

Biological Assessment of

Beauclerc Utilities

Duval County

NPDES #FL0023370

Sampled July 1995

October 1995

Biology Section
Division of Administrative and Technical Services

Comprehensive Quality Assurance Plan No. 870346G

Department of Environmental Protection
Results of Fifth Year Inspections

Discharger: Beauclerc Utilities
County: Duval
NPDES Number: FL0023370
State Permit Expiration Date: 10 March 1997

Toxics Sampling Inspection (XSI)

Date Sampled: 17 July 1995

Results: No organic pollutants were detected in the effluent. The effluent silver level (0.29 µg/L) exceeded Class III water quality standards (Rule 62-302. 530(60) FAC).

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 17 July 1995

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

Impact Bioassessment Inspection (IBI)

Date Sampled: 17 July 1995

Results: Measures of macroinvertebrate health indicated that the discharge was not negatively affecting the community. In the Hester-Dendy samples, macroinvertebrate taxa richness, the Florida Index, Shannon-Weaver diversity, and the EPT Index were all improved downstream of the discharge. The Stream Invertebrate Index for Florida score was 25 at the reference site and 19 at the test site, placing both stations in the moderately impaired category. The algal data indicate that the facility is not exerting negative effects on the immediate receiving water periphyton community, probably due to the fairly high water velocity in Goodbys Creek. However, AGP data suggest that enrichment effects may appear where water velocity decreases, farther downstream in the St. Johns River.

Water Quality Inspection (WQI)

Date Sampled: 17 July 1995

Results: Specific conductance of the effluent (1576 µmhos/cm) violated ambient standards (Rule 62-302.530(23) FAC). Fecal and total coliform bacteria violations occurred at the test and reference sites, as well as in the effluent (Rules 62-302.530(6) and 62-302.530(7) FAC). The facility also exceeded its permit limit for fecal coliforms. These data suggest that stormwater is contributing to bacterial contamination in Goodbys Creek, but that the problem is greatly exacerbated by the Beauclerc discharge. This position is supported by the 18-fold increase in bacterial populations between the reference and test sites. The somewhat lower bacteria counts in the effluent, compared with the test site, suggest the disinfection of the discharge is variable. Test site nutrient concentrations were higher than those found in 60% to 70% of typical Florida streams. Algal growth potential (AGP) exceeded the 5 mg dry wt/L "problem threshold" at both the reference site (14.3 mg dry wt/L) and at the test site (16.3 mg dry wt/L). The effluent AGP, at 11.3 mg dry wt/L, was actually lower than the receiving water values. This suggests that stormwater inputs are also having significant enrichment effects on the stream.

Introduction

The Beauclerc Wastewater Treatment Plant is located in Duval County (see maps in Appendix). Treatment at this 0.741 MGD privately owned domestic facility consists of extended aeration, tertiary filtration, disinfection, and de-chlorination. An average of 0.5 MGD of treated wastewater is currently discharged into the Class III Goodbys Creek, a tributary of the St. Johns River.

State permit limits are as follows: BOD (8 mg/L as an annual average, 10 mg/L as a monthly average, 12 mg/L as a weekly average, 16 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, 60 mg/L maximum), TKN (2.5 mg/L as an annual average, 3.1 mg/L as a monthly average, 3.8 mg/L as a weekly average, 5 mg/L maximum), total nitrogen (10 mg/L as an annual average, 12.5 mg/L as a monthly average, 15 mg/L as a weekly average, 20 mg/L maximum), total phosphorus (1.5 mg/L as an annual average, 1.9 mg/L as a monthly average, 2.3 mg/L as a weekly average, 3 mg/L maximum), pH (6.0 to 8.5 SU), dissolved oxygen (5.0 mg/L minimum), fecal coliforms (200 organisms/100 mL average, 800 organisms/100 mL maximum), and total residual chlorine (0.01 mg/L maximum at discharge).

During the past year, the facility has had no permit violations or plant disturbances reported. There have been recent reductions in effluent total nitrogen. The above permit limits were established through a Water Quality Based Effluent Limit study.

Major characteristics of invertebrate community structure of reference and test sites.

	Reference Site	Test Site
Macroinvertebrate Qualitative		
Number of Taxa	21	12
Florida Index	4	6
SIIF	25	19
EPT Index	1	1
% Contribution of Dominant Taxon	33.0	48.4
% Oligochaeta	17.8	1.3
% Diptera	3.6	2.6
% Amphipoda	3.6	33.1
% Isopoda	5.4	0
% Gastropoda	20	8.3
% Pelecypoda	33	48.0
% Other	1.6	6.7
% Predators	17.9	6.4
% Above Surface Deposit Feeders	6.7	8.9
% Below Surface Deposit Feeders	16.1	0.6
% Suspension Feeders	33.1	50.3
% Scavengers	2.7	16.6
% Scrapers	17.4	0
% Shredders	2.7	0.6
Macroinvertebrate Hester-Dendy		
Number of Taxa	23	39
Florida Index	8	13
Shannon-Weaver Diversity	2.95	4.59
EPT Index	1	3
% Oligochaeta	0.8	0.4
% Diptera	16.5	51.1
% Coleoptera	0	24.0
% Ephemeroptera	4.1	3.5
% Odonata	0.8	1.3
% Gastropoda	64.5	6.1
% Pelecypoda	2.5	1.3
% Amphipoda	0.8	8.7
% Decapoda	1.3	0
% Other	8.7	3.6
% Predators	12.8	23.6
% Above Surface Deposit Feeders	12.0	31.4
% Below Surface Deposit Feeders	0.8	0
% Suspension Feeders	3.5	23.5
% Scrapers	66.5	10.3
% Shredders	4.5	12.4

Major characteristics of algal community structure of control and test sites.

	Reference Site	Test Site
Periphyton Algae		
Number of Taxa	17	32
Shannon-Weaver Diversity	3.59	4.34
Algal Density (#/sq. cm)	20,446	62,826
Chlorophyll a (mg/sq. m)	4.5	6.0
Diatom/Diatom + B-G Abundance Ratio	0.87	0.71
% Blue-green	12.8	25.0
% Green	0	14.2
% Diatoms	84.6	60.8
% Other	2.6	0
Algal Growth Potential (mg dry wt/l)	14.3	16.3

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 Goodbys Creek approximately 400 yds above the outfall) and a test site (located approximately 100 yds below the 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 site samples. 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 multiple natural substrates (*e.g.*, snags, leaf packs, vegetation) using discrete dip net sweeps. Hester-Dendy multiplate samplers were also employed, however, only two of the three replicates incubated were recovered from the reference site. Periphyton was sampled at both reference and test sites by incubating glass microscope slides in a standard periphytometer for 28 days (Ross 1990). Chlorophyll *a* was also determined for the periphyton communities (Ross 1990). Bacterial populations were analyzed for total and fecal coliforms following the methods of APHA (1989). Algal Growth Potential tests, using *Selenastrum capricornutum* as the test organism, followed Miller *et al.* (1978).

Explanation of Measurements of Community Health

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

Taxa richness: 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.

Ephemeroptera/Plecoptera/Trichoptera Index: This index is the sum of the number of EPT taxa

present. Higher EPT values are associated with healthier systems.

