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Biological Assessment of  
**Northwest Regional Wastewater Treatment Plant**

Hillsborough County

NPDES #FL0041670

Sampled May 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: Northwest Regional WWTP  
County: Hillsborough  
NPDES Number: FL0041670  
Permit Expiration Date: 14 December 2002

#### Toxics Sampling Inspection (XSI)

Date Sampled: 4 May 1998

Results: The concentration of silver in the effluent sample (0.097 µg/L) exceeded the Class III water quality standard (0.07 µg/L) (Rule 62-302.530(60) FAC). All other metals detected in the effluent complied with Class III water quality standards.

#### Compliance Biomonitoring Inspection (CBI)

Date Sampled: 4 May 1998

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

#### Impact Bioassessment Inspection (IBI)

Date Sampled: 4 May 1998

Results: In the quantitative samples, the Shannon-Weaver diversity declined by 32% at test site 1, and failed to comply with Class III water quality standards (Rule 62-302.530 (11) FAC). Results of qualitative samples indicated no impairment at the test sites as a result of the discharge. Periphyton results for test site 1 showed improvements with respect to taxa richness, diversity, and algal density. Low water velocity at test site 2 contributed to higher algal density. Values for periphyton chlorophyll *a* at both the control site and test site 2 were higher than values found in 95% of Florida streams. Although the phytoplankton communities were disrupted at the test sites, the Northwest Regional WWTP discharge did not appear to be contributing any additional stress to the algal community.

#### Water Quality Inspection (WQI)

Date Sampled: 4 May 1998

Results: Dissolved oxygen was below the permit limit and Class III water quality standards (Rule 62-302.530 (31) FAC) at both test sites. There were elevated levels of total phosphorus and ortho-phosphate at the test sites that could be associated with the discharge. Algal growth potential exceeded the 5 mg dry wt/L "problem threshold" at the control site and test site 2, but test site 1 was at 5 mg dry wt/L. Effluent AGP was 20.9 mg dry wt/L. There may be algal growth inhibition at the test sites.

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 Northwest Regional Wastewater Treatment Plant is located in Hillsborough County, Florida (see maps in the Appendix). This is a publicly owned, 5.0 MGD wastewater treatment facility that provides irrigation water for residential lawns, a golf course, a park, road medians and right-of-ways, and common areas around the recreation center, club house, and marketing center at the Westchase Subdivision with a total application area of 381.8 acres. Wastewater treatment consists of oxidation ditches, denitrification via anoxic tanks, and filtration. The effluent then undergoes high level disinfection, dechlorination, and aeration prior to being discharged intermittently to Channel A, which ultimately flows into Old Tampa Bay. The average flow during the month of April 1998 was 2.71 MGD. At the time of the sampling event there was a trickle from the outfall.

State permit limits for the Northwest Regional WWTP effluent are listed in Table 1. The plant has consistently met permit standards for discharge to Channel A for the past year. A combined fifth year inspection for Northwest Regional WWTP and nearby River Oaks WWTP was conducted in 1993 and 1996.

## 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 con-

trol site (located approximately 250 meters upstream of the discharge) and two test sites (site 1 located 50 meters downstream of the discharge and site 2 located 20 meters upstream of the discharge). All field work was conducted on May 4 and 5, 1998. 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. 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 toxicity 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 the 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. According to district personnel, the facility's DMR indicates there was no flow from the facility during May 1998. As a result, the Hester-Dendy samplers were exposed to the effluent during the first 24 days of the 28 day incubation period.

Phytoplankton were sampled at the control site and test sites via subsurface grabs. (Phytoplankton were also sampled at five additional sites in order to obtain additional information. As this information is not pertinent to this fifth year study and has no corresponding

benthic or periphyton data, it will not be addressed in this report.) Periphyton were sampled at both the control site and the test sites by incubating glass microscope slides in a standard periphytometer for 28 days. Chlorophyll *a* was also determined for phytoplankton communities. *Selenastrum capricornutum* was used as the test organism for the algal growth potential tests. 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 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, and the % filter-feeders are measured as the control site minus test site divided by the control site. The percent differences between sites involving the 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, Rose Poynor, and Joe Squitieri (DEP Southwest District), and Julie Baughman, Ken Espy, Marshall Faircloth, 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

Table 1. Effluent limits and summary of chemistry data.

NW Regional WWTP	Effluent Limits	Effluent Samples	Control Site	Test Site 1	Test Site 2
<b>Organic Constituents (µg/L)</b>					
Atrazine	-	0.16 I	-	-	-
<b>Metals (µg/L)</b>					
Aluminum	≤ 1,500 **	89 I	-	-	-
Arsenic	≤ 50 **	30 U	-	-	-
Cadmium	≤ 1.81**c	0.35 A	-	-	-
Chromium	≤ 337**c	7 U	-	-	-
Copper	≤ 19.7**c	8.2 A	-	-	-
Iron	≤ 1,000 **	110 A	-	-	-
Lead	≤ 6.79**c	0.55 A	-	-	-
Mercury	≤ 0.012 **	0.10 U	-	-	-
Nickel	≤ 260**c	6 U	-	-	-
Selenium	≤ 5.0 **	40 U	-	-	-
Silver	≤ 0.07 **	0.097 I	-	-	-
Zinc	≤ 176**c	95 A	-	-	-
<b>Nutrients (mg/L)</b>					
Ortho-phosphate	-	2.9	0.055	0.13	0.13
Total phosphorus	≤ 2.0 *	3.2	0.11	0.18 A	0.19
Ammonia	-	0.19 A	0.064 A	0.062	0.056 A
Nitrate+Nitrite	-	0.62	0.24	0.16	0.16
TKN	-	1.5	0.92	0.91 A	0.88
Organic Nitrogen	-	1.3	0.86	0.85	0.82
Total Nitrogen	≤ 6.0 *	2.1	1.2	1.1	1.0
<b>General Phys-Chem Parameters</b>					
Habitat Assessment	-	-	50	52	45
D.O. (mg/L)	≥ 5.0 *	5.8	8.6	4.7	4.7
pH (SU)	6.0-8.5 *	6.6	7.4	7.3	7.2
Conductivity (µmhos/cm)	-	898	583	571	571
Tot. Susp Solids (mg/L)	≤ 10.0 *	-	-	-	-
Temperature (°C)	-	23.7	25.0	25.5	25.6
C.B.O.D., 5 day (mg/L)	≤ 10.0 *	8	4 A	2 U	2 U
Tot. Residual Chlorine (mg/L)	≤ 0.01 *	0.03 U	-	-	-
Flow (MGD)	≤ 5.0 *	2.5	-	-	-
Hardness (mg CaCO <sub>3</sub> )	-	181.4	-	-	-
AGP (mg dry wt/L)	-	20.9	6.3	5.0	5.6
<b>Toxicity (48-hour static, screening bioassay)</b>					
Bioassay - Fish	-	Not toxic	-	-	-
Bioassay - Invertebrate	-	Not toxic	-	-	-
<b>Microbiology (# counts/100mL)</b>					
Fecal Coliforms	≤ 25 *	2 J	92 A	3 J	9 J
Total Coliforms	-	4 J	318 A	386 A	64 J

c - Value is calculated based on hardness

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

J - Estimated value

I - Value reported is < the minimum quantitation limit, and ≥ the minimum detection limit

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

\* Permit limit

\*\* Class III water quality standard

Table 2. Benthic macroinvertebrate community structure.

