

Biological Assessment of

City of Altamonte Springs
Wastewater Treatment Facility

Seminole County

NPDES #FL0033251

Sampled October 1994

March 1995

Biology Section
Division of Administrative and Technical Services

Comprehensive Quality Assurance Plan No. 870346G

Department of Environmental Protection

Results of Fifth Year Inspections

Discharger: Altamonte Springs WWTP
County: Seminole
NPDES Number: FL0033251
State Permit Expiration Date: 1 May 1995

Toxics Sampling Inspection (**XSI**)

Date Sampled: 31 October 1994

Results: No organic pollutants or metals were found at levels which exceeded Class III standards.

Compliance Biomonitoring Inspection (**CBI**)

Date Sampled: 31 October 1994

Results: The effluent sample did not show toxicity to the bannerfin shiner, *Cyprinella leedsi,* or to the invertebrate, *Ceriodaphnia dubia.*

Impact Bioassessment Inspection (**IBI**)

Date Sampled: 31 October 1994

Results: Qualitative measures of benthic macroinvertebrate community health indicated that both receiving water stations were degraded, with conditions slightly worse downstream of the discharge. Macroinvertebrate taxa richness, the Florida Index, and the EPT Index were quite depressed at both sites, with values generally lower at the test site. SIIF scores of 16 points at the reference site and 14 points at the test site indicated that both sites were severely degraded. The low dissolved oxygen measured at the reference site, along with degraded habitat, were at least partially responsible for the poor quality macroinvertebrate community found there. The increased degradation at the test site may have been related to some aspect of the discharge which was not measured during the present investigation, since habitat quality and dissolved oxygen were actually improved there. Most phytoplankton parameters, such as taxa richness, Shannon-Weaver diversity, algal density, and chlorophyll *a* showed either little change or some improvement downstream of the discharge. It should be noted that the reference site already exhibited symptoms of nutrient enrichment, including elevated chlorophyll *a* (10.6 µg/L, which is higher than that found in 70% of other Florida streams). The high nutrient and AGP values found below the discharge suggest that eutrophication problems are likely to occur, perhaps farther downstream where velocity is reduced.

Water Quality Inspection (**WQI**)

Date Sampled: 31 October 1994

Results: Dissolved oxygen at the reference site was found to be below Class III water quality standards (2.7 mg/L). The City of Altamonte Springs discharge caused ortho-phosphate and nitrate-nitrite enrichment at the test site. Ortho-phosphate increased from 0.05 mg/L at the reference site to 0.24 mg/L at the test site, a value higher than those found in approximately 75% of other Florida streams. Nitrate-nitrite increased from 0.22 mg/L at the reference site to 1.0 mg/L at the test site. The test site value was higher than those found in approximately 95% of other Florida streams. AGP exceeded the "problem threshold" at both sites, but was extremely elevated (65.8 mg dry wt/L) at the test site.

Introduction

The City of Altamonte Springs Wastewater Treatment Facility is located in Seminole County, Florida (see map in Appendix). This is a 12.5 MGD anoxic/aerobic activated sludge wastewater treatment facility, with nitrification/denitrification, filtration, carbon dioxide feed (for pH control), and reuse storage tanks. An average of 5.26 MGD of the disinfected reclaimed water is discharged to an unrestricted public access reuse system. After dechlorination, a portion (1.8 MGD) of the treated wastewater is discharged to the Class III Little Wekiva River. Total discharge during this survey was 7.0 MGD.

State permit limits for the surface water discharge are as follows: $CBOD_5$ (annual average of 20 mg/L), ultimate oxygen demand (monthly average of 30 mg/L), TSS (weekly average of 45 mg/L, monthly average of 30 mg/L, annual average of 20 mg/L), dissolved oxygen (minimum of 6.0 mg/L), pH (6 to 7.0 S.U. when the river flow is less than 10 cfs), total residual chlorine (0.01 mg/L maximum prior to discharge), ammonia (monthly average of 1.0 mg/L when the stream flow is less than 10 cfs), and TKN (monthly average of 5.0 mg/L). The NPDES permit allows for a pH range of 6 to 8.5 S.U. when the river flow exceeds 10 cfs)

There have been some problems with this facility in the past. Between September, 1993, and the present, there have been several violations of pH, DO, and total residual chlorine limits. The department issued a warning letter to the facility in June, 1994, for unauthorized discharges from the reclaimed water system to the Little Wekiva River.

The facility currently plans to divert any substandard effluent back to the influent pump station to provide further treatment before discharging into the river. Permanent carbon dioxide feed facilities for the effluent will be installed to control pH.

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 50 meters upstream of the outfall) and a test site (approximately 50

Major characteristics of community structure of control and test sites.

	Reference Site	Test Site
Macroinvertebrate Qualitative		
Number of Taxa	14	11
Florida Index	8	4
SIIF	16	14
EPT Index	2	2
% Contribution of Dominant Taxon	38.5	40.0
% Trichoptera	38.5	40.0
% Diptera	53.0	25.3
% Ephemeroptera	2.6	10.6
% Coleoptera	0.9	20.0
% Amphipoda	3.4	1.3
% Pelecypoda	1.7	0
% Odonata	0	2.7
% Predators	18	14.5
% Above Surface Deposit Feeders	21.4	22.4
% Below Surface Deposit Feeders	0	0
% Suspension Feeders	41.4	40.0
% Scrapers	1.3	14.7
% Shredders	16.2	7.1
% Scavengers	1.7	1.4
Phytoplankton Algae		
Number of Taxa	27	29
Shannon-Weaver Diversity	3.6	4.0
Algal Density (#/L)	5776	1701
Chlorophyll a (µg/L)	10.6	5.2
% Blue-green	13.9	17.3
% Green	40.0	55.6
% Diatoms	38.8	16.7
% Other	7.3	9.3
Algal Growth Potential (mg dry wt/l)	23.9	65.8

meters below discharge) (see map in Appendix). A habitat assessment was performed *in situ* to establish comparability between sites. Supplemental physical/chemical data were also collected on the effluent and study sites. Acute screening toxicity bioassays, using *Ceriodaphnia dubia* and *Cyprinella leedsi* as test organisms, were performed on an effluent sample (Weber 1991). The effluent was analyzed for metals and for organic constituents (base neutral and acid extractables, and pesticide extractables). Additionally, nutrient analyses were performed on effluent, reference, and test sites. Methods used for all chemical analyses are on file at the Tallahassee DEP Chemistry Laboratory.

