

Biological Assessment of

Florida Juice, Inc.

Polk County

NPDES #FL0001457

Sampled April 1996

August 1996

Biology Section
Division of Administrative and Technical Services

Comprehensive Quality Assurance Plan No. 870346G

Department of Environmental Protection
Results of Fifth Year Inspections

Discharger: Florida Juice, Inc.
County: Polk
NPDES Number: FL0001457
Permit Expiration Date: 30 September 1996

Toxics Sampling Inspection (XSI)

Date Sampled: 29 April 1996

Results: Extremely low levels of the herbicides, atrazine (0.047 µg/L), simazine (0.11 µg/L), and norflurazon (0.028 µg/L) were detected in the effluent. These concentrations are below acutely or chronically toxic levels (AQUIRE 1991). Of the metals analyzed for, iron (2,510 µg/L) was detected in the effluent at a level above Class III standards (a violation of Rule 62-302.530(39) FAC).

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 29 April 1996

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: 29 April 1996

Results: Measures of macroinvertebrate health indicated both the reference and test sites showed signs of moderate disturbance, predominantly due to poor habitat. The discharge, however, appeared to make conditions somewhat worse at the test site. For example, in the Hester-Dendy samples, minor to moderate declines in taxa richness, the Florida Index, the % filter-feeders, and Shannon-Weaver diversity were observed between the upstream and downstream stations. Additional stressors at the test site (*e.g.*, lower dissolved oxygen, or perhaps variable effluent quality) probably were responsible for the slightly more disturbed conditions there. Periphyton density was elevated at both receiving water stations. Chlorophyll *a* increased from 17.3 mg/m^2 at the reference site to 22.3 mg/m^2 at the test site, values which exceed those found in 80% of other Florida streams.

Water Quality Inspection (WQI)

Date Sampled: 29 April 1996

Results: Dissolved oxygen did not comply with Class III standards at the test site (4.2 mg/L), a violation of Rule 62-302.530(31) FAC. Fecal and total coliform values complied with Class III water quality standards in the effluent and at the receiving water sites. Total phosphorus and ammonia concentrations at the reference and test sites were higher than those found in 85% to 90% of other Florida streams. The effluent contributed to the elevated nitrate-nitrite concentration of the test site (0.92 mg/L), since the reference site value was lower (0.56 mg/L). Effluent NO_2NO_3 was 1.4 mg/L. Algal Growth Potential (AGP) greatly exceeded the 5 mg dry wt/L "problem threshold" at both the reference site (44.3 mg dry wt/L) and at the test site (64.6 mg dry wt/L). The effluent AGP was 60.4 mg dry wt/L. The elevated nutrient and AGP levels at the reference site appeared to be the result of stormwater nutrient inputs. The higher test site AGP indicated the influence of the discharge, especially with respect to its nitrate-nitrite contribution.

Introduction

Florida Juice, Incorporated, is a citrus processing plant located approximately two miles west of Lakeland, south of Interstate 4, in Polk County, Florida (see map in Appendix). The plant is operational only from October to May each year. Wastewater from this 2.37 MGD facility is routed across two shaker screens for removal of solids and then released to three aerated settling basins. Ferric sulfate is added in the third basin (to aid flocculation), and then the wastewater passes through a sand filtration system. This treated wastewater is pumped across a riffle board to an unnamed Class III ditch which flows for approximately 0.5 mile before discharging into Itchepackasassa Creek. The average flow from August, 1994, to September, 1995, when the facility was operating, was 0.41 MGD. Average flow for April, 1996, was 0.602 MGD, and was 0.204 MGD on the day of this survey.

State permit limits are as follows: flow (2.37 MGD), temperature (maximum of 33.3 °C), pH (6.0 to 9.0 SU), dissolved oxygen (minimum of 5.0 mg/L), BOD_5 and CBOD (maximum of 20 mg/L), total suspended solids (maximum of 125.0 mg/L), unionized ammonia (maximum of 0.02 mg/L), specific conductance (maximum of 1275.0 µmhos/cm), and fecal coliforms (maximum of 800 organisms/100 mL) (see Facility Summary in Appendix). Additionally, acute toxicity tests are performed on the effluent.

In 1994, an existing consent order (#93-1596) was transferred from Early Juice, Inc. to Florida

Major characteristics of community structure of control and test sites.

	Reference Site	Test Site
Macroinvertebrate Qualitative		
Number of Taxa	37	46
Florida Index	10	9
SCI	23	21
EPT Index	0	0
% Contribution of Dominant Taxon	30.5	73.0
% Oligochaeta	11.8	5.8
% Diptera	22.4	6.6
% Ephemeroptera	0	0
% Trichoptera	0	0
% Amphipoda	30.5	73.0
% Coleoptera	1.6	0.1
% Gastropoda	26.4	12.1
% Other	7.3	2.6
% Predators	4.7	2.4
% Above Surface Deposit Feeders	28.3	39.7
% Below Surface Deposit Feeders	9.6	4.4
% Suspension Feeders	4.9	2.2
% Scrapers	1.8	0.5
% Shredders	23.2	38.7
% Scavengers	0.4	0.1
Macroinvertebrate Hester-Dendy		
Number of Taxa	46	42
Florida Index	19	10
Shannon-Weaver Diversity	3.6	2.8
EPT Index	3	3
% Oligochaeta	1.5	1.0
% Diptera	49.9	25.2
% Ephemeroptera	2.1	2.8
% Trichoptera	0.1	0.1
% Amphipoda	31.3	36.0
% Coleoptera	2.4	1.7
% Gastropoda	11.5	33.0
% Other	1.3	0.9
% Predators	8.5	3.0
% Above Surface Deposit Feeders	40.9	32.4
% Below Surface Deposit Feeders	0	0
% Suspension Feeders	3.9	1.3
% Scrapers	7.2	9.8
% Shredders	31.5	27.5
% Scavengers	1.1	0.6
% Parasites	1.2	0.2
Periphyton Algae		
Number of Taxa	17	28
Shannon-Weaver Diversity	2.5	2.9
Algal Density (#/sq. cm)	1,665,154	1,596,156
Chlorophyll a (mg/sq. m)	17.3	22.3
Diatom/Diatom + B-G Abundance Ratio	0.9	0.9
% Blue-green	5.7	10.5
% Green	2.6	6.1
% Diatoms	91.3	83.4
% Other	0.4	0
Algal Growth Potential (mg dry wt/l)	44.3	64.6

Juice, Inc., and modified to require a surface water monitoring plan. In September, 1994, the effluent was toxic to *Cyprinella leedsi*. In October, 1994, the effluent exceeded the permit limit for TSS (with a value of 145 mg/L). Although low dissolved oxygen levels (1.9 mg/L to 3.3 mg/L) and elevated fecal coliforms (1,600 organisms/100 mL) have been observed both upstream and downstream of the discharge, the effluent has consistently met these permit limits. This suggests that stormwater may be contributing to these violations of Class III standards in the unnamed tributary of Itchepackasassa Creek.