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

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

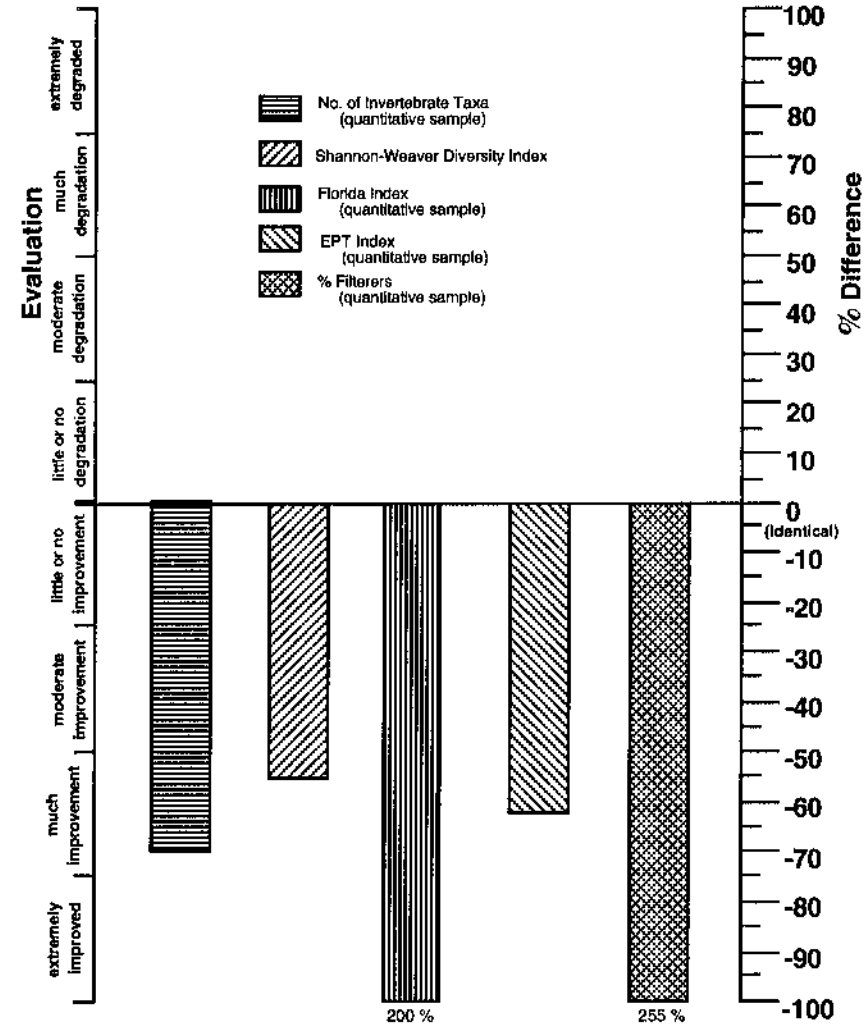
The Stream Invertebrate Index for Florida (SIIF) is a composite macroinvertebrate metric (EA Engineering 1994). The SIIF assigns points to a variety of parameters, depending on how closely each parameter approaches an expected reference condition (see SIIF calculation table in Appendix).

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, the diatom to blue-green algae ratio, and the % filter-feeders are measured as the reference site minus test site divided by the reference site. The percent differences between sites involving algal density, chlorophyll *a*, and algal growth potential are measured as the test site minus reference site divided by the reference site.

The following personnel were involved in this investigation: Tim McKelvey and Amy Kalmbacher (DEP Northeast District) and Lyn Burton, Marshall Faircloth, Russel Frydenborg, Christy LeDuc, Kathleen Lurding, Elizabeth Miller, Urania Quintana, Landon Ross, Bart Richard, Vicki Whiting, and Greg Wynn (Tallahassee Biology Laboratory). The report was reviewed by the Point Source Bioassessment Review Committee, consisting of Jan Mandrup-Poulsen, Wayne Magley, and Mike Tanski, as well as District representatives.

Results and Discussion

Habitat quality was somewhat better at the test site (with 117 points) than it was at the reference site, which scored 99 points. Both



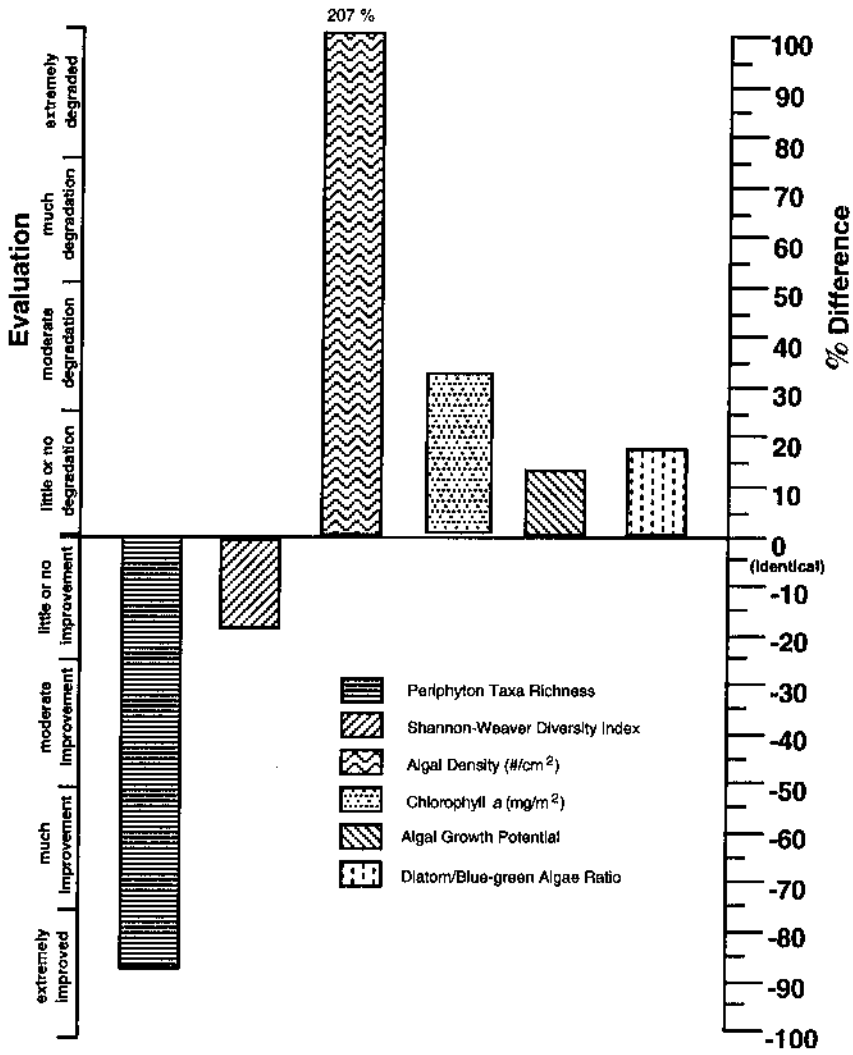
Effect of discharge on the benthic macroinvertebrate community.

sites had adequate in-stream substrates, similar width (2 to 3 meters), and optimal water velocity (0.3 m/sec). Dissolved oxygen was marginal at both stations (5.4 mg/L at the reference site and 5.2 at the test site), but was in compliance with Class III water quality standards. Water at both sites was neutral (pH = 7.1 SU at the reference site and 7.2 SU at the test site). Conductivity was lower at the reference site (237 µmhos/cm) than at the test site (274 µmhos/cm).

The effluent sample was not acutely toxic to the water flea, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi*. No mortality occurred during the two 48 hour bioassays (Appendix).

No organic pollutants were detected in the effluent. Of the metals analyzed for, only aluminum (220 µg/L), iron (281 µg/L), silver (0.29 µg/L), and zinc (33 µg/L) were found in the effluent at concentrations above minimum quantification limits. The effluent silver level exceeded Class III water quality standards (Rule 17-302. 530(60) FAC).

Effect of discharge on the algal community.



Specific conductance of the effluent was 1576 µmhos/cm. This value violates the Class III water quality standard of 1275 µmhos/cm (Rule 62-302.530(23) FAC).

Measured with the MPN (most probable number) method, Class III water quality standards for fecal and total coliform bacteria were violated in the effluent and at both study sites. Results of both the fecal and total coliform analyses were identical in samples from each station: 3,000 organisms/100 mL in the effluent, 9,000 organisms/100 mL at the reference site, and greater than 160,000 organisms/100 mL at the test site (Rules 62-302.530(6) and 62-302.530(7) FAC). The facility also exceeded its permit limit for fecal coliforms. These data suggest that stormwater is contributing to bacterial contamination in Goodbys Creek, but that the problem is greatly exacerbated by the Beauclerc discharge. This is supported by the 18-fold increase in bacterial populations between the reference and test site. The somewhat lower bacteria counts in the effluent, compared with the test site, suggests that the disinfection of the discharge is variable.

