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Biological Assessment of

Mid-County Services Inc. WWTP

Pinellas County

NPDES #FL0034789

Sampled June 1998

March 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: Mid-County Services Inc. WWTP
County: Pinellas
NPDES Number: FL0034789
Permit Expiration Date: 9/30/99

Toxics Sampling Inspection (XSI)

Date Sampled: 01 June 1998

Results: No organic compounds or metals were detected at levels that violated Class III water quality standards.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 01 June 1998

Results: The 48-hour acute screening test was invalid because the dissolved oxygen in the effluent sample dropped to below 40% saturation. The drop in the dissolved oxygen may have been a result of the high effluent CBOD (estimated at 78 mg/L). The CBOD level exceeds the facility's permit limit of 10.0 mg/L. There was a 76% increase in the CBOD between the control and test sites.

Impact Bioassessment Inspection (IBI)

Date Sampled: 01 June 1998

Results: There did not appear to be any negative effects on the macroinvertebrate communities as a result of the discharge. According to the qualitative and Hester-Dendy samples, macroinvertebrate communities were improved at the test site compared to the control site. The SCI placed the control site in the "poor" category and the test site in the "good" category. The algal communities were moderately improved at the test site.

Water Quality Inspection (WQI)

Date Sampled: 01 June 1998

Results: Effluent total nitrogen, total phosphorus, ortho-phosphate, and ammonia were associated with increases in these nutrients at the test site. AGP values at both the control and test sites moderately exceeded the 5 mg dry wt/L "problem threshold". The effluent fecal coliform count (29 counts/100mL) exceeded the facility's permit limit of 25 counts/100mL.

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 Mid-County Services, Inc. Wastewater Treatment Plant is located in Pinellas County, Florida (see maps in the Appendix). This private facility is a Type I advanced wastewater treatment plant. The discharge is filtered, chlorinated, and subsequently dechlorinated. The effluent is discharged via a 12-inch pipe into the Class III Curlew Creek, which flows into Jerry Branch and ultimately into St. Joseph Sound. The wastewater consists of domestic, commercial, and industrial waste. The design flow of this wastewater system is 0.90 MGD.

State Permit limits for the Mid-County Services, Inc. WWTP are listed in Table 1. According to the facility's monthly operating reports, the plant has failed routine toxicity testing several times during the past year (see Facility Summary in the Appendix). The plant effluent failed acute toxicity testing during the week of March 19-23, 1997, and chronic toxicity testing during the weeks of April 1-7, October 8-15, November 4-11, and November 18-25, 1997.

Methods

The focus of this investigation on June 1, 1998 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 Curlew Creek, approximately 100 meters upstream of the discharge) and a test site (located in Curlew Creek, approximately 100 meters downstream of the discharge) (see maps in the Appendix). Habitat assessments were performed *in situ* to establish comparability between the control and test sites. Supplemental physical/chemical data were also collected on the effluent and study sites. The effluent was analyzed for nutrients, metals, and for 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 bioassays, using the invertebrate, *Ceriodaphnia dubia,* and the fish, *Cyprinella leedsi,* as test organisms, were performed on an effluent sample.

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

Phytoplankton were sampled at both control and test sites via subsurface grabs. Chlorophyll *a* was also determined for phytoplankton communities. Algal growth potential tests were performed using *Selenastrum capricornutum* as the test organism. All field and laboratory biological methods were carried out following Biology Section Standard Operating Procedures (SOP's). The latest version of the SOP's can be viewed on our web site a '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 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, and the % filter-feeders are measured as the control site minus the test site divided by the control site. The percent differences between sites involving algal density, chlorophyll *a*, and algal growth potential are measured as the test site minus the control site divided by the control site.

The following personnel were involved in this investigation: Michelle Barrett, James Fine, and Neal Schobert (DEP Southwest District), and Julie Baughman, Ken Espy, Marshall Faircloth, Russel Frydenborg, Joy Jackson, Scott Lashbrook, Elizabeth Miller, Urania Quintana, Johnny Richardson, Lisa Tamburello, Steve Wolfe, David Whiting, and Vicki Whiting (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 control site received 51 points for habitat quality and the

test site 48 points (see Habitat Assessment Field Data Sheets in the Appendix). These scores placed both sites in the "marginal" category. Both sites were highly channelized with substantial habitat smothering and an inadequate riparian buffer zone. Physical/chemical measurements are listed in Table 1. Dissolved oxygen levels were the same at both study sites (6.1 mg/L). The pH (7.4 SU at the control site and 7.3 SU at the test site), temperature (27.5 °C at the control site and 27.9 °C at the test site), and conductivity (432 µmhos/cm at the control site and 548 µmhos/cm at the test site) were very similar at both sites.

Atrazine (0.049 mg/L) was detected in the effluent below the minimum quantitation limit and above the minimum detection limit (Table 1). Zinc (18 mg/L), copper (1.7 mg/L), and iron (401 mg/L) were detected in the effluent at levels that complied with the Class III water quality standards.

The effluent sample was not toxic to the invertebrate, *Ceriodaphnia dubia,* during the acute screening bioassay (Appendix). The acute screening bioassay using the fish, *Cyprinella leedsi*, was invalid because the dissolved oxygen in the sample dropped to less than 40% saturation (0.9 mg/L) in the first 24 hours. The CBOD of the effluent sample was estimated at 78 mg/L. The CBOD result was estimated because the effluent's dissolved oxygen concentration was below the recommended limit of 1.0 mg/L for the 5-day incubation period (APHA 1995). The CBOD was 4 mg/L at the control site and 17 mg/L at the test site, which is an increase of 76%.

The effluent fecal coliform level (29 counts/100 ml) exceeded the facility's permit limit (25 counts/100 ml) (Table 1). The effluent total coliform result was 60 counts/100 ml. Fecal coliforms exceeded 240 counts/100 ml at the control site and were estimated to be 804 counts/100 ml at the test site. The test site fecal coliform level exceeded Class III water quality standards (Rule 62-302.530(6) FAC). At the control site, there was confluent growth on the total coliform plates making them too numerous to count. Total coliforms at the test site exceeded 320 counts/100 ml.

Nutrient levels are shown in Table 1. There were increases in several nutrient concentrations at the test site compared to the control site. The total nitrogen at the control site was 0.84 mg/L and increased to 1.01 mg/L at the test site. Effluent total phosphorus (0.62 mg/L), ortho-phosphate (0.19 mg/L), and ammonia (0.39 mg/L) concentrations appeared to have had an effect on the receiving waters. For example, total phosphorus increased from 0.13 mg/L at the control site to 0.23 mg/L at the test site. Similarly, ortho-phosphate increased from 0.080 mg/L at the control site to 0.16 mg/L at the test site.

AGP, which measures bioavailable nutrients via algal response, was sampled at the receiving water sites. The AGP was higher at the control site (16.3 mg dry wt/L) compared to the test site (8.23 mg dry wt/L). Both sites exceeded the 5 mg dry wt/L "problem threshold" (Raschke and Schultz 1987).