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 approximately 200 yds upstream of the discharge in a channelized Class III tributary of Itchepackasassa Creek) and a test site (in the same drainage ditch , approximately 200 yds downstream of the discharge). A habitat assessment was performed *in situ* to establish comparability between sites. Supplemental physical/chemical data were also collected on the effluent and study sites. Acute screening toxicity bioassays, using *Ceriodaphnia dubia* and *Cyprinella leedsi* as test organisms, were performed on an effluent sample (Weber 1991). The effluent was analyzed for metals and for organic constituents (base neutral and acid extractables, and pesticide extractables). Additionally, nutrient analyses were performed on the effluent and study sites. Methods used for all chemical analyses are on file at the Tallahassee DEP Chemistry Laboratory.

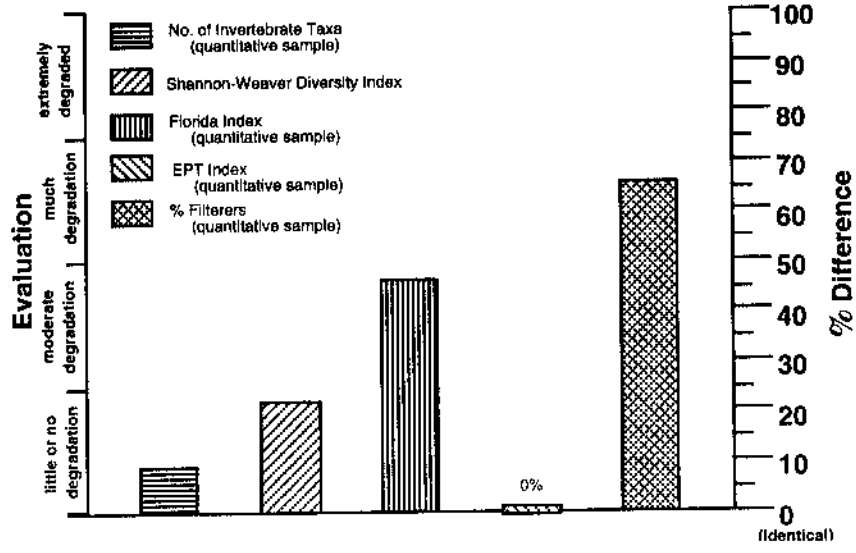
Benthic macroinvertebrate communities were evaluated at the study sites. Invertebrates were collected from multiple substrates (*e.g.*, snags, leaf packs, vegetation) using discrete dip net sweeps. Additional invertebrate collections were accomplished using Hester-Dendy multiplate samplers which were incubated for 28 days (Ross 1990). Periphyton was sampled at 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 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.

Habitat Assessment: Seven attributes known to have potential effects on the stream biota were evaluated and scored, with 20 possible points for each factor. Based on the sum of these individual scores, overall habitat quality is assigned to one of four categories: Optimal (105-140 points); Suboptimal (70-104 points); Marginal (35-69 points); or Poor (0-34 points).

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.



Effect of discharge on the benthic macroinvertebrate community.

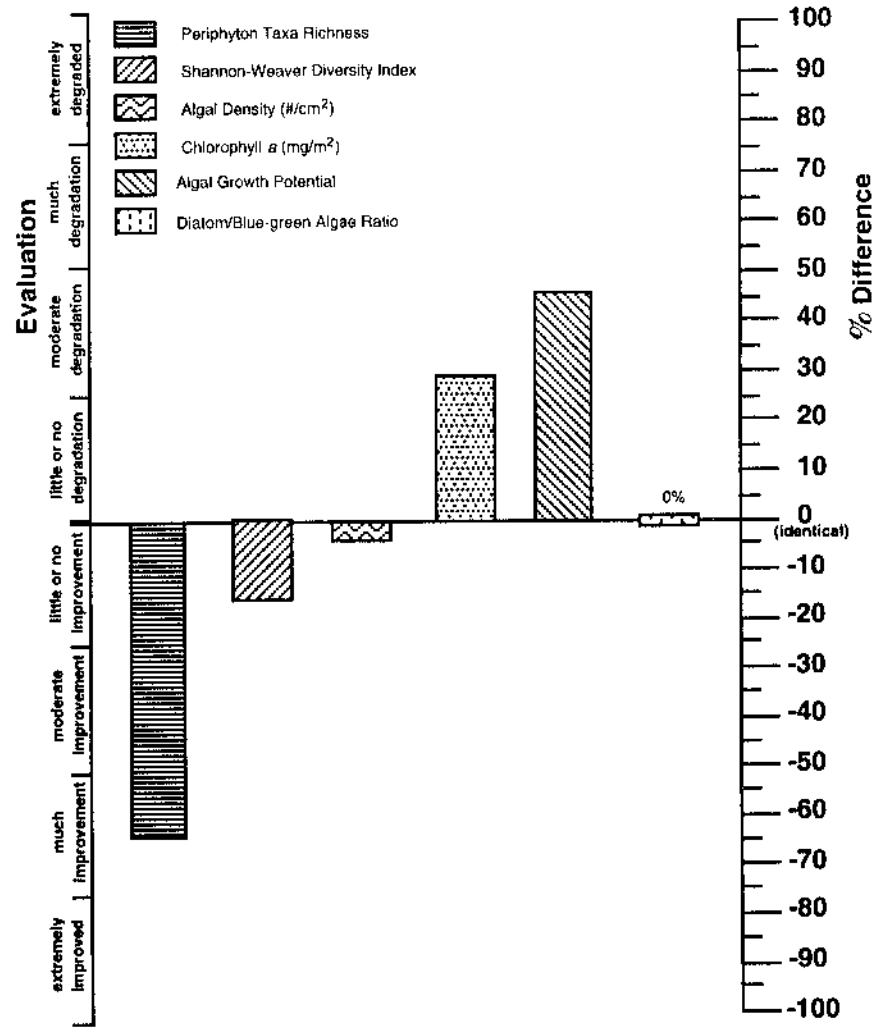
Shannon-Weaver diversity: This index is specified in the Florida Administrative Code as a measure of biological integrity. Low diversity scores are undesirable. They represent conditions where only a few organisms are abundant, to the exclusion of other taxa. Excessive numerical dominance of a single 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 Hudson *et al.* (1990), Lenat (1993), 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.