Northwest Regional WWTP	Control Site	Test Site 1	Test Site 2
<b>Macroinvertebrate Qualitative</b>			
Number of Taxa	33	30	30
Florida Index	5	11	3
SCI	19	23	19
EPT Index	1	4	2
% Dominant Taxon	15	13	20
<b>Community Composition</b>			
% Amphipoda	7	9	2
% Coleoptera	4	0	4
% Decapoda	3	13	2
% Diptera	44	38	59
% Ephemeroptera	15	4	4
% Gastropoda	3	3	10
% Hemiptera	5	7	2
% Odonata	13	5	2
% Oligochaeta	6	10	11
% Pelecypoda	0	4	2
% Trichoptera	0	4	0
% Other	0	3	2
<b>Functional Feeding Groups</b>			
% Predators	22	17	15
% Surface Deposit Feeders	42	28	33
% Suspension Feeders/Filterers	10	6	12
% Scrapers	1	3	11
% Shredders	14	22	16
<b>Macroinvertebrate Hester-Dendy *</b>			
Number of Taxa	65	22	45
Florida Index	22	6	12
Shannon-Weaver Diversity	4.4	3	4
EPT Index	6	2	6
<b>Community Composition</b>			
% Diptera	58	93	85
% Ephemeroptera	13	3	3
% Gastropoda	18	4	4
% Trichoptera	6	0	4
% Other	5	0	4
<b>Functional Feeding Groups</b>			
% Predators	14	3	6
% Surface Deposit Feeders	46	56	53
% Suspension Feeders	13	29	18
% Scrapers	16	4	3
% Shredders	6	6	14

\* Samplers were exposed to the effluent for 24 days during the 28 day incubation period.

was reviewed by the Point Source Studies Review Committee, consisting of Wayne Magley, Chuck Ziegmont, and Michael Tanski, as well as District representatives.

## Results

Habitat quality was "marginal" at the control site (50 points), test site

1 (52 points), and test site 2 (45 points) (Table 1). The receiving water was a typical canal system with poor habitat, artificial channelization, low water velocity, minimal riparian buffer zone, and intense human activities surrounding the system (see Habitat Assessment Data Sheets in the Appendix).

## Discussion

With the exception of the dissolved oxygen levels, the physical/chemical measurements were comparable at the control site and test sites (Table 1). Low water velocity at the test sites may have contributed to low dissolved oxygen levels which were below the permit limit and Class III water quality standards (Rule 62-302.530(31) FAC).

Atrazine was detected in the effluent at a level below the minimum quantitation limit (Table 1). Silver in the effluent exceeded Class III water quality standards (Rule 62-302.530(60) FAC). Aluminum, cadmium, copper, iron, lead, and zinc were detected in the effluent at concentrations that complied with Class III water quality standards (Table 1). All other metals and organic compounds detected in the effluent complied with Class III water quality standards.

Fecal and total coliforms complied with Class III water quality standards in the effluent sample, as well as at the three study sites.

Ammonia, nitrate+nitrite, and TKN were lower at the test sites than at the control site (Table 1). Total phosphorus in the effluent exceeded the permit limit of 2.0 mg/L. Total phosphorus at test site 1 and test site 2 was somewhat higher than at the control site. Orthophosphate in the effluent contributed to a substantial increase at the test sites compared to the control site. Other nutrient enrichment from the outfall did not cause substantial enrichment at the test sites.

Figure 1 represents changes in the periphyton algal community. Larger differences (that is, higher percentages) correspond with greater degrees of degradation. Test site

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

Northwest Regional WWTP	Control Site	Test Site 1	Test Site 2
<b>Phytoplankton Algae</b>			
Number of Taxa	18	10	6
Shannon-Weaver Diversity	2.6	1.9	0.9
Chlorophyll <i>a</i> (µg/L)	22	21	11
Algal Density (#/mL)	4,728	2,122	3,112
% Blue-green	0.3	1.1	0.8
% Green	41.9	6.3	9.1
% Cryptophyceae	7.2	24.4	5
% Prasinophyceae	44.7	61.9	83.5
% Diatoms	3.1	4	0.8
<b>Periphyton Algae</b>			
Number of Taxa	29	38	30
Shannon-Weaver Diversity	3.7	4.3	3
Chlorophyll <i>a</i> (mg/m <sup>2</sup> )	108	32	100
Algal Density (#/cm <sup>2</sup> )	769,687	129,916	1,286,008
Diatom/Diatom + B-G Ratio	0.9	0.7	1
% Blue-green	5	31	1
% Diatoms	77	59	95
<b>AGP (mg dry wt/L)</b>	6.3	5	5.6

I - Value reported is < the minimum quantitation limit, and ≥ the minimum detection limit

1 showed improved conditions compared to the control site. Periphyton taxa richness was higher at test site 1 than test site 2 or the control site (Table 3). Algal diversity was also higher at test site 1 than at test site 2, or the control site. Algal density was extremely elevated at all three study sites. The periphyton algal density at test site 2 was significantly greater than the control site and test site 1. Chlorophyll *a* was extremely elevated at all three study sites, but was substantially lower at test site 1 than at the control site or test site 2. Chlorophyll *a* at the control site and test site 2 was higher than the values found in approximately 95% of other Florida streams (see *Typical Values for Selected Parameters in Florida Waters* in the Appendix).

Phytoplankton algal communities were adversely affected at the test sites (Table 3). Taxa richness decreased by 44% and 67% from the

control site to test site 1 and test site 2, respectively. Percent contribution of dominant taxon rose by 49% from the control site to test site 2. Algal density was slightly lower at test site 1 and test site 2 than at the control site. Chlorophyll *a* was also lower at test site 1 and test site 2 than at the control site.

Examining the phytoplankton community data in conjunction with the AGP values, it appears that there is some algal growth inhibition at the test sites. The effluent AGP reflected the elevated nutrient levels in the discharge. Despite the high AGP value in the effluent, the test sites had lower AGP values than the control site (Table 1). AGP at both the control site and test site 2 slightly exceeded the 5 mg dry wt/L "problem threshold" (Raschke and Schultz 1987). AGP at test site 1 equaled the "problem threshold".

Habitat quality was "marginal" at the control site and test sites. Channel A is a straight cut canal with steep sides and no riparian buffer zone. Quantitative measures of macroinvertebrate community health showed degradation at both test sites. Shannon-Weaver diversity decreased 32% at test site 1, and fails to meet the biological integrity criterion, Rule 62-302.530(11) FAC. In the dipnet samples, taxa richness, number of chironomid taxa, and % contribution of dominant taxon at both test sites were similar to the control site. The Florida Index and EPT Index were higher at test site 1 than the control site. The control site and test site 2 SCI scores placed them in the "poor" category, while test site 1 was placed in the "good" category.

