

Biological Assessment of

Packaging Corporation of America

Hamilton County

NPDES #FL0000281

Sampled April 1995

August 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: Packaging Corporation of America
County: Hamilton
NPDES Number: FL0000281
State Permit Expiration Date: 3 April 1997

Toxics Sampling Inspection (XSI)

Date Sampled: 17 April 1995

Results: The effluent sample contained 43 µg/L of unidentified long-chain aliphatics and 300 µg/L of what was tentatively identified as motor oil. No metals were detected in the effluent above Class III water quality standards.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 17 April 1995

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

Impact Bioassessment Inspection (IBI)

Date Sampled: 17 April 1995

Results: The present macroinvertebrate data indicate that while Jumping Gully Creek is remarkably improved compared with past studies, some examples of stress are still present in the system. The major indicators of invertebrate community health were quite similar between the creek reference site (Bellville Creek) and the creek test site (Jumping Gully Creek). The creek reference and test sites scored an identical 23 points on the Stream Invertebrate Index for Florida, placing them both in the "no impairment" category. The only indicator of adverse effects from the discharge involved the extreme rarity of plecopterans and ephemeropterans at Jumping Gully Creek. Both river sites were basically healthy, containing many pollution sensitive taxa and good Shannon-Weaver diversities. On the basis of the periphyton data, the creek test site had considerably more taxa, a much higher diversity, and somewhat lower chlorophyll *a* than the creek reference site. However, the phytoplankton data did show some signs of degradation at the creek test site, mostly involving large increases in algal density and chlorophyll *a*. The chlorophyll *a* at Jumping Gully Creek (28.3 µg/L) was higher than the values found in 90% of other Florida stream systems. The creek test site was also characterized by large numbers of a lentic, pollution tolerant euglenophyte, *Lepocinclis* sp. These data suggest that phytoplankton is being imported to Jumping Gully Creek from sources upstream (either Sunset Lake or the PCA treatment ponds).

Water Quality Inspection (WQI)

Date Sampled: 17 April 1995

Results: Conductivity in the creek test site (1360 µmhos/cm) was in violation of Rule 62-302.530(23) FAC. Total coliforms at the creek test site (3,000 organisms/100 mL) were in violation of Rule 62-302.530(7) FAC. Nutrient values were questionable due to field blank contamination. Algal growth potential was above the 5 mg dry wt/L "problem threshold" at the creek test site, the river reference site, and the river test site.

Introduction

Packaging Corporation of America produces unbleached Kraft liner board at its facility, which is located near Clyattville, Lowndes County, Georgia (see map in Appendix). Although this facility is in Georgia, it discharges its wastewater to Jumping Gully Creek, which flows into the Withlacoochee River in Hamilton County, Florida. The last 0.6 mile segment of Jumping Gully Creek is in Florida.

Wastewater at this 20 MGD facility receives primary and secondary treatment. First, solids are removed in a sedimentation clarifier and associated sludge ponds. Next, the wastewater flows through a series of seven ponds (with a combined surface area of approximately 850 acres), with nutrient addition to the first and fourth ponds. There are four anaerobic/facultative ponds, followed by an aerated stabilization basin, a 350 acre facultative impoundment, and a final polishing pond. Treated wastewater then flows via an effluent channel to Jumping Gully Creek, through a control structure and submerged diffuser into the Withlacoochee River. Mean annual wastewater flow to the river has been 14 MGD.

Past MOR data show compliance with permit limits. However, previous studies show that Jumping Gully Creek macroinvertebrate populations were quite depressed in terms of average taxa richness (10 taxa), diversity (1.8), and the Florida Index (4) (FDER 1990). Additionally, several violations of the biological integrity criterion occurred in Jumping Gully Creek. This 1990 study also indicated that the periphyton community of Jumping Gully Creek was more similar to an enriched lentic system than to a stream. The site was dominated by pollution tolerant cyanophytes (*Microcystis* sp. and *Chroococcus* sp.) and euglenophytes (*Phacus* sp.). A Site Specific Alternative Criterion, issued February, 1990, allows for dissolved oxygen levels as low as 4.0 mg/L in a six mile segment of Jumping Gully Creek (extending from river mile 25 to river mile 19) during the period of June through October.

Methods

The focus of this investigation was to determine the discharger's effects on the immediate receiving waters (Jumping Gully Creek) and the ultimate receiving waters (the Withlacoochee River). A comparison of biological community health was made between a creek reference site (located in nearby Bellville Creek) and a creek test site (Jumping Gully Creek at Jumping Gully Road). A river test site (approximately 400 m downstream of the diffuser) was established to evaluate the effects of Jumping Gully Creek on the Withlacoochee River. A river site approximately 50 m upstream of the confluence with Jumping Gully Creek was used as a reference station. 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. An acute screening toxicity bioassay, using *Cyprinella leedsi* as the test organism, and a chronic definitive toxicity bioassay, using *Ceriodaphnia dubia* as the test organism, were performed on an effluent sample (Weber 1991). The effluent was analyzed for metals and for organic constituents (base neutral and acid extractables, volatile organic compounds, 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 all sites. Invertebrates were collected from multiple substrates (*e.g.*, snags, leaf packs, vegetation) using discrete dip net sweeps. Additional invertebrate collections were accomplished using Hester-Dendy multiplate samplers which were incubated for 28 days (Ross 1990). Periphyton was sampled at all sites by incubating glass microscope slides in a standard periphytometer for 28 days (Ross 1990). Periphytometers at the creek stations were recovered, but, unfortunately, they were lost at both river sites. Phytoplankton was sampled at all sites by subsurface grabs. Chlorophyll *a* was also determined for periphyton and phytoplankton communities (Ross 1990). Bacterial populations were analyzed for total and fecal coliforms following the methods of APHA (1989). Algal Growth Potential tests, using *Selenastrum capricornutum* as the test organism, followed Miller *et al.* (1978).

Explanation of Measurements of Community Health

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

Taxa richness: Stress tends to reduce the number of different types of organisms present in a system, although moderate nutrient enrichment may sometimes be cor-

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

	Creek Test Site	Creek Reference Site	River Reference Site	River Test Site
Macroinvertebrate Qualitative				
Number of Taxa	33	33	35	50
Florida Index	11	13	12	16
SIIF	23	23	19	25
EPT Index	7	5	3	8
% Contribution of Dominant Taxon	17	9	13	21
% Oligochaeta	0.7	0.8	22.2	14.4
% Diptera	65.5	48.8	42.2	32.1
% Ephemeroptera	0.7	6.6	1.5	3.9
% Trichoptera	28.3	18.2	4.4	3.0
% Plecoptera	0	6.6	0	0.3
% Isopoda	0	3.3	5.9	8.5
% Coleoptera	0	6.6	0	0.3
% Gastropoda	3.5	0	6.7	4.6
% Amphipoda	0.7	3.3	5.2	5.9
% Other	0.6	5.8	11.9	27.0
% Predators	16.5	20.5	6.0	6.8
% Above Surface Deposit Feeders	18.3	39.1	19.1	25.6
% Below Surface Deposit Feeders	0.7	0.9	22.9	15.0
% Suspension Feeders	50.7	24.2	26.7	21.8
% Scrapers	4.7	4.0	12.2	9.4
% Shredders	9.0	10.0	8.7	17.6
% Other	0	1.3	4.4	3.8
Macroinvertebrate Hester-Dendy				
Number of Taxa	32	25	39	25
Florida Index	18	17	21	18
Shannon-Weaver Diversity	3.9	3.8	3.6	3.3
EPT Index	4	5	12	4
% Diptera	69.3	41.2	77.6	43.9
% Coleoptera	0.3	0.7	1.7	2.0
% Ephemeroptera	0	24.2	7.3	48.6
% Trichoptera	30.0	1.3	9.5	2.0
% Plecoptera	0	24.2	2.8	1.4
% Gastropoda	0.3	6.5	0.4	0
% Other	0.1	1.9	0.7	2.1
% Predators	25.5	24.0	11.4	10.0
% Above Surface Deposit Feeders	14.8	39.0	17.6	28.1
% Suspension Feeders	51.2	12.5	60.2	30.4
% Scrapers	0.4	18.3	4.7	28.6
% Shredders	8.0	6.2	5.9	2.9
%Scavengers	0.2	0	0.3	0

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

	Creek Test Site	Creek Reference Site	River Reference Site	River Test Site
Phytoplankton Algae				
Number of Taxa	19	10	3	10
Shannon-Weaver Diversity	2.8	3.2	1.6	2.8
Algal Density (#/mL)	2990	134	32	205
Chlorophyll a (µg/L)	28.3	1.3	0.39 U	0.39 U
% Blue-green	26.8	30.8	33.3	25.0
% Green	39.8	30.8	33.3	50.0
% Diatoms	2.8	23.1	33.3	5.0
% Euglenophytes	28.5	15.4	0	20.0
Periphyton Algae				
Number of Taxa	36	16		
Shannon-Weaver Diversity	4.4	2.1		
Density (#/sq.cm)	64,295	62,538		
Chlorophyll a (mg/sq.m)	2.0	5.9		
Diatom/Diatom + B-G Abundance Ratio	0.96	0.99		
% Blue-green	3.9	1.2		
% Green	6.8	1.2		
% Diatoms	88.4	96.5		
% Euglenophytes	1.0	1.2		
Algal Growth Potential (mg dry wt/L)	19.3	2.0	24.0	22.8

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

related 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.

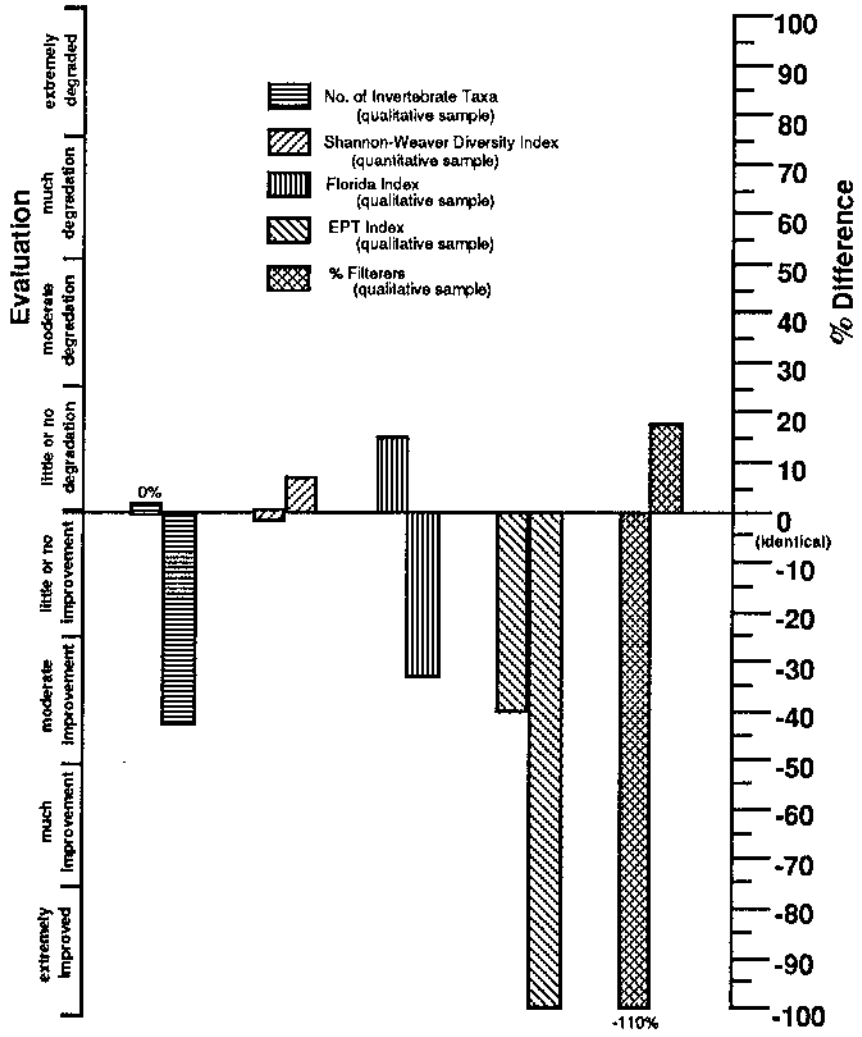
Numbers of pollution sensitive taxa: Some organisms become rare or absent as the intensity or duration of disturbance increases. For example, the Florida Index assigns points to stream-dwelling macroinvertebrates based on their sensitivity to pollution (see Ross 1990). A site with a high Florida Index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



Effect of discharge on the benthic macroinvertebrate community.