Effluent concentrations of ortho-phosphate (1.9 mg/L), total phosphorus (2.1 mg/L), ammonia (0.38 mg/L), and nitrate-nitrite (1.6 mg/L) were relatively high. The discharge appeared to be responsible for slightly elevated nutrients at the test site compared to the reference site. Test site concentrations of these parameters (*e.g.*, ammonia of 0.06 mg/L, ortho-phosphate of 0.14 mg/L, and nitrate-nitrite of 0.19 mg/L) were slightly higher than those found at the upstream site, as well as exceeding those found in 60% to 70% of representative Florida streams (see Table of Typical Water Quality Values in Appendix).

Algal growth potential (AGP) exceeded the 5 mg dry wt/L "prob-

lem threshold" at both the reference site (14.3 mg dry wt/L) and at the test site (16.3 mg dry wt/L) (Raschke and Schultz 1987). The effluent AGP, 11.3 mg dry wt/L, was actually lower than the receiving water values. This suggests that stormwater inputs are also having significant enrichment effects on the stream.

Measures of macroinvertebrate health indicated that the discharge was not affecting the community to any great degree. The Figure on p. 3 indicates the degree of difference between the invertebrate populations of the reference and test sites. Larger differences (that is, higher percentages) correspond with greater degrees of degradation. Negative values mean that the test site is better than the control.

In the Hester-Dendy samples, macroinvertebrate taxa richness (23 taxa at the reference site, 39 at the test site), the Florida Index (8 at the reference, 13 at the test site), and EPT index (1 at the reference, 3 at the test site) were somewhat improved downstream of the discharge. Shannon-Weaver diversity increased from 3.0 at the reference site to 4.6 at the test site. The lower values measured at the reference site may be due to the loss of one of the three artificial substrates, or may be a sign of enhancement due to the discharge. Suspension feeders increased from 3.5% of the population at the reference site, to 23.5% at the test site (also indicating improvement). Measures of community health calculated from the dip net samples were mostly analogous. The Stream Invertebrate Index for Florida score was 25 at the reference site and 19 at the test site, placing both stations in the moderately impaired category.

The Figure on p. 4 represents changes in the periphyton algal community. As was noted with the macroinvertebrates, larger differences (that is, higher percentages) correspond with greater degrees of degradation. With the exception of algal density, the facility appeared to have no negative effects on the test site periphyton. Periphyton taxa richness, diversity, and the diatom to blue-green ratio were either improved or unchanged between sites. Algal density increased by 207% between the reference and test site. Periphyton chlorophyll *a*, however, was relatively low (below 6 mg/m^2) at both stations, indicating no biomass problems near the discharge. Both sites were dominated by diatoms, while cyanophytes were the second most numerous group. In summary, these data suggest that the facility is not exerting negative effects on the immediate receiving water periphyton community, probably due to the fairly high water velocity in Goodbys Creek. However, AGP data suggest that enrichment effects may appear where water velocity decreases, farther downstream in the St. Johns River.

Conclusions

The effluent sample was not acutely toxic to the water flea, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi*. No organic pollutants were detected in either effluent. The effluent silver level (0.29 µg/L) exceeded Class III water quality standards (Rule 62-302. 530(60) FAC).

Specific conductance of the effluent was 1576 µmhos/cm. This value violates the Class III water quality standard of 1275 µmhos/cm (Rule 62-302.530(23) FAC).

Fecal and total coliform bacteria violations occurred at the test and reference sites, as well as in the effluent (Rules 62-302.530(6) and 62-302.530(7) FAC). The facility also exceeded its permit limit for fecal coliforms. These data suggest that stormwater is contributing to bacterial contamination in Goodbys Creek, but that the problem is greatly exacerbated by the Beauclerc discharge. This is supported by the 18-fold increase in bacterial populations between the reference and test sites. The somewhat lower bacteria counts in the effluent, compared with the test site, suggests that the disinfection of the discharge is variable.

The discharge appeared to be responsible for elevated nutrients at the test site compared to the reference site. Test site nutrient concentrations were higher than those found in 60% to 70% of typical Florida streams.

Algal growth potential (AGP) exceeded the 5 mg dry wt/L "problem threshold" at both the reference site (14.3 mg dry wt/L) and at the test site (16.3 mg dry wt/L). The effluent AGP, at 11.2 mg dry wt/L, was actually lower than the receiving water values. This suggests that stormwater inputs are also having significant enrichment effects on the stream.

Measures of macroinvertebrate health indicated that the discharge was not negatively affecting the

community. Macroinvertebrate taxa richness, the Florida Index, Shannon-Weaver diversity, and the EPT Index were all improved downstream of the discharge. The Stream Invertebrate Index for Florida score was 25 at the reference site and 19 at the test site, placing both stations in the moderately impaired category.

The algal data indicate the facility was not exerting negative effects on the immediate receiving water periphyton community, probably due to the fairly high water velocity in Goodbys Creek. However, AGP data suggest that enrichment effects may appear where water velocity decreases, farther downstream in the St. Johns River.

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Chemistry summary table for

Beauclerc Utilities	Effluent	Reference Site	Test Site
Organic Constituents (ug/L)			
None detected			
Metals (ug/L)			
Aluminum	220		
Arsenic	10 U		
Cadmium	0.1 U		
Copper	9 I		
Chromium	10 U		
Iron	281		
Lead	10 U		
Mercury	0.10 U		
Nickel	4 U		
Selenium	30 U		
Silver	0.29		
Zinc	33		
Nutrients (mg/L)			
Ortho-phosphate	1.9	0.060	0.13 A
Total phosphorus	2.1	0.096	0.14
Ammonia	0.38 A	0.031 I	0.059
Nitrate+Nitrite	1.6	0.17 A	0. 19
TKN	1.5	0.59	0.46
General Phys-Chem Parameters			
Habitat Assessment		99	117
D.O. (mg/L)	8.1	5.4	5.2
pH (SU)	7.3	7.1	7.2
Conductivity(µmhos/cm)	1576	237	274
Temperature (°C)	29.0	26.3	26.2
Hardness (mg CaCO3)	461.3		
Total Suspended Solids (mg/L)	10	3	4
Biological Oxygen Demand, 5 day (mg/L)	< 2	< 2	< 2
Algal Growth Potential (mg dry wt/L)	11.3	14.3	16.3
Toxicity			
Bioassay Fish	not toxic		
Bioassay Invertebrate	not toxic		
MIcrobiological Communities (org/100 mL)			
Fecal coliform	3,000	9,000	160,000
Total coliform	3,000	9,000	160,000