Phytoplankton data were used to assess algal community health (Figure 1). The algal community health was improved at the test site compared to the control site, with increases in taxa richness (22 at the control site and 27 at the test site)

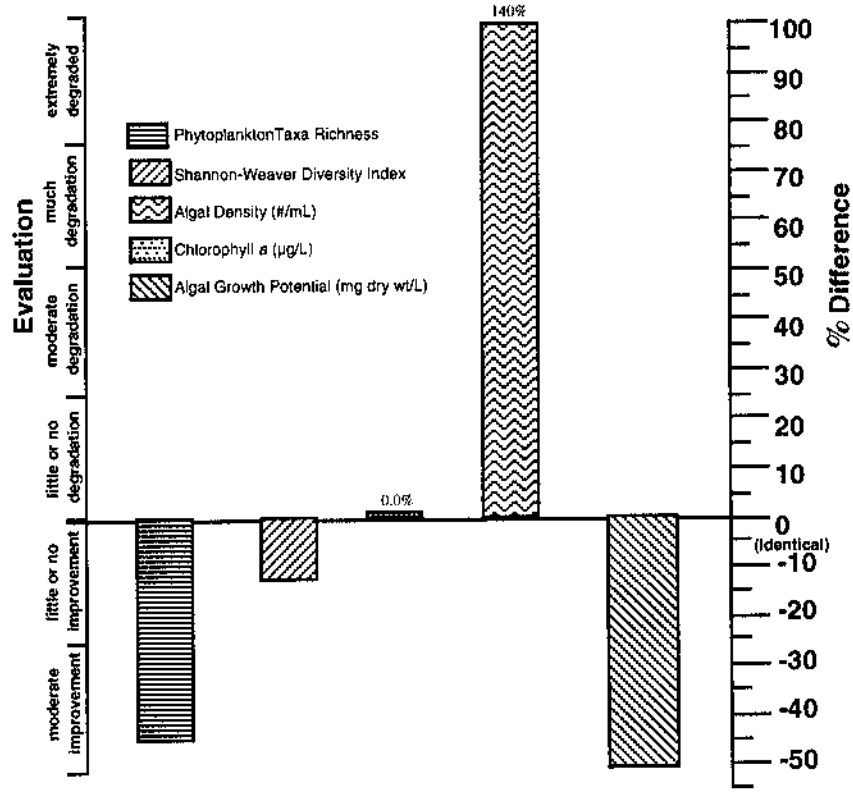


Figure 1. Effect of discharge on the phytoplankton community.

Table 1. Effluent limits and summary of chemistry data.

Mid-County Services Inc. WWTP	Effluent Limits	Effluent Samples	Control Site	Test Site
Organic Constituents (µg/L)				
Atrazine	-	0.049 I	-	-
Metals (µg/L)				
Aluminum	≤ 1,500 **	50 U	-	-
Arsenic	≤ 50 **	20 U	-	-
Cadmium	≤ 2.0 **c	0.05 U	-	-
Chromium	≤ 368 **c	10 U	-	-
Copper	≤ 22 **c	1.7 J	-	-
Iron	≤ 1,000 **	401	-	-
Lead	≤ 7.8 **c	0.10 U	-	-
Mercury	≤ 0.012 **	0.10 U	-	-
Nickel	≤ 286 **c	6.0 U	-	-
Selenium	≤ 5.0 **	-	-	-
Silver	≤ 0.07 **	0.05 U	-	-
Zinc	≤ 192 **c	18 I	-	-
Nutrients (mg/L)				
Ortho-phosphate	-	0.19 Q	0.080 Q	0.16 Q
Total phosphorus	2.0 *	0.62	0.13 A	0.23
Ammonia	-	0.39	0.061	0.084
Nitrate+Nitrite	-	0.020	0.20	0.12
TKN	-	1.5	0.64 A	0.89
Organic Nitrogen	-	1.11	0.579	0.806
Total Nitrogen	6.0 *	1.52	0.84	1.01
General Phys-Chem Parameters				
Habitat Assessment	-	-	51	48
D.O. (mg/L)	≥ 5.0 *	7.9	6.1	6.1
pH (SU)	6.0-8.5 *	7.4	7.4	7.3
Conductivity (µmhos/cm)	-	250	432	548
Temperature (°C)	-	28.9	27.5	27.9
Hardness (mg $CaCO_3$)	-	202	-	-
AGP (mg dry wt/L)	-	5.57 J	16.3 AJ	8.23 J
CBOD5 (mg/L)	10.0 *	78 J	4	17
TSS (mg/L)	10.0 *	3	5	6
Toxicity				
Bioassay - Fish	NOEC	Invalid	-	-
Bioassay - Invertebrate	NOEC	Not Toxic L	-	-
Microbiology (# counts/100mL)				
Fecal Coliforms	≤ 25 *	29	> 240 L	804 J
Total Coliforms	-	60 A	TNTC Z	> 320 L

c - Value is calculated based on hardness
A - Value reported is the mean of two or more determinations
* Permit limit
** Class III water quality standard
I - Value reported is less than the minimum quantitation limit, and ≥ the minimum detection limit
J - Estimated value
L- Actual value is known to be greater than value given
NOEC - A no observed effect concentration < 100% effluent will constitute a violation of this permit
Q - Sample held beyond normal holding time
U - Material analyzed for but not detected; value reported is the minimum detection limit
Z - Colonies were too numerous to count

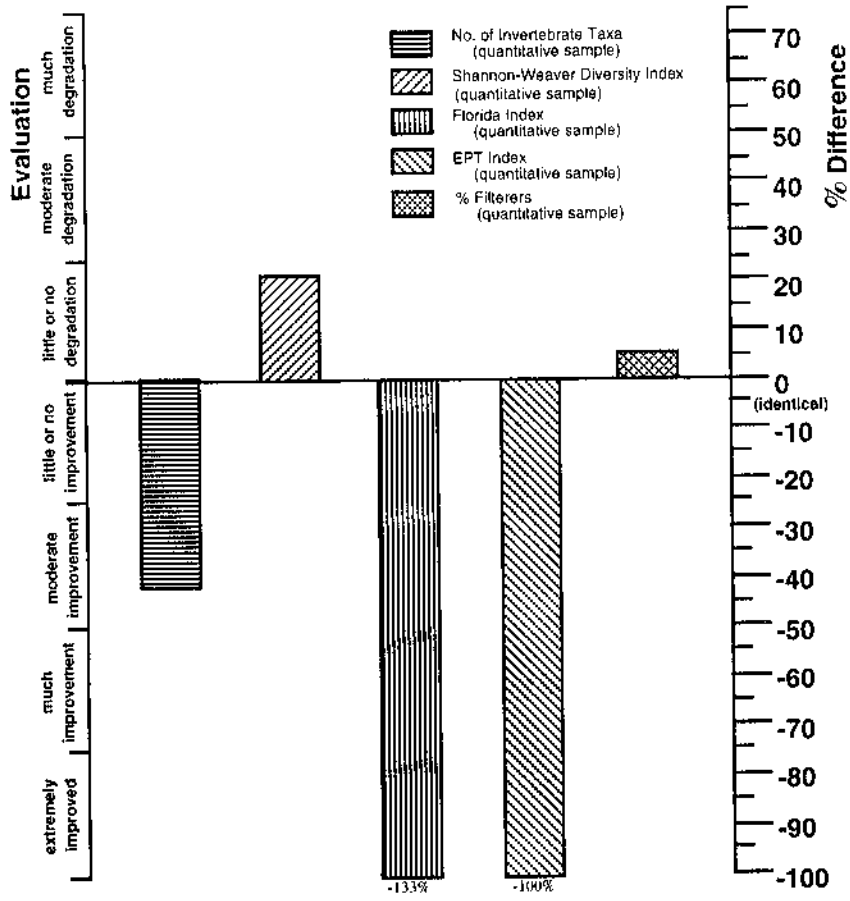


Figure 2. Effect of discharge on the macroinvertebrate community.

and Shannon-Weaver diversity (4.0 at the control site and 4.5 at the test site) (Table 2).

