

Biological Assessment of

Dade City Wastewater Treatment Plant

Pasco County

NPDES #FL0020273

Sampled January 1992

June 1992

Biology Section
Division of Technical Services

Department of Environmental Regulation

Results of Fifth Year Inspections

Discharger: Dade City Wastewater Treatment Plant
County: Pasco
NPDES Number: FL0020273
State Permit Expiration Date: 30 September 1992

Toxics Sampling Inspection (XSI)

Date Sampled: 13 January 1992

Results: No organic priority pollutants detected. The metals cadmium (0.2 µg/L), copper (14 µg/L), iron (23 µg/L), and silver (0.2 µg/L) were measured in the sample. The concentration of silver in the sample violated Class III standards, 17-302.560(FAC).

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 13 January 1992

Results: Acutely toxic to *Ceriodaphnia dubia*, not toxic to *Notropis leedsi*

Impact Bioassessment Inspection (IBI)

Date Sampled: 13 January 1992

Results: Populations of benthic macroinvertebrates were influenced by the different types of habitat present at the study sites, making a direct evaluation of the effects of the discharge difficult. Dip net samples suggested that macroinvertebrates were stressed at the test site, while results from Hester-Dendy samplers indicated that the test site was less affected. However, both data sets showed decreases in the Florida Index and the reduction or elimination of sensitive groups (ephemeropterans and trichopterans) downstream of the discharge. This may have been related to the toxicity of the effluent. Phytoplankton results did not correspond to the extremely high nutrient and AGP measurements. Although chlorophyll *a* was nearly twice as high at the test site, it was not high enough to indicate a problem. Phytoplankton may be flushed some distance downstream of the WWTP before blooms occur. Additional sampling for chlorophyll *a* conducted on 28 April 1992 showed that algal biomass had increased downstream of the WWTP (up to 5.4 µg/L of chlorophyll *a*) since the initial sampling.

Water Quality Inspection (WQI)

Date Sampled: 13 January 1992

Results: Elevated concentrations of bioavailable nutrients in the effluent: O-PO_4 (1.5 mg/L) and NO_2NO_3 (7.4 mg/L). Nutrient enrichment observed at the test site : T-PO_4 and O-PO_4 (1.7 and 1.6 mg/L, respectively) and NO_2NO_3 (7.7 mg/L). A very high algal growth potential of 126 mg dry wt/L was measured at the test site. At the reference site, all nutrients except TKN were undetected, and AGP was 0.2 mg dry wt/L. Fecal coliforms were above standards at the test site (880 organisms/100 ml), but not in the effluent.

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

Introduction

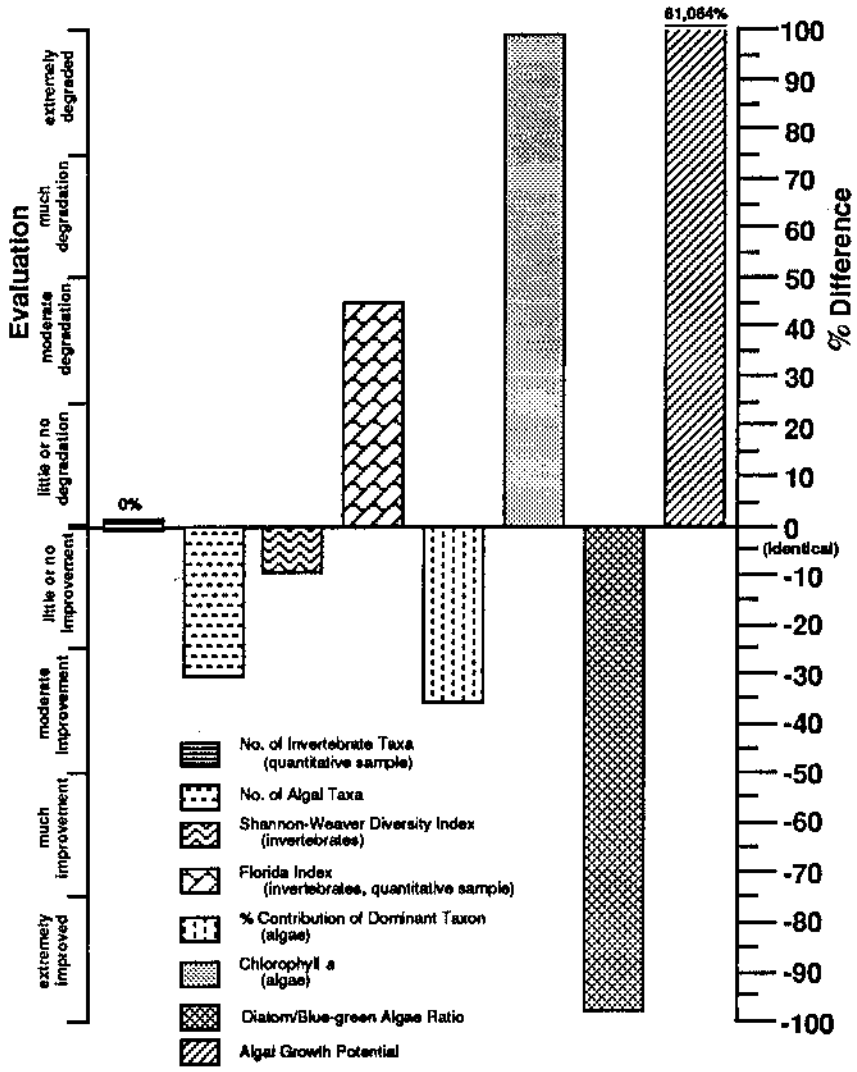
The Dade City Wastewater Treatment Plant, located in Pasco County, is a 1.5 MGD contact stabilization domestic waste facility (see map in Appendix). Dechlorinated effluent is discharged to the Class III Withlacoochee River via the (man-made) Larkin Canal that was cut through historic wetlands. Permit limits are as follows: BOD (10 mg/L), TSS (10 mg/L), fecal coliforms (200 organisms/100 ml as monthly or annual average), dissolved oxygen (6.0 mg/L minimum), organic nitrogen (3.0 mg/L), ammonia (2.0 mg/L), flow (1.5 MGD maximum), and pH (between 6 and 9 standard units) (see Appendix). The plant began operating in May, 1987. No major upsets or violations of permit parameters have been recorded since that time.

Methods

The focus of this investigation was to determine the discharger's effects on the receiving waters. A comparison of biological community health was made between a reference site (located in the Withlacoochee River) and a test site (in Larkin Canal, down gradient of the discharge) (see map in Appendix). An unusual situation occurred in Larkin Canal during the month of January, influencing the choice of study sites. Generally, the flow in the canal runs north from Dade City to the Withlacoochee River via some swampy areas and a small lake. Low water levels caused the flow in Larkin Canal

Major characteristics of community structure of control and test sites.