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

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, Mike Hollingsworth, and Pat O'Connor (DEP Northeast District) and Lyn Burton, Marshall Faircloth, Russel Frydenborg, Christy LeDuc, Kathleen Lurding, Tina Mikulski, Elizabeth Miller, Urania Quintana, Bart Richard, Lisa Tamburello, David Whiting, Vicki Whiting, and Greg Wynn (Tallahassee Biology Laboratory). The report was reviewed by the Point Source Studies Review Committee, consisting of Wayne Magley, Jan Mandrup-Poulsen, and Michael Tanski, as well as District representatives.

Results and Discussion

Habitat at the creek reference site (scoring 135 points) was slightly better than that of the creek test site (with 128 points). The creek test site lost points due to bottom deposition of silt/organic matter, which was not a problem at the creek reference site. Sediment at the creek test site had an anaerobic odor and slight oily sheen when disturbed. In all other categories, both creek sites scored the same, each possessing adequate substrate (such as shorezone roots, leaf packs, and woody debris), water velocity, and riparian zone vegetation.

Dissolved oxygen values at both the creek test site (6.3 mg/L) and the creek reference site (7.7 mg/L) complied with Class III standards. The pH was higher at the creek test site (7.9 S.U.'s) than it was at the creek reference site (6.1 S.U.'s). Conductivity at the creek test site (1360 µmhos/cm) was substantially higher than that of the creek reference site (41 µmhos/cm). This

constitutes greater than a 50% increase over background and also exceeds the 1,275 µmhos/cm maximum allowed by Class III standards (a violation of Rule 62-302.530(23) FAC).

Both the river reference site and the river test site scored 116 points on the habitat assessment. No major differences in standard physical/chemical parameters were noted between these two sites (see Chemistry Summary Table in Appendix).

The Packaging Corporation of America effluent was not toxic to the fish, *Cyprinella leedsi*. No chronic effects were observed in the chronic bioassay using the invertebrate, *Ceriodaphnia dubia* (Appendix).

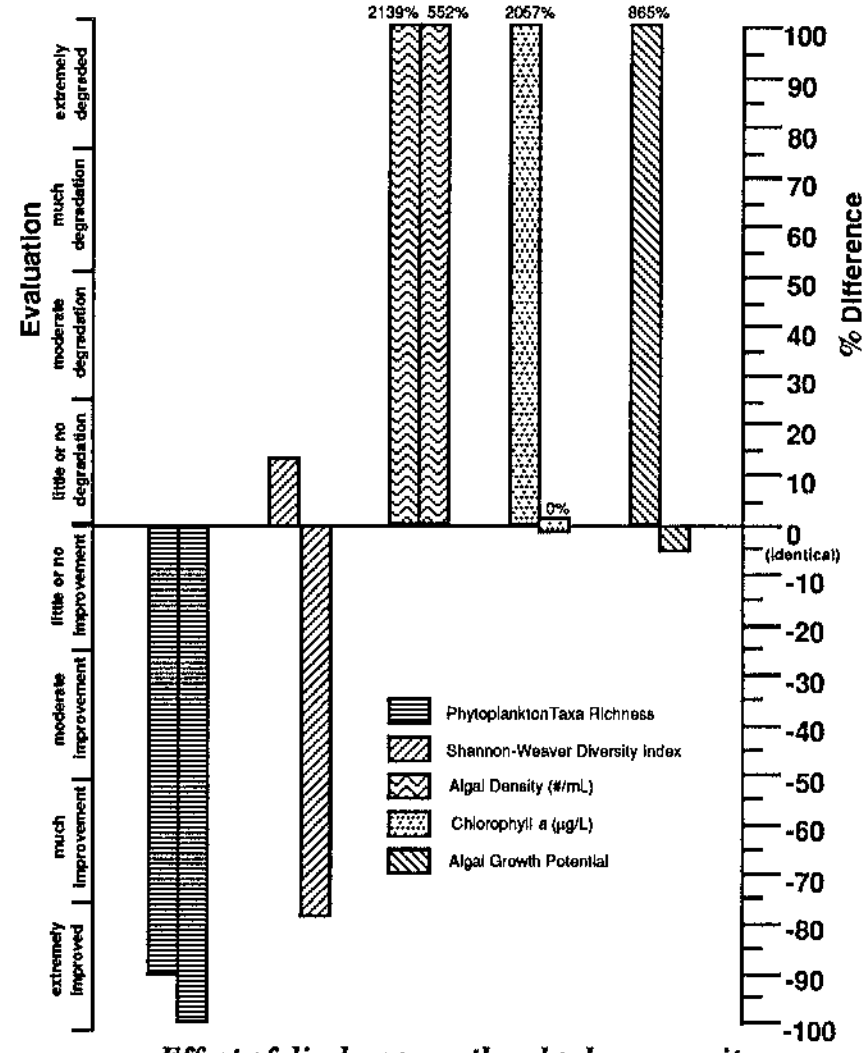
The effluent sample contained 43 µg/L of unidentified long-chain aliphatics and 300 µg/L of what was tentatively identified as motor oil. No pesticides or volatile organic compounds were detected. No metals were detected in the effluent above Class III water quality standards.

Nutrient values in both creeks were normal to slightly above average for a Florida stream. Nitrate-nitrite, TKN, and total phosphorus values were questionable, however, due to significant field blank contamination. Also, it was noted that the pH of the creek test site nutrient sample was above 5 S.U.'s at the time of analysis, indicating that the sample may not have been properly preserved in the field. Normal preservation techniques result in a pH below 2.0.

With the exception of nitrate-nitrite, nutrient concentrations in the Withlacoochee River were fairly average for Florida stream systems (see table of Typical Water Quality Parameters in Appendix). Nitrate-nitrite concentrations, which were 0.40 mg/L at the river reference site and 0.39 mg/L at the river test site, were both higher than those found in approximately 85% of typical Florida streams. However, as mentioned before, these values are questionable due to field blank contamination.

Algal growth potential (AGP) values at the creek test site (19.3 mg dry wt/L), the river reference site (24.0 mg dry wt/L), and the river test site (22.8 mg dry wt/L) were above the 5 mg dry wt/L "problem threshold" (Raschke and Schultz 1987). Although the effluent may be partially responsible for the somewhat elevated creek test site AGP, it appeared to have a negligible effect on the AGP of the Withlacoochee River. The elevated AGP at the river reference site may be due to nonpoint source (*e.g.*, agricultural) inputs.

Total coliform levels at the creek test site (3,000 organisms/100 mL) exceeded Class III standards (a violation of Rule 62-302.530(7)



Effect of discharge on the algal community.

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

FAC). Fecal coliforms at this site (less than 20 organisms/100 mL) complied with permit limits and Class III standards. Total and fecal coliforms at all other sites were in compliance with Class III standards.

Only some measures of benthic macroinvertebrate community health appeared to show adverse effects associated with the discharge. Compared with previous studies, the current data indicate substantial improvements in the health of Jumping Gully Creek's biota. The figure on p. 4 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 reference. The left bar indicates the comparison between the creek sites (reference vs. test) and the right bar shows the comparison between the river sites.

The major indicators of invertebrate community health were quite similar between the creek test site (Jumping Gully Creek) and the creek reference site (Bellville Creek at Loch Laurel Road), in both the Hester-Dendy and dip net samples. In the Hester-Dendy data set, for example, taxa richness (25 taxa at the reference site, 32 taxa at the creek test site), the Florida Index (17 at the reference site, 18 at the test site, Shannon-Weaver diversity (3.8 at the reference site, 3.9 at the test site), and the EPT Index (5 at the reference, 4 at the test site), were remarkably similar. The creek reference and test sites scored an identical 23 points on the Stream Invertebrate Index for Florida, placing them both in the "no impairment" category. The only indicator of adverse effects from the discharge involved the extreme rarity of plecopterans and ephemeropterans at Jumping Gully Creek. In Bellville Creek, stoneflies and mayflies were well represented, accounting for a combined 48.4 % of the population in the Hester-Dendys, and 13.2% of the community collected by dip net. In contrast, no (zero) stoneflies were collected using either sampling strategy in Jumping Gully Creek. Similarly, extremely few mayflies were collected at the creek test site by either sampling method (zero on the Hester-Dendys and only 0.7% of the dip net population consisted of ephemeropterans). In summary, the present data indicate that, while Jumping Gully Creek is remarkably improved compared with past studies, some examples of stress are still present in the system.

Macroinvertebrate results were somewhat more complicated in the Withlacoochee River. Sampling there was confounded by several factors, including river depth, recent extreme water level fluctuations, and difficulty in reaching inhabited substrates (present only on the shoreline and accessible only by boat). Nevertheless, combined results of the Hester-Dendy and qualitative sampling indicated that both river sites were basically healthy, containing many pollution sensitive taxa. Shannon-Weaver diversity (3.6 at the river reference site, 3.3 at the river test site) suggested good similarity between the stations. While taxa richness, the Florida Index, and the EPT Index were higher at the river reference site in the Hester-Dendy data set, these same parameters were higher at the river test site in the dip net data set. The river test site scored 25 points on the SIIF, which is in the "no impairment category", while the river reference site scored 19 points, which is in the "moderate impairment" category. Considering the macroinvertebrate results from the creek sites, in conjunction with the substantial dilution of the effluent at the river test site, most differences between the river sites are probably due to factors other than the effluent (*e.g.*, recent water level fluctuations or possible sampling inefficiency).

Periphyton samples were only recovered for the creek sites. Although these data indicate that the creek test site periphyton communities are not being adversely affected, the phytoplankton data indicate some degradation. The figure on p. 5 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.