Effect of discharge on the algal community.

Trophic composition/feeding guilds: Disturbance can shift the feeding strategies of invertebrates. In Florida for example, pollution may be responsible for reducing the numbers of filter-feeders (FDEP 1994) and shredders (EA Engineering 1994).

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

For graphical purposes, the percent differences between the reference and test sites involving the number of taxa, the diversity index, the Florida Index, the EPT Index, the diatom to blue-green algae ratio, 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: Lisa Carter, Brent Johnson, and Anna Luft (DEP SW District) and Lyn Burton, Marshall Faircloth, Russel Frydenborg, Joy Jackson, Kathleen Lurding, Tina Mikulski, Elizabeth Miller, Urania Quintana, Todd Space, Lisa Tamburello, David Whiting, Vicki Whiting, and Greg Wynn (Tallahassee Biology Laboratory). The report was reviewed by the Point Source Studies Review Committee, consisting of Wayne Magley, Jan Mandrup-Poulsen, and Michael Tanski, as well as District representatives.

Results and Discussion

With respect to habitat quality, the reference site (with 79 points) could be classified as "sub-optimal" and the test site (with 53 points) could be classified as "marginal". Both sites received fairly low scores in the categories of bottom substrate, water velocity, artificial channelization, and riparian buffer zone width. The test site lost additional points in the categories of bank stability and riparian zone vegetation quality. This unnamed ditch was obviously affected by stormwater runoff from the surrounding area, much of which consisted of industrial and residential or agricultural land uses.

There were some differences in physical/chemical measurements between the two sites. Dissolved oxygen levels were adequate at the reference site (6.3 mg/L), but did not comply with Class III standards at the test site (4.2 mg/L), a violation of Rule 62-302.530(31) FAC. The pH decreased from 7.3 SU at the reference site to 6.8 SU at the test, while specific conductance increased from 307 µmhos/cm to 442 µmhos/cm at the two study sites, respectively. Temperature decreased from 27.7 °C at the reference site to 24.9 °C at the test site.

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 acute bioassays (Appendix).

Extremely low levels of the herbicides, atrazine (0.047 µg/L), simazine (0.11 µg/L), and norflurazon (0.028 µg/L) were detected in the effluent. These concentrations are below acutely or chronically toxic levels (AQUIRE 1991). Of the metals analyzed for, iron (2,510 µg/L) was detected in the effluent at a level above Class III standards (a violation of Rule 62-302.530(39) FAC).

The effluent TSS (34 mg/L) complied with the permit limit of 125 mg/L. The effluent BOD was 16 mg/L.

Fecal coliform bacteria were measured to be 80 organisms/100 mL in the effluent, 420 organisms/100 mL at the reference site, and 280 organisms/100 mL at the test site. All values complied with Class III water quality standards, and the effluent also met its fecal coliform permit limit. Total coliform counts were 400 organisms/100 mL in the effluent, 1,800 organisms/100 mL at the reference site, and 2,200 organisms/100 mL at the test site. Again, these levels of total coliforms complied with Class III water quality standards.

With the exception of nitrate-nitrite and TKN, effluent nutrient concentrations were lower than the reference site values (see Chemistry Summary Table). Both receiving water sites had similarly elevated levels of total phosphorus (0.62 mg/L the reference site and 0.61 mg/L at the test site), which were higher than the values found in 85% of other Florida streams. Likewise, ammonia concentrations (reference = 0.34 mg/L; test = 0.48 mg/L) were higher than those found in 90% of other Florida streams (see Table of Typical Water Quality Parameters in Appendix). Elevated nutrient levels at the reference site indicate non-point source enrichment from the surrounding area. The effluent, with 1.4 mg/L nitrate-nitrite, contributed to the elevated nitrate-nitrite concentration of the test site (0.92 mg/L), since the reference site value was lower (0.56 mg/L).

Algal Growth Potential (AGP) greatly exceeded the 5 mg dry wt/L "problem threshold" at both the reference site (44.3 mg dry wt/L) and at the test site (64.6 mg dry wt/L) (Raschke and Schultz 1987). The effluent AGP was 60.4 mg dry wt/L. The elevated AGP level at the reference site appeared to be the result of stormwater nutrient inputs. The higher test site AGP indicated the influence of the discharge, especially with respect to its nitrate-nitrite contribution.

Measures of macroinvertebrate health indicated that both the reference and test sites showed signs of moderate disturbance, predominantly due to poor habitat. The discharge appeared to make conditions somewhat worse at the test site. The Figure on p. 2 indicates the degree of difference between the invertebrate populations of the reference and test sites. Larger differences (that is, higher percentages)

correspond with greater degrees of degradation. Negative values mean the test site is better than the reference site.