Benthic macroinvertebrate communities were evaluated at reference and test sites. Invertebrates were collected from natural substrates (snags, leaf packs, and undercut banks) using 20 dip net sweeps. Phytoplankton was sampled at both reference and test sites via subsurface grabs (Ross 1990). Chlorophyll *a* was also determined for phytoplankton communities (Ross 1990). Algal Growth Potential tests, using *Selenastrum capricornutum* as the test organism, followed Miller *et al.* (1978).

Explanation of Measurements of Community Health

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

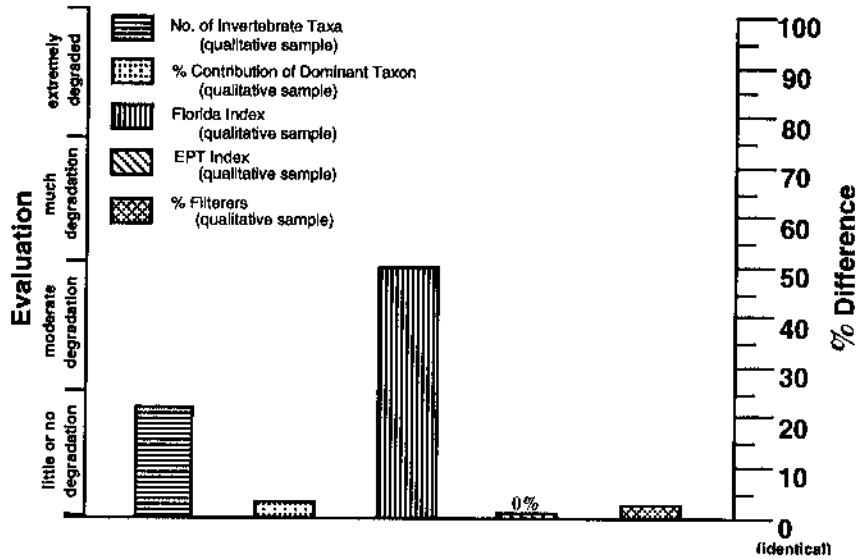
Taxa richness: Anthropogenic stress has a tendency to reduce the number of different types of macroinvertebrates present in a system. Algal taxa richness may increase with moderate nutrient enrichment, compared to an oligotrophic natural background, but become reduced with extreme nutrient enrichment or toxicity.

Shannon-Weaver diversity: This index is specified in the Florida Administrative Code as a measure of biological integrity. Low diversity scores are undesirable, in that 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: Unpolluted sites have characteristic types of taxa which are sensitive to anthropogenic stress. These organisms become rare or absent as the intensity or duration of the disturbance increases. For example, the Florida Index assigns points to stream-dwelling macroinvertebrates based on their sensitivity to pollution (see Ross 1990). A site with a high Florida Index score is considered healthy. Species sensitivity data from other sources, such as Hulbert (1990), Hudson *et al.* (1990), Lenat (1993), Farrell (1992), Chang *et al.* (1992), and Whitmore (1989), are used as appropriate.

Ephemeroptera/Plecoptera/Trichoptera Index: To calculate the index, one simply sums the number of EPT taxa present at a stream station. Higher EPT are associated with healthier systems, while lower scores indicate stressed conditions.

Community structure: An aquatic community is generally considered degraded if a substantial shift in the proportions of the major taxonomic groups (*e.g.*, mayflies, riffle beetles, etc.) is observed when compared to a reference site. In marine systems, an increase in the % tubificid oligochaetes, a decrease in the % pelecypods, and a decrease in the number of polycha-



Effect of discharge on the benthic macroinvertebrate community.

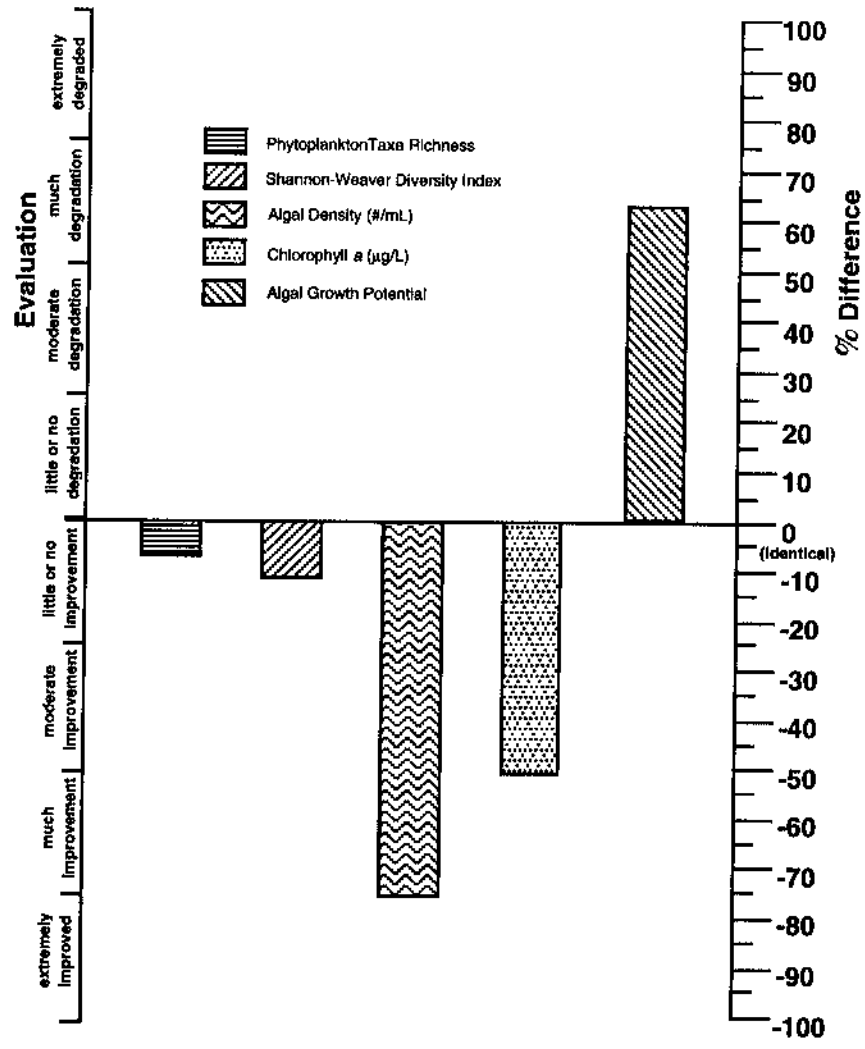
ete taxa are all considered indicators of disturbance (Engel *et al.* 1994).