On the basis of the periphyton data, the creek test site had considerably more taxa, a much higher diversity, and somewhat lower chlorophyll *a* than the creek ref-

erence site. However, the phytoplankton data did show some signs of degradation at the creek test site. Phytoplankton density increased by 2139% between the creek reference and test sites. Similarly, chlorophyll *a* was 28.3 µg/L at the creek test site, a 2057% increase over that measured for the creek reference site (1.3 µg/L). For comparison, the chlorophyll *a* at Jumping Gully Creek was higher than the values found in 90% of other Florida stream systems (see table of Typical Water Quality Parameters in Appendix). The creek test site was also characterized by large numbers of the euglenophyte, *Lepocinclis* sp., which is characteristic of waters enriched with organic and nitrogenous substances (Prescott 1961). This euglenophyte was also found in small numbers at the river test site, but was absent from the river or creek reference sites. These data suggest that phytoplankton is being imported to Jumping Gully Creek from sources upstream (either Sunset Lake or the PCA treatment ponds).

Conclusions

Conductivity in the creek test site (1360 µmhos/cm) was much higher than that of the creek reference site (41 µmhos/cm). This constitutes a violation of Rule 62-302.530(23) FAC.

The Packaging Corporation of America effluent was not acutely toxic to the fish, *Cyprinella leedsi*, or chronically toxic to the invertebrate, *Ceriodaphnia dubia*.

The effluent sample contained 43 µg/L of unidentified long-chain aliphatics and 300 µg/L of what was tentatively identified as motor oil. No pesticides or volatile organic compounds were detected. No metals were detected in the effluent above Class III water quality standards.

Nutrient results were questionable due to likely field blank contamination and improper preservation of the effluent sample.

Algal growth potential was above the 5 mg dry wt/L "problem threshold" at the creek test site, the river reference site, and the river test site. Although the effluent may be responsible for the somewhat elevated creek test site AGP, it appeared to have a negligible effect on the AGP of the Withlacoochee River. The elevated AGP at the river reference site may be due to other nonpoint source (*e.g.*, agricultural) inputs.

Total coliform levels at the creek test site (3,000 organisms/100 mL) exceeded Class III standards (a violation of Rule 62-302.530(7) FAC). Total and fecal coliforms at all other sites were in compliance with Class III standards.

The present macroinvertebrate data indicate that while Jumping Gully Creek is remarkably improved compared with past studies, some examples of stress are still present in the system. The major indicators of invertebrate community health were quite similar between the creek reference site (Bellville Creek) and the creek test site (Jumping Gully Creek). The creek reference and test sites scored an identical 23 points on the Stream Invertebrate Index for Florida, placing them both in the "no impairment" category. The only indicator of adverse effects from the discharge involved the extreme rarity of plecopterans and ephemeropterans at Jumping Gully Creek. Both river sites were basically healthy, containing many pollution sensitive taxa and good Shannon-Weaver diversities.

On the basis of the periphyton data, the creek test site had considerably more taxa, a much higher diversity, and somewhat lower chlorophyll *a* than the creek reference site. However, the phytoplankton data did show some signs of degradation at the creek test site, mostly involving large increases in algal density and chlorophyll *a*. The chlorophyll *a* at Jumping Gully Creek (28.3 µg/L) was higher than the values found in 90% of other Florida stream systems. The creek test site was also characterized by large numbers of the pollution tolerant euglenophyte, *Lepocinclis* sp. These data suggest that phytoplankton is being imported to Jumping Gully Creek from sources upstream (either Sunset Lake or the PCA treatment ponds).

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Chemistry summary table for

Packaging Corporation of America	Effluent/ Creek Test Site	Creek Reference Site	River Reference Site	River Test Site
Organic Constituents (ug/L)				
Long chain aliphatics	43			
Motor oil	300			
Metals (ug/L)				
Aluminum	478			
Arsenic	10 U			
Cadmium	0.1 U			
Chromium	10 U			
Copper	3 U			
Iron	344			
Lead	10 U			
Mercury	0.1 U			
Nickel	4 U			
Selenium	30 U			
Silver	0.05 U			
Zinc	16			
Nutrients (mg/L)**				
Ortho-phosphate	0.13 A	0.24 A	0.054	0.073
Total phosphorus	0.31 Q*	0.30	0.10	0.11
Ammonia	0.054 Q*	0.022 I	0.034	0.035
Nitrate+Nitrite	0.31 Q*	0.020 U	0.40 A	0.39
TKN	1.2 Q*	0.60	0.45	0.45
General Phys-Chem Parameters				
Habitat Assessment	128	135	116	116
D. O. (mg/L)	6.3	7.7	5.7	6.1
pH (SU's)	7.9	6.1	6.9	6.9
Specific Conductance (µmhos/cm)	1360	41	106	131
Temperature (°C)	20.5	17.9	21.0	20.8
Total Suspended Solids (mg/L)	6			
Biological Oxygen Demand, 5 day (mg/L)	2.7 A			
Turbidity (NTU's)	5.4			
Color (PCU's)	300			
Hardness (mg CaCO3)	67.3			
Algal Growth Potential (mg dry wt/L)	19.3	2.0	24.0	22.8
Toxicity				
Acute Bioassay Fish	No mortality			
Chronic Bioassay Invertebrate	No mortality in 100% sample			
Microbiological Communities (org/100 mL)				
Fecal Coliform	< 20	20	20	130
Total Coliform	3,000	500	230	800

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

Q - Sample held beyond normal holding time

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

* - Sample pH at time of analysis was > 5

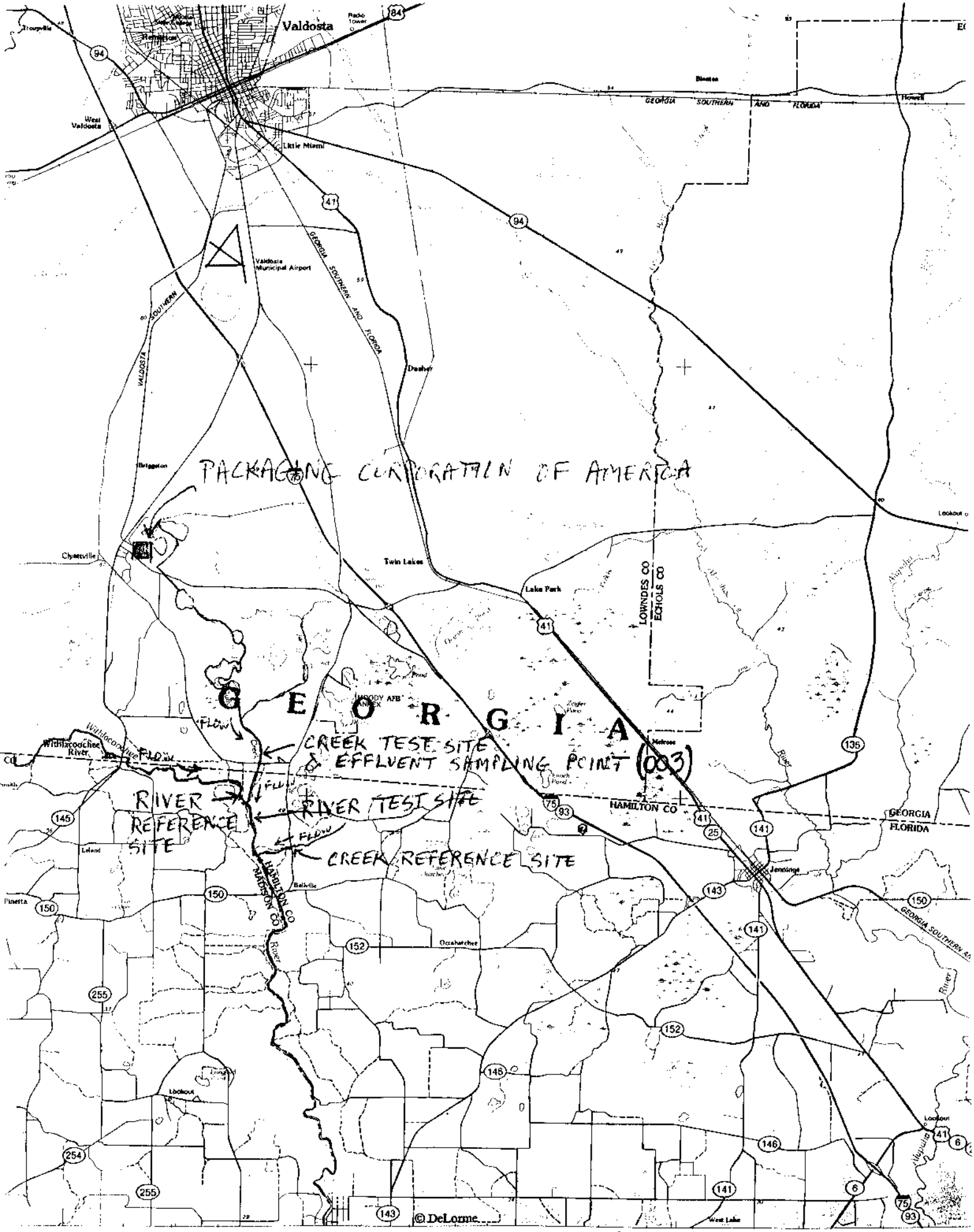
** - Nutrients field blank had 2.3 mg N/L Nitrate-Nitrite and 0.032 I mg P/L Total-P