In the Hester-Dendy samples, declines in taxa richness (46 taxa at the reference site, 42 at the test site), the Florida Index (19 at the reference site, 10 at the test site), and Shannon-Weaver diversity (3.6 at the reference site, 2.8 at the test site) were observed between the upstream and downstream stations. The % filter-feeders decreased by 66% between the reference and test sites. Note that the reference site Hester-Dendys were partially exposed, suggesting that these differences may have been more pronounced than indicated by this data set. The EPT Index was similarly low (with 3 EPTs) at both sites. It is possible the discharge contributed to these moderate decreases in community health, as the lower dissolved oxygen may be related to the elevated effluent BOD$_5$ (16 mg/L), or perhaps variable effluent quality was responsible for the slightly more disturbed conditions there.

In the dip net samples, the Florida Index scores (10 points at the reference site, 9 points at the test site) were reduced when compared to the corresponding Hester-Dendy Florida Index values. The dip net derived EPT Index (0 at both sites) was also lower than the Hester-Dendy EPT Index. The % contribution of the dominant taxon at the test site (with 73.0% of the dip net samples composed of *Hyalella azteca*) indicated worse conditions there than did the corresponding Shannon-Weaver diversity of 2.8. The Stream Condition Index (SCI) scores, with 23 points at the reference site and 21 points at the test site, placed both stations in the low to lowest range of the "good" category (Appendix). In general, the somewhat lower community measures using dip net sampling appears to be related to the poor habitat available in the stream, although the effluent still appeared to exert a slight adverse effect.

The Figure on p. 3 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. Periphyton taxa richness (17 taxa at the reference site, 28 taxa at the test site) and diversity (2.5 at the reference site, 2.9 at the test site) were higher at the test site than at the reference site. The diatom/blue-green ratio (0.9 at both sites) was unchanged by the discharge. Algal density, which was very elevated at both receiving water stations, was 1,665,154 cells/cm^2 at the reference site and 1,596,156 cells/cm^2 at the test site. Chlorophyll *a* increased from 17.3 mg/m^2 at the reference site to 22.3 mg/m^2 at the test site, values which exceed those found in 80% of other Florida streams. These data suggest nutrient enrichment at both sites, perhaps with minor additional contributions from the discharge.

Conclusions

Dissolved oxygen levels were adequate at the reference site (6.3 mg/L), but did not comply with Class III standards at the test site (4.2 mg/L), a violation of Rule 62-302.530(31) FAC.

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

Extremely low levels of the herbicides, atrazine (0.047 µg/L), simazine (0.11 µg/L), and norflurazon (0.028 µg/L) were detected in the effluent. These concentrations are below acutely or chronically toxic levels (AQUIRE 1991). Of the metals analyzed for, iron (2,510 µg/L) was detected in the effluent at a level above Class III standards (a violation of Rule 62-302.530(39) FAC).

Fecal and total coliform values complied with Class III water quality standards in the effluent and at the receiving water sites. The effluent also met its fecal coliform permit limit.

Total phosphorus and ammonia concentrations at the reference and test sites were higher than those found in 85% to 90% of other Florida streams. Elevated nutrient levels at the reference site indicate non-point source enrichment from the surrounding area. The effluent, with 1.4 mg/L nitrate-nitrite, contributed to the elevated nitrate-nitrite concentration of the test site (0.92 mg/L), since the reference site value was lower (0.56 mg/L).

Algal Growth Potential (AGP) greatly exceeded the 5 mg dry wt/L "problem threshold" at both the reference site (44.3 mg dry wt/L) and at the test site (64.6 mg dry wt/L). The effluent AGP was 60.4 mg dry wt/L. The elevated AGP level at the reference site appeared to be the result of stormwater nutrient inputs.

The higher test site AGP indicated the influence of the discharge, especially with respect to its nitrate-nitrite contribution.

Measures of macroinvertebrate health indicated that both the reference and test sites showed signs of moderate disturbance, predominantly due to poor habitat. The discharge, however, appeared to make conditions somewhat worse at the test site. For example, in the Hester-Dendy samples, declines in taxa richness, the Florida Index, the % filter-feeders, and Shannon-Weaver diversity were observed between the upstream and downstream stations. It is possible the discharge contributed to these moderate decreases in community health, as the lower dissolved oxygen may be related to the elevated effluent BOD[5] (16 mg/L), or perhaps variable effluent quality was responsible for the slightly more disturbed conditions there.

Periphyton density, which was very elevated at both receiving water stations, was 1,665,154 cells/cm^2 at the reference site and 1,596,156 cells/cm^2 at the test site. Chlorophyll *a* increased from 17.3 mg/m^2 at the reference site to 22.3 mg/m^2 at the test site, values which exceed those found in 80% of other Florida streams. These data suggest nutrient enrichment at both sites, with perhaps, minor additional contributions from the discharge.

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Chemistry Summary Table for Florida Juice, Inc., collected 29 April 1996.	Effluent	Reference Site	Test Site
Organic Constituents (ug/L)			
Atrazine	0.047 T		
Simazine	0.11 I		
Norflurazon	0.028 T		
Metals (ug/L)			
Aluminum	100 U		
Arsenic	10 U		
Cadmium	0.05 U		
Copper	3 I		
Chromium	10 U		
Iron	2510 A		
Lead	10 U		
Mercury	0.10 U		
Nickel	4 U		
Selenium	30 U		
Silver	0.04 U		
Zinc	10 U		
Nutrients (mg/L)			
Ortho-phosphate	0.004 U	0.55	0.33 A
Total phosphorus	0.41	0.62	0.61
Ammonia	0.27 A	0.34	0.48 A
Nitrate+Nitrite	1.4 A	0.56	0.92
TKN	2.8	1.0	2.1
General Phys-Chem Parameters			
Habitat Assessment		79	53
D.O. (mg/L)	6.4	6.3	4.2
pH (SU)	7.0	7.3	6.8
Conductivity (µmhos/cm)	670	307	442
Temperature (°C)	26.8	27.7	24.9
BOD (mg/L)	16		
TSS (mg/L)	34		
Hardness (mg CaCO3)	122.7		
Algal Growth Potential (mg dry wt/L)	60.4	44.3	64.6
Toxicity			
Bioassay Fish	Not Toxic		
Bioassay Invertebrate	Not Toxic		
Bacteria			
Total Coliforms	400 J	1,800	2,200
Fecal Coliforms	80 J	420	280 J

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

T - Value reported is less than the criterion of detection

J - Estimated Value

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

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

FACILITY SUMMARY

Facility Name: FLORIDA JUICE	Date Summary Prepared: 11/2/95 UPDATED 8-19-96	
Location (attach detailed map):	County: Polk	District: SWD
Federal Permit # FL0001457 and expiration date: 9/30/96	State GMS # and 4053P20092 State expiration date: 3/15/92	Facility Type: (Industrial) Municipal Federal Agricultural Other (list):

Function of facility: Citrus Processing Plant

Description of treatment process:
Wastewater is routed across two shaker screens to remove solids. water is then released to three aerated settling basins. In basin #3 ferric sulfate is added and wastewater is run through a sand filtration system. Treated wastewater is then pumped across a riffle board to the Itchepackasassa Creek.

