

Biological Assessment of

Meadowlands WWTP

Polk County

NPDES #FL0041416

Sampled January 1999

October 1999

Biology Section
Division of Administrative and Technical Services
Bureau of Laboratories

Comprehensive Quality Assurance Plan No. 870346G

Department of Environmental Protection
Results of Fifth Year Inspections

Discharger:	Meadowlands WWTP
County:	Polk
NPDES Number:	FL0041416
Permit Expiration Date:	10/31/99

Toxics Sampling Inspection (XSI)

Date Sampled: 25 January 1999

Results: Aluminum, cadmium, copper, iron, lead, and zinc were detected in the effluent at levels that complied with Class III water quality standards. No organic priority pollutants were detected in the effluent.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 25 January 1999

Results: The effluent sample was not toxic to the invertebrate, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi*. No mortality occurred in either 48-hour static acute bioassay. No organic priority pollutants were detected in the effluent.

Impact Bioassessment Inspection (IBI)

Date Sampled: 25 January 1999

Results: Measures of benthic macroinvertebrate and the phytoplankton community health generally indicated impairment at the test site compared to the control site as a result of the facility's discharge. These changes are reflected by significant decreases in species abundance, taxa richness, and increases in the dominant taxa.

Water Quality Inspection (WQI)

Date Sampled: 25 January 1999

Results: The test site temperature (23.2°C) was considerably higher than the temperature at the control site (15.4°C). Fecal coliform bacteria were estimated at 2,260 counts/100ml at the control and test sites which exceeded Class III water quality standards (Rule 62302.530(6) FAC) and is indicative of sources other than the effluent for these. Nitrate+nitrite, total nitrogen, and organic nitrogen were all elevated at the test site compared to the control site. Nitrate+nitrite was greater than 75% of other typical Florida streams. The test site AGP concentration greatly exceeded the 5 mg dry wt/L "problem threshold", and was approximately 165% above the concentration found at the control site. The control site AGP level slightly exceeded the "problem threshold". The effluent AGP was 17.9 mg dry wt/L.

This biological assessment was prepared by DEP staff to provide information to be used in reviewing an NPDES permit renewal application for the subject facility. This assessment will be used in conjunction with other information concerning the facility and its receiving water body to determine appropriate final permit conditions.

Introduction

The Meadowlands Wastewater Treatment Plant is located in Polk County, Florida (see maps in the Appendix). This facility is a 0.2 MGD extended aeration plant with chemical removal of nitrogen and phosphorus. High level disinfection is achieved through chlorination, and the effluent is dechlorinated prior to discharge. After treatment, the effluent is piped approximately 200 meters to the discharge point into a canal that flows through a wetland and enters the Class III Poley Creek approximately 1 mile downstream of the outfall. The mean flow during the sampling period was 0.1 MGD.

State permit limits for the facility are listed in Table 1. According to the facility's Monthly Operating Reports (MOR), the plant has had two violations of the permit limits within the past year (fecal coliform bacteria on August 24, 1998, and total nitrogen on November 19, 1998). The Department's legal tracking system shows that consent order 97-2038 was entered April 22, 1998, for failure to provide records and reports for the effluent results chronically exceeding permit limits and for failure to timely report abnormal events.

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 control site (located in Poley Creek just upstream of the confluence where the unnamed creek enters Poley Creek) and a test site (located in the unnamed creek approximately 100 meters downstream of the discharge). A habitat assessment was performed *in situ* to establish comparability between sites. Supplemental physical/chemical data were also collected on the effluent and study sites. Data for this report were collected on February 15, 1999. The effluent was analyzed for nutrients, metals, and organic constituents (base neutral and acid extractables, and pesticide extractables). Methods used for all chemical analyses are on file at the DEP Central Chemistry Laboratory in Tallahassee.

Acute screening toxicity bioassays, using the invertebrate, *Ceriodaphnia dubia,* and the fish, *Cyprinella leedsi* as test organisms, were performed on an effluent sample.

Benthic macroinvertebrate community structure and function were evaluated at the control and test sites utilizing discrete dip-net sweep collections from the available substrates (*e.g.*, snags, leaf packs, vegetation) within a 100 meter stream reach at each sampling site. Normally, additional invertebrate collections using Hester-Dendy multiplate samplers are taken in conjunction with the dip-net samples, however, they were not completed during this sampling period due to low water.

Phytoplankton were sampled at both control and test sites via subsurface grabs. These samples were analyzed for the diversity and density of the taxa present, and chlorophyll *a*. *Selenastrum capricornutum* was used as the test organism for algal growth potential tests. Periphyton samples at both control and test sites were not taken during this sampling period due to low water levels. All field and laboratory biological methods were carried out following Biology Section Standard Operating Procedures (SOP's). The SOP's can be viewed on our web site at <www.dep.state.fl.us/labs/sops.htm>.

Several different measurements of macroinvertebrate and algal community health have been employed to determine the effects of the discharge. These measurements include: habitat assessment, taxa richness, Shannon-Weaver Diversity Index, the Florida Index, Ephemeroptera/Plecoptera/Trichoptera (EPT) Index, community composition, functional feeding groups, algal biomass, and the Stream Condition Index (SCI). For a discussion of each of these measures, see *Explanation of Measurements of Community Health* in the Appendix.

For graphical purposes, the percent differences between the control and test sites involving the number of taxa, the diversity index, the Florida Index, the EPT Index, the diatom to blue-green algae ratio, the % filter-feeders, are measured as the control site minus test site divided by the control site. The percent differences between sites involving the % tubificids, % contribution, algal density, chlorophyll *a*, and algal growth potential are measured as the test site minus control site divided by the control site.