Algal biomass: A system has traditionally been considered nutrient stressed when biomass (algal density or chlorophyll *a*) exceeds problem threshold levels, often resulting in visible algal blooms and low dissolved oxygen from the decomposition of the decaying algal tissue. A decreased diatom to bluegreen algae ratio (calculated by dividing the number of individuals in the Bacillariophyta by the number of individuals in the Bacillariophyta + Cyanophyta) is often indicative of nutrient enriched conditions in flowing streams.

Trophic composition/feeding guilds: Human disturbance can shift the established feeding strategies of a system. In Florida, for example, pollution appears to be responsible for reducing the numbers of filter-feeders (FDEP 1994) and shredders (EA Engineering 1994).

The Stream Invertebrate Index for Florida (SIIF) is a composite metric which is based upon the macroinvertebrate communities found at Florida Eco-regional reference sites sampled with dip net sweeps (EA Engineering 1994). The SIIF assigns points to a variety of invertebrate parameters, depending on how closely that parameter approaches the expected Eco-regional reference condition. The points are then summed and an assessment of the condition of a site is made (see SIIF calculation table in Appendix).

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



Effect of discharge on the algal community.

The following personnel were involved in this investigation: Phil Kane, Steve Kent, Christianne Ferraro, and Herb Collado (DEP Central District) and Lyn Burton, Marshall Faircloth, Russel Frydenborg, Christy LeDuc, Kathleen Lurding, Tina Mikulski, Elizabeth Miller, Urania Quintana, Landon Ross, David Whiting, Vicki Whiting, Greg Wynn, and David Young (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

Physical disruption at the reference site (*e.g.*, severe erosion from

stormwater inputs) greatly reduced the productive habitat available there, leading to a reduced habitat quality score. Therefore, habitat quality was highest at the test site (with 81 points) and lowest at the reference site (with 70 points). Land use near both sites was approximately 90% residential and 10% forested. The study sites were fairly comparable with respect to many physical/chemical parameters, such as conductivity (ranging from 191 µmhos/cm at the reference site to 331 µmhos/cm at the test site), temperature (from 25.3 °C at the reference site to 25.9 °C at the test site), and pH (6.7 to 6.8 S.U.). Dissolved oxygen was considerably lower at the reference site (2.7 mg/L) than the test site (5.3 mg/L). Dissolved oxygen at the reference site was below Class III water quality standards. Total suspended solids were higher at the reference site (6.5 mg/L) than at the test site (2.4 mg/L), but undetected in the effluent. Carbonaceous BOD_5 was low in the effluent (2.0 mg/L) and was below quantitation limit at both receiving water sites.

No organic priority pollutants were detected in the effluent sample. Of the metals analyzed for, only iron (60 µg/L) was found in the discharge at levels above quantitation limits. This value is well within the Class III water quality standard.

The sample of effluent did not show toxicity to the invertebrate, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi* (Appendix).

The City of Altamonte Springs discharge caused ortho-phosphate and nitrate-nitrite enrichment at the test site. Ortho-phosphate increased from 0.05 mg/L at the reference site to 0.24 mg/L at the test site, a value higher than those found in approximately 75% of other Florida streams (see Table of Typical Water Quality Values in Appendix). Nitrate-nitrite increased from 0.22 mg/L at the reference site to 1.0 mg/L at the test site. The test site value was higher than those found in approximately 95% of other Florida streams.

Algal growth potential (AGP) greatly exceeded the "problem threshold" of 5 mg dry wt/L at both receiving water stations (Raschke and Schultz 1987). AGP increased from 23.9 mg dry wt/L at the reference site to 65.8 dry wt/L at the test site. Effluent AGP was 148.7 mg dry wt/L. These data indicate that the problems associated with eutrophication (*e.g.*, excessive macrophyte growth, low D.O) are likely to occur in this aquatic system, both upstream and downstream of the discharge.

Qualitative measures of benthic macroinvertebrate community health indicate that both receiving water stations were degraded, with conditions slightly worse downstream of the discharge. The figure on p. 2 indicates the degree of difference between the invertebrate populations of the reference and test sites. Larger differences (that is, higher percentages) correspond with greater degrees of degradation. Negative values mean that the test site is better than the reference.

Macroinvertebrate taxa richness was quite depressed at each site, with 14 taxa found at the reference site, decreasing to 11 at the test site. Similarly, while the Florida Index at the reference site (with 8 points) was far less than expected for a healthy stream, this measure decreased to only 4 points at the test site. The Ephemeroptera/Plecoptera/Trichoptera Index was 2 at both sites, half of what is expected from a healthy Peninsular stream. SIIF scores of 16 points at the reference site and 14 points at the test site indicated that both sites were severely degraded.

The low dissolved oxygen measured at the reference site, along with the degraded habitat, were at least partially responsible for the poor quality macroinvertebrate community found there. The somewhat more degraded conditions (lower Florida Index) at the test site may have been related to some aspect of the discharge which was not measured during the present investigation. It should be noted that habitat quality and dissolved oxygen were actually improved at the test site, compared with the reference site.

The figure on p. 3 represents changes in the phytoplankton algal community. As was noted with the macroinvertebrates, larger differences (that is, higher percentages) correspond with greater degrees of degradation. Although periphyton is generally considered the most useful algal community for assessments of flowing waters, only phytoplankton was collected in this study. Most phytoplankton parameters, such as taxa richness, Shannon-Weaver diversity, algal density, and chlorophyll *a* showed either little change or some improvement downstream of the discharge. It should be noted that the reference site already exhibited symptoms of nutrient enrichment, including elevated chlorophyll *a* (10.6 µg/L, which is higher than that found in 70% of other Florida streams). The high nutrient and AGP values found below the discharge suggest that eutrophication problems are likely to occur, perhaps farther downstream where velocity is reduced.

Conclusions

No organic priority pollutants were detected in the effluent sam-

ple. Of the metals analyzed for, only iron (60 µg/L) was found in the discharge at levels above quantitation limits. This value is well within the Class III water quality standard.