Receiving waters: Itchepackasassa Creek	Classification: I II (III)	
Design Flow: 2.37 MGD	Mean Flow: 8/94 - 9/95 .411 MGD (AVG)	Flow during survey: 0.204 MGD

Mean flow for April 1996 was 0.602 MGD

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

therefore, the best time to sample is: Citrus Fruit processing season (OCT - MAY)

If facility has a mixing zone, give details (size, parameters affected, etc.): none

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

Parameter	Limit (units)
Flow	2.37 MGD
ph	6.0 - 9.0 st. units
Temp	33.3 °C
DO	5.0 min
BOD5	20.0 mg/L
CBOD5	20.0 mg/L
TSS	125.0
UN-ionized ammonia	0.02 mg/L
Specific Conductance	1275.0 umh/cm
Fecal Coliform	800 cts/ml

Describe special permit conditions and permit modifications:
permit modified on 11/26/91 with changes to SC# 6 for toxicity testing requirements. see Attached permit.

Florida Juice
(Facility)

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Description of permitted outfall(s): At southern most evel of polishing pond 12" Cipoletti weir. Elevation of discharge invert = 1/2 Receiving water bottom depth at point of discharge = 1/2 Ft. After weir, water cascades over a Riffle board prior to dischar

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

DATE	Outfall 001	upstream 001	Downstream 001
10/94	[redacted]	Fecal = 900 cts/100	DO = 4.8 mg/L

only have data through 6/95 at this time. On 3/95, 4/95, and 5/95, the outfall DO Levels are within limits. Upstream and down stream values Range from 1.9 - 3.3 mg/L. On 6/95, the fecals at 001 are within limits. upstream & downstrea are at 1600 cts/100 - Tech support memo of 9/22/94 showed the effluent acutely toxic to C. leedsi

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

WQBEL - Pending - 8/95

SWMP - Approved 7/95

UNDER CO# 93-1596 - ammended on July 15, 1994. Transferred the original CO from Eddy Juice to Florida Juice and required the SWMP

Discuss comparability of MOR results to past DER results and whether there are trends (improving, declining) in the data set: These issues addressed under the consent ORDER, although quality appears to have improved.

Additional information:

Staff contributing to this review (signature):

(Biologist

(Inspector

(Engineer

( )

( )

( )

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:
		4-29-94	1400	Hatchepelaga

REMARKS:	LOCATION:	FIELD ID/NAME:
water level was lower by 1m than at deployment.	Fla. Juice	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)
60			20			4020	

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

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

Width of riparian vegetation (m) on least buffered side: ***List & map dominant vegetation on back***

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

.07 .06 .05

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

Artificially Impounded ☐ yes

High Water Mark (m above bed): 2m

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)	2	2	dipnet	Sand	50-60	2	dipnet
Leaf Packs or Mats	5-10	5	dipnet	Mud/Muck/Silt			
Aquatic Vegetation	5-10	6	dipnet	Other:			
Rock or Shell Rubble				Other:			
Shorezone (Roots/Veg.)	15	5	dipnet	*Draw aerial view sketch of habitats found in 100 m sectio*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m
Top/Surface		27.71	7.26	6.34	307			VOB
Mid-depth								.25m
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): Slightly Tannic: ☑ Green (algae): ☐ Clear: ☐ Other: ☐

Weather Conditions/Notes:
bottom substrate (sand) consistently almost entirely of Corbicula.
light dry

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

SAMPLING TEAM: Carter, Hornsby

SIGNATURE:

DATE: 4-29-

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:
		4/29/96	1030	Itchepackassassa

REMARKS: water level is much lower than when we deployed the HDS. Sed. is sandy/silty/mucky. Flocculent along the shoreline	LOCATION: Florida Juice - Test Site	FIELD ID/NAME: Test Site

~1.75m

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify
~25				~95		50	

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

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

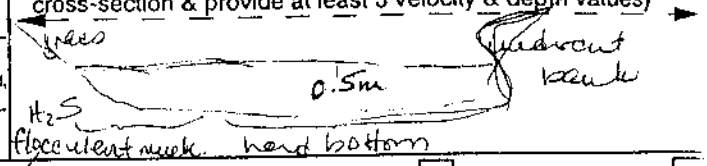
Width of riparian vegetation (m) on least buffered side: 0.5

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)



High Water Mark (m above bed): 3

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

45%

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)	1	2	direct	Sand	65	4	direct
Leaf Packs or Mats	10	3	diving	Mud/Muck/Silt			
Aquatic Vegetation	5	5	direct	Other: under muck	4	3	D
Rock or Shell Rubble				Other:			
Shorezone (Roots/Veg.)	15	3	direct	*Draw aerial view sketch of habitats found in 100 m sectio*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m
Top								NM
Mid-depth								
~~Bottom~~ Surface	0.7	24.82	6.75	4.20	442			

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: ☐ algae? Slick: ☐

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

Color (check box): Tannic: ☐ Green (algae): ☐ Clear: ☐ Other: ☑ Muddy

Weather Conditions/Notes:

Sunny & Clear - 85° F

Black gravel sediment was observed near transect is gone. Silty & mucky.