The following personnel were involved in this investigation: Andrea Grainger and Joe Squiteri (DEP Southwest District), and Julie Baughman, Ken Espy, Marshall Faircloth, Michael Heyn, Joy Jackson, Elizabeth Miller, Urania Quintana, Johnny Richardson, Lisa Homann, Amy Weaver, David Whiting, Vicki McGee, and Steve

Table 1. Effluent limits and summary of chemistry data.

Meadowlands WWTP	Effluent Limits	Effluent Sample	Control Site	Test Site
Organic Constituents (µg/L)				
None Detected	-	-	-	-
Metals (µg/L)				
Aluminum	-	147 I	-	-
Arsenic	-	20 U	-	-
Cadmium	1.36 **b	0.17 I	-	-
Chromium	251 **b	10 U	-	-
Copper	14.5 **b	13.5 A	-	-
Iron	1000 **	18 I	-	-
Lead	4.3 **b	0.38 I	-	-
Mercury	0.012 **	0.10 U	-	-
Nickel	192 **b	6 U	-	-
Selenium	5.0 **	40 U	-	-
Silver	0.07 **	0.04 U	-	-
Zinc	129	45 J	-	-
Nutrients (mg/L)				
Ortho-phosphate	-	0.15	0.33	0.15
Total phosphorus	1.0	0.20	0.55	0.19 A
Ammonia	-	0.027 I	0.023 I	0.036 I
Nitrate+Nitrite	-	0.73	0.11	0.30
TKN	-	0.68	0.48	0.67
Organic Nitrogen	-	0.65	0.46	0.63
Total Nitrogen	3 *a	1.41	0.59	0.97
General Phys-Chem Parameters				
Habitat Assessment	-	-	123	121
DO (mg/L)	≥ 5.0 *	-	6.7	6.4
pH (SU)	6.0 - 8.5 *	7.0	6.6	7.2
Conductivity (µmhos/cm)	-	517	234	180
Temperature (°C)	-	23.2	15.4	23.2
CBOD 5 day (mg/L)	≤ 5.0 *a	2 U	2 U	2 U
Flow (MGD)	≤ 0.2 *	0.1	-	-
Hardness (mg $CaCO_3$)	-	127	-	-
TSS (mg/L)	≤ 5 *a	0.1 U	6	3
Turbidity (NTU)	-	0.5	0.8	6
AGP (mg dry wt/L)	-	17.9	5.4	14.3
Toxicity (48-hour static, screening bioassay)				
Bioassay - Fish	-	Not Toxic	-	-
Bioassay - Invertebrate	-	Not Toxic	-	-
Microbiology (# counts/100mL)				
Fecal Coliforms	≤ 25 *	274 A	2260 J	2260 J
Total Coliforms	-	1 K	1190 J	410

A - The mean of two or more determinations
I - Value is < the MQL, and ≥ the MDL
J - Estimated value
K - Actual value is known to be less than value given
U - Not detected; value is the minimum detection limit

* Permit limit
** Class III standard
a - Annual average
b - Based on hardness

Wolfe (DEP Central Biology Laboratory in Tallahassee). The report was reviewed by the Point Source Studies Review Committee, consisting of Wayne Magley, Chuck Ziegmont, and Michael Tanski, as well as District representatives.

Results

The chemical and biological results for this report are presented in Table 1 and Table 2.

Discussion

The temperature at the test site (23.2°C) was considerably higher than that of the control site (15.4°C). The reason for the 7.8°C increase in temperature at the test site compared to the control site appears to be in part, related to the discharge. The temperature of the effluent was 23.2°C. However, the unnamed creek was slightly shallower and more open than Poley Creek and this may have contributed to the difference in temperature (see Habitat Asssessment Data Sheets in the Appendix).

Aluminum, cadmium, copper, iron, lead, and zinc were detected in the effluent at concentrations that complied with Class III water quality standards (Table 1). No organic pollutants were detected in the effluent (Table 1).

The effluent sample was not toxic to the fish, *Cyprinella leedsi,* or to the invertebrate, *Ceriodaphnia dubia,* during the 48-hour bioassay.

The nitrate+nitrite level at the test site exceeded values found in over 75% of other Florida streams

Table 2. Community structure of study sites.

Meadowlands WWTP	Control Site	Test Site
Macroinvertebrate Qualitative		
% Dominant Taxon	15.0	40.6
EPT Index	3	0
Florida Index	14	3
Number of Taxa	23	17
SCI	29	11
Community Composition		
% Amphipoda	12.0	0.0
% Coleoptera	9.0	2.1
% Diptera	37.0	79.2
% Ephemeroptera	6.0	0.0
% Gastropoda	9.0	6.3
% Odonata	2.0	1.0
% Oligochaeta	1.0	5.2
% Other	5.0	4.1
% Pelecypoda	0.0	2.1
% Trichoptera	19.0	0.0
Functional Feeding Groups		
% Burrowing Deposit Feeders	1.0	5.2
% Predators	6.5	2.1
% Scrapers	16.5	1.0
% Shredders	12.5	32.8
% Surface Deposit Feeders	25.0	44.3
% Suspension Feeders/Filterers	23.5	2.6
Phytoplankton Algae		
Number of Taxa	9	6
Shannon-Weaver diversity	2.16	2.25
Chlorophyll *a* (µg/L)	1.0 U	1.0 U
Algal Density (#/mL)	142.3	26.3
% Bacillariophyceae	63.4	47.1
% Chlorophyceae	2.2	0.0
% Cryptophyceae	31.2	11.8
% Cyanophyceae	2.2	41.2
% Euglenophyceae	1.1	0.0
AGP (mg dry wt/L)	5.4	14.3