	Reference Site	Test Site
Macroinvertebrate Qualitative		
Number of Taxa	34	15
Florida Index	8	3
% Contribution of Dominant Taxon	18.7	34.9
% Diptera	70.3	39.5
% Hemiptera	0	34.9
% Malacostraca	13.2	4.7
% Ephemeroptera	11.0	4.7
% Coleoptera	2.2	0
% Pelecypoda	1.1	7.0
% Other	2.2	9.4
% Predators	17.6	57.3
% Collector-Gatherers	46.2	19.4
% Collector-Filterers	13.3	12.0
% Scrapers	13.8	6.2
% Shredders	7.6	5.1
% Piercers	1.1	0
% Parasites	0.4	0
Macroinvertebrate Hester-Dendy		
Number of Taxa	25	25
Florida Index	9	5
Shannon-Weaver Diversity	3.42	3.75
% Diptera	61.6	31.4
% Gastropoda	2.7	59.1
% Ephemeroptera	30.4	0
% Hirudinea	0.9	4.4
% Odonata	0.9	3.6
% Other	3.6	0.7
% Predators	29.1	7.4
% Collector-Gatherers	30.4	20.4
% Scrapers	25.5	61.2
% Collector-Filterers	12.0	4.1
% Shredders	1.1	4.7
% Other	1.9	2.2
Phytoplankton Algae		
Number of Taxa	13	17
% Contribution of Dominant Taxon	31.7	20.2
Chlorophyll a (µg/L)	0.86	1.71
Diatom/Diatom + B-G Abundance Ratio	0.43	1.85
% Blue-green	31.7	12.8
% Green	26.8	16.0
% Diatoms	24.4	71.3
% Cryptophytes	14.6	0
% Chrysophytes	2.4	0
Algal Growth Potential (mg dry wt/l)	.206	125.997



Effect of discharge on receiving stream
(measured as difference between control and test sites).

to reverse and travel south. The origin and pattern of this unusual water flow are not well understood. Therefore, the test site was established in the area which normally would have been upstream of the discharge. Since no suitable control existed in Larkin Canal, a reference site was chosen in the Withlacoochee River. 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 *Notropis leedsi* as test organisms, were performed on an effluent sample (Weber 1991). The effluent was analyzed for metals and for organic constituents (base neutral and acid extractables, and pesticide extractables). Additionally, nutrient analyses were performed on effluent, reference, and test sites. Methods used for all chemical analyses are on file at the Tallahassee DER Chemistry Laboratory.

Benthic macroinvertebrate communities were evaluated at reference and test 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). Phytoplankton was sampled at both reference and test sites via subsurface grab samples Chlorophyll a was also determined for 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 in this report. Many of these, such as the number of taxa, Shannon-Weaver Diversity Index, and chlorophyll *a* are well known. Others are briefly explained here. 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 (*i.e.*, many clean-water organisms are present). Excessive numerical dominance of a single type of organism (a high % contribution of dominant taxon) is usually associated with disturbance. 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. The determination of the Quantitative

Stability Index (for taxonomic % composition) is a two step process. First, the relative proportions of major taxonomic groups are calculated for each site. Then, the lesser of the two percentages for each discrete taxonomic group is totaled. A QSI (% composition) of 100% means that the two sites being compared are identical. This same type of procedure is used for calculating the QSI (functional feeding groups).

For graphical purposes, the percent differences between the reference and test sites involving the number of taxa, the diversity index, Florida Index and the diatom to blue-green algae ratio are measured as the reference site minus test site divided by the reference site. The percent differences between sites involving the percent contribution of dominant taxon, 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: Pat Fricano, Peggy Morgan, and Kathryn Hicks (DER Southwest District), and Lyn Burton, Russel Frydenborg, Kathleen Lurding, and Sandy McClure (Tallahassee Biology Laboratory).

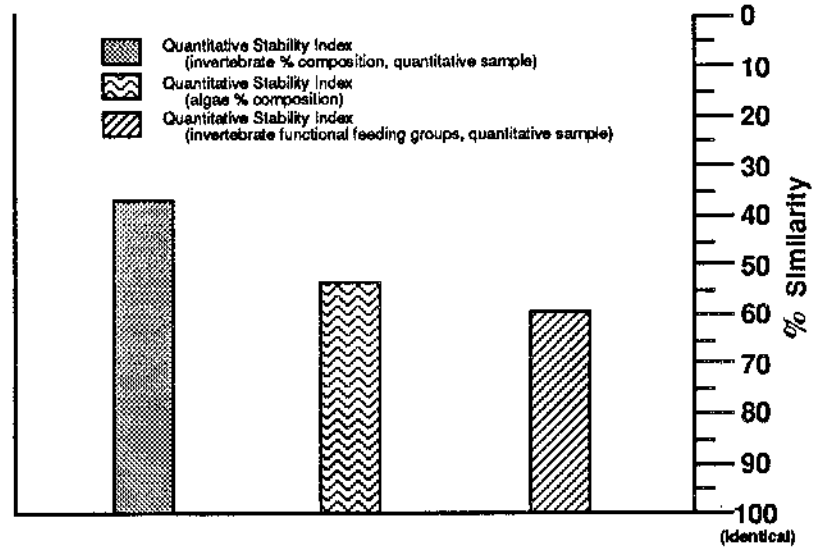
Results and Discussion

Habitat scores for the two study areas were similar (66 and 61 for reference and test sites, respectively), although there were differences in the size and origin of the two systems. The reference site was characterized by a sandy bottom with nearly half the area covered by leaf packs and woody debris. The test site had more muddy substrate and was dominated by aquatic vegetation. The reference site (in the Withlacoochee River) was wider and deeper than the test site (in Larkin Canal), but water velocity at both stations was basically the same (0.09 and 0.08 m/s at reference and test sites, respectively). Dissolved oxygen was adequate at both sites (above 7.8 mg/L). The water was slightly alkaline (pH = 7.9 at the reference site and 7.8 in Larkin Canal). Specific conductance was slightly higher at the test site (510 µmhos/cm) as compared to the 320 µmhos/cm measured at the reference site (Appendix).

The effluent sample was acutely toxic to the invertebrate, *Ceriodaphnia dubia*, in the 48 hour screening bioassay (a violation of 17-302.510(5)(p) FAC, 17-302.500(1)(d) FAC, and 17-4.244(3)(a) FAC). All of the fish, *Notropis leedsi*, survived exposure to the plant discharge.

No organic priority pollutants were present in the effluent at levels above detection limits. The metals cadmium (0.2 µg/L), copper (14 µg/L), iron (23 µg/L), and silver (0.2 µg/L) were measured in the sample. While aluminum and zinc were also detected in the sample, sufficient amounts of these two metals were found in the field blank, to suggest a source of aluminum and zinc other than the effluent. It was determined, however, that the concentration of silver in the sample was in violation of the Class III standard of 0.07 µg/L. It should be noted that 0.2 µg/L is less than the DER Laboratory's practical quantitation limit for silver.