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

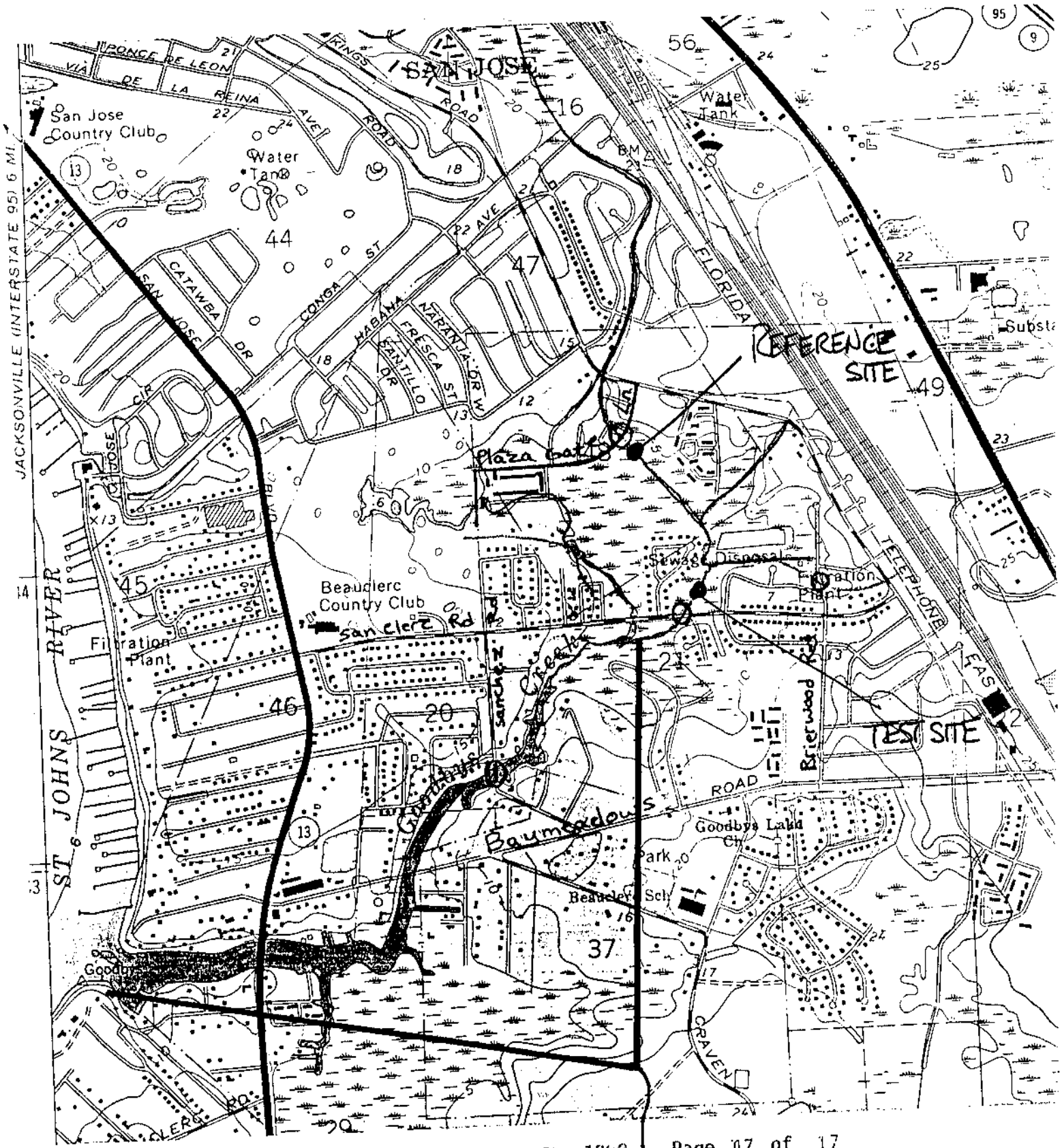
Typical Values for Selected Parameters in Florida Waters

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

Percentile Distribution

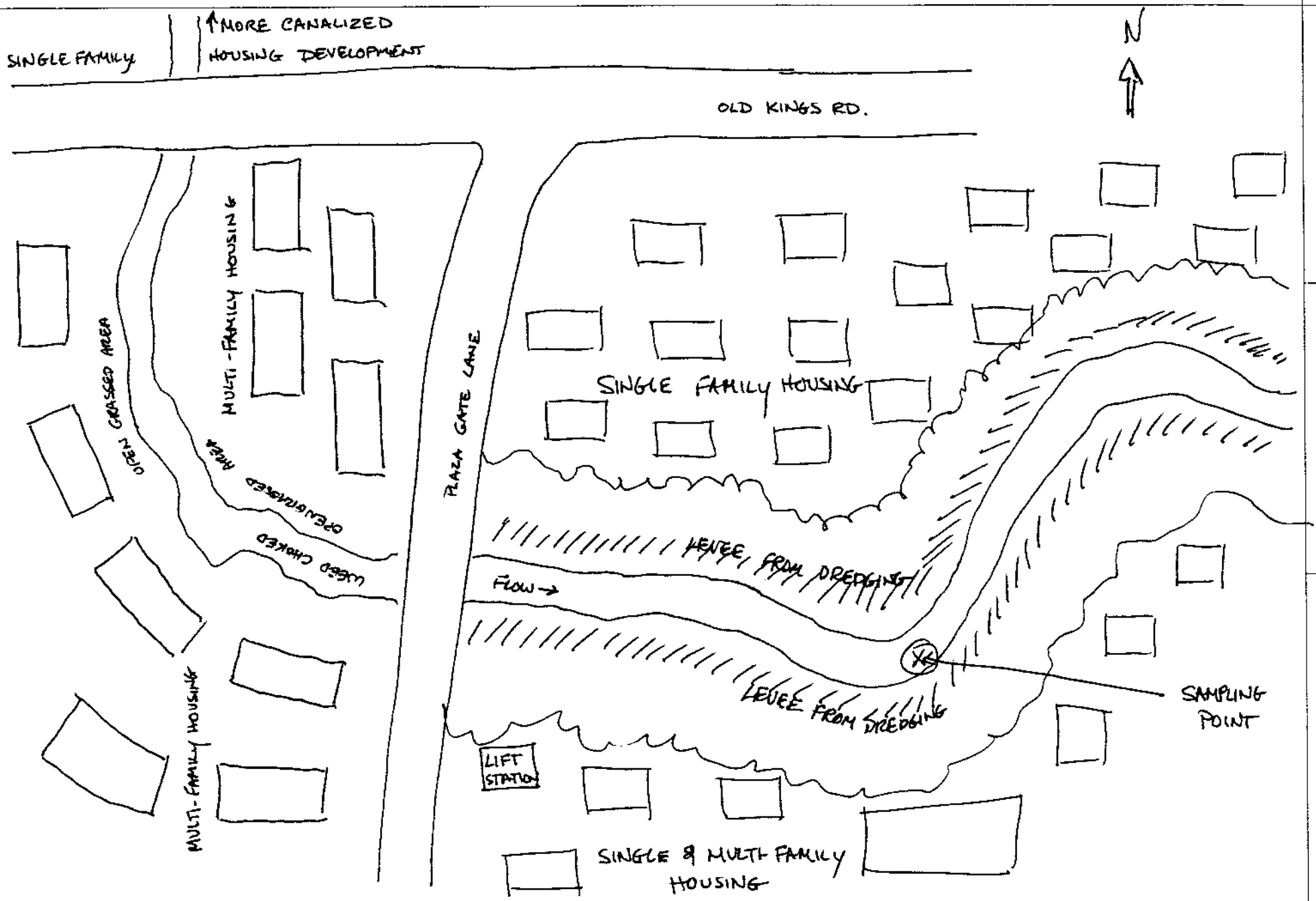
Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%
STREAMS (1617 stations)											
Phytoplankton Chlorophyll *a*	0.22	0.52	0.94	1.60	3.02	4.63	6.72	9.87	14.68	27.35	48.70
Periphyton Chlorophyll *a*	0.31	0.43	0.77	1.04	2.16	2.94	6.45	10.51	17.00	39.51	60.85
H-D Diversity	0.84	2.12	2.48	2.74	2.88	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