## 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.
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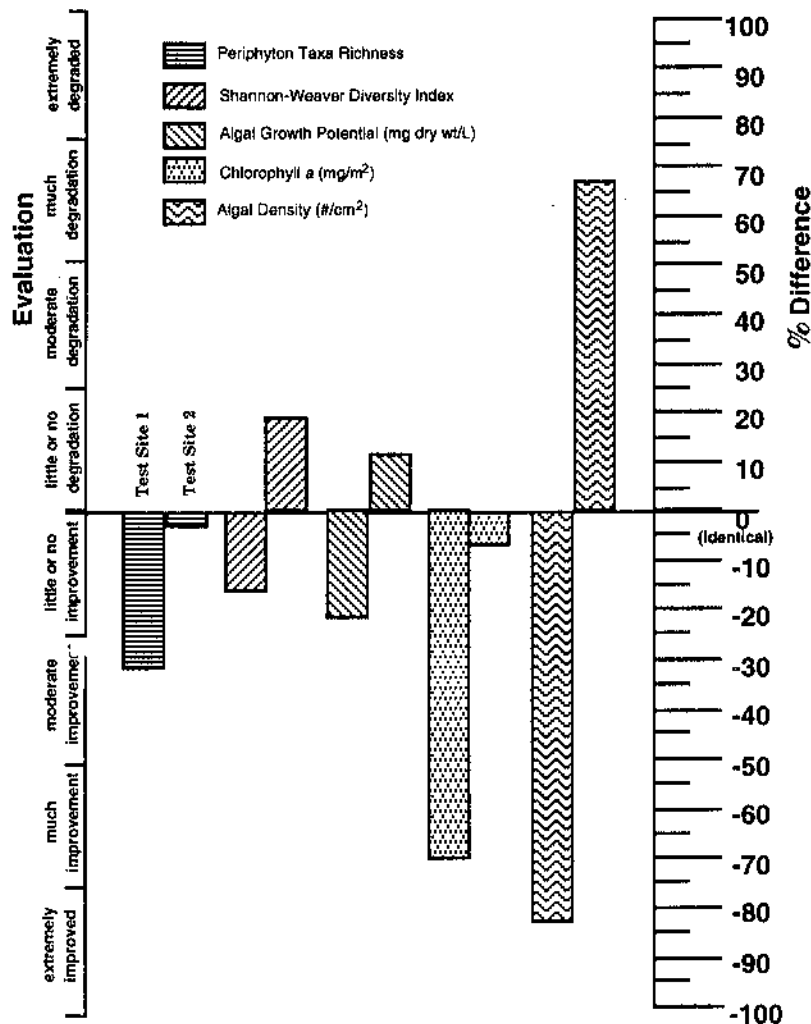


Figure 1. Effect of discharge on the algal community.

*nastrum capricornutum* Printz algal assay bottle test. U. S. Environ. Prot. Agency, EPA-600/9-78-018. 126 p.

EPA/600/4-90/027. U. S. EPA, Cincinnati, Ohio. 216 pp.

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

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Weber, C. I. 1993. Methods for measuring the acute toxicity of effluents to freshwater and marine organisms. 4th edition.

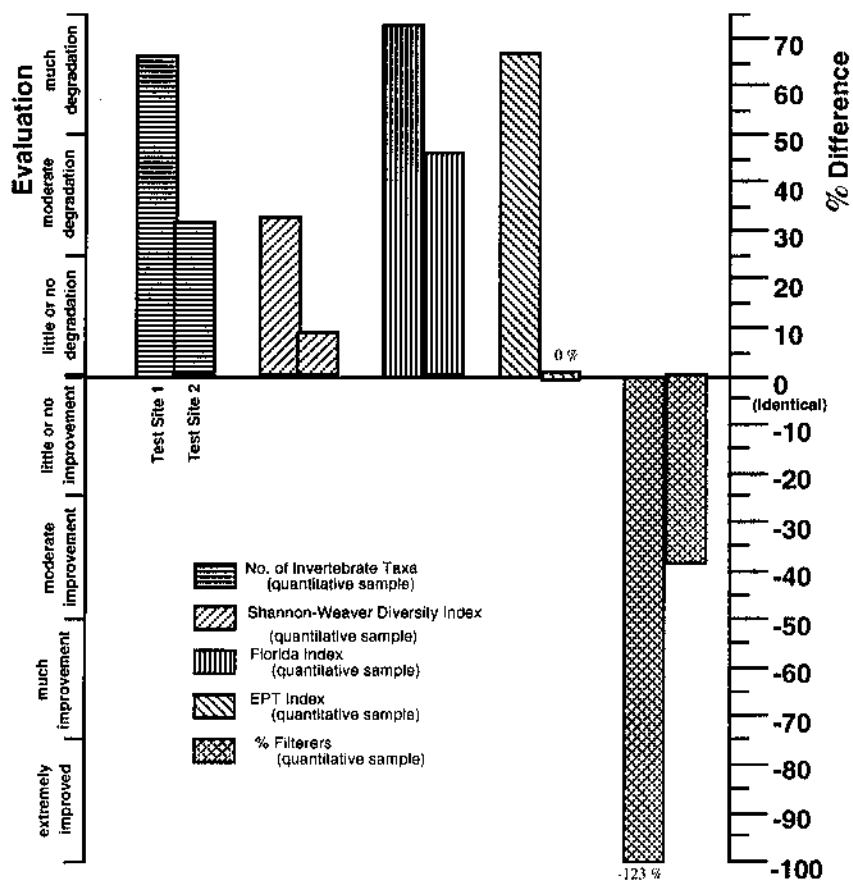


Figure 2. Effect of discharge on the macroinvertebrate community.



**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%
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**STREAMS**

(1617 stations)

Phytoplankton Chlorophyll <i>a</i>	0.22	0.52	0.94	1.60	3.02	4.63	6.72	9.87	14.68	27.35	48.70
Periphyton Chlorophyll <i>a</i>	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
NO <sub>2</sub> -NO <sub>3</sub>	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 <i>a</i>	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
NH <sub>3</sub> +NH <sub>4</sub>	0.01	0.02	0.02	0.03	0.04	0.06	0.08	0.12	0.15	0.21	0.28
NO <sub>2</sub> -NO <sub>3</sub>	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 <i>a</i>	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
NH <sub>3</sub> +NH <sub>4</sub>	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.09	0.13	0.22	0.28
NO <sub>2</sub> -NO <sub>3</sub>	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<sup>2</sup>), Nutrients (mg/L), Turbidity (NTU), Taxa richness and diversity values are for macroinvertebrates

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION  
FACILITY SUMMARY

Facility Name: <b>Northwest Regional WWT</b>		Date Summary Prepared: <b>4/30/98</b>	
Location (attach detailed map):	County <b>Hillsborough</b>	District <b>SW District</b>	
Federal Permit # <b>FL0041670</b> and expiration date:	State GMS # and State expiration date: <b>12/14/02</b> <b>4029C/0857</b>	Facility Type: <b>Industrial</b> <input checked="" type="checkbox"/> <b>Municipal</b> <input type="checkbox"/> Federal <input type="checkbox"/> Agricultural Other (list):	
Function of facility: <b>Type I Domestic AWT</b>			
Description of treatment process: <b>Oxidation ditches with denitrification through anoxic tanks and infiltration. Flow then undergoes high level disinfection, dechlorination and aeration</b>			
Receiving waters: <b>Channel A to Old Tampa Bay</b>		Classification: <b>I II III</b>	
Design Flow: <b>5.0</b>	Mean Flow: <b>2.75</b> <sup>3-month</sup> <b>ADF MGD</b>	Flow during survey: <b>~ 2.5 MGD</b>	
Discharge is: Continuous <input checked="" type="checkbox"/> <b>Intermittent</b> Seasonal Rainfall dependent Other (describe): therefore, the best time to sample is:			
If facility has a mixing zone, give details (size, parameters affected, etc.):  <b>No mixing zone</b>			