Typical Values for Selected Parameters in Florida Waters

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

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

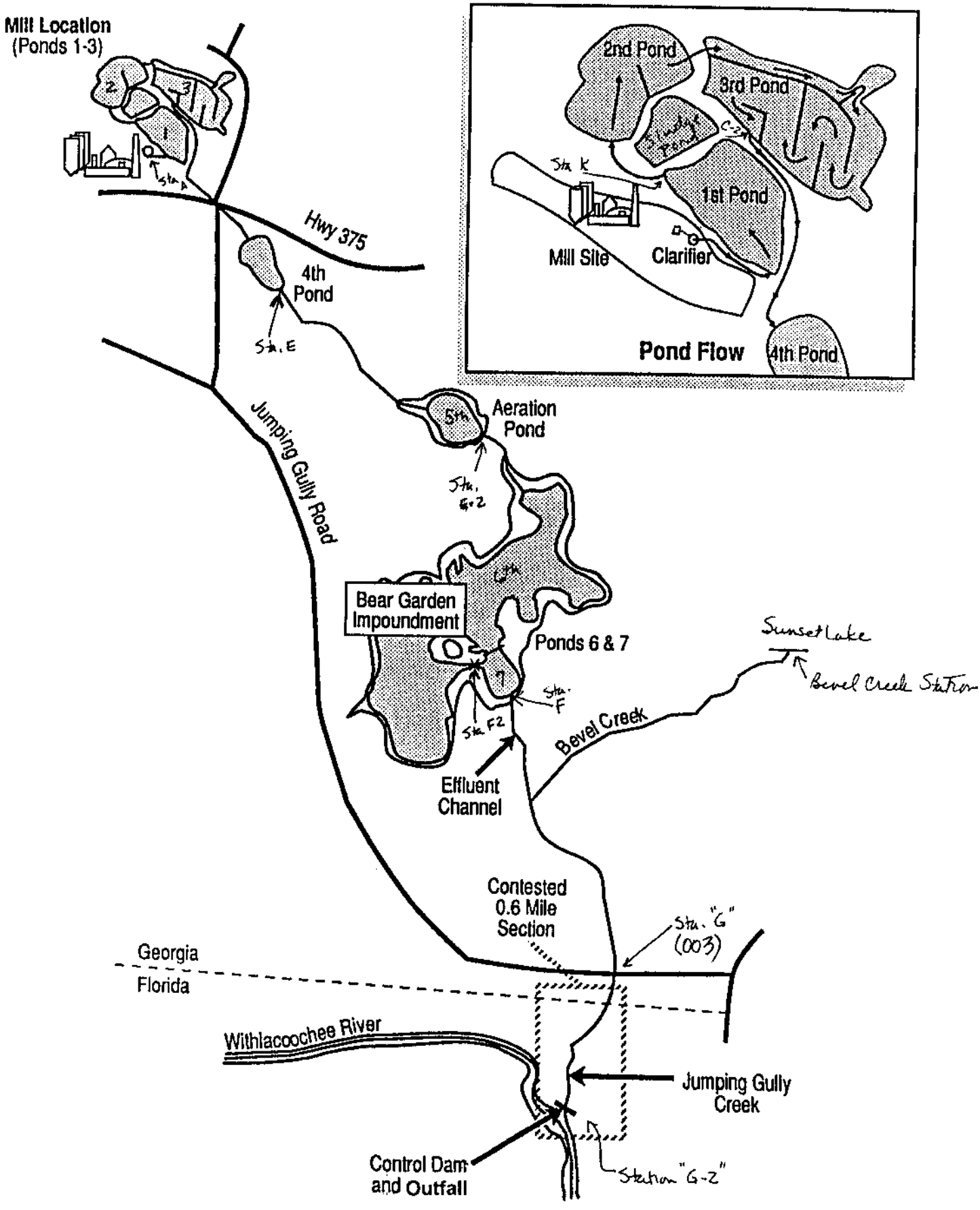
Units:
Phytoplankton Chlorophyll *a* (ug/L), Periphyton Chlorophyll *a* (mg/m^2), Nutrients (mg/L), Turbidity (NTU), Taxa richness and diversity values are for macroinvertebrates



Continue on Page 53

Scale 1:150,000
1 INCH = 2.3 miles

Effluent System



STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Facility Name: PACKAGING CORP. OF AMERICA		Date Summary Prepared: APRIL 14, 1995
Location (attach detailed map): SEE Attached	County: HAMILTON (24)	District: NORTHEAST - JAX
Federal Permit # and expiration date: FL00 00281 6/30/94	State GMS # and State expiration date: 3124P00101 Expires: 4/3/95	Facility Type: (Industrial) Municipal Federal Agricultural Other (list):

Function of facility: Unbleached kraft liner board production facility.

Description of treatment process:

operation of a 20 MGD average (design) industrial wastewater treatment system for an unbleached kraft liner board production facility. Existing treatment consists of primary treatment for settleable solids removal in a sedimentation clarifier and associated sludge ponds. Secondary treatment is accomplished in a series of seven ponds covering approximately 850 acres, with nutrient addition to the first and fourth ponds. There are four anaerobic/facultative ponds, followed by an aerated stabilization basin, a 350 acre facultative impoundment, a final polishing pond, then to an effluent channel to Jumping Gully Creek with final discharge through a control structure and submerged diffuser into the Withlacoochee River at the confluence with Jumping Gully Creek.

Receiving waters: Jumping Gully & Withlacoochee Creeks	Classification: I II (III)	
Design Flow: 20 MGD	Mean Flow: 14 MGD	Flow during survey:

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

therefore, the best time to sample is:

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

A SSAC, VE-24-334 was issued 2/14/90 for DO, which allows for 4.0 mg/L DO for months June through October.

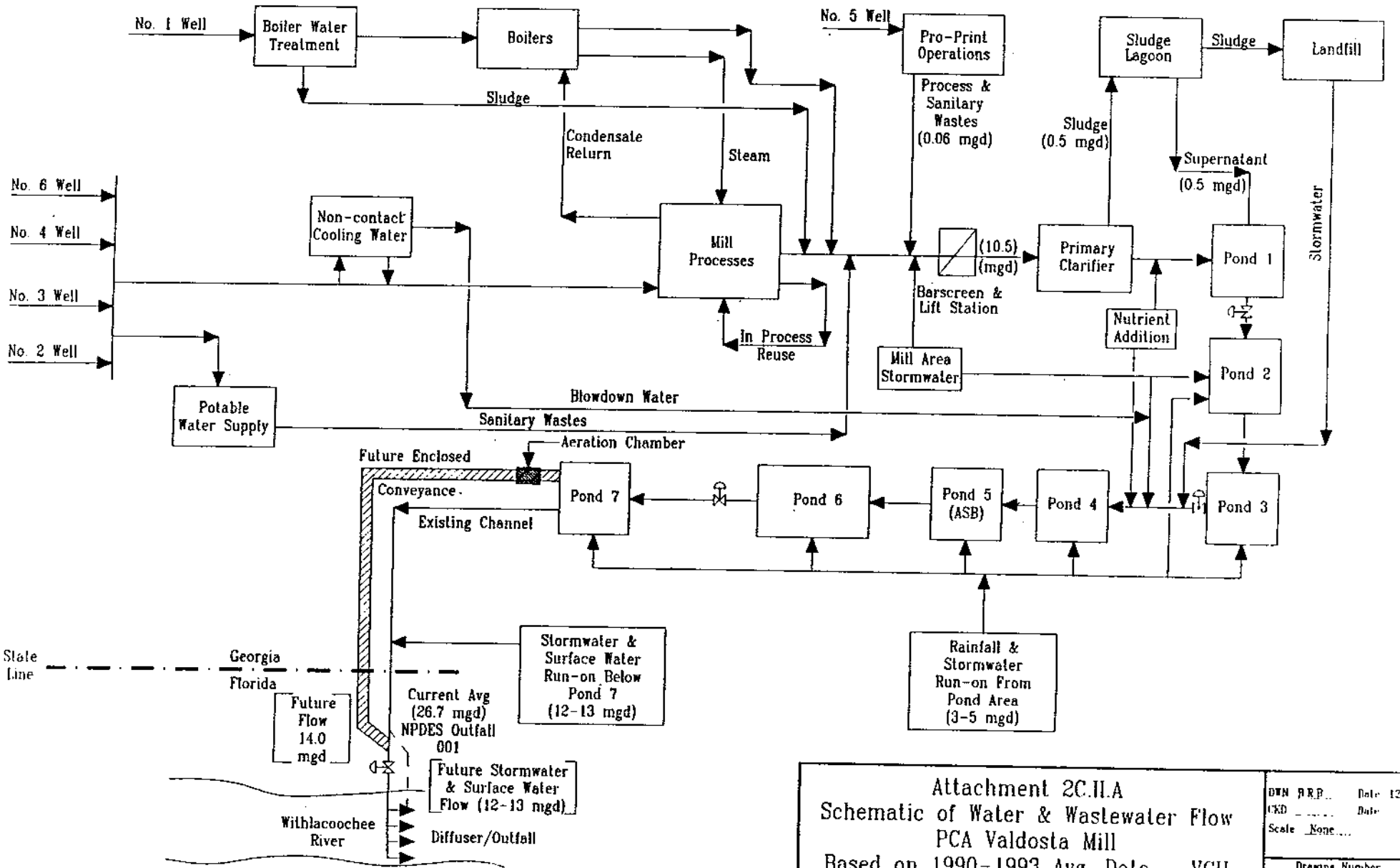
Mixing zones are proposed in the current draft permit which is in administrative hearing process.

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

Parameter	Limit (units)
See Attached	

Describe special permit conditions and permit modifications:

- currently under temporary op. permit in conjunction with C.O. # 91-2109.
- submit MOR's
- no modifications to plant without notice.
- no solid disposal into receiving waters.
- bioassay toxicity rules
- shall comply with schedules in the C.O. # 91-2109.



Attachment 2C.II.A
Schematic of Water & Wastewater Flow
PCA Valdosta Mill
Based on 1990-1993 Avg. Data - VCH

DWN RRB Date 12-27-94
CKD Date
Scale None

Drawing Number
Waterflo

CURRENT REQUIREMENTS

10. The monitoring requirements and effluent limitations are as follows:

PARAMETERS	EFFLUENT SAMPLING LOCATION (Note (1)	MEASUREMENT FREQUENCY	SAMPLE METHOD/ TYPE
Flow (MGD)	Outfall 001	Continuous	Recorder
BOD_5 (lbs/day)	Outfall 001	Daily	24-hour Composite
TSS (lbs/day)	Outfall 001	Daily	24-hour Composite
pH (S.U.)	Outfall 001	Daily	Grab
DO (mg/L)	Outfall 001	Daily	Grab
Temperature (°F)	Outfall 001	Daily	In Situ
Specific Conductivity(umhos/cm)	Outfall 001	Daily	Grab
Color (PCU)	Outfall 001	Weekly	Grab
Turbidity (NTU)	Outfall 001	Weekly	Grab
Fecal Coliform (#/100 ml)	Outfall 001	Quarterly	Grab
Total Coliform #/100 ml)	Outfall 001	Quarterly	Grab

NOTE (1): The sampling locations are identified as follows: Outfall 001- Monitoring station at the dam and diffuser system located at the confluence of Jumping Gully Creek and the Withlachoochee River.

The following discharge limitations shall apply at Outfall 001:

Parameter	Discharge Limitation Monthly Average	Daily Maximum*	Annual Average**
BOD_5	6,434 lbs/day	12,869 lbs/day	5,550 lbs/day

*The maximum allowable loading of BOD_5 at any time shall not exceed 12 lbs of BOD_5 for each cubic foot per second of stream flow measured downstream of Outfall 001 in the Withlacoochee River.

**The annual average of 5,550 lbs/day BOD is calculated as monthly average BOD discharge for previous 12 months/12.

TSS	10,760 lbs/day	16,140 lbs/day
Fecal Coliform	- - - - - - -	1,000 (#/100 ml)

	Minimum	Maximum
pH	6.0 (S.U.)	9.0 (S.U.)