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Chemistry summary table for

Altamonte Springs WWTP	Effluent	Reference Site	Test Site
Organic Constituents (ug/L)			
none detected			
Metals (ug/L)			
Aluminum	200 U		
Arsenic	10 U		
Calcium	32.6 A		
Copper	6 I		
Chromium	10 U		
Iron	60 A		
Lead	10 U		
Magnesium	7.36 A		
Nickel	7 I		
Selenium	30 U		
Silver	0.05 U		
Zinc	34 I		
Nutrients (mg/L)			
Ortho-phosphate	0.53	0.049	0.24
Total phosphorus	0.55	0.13	0.31 A
Ammonia	0.041 A	0.088 A	0.070 A
Nitrate+Nitrite	2.3	0.22 A	1.0
TKN	0.65	0.91	0.80 A
General Phys-Chem Parameters			
Habitat Assessment		70	81
D.O. (mg/L)	8.3	2.7	5.3
pH (SU's)	6.9	6.7	6.8
Conductivity/Salinity (µmhos/cm or ppt)	494	191	331
Temperature (°C)	27.4	23.8	25.3
Hardness (mg CaCO3)	111.7		
CBOD5 (mg/L)	2.0	0.7 I	0.8 I
TSS (mg/L)	1 U	6.5 A	2.4
Algal Growth Potential (mg dry wt/L)	148.7	23.9	65.8
Toxicity			
Bioassay Fish	no mortality		
Bioassay Invertebrate	no mortality		

A - Value reported is the mean of two or more determinations

I - Value reported is less than the minimum quantitation limit, and greater than or equal to the minimum detection limit

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

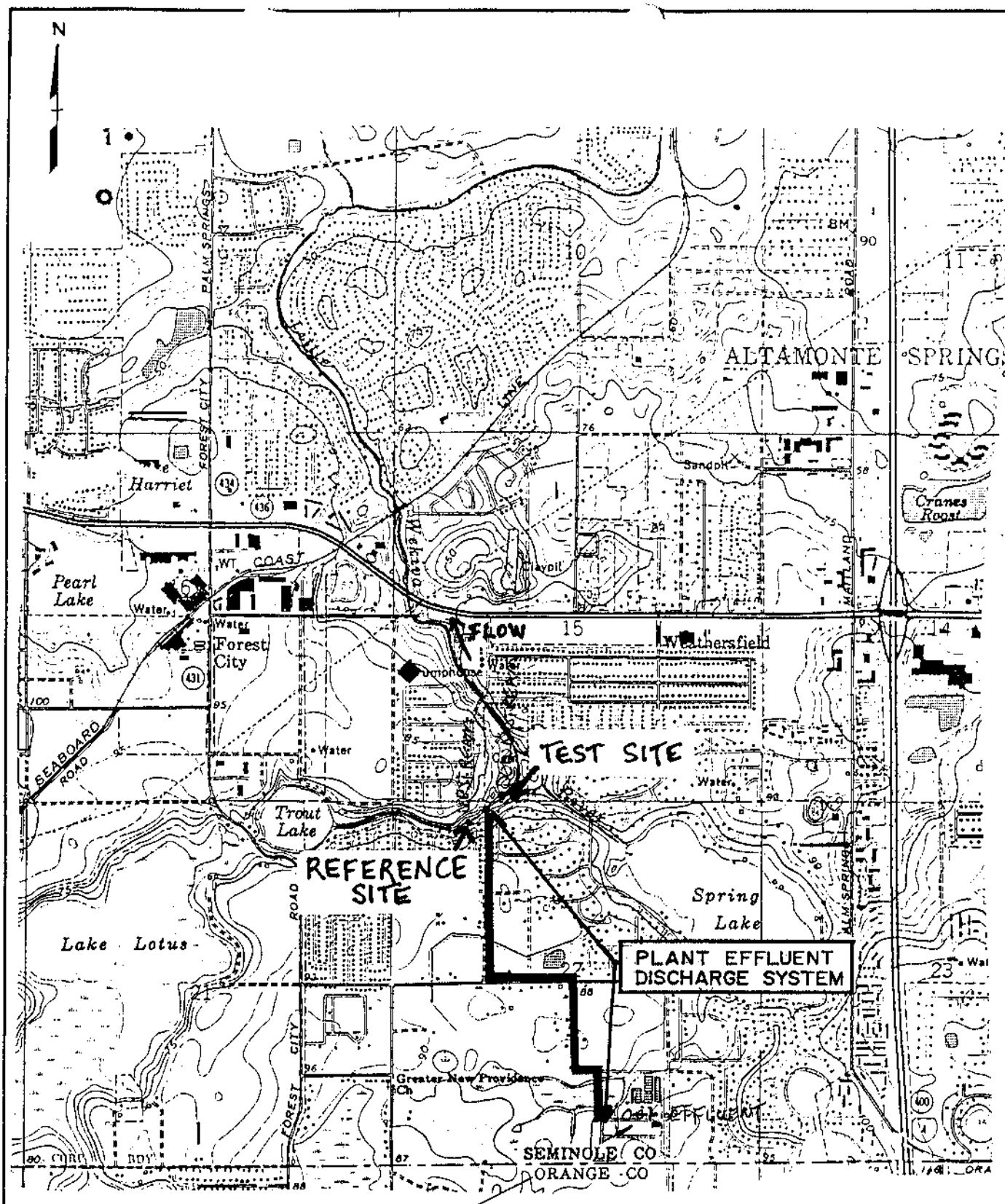
Typical Values for Selected Parameters in Florida Waters

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

Percentile Distribution

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

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



ALTAMONTE SPRINGS REGIONAL
WASTEWATER TREATMENT PLANT FACILITY

MAP SOURCE: USGS FOREST CITY QUADRANGLE

HNTB
HOWARD NEEDLES TAMMEN & BERGENDOFF
ENGINEERS PLANNERS
ORLANDO, FLORIDA

EXHIBIT TO PART III - SUBPART B
EFFLUENT ROUTE FROM RWWTF

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Facility Name: CITY OF ALTAMONTE SPRINGS WASTEWATER TREATMENT FACILITY		Date Summary Prepared: 9/26/94
Location (attach detailed map): SEE ATTACHED MAP	County: SEMINOLE	District: CENTRAL
Federal Permit # FL0033251 and expiration date: 12/31/97	State GMS # and 3059M01771 State expiration date: 5/01/95 D059-178763	Facility Type: Industrial (Municipal) Federal Agricultural Other (list):

Function of facility: DOMESTIC WASTEWATER TREATMENT FACILITY

Description of treatment process: A 12.5 MGD DESIGN CAPACITY ANOXIC/AEROBIC ACTIVATED SLUDGE WASTEWATER TREATMENT FACILITY WITH NITRIFICATION/DENITRIFICATION, FILTRATION, CARBON DIOXIDE FEED FOR PH CONTROL AND REUSE STORAGE TANKS. THE DISINFECTED RECLAIMED WATER IS DISCHARGED TO AN UNRESTRICTED PUBLIC ACCESS REUSE SYSTEM AND TO THE LITTLE WEKIVA RIVER (AFTER DECHLORINATION).