U - Not detected; value is the minimum detection limit

(see *Typical Values for Selected Parameters in Florida Waters* in Appendix) and was 173% higher than the control site (Table 1). Total and organic nitrogen were 64% and 37% higher, respectively, than the control site level but are similar to other streams throughout Florida (Table 1). The AGP value in the effluent was 17.9 mg dry wt/L, and reflects the higher nutrient levels in the effluent. The AGP value at the test site increased 165% from the control site, which indicates some nutrient loading resulting from the discharge. AGP exceeded the 5 mg dry wt/L "problem threshold" at both the control and test sites (Table 1) (Rashke and Shultz 1987).

Differences in the test site phytoplankton community structure may be associated with the discharge (Figure 1). These changes are reflected in decreases in taxa richness (-33%) and algal density (-81%), as well as an increase in the Cyanophyceae (1,770%). The percent dominant taxon was similar at both the control and test sites: however, the community shifted from one dominated by *Navicula* sp., representing 46% of the total individuals collected at the control site, to one dominated by *Nitzchia* sp., representing 40% of the collection at the test site (Table 2).

Qualitative dip net samples of the macroinvertebrate community revealed several differences in community structure and function at the test site compared to the control site (Figure 2) which appear to be the result of the effluent. These differences are reflected in a 26% decline in taxa richness, a 79% decline in the Florida index, and a 300% decline in the EPT Index. The dominant taxon contribution increased from 15% at the control site to 41% at the test site. These changes are reflected in the composite SCI score. The control site received 29 SCI points placing it the "excellent" category, while the test site received only 11 points placing it in the "poor" category (see the SCI Worksheet in Appendix).

Literature Cited

Barbour, M. T., J. Gerritsen, and J. S. White. 1996. Development of the Stream Condition Index for Florida. Prepared for the Fla. Dept. Environ. Protection. 105 p.

EA Engineering, Science, and Technology and Tetra Tech, Inc. 1994. Bioassessment for the nonpoint source program (draft). Prepared for the Fla. Dept. Environ. Protection. Unpaginated.

FDEP. 1994. Lake bioassessments for the determination of nonpoint source impairment in Florida. Fla. Dept. Environ. Protection, Biology Section, Tallahassee, Fla. 73 p.

Miller, W. E., T. E. Maloney, and J. C. Greene.1978. The *Selenastrum capricornutum* Printz algal as-

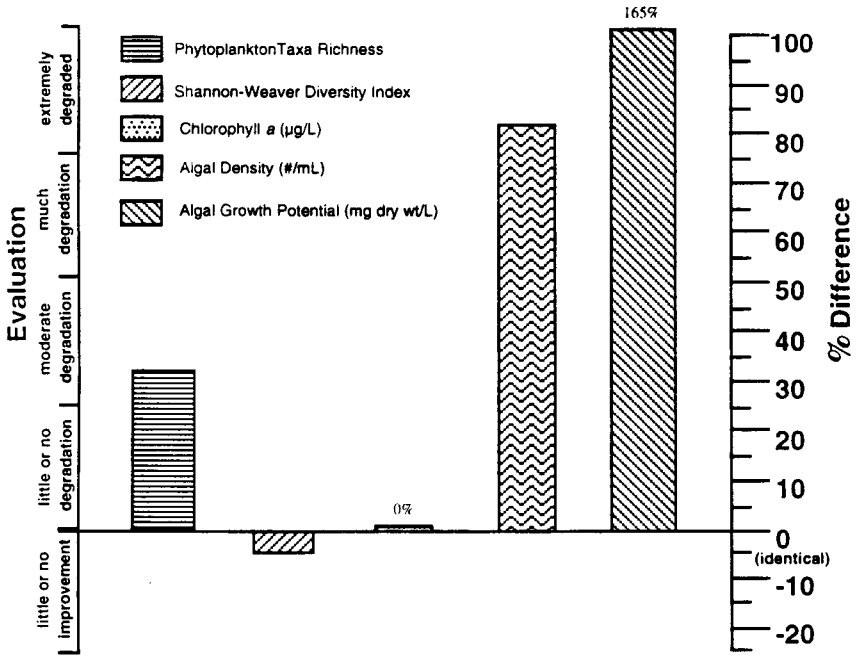


Figure 1. Effect of discharge on the phytoplankton community.