'ERMITTEE:

ackaging Corporation of America
ndustrial Wastewater Treatment System

I.D. Number: 3124P00101
Permit Number: IT24-192462
Date of Issue: April 3, 1992
Expiration Date: April 3, 1995

1. The monitoring requirements and effluent limitations are as follows:

PARAMETERS	EFFLUENT SAMPLING LOCATION Note (1)	DISCHARGE LIMITATIONS Min.	DISCHARGE LIMITATIONS Max.	MEASUREMWNT FREQUENCY	SAMPLE METHOD/TYPE
BOD_5 (mg/L)	Station 003	---	---	3 times/week	Grab
TSS (mg/L)	Station 003	---	---	3 times/week	Grab
pH (S.U.)	Station 003	---	---	Weekly	Grab
Specific Conductivity (umhos/cm)	Station 003	---	---	Weekly	Grab
DO (mg/L)	Station 003	---	---	Weekly	Grab
Temperature (°F)	Station 003	---	---	Weekly	In Situ
Color (PCU)	Station 003	---	---	Weekly	Grab
Turbidity (NTU)	Station 003	---	---	Weekly	Grab
Ammonia as N (Unionized) (mg/L)	Station 003	---	---	Monthly	Grab
MBAS (mg/L)	Station 003	---	---	Monthly	Grab
Oil & Grease (mg/L)	Station 003	---	---	Monthly	Grab
Arsenic (mg/L)	Station 003	---	---	Quarterly	Grab
Copper (mg/L)	Station 003	---	---	Quarterly	Grab
Silver (ug/L)	Station 003	---	---	Quarterly	Grab
Lead (mg/L)	Station 003	---	---	Quarterly	Grab
Zinc (mg/L))	Station 003	---	---	Quarterly	Grab
Fecal Coliform (#/100 ml)	Station 003	---	---	Quarterly	Grab
Total Coliform (#/100 ml)	Station 003	---	---	Quarterly	Grab
Acute Toxicity	Station 003	---	---	See Specific Condition No. 14	

NOTE (1): The sampling locations are identified as follows: Station 003 - Confluence of Jumping Gully Creek at the Florida State line (or nearest accessible point, Jumping Gully Road at Bridge No. 79).

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		4-17-95	0945	BELLVILLE CK.

REMARKS:	LOCATION:	FIELD ID/NAME:
		BELLVILLE CK.

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)
50	10	40				paper mill	

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: 50 M

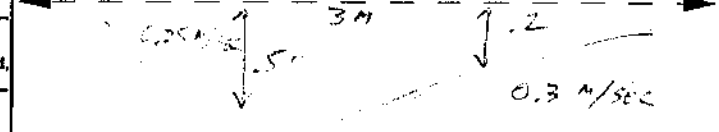
List & map dominant vegetation on back

Artificially Channelized ☒ no ☐ ☐ ☐

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

High Water Mark (m above bed): 0.2

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



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)	3	6		Sand	80	1	
Leaf Packs or Mats	2	6		Mud/Muck/Silt	5	1	
Aquatic Vegetation	0			Other:			
Rock or Shell Rubble	0			Other:			
Shorezone (Roots/Veg.)	10	6		***Draw aerial view sketch of habitats found in 100 m section***			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	SURF	17.9	6.1	7.7	41			BOT.
Mid-depth								
Bottom								

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: FOGGY, COOL (OVER)

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

SAMPLING TEAM:	SIGNATURE:	DATE:
LORDING / RITTENBERG	Russell Lyndmire	4-17-95

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER: 21[illegible]33	DATE (M/D/Y): 4-17-95	RECEIVING BODY OF WATER: BELLVILLE CR.

REMARKS:	LOCATION:	FIELD ID/NAME: BELLVILLE CR.

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Bottom Substrate/ Available Cover 10	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 20	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 20	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 20	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 20	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 20	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 20	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 20 19 18 17 16	50% to 80% of riparian zone is vegetated, but one class of plants normally expected for the sunlight & habitat conditions 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 expected 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.

135 **TOTAL SCORE**

Comments

ANALYSIS DATE: 4-17-95	ANALYST: LURDING, FREDENSBERG	SIGNATURE: [signature]

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		4-17-96	2955	JUMPING [illegible]

REMARKS:	LOCATION:	FIELD ID/NAME:
SOMEWHAT LOGGED. 3 MORE FLOW TUBE OFF.	JUMPING [illegible] SILTY	TEST SITE

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
40		50				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: +100

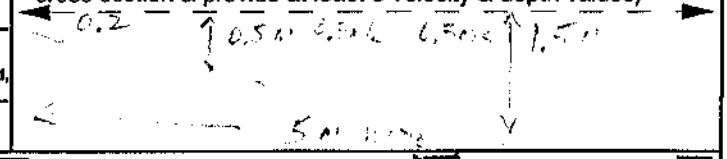
List & map dominant vegetation on back

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

Artificially Impounded ☐ yes

High Water Mark (m above bed): 0.5

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



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

SEDIMENT/SUBSTRATE

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

Sediment Oils: Absent: ☐ Slight: ☒ Moderate: ☐ Profuse: ☐ SHEEN WITH SOME AREAS DISTURBED

Sediment Deposition: Sludge: ☒ Sand smothering: none / slight / moderate / severe Silt smothering: none / slight / moderate / severe Other: POCKETS OF MUCK SLUDGE

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	10	6	[illegible]	Sand (SILT ON TOP)	50	1	[illegible]
Leaf Packs or Mats	5	6	[illegible]	Mud/Muck/Silt	30	1	[illegible]
Aquatic Vegetation	0			Other:			
Rock or Shell Rubble	0			Other:			
Shorezone (Roots/Veg.)	5	6	[illegible]	*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	SURF	20.5	7.9	6.3	1360			~0.3
Mid-depth								
Bottom								

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: ☒ VERY DARK

Weather Conditions/Notes:

SUNNY

DIFFICULT TO DETERMINE SUBSTRATE % DUE TO DARK WATER, BUT MORE THAN ADEQUATE FOR SAMPLING.

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

? FILAMENTOUS W/A SLIME SHEATH

SAMPLING TEAM:	SIGNATURE:	DATE:
KRYDENOUER, LURDING	[signature]	4-17-96

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER: 21010302	DATE (M/D/Y): 4-17-03	RECEIVING BODY OF WATER: JUMPING GULLY CR.

REMARKS:	LOCATION: 2ND SITE JUMPING GULLY (cont'd)	FIELD ID/NAME: 2ND SITE JUMPING GULLY CR.

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Bottom Substrate/ Available Cover [10]	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 [20]	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 [20]	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 (SLUDGE) 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 [20]	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 [20]	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 [20]	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 20 19 18 17 16	50% to 80% of riparian zone is vegetated, but one class of plants normally expected for the sunlight & habitat conditions 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 expected 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.

[128] **TOTAL SCORE**

Comments

ANALYSIS DATE: 4-17-03	ANALYST: LORDING, T. RYDQUIST	SIGNATURE: Russell Rydquist

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	21KI6029	[illegible]	1450	[illegible]

REMARKS:	LOCATION:	FIELD ID/NAME:
	UP stream of [illegible] Discharge	[illegible] 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)
50		40				10	

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

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

Width of riparian vegetation (m) on least buffered side: +50m

List & map dominant vegetation on back

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



Artificially Channelized [X] no [ ] [ ] [ ]

Artificially Impounded [ ] yes — recent, severe / some recovery / mostly recovered, more sinuous

High Water Mark (m above bed): [illegible]

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

SEDIMENT/SUBSTRATE

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

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

Sediment Deposition: Sludge: [ ] Sand smothering: none / slight / moderate / severe Silt smothering: none / slight (circled) / moderate / severe Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	~3		NET	Sand [illegible]	?	1	NET
Leaf Packs or Mats	<1		NET	Mud/Muck/Silt [illegible]	?	1	NET
Aquatic Vegetation	0			Other:			
Rock or Shell Rubble	~1		NET	Other:			
Shorezone (Roots/Veg.)	~2		NET	*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	[illegible]	21.0	6.9	5.7	106			1.0
Mid-depth								
Bottom								

System Type : Stream: [ ] (1st - 2nd order / 3rd - 4th order / 5th - 6th order / 7th order or greater (circled)) Lake: [ ] Wetland: [ ] Estuary: [ ] Other: [ ] ______

Water Odors (check box): Normal: [X] Sewage: [ ] Petroleum: [ ] Chemical: [ ] Other: [ ] ______

Water Surface Oils (check box): None: [X] Sheen: [ ] Globs: [ ] Slick: [ ]

Clarity (check box): Clear: [ ] Slightly turbid: [X] Turbid: [ ] Opaque: [ ]

Color (check box): Tannic: [X] Green (algae): [ ] Clear: [ ] Other: [ ] ______

Weather Conditions/Notes: Substrate proportions difficult to determine due to high water levels

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

SAMPLING TEAM:	SIGNATURE:	DATE:
[illegible]	[signature]	[illegible]

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
	21[illegible]		[illegible] River

REMARKS:	LOCATION:	FIELD ID/NAME:
	[illegible]	[illegible] REFERENCE SITE

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Bottom Substrate/ Available Cover [5]	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 [20]	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 [20]	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 [16]	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 [20]	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 riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 20 19 18 17 16	50% to 80% of riparian zone is vegetated, but one class of plants normally expected for the sunlight & habitat conditions 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 expected 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.

Comments

[116] **TOTAL SCORE**

ANALYSIS DATE:	ANALYST:	SIGNATURE:
[illegible]	FRIDENBORG	[signature]

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	21010230	4-17-95	1225	[illegible] RIVER

REMARKS:	LOCATION:	FIELD ID/NAME:
	DOWNSTREAM OF [illegible]	RIVER 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)
50		40				10	

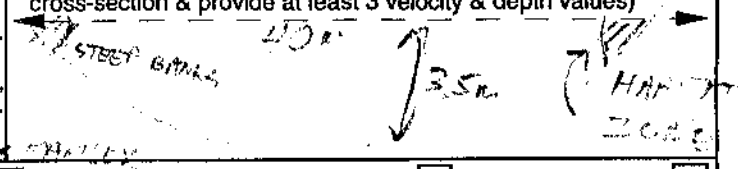
Local Watershed Erosion (check box): None ☐ Slight ☒ Moderate ☐ Heavy ☐

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

Width of riparian vegetation (m) on least buffered side: +50 m

List & map dominant vegetation on back

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



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

Artificially Impounded ☐ yes

High Water Mark (m above bed): 1m BOT [illegible]

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)	~3	6	NET	Sand REST	?	1	NET
Leaf Packs or Mats	<1	0	NET	Mud/Muck/Silt REST	?	1	NET
Aquatic Vegetation	0			Other:			
Rock or Shell Rubble	~2	6	NET	Other:			
Shorezone (Roots/Veg.)	~2	6	NET	*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	SURF	20.8	6.9	6.1	131			1.0
Mid-depth								
Bottom								

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 BREEZE

Substrate proportions difficult to determine due to high water levels

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

SAMPLING TEAM: LORDING, MCVEY, HOLLINGSWORTH, FREDERICK, DENNIS

SIGNATURE: [signature]

DATE: [illegible]

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER: 21FLGW	DATE (M/D/Y): 4-1-15	RECEIVING BODY OF WATER: [illegible]

REMARKS:	LOCATION: DOWNSTREAM OF RCA DISCHARGE	FIELD ID/NAME: RIVER TEST SITE

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Bottom Substrate/ Available Cover [5]	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 [20]	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
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Deposition [16]	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
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Riparian Zone Vegetation Quality [illegible] [15]	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 20 19 18 17 16	50% to 80% of riparian zone is vegetated, but one class of plants normally expected for the sunlight & habitat conditions 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 expected 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.