Nutrient concentrations in the effluent were extremely high, particularly nitrate-nitrite and phosphorus-containing compounds (see Chemistry Summary Table in Appendix). Nutrient levels measured at the test site indicated severe enrichment. STORET data from 1617 Florida stream stations, for the period of 1980 to 1989, have been compiled into a percent distribution, which can be found in the Appendix (Joe Hand, personal communication). Data from this present investigation were evaluated against these values. Concentrations of total phosphorus, ortho-phosphorus, and nitrate-nitrite



Effect of discharge on receiving stream
(measured as similarity between control and test sites).

were all higher than 95% of typical Florida streams. In fact, the NO_2NO_3 measured at the test site (7.7 mg/L) was more than seven times that of the 95th percentile statewide concentration of 1.05 mg/L, suggesting that Larkin Canal is dominated by the effluent. In contrast, nutrients were below detection limits at the reference site, with the exception of a small amount of TKN (see chemistry summary table).

At the test site, algal growth potential was several orders of magnitude higher than that of the reference station, attributable to the excess bioavailable nutrients found downstream of the facility. At AGP levels above 5 mg dry wt/L, the undesirable consequences of nutrient enrichment are likely to occur, including excessive algal or macrophyte growth, low dissolved oxygen, and fish kills (Raschke and Schultz 1987). The AGP of 126 mg dry wt/L measured at the test site far exceeded this problem threshold.

Populations of coliform bacteria were analyzed in water samples from effluent, reference, and test sites. Total coliform densities were >1200 organisms/100 ml at each station. Since the ambient standard for a single sampling is 2400 organisms/100 ml, it could not be determined if the total coliform standard was violated in any sample. Fecal coliforms were measured to be 100 organisms/100 ml in the effluent, 168 organisms/100 ml at the reference site, and 880 organisms/100 ml at the test site. The fecal coliform standard was exceeded at the test site. Since fecal coliform levels were lower in the effluent at the time of sampling, this suggests that the bacterial contamination may be intermittent (perhaps due to variable chlorination, etc.).

Benthic macroinvertebrate communities sampled by dip net sweeps appeared to be influenced by the differences in habitat and substrate type between Larkin Creek and the Withlacoochee River. Taxa richness at the reference site was more than double that of the test site (see taxa list in Appendix), and Florida Index decreased from 8 to 3 at reference and test sites, respectively. Although 70.3% of the population at the reference site were dipterans, this group was represented by 22 taxa. The test site was dominated by the hemipteran predator, *Ranatra buenoi*, which is considered indifferent to water quality. A wide variety of other groups of invertebrates was found in the Withlacoochee snag/leaf pack habitat.

Macroinvertebrate data collected with Hester-Dendy artificial substrates help to alleviate the variation in physical habitat between study sites. The figure on p. 2 indicates the degree of difference between 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 figure on p. 3 summarizes similarities between the sites. Smaller similarities (lower percentages) generally correspond with greater degradation. In this particular case, though, the lack of similarity between macroinvertebrate communities at the two sites was probably related to the different habitats present, as well as to water quality.

Taxa richness and Shannon-Weaver diversity from Hester-Dendy samplers were similar at both sites (see table and figures). The Florida Index was 44% lower at the test site, indicating that some pollution sensitive taxa were unable to survive there. This is consistent with the observation that the effluent was acutely toxic to an invertebrate. It is possible that the toxicity present prevented the dominance of any one organism, thereby artificially increasing the Shannon-Weaver diversity. It should be noted that sensitive groups, such as ephemeropterans and trichopterans, were severely reduced or eliminated downstream of the discharge in both data sets.

Phytoplankton was more abundant and more diverse at the test site, although densities were relatively low at both areas. In flowing systems, the phytoplankton is usually a minor component of the algal community, and is often made up of attached algae (periphyton) that has become dislodged from its substrate. Due to the vandalism of periphyton racks, phytoplankton samples were all that was available to characterize algal communities. Percent composition of the three major algal groups was nearly equal in the Withlacoochee (24.4 to 31.7%), with cyanophytes in the largest proportion. Community structure at the test site was more similar to that expected from a periphyton sample, with diatoms in the greatest proportion (71.3%). The increased amount of vegetative substrate available for algal growth (and subsequent sloughing) offered by the extensive macrophyte growth may account for some of these differences in algal species composition. The high concentrations of bioavailable nutrients in Larkin Canal should have contributed to an extensive algal bloom. While chlorophyll *a* was 99% higher at the test site (corresponding to the increased algal density there), it was not high enough to indicate a problem. Phytoplankton may be flushed some distance downstream of the WWTP before blooms occur. Since this study was performed during the winter, it is also possible that cold tempera-

tures inhibited algal growth. Additional sampling for chlorophyll *a* conducted on 28 April 1992 showed that algal biomass had increased downstream of the WWTP (up to 5.4 µg/L of chlorophyll *a*) since the initial sampling

Conclusions

The effluent sample collected from the Dade City Wastewater Treatment Plant was toxic to *Ceriodaphnia dubia* in the 48 hour static acute toxicity bioassay, a violation of 17-302.510(5)(p) FAC, 17-302.500(1)(d) FAC, and 17-4.244(3)(a) FAC. The sample was not toxic to *Notropis leedsi*. No organic priority pollutants were detected in the discharge sample. The metals cadmium, copper, iron, and silver were present. The 0.2 µg/L of silver violated Class III freshwater standards.

Concentrations of bioavailable nutrients were extremely high in the effluent and in waters from the downstream study site. Levels of total phosphorus and ortho-phosphate (1.7 and 1.6 mg/L, respectively) and NO_2NO_3 (7.7 mg/L) at the test site were higher than 95% of typical Florida streams. This severe enrichment in Larkin Creek was further exhibited by an algal growth potential result of 126 mg dry wt/L, well exceeding the 5 mg dry wt/L problem threshold.

Populations of benthic macroinvertebrates were strongly influenced by the types of habitat present, making a direct evaluation of the effects of the discharge difficult. In Larkin Creek, extensive growth of aquatic macrophytes was favored by high concentrations of bioavailable nutrients. Conversely, the Withlacoochee River was characterized mostly by snags and leaf packs. Dip net samples suggested that macroinvertebrates were stressed at the test site, while results from Hester-Dendy samplers indicated that the test site was more similar to the reference site. However, both data sets showed decreases in the Florida Index and the reduction or elimination of sensitive groups (ephemeropterans and trichopterans) downstream of the discharge. This may have been related to the toxicity of the effluent.