In the Hester-Dendy samples, there were 29 taxa at the control site and 28 taxa at the test site (Table 3). Shannon-Weaver diversity decreased by 22% from 3.6 at the control site to 2.8 at the test site. The Florida Index increased from 10 points at the control site to 19 points at the test site. EPT Index results were low at both study sites (1 taxa each). Suspension feeders, indicators of good water quality, made up 24% of the control community and 44% of the test community.

In the qualitative samples, taxa richness increased from 19 at the control site to 27 at the test site (Table 3). The EPT Index was 1 at the control site and 2 at the test site. Chironomid taxa increased from 6 at the control site to 14 at the test site. The percent contribution of dominant taxon decreased from 35% at the control site to 23% at the test site. The Florida Index increased from 3 points at the control site to 7 points at the test site. Suspension feeders made up 37% of the control community and 35% of the test community. The SCI score increased significantly from 17 points at the control site, which puts it in the "poor" category, to 25 points at the test site, placing it in the "good" category (see SCI Worksheet in the Appendix).

Discussion

The CBOD of the effluent sample was estimated at 78 mg/L, which exceeds the permit limit of 10.0 mg/L. At the time of the inspection, the operator reported a plant upset. After the plant returned to service, there was an hydraulic surge that caused a methanol overfeed which may explain the extremely elevated CBOD value. It appears the CBOD sample result, while still a violation of the facility's permit, is a function of equipment failure and not necessarily typical of the facility's discharge. The CBOD increased from 4 mg/L at the control site to 17 mg/L at the test site.

Atrazine was detected in the effluent below chronically toxic levels (AQUIRE 1991). Zinc, copper, and iron were detected in the effluent at concentrations that complied with Class III water quality standards.

Fecal and total coliforms were elevated throughout the study area. At the control and test sites, fecal and total coliforms were greater than expected and the actual values are known to be greater than the values given in Table 1. The effluent fecal coliform level (29 counts/100 ml) exceeded the facility's permit limit (25 counts/100 ml). The test site fecal coliform level exceeded Class III water quality standards (Rule 62-302.530(6) FAC).

The test site levels of total nitrogen, total phosphorus, orthophosphate, and ammonia were slightly elevated as a result of the effluent. The AGP values at both the control and test sites exceeded the "problem threshold", indicating sources of nutrient enrichment, in

Table 2. Algal community structure of control and test sites.

Mid-County Services, Inc. WWTP	Control Site	Test Site
Phytoplankton Algae		
Number of Taxa	22	32
Shannon-Weaver Diversity	4.0	4.5
Chlorophyll *a* (µg/L)	1.0 U	1.0 U
Algal Density (#/mL)	179	430
% Blue-green	18	33
% Green	27	37
% Diatoms	21	19
AGP (mg dry wt/L)	16.27 JA	8.23 J

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

J- Estimated value

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

addition to the effluent, in this portion of Curlew Creek.

The phytoplankton community did not appear to be affected by the elevated nutrients in the effluent. The test site algal community was moderately improved compared to the control site.

Curlew Creek is a typical stormwater canal, with a minimal riparian buffer zone and severe channelization. Sand smothering was prevalent and reduced the available habitat at both sites. Habitat quality was "marginal" at both the control and test sites. In the quantitative samples, large numbers of the trichopteran, *Cheumatopsyche* sp., and the chironomid, *Polypedilum convictum* grp., at the test site resulted in a 22% decline in diversity. All other quantitative measures at the test site compared favorably to the control site.

Based on the qualitative measures, the discharge did not appear to have any negative effects on the macroinvertebrate community. The SCI scores placed the control site in the "poor" category and the test site in the "good" category. Overall, the facility did not appear to have any negative effects on the receiving water macroinvertebrate communities.

Literature Cited

Aquatic Toxicity Information Retrieval Data Base (AQUIRE). 1991. U.S. EPA Environmental Research Laboratory, Duluth, Mn.

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.

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

APHA. Standard methods for the examination of water and wastewater. 19th edition. Amer. Publ. Health Assoc. Washington, DC.

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.

Table 3. Macroinvertebrate community structure of control and test sites.

Mid-County Services, Inc. WWTP	Control Site	Test Site
Macroinvertebrate Qualitative		
Number of Taxa	19	27
Florida Index	3	7
SCI	17	25
EPT Index	1	2
% Dominant Taxon	35	23
Community Composition		
% Amphipoda	3	5
% Coleoptera	4	8
% Diptera	17	42
% Ephemeroptera	2	1
% Gastropoda	3	8
% Odonata	24	4
% Oligochaeta	5	0.0
% Pelecypoda	35	23
% Trichoptera	0.0	9
% Other	7	4
Functional Feeding Groups		
% Predators	32	7
% Burrowing Deposit Feeders	5	0.0
% Surface Deposit Feeders	11	29
%Suspension Feeders/Filterers	37	35
% Scrapers	5	12
% Shredders	8	16
Macroinvertebrate Hester-Dendy		
Number of Taxa	29	28
Florida Index	10	19
Shannon-Weaver Diversity	3.6	2.8
EPT Index	1	1
Dominant taxon	22	41
Community Composition		
% Coleoptera	12	11
% Diptera	67	46
% Gastropoda	13	2
% Trichoptera	3	41
% Other	5	0.0
Functional Feeding Groups		
% Predators	12	4
% Surface Deposit Feeders	34	29
% Suspension Feeders/Filterers	24	44
% Scrapers	19	7
% Shredders	11	16

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).