Comments

[116] **TOTAL SCORE**

ANALYSIS DATE: [illegible]	ANALYST: FRYDENBERG	SIGNATURE: [signature]

Sample Source: PCA
NPDES Permit #: FL00 NO FQF District:: NEast
LIMS #: 104181 YCT Batch #: 11 Algae Batch #: 15
7 SAPR 18 14

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BIOLOGY LABORATORY CHRONIC BIOASSAY
Ceriodaphnia dubia BENCH SHEET - *REPRODUCTION*

Sample Collection A: Date 4/17/95 Time 1115
B: Date 4/19/95 Time 1240
C: Date 4/21/95 Time 1180 ~~BB~~ to many 2ans mf 4/24

Begin Test: Date 4/18/95 Time 0900
End Test: Date 4/24/95 Time 13.00

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	# Young	# Adults	Young Adult
Control	1	[illegible]											10	
	2	[illegible]											10	
	3												10	
	4	6	3	5	4	4	5	1	3	3	5		10	
	5	0	0	0	0	X	0	0	0	0	0		9	
	6	6	7	8	10	5	X	8	8	4	8	9	9	
	7	15	4	15	8	X	9	12	6	9	14		9	
	8													
	Total	27	14	30	17	4	22	21	13	20	28	196	10 C	19.6
6.25%	1	[illegible]											10	
	2	[illegible]											10	
	3												10	
	4	3	4	5	5	6	2	4	3	2	4		10	
	5	0	0	0	0	8	0	0	0	0	6		10	
	6	8	11	6	10	11	12	10	9	8	2		10	
	7	5	16	4	14	11	10	14	8	8	13		10	
	8													
	Total	16	31	15	29	28	24	28	20	2	25	218	10	21.8
12.5%	1	[illegible]											10	
	2	[illegible]											10	
	3												10	
	4	5	6	5	5	5	4	5	3	6	5		10	
	5	0	0	0	0	0	0	0	0	0	0		10	
	6	10	8	9	12	8	9	5	7	8	6		10	
	7	14	16	15	14	13	8	10	13	15	11		10	
	8													
	Total	33	30	29	31	26	21	20	23	29	22	264	10	26.4
25%	1	[illegible]											10	
	2	[illegible]											10	
	3												10	
	4	5	5	6	3	0	7	0	6	5	6		10	
	5	0	0	0	0	0	0	0	0	0	0		10	
	6	3	9	9	9	0	11	7	9	8	10		10	
	7	8	13	16	0	5	14	11	13	13	15		10	
	8													
	Total	16	27	31	12	5	32	18	28	26	31	226	10	22.6
50%	1	[illegible]											10	
	2	[illegible]											10	
	3												10	
	4	6	4	6	4	6	6	4	5	6	5		10	
	5	0	0	0	0	0	0	0	0	0	0		10	
	6	9	8	10	9	10	10	11	9	9	12		10	
	7	16	14	10	13	13	11	13	7	11	12		10	
	8													
	Total	22	26	26	26	29	27	28	21	26	29	260	10	26.0
100%	1	[illegible]											10	
	2	[illegible]											10	
	3												10	
	4	6	5	7	6	6	4	7	4	3	4		10	
	5	0	0	0	0	0	0	0	0	0	0		10	
	6	3	8	10	8	9	12	11	12	11	11		10	
	7	13	17	14	18	16	9	13	15	10	13		10	
	8													
	Total	22	30	31	32	31	25	31	31	24	28	285	10	28.5
Day:		1	2	3	4	5	6	7	8					
Counted by:		TM	MF	TM	TM	TM	MF	MF						

A 4/13/95 wrong # written MF

Instrument Calibrations:

	Day 1	Day 2	Day 3	Day 4
pH	7.0@7.0/9.0@9.0	7.0@7.0/9.0@9.0	7.0@7.0/10.0@10.0	7.0@7.0/10.0@10.0
Temp	23.9@23.8°C	24.5@24.4	23.3@23.4°C	24.9@25.0
D.O.	8.2@25.1°C	8.2@24.9	8.3@24.5°C	8.2@25.3
Cond	110@98.6 990@990 10280@10175@24.5°C	110.7@98.6 @24.8°C 981@990	109.0@98.6 978@998 10280/10175	110.9@98.6/998@990 10439@10175@25.3

	Day 5	Day 6	Day 7	Day 8
pH	7.0@7.0 9.0@9.0	7.0@7.0/10.0@10.0	7.0@7.0/10.0@10.0	
Temp	23.9@23.9°C	23.5@24.0	23.6@23.7°C	
D.O.	8.3@24.4°C	8.2@24.7	8.2@24.9	
Cond	10.45@98.6 970@990@24.3°C	16.06@10.73 987@990 10329@10175@24.7	15.62@10.73 1022@1004	

Meter #
pH 076790 Account 980
DO/Temp 29061 DER
Cond 28149 DER

Remarks: C # Adults = 10 although one died on day 5 per EPA manual, MF 4/25/95

X = dead

NOEC = 100% sample

Investigators' Signatures
Marshall Goodrich Tina Mikulski

Sample Source: PCA

NPDES Permit #: FL00 District: NE

LIMS #: 10417X1 Start Date: 4/18/95

95 APR 18-M Termination date: 4/24/95

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BIOLOGY LABORATORY CHRONIC BIOASSAY

Ceriodaphnia dubia BENCH SHEET - CHEMISTRY

		New Sample				Old Sample	
	Conc.	pH (su)	Temp (°C)	DO (mg/L)	Cond (µmhos/cm)	pH (su)	DO (mg/L)
Day 1	Control	8.0	23.9	8.0	165		
Sample A	6.25%	8.0			250		
Measured by DW	12.5%	8.0			330		
Recorded by LW	25%	8.1			485		
	50%	8.1			810		
	100%	8.1	24.5	7.7	1445		
Day 2	Control	8.0	23.9	8.0	165	8.1	7.9
Sample A	6.25%	8.1			245	8.1	7.9
Measured by MF	12.5%	8.1			325	8.1	8.0
Recorded by TR	25%	8.1			475	8.3	8.0
	50%	8.2			785	8.5	8.0
	100%	8.2	23.7	8.1	1380	8.7	8.0
Day 3	Control	8.3	24.0	7.9	175	8.2	8.2
Sample B	6.25%	8.1			250	8.1	8.3
Measured by ____	12.5%	8.1			335	8.2	8.3
Recorded by ____	25%	8.1			500	8.3	8.3
	50%	8.0			830	8.5	8.3
	100%	8.1	7.8	7.8	1460	8.7	8.3
Day 4	Control	8.1	24.1	8.1	170	8.0	8.2
Sample B	6.25%	8.1			255	8.1	8.1
Measured by JLS	12.5%	8.1			330	8.1	8.1
Recorded by LW	25%	8.1			510	8.2	8.0
	50%	8.2			825	8.4	8.0
	100%	8.2	~~8.4~~	~~8.4~~	1480	8.6	8.0

revised 9/15/93

LW 4-21-95 records pa/temp ra wrong spaces

		New Sample				Old Sample	
	Conc.	pH (su)	Temp (°C)	DO (mg/L)	Cond (µmhos/cm)	pH (su)	DO (mg/L)
Day 5	Control	8.0	23.3	8.2	165	8.1	8.2
Sample C	6.25%	8.0			250	8.1	8.1
Measured by JRS	12.5%	8.0			340	8.2	8.1
Recorded by DW	25%	8.0			500	8.3	8.2
	50%	8.1			830	8.5	8.2
	100%	8.1	23.2	8.2	1750	8.6	8.2
Day 6	Control	8.0	23.9	8.3	170	8.0	8.0
Sample C	6.25%	8.1			245	8.1	8.0
Measured by MF	12.5%	8.1			340	8.2	8.0
Recorded by JN	25%	8.1			475	8.3	7.9
	50%	8.1		8.0	~~1715~~	8.4	7.9
	100%	8.1	23.8	8.2	1520	8.6	8.0
Day 7	Control					8.1	7.8
Sample ____	6.25%					8.2	7.7
	12.5%					8.2	7.8
Measured by MF	25%					8.3	7.9
Recorded by TR	50%					8.5	7.9
	100%					8.6	7.9
Day 8	Control						
	6.25%						
Measured by ____	12.5%						
	25%						
Recorded by ____	50%						
	100%						

A- Incorrect Oral recbd MF 4/12/95

Water-quality Parameters

	Field Cl2	Lab Cl2	Alkalinity	Hardness	NH3+NH4
Sample A:		0.04	260	80	<0.017
Method		DR-100	Hach	Hach	Orion
Measured by		TM	TM	TM	TM

Cl2 blank: <0.03 Ammonia meter slope: -56.7

Sample B:		004	280	80	<0.017
Method		DR-100	Hach	Hach	Orion
Measured by		TM	JN	JN	JN

Cl2 blank: <0.03 Ammonia meter slope: -57.8

Sample C:		<0.03	290	80	0.056
Method		DR-100	Hach	Hach	Orion
Measured by		TM/MF	JLS/TM	JLS/TM	MF

Cl2 blank: <0.03 Ammonia meter slope: -55.6

Diluent batch # 17 Days Used: 7

Diluent batch # ____ Days Used: ____

Remarks:

Investigators' Signatures

Marshall Faircloth Jennifer Sparagni Tina M. Mulkin

Lori Wenner Robin C. Rader

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Packaging Corp. of America
County: Lowndes Co., Georgia
Contact / District: Tim Mckelvey / Northeast
NPDES Permit #: FL00
LIMS Sample #: 104181 **LIMS Job #:** 95-Apr-18-14
Limss sample log 4/24/95 mf **Instrument**

Sample Collection: Date 4/17/95 Time 1135
Test Beginning: Date 4/18/95 Time 1000
Test Ending: Date 4-20-95 Time 1000
Organism Batch #: 15 **Diluent Batch #:** well
Organism Age: 10 days
Test Organism: Cyprinella leedsi

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

Test Number: 1 of 2

Remarks: Test 2 C. dubia chronic

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	23.9 @ 23.8	8.2 @ 25.1 °C	110.0 @ 98.6 970 @ 990 @ 24.5 °C (10280 / 10175)
24 hr	7.0 @ 7.0 9.0 @ 9.0	24.5 @ 24.3	8.2 @ 24.9 °C	110.7 @ 98.6 970 @ 990 @ 24.8 °C (10280 / 10175)
48 hr	7.0 @ 7.0 10.0 @ 10.0	23.3 @ 23.4	8.3 @ 24.5 °C	109.0 @ 98.6 978 @ 990 @ 24.4 °C (10280 & 10175)