Phytoplankton results did not correspond to the extremely high nutrient and AGP measurements. Although chlorophyll *a* was nearly twice as high at the test site, it was not high enough to indicate a problem (1.9 µg/L). Phytoplankton may be flushed some distance downstream of the WWTP before blooms occur. Additional sampling for chlorophyll *a* conducted on 28 April 1992 showed that algal biomass had increased downstream of the WWTP (up to 5.4 µg/L of chlorophyll *a*) since the initial sampling.

Literature Cited

American Public Health Assoc., American Water Works Assoc., and Water Pollution Control Federation. 1989. Standard Methods for the Examination of Water and Wastewater, 17th ed. New York, N.Y. 1268 p.

Miller, W. E., T. E. Maloney, and J. C. Greene. 1978. The Selenastrum capricornutum Printz algal assay bottle test. U. S. Environ. Prot. Agency, EPA-600/9-78-018. 126 p.

Weber, C. I. 1991. Methods for measuring the acute toxicity of effluents to freshwater and marine organisms. 4th edition. EPA/600/4-90/027. U. S. EPA, Cincinnati, Ohio. 216 p.

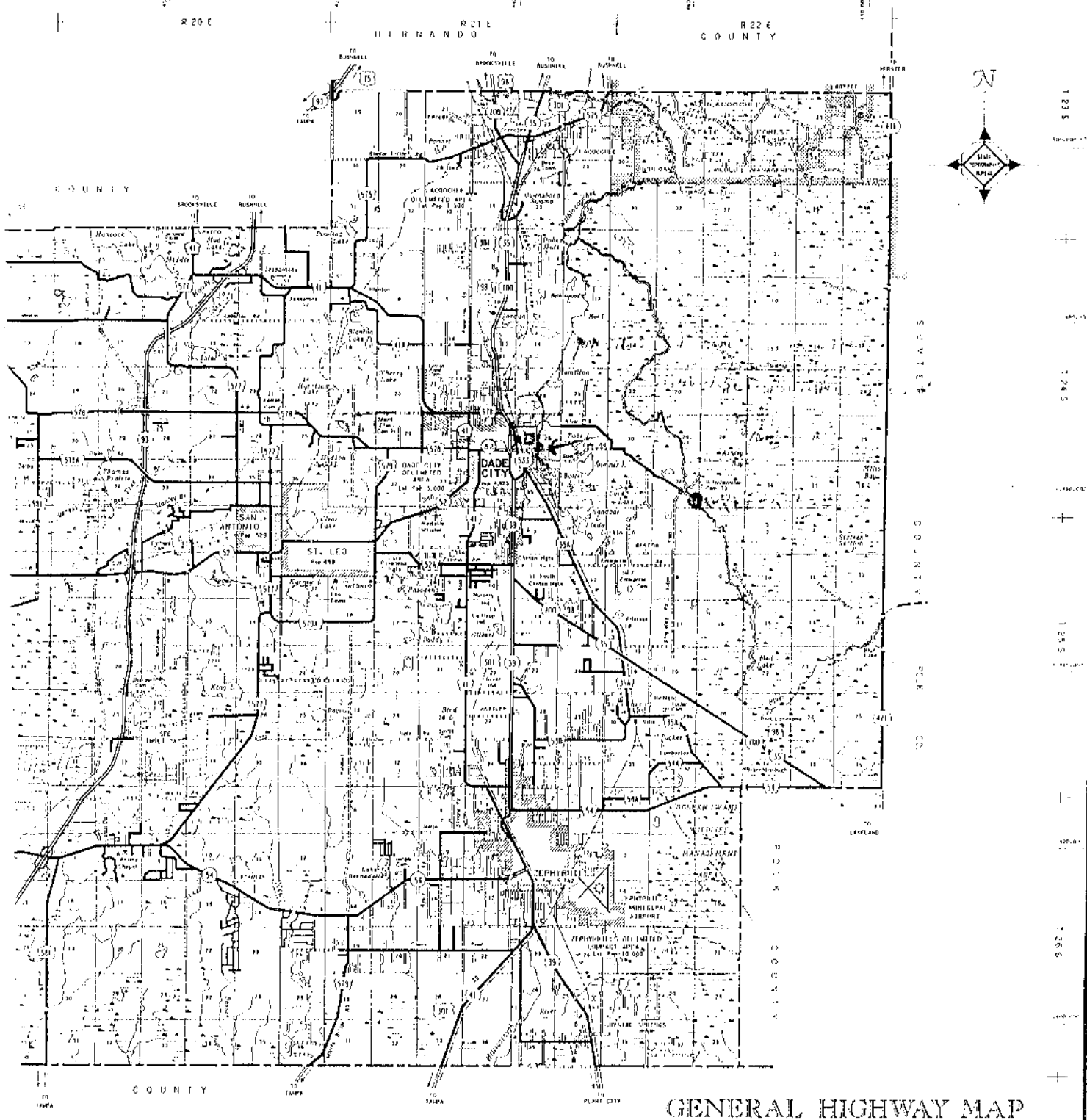
Raschke, R. L. and D. A. Schultz. 1987. The use of the algal growth potential test for data assessment. J. Wat. Poll. Cont. Fed. 59(4): 222-227.

Ross, L. T. 1990. Methods for aquatic biology. Fla. Dept. Environ. Reg. Tech. Ser. 10(1): 1-47.

Chemistry summary table for

Dade City STP	Effluent	Reference Site	Test Site
Organic Constituents (ug/L)			
None Detected			
Metals (ug/L)			
Aluminum	56	Field blank contaminated	
Arsenic	20 U		
Cadmium	0.2		
Copper	14		
Chromium	10 U		
Iron	23		
Lead	1 U		
Mercury	0.1 U		
Nickel	5 U		
Silver	0.2 T		
Zinc	53	Field blank contaminated	
Nutrients (mg/L)			
Ortho-phosphorus	1.5 A	0.04 U	1.6 A
Total phosphorus	1.5	0.05 U	1.7
Ammonia	0.050 A	0.02 U	0.055 A
Nitrate+Nitrite	7.4	0.04 U	7.7 A
TKN	1.2	0.44	1.1
Other Parameters			
Habitat Assessment		66	61
D.O. (mg/L)	8.2	9.8	7.8
pH (SU's)	5.96	7.94	7.82
Conductivity (µmhos/cm)	485	320	510
Temperature (°C)	22.5	19.0	22.5
Hardness (mg CaCO3/L)	140		
BOD5	1.2		
Bioassay Fish-Dechlorinated	Not Toxic		
Bioassay Invertebrate-Dechlorinated	LC50<100%		
Fecal coliform (org/100 ml)	100	168	880
Total coliform (org/100 ml)	>1200	>1200	>1200

A - Value reported is the mean of two or more determinations
L - Actual value is known to be greater than value given
N - Not analyzed for this compound
T - Value reported is less than the practical quantitation limit
U - Material analyzed for but not detected; value reported is the minimum detection