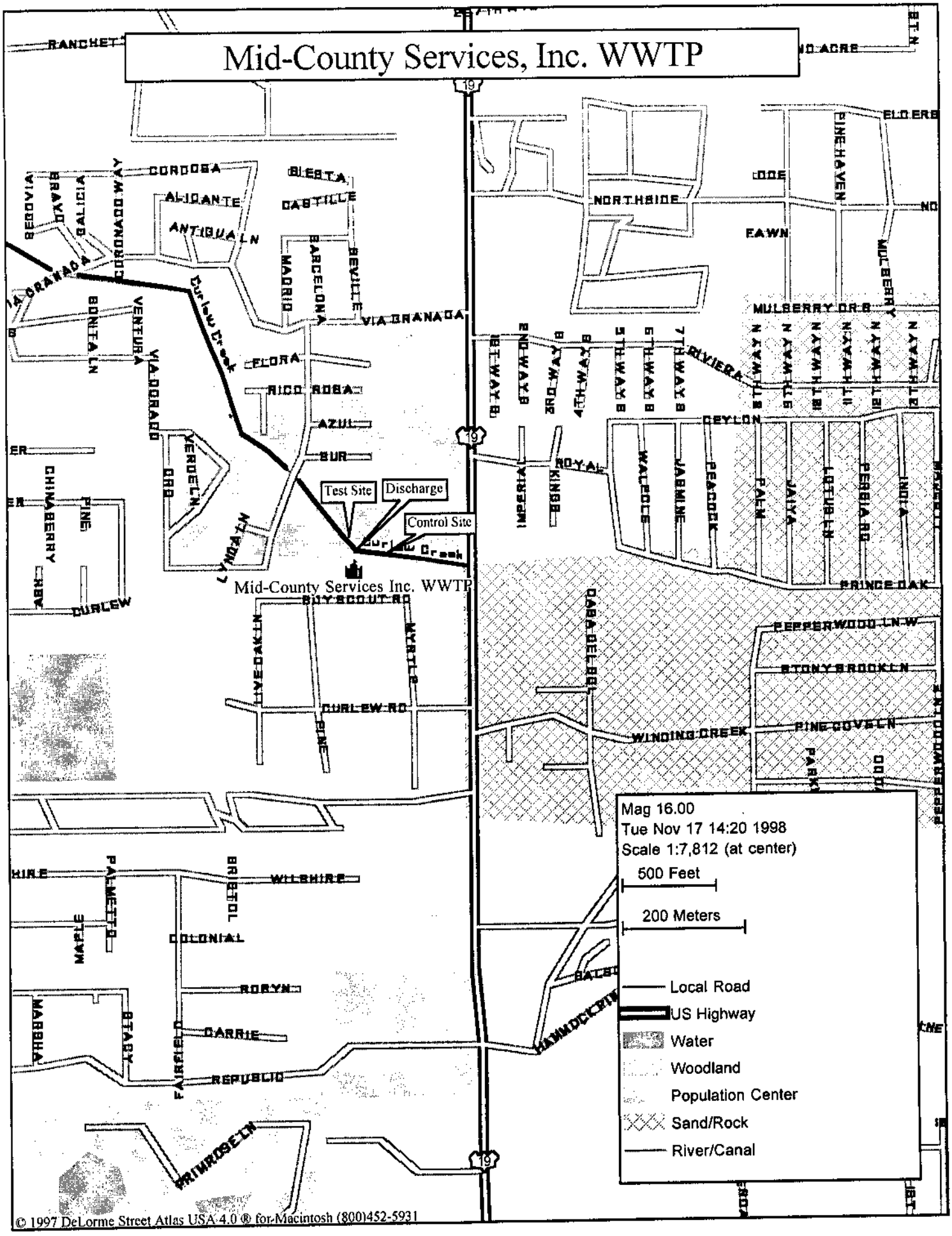
Typical Values for Selected Parameters in Florida Waters

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

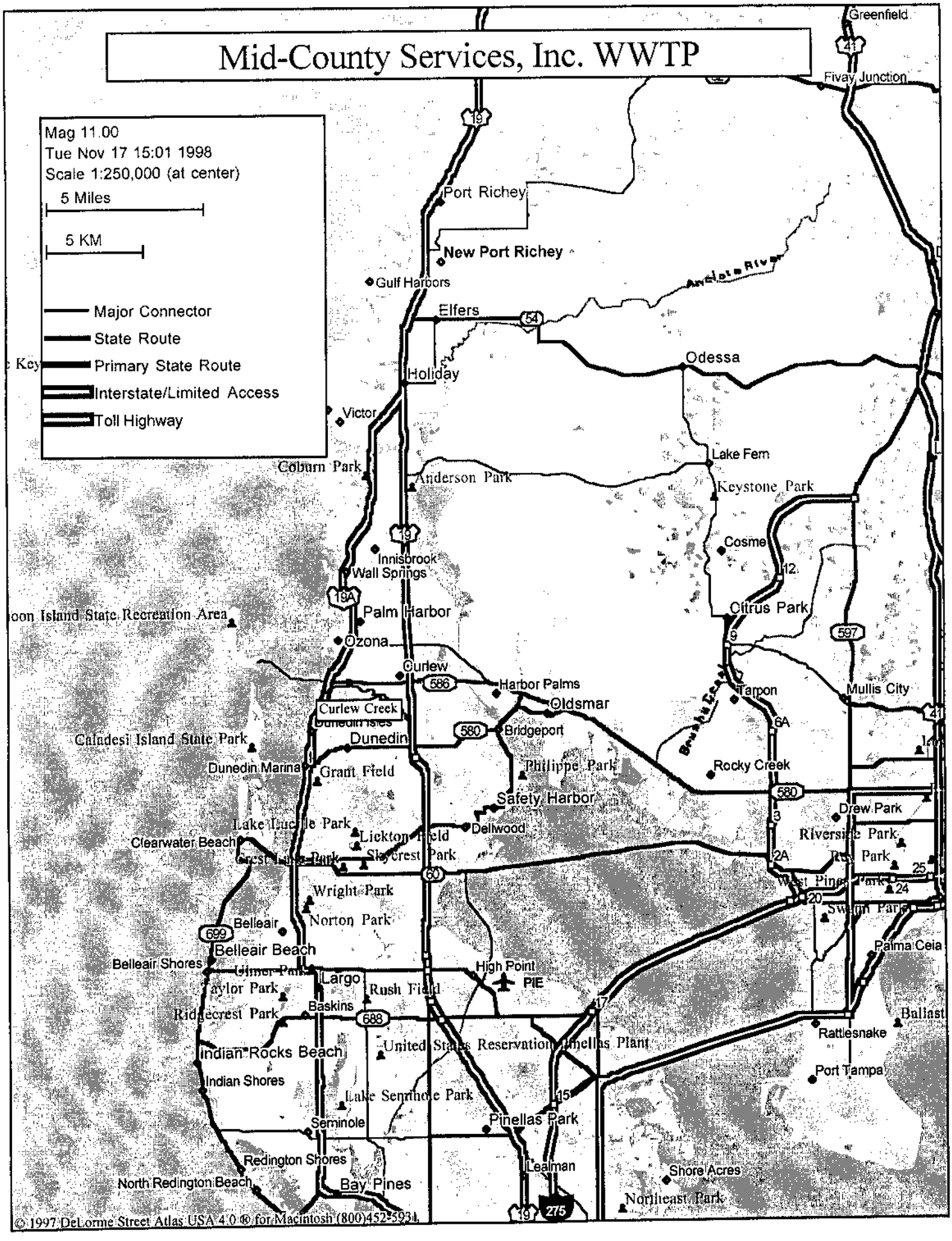
Percentile Distribution

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 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