List effluent limits (if necessary, attach relevant paperwork): Describe special permit conditions and permit modifications:

**PROPOSED EFFLUENT LIMITS FOR RECLAIMED WATER LIMITATIONS**

Outfall: Sewer Number D001

Parameters	Effluent or Reclaimed Water Limitations				
	Maximum Minimum	Annual Average	Monthly Average	Weekly Average	Single Sample
Flow (mgd)	Maximum	-	-	-	-
		5.0	6.25	7.5	10.0
Chemical Oxygen Demand (5 day) (mg/L)	Maximum	5.0	6.25	7.5	10.0
Total Suspended Solids (mg/L)	Maximum	5.0	6.25	7.5	10.0
pH (standard units)	Range	-	-	-	6.0-8.5
Fecal Coliform Bacteria (4,100 /ml)	Maximum	-	-	-	See below (1)
Total Residual Chlorine (for Disinfection) (mg/L)	Minimum	-	-	-	1.0
Total Residual Chlorine (for Disinfection) (mg/L)	Maximum	-	-	-	6.0
Nitrogen, Total as N (mg/L as N)	Maximum	3.0	3.75	4.5	6.0
Phosphorus, Total as P (mg/L as P)	Maximum	1.0	1.25	1.5	2.0
Whole Effluent Toxicity	-	-	-	-	See below
Oxygen, Dissolved (DO) (mg/L)	Minimum	-	-	-	5.0

(1) Fecal Coliform: Over a 30 day period, 75 percent of the fecal coliform values (the 75th percentile value) shall be below the detection limits. Any one sample shall not exceed 25 fecal coliform units.

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION  
FACILITY SUMMARY

Northwest Regional WWTP  
(Facility)

Description of permitted outfall(s):

Outfall is located in Channel A. The pipeline from the WWTP to the outfall is 3 1/2 miles long.

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

There have been no significant permit exceedances

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

A combined FYI-5 for both River Oaks WWTP and Northwest Regional WWTPs were conducted in 1993 and 1996.

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):

*Carolee Granger* (Biologist)

*For. Gustin* (Inspector)

(Engineer)

( )

( )

( )

**STATE OF FLORIDA**  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
**PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)**

SUBMITTING AGENCY CODE: _____	STORET STATION NUMBER: <b>24030110</b>	DATE (M/D/Y): <b>5/4/98</b>	TIME: <b>1150</b>	RECEIVING BODY OF WATER: <b>Channel A</b>
SUBMITTING AGENCY NAME: _____				

REMARKS: <b>windy, cloudy, raining</b>	COUNTY: <b>Hills</b>	LOCATION: <b>Northwest Regional WWTP</b>	FIELD ID NAME: <b>Reference Site</b>
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**RIPARIAN ZONE/INSTREAM FEATURES**

Predominant Land-Use in Watershed (specify relative percent in each category):							
Forest/Natural <b>15</b>	Silviculture <b>0</b>	Field/Pasture <b>20</b>	Agricultural <b>5</b>	Residential <b>40</b>	Commercial <b>20</b>	Industrial <b>0</b>	Other (Specify) <b>0</b>
Local Watershed Erosion (check box): None <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Heavy <input type="checkbox"/>							
Local Watershed NPS Pollution (check box): No evidence <input type="checkbox"/> Slight <input type="checkbox"/> Moderate potential <input type="checkbox"/> Obvious sources <input checked="" type="checkbox"/>							
Width of riparian vegetation (m) on least buffered side: <b>0.5</b>		List & map dominant vegetation on back		Typical Width (m)/Depth (m) /Velocity (m/sec) Transect			
Artificially Channelized <input type="checkbox"/> no <input checked="" type="checkbox"/> recent <input checked="" type="checkbox"/> some recovery <input type="checkbox"/> mostly recovered <input type="checkbox"/> mpre sinuous				<div style="display: flex; justify-content: space-around;"> <div><b>0.09</b> m/s</div> <div><b>0.09</b> m/s</div> <div><b>0.13</b> m/s</div> </div>			
Artificially Impounded <input checked="" type="checkbox"/> yes				<div style="display: flex; justify-content: space-around;"> <div><b>2.3</b> m deep</div> <div><b>2.8</b> m deep</div> <div><b>2</b> m deep</div> </div>			
High Water Mark: <b>0.3</b> (m above present water level) + <b>2.8</b> (present depth in m) = <b>3.1</b> (m above bed)							
Canopy Cover %: Open: <input checked="" type="checkbox"/> Lightly Shaded (11-45%): <input type="checkbox"/> Moderately Shaded (46-80%): <input type="checkbox"/> Heavily Shaded: <input type="checkbox"/>							

**SEDIMENT/SUBSTRATE**

Sediment Odors: Normal: <input checked="" type="checkbox"/> Sewage: <input type="checkbox"/> Petroleum: <input type="checkbox"/> Chemical: <input type="checkbox"/> Anaerobic: <input type="checkbox"/> Other: <input type="checkbox"/>																																													
Sediment Oils: Absent: <input checked="" type="checkbox"/> Slight: <input type="checkbox"/> Moderate: <input type="checkbox"/> Profuse: <input type="checkbox"/>																																													
Sediment Deposition: Sludge: <input type="checkbox"/> Sand smothering: none slight <input type="checkbox"/> moderate <input type="checkbox"/> severe <input type="checkbox"/> Silt smothering: none slight <input checked="" type="checkbox"/> moderate <input type="checkbox"/> severe <input type="checkbox"/> Other: <input type="checkbox"/>																																													
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Substrate Types</th> <th>% coverage</th> <th># times sampled</th> <th>method</th> </tr> <tr> <td>Woody Debris (Snags)</td> <td><b>0</b></td> <td><b>0</b></td> <td></td> </tr> <tr> <td>Leaf Packs or Mats</td> <td><b>0</b></td> <td><b>0</b></td> <td></td> </tr> <tr> <td>Aquatic Vegetation</td> <td><b>10</b></td> <td><b>15</b></td> <td><b>Net</b></td> </tr> <tr> <td>Rock or Shell Rubble</td> <td><b>0</b></td> <td><b>0</b></td> <td></td> </tr> <tr> <td>Undercut banks/Roots</td> <td><b>0</b></td> <td><b>0</b></td> <td></td> </tr> </table>	Substrate Types	% coverage	# times sampled	method	Woody Debris (Snags)	<b>0</b>	<b>0</b>		Leaf Packs or Mats	<b>0</b>	<b>0</b>		Aquatic Vegetation	<b>10</b>	<b>15</b>	<b>Net</b>	Rock or Shell Rubble	<b>0</b>	<b>0</b>		Undercut banks/Roots	<b>0</b>	<b>0</b>		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Substrate Types</th> <th>% coverage</th> <th># times sampled</th> <th>method</th> </tr> <tr> <td>Sand</td> <td><b>70</b></td> <td><b>2</b></td> <td><b>Net</b></td> </tr> <tr> <td>Mud/Muck/Silt</td> <td><b>15</b></td> <td><b>3</b></td> <td><b>Net</b></td> </tr> <tr> <td>Other:</td> <td><b>0</b></td> <td><b>0</b></td> <td></td> </tr> <tr> <td>Other:</td> <td><b>0</b></td> <td><b>0</b></td> <td></td> </tr> </table>	Substrate Types	% coverage	# times sampled	method	Sand	<b>70</b>	<b>2</b>	<b>Net</b>	Mud/Muck/Silt	<b>15</b>	<b>3</b>	<b>Net</b>	Other:	<b>0</b>	<b>0</b>		Other:	<b>0</b>	<b>0</b>	
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Other:	<b>0</b>	<b>0</b>																																											
Other:	<b>0</b>	<b>0</b>																																											
Draw aerial view sketch of habitats found in 100 m section																																													