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

SAMPLING TEAM: BRENT JOHNSON / LISA CARLTON

SIGNATURE:

DATE: 4/29/96

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		4-29-96	Hehepachasassa Creek

REMARKS:	LOCATION:	FIELD ID/NAME:
non-riparian needs growing on facility side of stream	Florida Juice	Test Site

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 [6] Velocity	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 [8]	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
(on side of facility) **Deposition** [11]	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 [7]	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 [3]	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 [8]	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

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

[53] **TOTAL SCORE**

Comments: ACS [illegible] 7 [illegible]

ANALYSIS DATE:	ANALYST:	SIGNATURE:
4/29/96	[illegible]	[signature]

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:
		4-29-96	Hchepeekaska Creek

REMARKS:	LOCATION:	FIELD ID/NAME:
water level was down by 1m! (one)	FLA-JUICE	Reference

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Bottom Substrate/ Available Cover **11**	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 **7**	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 0.06 10 9 8 (7) 6	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec 5 4 3 2 1
Artificial Channelization **10**	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 **14**	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 **14**	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 **9**	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 **14**	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

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

Comments

TOTAL SCORE **79**

ANALYSIS DATE:	ANALYST:	SIGNATURE:
4-29-96	CARTER JOHNSON	Carter L. Johnson

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Florida Juice
County: Polk
Contact / District: B. Johnson / Southwest
NPDES Permit #: FL00
LIMS Sample #: 137284 LIMS Job #: 96-APR-30-26

Sample Collection: Date 4/29/96 Time 1150
Test Beginning: Date 4/30/96 Time 1300
Test Ending: Date 5-2-96 Time 1300
Organism Batch #: 20 Diluent Batch #: 20
Organism Age: 524 hrs
Test Organism: Ceriodaphnia dubia

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

Test Number: 1 of 2

Remarks:

Instrument Calibrations:	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0@7.0 9.0@9.0	23.7@23.7	8.1@26.1 °C	107.9@105.4 1028@1025@25.8 °C
24 hr	7.0@7.0 9.0@9.0	23.3°C@23.4°C	8.3@24.6 °C	107.6@105.4 1026@1025@24.6 °C
48 hr	7.0@7.0 9.0@9.0	23.0@23.0	8.1@26.0 °C	106.1@105.4 1019@1025@25.3°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
CTL	A	5	5	5	8.2	8	8.4	24.1		25.2	7.9		7.5	205		220
CTL	B	5	5	5			8.4			25.1			7.5			230
CTL	C	5	5	5			8.4			25.1			7.5			220
CTL	D	5	5	5			8.4			25.1			7.5			230
100%	A	5	5	5	7.4		9.0	24.3		25.2	7.5		8.6	690		~~230~~ *660
100%	B	5	5	5			9.0			25.2			8.6			650
100%	C	5	5	5			9.0			25.2			8.7			660
100%	D	5	5	5			9.0			25.1			8.7			650
Measured/Loaded by:		MF	MF	JMF	TM		MF	TM		ME	TM		ME	TM		ME
Recorded by:		MF	MF	TM	DB		ME	DB		TM	DB		TM	DB		TM

*660 weight wrong place 5/2/96 TM

Investigators' Signatures

Tina Mikulski
Damien Burke
Marshall Faircloth
Joseph Smith

Reviewer

form updated 5/05/95

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			NOT measured		
Lab Total Residual Cl2 (mg/L):	—	<0.03	<0.03	DR100	DB
Alkalinity (mg/L as $CaCO_3$):	—	80	220	HACH	DB
Hardness (mg/L as $CaCO_3$):	—	85	125	HACH	DB
Total ammonia (mg/L as N):	—	<0.017	<0.017	ORION	JN

Ammonia Meter #98136 Ammonia Meter Slope: -54.4 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Florida Juice
County: Polk
Contact / District: B. Johnson / Southwest
NPDES Permit #: FL00
LIMS Sample #: 137284 **LIMS Job #:** 96-APR-30-26

Sample Collection: Date 4/29/96 Time 1150
Test Beginning: Date 4/30/96 Time 1300
Test Ending: Date 5-2-96 Time 1300
Organism Batch #: 29 **Diluent Batch #:** well
Organism Age: 11 days old
Test Organism: Cyprinella leedsi

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

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	23.7 @ 23.7	8.1 @ 26.1 °C	1079 @ 1054 1028 @ 1025 @ 25.8 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.3°C @ 23.4°C	8.3 @ 24.6 °C	1076 @ 1054 1026 @ 1025 @ 24.6 °C
48 hr	7.0 @ 7.0 9.0 @ 9.2	23.2 @ 23.0	8.1 @ 26.0 °C	1061 @ 1054 1019 @ 1025 @ 25.3 °C

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	24 h	48 h
CTL A	775	5	5	5	7.9	8.3	8.5	25.4	23.9	~~25.5~~	7.9	7.4	7.9	255	250	255
CTL B	26	5	5	5	7.9	8.3	8.5	25.2	23.9	24.1	7.8	7.4	7.8	255	245	250
CTL C	308	5	5	5	7.9	8.3	8.5	25.1	23.9	24.1	7.9	7.5	7.7	255	250	250
CTL D	380	5	5	5	7.9	8.3	8.5	25.0	24.2	24.3	7.9	7.6	7.8	255	250	250
100% A	302	5	5	5	7.2	8.1	8.5	24.2	23.9	24.2	7.1	7.5	7.5	720	720	720
100% B	608	5	5	5	7.2	8.1	8.5	24.1	23.9	24.1	7.1	7.5	7.5	720	720	720
100% C	700	5	5	5	7.2	8.1	8.5	24.1	23.9	24.1	7.1	7.5	7.5	720	720	725
100% D	79	5	5	5	7.2	8.1	8.5	24.1	24.2	24.1	7.2	7.5	7.5	725	725	725
										*24.2 calculated mortality 5/4/96 TM						
Measured/Loaded by:		TM	MF	JMF	TM	MF	ME	TM	MF	MF	TM	MF	ME	TM	MF	ME
Recorded by:		MF	MF	TM	DB	DB	TM	DB	DB	TM	DB	DB	TM	DB	DB	TM

Investigators' Signatures
Tina M. Kulaski
Tom Burke Donna Burke
Maria Fairbrother
Joseph Mazza
reviewer
form updated 5/05/95