Receiving waters: LITTLE WEKIVA RIVER	Classification: I II (III)	
Design Flow: 12.5 MGD	Mean Flow: 1.8 MGD L. WEKIVA R. 08/93-08/94 5.26 MGD REUSE	Flow during survey: TO BE DETERMINED 7.0 MGD

Discharge is: (Continuous) Intermittent Seasonal Rainfall dependent
Other (describe) THERE ARE PERIODS OF TIME WHEN A SMALL AMOUNT OF WATER (.1 MGD) IS DISCHARGED TO THE RIVER DUE TO DEMAND FOR REUSE WATER.
therefore, the best time to sample is: AT THE END OF SUMMER OR BEGINNING OF FALL (AUG. TO OCT.)

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

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

Parameter (STATE PERMIT)	Limit (units)
CBOD$_5$	20 mg/l annual AVG.
TSS (FOR REUSE)	≤ 5.0 mg/l
TSS (FOR SURFACE WATER)	20 mg/l annual AVG.
DO	6.0 mg/L Daily max.
TRC (surface water)	0.01 mg/l Daily max
pH	7.0 S.U. DAILY MAX. WITH STREAM FLOW ≥ 10 CFS
AMMONIA, AS N	1.0 mg/l max. monthly AVG. WITH STREAM FLOW ≥ 10 CFS
TKN, AS N	5.0 mg/L max. Monthly AVG.

Describe special permit conditions and permit modifications: A CALIBRATED STAFF GAUGE SHALL BE MAINTAINED IN THE RECEIVING STREAM FOR DETERMINATION OF STREAM FLOWS ABOVE OR BELOW 10 CFS. D059-178763 MODIFIED ON 3/17/94: ADDITION OF SURFACE WATER FROM LAKE MARIE (.25 MGD), LAKE ORIENTA (1.0 MGD) AND CRANES ROOST LAKE (1.5 MGD) TO THE CITY COLLECTION SYSTEM, DURING THE PERIOD OF APRIL TO SEPTEMBER. ON 05/11/93 DER APPROVED USE OF WATER FROM PLANT #3 HIGH SERVICE PUMPS TO TRANSFER RECLAIMED WATER THRU A NEW 12" φ LINE AND CONNECT TO A REUSE MAIN. RAW SEWAGE IS DIVERTED FROM WEATHERSFIELD STP (D059-185631) TO ALT. SPRINGS WWTF SINCE 4/30/94.

* SEE ATTACHED SHEETS FOR NPDES PERMIT LIMITS

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

CITY OF ALTAMONTE SPRINGS WWTF (Facility)

FACILITY SUMMARY

Description of permitted outfall(s): Reinforced concrete headwall with stilling basin and dissipator with 48" diameter pipe at the shoreline.

List permit violations (from MOR data or other source) and plant upsets that occurred within past year:
TOTAL CHLORINE RESIDUAL (TCR) LIMITS FOR SURFACE DISCHARGE (TRC >.01 mg/l) WERE EXCEEDED SEVERAL TIMES DURING THE PERIOD OF 9/93 TO 8/94. pH and D.O. were also exceeded on occasions DURING THE SAME PERIOD OF TIME.

Describe previous impact bioassessments, WQBEL's, and previous or current enforcement actions:
REVIEW OF THE FILES SHOWED NO INDICATION THAT PREVIOUS IMPACT BIOASSESSMENTS HAVE BEEN PERFORMED FOR THIS FACILITY. ON 6-13-94 THE DEPARTMENT ISSUED A WARNING LETTER TO THE FACILITY (OWL-DW-44-0016) FOR UNAUTHORIZED DISCHARGE OF SILT ACCUMULATION FLUSHING FROM THE RECLAIMED WATER DIST. SYSTEM TO L. WEKIVA RIVER ON AN INTERMITTENT BASIS. THE PIPE HAS BEEN REMOVED BY THE CITY. Resolution of this enforcement case is pending.
A waste load allocation, dated 10/10/83 and subsequently updated, established the effluent limits to the river for BOD, pH, Ammonia Nitrogen and DO (on previous page).

Discuss comparability of MOR results to past DER results and whether there are trends (improving, declining) in the data set: THE MORS FOR THE PAST YEAR SHOWED SEVERAL EFFLUENT LIMITS VIOLATIONS (TOTAL Cl_2 RESIDUAL AND pH). THE FACILITY TESTED THE USE OF CARBON DIOXIDE FOR pH CONTROL AND IT APPEARS THAT THE USE OF CO_2 IMPROVED THE RESULTS FOR pH. THE FACILITY WILL INSTALL A LINE TO DIVERT SUBSTANDARD EFFLUENT INTO THE PLANT'S INFLUENT PUMP STATION FOR FURTHER TREATMENT, BEFORE DISCHARGE TO L. WEKIVA RIVER, IN AN ATTEMPT TO ELIMINATE THE EXCURSIONS.

Additional information: THE FACILITY WAS RECENTLY AUTHORIZED TO ADD PERMANENT CARBON DIOXIDE FEED FACILITIES FOR EFFLUENT pH CONTROL, INSTALLATION OF PIPES TO DIVERT SUBSTANDARD EFFLUENT BACK INTO THE TREATMENT SYSTEM.

Staff contributing to this review (signature):

DR. PHIL KANE	(Biologist)
Heriberto Collazo 9/26/94	(Inspector)
Al Castro	(Engineer)
Christianne Fernandez	(P.E.)
	( )
	( )

Part I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS - FINAL

1. These limitations are to be achieved on the effective date of the permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from Outfall 001, sanitary wastewater.

   Such discharges shall be limited and monitored by the permittee as specified below:

PARAMETER	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS		
	Monthly Average	Weekly Average	Daily Maximum	Measurement Frequency	Sample Type	Sampling Point
Flow, MGD	Report	Report	--	Continuous	Recording flow meter & totalizer	Effluent
Flow, MGD	--	--	Report	7 days/week	Instantaneous	Instream
Temperature, °C	--	--	Report	5 days/week	Grab	Effluent
Carbonaceous Biochemical Oxygen Demand, 5 Day, mg/l	8.0	9.6	--	5 days/week	24-Hour Composite	Effluent
Total Suspended Solids, mg/l	30.0	45.0	--	5 days/week	24-Hour Composite	Effluent
Total Suspended Solids, mg/l	Report	Report	--	5 days/week	24-Hour Composite	Influent
Fecal Coliform Bacteria, #/100 ml	See Item 7 on Page I-4			5 days/week	Grab	Effluent

Instream sampling point is the staff gage affixed to the side of the bridge on Northwestern Avenue that crosses Little Wekiva River approximately 0.25 miles upstream of Altamonte Springs WWTP Outfall 001.