WATER QUALITY	Depth (m)	Temp. (°C)	pH (SU)	D.O. (mg/l)	Concl. (µmho/cm) or Salinity (ppt)	Secchi (m)
Top	<b>0.3</b>	<b>25.0</b>	<b>7.37</b>	<b>8.60</b>	<b>583</b>	<b>1.5</b>
Mid-depth	<b>1.4</b>	<b>25.12</b>	<b>7.42</b>	<b>10.11</b>	<b>504</b>	
Bottom	<b>2.8</b>	<b>23.76</b>	<b>7.30</b>	<b>9.72</b>	<b>374</b>	

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

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

Water Surface Oils (check box): None: ☒ Sheen: ☐ Globbs: ☐ Slick: ☐

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

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

Weather Conditions/Notes: <b>water flow direction was South</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Abundance:</th> <th>Absent</th> <th>Rare</th> <th>Common</th> <th>Abundant</th> </tr> <tr> <td>Periphyton</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Fish</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Aquatic Macrophytes</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Iron/sulfur Bacteria</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	Abundance:	Absent	Rare	Common	Abundant	Periphyton	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Fish	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Aquatic Macrophytes	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Iron/sulfur Bacteria	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Abundance:	Absent	Rare	Common	Abundant																						
Periphyton	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																						
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Iron/sulfur Bacteria	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																						

SAMPLING TEAM: <b>Granger, Poyner</b>	SIGNATURE: <b>Andrea Granger</b>	DATE: <b>5/6/98</b>
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**STATE OF FLORIDA**  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
**FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (v2)**

SUBMITTING AGENCY CODE: _____	STORET STATION NUMBER: _____	DATE (M/D/Y): <u>5/4/98</u>	RECEIVING BODY OF WATER: <u>Channel A</u>
SUBMITTING AGENCY NAME: _____			

REMARKS: <u>Windy, raining, cloudy</u>	LOCATION: <u>Northwest Regional WWTP</u>	FIELD ID NAME: <u>Reference Site</u>
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Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
<b>Bottom Substrate/Available Cover</b> <div style="border: 1px solid black; width: 40px; text-align: center; margin: 5px auto;">8</div>	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs (partially decayed), undercut banks, rubble, or other stable habitat. 20 19 18 17 16	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable. 5 4 3 2 1
<b>Water Velocity</b> <div style="border: 1px solid black; width: 40px; text-align: center; margin: 5px auto;">12</div>	Max. observed: >0.25 m/sec. but < 2 m/sec 20 19 18 17 16	Max. observed; 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed; 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec 5 4 3 2 1
<b>Artificial Channelization</b> <div style="border: 1px solid black; width: 40px; text-align: center; margin: 5px auto;">3</div>	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
<b>Deposition</b> <div style="border: 1px solid black; width: 40px; text-align: center; margin: 5px auto;">13</div>	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
<b>Bank Stability</b> <div style="border: 1px solid black; width: 40px; text-align: center; margin: 5px auto;">5</div>	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
<b>Riparian Buffer Zone Width</b> <div style="border: 1px solid black; width: 40px; text-align: center; margin: 5px auto;">1</div>	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
<b>Riparian Zone Vegetation Quality</b> <div style="border: 1px solid black; width: 40px; text-align: center; margin: 5px auto;">10</div> <div style="border: 1px solid black; width: 40px; text-align: center; margin: 5px auto;">83</div>	Over 80% of streambank surfaces consist of native plants, including trees understory shrubs, or non-woody macrophytes. Plants growing naturally. 20 19 18 17 16	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. Some disruption in community evident. 15 14 13 12 11	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 10 9 8 7 6	Less than 25% of streambank surfaces are vegetated. <u>Poor plant community (e.g. grass monoculture or exotics) present.</u> Vegetation removed to stubble height of 2 inches or less. 5 4 3 2 1

5

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

50

**TOTAL SCORE**

**Comments**

ANALYSIS DATE: <u>5/4/98</u>	ANALYST: <u>Grainger</u>	SIGNATURE: <u>Candace Grainger</u>
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STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-95)

SUBMITTING AGENCY CODE: _____	STORET STATION NUMBER: <b>24030112</b>	DATE (M/D/Y): <b>5/4/98</b>	TIME: <b>1330</b>	RECEIVING BODY OF WATER: <b>Channel A</b>
SUBMITTING AGENCY NAME: _____				

REMARKS: <b>rainy, windy, cloudy</b>	COUNTY: <b>Hills</b>	LOCATION: <b>Northwest Regional</b>	FIELD ID/NAME: <b>Test Site 1</b>
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**RIPARIAN ZONE/INSTREAM FEATURES**

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

Forest/Natural <b>15</b>	Silviculture <b>0</b>	Field/Pasture <b>20</b>	Agricultural <b>5</b>	Residential <b>40</b>	Commercial <b>20</b>	Industrial <b>0</b>	Other (Specify) <b>0</b>
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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: **1.0** List & map dominant vegetation on back

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

Artificially Impounded ☒ yes

High Water Mark: **0.3** (m above present water level) + **3** (present depth in m) = **3.3** (m above bed)

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

<b>0.11</b> m/s <b>2.3</b> m deep	<b>0.13</b> m/s <b>3</b> m deep	<b>0.13</b> m/s <b>2.6</b> m deep
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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)	<b>0</b>	<b>0</b>		Sand	<b>65</b>	<b>2</b>	<b>net</b>
Leaf Packs or Mats	<b>0</b>	<b>0</b>		Mud/Muck/Silt	<b>15</b>	<b>3</b>	<b>net</b>
Aquatic Vegetation	<b>15</b>	<b>15</b>	<b>net</b>	Other:	<b>0</b>	<b>0</b>	
Rock or Shell Rubble	<b>0</b>	<b>0</b>		Other:	<b>0</b>	<b>0</b>	
Undercut banks/Roots	<b>0</b>	<b>0</b>		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	<b>0.3</b>	<b>25.54</b>	<b>7.25</b>	<b>4.65</b>	<b>571</b>	<b>1.5</b>
Mid-depth	<b>1.5</b>	<b>25.54</b>	<b>7.24</b>	<b>4.54</b>	<b>571</b>	
Bottom	<b>3</b>	<b>25.49</b>	<b>7.22</b>	<b>4.67</b>	<b>571</b>	