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	24 h	48 h
ctl A	304	5	5	5	7.8	8.2	8.3	25.6	24.4	23.7	7.4	7.9	8.3	255	255	250
ctl B	505	5	5	5	7.8	8.2	8.3	25.9	24.3	23.6	7.7	8.0	8.3	260	250	245
ctl C	136	5	5	5	7.8	8.2	8.3	25.9	24.3	23.7	7.9	8.0	8.4	260	250	250
ctl D	11	5	5	5	7.8	8.2	8.3	25.6	24.3	23.8	7.9	8.0	8.4	255	250	250
6.25% A	630	5	5	5	7.9	8.2	8.3	25.0	24.3	23.6	8.0	8.2	8.3	330	325	320
6.25% B	414	5	5	5	7.8	8.2	8.3	24.9	24.2	23.4	8.0	8.1	8.3	330	325	320
6.25% C	28	5	5	5	7.8	8.2	8.3	24.9	24.2	23.4	8.0	8.1	8.4	330	325	320
6.25% D	348	5	5	5	7.8	8.2	8.3	24.8	24.3	23.7	8.0	8.0	8.4	330	325	320
12.5% A	380	5	5	5	7.8	8.2	8.3	25.1	24.3	23.5	8.0	8.0	8.4	405	400	395
12.5% B	30	5	5	5	7.8	8.2	8.3	25.2	24.3	23.4	8.0	8.0	8.4	405	400	395
12.5% C	53	5	5	5	7.8	8.2	8.3	25.2	24.2	23.4	8.0	8.0	8.4	410	400	395
12.5% D	413	5	5	5	7.8	8.2	8.3	25.2	24.3	23.7	7.9	7.9	8.4	410	400	400
25% A	2190	5	5	5	7.8	8.3	8.4	25.3	24.3	23.6	7.9	8.0	8.3	560	550	540
25% B	65	5	5	5	7.8	8.3	8.4	25.4	24.3	23.4	7.9	7.9	8.2	565	550	545
25% C	216	5	5	5	7.8	8.3	8.3	25.4	24.2	23.4	7.9	7.8	8.3	565	555	545
25% D	219	5	5	5	7.8	8.3	8.4	25.3	24.3	23.7	7.9	7.8	8.5	565	555	550
50% A	506	5	5	5	7.9	8.3	8.4	25.2	24.3	23.6	7.9	7.8	8.3	860	850	835
50% B	501	5	5	5	7.9	8.3	8.4	25.3	24.3	23.4	7.9	7.8	8.2	880	865	850
50% C	351	5	5	5	7.9	8.3	8.4	25.3	24.3	23.4	7.8	7.8	8.2	895	875	865
50% D	10	5	5	5	7.9	8.3	8.4	25.2	24.3	23.6	7.8	7.8	8.3	895	880	875
100% A	307	5	5	5	7.9	8.4	8.5	25.4	24.4	23.6	6.9	7.7	8.1	1510	1480	1460
100% B	20	5	5	5	7.9	8.4	8.5	25.5	24.4	23.3	7.2	7.6	8.0	1515	1475	1455
100% C	412	5	5	5	7.9	8.4	8.5	25.5	24.4	23.3	7.4	7.6	8.1	1510	1485	1460
100% D	114	5	5	5	7.9	8.4	8.5	25.3	24.4	23.6	7.4	7.6	8.1	1510	1480	1465
Recorded by:		TM	TR	5W	LW	TR	JN	LW	TR	JN	LW	TR	JN	LW	TR	JN
Measured/Loaded by:		MF	TR	LW	DW	MF	NW	DW	MF	NW	DW	MF	NW	DW	MF	NW

Investigators' Signatures

Marshall Farnhath
Lori Wenn
Tina Mikulski
Robin G. Rader
Reviewer

* wrote in wrong space LW 4.20.95

Water Quality Parameters	Salt Water: Well Water / 20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):		not measured		
Lab Total Residual Cl2 (mg/L):	<0.03	0.04	DR-100	TM
Alkalinity (mg/L as $CaCO_3$):	115	260	Hach	TM
Hardness (mg/L as $CaCO_3$):	125	80	Hach	TM
Total ammonia (mg/L as N)	<0.017	<0.017	Orion	MF

Ammonia Meter #98136 Meter Slope: -56.7 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

Jack Ref - Bellville Ck.

Calculation & Interpretation of the Stream Invertebrate Index for Florida (SIIF) (Draft 1994)									
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	**Panhandle (65, 75a)**					**Peninsula (75b, c, d)**			
	Value	5	3	1	Score	5	3	1	Score
Number of Taxa	33	≥ 31	16–30	0–15	5	≥ 27	14–26	0–13	
EPT Index	5	≥ 7	4–6	0–3	3		≥ 4	0–3	
% Contribution of Dominant Taxon	9		≤ 20	> 20	3		≤ 37	> 37	
Florida Index	13	≥ 18	9–17	0–8	3	≥ 7	4–6	0–3	
% Diptera	48.8		≤ 38	> 38	1		≤ 32	> 32	
% Suspension feeders/ Collector-Filterers	24.2	≥ 12	7–11	0–6	5	≥ 8	4–7	0–3	
% Shredders	10		≥ 10	0–9	3		≥ 13	0–12	
% Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 16	0–15	
# Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 4	0–3	
Total Score		**Panhandle**			23	**Peninsula**			
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**

Creek Test - Jumping Gully

Calculation & Interpretation of the Stream Invertebrate Index for Florida (SIIF) (Draft 1994)									
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	**Panhandle (65, 75a)**					**Peninsula (75b, c, d)**			
	Value	5	3	1	Score	5	3	1	Score
Number of Taxa	33	≥ 31	16–30	0–15	5	≥ 27	14–26	0–13	
EPT Index	7	≥ 7	4–6	0–3	5		≥ 4	0–3	
% Contribution of Dominant Taxon	16.6		≤ 20	> 20	3		≤ 37	> 37	
Florida Index	11	≥ 18	9–17	0–8	3	≥ 7	4–6	0–3	
% Diptera	65.5		≤ 38	> 38	1		≤ 32	> 32	
% Suspension feeders/ Collector-Filterers	50.7	≥ 12	7–11	0–6	5	≥ 8	4–7	0–3	
% Shredders	9		≥ 10	0–9	1		≥ 13	0–12	
% Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 16	0–15	
# Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 4	0–3	
Total Score		**Panhandle**			23	**Peninsula**			
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**

River Ref - Upstream discharge in Withlacoochee

Calculation & Interpretation of the Stream Invertebrate Index for Florida (SIIF) (Draft 1994)									
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	**Panhandle (65, 75a)**					**Peninsula (75b, c, d)**			
	Value	5	3	1	Score	5	3	1	Score
Number of Taxa	35	≥ 31	16–30	0–15	5	≥ 27	14–26	0–13	
EPT Index	3	≥ 7	4–6	0–3	1		≥ 4	0–3	
% Contribution of Dominant Taxon	13.3		≤ 20	> 20	3		≤ 37	> 37	
Florida Index	12	≥ 18	9–17	0–8	3	≥ 7	4–6	0–3	
% Diptera	42.2		≤ 38	> 38	1		≤ 32	> 32	
% Suspension feeders/ Collector-Filterers	26.7	≥ 12	7–11	0–6	5	≥ 8	4–7	0–3	
% Shredders	8.7		≥ 10	0–9	1		≥ 13	0–12	
% Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 16	0–15	
# Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 4	0–3	
Total Score		**Panhandle**			19	**Peninsula**			
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**

River Test - Downstream discharge in Withlacoochee

Calculation & Interpretation of the Stream Invertebrate Index for Florida (SIIF) (Draft 1994)									
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	**Panhandle (65, 75a)**					**Peninsula (75b, c, d)**			
	Value	5	3	1	Score	5	3	1	Score
Number of Taxa	50	≥ 31	16–30	0–15	5	≥ 27	14–26	0–13	
EPT Index	8	≥ 7	4–6	0–3	5		≥ 4	0–3	
% Contribution of Dominant Taxon	21.2		≤ 20	> 20	1		≤ 37	> 37	
Florida Index	16	≥ 18	9–17	0–8	3	≥ 7	4–6	0–3	
% Diptera	32.1		≤ 38	> 38	3		≤ 32	> 32	
% Suspension feeders/ Collector-Filterers	21.8	≥ 12	7–11	0–6	5	≥ 8	4–7	0–3	
% Shredders	17.6		≥ 10	0–9	3		≥ 13	0–12	
% Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 16	0–15	
# Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 4	0–3	
Total Score		**Panhandle**			25	**Peninsula**			
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 Packaging Corporation of America, collected via Hester-Dendy artificial substrates in Bellville Creek, Jumping Gully Creek and the Withlacoochee River, on 17 April, 1995. Densities, in number/m^2, represent the mean of three replicates.

	Creek Reference Site	Creek Test Site	River Reference Site	River Test Site
Gastropoda				
Laevapex diaphanus	–	8	–	–
Laevapex sp.	26	–	5	–
Viviparidae	–	–	3	–
Trombidiformes				
Sperchonopsis sp.	–	–	8	–
Torrenticola sp.	–	–	–	3
Isopoda				
Caecidotea sp.	8	–	5	–
Decapoda				
Procambarus spiculifer	–	–	3	–
Cambaridae	–	–	–	3
Ephemeroptera				
Acerpenna pygmaeus	8	–	–	–
Baetis propinquus	11	–	3	–
Isonychia arida	–	–	16	–
Stenacron interpunctatum	–	–	5	95
Stenonema exiguum	–	–	98	95
Stenonema smithae	58	–	–	–
Stenonema sp.	–	–	3	–
Baetidae	3	–	–	–
Ephemeroptera	11	–	–	–
Heptageniidae	8	–	40	–
Plecoptera				
Neoperla sp.	–	–	5	3
Neoperla clymene	–	–	16	3
Perlesta placida	95	–	29	–
Perlidae	3	–	13	–
Coleoptera				
Ancyronyx variegata	3	–	–	–
Dineutus sp.	–	8	11	–
Stenelmis hungerfordi	–	–	13	–
Stenelmis sp.	–	–	13	8
Megaloptera				
Corydalus cornuta	–	–	3	3
Trichoptera				
Ceraclea sp.	–	–	3	–
Cheumatopsyche sp.	5	108	26	–
Chimarra sp.	–	–	77	–

Cyrnellus fraternus	–	235	–	8
Hydropsyche decalda	–	11	–	–
Hydropsyche rossi	–	53	69	–
Hydropsyche sp.	–	270	19	–
Nectopsyche exquisita	–	–	8	–
Neotrichia sp.	–	–	8	–
Trichoptera	–	32	5	–
Diptera				
Ablabesmyia mallochi	5	5	11	16
Ablabesmyia rhamphe grp.	–	56	–	3
Asheum beckae	–	34	–	–
Atrichopogon sp.	–	3	–	–
Chironomus sp.	–	13	–	–
Conchapelopia sp.	13	5	8	–
Corynoneura sp. B Epler	–	8	21	3
Corynoneura sp. F Epler	–	–	8	5
Corynoneura taris	–	8	–	3
Cricotopus bicinctus	3	–	–	–
Dicrotendipes modestus	–	5	–	–
Dicrotendipes neomodestus	–	–	–	3
Dicrotendipes sp.	–	–	3	–
Hayesomyia sp.	–	40	–	–
Helopelopia sp.	5	–	–	–
Hemerodromia sp.	8	66	–	–
Labrundinia pilosella	–	3	–	–
Nanocladius distinctus	–	11	–	–
Pentaneura inconspicua	–	220	8	–
Polypedilum convictum grp.	8	315	167	5
Polypedilum fallax	8	40	63	11
Polypedilum scalaenum grp.	–	132	19	11
Polypedilum tritum	–	–	8	–
Rheocricotopus robacki	40	34	87	3
Rheopelopia sp.	–	63	32	3
Rheotanytarsus distinctissimus grp.	13	355	474	48
Rheotanytarsus exiguus grp.	13	85	537	37
Rheotanytarsus sp.	–	–	122	8
Simulium sp.	–	24	–	–
Stelechomyia perpulchra	–	–	3	–
Stempellinella sp.	3	–	–	–
Tanytarsus sp. A Epler	–	11	–	–
Tanytarsus sp. L Epler	13	–	–	3
Tanytarsus sp. M Epler	5	–	8	–
Tanytarsus sp. S Epler	8	–	3	3
Tanytarsus sp. U Epler	–	–	3	–
Tanytarsus sp. W Epler	5	–	–	–
Tanytarsus sp.	5	–	–	–
Thienemanniella fusca	–	3	–	–
Thienemanniella sp. A Epler	5	–	–	–

Thienemanniella sp. D Epler	3	–	–	–
Tribelos fuscicornis	–	5	–	3
Tribelos jucundus	–	–	–	3
Tvetenia discoloripes grp.	–	8	111	–
Chironomidae	3	87	53	5

Benthic macroinvertebrate taxa list for Packaging Corporation of America, collected via 20 discrete dip net sweeps in Bellville Creek, Jumping Gully Creek, and the Withlacoochee River, on 17 April, 1995.