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


Mid-County Services, Inc. WWTP
Test Site
Discharge
Control Site
Mid-County Services Inc. WWTP
Curlew Creek
VIA GRANADA
CORDOBA
ALICANTE
ANTIBUA LN
CASTILLE
BARCELONA
MADRID
BEVILLE
BONITA LN
VENTURA
VIA DORADO
FLORA
RICO ROSA
AZUL
SUR
VERDELN
ORO
CHINABERRY
PINE
CURLEW
BOY SCOUT RD
LIVE OAK LN
MYRTLE
CURLEW RD
NORTHSIDE
ELDERB
PINE HAVEN
MULBERRY
MULBERRY DR S
RIVIERA
CEYLON
ROYAL
IMPERIAL
KING
WALDOLF
JASMINE
PEACOCK
PALM
JAIXA
LATUB LN
PERSIA RD
INDIA
PRINCE OAK
CASA DEL RIO
PEPPERWOOD LN W
STONY BROOK LN
WINDING CREEK
PINE COVE LN
WILSHIRE
PALMETTO
BRISTOL
COLONIAL
RORYN
CARRIE
REPUBLIC
MARTHA
STARY
PRIMROSE LN
HAWKSCREST
Mag 16.00
Tue Nov 17 14:20 1998
Scale 1:7,812 (at center)
500 Feet
200 Meters
Local Road
US Highway
Water
Woodland
Population Center
Sand/Rock
River/Canal
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Mid-County Services, Inc. WWTP



DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Facility Name: Mid County Services, Inc	Date Summary Prepared: 6/1/98	
Location (attach detailed map): 2299 Spanish Vista Dr	County: Pinellas	District: Southwest District
Federal Permit # and expiration date: FL0034789	State GMS # and State expiration date: 4052 P01064	Facility Type: Industrial; (Municipal) Federal Agricultural; Other (list):

Function of facility:
Domestic wastewater Facility

Description of treatment process: Type I advanced waste water treatment plant discharging filtered, chlorinated and dechlorinated effluent

Receiving waters: Curlew Creek	Classification: I II (III)	
Design Flow: .9 MGD	Mean Flow:	Flow during survey:

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

therefore, the best time to sample is:

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

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

Parameter	Limit (units)
See Attached Permit Conditions	

Describe special permit conditions and permit modifications:
N/A

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Mid County Services, Inc
(Facility)

Description of permitted outfall(s): Effluent discharged from facility via 12" pipe that extends into Curlew Creek canal.

List permit violations (from MOR data or other source) and plant upsets that occurred within past year: In 1997, the Routine Toxicity Testing resulted in Failure for: Acute, 3/19-23
chronic, 4/1-7 & 10/8-15,
while the Follow-up testing failed on:
chronic, 11/4-11 & 11/18-25

Describe previous impact bioassessments, WQBEL's, and previous or current enforcement actions:
Tie/Tre Submitted in September 1992.

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

Additional information:

Staff contributing to this review (signature):
James Fine (Biologis
Neal R. Schobert (Inspecto
(Enginee
(
(
(

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS - Final

1. These limitations are to be achieved by the effective date of the permit, and shall remain in effect until permit expiration for outfall Serial Number 001, treated domestic wastewater.

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

PARAMETERS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS		
	Annual Average	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type	Sampling Point
Flow, MGD	Report	Report	Report	Continuous	Recording flow meter & totalizer	Effluent
Carbonaceous Biochemical Oxygen Demand (5-Day), mg/l	5.0	6.25	10.0	1/week	16-Hr. Comp.	Effluent
Total Suspended Solids, mg/l	5.0	6.25	10.0	1/week	16-Hr. Comp.	Effluent
Total Nitrogen (as N), mg/l	3.0	3.75	6.0	1/week	16-Hr. Comp.	Effluent
Total Phosphorus (as P), mg/l	1.0	1.25	2.0	1/week	16-Hr. Comp.	Effluent
Chlorine, Total Residual, mg/l		See Item 3 on Page I-2		7/week	Grab	Effluent
pH, standard units		See Item 4 on Page I-2		Continuous or Hourly	Recorder Grab	Effluent Effluent
Dissolved Oxygen, mg/l		See Item 5 on Page I-2		1/week	Grab	Effluent
Fecal Coliform Bacteria, MPN/100 ml		See Item 6 on Page I-2		1/week	Grab	Effluent
Chronic Whole Effluent Toxicity		See Item 7 on Page I-2		See Part IV	24-Hr. Comp.	Effluent

PART I (CONTINUATION)
EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

2. Samples taken in compliance with the effluent monitoring requirements specified in this permit shall be taken at the nearest accessible point after final treatment but prior to the actual discharge or mixing with the receiving water.

3. The daily maximum concentration of total residual chlorine (TRC) in the final effluent shall not exceed 0.01 mg/l. Testing for total residual chlorine (TRC) shall be conducted according to either the low-level amperometric titration method or the DPD colorimetric method as specified in Section 4500-Cl E. or 4500-Cl G., respectively, Standard Methods for the Examination of Water and Wastewater, 18th Edition, or most current edition.

4. The pH of the effluent may be monitored continuously with a recorder. In such cases, the pH values shall not deviate outside the required range of 6.0 standard units to 8.5 standard units more than 1% of the time in any calendar month and no individual excursion shall exceed 60 minutes. An "excursion" is an unintentional and temporary incident in which the pH value of discharge wastewater exceeds the range set forth in this permit. [Hourly grab samples may be substituted for the continuous recordings during periods of certified operator attendance.] If hourly grabs are used, the pH shall not be less than 6.0 standard units nor greater than 8.5 standard units.

5. The effluent dissolved oxygen concentration shall not be less than 5.0 mg/l.

6. a) During a 30-day period (monthly), 75 percent of the fecal coliform values measured shall be below detectable limit.

   b) Any one sample shall not exceed 25 fecal coliform values per 100 ml of sample.

7. The effluent shall not be chronically toxic to, or produce adverse physiological or behavioral responses in aquatic animals. An effluent no observable effect concentration (NOEC) of less than 100% will constitute a violation of FAC Section 17-302.530(62) (April 25, 1993) and the terms of this permit. The testing for this requirement must conform with Part IV of this permit.

8. There shall be no discharge of floating solids or visible foam in other than trace amounts. Also, the effluent shall not cause a visible sheen on the receiving water.

9. Any bypass of the treatment facility which is not included in the effluent monitored above, is to be monitored for flow and for all other parameters in this permit (except chronic whole effluent toxicity). For parameters other than flow, at least one grab sample per day shall be monitored. Daily flow shall be monitored or estimated, as appropriate, to obtain reportable data. All monitoring results shall be reported on a Discharge Monitoring Report (DMR) Form (EPA No. 3320-1).

10. If the results for a given sample analysis are such that any parameter (other than fecal coliform) is not detected at or above the minimum level for the test method used, a value of zero will be used for that sample in calculating an arithmetic effluent mean value for the parameter. If the resulting calculated arithmetic mean value for that reporting period is zero, the permittee shall report "NODI=B" on the Discharge Monitoring Report (DMR) Form (EPA No. 3320-1). For fecal coliform, the permittee shall report "NODI=B" on the DMR. For each quantitative sample value that is not detectable, the test method used and the minimum level for that method for that parameter shall be attached to and submitted with the DMR. The permittee shall then be considered in compliance with the appropriate effluent limitation and/or reporting requirement.