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			NOT	measured	
Lab Total Residual Cl2 (mg/L):	<0.03	—	<0.03	DR100	DB
Alkalinity (mg/L as $CaCO_3$):	130	—	226	HACH	DB
Hardness (mg/L as $CaCO_3$):	135	—	125	HACH	DB
Total ammonia (mg/L as N):	<0.017	—	<0.017	Orion	JN

Ammonia Meter #98136 Meter Slope: -54.4
Ammonia Blank: <0.017
Control Salinity: 0 ppt
Sample Salinity: 0 ppt

FLORIDA JUICE

REFERENCE SITE

Summer Index Period: Stream Condition Index for Florida (SCI) (April 1996)													
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	Panhandle			Score	Peninsula			Score	Northeast			Score
		5	3	1		5	3	1		5	3	1	
Total Number of Taxa	37	≥ 31	30-16	<16		≥ 26	25-14	<14	5	≥ 22	21-12	<12	
EPT Index	0	≥ 7	6-4	<4		≥ 4	3-2	<2	1	-	≥2	<2	
# Chironomid Taxa	15	≥9	8-5	<5		≥7	6-4	<4	5	≥7	6-4	<4	
% Contribution of Dominant Taxon	30.5	≤22	23-61	>61		≤29	30-64	>64	3	≤31	32-66	>66	
% Diptera	22.4	-	≤50	>50		-	≤37	>37	3	-	≤47	>47	
Florida Index	10	≥ 16	15-8	<8		≥7	6-4	<4	5	≥ 8	7-4	<5	
% Suspension feeders/Filterers	4.9	≥ 12	11-6	<6		-	≥7	<7	1	-	≥7	<7	
Total Score		Panhandle				Peninsula			23	Northeast			
Interpretation of Score		Excellent			27-33	Excellent			26-32	Excellent			25-29
		Good			21-26	Good			20-25	Good			19-24
		Poor			14-20	Poor			13-19	Poor			13-18
		Severely Degraded			7-13	Severely Degraded			7-12	Severely Degraded			7-12

TEST SITE

Summer Index Period: Stream Condition Index for Florida (SCI) (April 1996)													
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	Panhandle			Score	Peninsula			Score	Northeast			Score
		5	3	1		5	3	1		5	3	1	
Total Number of Taxa	46	≥ 31	30-16	<16		≥ 26	25-14	<14	5	≥ 22	21-12	<12	
EPT Index	0	≥ 7	6-4	<4		≥ 4	3-2	<2	1	-	≥2	<2	
# Chironomid Taxa	21	≥9	8-5	<5		≥7	6-4	<4	5	≥7	6-4	<4	
% Contribution of Dominant Taxon	73.0	≤22	23-61	>61		≤29	30-64	>64	1	≤31	32-66	>66	
% Diptera	6.6	-	≤50	>50		-	≤37	>37	3	-	≤47	>47	
Florida Index	9	≥ 16	15-8	<8		≥7	6-4	<4	5	≥ 8	7-4	<5	
% Suspension feeders/Filterers	2.2	≥ 12	11-6	<6		-	≥7	<7	1	-	≥7	<7	
Total Score		Panhandle				Peninsula			21	Northeast			
Interpretation of Score		Excellent			27-33	Excellent			26-32	Excellent			25-29
		Good			21-26	Good			20-25	Good			19-24
		Poor			14-20	Poor			13-19	Poor			13-18
		Severely Degraded			7-13	Severely Degraded			7-12	Severely Degraded			7-12

Benthic macroinvertebrate taxa list for Florida Juice Inc., collected via Hester-Dendy artificial substrates, in Itchepackasassa Creek, on 29 April 1996. Densities in #/m^2, represent the mean of three replicates.

	Reference Site	Test Site
Hirudinea		
Desserobdella phalera	–	14
Gloiobdella elongata	2	–
Helobdella fusca	24	4
Helobdella stagnalis	4	18
Placobdella translucens	–	2
Gastropoda		
Amnicola dalli johnsoni	111	897
Ferrissia sp.	–	4
Hebetancylus excentricus	14	60
Littoridinops monroensis	30	–
Micromenetus dilatatus	4	–
Micromenetus floridensis	–	2
Physella sp.	44	101
Planorbella duryi	2	2
Ancylidae	26	129
Gastropoda	4	8
Pelecypoda		
Pisidiidae	–	8
Amphipoda		
Hyalella azteca	637	1298
Ephemeroptera		
Caenis sp.	–	6
Stenonema sp.	–	2
Stenonema smithae	–	36
Stenacron sp.	26	20
Stenacron interpunctatum	18	40
Odonata		
Argia fumipennis	–	2
Argia sedula	–	2
Enallagma cardenium	22	8
Ischnura sp.	–	6
Ischnura ramburi	2	–
Zygoptera	2	6
Coleoptera		
Dineutus sp.	46	44
Stenelmis sp.	2	16
Microcylloepus pusillus	2	2
Trichoptera		
Cheumatopsyche sp.	2	–
Trichoptera	–	4

Diptera		
Ablabesmyia mallochi	2	14
Ablabesmyia rhamphe grp.	2	10
Asheum beckae	2	24
Atrichopogon sp.	89	–
Chironomus sp.	–	2
Cladopelma sp.	2	–
Corynoneura sp.	4	–
Corynoneura sp. C Epler	2	–
Cryptotendipes sp.	–	2
Dicrotendipes modestus	14	36
Dicrotendipes simpsoni	–	4
Endochironomus subtendens	2	2
Glyptotendipes sp.	145	698
Goeldichironomus sp.	–	2
Kiefferulus sp.	–	2
Labrundinia sp.	4	–
Labrundinia neopilosella	2	–
Labrundinia pilosella	20	–
Nanocladius sp.	2	2
Palpomyia/Bezzia grp.	2	–
Parachironomus carinatus	–	2
Paratanytarsus sp.	2	2
Paratanytarsus sp. A Epler	24	–
Paratanytarsus sp. B Epler	4	–
Paratendipes albimanus	–	2
Pentaneura inconspicua	2	–
Phaenopsectra punctipes grp.	2	–
Polypedilum convictum grp.	24	–
Polypedilum halterale grp.	4	–
Polypedilum illinoense grp.	431	–
Polypedilum scalaenum grp.	38	10
Rheocricotopus robacki	2	–
Rheotanytarsus distinctissimus grp.	10	–
Rheotanytarsus exiguus grp.	4	–
Tanytarsus sp.	6	–
Tanytarsus sp. A Epler	20	8
Tanytarsus sp. C Epler	52	26
Tanytarsus sp. L Epler	2	–
Tanytarsus sp. M Epler	2	–
Tanytarsus sp. T Epler	2	6
Chironomidae	93	67

Benthic Macroinvertebrate taxa list for Florida Juice Inc., collected via 20 dipnet sweeps, in Itchepackasassa Creek, on 29 April 1996.