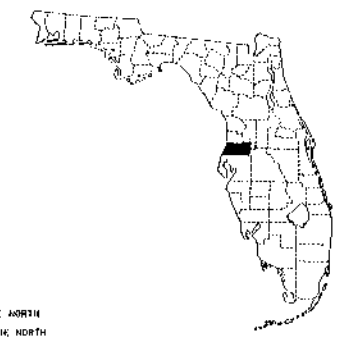


GENERAL HIGHWAY MAP

PASCO COUNTY

FLORIDA

PREPARED BY THE
STATE TOPOGRAPHIC BUREAU
FOR THE
DIVISION OF TRANSPORTATION PLANNING
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION





TRIANGULATION STATION "ANTONIO" IS 00°07'06" WEST OF TRUE NORTH
* SEPTEMBER, 1979 IS APPROXIMATELY 01°15'24" WEST OF TRUE NORTH
MAG. MAGNETIC CHANGE IS APPROXIMATELY 8.5' WESTWARD

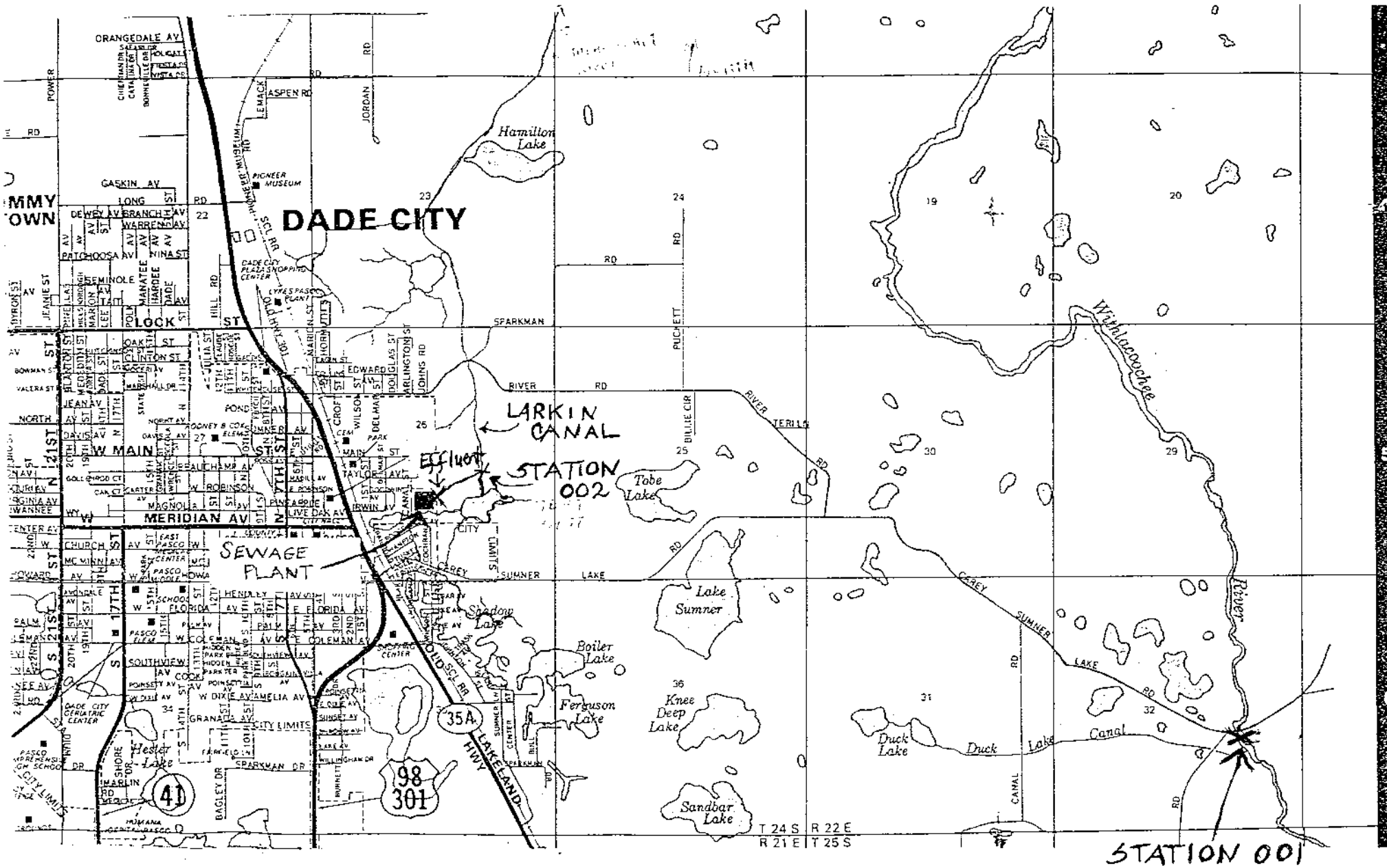
0 0.5 1 2 3 4 5 6 MILES
0 0.5 1 2 3 4 5 6 KILOMETERS
SCALE

SCALE FOR INSETS

MAY, 1979

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REVISIONS	
FEATURES	DATE
State Highway Route	August, 1979


DADE CITY
LARKIN CANAL
Effluent
STATION 002
STATION 001
SEWAGE PLANT
Hamilton Lake
Tobe Lake
Lake Sumner
Shadow Lake
Boiler Lake
Ferguson Lake
Knee Deep Lake
Duck Lake
Sandbar Lake
Hester Lake
Withlacoochee River
Duck Lake Canal
ORANGEDALE AV
ASPEN RD
GASKIN AV
LONG RD
SPARKMAN
RIVER RD
SUMNER LAKE RD
CAREY
W MAIN ST
W MERIDIAN AV
21ST ST
17TH ST
SOUTHVIEW
HILL RD
PUCKETT
JORDAN
LEMACK
POWER
LAKELAND HWY
35A
98
301
41
T 24 S R 22 E
R 21 E T 25 S

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

City of Dade City S.T.P.
(Facility)

Description of permitted outfall(s):

Operation of a 1.5 MGD Type I contact stabilization sewage treatment plant with chlorinated effluent to a drainage ditch swale, drainage stream and ultimately to the Withlacoochee River.

List permit violations (from MOR data or other source) and plant upsets that occurred within past year: ① No Plant upsets have been reported to the Department in 1991.
② Facility Not Providing Cl_2 Total Residual of 5-0.5 mg/l for 15 min at max flow prior to Dechlorination.
③ Not Providing continuous monitoring of Cl_2 Residual or pH 7 days per week

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

N.A

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

This is the first complete Cycle (first 5 year) permit for this facility since the Expansion of the facility. Plant As is was placed in operation May 8, 1987. - No Past DER results for comparison.