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

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

Water Surface Oils (check box): None: ☒ Sheen: ☐ Globbs: ☐ Slick: ☐

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

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

Weather Conditions/Notes: <b>water flow direction was northeast</b>	Abundance:
	Absent Rare Common Abundant
	Periphyton <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
	Fish <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
	Aquatic Macrophytes <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
	Iron/sulfur Bacteria <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

SAMPLING TEAM: <b>Granger / Poyner</b>	SIGNATURE: <b>Charles Granger</b>	DATE: <b>5/8/98</b>
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**STATE OF FLORIDA**  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
**FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (v2)**

SUBMITTING AGENCY CODE: SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y): <b>5/4/98</b>	RECEIVING BODY OF WATER: <b>Channel A</b>
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REMARKS: <b>Windy, raining, cloudy</b>	LOCATION: <b>North west Regional</b>	FIELD ID NAME: <b>Test Site 1</b>
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Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
<b>Bottom Substrate/ Available Cover</b> <div style="border: 1px solid black; width: 40px; text-align: center; margin: 5px auto;">9</div>	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs (partially decayed), undercut banks, rubble, or other stable habitat. 20 19 18 17 16	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	5% to 20% snags, logs, tree roots, <u>emergent vegetation</u> , leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 <b>9</b> 8 7 6	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable. 5 4 3 2 1
<b>Water Velocity</b> <div style="border: 1px solid black; width: 40px; text-align: center; margin: 5px auto;">12</div>	Max. observed: >0.25 m/sec. but < 2 m/sec 20 19 18 17 16	Max. observed; 0.1 to 0.25 m/sec 15 14 13 <b>12</b> 11	Max. observed; 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec 5 4 3 2 1
<b>Artificial Channelization</b> <div style="border: 1px solid black; width: 40px; text-align: center; margin: 5px auto;">3</div>	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 <b>3</b> 2 1
<b>Deposition</b> <div style="border: 1px solid black; width: 40px; text-align: center; margin: 5px auto;">12</div>	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 <b>12</b> 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
<b>Bank Stability</b> <div style="border: 1px solid black; width: 40px; text-align: center; margin: 5px auto;">4</div>	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 <b>4</b> 3 2 1
<b>Riparian Buffer Zone Width</b> <div style="border: 1px solid black; width: 40px; text-align: center; margin: 5px auto;">2</div>	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 <b>2</b> 1
<b>Riparian Zone Vegetation Quality</b> <div style="border: 1px solid black; width: 40px; text-align: center; margin: 5px auto;">5</div>	Over 80% of streambank surfaces consist of native plants, including trees understory shrubs, or non-woody macrophytes. Plants growing naturally. 20 19 18 17 16	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. Some disruption in community evident. 15 14 13 12 11	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 10 9 8 7 6	Less than 25% of streambank surfaces are vegetated. Poor plant community (e.g. grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 5 <b>4</b> 3 2 1

5

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

52

**TOTAL SCORE**

**Comments**

ANALYSIS DATE: <b>5/4/98</b>	ANALYST: <b>Granger</b>	SIGNATURE: <i>Andrea Granger</i>
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**STATE OF FLORIDA**  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
**PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET** (5-10-96)

SUBMITTING AGENCY CODE: _____	STORET STATION NUMBER: <b>24030112</b>	DATE (MDY): <b>5/4/98</b>	TIME: <b>1350</b>	RECEIVING BODY OF WATER: <b>Channel A</b>
SUBMITTING AGENCY NAME: _____				

REMARKS: <b>windy, ramme, cloudy</b>	COUNTY: <b>Hills</b>	LOCATION: <b>Northwest Regional</b>	FIELD ID NAME: <b>Test Site 2</b>
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**RIPARIAN ZONE/INSTREAM FEATURES**

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

Forest/Natural <b>15</b>	Silviculture 	Field/Pasture <b>20</b>	Agricultural <b>5</b>	Residential <b>40</b>	Commercial <b>20</b>	Industrial 	Other (Specify) 
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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: **1.0** List & map dominant vegetation on back

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

Artificially Impounded ☒ yes

High Water Mark: **0.3** + **2.8** = **3.1**  
(m above present water level) (present depth in m) (m above bed)

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

<b>0.04 m/s</b> <b>2.3 m deep</b>	<b>0.06 m/s</b> <b>2.8 m deep</b>	<b>0.05 m/s</b> <b>3 m deep</b>
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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)	<b>0</b>	<b>0</b>		Sand	<b>65</b>	<b>2</b>	<b>net</b>
Leaf Packs or Mats	<b>0</b>	<b>0</b>		Mud/Muck/Silt	<b>15</b>	<b>3</b>	<b>net</b>
Aquatic Vegetation	<b>15</b>	<b>15</b>	<b>net</b>	Other:	<b>0</b>	<b>0</b>	
Rock or Shell Rubble	<b>0</b>	<b>0</b>		Other:	<b>0</b>	<b>0</b>	
Undercut banks/Roots	<b>0</b>	<b>0</b>		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	<b>0.3</b>	<b>25.59</b>	<b>7.24</b>	<b>4.73</b>	<b>571</b>	<b>1.5</b>
Mid-depth	<b>1.4</b>	<b>25.59</b>	<b>7.24</b>	<b>4.88</b>	<b>571</b>	
Bottom	<b>2.8</b>	<b>25.42</b>	<b>7.24</b>	<b>4.83</b>	<b>571</b>	

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

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

Water Surface Oils (check box): None: ☒ Sheen: ☐ Globbs: ☐ Slick: ☐

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

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

Weather Conditions/Notes: <b>water flow direction was northeast.</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Abundance:</th> <th>Absent</th> <th>Rare</th> <th>Common</th> <th>Abundant</th> </tr> <tr> <td>Periphyton</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Fish</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Aquatic Macrophytes</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Iron/sulfur Bacteria</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	Abundance:	Absent	Rare	Common	Abundant	Periphyton	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Fish	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Aquatic Macrophytes	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Iron/sulfur Bacteria	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Abundance:	Absent	Rare	Common	Abundant																						
Periphyton	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																						
Fish	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																						
Aquatic Macrophytes	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																						
Iron/sulfur Bacteria	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																						

SAMPLING TEAM: <b>Granger / Poyner</b>	SIGNATURE: <b>Candace Granger</b>	DATE: <b>5/8/98</b>
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**STATE OF FLORIDA**  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
**FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (v2)**

SUBMITTING AGENCY CODE: _____	STORET STATION NUMBER: _____	DATE (M/D/Y): <b>5/4/98</b>	RECEIVING BODY OF WATER: <b>Channel A</b>
SUBMITTING AGENCY NAME: _____			