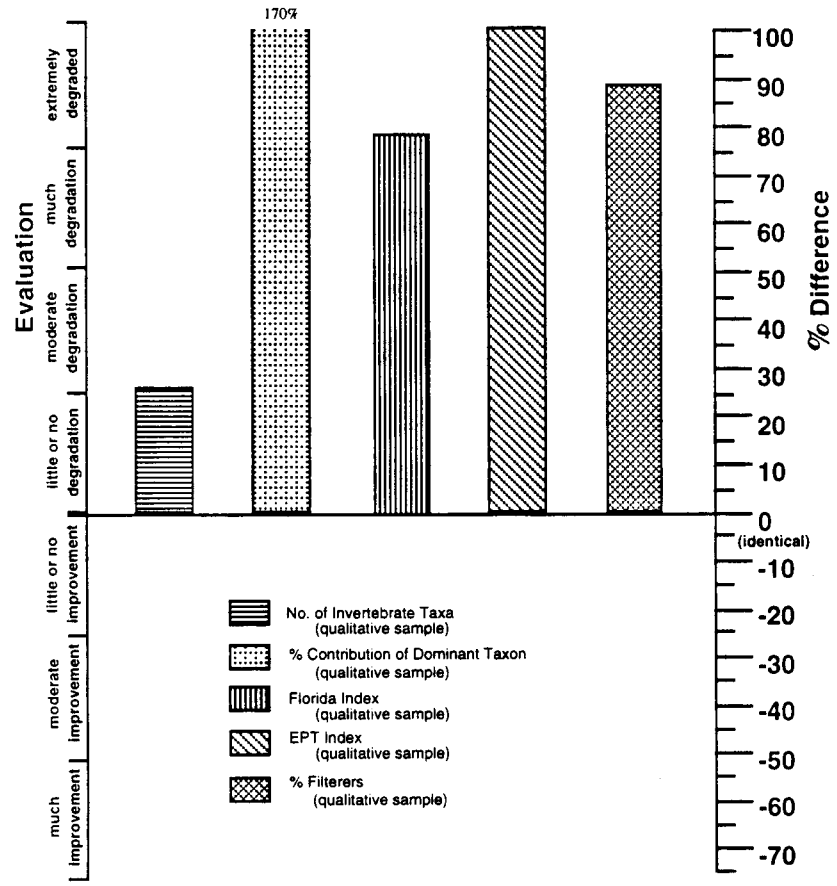


Figure 2. Effect of discharge on the macroinvertebrate community.

say bottle test. U. S. Environ. Protection Agency, EPA-600/9-78-018. 126 p.

Raschke. R. L. and D. A. Schultz. 1987. The use of the algal growth potential test for data assessment. J. Water. 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.

Weber, C. I. 1993. 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 pp.

Typical Values for Selected Parameters in Florida Waters

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

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

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

Explanation of Measurements of Community Health

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

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

Taxa richness: Stress tends to reduce the number of different types of organisms present in a system, although moderate nutrient enrichment may sometimes be correlated with increased algal taxa richness.

Shannon-Weaver diversity: This index is specified in the Florida Administrative Code as a measure of biological integrity. Low diversity scores are undesirable. They represent conditions where only a few organisms are abundant, to the exclusion of other taxa.

The Florida Index: Some organisms become rare or absent as the intensity or duration of disturbance increases. 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.

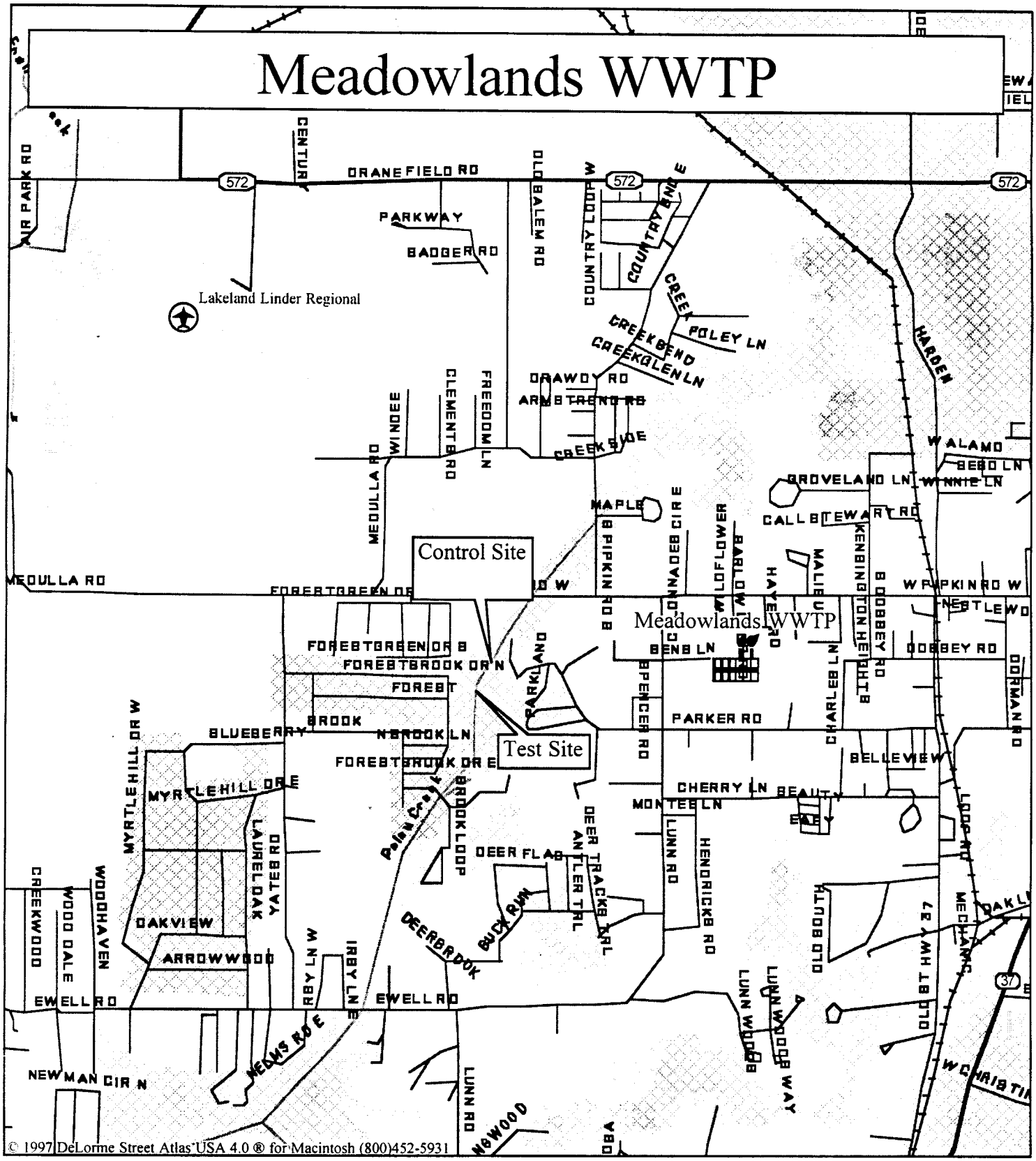
Ephemeroptera/Plecoptera/Trichoptera (EPT) Index: This index is the sum of the number of EPT taxa present. Higher EPT values are associated with healthier systems.