Additional information:

Current Permit Does Not require monitoring for Phosphorus or $NO_2 + NO_3 - N$. Both of these parameters during our sampling were high enough to potentially result in degradation of the receiving waters through Nutrient Loading and should be addressed in the upcoming Permit Review.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

FACILITY SUMMARY

Facility Name: Dade City Wastewater Treatment Plant

Prepared by: Kathryn A. Hick
Date: 4-7-92

Location (attach detailed map): Irvin and Delmar Streets Dade City, Pasco County, FL

County: Pasco

District: Southwest

Federal Permit # FL0020273 and expiration date: 9-30-94

State GMS # and 51M00779
State expiration date: 9-30-92

Facility Type: Industrial (Municipal) Federal Agricultural Other (list):

Function of facility: Treatment of Domestic Waste

Description of treatment process: Extended aeration, stabilization aeration, clarification, chlorine contact, dechlorination before discharge

Receiving waters: Withlacoochee

Classification: III

Design Flow: 1.5 MGD

Actual Mean Flow: 0.7 MGD

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

therefore, the best time to sample is: N/A

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

N/A

List effluent limits:

Parameter	Limit (units)

5. The discharge from the chlorine contact chamber shall be sampled in accordance with Chapter 17-19 F.A.C. and shall meet the following limitations:

Parameter	Unit	Min-imum	Maximum	Type Sample	Frequency
BOD	mg/l	0	10.0	16 hr. composite	Weekly
TSS	mg/l	0	20.0	16 hr. composite	Weekly
Fecal coliform	#/100	0	200 annual avg. 200 monthly avg.	grab	Weekly
Dissolved Oxygen	mg/l	6.0	---	grab	Weekly
Organic Nitrogen	mg/l	0	3.0	16 hr. composite	Weekly
Ammonia Nitrogen	mg/l	0	2.0	16 hr. composite	Weekly
Flow	mgd	.000	1.5	Continuous	7/wk
pH	STD UN	6.00	8.50	Continuous	7/wk

The results shall be reported monthly on DER Form 17-1.205(7).

Describe special permit conditions and permit modifications:

Permit modifications: (Date 12-18-87)

Description of Source: From As Issued To "extended aeration

Condition #4: From: As Issued To: A Class C or Higher operator for 6 hrs/day, 5 days/wk and 2 visits on weekends.

Condition #11: From: Outfall To: approved monitoring Station

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (MO/YR): 1/13/92	RECEIVING BODY OF WATER: Withlacoochee River

REMARKS: Withlacoochee River Park, A Pasco County Park	LOCATION: Dade City STP Upstream	FIELD ID NAME: Sta. C01

Habitat Parameter / score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover: 23	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs, undercut banks, rubble, or other stable habitat. 23-30 points	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. 16-22 points	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat. 8-15 points	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious. 0-7 points
Water Velocity: 14	Max. observed; >0.3 m/sec. 23-30 points	Max. observed; 0.1 to 0.3 m/sec 16-22 points	Max. observed; 0.05 to 0.1 m/sec 8-15 points	Max. observed; <0.05 m/sec 0-7 points
Artificial Channel/ Flow Alteration: 15	No artificial channelization. Little activity (impervious surface) in watershed which would cause scouring during spates. 12-15 points	—	—	Artificially channelized, or scouring present during spates because of excess impervious surface in watershed. 0-3 points
Bank Stability: 3	Stable. No evidence of erosion or bank failure. Little potential for future problems. 9-10 points	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 6-8 points	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 3-5 points	Unstable. Many raw, eroded areas. Obvious bank sloughing. 0-2 points
Riparian Zone Vegetation Quality: 10	Over 80% of streambank surfaces consist of native plants, classified as: bottomland hardwoods, understory shrubs, or non-woody macrophytes. 9-10 points	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. 6-8 points	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. 3-5 points	Less than 25% of streambank surfaces are vegetated. Poor plant community (e.g. grass monoculture) present. 0-2 points

Adjustments: 5	Add 5 points if cross-sectional area of flow is estimated to be greater than one square meter during periods of normal flow.	TOTAL SCORE: 66

COMMENTS: Riparian Zone forested w hardwoods, but no understory shrubs or non-woody macrophytes

ANALYSIS DATE: 1/13/91	ANALYST: Fricano	SIGNATURE: Pat Fricano

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (MO/YR): 1/13/92	RECEIVING BODY OF WATER: LARKIN CANAL

REMARKS: An artificially cut canal through riparian wetlands. Banks have since recolonized w/native vegetation	LOCATION: Dade City STP Downstream	FIELD NAME: Sta. 002

Habitat Parameter / score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover **22**	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs, undercut banks, rubble, or other stable habitat. **23-30 points**	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. **16-22 points**	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat. **8-15 points**	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious. **0-7 points**
Water Velocity **13**	Max. observed; >0.3 m/sec. **23-30 points**	Max. observed; 0.1 to 0.3 m/sec **16-22 points**	Max. observed; 0.05 to 0.1 m/sec **8-15 points**	Max. observed; <0.05 m/sec **0-7 points**
Artificial Channel/ Flow Alteration **4**	No artificial channelization. Little activity (impervious surface) in watershed which would cause scouring during spates. **12-15 points**	—	—	Artificially channelized, or scouring present during spates because of excess impervious surface in watershed. **0-3 points**
Bank Stability **6**	Stable. No evidence of erosion or bank failure. Little potential for future problems. **9-10 points**	Moderately stable. Infrequent or small areas of erosion, mostly healed over. **6-8 points**	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. **3-5 points**	Unstable. Many raw, eroded areas. Obvious bank sloughing. **0-2 points**
Riparian Zone Vegetation Quality **7**	Over 80% of streambank surfaces consist of native plants, classified as: bottomland hardwoods, understory shrubs, or non-woody macrophytes. **9-10 points**	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. **6-8 points**	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. **3-5 points**	Less than 25% of streambank surfaces are vegetated. Poor plant community (e.g. grass monoculture) present. **0-2 points**

Adjustments **5**	Add 5 points if cross-sectional area of flow is estimated to be greater than one square meter during periods of normal flow.	TOTAL SCORE **61**

COMMENTS: Fish seen include Gambusia affinis, Heterandria formosa, Tilapia aurea and Lepomis [illegible]. Lots of [illegible]

ANALYSIS DATE: 1/13/92	ANALYST: Fricano	SIGNATURE: Pat Fricano

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 3)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y): 1/23/12	TIME	RECEIVING BODY OF WATER: Withlacoochee River

REMARKS: Withlacoochee River Park (A Pasco County Park)	LOCATION: Dade City STP Upstream	FIELD GNAME: SR 001

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
100%						

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

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

Point-Source Pollution (list location and describe): None

Estimated System Width (range, m): 10	Estimated System Depth (range, m): 1.3		yes	
High Water Mark (m above bed): 1.3	Velocity (range, m/s): 0.09	Impounded ☐	Channelized ☐	