Part I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS - FINAL (Continued)

1. These limitations are to be achieved on the effective date of the permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from Outfall 001, sanitary wastewater.

Such discharges shall be limited and monitored by the permittee as specified below:

PARAMETER	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS		
	Monthly Average	Weekly Average	Daily Maximum	Measurement Frequency	Sample Type	Sampling Point
pH, std. units	See Item 8.a. & b. on Pages I-4 & I-5			Continuous or hourly grab		Effluent
pH, std. units	--	--	Report	5 days/week	Grab	Effluent
Total Ammonia, as N, mg/l	--	--	Report	5 days/week	Grab	Effluent
Total Ammonia, as N, mg/l	1.0	1.2	--	5 days/week	24-Hour Composite	Effluent
Total Kjeldahl Nitrogen, as N, mg/l	5.0	6.0	--	5 days/week	24-Hour Composite	Effluent
Un-ionized Ammonia, as N, mg/l	--	--	0.02	5 days/week	Calculate **	Effluent

** Effluent samples for pH and temperature shall be taken simultaneously with each total ammonia grab sample. Un-ionized ammonia shall be calculated in accordance with Attachment A,(attached). All measured values for pH, temperature, and total ammonia used to calculate an un-ionized ammonia valu shall be reported as an attachment to the Discharge Monitoring Report (DMR) Form (3320-1). All calculated un-ionized ammonia values shall also be reported on the attachment. The daily maximum value for un-ionized ammonia for each reporting period shall be reported on the DMR. The un-ionize ammonia effluent limitation shall apply only when stream flow in the Little Wekiva River is greater than or equal to 10 cfs when measured at the instream sampling point.

Part I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS - FINAL (Continued)

1. These limitations are to be achieved on the effective date of the permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from Outfall 001, sanitary wastewater.

Such discharges shall be limited and monitored by the permittee as specified below:

PARAMETER	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS		
	Monthly Average	Weekly Average	Daily Maximum	Measurement Frequency	Sample Type	Sampling Point
Nitrate-Nitrite, as N, mg/l	Report	Report	--	1 day/week	24-Hour Composite	Effluent
Total Phosphorus, as P, mg/l	Report	Report	--	1 day/week	24-Hour Composite	Effluent
Dissolved Oxygen, mg/l	See Item 9 on Page I-5			7 days/week	Grab	Effluent
Total Residual Chlorine, mg/l	See Item 10 on Page I-6			7 days/week	Grab	Effluent
Total Recoverable Copper, as Cu, ug/l	See Item 12 on Page I-5		Report	1/month	24-Hour Composite	Effluent
Total Recoverable Mercury, as Hg, ug/l	See Item 12 on Page I-5		Report	1/month	24-Hour Composite	Effluent
Total Recoverable Selenium, as Se, ug/l	See Item 12 on Page I-5		Report	1/month	24-Hour Composite	Effluent
Acute Whole Effluent Toxicity	See Item 11 on Page I-5			Part IV	Grab	Effluent

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: 30 / SUBMITTING AGENCY NAME: FDEP CENTRAL DISTRICT	STORET STATION NUMBER:	DATE (M/D/Y): 10/31/94	TIME: 1115	RECEIVING BODY OF WATER: LITTLE WEKIVA
REMARKS: UPSTREAM	LOCATION: CITY OF ALTAMONTE SPRINGS STP KELLER ROAD			FIELD ID/NAME: ASP

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
10			90			

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): 5-6	Estimated System Depth (range, m): 1.25		yes
High Water Mark (m above bed): 2.25	Velocity (range, m/s): .3	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: ☐

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	15	6	VET	Riffles			
Leaf Packs	15	6	VET	Sand	60	2	VET
Aquatic Vegetation				Mud/Muck/Silt			
Rock or Shell Rubble				Benthic leaf mats			
Undercut Banks/Roots	10	6	VET	Other:			

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):			Secchi (m):
Top								
Mid-depth	.6m	23.34	6.16	2.73	191			TO BOTTOM
Bottom								

System Type : Stream: ☑ (Sand Bottomed / Sand Bot w/ Spring / Swamp & Bog / Calcareous / Alluvial / Misc.) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐ _____

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

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

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

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

Weather Conditions: CLOUDY/SUN

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

SAMPLING TEAM:	SIGNATURE:	DATE:
KANE, KENT, FERRACO	Phil Kane	10/31/94

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

SUBMITTING AGENCY CODE: 30 SUBMITTING AGENCY NAME: FDEP CENTRAL DISTRICT	STORET STATION NUMBER:	DATE (M/D/Y): 10/31/94	RECEIVING BODY OF WATER: LITTLE WEKIVA

REMARKS:	LOCATION: CITY OF ALTAMONTE SPRINGS STP	FIELD ID/NAME:
UPSTREAM	KELLER ROAD	ASP

Habitat Parameter score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover 20	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 22	Max. observed: >0.3 m/sec. but < 1 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, or spate occurring; > 2 m/sec **0-7 points**
Artificial Channel/ Flow Alteration 12	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 4	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** 76

COMMENTS: BANK HAS EXPOSED ROOTS DUE TO STORMWATER PIPE EROSION

ANALYSIS DATE:	ANALYST:	SIGNATURE:
10/31/94	PHIL KANE	Phil Kane

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: 30 / SUBMITTING AGENCY NAME: FDER CENTRAL DISTRICT	STORET STATION NUMBER:	DATE (M/D/Y): 10/31/94	TIME: 10:05	RECEIVING BODY OF WATER: LITTLE WEKIVA

REMARKS: DOWNSTREAM	LOCATION: CITY OF ALTAMONTE SPRINGS STP KELLER ROAD	FIELD ID/NAME: ASP

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
10			90			

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): Altamonte Springs STP upstream (WWTP)

Estimated System Width (range, m): 6 to 9	Estimated System Depth (range, m): 1	yes
High Water Mark (m above bed): 2	Velocity (range, m/s): .25	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: ☐