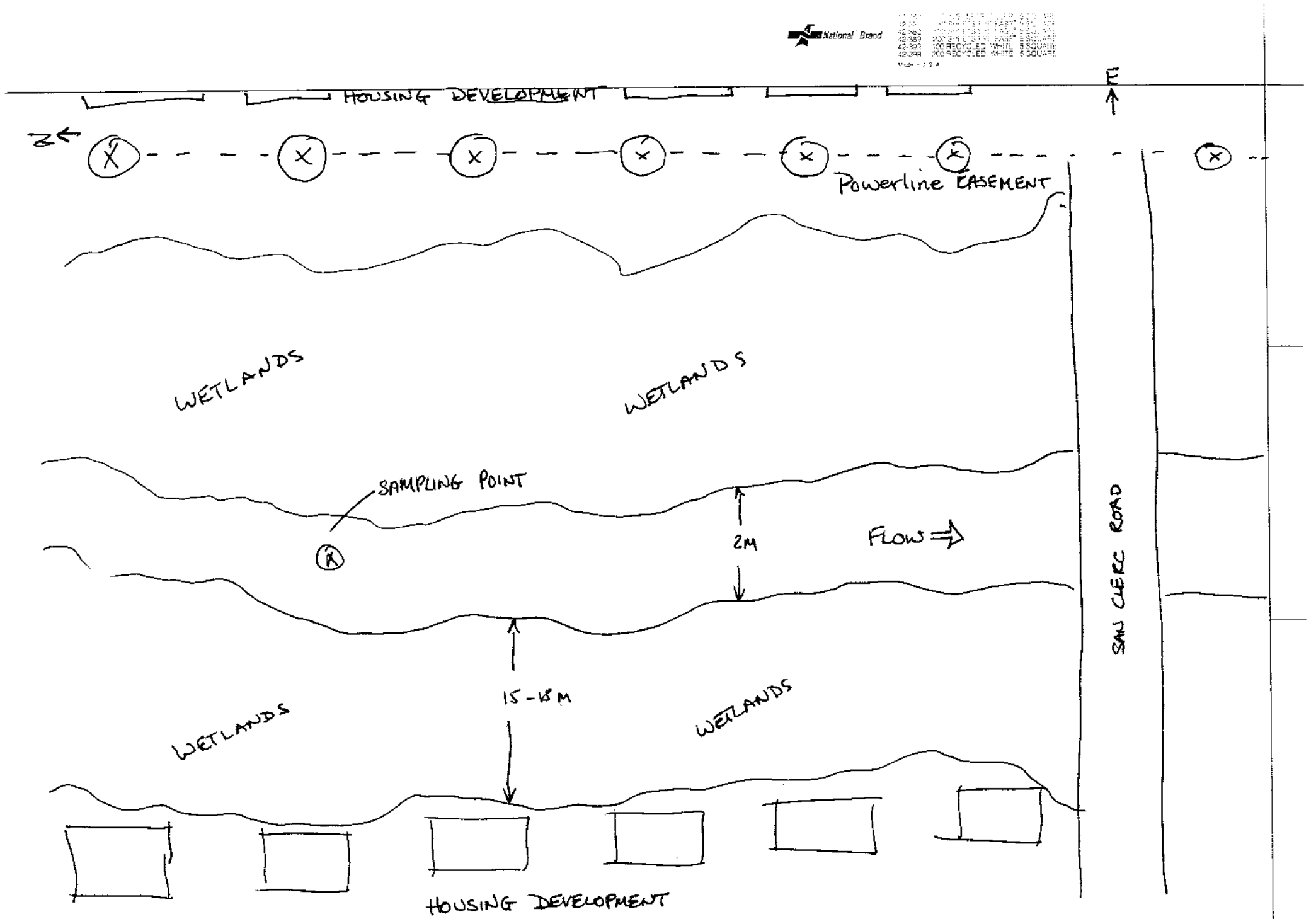


DER Form 17-1.201(5) Effective November 30, 1982

= tidally influenced



BEAUCLERC UTILITIES FYI 5 7-17-95 UPSTREAM REFERENCE SITE, ABOVE P.O.D. STORET # 20030537



BENICLERC UTILITIES FILE 7-17-97 GOODBYS CREEK DOWNSTREAM TEST SITE, BELOW P.O.D. STORET # 20030538

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Facility Name: BEAUCLERC UTILITIES		Prepared by: Jon Dinges Date: 6/23/95
Location (attach detailed map):	County Duval	District NED
Federal Permit # FL0023370 and expiration date: 3/31/96	State GMS # and 3116P00074 State expiration date: 3/10/97	Facility Type: Industrial Municipal Federal Agricultural Other (list): Private Domestic

Function of facility: Treatment of Domestic Wastewater

Description of treatment process: Influent is split between a 0.342 MGD, a 0.30 MGD, and a 0.099 MGD extended aeration WWTF. Effluent is pumped to a common tertiary filter.

Receiving waters: Goodbys Creek to St. Johns River	Classification: III
Design Flow: 0.741 MGD	Actual Mean Flow: 0.5 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.): None

List effluent limits: From State Permit

Parameter	Limit (units) mg/L			
CBOD5	8	10	12	16
TSS	20	30	45	60
TKN	2.5	3.1	3.8	5.0
TN	10	12.5	15	20
TP	1.5	1.9	2.3	3.0
	Annual Average	Monthly Avg.	Weekly Avg	One sample max
pH	6.0 - 8.5			
Fecal Coliform	200 Annual (col./100ml) 800 one sample max			
D.O.	5.0 mg/L minimum			
Chlorine Residual	0.01 max in discharge			

Describe special permit conditions and permit modifications:

1. Final limits found at left are currently in effect.

2. Polishing ponds on site may be put back into use but are currently not used.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: 8D3I / SUBMITTING AGENCY NAME: FDEP - NED JAX	STORET STATION NUMBER: 20030537	DATE (M/D/Y): 7-17-95	TIME: P.M.	RECEIVING BODY OF WATER: GOODBYS CREEK

REMARKS: FLI 5 (Goodbys Creek @ Plaza Gate Rd)	LOCATION: UPPER GOODBYS CREEK ABOVE BEAUCLERC UTILITIES P.O.D.	FIELD ID/NAME: ABOVE P.O.D UPSTREAM REFFRENCE 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)
				10%			

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

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

Width of riparian vegetation (m) on least buffered side: 6-8m

List & map dominant vegetation on back ☑

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

Artificially Impounded ☑ yes (levees)

High Water Mark (m above bed): 2m

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

width - 3m
depth - .5 - 1.0 m
velocity: 1.0 ft/sec.

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)	20	5	dipnet	Riffles			
Leaf Packs or Mats	10	5	dipnet	Sand	40	0	
Aquatic Vegetation	10	5	dipnet	Mud/Muck/Silt			
Rock or Shell Rubble				Other:			
Undercut Banks/Roots	20	5	dipnet	*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):	Salinity		Secchi (m):
Top	0							.5
Mid-depth	1.5 ft.	26.30	7.14	5.41	237	.11		
Bottom	3 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: ☑ muddy brown

Weather Conditions/Notes:

HOT 80°F, Humid, Overcast, Rainy
Water level up due to recent rainfall

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Tim McKelvey / Ruth Berman / Pat O'Connor	Tim McKelvey	7/11/95

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

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FDEP - NED JAX	STORET STATION NUMBER: 20030537	DATE (M/D/Y): 7-17-95	RECEIVING BODY OF WATER: GOODBYS CREEK

REMARKS: FYI5 (Goodbys Creek @ Plaza Cater Rd)	LOCATION: UPPER GOODBYS CREEK ABOVE BEAUCLERC UTILITIES P.O.D.	FIELD ID/NAME: ABOVE P.O.D. UPSTREAM REFERENCE SITE

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

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

99 TOTAL SCORE

Comments: This area received heavy rainfall for two days before FYI5.

ANALYSIS DATE:	ANALYST:	SIGNATURE:
7-17-95	Tim McKelvey	Tim McKelvey

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FDEP-NEP JAX	STORET STATION NUMBER: 20030538	DATE (M/D/Y): 7-17-95	TIME: P.M.	RECEIVING BODY OF WATER: GOODBYS CREEK

REMARKS: FYI-5 (Goodbys Creek @ San Clore Rd)	LOCATION: UPPER GOODBYS CREEK BELOW BEAULERIE UTILITIES P.O.D.	FIELD ID/NAME: BELOW P.O.D. DOWNSTREAM 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)
				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: 15-18m

List & map dominant vegetation on back

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

Artificially Impounded ☐ yes

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

width 2m
depth: .5-1.0m
velocity: 1.5 ft/sec

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)	50	5	dipnet	Riffles			
Leaf Packs or Mats	10	5	dipnet	Sand	10	~~0~~	
Aquatic Vegetation				Mud/Muck/Silt			
Rock or Shell Rubble	10	5	dipnet	Other:			
Undercut Banks/Roots	20	5	dipnet	*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (~~ft~~ m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):	Salinity		Secchi (m):
Top	0							.5
Mid-depth	1.5	26.24	7.17	5.18	274	0.13		
Bottom	3'							

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): ~~Slightly~~ Tannic: ☑ Green (algae): ☐ Clear: ☐ Other: ☐

Weather Conditions/Notes:
Hot - 80°F, Humid, ~~Sunny~~ Overcast
Water level up due to recent rainfall.