Community structure: Substantial shifts in proportions of major groups of organisms, compared to control conditions, may indicate degradation.

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

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

The Stream Condition Index (SCI): The SCI is a composite macroinvertebrate metric (Barbour *et al.* 1996) developed for Florida. The SCI assigns points to a variety of parameters, depending on how closely each parameter approaches an expected control condition (see SCI calculation table in Appendix).



Mag 14.00
Tue Nov 02 15:34 1999

Scale 1:31,250 (at center)

2000 Feet

1000 Meters

Local Road

State Route

US Highway

Railroad

Facility Summary Sheet for Meadowland Regional WWTP's FYI-5 Conducted in December 1998

Facility Name: Meadowland Regional WWTP Date Summary Prepared: January 22, 1999
Location: send map County: Polk District: SW District

Function of Facility: Treatment and disposal domestic wastewater .

Description of Treatment Process: This is a 0.2 mgd extended aeration plant with chemical removal of nitrogen and phosphorus. High level disinfection is achieved through dechlorination and the effluent is dechlorinated prior to discharge.

Receiving Waters: Poley Creek Water Classification: Class III Freshwater

Design Flow: 0.2 mgd Mean Flow: 0.1 mgd

The Discharge is Continuous

List Effluent Limits:

Parameter Frequency	Min	Max	Type Sample
TSS (mg/L) every 2 weeks	0	5 annual avg.	fpc*
CBOD5 (mg/L) every 2 weeks	0	5 annual avg.	fpc
Fecal Coliform (#/100 ml) month	**ND	25	grab
Total nitrogen (mg/L) every 2 weeks	0	3 annual avg.	fpc
Total phosphorus (mg/L) every 2 weeks	0	1.0	fpc
TRC (mg/L) daily 5/week	0	0.01	grab
Flow (mgd) daily, 5/week	0.000	2.25	record flow rate
pH (SU) daily, 5/week	6.00	8.50	grab/meter
Dissolved oxygen (mg/L) daily	5.0	.	grab

* flow proportioned composite sample
** Non-detectable

Description of permitted outfall: The outfall is located approximately 200 meters from the WWTP. Outfall is a pvc pipe approximately 12 inch in diameter. Effluent discharges into a canal which flows through a wetland and then into Poley Creek approximately 1 mile downstream from the outfall.

List permit violations and plant upsets that occurred within past 3 years:

Total nitrogen was 15.4 mg/L on November 19, 1998. Monthly average was 9.75 that month.
Total coliform was 137 colonies/100 ml on August 31, 1998.

Fecal coliform was 40 colonies/100 ml on August 24, 1998.

Describe previous impact bioassessments, WQBELs, and previous and current enforcement actions:
OGC Case 97-2038 was entered April 22, 1998, mainly due to the failure to meet permit limits for discharge to surface waters, including total nitrogen, $CBOD_5$, and fecal coliform. Final compliance was expected by April 30, 1998.

Staff contributing to this review:

Andrea Grainger	(Biologist)
Joe Squitieri	(Inspector)

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		1/25/99	0930	Poley Creek

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Creek level was high due to heavy rains 1/23/99	Polk	Meadowlands Regional Park	Control Site

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
30		15	15	40			

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

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

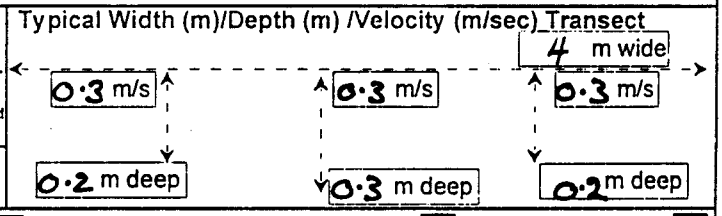
Width of riparian vegetation (m) on least buffered side: 16 — *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes ☐ more sinuous

High Water Mark: 0.5 (m above present water level) + 0.3 (present depth in m) = 0.8 (m above bed)

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect



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

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☑ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☐

Sediment Oils: Absent: ☑ Slight: ☐ Moderate: ☐ Profuse: ☐

Sediment Deposition: Sludge: ☐ Sand smothering: none slight (moderate severe) Silt smothering: (none slight) moderate severe Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	5	5	net	Sand	70	2	net
Leaf Packs or Mats	5	5	net	Mud/Muck/Silt	10	3	net
Aquatic Vegetation	-	-	-	Other:			
Rock or Shell Rubble	-	-	-	Other:			
Undercut banks/Roots	10	5	net	*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.1	15.39	6.55	6.68	284			VOB
Mid-depth								
Bottom								