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	30	6	net	Riffles			
Leaf Packs	20	6	net	Sand	40	2	net
Aquatic Vegetation				Mud/Muck/Silt			
Rock or Shell Rubble				Benthic leaf mats			
Undercut Banks/Roots	10	6	net	Other:			

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):			Secchi (m):
Top								TO BOTTOM
Mid-depth	.5	25.25	6.79	5.29	331			
Bottom								

System Type : Stream: ☑ (Sand Bottomed / Swamp & Bog / Alluvial / Sand Bot w/ Spring / Calcareous / Misc.) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

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

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

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

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

Weather Conditions: CLOUD/SUN

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

SAMPLING TEAM: Phil Kan, Chris Ferraro	SIGNATURE: Phil Kan	DATE: 10/31/94

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

SUBMITTING AGENCY CODE: 30 SUBMITTING AGENCY NAME: FDEP CENTRAL DISTRICT	STORET STATION NUMBER:	DATE (M/D/Y): 10/31/94	RECEIVING BODY OF WATER: LITTLE WEKIVA

REMARKS:	LOCATION: CITY OF ALTAMONTE SPRINGS STP KELLER ROAD	FIELD ID/NAME: ASP
DOWNSTREAM		

Habitat Parameter score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover 25	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 22	Max. observed: >0.3 m/sec. but < 1 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, or spate occurring; > 2 m/sec **0-7 points**
Artificial Channel/ Flow Alteration 13	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 9	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 81

COMMENTS:

ANALYSIS DATE:	ANALYST:	SIGNATURE:
10/31/94	PHIL KANE	Phil Kane

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Altamonte Springs STP
County:
Contact / District: Phil Kane / Central
NPDES Permit #: FL0033251
LIMS Sample #: 92793 **LIMS Job #:** 94-NOV-01-10

Sample Collection: Date 10/31/94 Time 0845
Test Beginning: Date 11/1/94 Time 1130
Test Ending: Date 11/3/94 Time 1250
Organism Batch #: 42 **Diluent Batch #:** 42
Organism Age: < 24 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	22.4 @ 22.5	8.6 @ 22.7 °C	112.0 @ 102.0 1007 @ 1047 @ 24.7 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	22.0 @ 22.1	8.6 @ 22.4 °C	111.0 @ 102.6 1014 @ 1047 @ 23.8 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	22.4 @ 22.5	8.5 @ 23.0 °C	110.0 @ 102.6 1026 @ 1047 @ 25.1 °C

		Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED ~~Cond. (mmhos/cm)~~ Cond. (µmhos/cm)		
Conc.	Chamber #	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Control	A	5	5	5	8.3		8.2	23.0		23.3	8.1		8.1	165		185
Control	B	5	5	5			8.3			23.3			8.0			185
Control	C	5	5	5			8.3			23.0			8.1			180
Control	D	5	5	5			8.3			22.5			8.3			200
100%	A	5	5	5	7.3		8.4	21.9		23.3	7.8		8.1	445		445
100%	B	5	5	5			8.4			23.2			8.2			480
100%	C	5	5	5			8.4			22.9			8.3			480
100%	D	5	5	5			8.5			22.5			8.4			525
Recorded by:		TR	TR	MF	TR		MF	TR		MF	TR		MF	TR		MF
Measured/Loaded by:		TR	TR	MF	TR		JLS	TR		JLS	TR		JLS	TR		JLS

Investigators' Signatures

Kevin C. Radke
Marshall Faircloth
Jennifer Spraggins
Tena Mikkelsen
Reviewer

form updated 10/05/94

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			0.6	-	PK
Lab Total Residual Cl2 (mg/L):		< 0.03	< 0.03	HR 116	TR
Alkalinity (mg/L as $CaCO_3$):		79	95	Hach	TR
Hardness (mg/L as $CaCO_3$):		82	110	Hach	TR
Total ammonia (mg/L as N):		< 0.017	< 0.017	orion	MF

Ammonia Meter #98136 Ammonia Meter Slope: -57.8 Ammonia Blank: < 0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Altamonte Springs STP
County:
Contact / District: Phil Kane / Central
NPDES Permit #: FL0033251
LIMS Sample #: 92793 **LIMS Job #:** 94-NOV-01-10

Sample Collection: Date 10/31/94 Time 0845
Test Beginning: Date 11/1/94 Time 1145
Test Ending: Date 11/3/94 Time 1145
Organism Batch #: 44 **Diluent Batch #:** well
Organism Age: 11 days
Test Organism: Cyprinella leedsi

Test Type: Screening / Definitive
Static / Static Renewal / Flow-through

Test Number: 2 of 2

Remarks:

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	22.4 @ 22.5	8.6 @ 22.7 °C	112.0 @ 102.6 1007 @ 1047 @ 24.7 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	22.0 @ 22.1	8.6 @ 22.4 °C	111.0 @ 102.6 1014 @ 1047 @ 23.6 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	22.4 @ 22.5	22.4 @ 22.5 °C	110.6 @ 102.6 1016 @ 1047 @ 23.7 °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
Control A	53	5	5	5	7.9	8.3	8.4	22.8	22.6	22.4	8.3	8.2	8.3	245	250	250
Control B	366	5	5	5	7.9	8.3	8.4			22.4	8.3	8.1	8.4	245	245	245
Control C	196	5	5	5	7.9	8.3	8.4			22.3	8.3	8.1	8.4	245	250	250
Control D	21	5	5	5	7.9	8.3	8.4			22.4	8.3	8.1	8.2	245	240	245
100% A	3	5	5	5	7.3	7.9	8.1	21.5	22.5	22.2	8.4	8.0	8.2	460	480	480
100% B	1	5	5	5	7.3	7.9	8.1			22.0	8.4	7.9	8.2	460	475	475
100% C	65	5	5	5	7.3	7.9	8.2			22.0	8.4	8.0	8.3	460	480	480
100% D	1266	5	5	5	7.3	7.9	8.2			22.3	8.4	7.9	8.1	460	480	480
Recorded by:		TR	TM	TM	TR	TR	MF	TR	TR	MF	TR	TR	MF	TR	TR	MF
Measured/Loaded by:		TR	TM	TM	TR	TM	JLS	TR	TR	JLS	TR	TM	JLS	TR	TM	JLS

Investigators' Signatures

Reviewer

form updated 10/05/94

Water Quality Parameters

	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			0.6	—	pk
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03	<0.03	DPD-CO	TR
Alkalinity (mg/L as $CaCO_3$):	120	75	75	Hach	TR
Hardness (mg/L as $CaCO_3$):	125	86	110	Hach	TR
Total ammonia (mg/L as N):	<0.017		<0.017	orion	MF