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

SAMPLING TEAM: Tim McKelvey / Ruth Bowman & Pat O'Connor

SIGNATURE: Tim McKelvey

DATE: 7/17/95

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

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FDEP-NED JAX	STORET STATION NUMBER: 20030538	DATE (M/D/Y): 7-17-95	RECEIVING BODY OF WATER: GOODBYS CREEK

REMARKS: FYI (GOODBYS CREEK @ SAN CLERC RD)	LOCATION: UPPER GOODBYS CREEK BELOW BEAUCLERC UTILITIES P.O.D.	FIELD ID/NAME: BELOW P.O.D. DOWNSTREAM TEST SITE

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

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

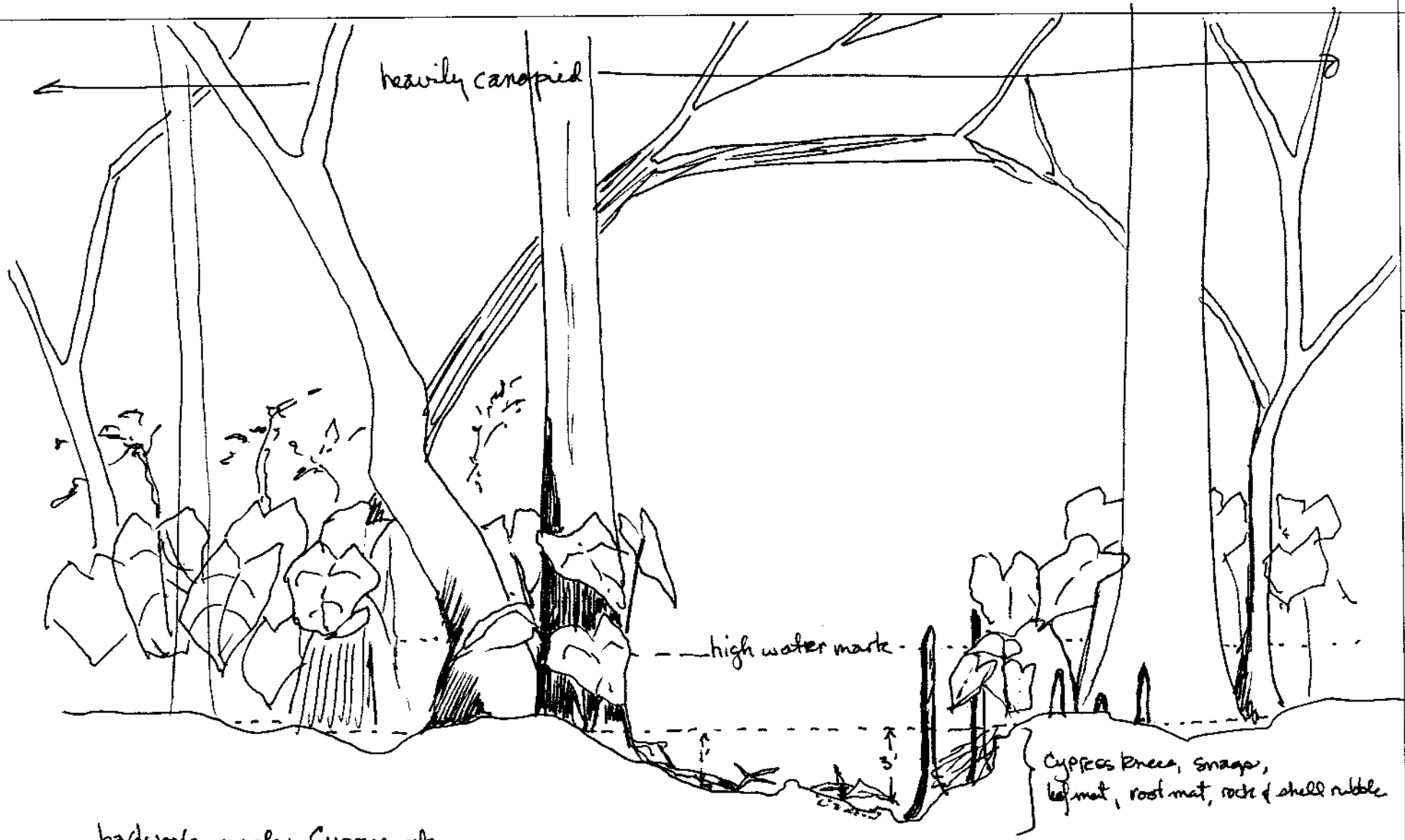
TOTAL SCORE 110

Comments: HOT - 90°F, ~~sunny~~ Cloudy, RECENT RAIN HAS BROUGHT UP WATERLEVEL SINCE Preliminary.

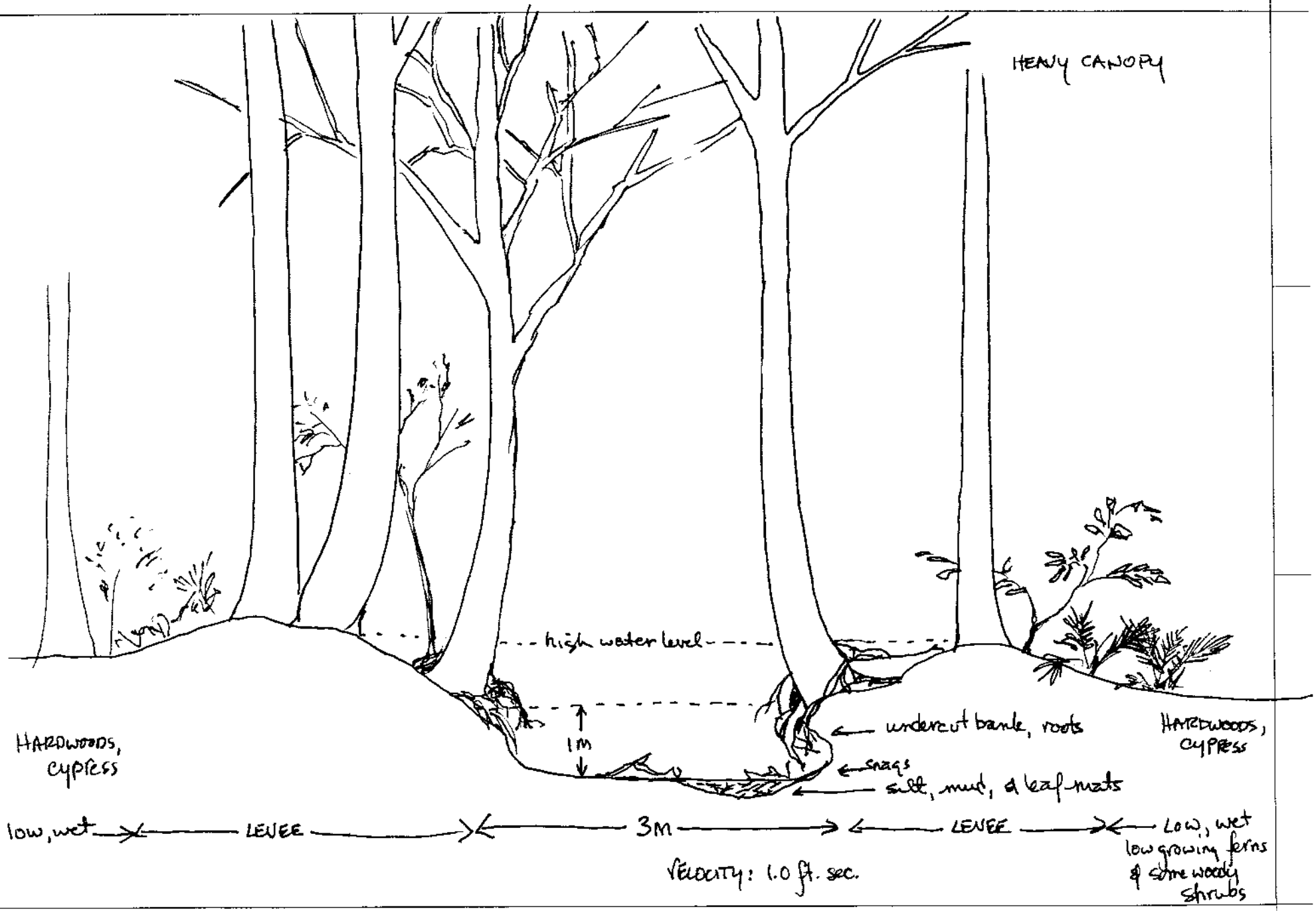
ANALYSIS DATE:	ANALYST:	SIGNATURE:
7-17-95	TIM McKELVEY	Tim McKelvey