System Type : Stream: 2 (1st - 2nd order, 3rd - 4th order, 5th - 6th order, 7th order or greater) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

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

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

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

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

Weather Conditions/Notes: Weather is clear cool. Very heavy rains 1/23/99

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Grainger		2/5/99

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		1/25/99	1130	Poley Creek

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
There were heavy rains on 1/25/99 up to 3 inches	Polk	Meadowlands Regional WWTP	Downstream Site

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
30		15	15	40			

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

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

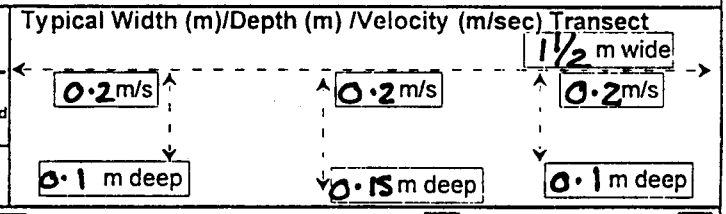
Width of riparian vegetation (m) on least buffered side: 7 | *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

High Water Mark: 0.5 (m above present water level) + 0.15 (present depth in m) = 0.65 (m above bed)

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect



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

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☐ Sewage: ☐ Petroleum: ☐ Chemical: ☑ Anaerobic: ☐ Other: ☐ _____

Sediment Oils: Absent: ☑ Slight: ☐ Moderate: ☐ Profuse: ☐

Sediment Deposition: Sludge: ☐ Sand smothering: none (slight) ~~moderate~~ severe Silt smothering: none slight moderate severe Other: Detritus

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	1	4	net	Sand	65	2	net
Leaf Packs or Mats	2	4	net	Mud/Muck/Silt	25	2	net
Aquatic Vegetation	15	4	net	Other:	–	–	–
Rock or Shell Rubble	–	–	–	Other:			
Undercut banks/Roots	2	4	net	*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) ~~or Salinity (ppt)~~:			Secchi (m):
Top	0.1	23.16	7.21	6.35	180			VOB
Mid-depth								
Bottom								

System Type : Stream: 1 (1st - 2nd order, 3rd - 4th order, 5th - 6th order, 7th order or greater) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐ _____

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

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

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

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

Weather Conditions/Notes: sunny, weather warming up. The WWTP's outfall is the headwaters of an unnamed ditch that flows 3/4 miles prior to entering Poley's Creek

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Andrea Grainger	Andrea Grainger	2/5/99

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (5-27-98)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		1/25/99	Poley Creek.

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Heavy rains (3 inches) on 1/23/99	Polk.	Headwaters Regional WWTP	Control Site

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** [15]	Four or more productive habitats present (snags, tree roots, aquatic vegetation, leaf packs (partially decayed), undercut banks, rock). 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	One or less productive habitat. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Substrate Availability [13]	Greater than 30% productive habitat present at site. 20 19 18 17 16	16% to 30% productive habitat, by aerial extent. 15 14 13 12 11	6% to 15 % productive habitat 10 9 8 7 6	Less than 5% productive habitat. 5 4 3 2 1
Water Velocity [17]	Max. observed at typical transect: >0.25 m/sec. but < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect <0.05 m/sec, or spate occurring; > 1 m/sec 5 4 3 2 1
Habitat Smothering [5]	Less than 20% of habitats affected by sand or silt accumulation	20%-50% of habitats affected by sand or silt accumulation	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent
Primary Score [50]	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Secondary Habitat Components **Artificial Channelization** [20]	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Bank Stability Right Bank [8] Left Bank [8]	Stable. No evidence of erosion or bank failure. Little potential for future problems. 10 9	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 8 7 6	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 5 4	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 3 2 1
Riparian Buffer Zone Width Right Bank [10] Left Bank [7]	Width of native vegetation (least buffered side) greater than 18 m 10 9	Width of native vegetation (least buffered side) 12 m to 18 m 8 7 6	Width of native vegetation 6 to 12 m, human activities still close to system 5 4	Less than 6 m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank [10] Left Bank [10]	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian zone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 3 2 1
Secondary Score [73]				

[123] TOTAL SCORE

ANALYSIS DATE:	ANALYST:	SIGNATURE:
1/25/99	Grainger	Candrea Grainger

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (5-27-98)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		1/25/99	Poley Creek

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Heavy rains (3 inches) on 1/23/99	Polk	Meadowlands Regional WWTP	Downstream

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** [16]	Four or more productive habitats present (snags, tree roots, aquatic vegetation, leaf packs (partially decayed), undercut banks, rock). 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	One or less productive habitat. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Substrate Availability [12]	Greater than 30% productive habitat present at site. 20 19 18 17 16	16% to 30% productive habitat, by aerial extent. 15 14 13 12 11	6% to 15 % productive habitat 10 9 8 7 6	Less than 5% productive habitat. 5 4 3 2 1
Water Velocity [14]	Max. observed at typical transect: >0.25 m/sec. but < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect <0.05 m/sec, or spate occurring; > 1 m/sec 5 4 3 2 1
Habitat Smothering [5]	Less than 20% of habitats affected by sand or silt accumulation	20%-50% of habitats affected by sand or silt accumulation	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent
Primary Score [47]	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Secondary Habitat Components **Artificial Channelization** [20]	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Bank Stability Right Bank [10] Left Bank [10]	Stable. No evidence of erosion or bank failure. Little potential for future problems. 10 9	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 8 7 6	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 5 4	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 3 2 1
Riparian Buffer Zone Width Right Bank [4] Left Bank [10]	Width of native vegetation (least buffered side) greater than 18 m 10 9	Width of native vegetation (least buffered side) 12 m to 18 m 8 7 6	Width of native vegetation 6 to 12 m, human activities still close to system 5 4	Less than 6 m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank [10] Left Bank [10]	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian zone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 3 2 1
Secondary Score [74]				