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 Deposits: Sludge: ☐ Paper Fiber: ☐ Mud: ☐ Sand: ☑ Shell: ☐ Other: ☑ Detritus

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	9	5	qual	Rock or Shell Rubble			
Leaf Packs	40	10	"	Sand	50	5	D-Net
Aquatic Vegetation	1%			Mud/Muck			
Submerged Roots				Other:			
Undercut Banks				Other:			

WATER QUALITY

	Temp. (°C):	D.O. (mg/l):	pH (SU):	Cond. (µmho/cm):				Secchi (m):
Top	19	9.8	7.94	320				1 m
Mid-depth								
Bottom								

System Type : Stream: ☑ (Surficial Aquifer Fed / Deep Aquifer Fed / Alluvial / Blackwater) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

Water Odors (check box): Normal: ☑ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐

Water Surface Oils (check box): Slick: ☐ Sheen: ☑ Globs: ☐ None: ☐

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

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

Weather Conditions: Partly Sunny 75° Windy

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

ANALYSIS DATE: 1/23/12	ANALYST: Friends	SIGNATURE: [signature]

STATE OF FLORIDA
D ARTMENT OF ENVIRONMENTAL REGU .TION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD-DATA SHEET (Version 3)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		1/13/12	11:45 AM	LAKE IN CANAL

REMARKS: An artificially cut canal through a ridge of Highlands	LOCATION: Dade City STP Downstream (Lake)	FIELD ID NAME: Sta 002

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
50			50			

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

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

Point-Source Pollution (list location and describe): Dade City STP
Residential Drainage Canals.

Estimated System Width (range, m): 7 m	Estimated System Depth (range, m): 0.5		yes
High Water Mark (m above bed): 1	Velocity (range, m/s): 0.08	Impounded	☐
		Channelized	☑

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 Deposits: Sludge: ☐ Paper Fiber: ☐ Mud: ☑ Sand: ☐ Shell: ☐ Other: ☑ detritus

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Rock or Shell Rubble			
Leaf Packs	1	1	DWRD	Sand	5	5	
Aquatic Vegetation	40	10		Mud/Muck	50		
Submerged Roots	4	4		Other:			
Undercut Banks				Other:			

WATER QUALITY

	Temp. (°C):	D.O. (mg/l):	pH (SU):	Cond. (µmho/cm):				Secchi (m):
Top	22.5	7.6	7.8	510				Bot
Mid-depth	/	/	/	/				
Bottom	/	/	/	/				

System Type: Stream: ☐ (Surficial Aquifer Fed / Deep Aquifer Fed / Alluvial / Blackwater) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☑ Canal

Water Odors (check box): Normal: ☑ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐

Water Surface Oils (check box): Slick: ☐ Sheen: ☐ Globs: ☐ None: ☑

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

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

Weather Conditions:
75°
Partly Cloudy

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

ANALYSIS DATE:	ANALYST:	SIGNATURE:
1/13/12	Fricano	Pat Fricano

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Dade City STP
Address/City:
County: Pasco
Contact/District: Pat Fricano / SW
NPDES Permit #: FL00 Outfall #:

Sample Collection: Date 1/13/92 Time 1030
Test Beginning: Date 1/14/92 Time 1330
Test Ending: Date 1/16/92 Time 1330
Test Organism: N. Leedsi
Life Stage/Age: 23 days

Test Number: 1 of 2 Test Type: (Screening) | Definitive
(Static) Static Renewal | Flow-through

27424

Remarks: * DO @ 0h cal. recorded temp MF/14/92

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7@7.99	* 8.5@24°C MF/14/92 ~~22.5@22.4°C~~	22.5°C@22.4°C	1374@1378@22.4°C
24 hr	7@7.9@9	8.6@23.5°C	22.9@23.1°	1359@
48 hr	7@7; 9@9	8.6@23.5°C	22.5°@22.5°C	1332@1342@22.8°C

Conc.	Chamber #	Number Live 0	Number Live 24	Number Live 48	pH 0	pH 24	pH 48	Temp. (°C) 0	Temp. (°C) 24	Temp. (°C) 48	DO (mg/L) 0	DO (mg/L) 24	DO (mg/L) 48	Cond. (µmhos/cm) 0	Cond. (µmhos/cm) 24	Cond. (µmhos/cm) 48
Control	65	5	5	5	7.7	8.2	8.2	21.2	21.7	21.3	9.0	8.7	8.7			
Control	3	5	5	5	7.7	8.2	8.2				9.0	8.7	8.7	230	236	239
100%	74	5	5	5	7.8	8.1	8.2	20.8	21.5	21.3	9.5	8.7	8.5			
100%	19	5	5	5	7.8	8.1	8.2				9.5	8.7	8.5	503	512	515
Measured/Loaded by:		MF	AJ	AJ	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF
Recorded by:		MF	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ

Investigators' Signatures

[signature]

Marti Fandall

[signature]

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl_2:			0.06	HACH	PM
Lab Tot. Resid. Cl_2:	0.0	0.0	0.0	HACH	MF
Alkalinity:	130	70	135	HACH	AJ
Hardness:	130	85	140	HACH	AJ
Total Ammonia:	0.0	0.0	.58	HACH	AJ

Ammonia Meter Slope: ______ Ammonia Blank: 0 Salinity Sample: ______ ppt

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Dade City STP
Address/City:
County: Pasco
Contact/District: Pat Fricano/SW
NPDES Permit #: FL00 Outfall #:

Sample Collection: Date 1/13/92 Time 1030
Test Beginning: Date 1/14/92 Time 1330
Test Ending: Date 1/16/92 Time 1330
Test Organism: Columbia
Life Stage/Age: <24 hours

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

27424

Remarks: * wrote DO value in temp. space 1/14/92 AJ

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7@7@9	8.5@2°C	22.5@22.4	1374@1378°C
24 hr	7@7@9	8.6@23.5°C	22.9@23.1	1359@23.4 23.7°C
48 hr	7@7@9	8.6@23.5°C	22.5@22.5°C	1332@22.8°C 1347

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	DO (mg/L) 0	24	48	Cond. (µmhos/cm) 0	24	48
Control		5	5	5	8.1		8.2	23.7		22.9	9.2		9.1	160		177
Control		5	5	4			8.2						9.1			
Control		5	5	4			8.2						9.1			
Control		5	5	5			8.2						9.1			
100%		5	5 2	0	7.9		8.5	21.5		22.0	9.6		9.1	490		512
100%		5	5 1	0			8.5	21.5					9.1			
100%		5	5 0	0			8.5						9.1			
100%		5	5 1	0			8.5						9.1			
			mf ** 1/15/92 counted fish in the													
Measured/Loaded by:		MK	MK	MK	MF		MF	MF		MK	MF		MK	MF		MK
Recorded by:		MK	MK	MK	AJ		AJ	AJ		AJ	AJ		AJ	AJ		AJ

Investigators' Signatures

Marshall Hanchett

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			0.06	HACH	PM
Lab Tot. Resid. Cl2:	0.0	0.0	0.0	Hach	MF
Alkalinity:	130	>20	135	T/A	RS
Hardness:	130	85	140	HACH	RS
Total Ammonia:	0.0	0.0	0 58	Hach	AJ

Ammonia Meter Slope:

Ammonia Blank:

Salinity

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

Macroinvertebrate taxa list for Dade City STP, Pasco County, collected via discrete dip net sweeps on 13 January 1992.