heavy rainfall for 2 days prior to Fyck

National Brand
42-381 500 SHEETS RULED 8 1/2 x 11
42-382 500 SHEETS RULED LEGAL
42-389 500 SHEETS RULED LEGAL
42-382 100 RECYCLED WHITE 5 SQUARE
42-399 200 RECYCLED WHITE 5 SQUARE
Made in U.S.A.



BEAUCLERC UTILITIES, FYIS 7-17-95 GOODBYS CREEK DOWNSTREAM TEST SITE. BELOW P.O.D. STORET #20030538



BEAUCLERC UTILITIES FYIS 7-17-95 UPSTREAM REFERENCE SITE, ABOVE P.O.D. STORET # 20030537

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Beaucleres Utilities
County: Duval
Contact / District: Tim McKelvey / NE
NPDES Permit #: FL00
LIMS Sample #: 11109 **LIMS Job #:** 95-JUL-18-43

Sample Collection: Date 7-17-95 Time 0910
Test Beginning: Date 7-18-95 Time 1545
Test Ending: Date 7-20-95 Time 1530
Organism Batch #: 28 **Diluent Batch #:** well
Organism Age: 12 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	23.4 @ 23.6	8.1 @ 25.6 °C	103.8 @ 102.1 1394 @ 1400 @ 24.6 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	25.3 @ 25.3	8.3 @ 23.6 °C	101.6 @ 102.1 1388 @ 1400 @ 23.9 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	24.2 @ 24.3	8.4 @ 23.8 °C	1027 @ 1021 57.0@58.7 1400 @ 1400.8 @ 24.5 °C

		Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) Cond. ~~(µmhos/cm)~~		
Conc.	Chamber #	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Control	A 11	5	5	5	8.0	8.4	8.3	24.1	22.6	23.7	8.4	8.1	8.2	245	245	255
Control	B 601	5	5	5	8.0	8.4	8.3	24.0		23.7	8.3	8.1	8.3	245	245	250
Control	C 88	5	5	5	8.0	8.4	8.3	24.0		23.6	8.2	8.2	8.3	245	240	245
Control	D 414	5	5	5	8.0	8.3	8.3	24.0		23.6	8.3	8.3	8.3	245	240	250
100%	A 366	5	5	5	7.5	8.1	~~8.2~~	24.3	22.5	23.7	8.4	8.2	8.3	1595	1540	1600
100%	B 618	5	5	5	7.5	8.1	~~8.2~~	24.3		23.7	8.2	8.2	8.3	1600	1545	1600
100%	C 30	5	5	5	7.5	8.1	~~8.2~~	24.3		23.7	8.2	8.2	8.3	1600	1550	1600
100%	D 630	5	5	5	7.5	8.1	~~8.2~~	24.3		23.7	8.1	8.2	8.3	1600	1555	1610
					* JN 7/21 numerals data in wrong place		8.2									
							8.2									
							8.2									
							8.2									
Recorded by:		TM	MF	MP	LM	MF	JN	LM	MF	JN	LM	MF	JN	LM	MF	JN
Measured/Loaded by:		TM	MF	MP	JLS	JLS	JLS	JLS	JLS	JLS	JLS	JLS	JLS	JLS	JLS	JLS

Investigators' Signatures

Tina McKelvey
Marshall Faircloth
Tobin C. Rader
Tim Morris
Jennifer Savarese
Joseph Smith
Reviewer

Salt Water
Well Water

Water Quality Parameters	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 $CaCO_3$) :	12.5	135	Hach	TR
Hardness (mg/L as $CaCO_3$) :	120	435	Hach	TR
Total ammonia (mg/L as N) :	<0.017	0.254	Orion	JN

Ammonia Meter #98136 Ammonia Meter Slope: -57.4 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: <1 ppt

form updated 10/05/94

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Beaudere Utilities
County: Duval
Contact / District: Tim McKelvey / NE
NPDES Permit #: FL00
LIMS Sample #: 111109 (sample log 7/26/95) **LIMS Job #:** 95-JUL-18-43

Sample Collection: Date 7-17-95 Time 0910
Test Beginning: Date 7-18-95 Time 1530
Test Ending: Date 7-20-95 Time 1530
Organism Batch #: 35 **Diluent Batch #:** 29
Organism Age: < 24hrs
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	23.4 @ 23.6	8.1 @ 25.6 °C	1038 @ 1021 1394 @ 1400 @ 24.6 °C
24 hr	___ @ 7.0 ___ @ ___	___ @ ___	___ @ ___ °C	___ @ ___ ___ @ ___ @ ___ °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	24.2 @ 24.3	8.4 @ 23.8 °C	1027 @ 1021 1400 @ 14008 @ 24.5 °C

57.0 @ 58.7 µmhos/cm

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. (µmhos/cm) 0 hr	UNCORRECTED Cond. (µmhos/cm) 24 h	UNCORRECTED Cond. (µmhos/cm) 48 h
Control	A	5	5	5	8.2		8.3	23.9		24.1	8.1		8.2	185		205
Control	B	5	5	5			8.3			24.2			8.2			210
Control	C	5	5	5			8.3			24.2			8.2			215
Control	D	5	5	5			8.3			24.1			8.2			215
100%	A	5	5	5	7.6		8.5	24.3		24.2	7.6		8.3	1500		1715
100%	B	5	5	5			8.5			24.2			8.3			1815
100%	C	5	5	5			8.5			24.2			8.3			1810
100%	D	5	5	5			8.5			24.1			8.3			1820
Recorded by:		TM	MF	MF	LM		JN	LM		JN	LM		JN	LM		JN
Measured/Loaded by:		TM	MF	MF	JLS		JLS	JLS		JLS	JLS		JLS	JLS		JLS

Investigators' Signatures
Tina McKelvey
Marshall Faircloth
Robin G. Foder
Jennifer Sparapani
Joyce Smith
Reviewer

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	135	Hach	TR
Hardness (mg/L as $CaCO_3$):	80	435	Hach	TR
Total ammonia (mg/L as N):	<0.017	0.254	Orion	JN

Ammonia Meter #98136 Ammonia Meter Slope: -57.4 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: <1 ppt

form updated 10/05/94

Ref

Calculation and Interpretation of the Stream Invertebrate Index for Florida (SIIF) (Draft Version 1994)								
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	**Panhandle (65, 75a)**				**Peninsula (75b, c, d)**			
	5	3	1	Score	5	3	1	Score
Number of Taxa	≥ 31	16–30	0–15		≥ 27	14–26	0–13	3
EPT Index	≥ 7	4–6	0–3			≥ 4	0–3	1
% Contribution of Dominant Taxon		≤ 20	> 20			≤ 37	> 37	3
Florida Index	≥ 18	9–17	0–8		≥ 7	4–6	0–3	3
% Diptera		≤ 38	> 38			≤ 32	> 32	3
% Suspension feeders/ Collector-Filterers	≥ 12	7–11	0–6		≥ 8	4–7	0–3	5
% Shredders		≥ 10	0–9			≥ 13	0–12	1
% Crustacean/Mollusks (Peninsula only)	–	–	–			≥ 16	0–15	3
# Crustacean/Mollusks (Peninsula only)	–	–	–			≥ 4	0–3	3
Total Score	**Panhandle**				**Peninsula**			25
Interpretation of Score	**No Impairment**			**29-23**	**No Impairment**			**33-27**
	Moderate Impairment			**22-15**	**Moderate Impairment**			**26-17**
	Severe Degradation			**14-7**	**Severe Degradation**			**16-9**