Ammonia Meter #98136 Ammonia Meter Slope: -57.8 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

Test Site

Calculation & Interpretation of the Stream Invertebrate Index for Florida (SIIF) (Draft 1994)									
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	**Panhandle (65, 75a)**					**Peninsula (75b, c, d)**			
	Value	5	3	1	Score	5	3	1	Score
Number of Taxa		≥ 31	16–30	0–15		≥ 27	14–26	0–13	1
EPT Index		≥ 7	4–6	0–3			≥ 4	0–3	2
% Contribution of Dominant Taxon			≤ 20	> 20			≤ 37	> 37	1
Florida Index		≥ 18	9–17	0–8		≥ 7	4–6	0–3	3
% Diptera			≤ 38	> 38			≤ 32	> 32	3
% Suspension feeders/ Collector-Filterers		≥ 12	7–11	0–6		≥ 8	4–7	0–3	1
% Shredders			≥ 10	0–9			≥ 13	0–12	1
% Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 16	0–15	1
# Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 4	0–3	1
Total Score		**Panhandle**				**Peninsula**			14
Interpretation of Score		**No Impairment**			**29-23**	**No Impairment**			**33-27**
		Moderate Impairment			**22-15**	**Moderate Impairment**			**26-17**
		Severe Degradation			**14-7**	**Severe Degradation**			**16-9**

Reference Site

Calculation & Interpretation of the Stream Invertebrate Index for Florida (SIIF) (Draft 1994)									
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	**Panhandle (65, 75a)**					**Peninsula (75b, c, d)**			
	Value	5	3	1	Score	5	3	1	Score
Number of Taxa		≥ 31	16–30	0–15		≥ 27	14–26	0–13	3
EPT Index		≥ 7	4–6	0–3			≥ 4	0–3	2
% Contribution of Dominant Taxon			≤ 20	> 20			≤ 37	> 37	1
Florida Index		≥ 18	9–17	0–8		≥ 7	4–6	0–3	5
% Diptera			≤ 38	> 38			≤ 32	> 32	1
% Suspension feeders/ Collector-Filterers		≥ 12	7–11	0–6		≥ 8	4–7	0–3	1
% Shredders			≥ 10	0–9			≥ 13	0–12	1
% Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 16	0–15	1
# Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 4	0–3	1
Total Score		**Panhandle**				**Peninsula**			16
Interpretation of Score		**No Impairment**			**29-23**	**No Impairment**			**33-27**
		Moderate Impairment			**22-15**	**Moderate Impairment**			**26-17**
		Severe Degradation			**14-7**	**Severe Degradation**			**16-9**

Benthic macroinvertebrate taxa list for Altamonte Springs WWTP, collected via 20 dip net sweeps in the Little Wekiva River, on 31 October, 1994.

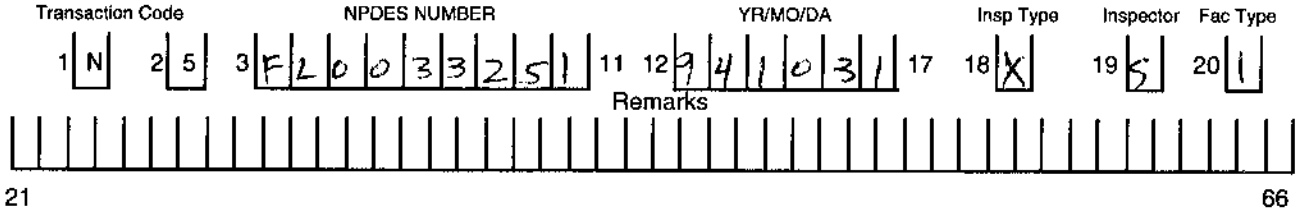
	Reference Site	Test Site
Amphipoda		
Hyalella azteca	392	33
Coleoptera		
Dineutus discolor	–	33
Microcylloepus pusillus	–	456
Undetermined Coleopteran	98	–
Diptera		
Asheum beckae	98	–
Palpomyia / Bezzia grp. sp.	98	–
Pentaneura inconspicua	196	98
Pericoma sp.	98	–
Polypedilum convictum grp.	3822	163
Polypedilum halterale grp.	–	33
Polypedilum illinoense grp.	196	–
Polypedilum scalaenum grp.	1372	326
Rheotanytarsus exiguus grp.	98	–
Stenochironomus sp.	98	–
Ephemeroptera		
Caenis sp.	294	261
Odonata		
Aphylla williamsoni	–	33
Ischnura sp.	–	33
Pelecypoda		
Undetermined Pisidiidae	196	–
Trichoptera		
Cheumatopsyche sp.	4410	978

Phytoplankton taxa list and densities (#/mL) for The City of Altamonte Springs waste water treatment facility, collected via subsurface grabs in the Little Wekiva River, on 31 October, 1994.

	Reference Site	Test Site
Bacillariophyceae		
Achnanthes sp.	–	11
Cyclotella sp.	1768	95
Gomphonema sp.	–	11
Melosira sp.	263	105
Navicula sp.	35	11
Nitzschia sp.	158	53
Unidentified pennate diatom	18	–
Chlorophyceae		
Ankistrodesmus sp.	53	21
Carteria sp.	–	11
Chlamydomonas sp.	280	147
Chlorella sp.	70	63
Crucigenia sp.	175	63
Desmidium sp.	–	11
Euastrum sp.	–	11
Eudorina sp.	–	11
Gloeocystis sp.	35	–
Kirchneriella sp.	–	11
Oocystis sp.	–	32
Pediastrum sp.	18	–
Scenedesmus sp.	963	410
Schroederia sp.	–	11
Selenastrum sp.	158	–
Tetraedron sp.	420	116
Tetraedron minimum	35	–
Treubaria sp.	1	–
Unknown chlorophyte flagellate	105	32
Chrysophyceae		
Mallomonas sp.	–	21
Cryptophyceae		
Carteria sp.	18	–
Chroomonas sp.	105	–
Cryptomonas sp.	263	158
Cyanophyceae		
Aphanocapsa	70	21
Chroococcus sp.	263	32
Dactylococcopsis sp.	175	95
Gloeocapsa sp.	18	–
Lyngbya sp.	–	11

Merismopedia sp.	88	42
Microcystis sp.	–	53
Oscillatoria sp.	193	42
Euglenophyceae		
Phacus sp.	18	–
Trachelomonas sp.	18	–

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)