	Creek Reference Site	Creek Test Site	River Reference Site	River Test Site
Platyhelminthes				
Dugesia sp.	–	–	25	7
Nemertea				
Prostoma rubrum	12	–	–	15
Oligochaeta				
Eclipidrilus palustris	12	–	–	–
Eclipidrilus sp.	–	–	75	7
Haber speciosus	–	–	–	30
Limnodrilus hoffmeisteri	–	–	125	53
Lumbriculus inconstans	–	–	25	–
Nais behningi	–	–	400	176
Nais communis	–	–	25	15
Nais simplex	–	–	–	7
Slavina appendiculata	–	–	25	30
Stylaria lacustris	–	–	75	7
Enchytraeidae	–	100	–	–
Lumbriculidae	–	–	–	7
Gastropoda				
Ferrissia hendersoni	–	–	–	38
Laevapex diaphanus	–	200	–	–
Micromenetus dilatatus	–	300	175	61
Planorbella duryi	–	–	–	7
Viviparus georgianus	–	–	25	–
Hydrobiidae	–	–	25	–
Pelecypoda				
Corbicula fluminea	–	–	–	30
Pisidiidae	25	–	25	23
Trombidiformes				
Arrenurus sp.	–	–	25	7
Oribatei	12	–	–	–
Trombidiformes	–	–	–	7
Isopoda				
Caecidotea sp.	–	–	275	492
Lirceus sp.	125	–	–	–
Amphipoda				
Crangonyx sp.	12	–	–	–
Hyalella azteca	37	–	200	200
Decapoda				
Palaemonetes paludosus	–	–	50	38
Procambarus sp.	–	–	–	7

Procambarus spiculifer	–	–	–	7
Ephemeroptera				
Acerpenna pygmaeus	50	–	–	38
Baetis propinquus	37	–	50	15
Caenis sp.	–	100	–	–
Isonychia arida	–	–	–	15
Stenonema exiguum	–	–	–	23
Heptageniidae	12	–	–	–
Odonata				
Hagenius brevistylus	–	100	–	–
Plecoptera				
Perlesta placida	87	–	–	7
Perlidae	12	–	–	–
Hemiptera				
Hydrometra sp.	12	–	–	–
Coleoptera				
Dineutus sp.	12	–	–	–
Dubiraphia sp.	–	–	–	7
Dubiraphia vittata	–	–	150	–
Hydroporus sp.	25	100	–	–
Laccornis difformis	–	–	–	7
Macronychus glabratus	–	–	–	115
Microcylloepus pusillus	–	–	–	7
Pelonomus sp.	12	–	–	–
Stenelmis sp.	–	–	25	–
Trichoptera				
Cernotina sp.	–	–	–	15
Cheumatopsyche sp.	125	1200	–	7
Hydropsyche sp.	–	2400	–	–
Hydroptila sp.	–	–	125	–
Nectopsyche exquisita	–	–	25	–
Nectopsyche sp.	–	–	–	46
Neotrichia sp.	–	100	–	–
Oecetis sp.	–	100	–	–
Oxyethira sp.	62	–	–	–
Rhyacophila carolina	–	100	–	–
Triaenodes flavescens	–	100	–	–
Hydropsychidae	50	–	–	–
Trichoptera	37	100	–	–
Diptera				
Ablabesmyia mallochi	62	100	50	7
Ablabesmyia rhamphe grp.	12	100	75	23
Asheum beckae	–	100	–	–
Atrichopogon sp.	–	100	–	–
Cladotanytarsus sp.	–	–	–	7
Cricotopus bicinctus	–	–	–	38
Cricotopus or *Orthocladius* sp.	–	–	–	23
Cryptochironomus sp.	–	–	–	7
Cryptotendipes sp.	–	100	25	–

Hayesomyia sp.	12	–	–	–
Hemerodromia sp.	12	100	–	–
Labrundinia pilosella	–	300	–	23
Labrundinia sp.	12	–	–	–
Microtendipes pedellus grp.	–	100	–	–
Nanocladius sp.	–	100	–	7
Nilothauma sp.	12	–	–	–
Palpomyia/Bezzia grp.	–	200	50	15
Paralauterborniella nigrohalterale	–	300	–	–
Pentaneura inconspicua	–	300	–	–
Polypedilum convictum grp.	12	1400	25	7
Polypedilum halterale grp.	–	100	–	–
Polypedilum illinoense grp.	137	1500	25	7
Polypedilum scalaenum grp.	–	300	75	–
Rheocricotopus robacki	25	–	–	–
Rheotanytarsus distinctissimus grp.	37	1200	450	15
Rheotanytarsus exiguus grp.	–	600	325	376
Rheotanytarsus sp.	37	–	25	–
Simulium sp.	–	1600	–	–
Stempellinella sp.	25	–	–	–
Stenochironomus sp.	–	–	50	38
Tanytarsus sp.	12	–	50	7
Tanytarsus sp. C Epler	–	–	25	–
Tanytarsus sp. J Epler	–	–	–	7
Tanytarsus sp. L Epler	75	–	–	23
Tanytarsus sp. M Epler	37	–	–	–
Tanytarsus sp. R Epler	–	–	–	7
Tanytarsus sp. S Epler	–	–	25	–
Thienemanniella sp. A Epler	–	–	25	–
Thienemannimyia grp.	–	100	–	–
Tribelos fuscicornis	25	–	–	–
Tribelos jucundus	112	–	25	–
Tvetenia discoloripes grp.	–	400	–	–
Chironomidae	75	400	100	107

Periphyton taxa list and densities (#/cm^2) for Packaging Corporation of America, collected via glass microscope slides in Bellville Creek and Jumping Gully Creek, on 17 April, 1995.

	Creek Reference Site	Creek Test Site
Cyanophyceae		
Anabaena sp.	–	312
Dactylococcopsis sp.	364	1248
Lyngbya sp.	–	312
Microcystis sp.	364	–
Oscillatoria sp.	–	312
Spirulina sp.	–	312
Bacillariophyceae		
Achnanthes sp.	–	312
Achnanthes exigua	–	8115
Achnanthes hungarica	1091	2809
Achnanthes hustedtii	2545	–
Achnanthes lanceolata dubia	–	4370
Achnanthes lapponica	–	2185
Achnanthes microcephala	364	–
Cyclotella meneghiniana	–	2497
Cymbella minuta	–	312
Eunotia sp.	47631	–
Eunotia incisa	364	–
Eunotia naegelii	364	–
Eunotia pectinalis	4363	312
Eunotia vanheurcki	1454	312
Frustulia rhomboides	727	–
Gomphonema parvulum	–	1248
Gyrosigma sp.	–	624
Navicula sp.	–	312
Navicula capitata	–	624
Navicula clementis	364	–
Navicula cryptocephala	–	4057
Navicula exigua capitata	–	624
Navicula minima	–	4370
Navicula radiosa	–	2809
Navicula rhynchocephala	–	5306
Navicula viridula	–	4682
Nitzschia sp.	–	624
Nitzschia amphibia	–	1561
Nitzschia fonticola	–	936
Nitzschia linearis	–	624
Nitzschia palea	364	4057
Pinnularia sp.	–	312

Surirella sp.	–	312
Pennales	727	2497
Chlorophyceae		
Characium sp.	–	936
Closterium sp.	364	312
Netrium sp.	364	–
Oocystis sp.	–	312
Scenedesmus sp.	–	1873
Schroederia sp.	–	312
Selenastrum sp.	–	624
Euglenophyceae		
Phacus sp.	364	312
Trachelomonas sp.	364	312

Phytoplankton taxa list and densities (#/mL) for Packaging Corporation of America, collected via subsurface grabs in Bellville Creek, Jumping Gully Creek,and the Withlacoochee River on 17 April, 1995.

	Creek Reference Site	Creek Test Site	River Reference Site	River Test Site
Cyanophyceae				
Anabaena sp.	10	–	–	–
Aphanocapsa sp.	–	10	–	–
Chroococcus sp.	–	–	–	10
Dactylococcopsis sp.	–	791	–	21
Lyngbya sp.	10	–	–	10
Oscillatoria sp.	21	–	11	10
Chrysophyceae				
Ophiocytium sp.	–	31	–	–
Bacillariophyceae				
Achnanthes sp.	10	–	–	–
Cyclotella sp.	–	10	–	–
Navicula sp.	10	21	11	–
Nitzschia sp.	10	31	–	10
Stauroneis sp.	–	10	–	–
Pennales	–	10	–	–
Chlorophyceae				
Ankistrodesmus sp.	–	10	–	–
Chlamydomonas sp.	10	51	–	–
Cladophora sp.	–	–	11	–
Crucigenia sp.	31	–	–	–
Oocystis sp.	–	21	–	–
Phacotus sp.	–	–	–	10
Scenedesmus sp.	–	668	–	62
Selenastrum sp.	–	421	–	–
Spermatozoopsis sp.	–	10	–	10
Tetraedron sp.	–	10	–	–
Chlorophyceae	–	–	–	10
Volvocaceae	–	–	–	10
Euglenophyceae				
Euglena sp.	10	82	–	–
Lepocinclis sp.	–	658	–	41
Phacus sp.	–	62	–	–
Trachelomonas sp.	10	10	–	–
Euglenophyceae	–	41	–	–
Cryptophyceae				
Cryptomonas sp.	–	31	–	–

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

Transaction Code		NPDES NUMBER		YR/MO/DA		Insp Type	Inspector	Fac Type
1 N	2 5	3 FL0002381	11 12	95 04 17	17	18 X	19 S	20 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 N	2 5	3 FL0002381	11 12	95 04 17	17	18 B	19 S	20 2

Remarks

21 66