Test

Calculation and Interpretation of the Stream Invertebrate Index for Florida (SIIF) (Draft Version 1994)								
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	**Panhandle (65, 75a)**				**Peninsula (75b, c, d)**			
	5	3	1	Score	5	3	1	Score
Number of Taxa	≥ 31	16–30	0–15		≥ 27	14–26	0–13	1
EPT Index	≥ 7	4–6	0–3			≥ 4	0–3	1
% Contribution of Dominant Taxon		≤ 20	> 20			≤ 37	> 37	1
Florida Index	≥ 18	9–17	0–8		≥ 7	4–6	0–3	3
% Diptera		≤ 38	> 38			≤ 32	> 32	3
% Suspension feeders/ Collector-Filterers	≥ 12	7–11	0–6		≥ 8	4–7	0–3	5
% Shredders		≥ 10	0–9			≥ 13	0–12	1
% Crustacean/Mollusks (Peninsula only)	–	–	–			≥ 16	0–15	3
# Crustacean/Mollusks (Peninsula only)	–	–	–			≥ 4	0–3	1
Total Score	**Panhandle**				**Peninsula**			19
Interpretation of Score	**No Impairment**			**29-23**	**No Impairment**			**33-27**
	Moderate Impairment			**22-15**	**Moderate Impairment**			**26-17**
	Severe Degradation			**14-7**	**Severe Degradation**			**16-9**

Benthic macroinvertebrate taxa list for Beauclerc Utilities, collected via 20 discrete dip net sweeps in Goodbys Creek, on 17 July, 1995.

	Reference site	Test site
Oligochaeta		
Bratislavia unidentata	14	–
Dero trifida	42	–
Eclipidrilus sp.	114	25
Limnodrilus hoffmeisteri	42	–
Undetermined Enchytraeidae	42	–
Hirudinea		
Helobdella sp.	14	–
Mooreobdella sp.	–	25
Mooreobdella tetragon	14	–
Gastropoda		
Gyraulus sp.	57	–
Physella sp.	14	–
Planorbella duryi	14	–
Undetermined Ancylidae	171	–
Undetermined Hydrobiidae	42	325
Undetermined Lymnaeidae	14	–
Pelecypoda		
Undetermined Pisidiidae	528	1900
Isopoda		
Lirceus sp.	85	–
Decapoda		
Gammarus sp.	–	1300
Amphipoda		
Hyalella azteca	57	–
Ephemeroptera		
Undetermined Baetidae	14	–
Odonata		
Argia sp.	100	175
Argia fumipennis	14	–
Enallagma sp.	142	25
Undetermined Corduliidae	–	25
Trichoptera		
Cheumatopsyche sp.	–	25
Diptera		
Ablabesmyia mallochi	14	–
Polypedilum illinoense grp.	28	50
Rheotanytarsus distinctissimus grp.	–	25
Rheotanytarsus exiguus grp.	–	25
Undetermined Chironomidae	14	–

Macroinvertebrate taxa list for Beauclerc Utilities, collected via Hester Dendy artificial substrates in Goodby's Creek on 17 July , 1995.

	Reference Site	Test site
Platyhelminthes		
Dugesia sp.	8	3
Nemertea		
Prostoma rubrum	-	34
Oligochaeta		
Dero pectinata	4	-
Hirudinea		
Desserobdella phalera	-	3
Gastropoda		
Ferrissia hendersoni	-	11
Gyraulus parvus	20	-
Hebetancylus excentricus	242	8
Micromenetus sp.	24	-
Micromenetus dilatatus	20	-
Physella sp.	4	-
Planorbella trivolvis intertexta	-	8
Undetermined Ancylidae	-	5
Undetermined Hydrobiidae	-	5
Pelecipoda		
Corbicula fluminea	12	-
Undetermined Pisidiidae	-	8
Amphipodas		
Gammarus sp.	-	53
Hyalella azteca	4	-
Decapoda		
Procambarus sp.	4	-
Ephemeroptera		
Caenis sp.	20	21
Odonata		
Argia sp	8	5
Argia sedula	4	-
Argia tibialis	16	42
Enallagma sp.	4	8
Enallagma signatum	4	-
Libellula sp.	4	-
Undetermined Corduliidae	-	8
Coleoptera		
Ancyronyx variegata	-	50
Microcylloepus sp	-	5
Trichoptera		
Cheumatopsyche sp.	-	16
Oxyethira sp.	-	3
Diptera		
Ablabesmyia (Karelia) grp.	-	3

Ablabesmyia mallochi	4	-
Ablabesmyia rhamphe grp.	-	13
Asheum beckae	4	16
Cryptochironomus sp.	-	5
Dicrotendipes modestus	-	3
Dicrotendipes neomodestus	-	3
Dicrotendipes simpsoni	4	16
Hemerodromia sp.	4	5
Kiefferulus sp	-	3
Labrundinia sp.	-	3
Nanocladius sp.	-	3
Nanocladius distinctus	-	3
Paratanytarsus sp.	-	3
Paratanytarsus sp. A Epler	-	3
Paratanytarsus sp. B Epler	-	3
Polypedilum halterale grp.	4	8
Polypedilum illinoense grp.	4	71
Polypedilum scalaenum grp.	-	8
Rheocricotopus robacki	-	42
Rheotanytarsus distinctissimus grp.	8	13
Rheotanytarsus exiguus grp.	-	19
Stenochironomus sp.	28	21
Tanytarsus sp. L Epler	-	5
Tribelos sp.	4	-
Tribelos fuscicornis	4	3
Xestochironomus sp.	4	-
Undetermined Chironomidae	16	48

Periphyton taxa list and densities (#/cm^2) for Beauclerc Utilities, collected via glass microscope slides in Goodby's Creek on 17 July, 1995.

	Reference site	Test site
Cyanophyta		
Anabaena sp.	524	1047
Aphanocapsa sp.	524	-
Gomphosphaeria sp.	-	524
Microcystis sp.	-	524
Oscillatoria sp.	524	1047
Plectonema sp.	1049	11518
Rhabdoderma sp	-	1047
Diatoms		
Achnanthes exigua	-	524
Achnanthes lanceolata dubia	2621	1571
Achnanthes linearis	-	5235
Bacillaria paradoxa	-	2618
Capartogramma crucicula	-	524
Cocconeis placentula	1049	1047
Cyclotella meneghiniana	2097	3141
Gomphonema parvulum	1049	1047
Mastogloia smithii	524	-
Melosira granulata	524	-
Navicula arvensis	-	524
Navicula decussis	524	524
Navicula minima	524	2094
Navicula placentula	524	524
Navicula radiosa	524	2094
Navicula viridula	-	2094
Nitzschia amphibia	-	3665
Nitzschia linearis	1573	3141
Nitzschia palea	-	6283
Synedra ulna	3146	1571
Pennales	2621	-
Chlorophyta		
Characium sp.	-	524
Chlamydomonas sp.	-	524
Chlorococcum sp.	-	1047
Gloeocystis sp.	-	524
Oocystis sp.	-	4188
Scenedesmus sp.	-	1047
Stigeoclonium sp.	-	524
Tetraedron sp.	-	524
Dinophyceae		
Peridinium sp	524	-

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	2	3	11	12	17	18	19	20
N	5	FL0023370		950717		X	S	2

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	2	3	11	12	17	18	19	20
N	5	FL0023370		950717		B	S	2

Remarks

21 66