REMARKS: <b>Raining, cloudy, Windy</b>	LOCATION: <b>Northwest Regional</b>	FIELD ID NAME: <b>Test Site 2</b>
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Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
<b>Bottom Substrate/ Available Cover</b> <div style="border: 1px solid black; padding: 2px; display: inline-block;">8</div>	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs (partially decayed), undercut banks, rubble, or other stable habitat. 20 19 18 17 16	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 9 <b>8</b> 7 6	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable. 5 4 3 2 1
<b>Water Velocity</b> <div style="border: 1px solid black; padding: 2px; display: inline-block;">6</div>	Max. observed: >0.25 m/sec. but < 2 m/sec 20 19 18 17 16	Max. observed; 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed; 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec 5 4 3 2 1
<b>Artificial Channelization</b> <div style="border: 1px solid black; padding: 2px; display: inline-block;">3</div>	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 <b>3</b> 2 1
<b>Deposition</b> <div style="border: 1px solid black; padding: 2px; display: inline-block;">12</div>	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 <b>12</b> 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
<b>Bank Stability</b> <div style="border: 1px solid black; padding: 2px; display: inline-block;">4</div>	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 <b>4</b> 3 2 1
<b>Riparian Buffer Zone Width</b> <div style="border: 1px solid black; padding: 2px; display: inline-block;">2</div>	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 <b>2</b> 1
<b>Riparian Zone Vegetation Quality</b> <div style="border: 1px solid black; padding: 2px; display: inline-block;">5</div>	Over 80% of streambank surfaces consist of native plants, including trees understory shrubs, or non-woody macrophytes. Plants growing naturally. 20 19 18 17 16	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. Some disruption in community evident. 15 14 13 12 11	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 10 9 8 7 6	Less than 25% of streambank surfaces are vegetated. Poor plant community (e.g. grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 5 <b>4</b> 3 2 1

5

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

45

**TOTAL SCORE**

**Comments**

ANALYSIS DATE: <b>5/4/98</b>	ANALYST: <b>Grammer</b>	SIGNATURE: <i>Candace Grammer</i>
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**STATE OF FLORIDA**  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
**PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET** (5-10-90)

SUBMITTING AGENCY CODE: _____	STORET STATION NUMBER: <b>24030113</b>	DATE (M/D/Y): <b>5/4/98</b>	TIME: <b>1300</b>	RECEIVING BODY OF WATER: <b>Channel A</b>
SUBMITTING AGENCY NAME: _____				

REMARKS:	COUNTY: <b>Hills</b>	LOCATION: <b>Northwest Regional</b>	FIELD ID NAME: <b>Test Site 3</b>
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**RIPARIAN ZONE/INSTREAM FEATURES**

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

Forest/Natural <b>15</b>	Silviculture	Field/Pasture <b>20</b>	Agricultural <b>5</b>	Residential <b>40</b>	Commercial <b>20</b>	Industrial	Other (Specify)
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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: **1** List & map dominant vegetation on back

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

Artificially Impounded ☒ yes

High Water Mark: **0.3** + **2.7** = **3.0**  
(m above present water level) (present depth in m) (m above bed)

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: ☐ Silt smothering: ☐ Other: ☐

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				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	<b>0.3</b>	<b>25.34</b>	<b>7.34</b>	<b>5.02</b>	<b>568</b>	
Mid-depth	<b>1.4</b>	<b>25.31</b>	<b>7.33</b>	<b>4.97</b>	<b>568</b>	<b>1.5</b>
Bottom	<b>2.7</b>	<b>25.28</b>	<b>7.30</b>	<b>4.93</b>	<b>569</b>	

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

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

Water Surface Oils (check box): None: ☒ Sheen: ☐ Globbs: ☐ Slick: ☐

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

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

Weather Conditions/Notes: <b>Water flow was slightly to east direction.</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Abundance:</th> <th>Absent</th> <th>Rare</th> <th>Common</th> <th>Abundant</th> </tr> <tr> <td>Periphyton</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Fish</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Aquatic Macrophytes</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Iron/sulfur Bacteria</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	Abundance:	Absent	Rare	Common	Abundant	Periphyton	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Fish	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Aquatic Macrophytes	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Iron/sulfur Bacteria	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Abundance:	Absent	Rare	Common	Abundant																						
Periphyton	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																						
Fish	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																						
Aquatic Macrophytes	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																						
Iron/sulfur Bacteria	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																						

SAMPLING TEAM: <b>Cravenger, Poyner</b>	SIGNATURE: <b>cravenger</b>	DATE: <b>5/6/98</b>
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STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: _____	STORET STATION NUMBER: <b>24030114</b>	DATE (M/D/Y): <b>5/4/98</b>	TIME: <b>1240</b>	RECEIVING BODY OF WATER: <b>Channel A</b>
SUBMITTING AGENCY NAME: _____				

REMARKS:	COUNTY: <b>Hills</b>	LOCATION: <b>Northwest Regional</b>	FIELD ID NAME: <b>Test Site 4</b>
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**RIPARIAN ZONE/INSTREAM FEATURES**

Predominant Land-Use in Watershed (specify relative percent in each category):							
Forest/Natural <b>15</b>	Silviculture	Field/Pasture <b>20</b>	Agricultural <b>5</b>	Residential <b>40</b>	Commercial <b>20</b>	Industrial	Other (Specify)
Local Watershed Erosion (check box): None <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Heavy <input type="checkbox"/>							
Local Watershed NPS Pollution (check box): No evidence <input type="checkbox"/> Slight <input type="checkbox"/> Moderate potential <input type="checkbox"/> Obvious sources <input checked="" type="checkbox"/>							
Width of riparian vegetation (m) on least buffered side: <b>0.5</b>		List & map dominant vegetation on back		Typical Width (m)/Depth (m) /Velocity (m/sec) Transect			
Artificially Channelized <input type="checkbox"/> no <input checked="" type="checkbox"/> recent, severe some recovery mostly recovered more sinuous				<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">m/s ↓ m deep</div> <div style="text-align: center;">m/s ↓ m deep</div> <div style="text-align: center;">m/s ↓ m deep</div> </div>			
Artificially Impounded <input checked="" type="checkbox"/> yes							
High Water Mark: <b>0.3</b> + <b>3.2</b> = <b>3.5</b> <small>(m above present water level) (recent depth in m) (m above bed)</small>							
Canopy Cover % : Open : <input checked="" type="checkbox"/> Lightly Shaded (11-45%): <input type="checkbox"/> Moderately Shaded (46-80%): <input type="checkbox"/> Heavily Shaded: <input type="checkbox"/>							

**SEDIMENT/SUBSTRATE**

Sediment Odors: Normal: <input type="checkbox"/> Sewage: <input type="checkbox"/> Petroleum: <input type="checkbox"/> Chemical: <input type="checkbox"/> Anaerobic: <input type="checkbox"/> Other: <input type="checkbox"/>							
Sediment Oils: Absent: <input type="checkbox"/> Slight: <input type="checkbox"/> Moderate: <input type="checkbox"/> Profuse: <input type="checkbox"/>							
Sediment Deposition: Sludge: <input type="checkbox"/> Sand smothering: none slight moderate severe Silt smothering: none slight moderate severe Other: <input type="checkbox"/>							
Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				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	<b>3-20.3</b>	<b>24.99</b>	<b>7.30</b>	<b>4.93</b>	<b>568</b>	<b>1.4</b>
Mid-depth	<b>1-61.6</b>	<b>24.92</b>	<b>7.28</b>	<b>4.91</b>	<b>568</b>	
Bottom	<b>3.2</b>	<b>24.55</b>	<b>7.24</b>	<b>4.28</b>	<b>571</b>	