[121] TOTAL SCORE

ANALYSIS DATE:	ANALYST:	SIGNATURE:
1/25/99	Granger	Edward A. Granger Jr

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Meadowood
County:
Contact / District: Andrea Grainger / Southwest
NPDES Permit #: FL00 41416
LIMS Sample #: 366581 LIMS Job #: JLH-1999-01-26-26
sample log 1/8/99 aw
Test Type: (Screening) / Definitive
(Static) / Static Renewal / Flow-through
Test Number: 2 of 2

Sample Collection: Date 1-25-99 Time 10:45
Test Beginning: Date 1-26-99 Time 1430
Test Ending: Date 1-28-99 Time 14:20
Organism Batch #: 4 Diluent Batch #: well
Organism Age: 12 days SRT toxicant batch #: N/A
Test organism: Cyprinella leedsi

Remarks: Culture Room temperature range = 24.1-24.5 °C.
Incubator #3 temperature range = 25.5-26.1 °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	UNCORRECTED Cond. (mmhos/cm) (Cond. (µmhos/cm)) 24 h	UNCORRECTED Cond. (mmhos/cm) (Cond. (µmhos/cm)) 48 h
Control A	F1	5	5	5	7.9	8.4	8.5	24.5	24.4	24.6	8.0	7.3	7.8	250	270	280
Control B	F2	5	5	5	7.9	8.4	8.5	24.5	24.4	25.5		7.4	7.8	250	275	290
Control C	F3	5	5	5	7.9	8.4	8.5	24.5	24.1	25.5		7.5	7.8	250	275	295
Control D	F4	5	5	5	7.9	8.4	8.5	24.5	23.9	25.2		7.5	7.8	250	295	305
100% A	F5	5	5	5	7.4	8.2	8.5	25.4	24.2	25.5	~~8.0~~ 7.2	7.6	7.6	585	575	605
100% B	F6	5	5	5	7.4	8.2	8.6	25.2	24.4	26.0	wrong Fraction 1-26-99	7.4	7.6	585	590	650
100% C	F7	5	5	5	7.4	8.2	8.6	25.2	24.4	25.4		7.4	7.6	580	590	620
100% D	F8	5	5	5	7.4	8.4	8.6	25.2	24.3	25.7		7.4	7.6	580	600	640
									Control A		7.6					
									" B		7.6					
									" C		7.6					
									" D		7.6					
									100% A		7.5					
									" B		7.5					
									" C		7.5					
									" D		7.5					
measured by:		MF	FW	FW	MF	CH	CH	MF	CH	CH	MF	CH	CH	MF	CH	CH
recorded by:		CH	FW	FW	MF	FW	FW	MF	FW	FW	MF	FW	FW	MF	FW	FW

Investigators' Signatures

Marshall Fairchild
Courtney Head
Tara Wendell

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			<0.02	—	A.G.	FW
Lab Total Residual Cl2 (mg/L):	<0.03		<0.03	DPD-ITC	CH	FW
Alkalinity (mg/L as $CaCO_3$):	134		166	Hach	CH	FW
Hardness (mg/L as $CaCO_3$):	122		116	Hach	CH	FW
Total ammonia (mg/L as N):	<0.017		<0.017	Orion	MF	FW
Salinity:	—		0	YSI	MF	FW

reviewer form updated 5/22/98

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Meadowland
County: (FW) Polk
Contact / District: Andrea Graingers / Southwest
NPDES Permit #: FL0041416
LIMS Sample #: 366581 LIMS Job #: TLH-1999-01-26-26
sample log 2/5/99 DW
Test Type: Screening / Definitive
Static / Static Renewal / Flow-through
Test Number: 1 of 2

Sample Collection: Date 1-25-99 Time 10:45
Test Beginning: Date 1-26-99 Time 1400
Test Ending: Date 1-28-99 Time 14:00
Organism Batch #: 4 Diluent Batch #: 7
Organism Age: <24 hours SRT toxicant batch #: NA
Test organism: Ceriodaphnia dubia

Remarks: Culture Room temperature range = 24.1-24.5°C.
Incubator #2 temperature range = 26.1-26.5°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	5	5	5	8.3		8.1	23.9		23.8	8.0		7.5	165		220
Control	B	5	5	5			8.3			23.8			7.9			210
Control	C	5	5	5			8.3			23.6			8.0			225
Control	D	5	5	5			8.4			23.8			8.0			215
100%	A	5	5	5	7.3		8.6	24.5		23.9	8.0		8.1	575		645
100%	B	5	5	5			8.7			23.9			8.0			635
100%	C	5	5	5			8.7			23.8			8.1			630
100%	D	5	5	5			8.7			23.8			8.1			645
measured by:		MF	FW	MF	MF		FW	MF		FW	ME		FW	MF		FW
recorded by:		CH	FW	FW	MF		FW	ME		FW	MF		FW	MF		FW