11. The permittee shall identify all wastewater discharges, at locations not authorized as permitted outfalls, that occur prior to the headworks of the wastewater treatment plant covered by this permit. The permittee shall submit, with the scheduled Discharge Monitoring Report (DMR) Form, the following information for each discharge event at each source that occurs during the reporting period covered by the DMR:

a. the cause of the discharge;
b. duration and volume (estimate if unknown);
c. description of the source, e.g., manhole cover, pump station;
d. type of collection system that overflowed, i.e., combined or separate;
e. location by street address, or any other appropriate method;
f. date of event;
g. the ultimate destination of the flow, e.g., surface waterbody, land use location, via municipal separate storm sewer system to a surface waterbody, (show location on a USGS map or copy thereof); and
h. corrective actions or plans to eliminate future discharges.

The permittee shall refer to Part II of this permit, paragraph D.8. Twenty-Four Hour Reporting, to report any unpermitted discharge events which may endanger health or the environment.

Submittal or reporting of any of this information does not provide relief from any subsequent enforcement actions for unpermitted discharges to waters of the United States.

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:
		06/01/98	10:30AM	Curlew Creek

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Pinellas	Mid County Services Inc. DOWN Stream	

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)
				70	20	10	

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

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

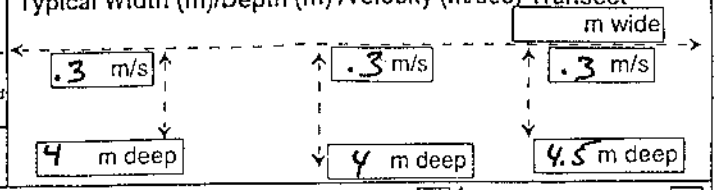
Width of riparian vegetation (m) on least buffered side: 2 | *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

High Water Mark: 3 (m above present water level) + .75 (present depth in m) = 3.75 (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)				Sand	70	17	
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation	30	3		Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*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	.10	27.91	7.34	6.09	550			N/OB
Mid-depth	.25	27.90	7.34	6.06	548			
Bottom	.25	27.90	7.33	6.04	550			

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

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:

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

SAMPLING TEAM: Jamer Fine / Michelle Barretto

SIGNATURE: James Fine

DATE: 6/1/98

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (4-22-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		6/1/98	Curlew Creek

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Pinellas	Mid County Services Inc Downstream	

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Substrate Types & Availability [7]	Greater than 30% snags, logs, tree roots, aquatic vegetation, leaf packs (partially decayed), undercut banks, rock, or other stable habitat. 20 19 18 17 16	16% to 30% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	5% to 15% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 9 8 (7) 6	Less than 5% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Water Velocity [12]	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
Artificial Channelization [4]	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
Habitat Smothering [6]	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 16	20%-50% of habitats affected by sand or silt accumulation 15 14 13 12 11	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 (6)	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1
Bank Stability [7]	Stable. No evidence of erosion or bank failure. Little potential for future problems. 20 19 18 17 16	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 15 14 13 12 11	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 10 9 8 (7) 6	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 5 4 3 2 1
Riparian Buffer Zone Width [4]	Width of native vegetation (least buffered side) greater than 18 m 20 19 18 17 16	Width of native vegetation (least buffered side) 12 m to 18 m 15 14 13 12 11	Width of native vegetation 6 to 12 m, human activities still close to system 10 9 8 7 6	Less than 6 m of native buffer zone due to intensive human activities 5 (4) 3 2 1
Riparian Zone Vegetation Quality [8]	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 20 19 18 17 16	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 15 14 13 12 11	25% to 50% of riparian zone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 10 9 (8) 7 6	Less than 25% of streambank surfaces are vegetated and/or poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 5 4 3 2 1

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

Comments

[48] **TOTAL SCORE**

ANALYSIS DATE:	ANALYST:	SIGNATURE:
6/1/98	James Fine	James Fine

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:
		06/01/98	10:50AM	Curlew Creek

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Pinellas	Mid County Services Inc. Up Stream	

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)
				70	20	10	

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

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

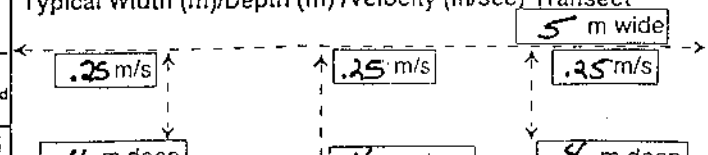
Width of riparian vegetation (m) on least buffered side: 2.5 | *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

High Water Mark: 3 (m above present water level) + 1 (present depth in m) = 4 (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)				Sand	70	17	
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation	30	3		Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*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	.10	27.48	7.44	6.20	419			
Mid-depth	.5	27.48	7.42	6.09	432			V OB
Bottom	1	27.46	7.35	5.95	431			

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

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: ~90° clear sky, Previous Day was rainy (~2-3inches).

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

SAMPLING TEAM:	SIGNATURE	DATE:
James Fine / Michelle Barretto	James Fine	6/1/98

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (4-22-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		6/1/98	Curlew Creek

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Pinellas	Mid County Services Inc upstream	

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Substrate Types & Availability **9**	Greater than 30% snags, logs, tree roots, aquatic vegetation, leaf packs (partially decayed), undercut banks, rock, or other stable habitat. 20 19 18 17 16	16% to 30% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	5% to 15% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 (9) 8 7 6	Less than 5% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Water Velocity **13**	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
Artificial Channelization **4**	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
Habitat Smothering **7**	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 16	20%-50% of habitats affected by sand or silt accumulation 15 14 13 12 11	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 (7) 6	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1
Bank Stability **6**	Stable. No evidence of erosion or bank failure. Little potential for future problems. 20 19 18 17 16	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 15 14 13 12 11	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 10 9 8 7 (6)	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 5 4 3 2 1
Riparian Buffer Zone Width **4**	Width of native vegetation (least buffered side) greater than 18 m 20 19 18 17 16	Width of native vegetation (least buffered side) 12 m to 18 m 15 14 13 12 11	Width of native vegetation 6 to 12 m, human activities still close to system 10 9 8 7 6	Less than 6 m of native buffer zone due to intensive human activities 5 (4) 3 2 1
Riparian Zone Vegetation Quality **8**	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 20 19 18 17 16	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 15 14 13 12 11	25% to 50% of riparian zone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 10 9 (8) 7 6	Less than 25% of streambank surfaces are vegetated and/or poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 5 4 3 2 1

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

51 TOTAL SCORE

Comments

ANALYSIS DATE:	ANALYST:	SIGNATURE:
6/1/98	James Fine	

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Dyna Flow Mid-County Services, Inc.
County: Pinellas
Contact / District: James Fine / Southwest
NPDES Permit #: FL0034789
LIMS Sample #: 327214 LIMS Job #: JLH-1998-06-02-27
sample log 6/5/98 DW
Test Type: (Screening) / Definitive
(Static) / Static Renewal / Flow-through
Test Number: 2 of 2
Incubator #3 Temp Range = 25.6-26.6°C
Room temp Range 23.5-28.5°C

