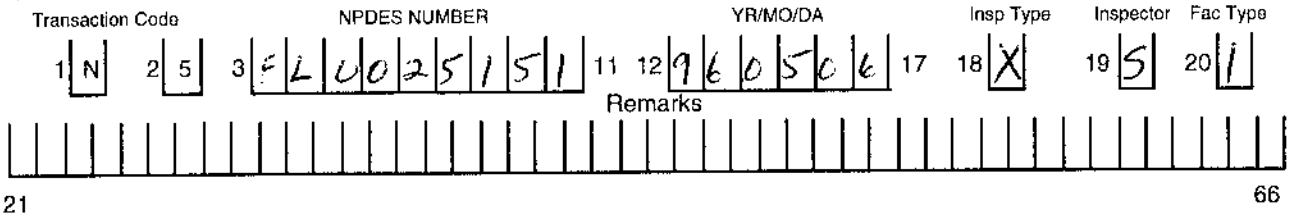
	Reference Site	Test Site 1	Test Site 2
Oligochaeta			
Aulodrilus pigueti	–	7	6
Bratislavia unidentata	–	1	–
Limnodrilus hoffmeisteri	–	71	18
Gastropoda			
Hydrobiidae	10	77	27
Littoridinops tenuipes	–	–	1
Pelecypoda			
Corbicula fluminea	6	19	3
Mytilopsis leucophaeata	1	7	–
Pisidiidae	1	–	–
Thoracica			
Balanus sp.	4	–	–
Isopoda			
Cyathura polita	1	–	–
Amphipoda			
Crangonyx sp.	–	5	–
Monoculodes sp.	2	–	–
Trichoptera			
Oecetis sp.	–	2	–
Diptera			
Coelotanypus sp.	1	14	10
Cryptochironomus sp.	3	1	–
Paralauterborniella nigrohalterale	1	–	–
Procladius sp.	1	3	2
Tanytarsus sp.	–	2	–

Phytoplankton taxa list and densities (#/mL) for Miller Street WWTF, collected via subsurface grabs in the St. Johns River, on 6 May, 1996.

	Reference Site	Test Site 1	Test Site 2
Cyanophyceae			
Anabaena sp.	21	10	–
Aphanocapsa sp.	134	312	168
Aphanothece sp.	21	–	21
Chroococcus sp.	195	131	84
Cylindrospermopsis sp.	21	–	–
Dactylococcopsis sp.	21	50	–
Gloeocapsa sp.	10	60	–
Gomphosphaeria sp.	–	10	11
Lyngbya sp.	31	91	32
Marssoniella sp.	–	10	11
Merismopedia sp.	349	452	231
Microcystis sp.	103	211	158
Oscillatoria sp.	–	70	63
Schizothrix sp.	–	10	–
Chrysophyceae			
Ophiocytium sp.	–	10	–
Chryosphaerales	–	–	11
Chrysophyceae	21	–	–
Xanthophyceae			
Tribonema sp.	247	261	116
Bacillariophyceae			
Achnanthes sp.	–	30	–
Attheya sp.	10	–	–
Biddulphia sp.	–	–	21
Coscinodiscus sp.	–	10	21
Cyclotella sp.	154	221	105
Epithemia sp.	–	10	–
Hantzschia sp.	10	10	–
Melosira sp.	164	332	294
Navicula sp.	41	70	–
Nitzschia obtusa	–	10	–
Nitzschia sp.	31	101	53
Rhizosolenia sp.	–	20	–
Skeletonema sp.	–	–	11
Stephanodiscus sp.	31	80	32
Pennales	72	10	–
Chlorophyceae			
Ankistrodesmus sp.	62	20	53
Chlamydomonas sp.	411	211	200
Chlorococcum sp.	–	10	–
Chlorogonium sp.	21	–	–

Chodatella sp.	–	10	–
Coelastrum sp.	10	–	11
Crucigenia sp.	–	80	–
Dichotomococcus sp.	–	–	11
Dictyosphaerium sp.	–	30	11
Dimorphococcus sp.	–	–	21
Gloeocystis sp.	10	–	–
Golenkinia sp.	–	10	–
Micractinium sp.	–	10	–
Oocystis sp.	21	20	–
Pediastrum sp.	10	–	–
Pteromonas sp.	21	10	–
Scenedesmus sp.	103	312	116
Selenastrum sp.	–	–	21
Spermatozoopsis sp.	10	10	–
Staurastrum sp.	10	–	–
Stichococcus sp.	–	–	11
Tetradesmus sp.	–	–	11
Tetraedron caudatum	21	10	21
Tetraedron minimum	–	–	11
Tetraedron sp.	–	10	–
Tetrastrum sp.	92	30	32
Chlorophyceae	–	40	–
Euglenophyceae			
Euglena sp.	10	–	21
Lepocinclis sp.	216	30	63
Dinophyceae			
Gymnodinium sp.	62	10	21
Peridinium sp.	21	–	63
Cryptophyceae			
Cryptomonas sp.	123	20	11

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)