Investigators' Signatures
Marshall Faircloth
Courtenay Head
Tara Henkel

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			<0.02	—	A.G.	FW
Lab Total Residual Cl2 (mg/L):		<0.03	<0.03	DR-700	CH	FW
Alkalinity (mg/L as $CaCO_3$):		85	166	Hach	CH	FW
Hardness (mg/L as $CaCO_3$):		80	116	Hach	CH	FW
Total ammonia (mg/L as N):		<0.017	<0.017	Orion	MF	FW
Salinity:		—	0	YSI	MF	FW

reviewer

form updated 5/22/98

Meadowlands WWTP **Control Site**

Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	**Value**	5	3	1	**Score**
Total Number of Taxa	23	≥27	26-14	<14	3
EPT Index	3	≥4	3-2	<2	3
# Chironomid Taxa	9	≥9	8-5	<5	5
% Contribution of Dominant Taxon	15	≤30	31-65	>65	5
% Diptera	37	-	≤52	>52	3
Florida Index	14	≥10	9-5	<5	5
% Suspension feeders/Filterers	24	≥15	14-8	<8	5
Total Score			**Peninsula**		**29**
Interpretation of Scores			**Excellent**		27-33
			Good		21-26
			Poor		14-20
			Severely Degraded		7-13

Winter Index Period: Stream Condition Index (SCI) for Florida Peninsula (April 1996)

Meadowlands WWTP **Test Site 1**

Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	**Value**	5	3	1	**Score**
Total Number of Taxa	18	≥27	26-14	<14	3
EPT Index	0	≥4	3-2	<2	1
# Chironomid Taxa	5	≥9	8-5	<5	3
% Contribution of Dominant Taxon	41	≤30	31-65	>65	1
% Diptera	79	-	≤52	>52	1
Florida Index	3	≥10	9-5	<5	1
% Suspension feeders/Filterers	2.6	≥15	14-8	<8	1
Total Score			**Peninsula**		**11**
Interpretation of Scores			**Excellent**		27-33
			Good		21-26
			Poor		14-20
			Severely Degraded		7-13

Winter Index Period: Stream Condition Index (SCI) for Florida Peninsula (April 1996)

Phytoplankton taxa list and densities (#/mL) for Meadowlands WWTP facility, collected via subsurface grabs in receiving water, on 25 January, 1999.

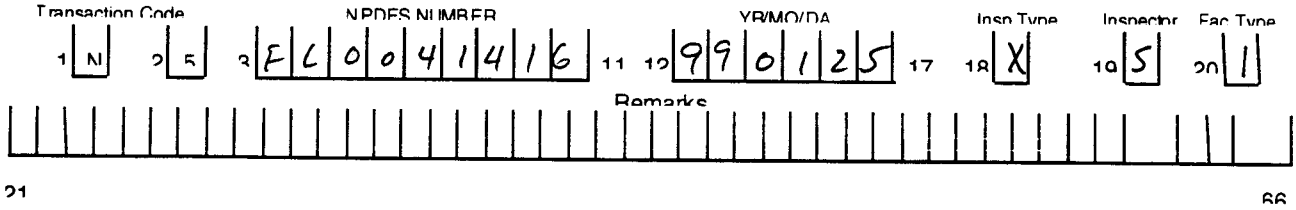
	Control Site	Test Site
Bacillariophyceae		
Achnanthes sp.	2	2
Navicula sp.	55	–
Nitzschia sp.	20	9
Penales sp.	14	2
Chlorophyceae		
Rhizoclonium sp.	2	–
Undetermined Chlorophyceae	2	–
Cryptophyceae		
Chroomonas sp.	28	3
Cryptomonas sp.	17	–
Cyanophyceae		
Dactylococcopsis sp.	–	5
Merismopedia sp.	–	5
Oscillatoria sp.	2	2
Spirulina sp.	23	–
Euglenophyceae		
Euglena sp.	2	–

Benthic macroinvertebrate taxa list for Meadowlands WWTP facility, collected via 20 discrete dip net sweeps in receiving water, on 25 January, 1999.

	Control Site	Test Site
Acariformes		
Atractides sp.	2	–
Oribatei	–	4
Amphipoda		
Gammarus sp.	12	–
Annelida		
Limnodrilus hoffmeisteri	1	–
Nais communis	–	5
Coleoptera		
Dubiraphia sp.	1	–
Microcylloepus pusillus	8	1
Stenelmis sp.	–	1
Decapoda		
Palaemonetes paludosus	3	–
Undetermined Decapoda	–	1
Diptera		
Ablabesmyia mallochi	1	–
Ceratopogon sp.	–	1
Chironomidae	1	3
Cladotanytarsus sp.	–	1
Corynoneura sp.	–	2
Palpomyia / Bezzia sp.	–	1
Paracladopelma nereis	–	2
Paracladopelma sp.	–	1
Pentaneura inconspicua	1	–
Polypedilum convictum grp.	15	–
Polypedilum illinoense grp.	8	39
Polypedilum scalaenum grp.	1	23
Sciaridae	–	1
Simulium sp.	1	–
Stempellina sp.	1	–
Stenochironomus sp.	1	–
Tanytarsus sp. A Epler	3	–
Tanytarsus sp. M Epler	3	–
Tanytarsus sp.	1	–
Tipulidae	–	1
Ephemeroptera		
Caenis sp.	2	–
Labiobaetis sp.	4	–
Gastropoda		
Amnicola dalli johnsoni	–	1
Ancylidae	6	–
Micromenetus sp.	3	–

Undetermined Gastropoda	–	5
Odonata		
Aeshnidae	1	–
Coenagrionidae	1	1
Pelecypoda		
Undetermined Pelecypoda	–	2
Trichoptera		
Cheumatopsyche sp.	12	–
Hydropsychidae	5	–
Undetermined Trichoptera	2	–

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)