Sample Collection: Date 6/1/98 Time 0917
Test Beginning: Date 6/2/98 Time 1605
Test Ending: Date 6-4-98 Time 16:30
Organism Batch #: 40 Diluent Batch #: well H2O
Organism Age: 14 days SRT toxicant batch #: NA
Test organism: C. Lecis. Cyprinella leedsi

Remarks: Sample reps <40% saturation for D.O. at 24-hours. Cnt + 100% sample reps aerated for the remainder of the test. DW 6/5/98

Conc.	Chamber #	Number Live 0 hr	24 h	48 h	pH 0 hr	24 h	48 h	Temperature (°C) 0 hr	24 h	48 h	D.O. (mg/L) 0 hr	24 h	48 h	UNCORRECTED Cond. (mmhos/cm) (Cond. (µmhos/cm)) 0 hr	24 h	48 h
Control	D1	5	5	5	8.1	8.3	8.5	25.9	25.3	24.2	7.9	7.4	7.1	240	250	260
	D2	5	5	4 [10]	8.1	8.3	8.5	25.9	25.1	24.1	8.1	7.4	7.2	250	265	270
	D3	5	5	5	8.1	8.3	6.6	25.9	25.3	24.1	8.2	6.9	7.1	255	260	270
	D4	5	5	5	8.1	8.3	8.6	25.8	25.1	24.2	8.3	6.8	7.2	255	265	280
100%	D5	5	[28] 1 [78]	1	7.4	7.6	8.2	26.8	25.4	23.9	7.0	.9	6.1	850	845	900
	D6	5	5	5	7.4	7.6	8.2	26.8	25.1	23.9	7.3	1.5	6.1	885	885	910
	D7	5	2 [30]	2	7.4	7.6	8.2	26.8	25.0	23.9	6.9	.8	5.8	900	885	915
	D8	5	4 [10]	3 [10]	7.4	7.6	8.2	26.8	25.0	24.1	7.4	1.7	5.9	905	895	940
measured by:		mf	DAW	DAW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW
recorded by:		mf	DAW	MF	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH

A. Recorded wrong number DAW 6/3/98

Investigators' Signatures
Marshall Faircloth
Cynthia Head
David Wainright
Dawn Wendell

	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			<0.01	—	James Fine	MF
Lab Total Residual Cl2 (mg/L):	<0.03	—	<0.03	DR-100	CH/DAW	MF
Alkalinity (mg/L as $CaCO_3$):	124	—	140	Hach	CH	MF
Hardness (mg/L as $CaCO_3$):	125	—	189	Hach	CH	MF
Total ammonia (mg/L as N):	<0.017	—	0.47	Orion	FW	MF
Salinity:	0	—	0	YSI	DAW	MF

reviewer form updated 5/22/98

A Incorrect initials MF 6/12/98

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Dynaflow Mid-County Services, Inc.
County: Pinellas
Contact / District: James Fine / SouthwesT
NPDES Permit #: FL0034789
LIMS Sample #: 32721 LIMS Job #: TLH-1998-06-02-27
sample log 6/5/98 aw
Test Type: (Screening) / Definitive
(Static) / Static Renewal / Flow-through
Test Number: 1 of 2
Incubator # / Temp Range - 23.6 - 24.4°C
Room Temperature Range 23.5 - 28.0°C

Sample Collection: Date 6/1/98 Time 0917
Test Beginning: Date 6/2/98 Time 1530
Test Ending: Date 6-4-98 Time 16:30
Organism Batch #: 25 Diluent Batch #: 26
Organism Age: <24 hours SRT toxicant batch #: NA
Test organism: C. dubia Ceriodaphnia dubia

Remarks:

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	5	5	5	8.0		8.3	23.8		24.9	7.2		7.5	155		182
	B	5	5	4 ID			8.3			25.0			7.6			180
	C	5	5	5			8.3			25.0			7.5			185
	D	5	5	5			8.3			24.9			7.5			190
100%	A	5	5	5	7.4		8.2	25.6		24.8	7.2		6.5	760		925
	B	5	5	4 ID			8.3			24.9			6.8			965
	C	5	5	5			8.3			24.8			6.8			995
	D	5	5	5			8.4			24.8			6.9			1010
											(B)	Above CH	6.4-7.5			
measured by:		MF	FW	FW	DW		FW	DW		FW	DW		FW	DW		FW
recorded by:		MF	FW	FW	CH		CH	CH		CH	CH		CH	CH		CH

Investigators' Signatures
Marshall Faircloth
Courtney Head
David Wainright
Fran Wendt

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			<0.01	—	James Fine	MF
Lab Total Residual Cl2 (mg/L):	—	<0.03	<0.03	DR-100	CH H/DAW	MF
Alkalinity (mg/L as $CaCO_3$):	—	77	140	Hach	CH	MF
Hardness (mg/L as $CaCO_3$):	—	85	189	Hach	CH	MF
Total ammonia (mg/L as N):	—	<0.017	0.47	Orion	FW	MF
Salinity:	—	0	0	YSI	DAW	MF

reviewer

form updated 5/22/98

(2A) Incorrect Initials MF 6/2/98

Mid-County Services Inc. WWTP – Control Site

Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	5	3	1	Score
Total Number of Taxa	19	≥26	25-14	<14	3
EPT Index	1	≥4	3-2	<2	1
# Chironomid Taxa	6	≥7	6-4	<4	3
% Contribution of Dominant Taxon	35	≤29	30-64	>64	3
% Diptera	17	-	≤37	>37	3
Florida Index	3	≥7	6-4	<4	1
% Suspension feeders/Filterers	37	-	≥7	<7	3
Total Score		**Peninsula**			**17**
Interpretation of Scores		**Excellent**			26-32
		Good			20-25
		Poor			13-19
		Severely Degraded			7-12

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

Mid-County Services Inc. WWTP – Test Site

Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	5	3	1	Score
Total Number of Taxa	27	≥26	25-14	<14	5
EPT Index	2	≥4	3-2	<2	3
# Chironomid Taxa	14	≥7	6-4	<4	5
% Contribution of Dominant Taxon	23	≤29	30-64	>64	3
% Diptera	42	-	≤37	>37	1
Florida Index	7	≥7	6-4	<4	5
% Suspension feeders/Filterers	35	-	≥7	<7	3
Total Score		**Peninsula**			**25**
Interpretation of Scores		**Excellent**			26-32
		Good			20-25
		Poor			13-19
		Severely Degraded			7-12

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

Phytoplankton taxa list and densities (#/mL) for Mid-County Services Inc., collected via subsurface grabs in Curlew Creek, on 01 June, 1998.