	Reference Site	Test Site
Coleoptera		
Macronychus glabratus	12	–
Microcylloepus sp.	12	–
Diptera		
Ablabesmyia mallochi	12	–
A. peleensis	12	–
Atrichopogon sp.	–	4
Chironomus decorus grp.	–	4
Chironomus (Lobochironomus) sp.	12	–
Cladotanytarsus sp.	12	–
Cricotopus bicinctus	48	–
Cricotopus/Orthocladius grp.	24	–
Cryptotendipes sp.	24	–
Cryptochironomus sp.	12	–
Dicrotendipes modestus	12	–
D. neomodestus	36	–
D. thanatogratus	12	–
Monopelopia boliekae	12	–
Nanocladius rectinervis	12	–
Pagastiella orophila	24	–
Palpomyia grp.	108	–
Parachironomus sp.	12	–
Polypedilum halterale grp.	–	4
P. illinoense	24	16
P. scalaenum	72	–
Procladius sp.	–	16
Pseudochironomus sp.	12	–
Stilocladius sp.	12	–
Stratiomys sp.	–	4
Tanytarsus sp.	204	20
Tanytarsini type 1	24	–
Undetermined dipteran pupa	36	–
Ephemeroptera		
Caenis sp.	108	8
Callibaetis floridanus	12	–
Gastropoda		
Micromenetus sp.	12	–
Hemiptera		
Ranatra buenoi	–	60
Malacostraca		
Hyalella azteca	72	–
Palaemonetes paludosus	48	–
Procambarus sp.	–	8
P. fallax	24	–

Odonata		
Epitheca sepia	–	4
Libellula auripennis	–	4
Oligochaeta		
Limnodrilus hoffmeisteri	–	8
Pelecypoda		
Corbicula manilensis	–	8
Sphaerium/Musculium sp.	12	–
Undetermined unionid	–	4
Trichoptera		
Orthotrichia sp.	12	–

Macroinvertebrate taxa list for Dade City STP, Pasco County, collected via Hester-Dendy samplers on 10 February 1992.

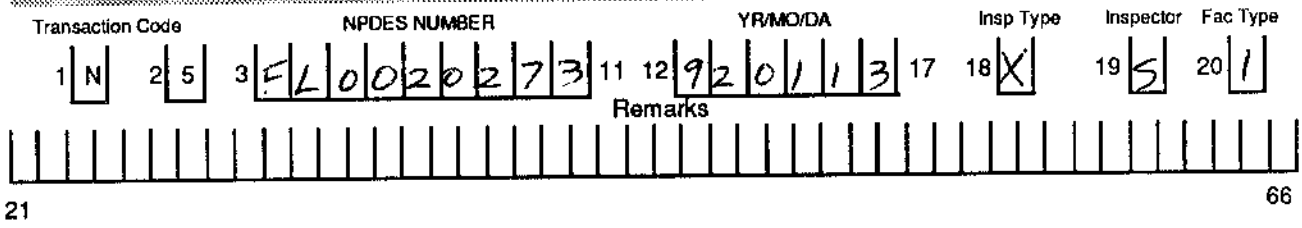
	Reference Site	Test Site
Coleoptera		
Scirtes sp.	1	–
Diptera		
Ablabesmyia mallochi	24	–
A. rhamphe grp.	4	–
Atrichopogon sp.	–	1
Chironomus sp.	–	1
Cladotanytarsus sp.	1	–
Corynoneura sp.	–	1
Cricotopus bicinctus	–	4
Dicrotendipes modestus	3	–
D. neomodestus	6	–
D. simpsoni	1	–
Glyptotendipes lobiferus	–	7
Goeldichironomus amazonicus	–	2
G. holoprasinus	–	3
Orthocladius annectens	–	8
Polypedilum illinoense	1	6
P. scalaenum	1	–
Paramerina sp.	1	–
Pseudochironomus sp.	–	1
Tanytarsus sp.	22	5
Tanytarsini type 1	–	2
Undetermined dipteran pupa	5	2
Ephemeroptera		
Baetis sp.	1	–
Caenis sp.	3	–
Choroterpes hubbeli	1	–
Stenacron sp.	1	–
S. floridense	26	–
S. interpunctatum	2	–
Gastropoda		
Hebetancyclus excentricus	1	32
Micromenetus sp.	1	–
M. dilatus	1	–
Physella sp.	–	15
Planorbella duryi	–	17
Pseudosuccinea columella	–	17
Hirudinea		
Batracobdella phalera	1	4
Helobdella elongata	–	2

Odonata		
Enallagma sp.	–	1
E. cardenium	–	1
Ischnura sp.	1	2
I. hastata	–	1
Oligochaeta		
Dero lodeni	–	1
Platyhelminthes		
Dugesia sp.	1	1
Trichoptera		
Oxyethira sp.	2	–

Phytoplankton taxa list for Dade City STP, collected via subsurface grab in the Withlacoochee River (reference) and downstream of the facility in Larkin Creek on 13 January 1992.

	Reference Site	Test Site
Diatoms		
Achnanthes exigua	22	276
A. cf. *lanceolata* v. *dubia*	22	–
A. linearis	–	426
Eunotia sp.	–	50
Gomphonema parvulum	22	–
Melosira sp.	–	100
Navicula sp.	–	125
N. cf. *decussis*	22	–
N. cf. *pupula*	22	–
Nitzschia cf. *amphibia*	–	477
N. cf. *filiformis*	–	25
N. cf. *palea*	44	50
Pinnularia sp.	–	25
Rhopalodia sp.	22	–
Synedra ulna	44	–
Unidentified pennate diatom	–	125
Chlorophyta		
Pandorina sp.	–	75
Scenedesmus sp.	–	25
Spermatozoopsis sp.	154	–
Unknown chlorophyte flagellate	88	276
Chrysophyta		
Dinobryon sp.	22	–
Cryptophyta		
Cryptomonas sp.	132	–
Cyanophyta		
Anabaena sp.	–	25
Aphanothece sp.	–	50
Chroococcus sp.	286	151
Gloeothece sp.	–	25
Oscillatoria sp.	–	50

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



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