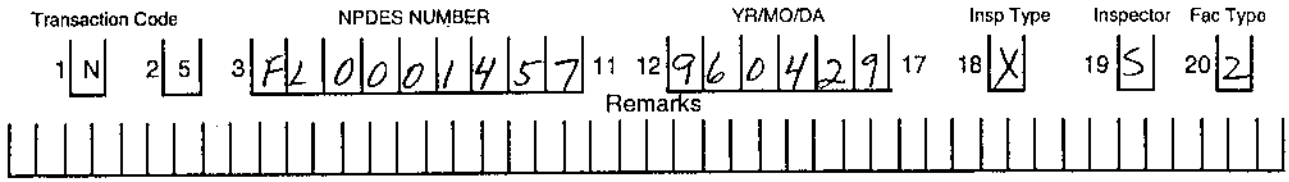
	Reference Site	Test Site
Platyhelminthes		
Dugesia tigrina	1	4
Oligochaeta		
Aulodrilus pigueti	4	26
Dero trifida	8	16
Haber speciosus	4	2
Limnodrilus hoffmeisteri	11	30
Pristina synclites	–	3
Psammoryctides convolutus	–	1
Hirudinea		
Desserobdella phalera	–	4
Helobdella stagnalis	2	18
Hirudinea	–	1
Gastropoda		
Amnicola dalli johnsoni	62	202
Hebetancylus excentricus	2	4
Micromenetus sp.	–	1
Physella sp.	1	1
Pelecypoda		
Corbicula fluminea	9	6
Pisidiidae	–	19
Pelecypoda	–	2
Amphipoda		
Hyalella azteca	75	1257
Decapoda		
Palaemonetes sp.	–	1
Palaemonetes paludosus	2	2
Odonata		
Enallagma cardenium	–	1
Enallagma sp.	1	–
Ischnura sp.	2	4
Macromia sp.	1	–
Progomphus sp.	1	–
Zygoptera	–	2
Hemiptera		
Belostoma sp.	1	–
Ranatra sp.	–	1
Corixidae	–	1
Coleoptera		
Dubiraphia sp.	1	1
Microcylloepus pusillus	1	–
Peltodytes sp.	1	–
Stenelmis sp.	1	–

Diptera		
Ablabesmyia mallochi	3	1
Asheum beckae	–	1
Atrichopogon sp.	1	–
Chironomus sp.	11	8
Clinotanypus sp.	–	2
Cryptotendipes sp.	1	–
Dicrotendipes sp.	–	1
Dicrotendipes modestus	–	5
Dicrotendipes simpsoni	–	2
Endochironomus subtendens	–	1
Glyptotendipes sp.	12	46
Goeldichironomus sp.	–	1
Nanocladius sp.	1	1
Palpomyia/Bezzia grp.	–	2
Parachironomus hirtalatus	–	1
Paralauterborniella nigrohalterale	1	2
Paratanytarsus sp. a epler	–	2
Polypedilum halterale grp.	2	4
Polypedilum illinoense grp.	9	15
Polypedilum scalaenum grp.	4	1
Procladius sp.	1	5
Rheotanytarsus exiguus grp.	–	1
Stempellinella sp.	1	1
Tanytarsus sp.	1	2
Tanytarsus sp. A Epler	–	5
Tanytarsus sp. C Epler	1	1
Tanytarsus sp. L Epler	1	–
Tanytarsus sp. S Epler	2	–
Tanytarsus sp. T Epler	–	1
Tribelos jucundus	2	–
Tribelos sp.	1	–
Chironomidae	–	1

Periphyton taxa list and densites (#/cm^2) for Florida Juice, Inc., collected via diatometer in Itchepackasassa Creek, on 29 April 1996.

	Reference Site	Test Site
Cyanophyceae		
Chamaesiphon sp.	55,198	–
Dactylococcopsis sp.	–	6,900
Gloeocapsa sp.	–	2,300
Gomphosphaeria sp.	39,866	131,096
Lyngbya sp.	–	2,300
Marssoniella sp.	–	6,900
Merismopedia sp.	–	11,500
Oscillatoria sp.	–	6,900
Chrysophyceae		
Lagynion sp.	6,133	–
Bacillariophyceae		
Achnanthes exigua	729,847	627,883
Achnanthes hauckiana	3,067	–
Achnanthes lanceolata	239,193	188,595
Achnanthes minutissima	–	2,300
Cocconeis placentula	269,859	135,696
Cyclotella meneghiniana	9,200	29,899
Eunotia pectinalis	–	4,600
Gomphonema parvulum	21,466	22,999
Navicula cocconeiformis	12,266	11,500
Navicula minima	233,060	275,992
Navicula pupula	–	3,067
Nitzschia sp.	–	2,300
Nitzschia gracilis	–	4,600
Nitzschia microcephala	–	6,900
Nitzschia palea	–	18,400
Chlorophyceae		
Ankistrodesmus sp.	–	13,800
Characium sp.	–	9,200
Chlamydomonas sp.	9,200	–
Coelastrum sp.	–	2,300
Dictyosphaerium sp.	–	2,300
Gloeocystis sp.	3,067	–
Kirchneriella sp.	–	4,600
Pediastrum sp.	–	2,300
Scenedesmus sp.	3,067	52,899
Stigeoclonium sp.	24,533	6900
Tetraedron sp.	3,067	–
Tetrastrum sp.	–	2,300

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



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