	Control Site	Test Site
Cyanophyceae		
Aphanothece sp.	–	1
Chroococcus sp.	–	9
Gomphosphaeria sp.	3	1
Merismopedia sp.	–	2
Microcystis sp.	–	1
Dactylococcopsis sp.	–	6
Dermocarpa sp.	–	1
Lyngbya sp.	2	1
Oscillatoria sp.	5	11
Anabaena sp.	1	–
Chrysophyceae		
Centritractis sp.	–	1
Bacillariophyceae		
Melosira sp.	2	–
Cyclotella sp.	3	3
Pennales sp.	1	–
Synedra sp.	–	1
Achnanthes sp.	2	2
Navicula sp.	3	5
Pinnularia sp.	–	1
Gomphonema sp.	1	1
Nitzschia sp.	1	6
Chlorophyceae		
Chlorophyceae	4	5
Chlamydomonas sp.	7	6
Chlorogonium sp.	1	–
Pteromonas sp.	–	1
Chlorococcum sp.	3	6
Schroederia sp.	–	2
Characium sp.	–	2
Chlorella sp.	–	4
Scenedesmus sp.	–	6
Selenastrum sp.	1	3
Sphaerocystis sp.	–	1
Elakatothrix sp.	1	1
Spermatozoopsis sp.	–	1
Euglenopyceae		
Euglena sp.	5	3
Trachelomonas sp.	1	1
Lepocinclis sp.	1	–
Phacus sp.	2	2
Dinophyceae		

Peridinium sp.	2	–
Ceratium sp.	1	–
Cryptophyceae		
Cryptomonas sp.	9	2

Benthic macroinvertebrate taxa list for Mid-County Services Inc., collected via 20 discrete dip net sweeps in Curlew Creek, on 01 June, 1998.

	Control Site	Test Site
Amphipoda		
Hyalella azteca	4	9
Coleoptera		
Elmidae	–	1
Microcylloepus pusillus	5	1
Stenelmis sp.	–	12
Decapoda		
Undetermined Decapoda	1	1
Diptera		
Ceratopogonidae	–	1
Chironomidae	3	2
Chironomus sp.	1	4
Cladotanytarsus sp.	1	–
Cricotopus bicinctus grp.	–	16
Cricotopus or *orthocladius*	–	2
Culicoides sp.	–	1
Dicrotendipes modestus	–	5
Dicrotendipes sp.	–	1
Goeldichironomus holoprasinus	1	–
Goeldichironomus sp.	–	1
Parachironomus hirtalatus	–	1
Parachironomus sp.	–	1
Paratanytarsus dissimilis	–	2
Paratanytarsus sp.	–	1
Pentaneura inconspicua	1	3
Polypedilum convictum grp.	–	13
Polypedilum illinoense grp.	14	11
Polypedilum scalaenum grp.	–	2
Rheotanytarsus sp.	1	–
Tanytarsus sp. E Epler	–	1
Tanytarsus sp. T Epler	–	1
Thienemanniella sp. B Epler	–	1
Thienemanniella sp.	–	1
Ephemeroptera		
Callibaetis floridanus	–	1
Undetermined Ephemeroptera	2	–
Gastropoda		
Ancylidae	1	4
Undetermined Gastropoda	–	1
Hydrobiidae	–	2
Littoridinops sp.	–	1
Melanoides sp.	–	1
Physella sp.	3	4

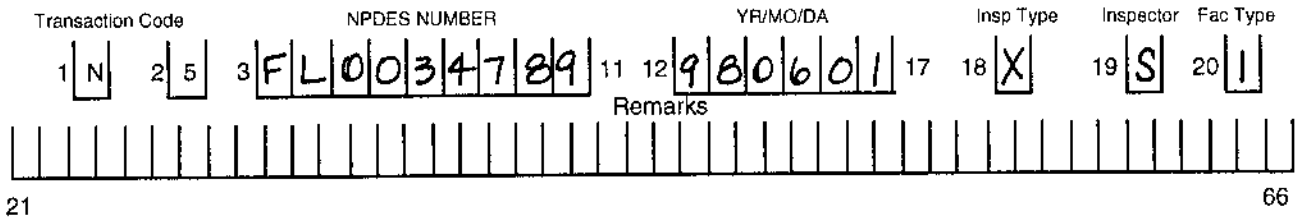
Hemiptera		
Belostoma sp.	7	–
Lepidoptera		
Undetermined Lepidoptera	1	–
Noctuidae	1	–
Odonata		
Coenagrionidae	–	2
Enallagma sp.	26	4
Ischnura sp.	4	–
Zygoptera	1	–
Oligochaeta		
Eclipidrilus palustris	1	–
Limnodrilus hoffmeisteri	5	–
Pelecypoda		
Corbicula fluminea	46	–
Sphaeriidae	–	39
Trichoptera		
Cheumatopsyche sp.	–	12
Hydropsychidae	–	3

Benthic macroinvertebrate taxa list for Mid-County Services Inc., collected via Hester-Dendy artificial substrates in receiving water, on 01 June, 1998. Densities, in number/m^2, represent the mean of four replicates.

	Control Site	Test Site
Amphipoda		
Undetermined Amphipoda	2	–
Hyalella azteca	18	8
Coleoptera		
Elmidae	–	6
Microcylloepus pusillus	6	363
Stenelmis sp.	115	415
Diptera		
Ablabesmyia mallochi	10	–
Asheum beckae	2	22
Chironomidae	28	109
Chironomus sp.	–	103
Cricotopus bicinctus	–	438
Cryptochironomus sp.	2	–
Dicrotendipes modestus	214	405
Dicrotendipes neomodestus	22	40
Dicrotendipes sp.	2	10
Goeldichironomus holoprasinus	–	10
Goeldichironomus	–	6
Labrundinia sp.	6	–
Nanocladius sp.	6	–
Paratanytarsus dissimilis	28	–
Paratanytarsus sp.	28	–
Pentaneura inconspicua	69	167
Polypedilum convictum grp.	28	1609
Polypedilum halterale grp.	4	–
Polypedilum illinoense grp.	–	30
Polypedilum scalaenum grp.	16	10
Polypedilum tritum	6	10
Rheotanytarsus distinctissimus grp.	32	–
Rheotanytarsus sp.	6	–
Simulium sp.	–	12
Stenochironomus sp.	147	111
Tanytarsus sp. C Epler	6	–
Tanytarsus sp. E Epler	6	10
Tanytarsus sp. G Epler	2	–
Tanytarsus sp. T Epler	2	–
Thienemanniella similis	–	10
Thienemanniella sp. B Epler	–	6
Thienemanniella sp. C Epler	–	40
Thienemanniella sp.	–	89
Thienemanniella xena	–	10

Gastropoda		
Ancylidae	58	95
Undetermined Gastropoda	–	2
Hebetancylus excentricus	69	–
Physella sp.	–	8
Hirudinea		
Helobdella fusca	2	–
Odonata		
Argia sedula	4	6
Argia sp.	2	2
Oligochaeta		
Eclipidrilus sp.	2	–
Pelecypoda		
Corbicula fluminea	10	–
Corbiculidae	4	–
Undetermined Pelecypoda	–	2
Sphaeriidae	–	2
Trichoptera		
Cheumatopsyche sp.	20	2839
Hydropsychidae	12	20
Undetermined Trichoptera	–	2
Trombidiformes		
Hygrobates sp.	4	8
Oribatei sp.	–	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)