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

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

Water Surface Oils (check box): None: ☒ Sheen: ☐ Globbs: ☐ Slick: ☐

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

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

Weather Conditions/Notes: <b>No noticeable flow</b>	<table style="width: 100%;"> <tr> <th>Abundance:</th> <th>Absent</th> <th>Rare</th> <th>Common</th> <th>Abundant</th> </tr> <tr> <td>Periphyton</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Fish</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Aquatic Macrophytes</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Iron/sulfur Bacteria</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	Abundance:	Absent	Rare	Common	Abundant	Periphyton	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Fish	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Aquatic Macrophytes	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Iron/sulfur Bacteria	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Abundance:	Absent	Rare	Common	Abundant																						
Periphyton	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																						
Fish	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																						
Aquatic Macrophytes	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																						
Iron/sulfur Bacteria	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																						

SAMPLING TEAM: <b>Corampos, Paynor</b>	SIGNATURE: <b>Condrea</b>	DATE: <b>5/6/98</b>
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STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: _____	STOREY STATION NUMBER: <b>24030115</b>	DATE (M/D/Y): <b>5/4/98</b>	TIME: _____	RECEIVING BODY OF WATER: <b>Channel A</b>
SUBMITTING AGENCY NAME: _____				

REMARKS: _____	COUNTY: <b>Hill</b>	LOCATION: <b>Northwest Regional</b>	FIELD ID/NAME: <b>Test Site 5</b>
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**RIPARIAN ZONE/INSTREAM FEATURES**

Predominant Land-Use in Watershed (specify relative percent in each category):							
Forest/Natural <b>15</b>	Silviculture <b>0</b>	Field/Pasture <b>20</b>	Agricultural <b>5</b>	Residential <b>40</b>	Commercial <b>20</b>	Industrial <b>0</b>	Other (Specify) <b>0</b>
Local Watershed Erosion (check box): None <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Heavy <input type="checkbox"/>							
Local Watershed NPS Pollution (check box): No evidence <input type="checkbox"/> Slight <input type="checkbox"/> Moderate potential <input type="checkbox"/> Obvious sources <input checked="" type="checkbox"/>							
Width of riparian vegetation (m) on least buffered side: <b>1</b>		List & map dominant vegetation on back		Typical Width (m)/Depth (m) /Velocity (m/sec) Transect			
				<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">             m/s ↓ m deep           </div> <div style="text-align: center;">             m/s ↓ m deep           </div> <div style="text-align: center;"> <b>45</b> m wide ↓ m/s ↓ m deep           </div> </div>			
Artificially Channelized <input type="checkbox"/> no <input checked="" type="checkbox"/> recent, severe <input type="checkbox"/> some recovery <input type="checkbox"/> mostly recovered <input type="checkbox"/> more sinuous							
Artificially Impounded <input checked="" type="checkbox"/> yes							
High Water Mark: <b>0.3</b> + <b>2.8</b> = <b>3.1</b>							
(m above present water level) (present depth in m) (m above bed)							
Canopy Cover % : Open : <input type="checkbox"/> Lightly Shaded (11-45%): <input type="checkbox"/> Moderately Shaded (46-80%): <input type="checkbox"/> Heavily Shaded: <input type="checkbox"/>							

**SEDIMENT/SUBSTRATE**

Sediment Odors: Normal: <input checked="" type="checkbox"/> Sewage: <input type="checkbox"/> Petroleum: <input type="checkbox"/> Chemical: <input type="checkbox"/> Anaerobic: <input type="checkbox"/> Other: <input type="checkbox"/>							
Sediment Oils: Absent: <input checked="" type="checkbox"/> Slight: <input type="checkbox"/> Moderate: <input type="checkbox"/> Profuse: <input type="checkbox"/>							
Sediment Deposition: Sludge: <input type="checkbox"/> Sand smothering: <input type="checkbox"/> Silt smothering: <input type="checkbox"/> Other: <input type="checkbox"/>							
Substrate Types		% coverage	# times sampled	method	Substrate Types		% coverage
Woody Debris (Snags)					Sand		
Leaf Packs or Mats					Mud/Muck/Silt		
Aquatic Vegetation					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	<b>0.3</b>	<b>25.56</b>	<b>7.23</b>	<b>4.76</b>	<b>581</b>	<b>1.7</b>
Mid-depth	<b>1.4</b>	<b>25.48</b>	<b>7.22</b>	<b>4.52</b>	<b>581</b>	<b>1.7</b>
Bottom	<b>2.8</b>	<b>25.38</b>	<b>7.21</b>	<b>4.42</b>	<b>583</b>	<b>1.7</b>

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

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

Water Surface Oils (check box): None: ☐ Sheen: ☒ Globbs: ☒ Slick: ☐

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

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

Weather Conditions/Notes: <b>Flow was northeast</b>	Abundance: Periphyton <input type="checkbox"/> Absent <input type="checkbox"/> Rare <input type="checkbox"/> Common <input checked="" type="checkbox"/> Abundant <input type="checkbox"/> Fish <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> Aquatic Macrophytes <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> Iron/sulfur Bacteria <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
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SAMPLING TEAM: <b>Granger / Poyner</b>	SIGNATURE: <b>Carolea Granger</b>	DATE: <b>5/6/98</b>
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STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: _____	STORET STATION NUMBER: <b>24030116</b>	DATE (M/D/Y): <b>5/4/98</b>	TIME: _____	RECEIVING BODY OF WATER: <b>Rocky Creek</b>
SUBMITTING AGENCY NAME: _____				

REMARKS: _____	COUNTY: <b>Hills</b>	LOCATION: <b>Northwest Regional</b>	FIELD ID/NAME: <b>Test Site 6</b>
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**RIPARIAN ZONE/INSTREAM FEATURES**

Predominant Land-Use in Watershed (specify relative percent in each category):							
Forest/Natural <b>15</b>	Silviculture <b>2AG</b>	Field/Pasture <b>20</b>	Agricultural <b>5</b>	Residential <b>40</b>	Commercial <b>20</b>	Industrial 	Other (Specify) 
Local Watershed Erosion (check box): None <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Heavy <input type="checkbox"/>							
Local Watershed NPS Pollution (check box): No evidence <input type="checkbox"/> Slight <input type="checkbox"/> Moderate potential <input type="checkbox"/> Obvious sources <input checked="" type="checkbox"/>							
Width of riparian vegetation (m) on least buffered side: <b>2</b>		List & map dominant vegetation on back		Typical Width (m)/Depth (m)/Velocity (m/sec) Transect			
Artificially Channelized <input type="checkbox"/> no <input type="checkbox"/> recent, severe some recovery mostly recovered				<div style="display: flex; justify-content: space-around;"> <div> <div style="border: 1px solid black; padding: 2px;">m/s</div> <div style="border: 1px solid black; padding: 2px;">0.5m deep</div> </div> <div> <div style="border: 1px solid black; padding: 2px;">m/s</div> <div style="border: 1px solid black; padding: 2px;">1 m deep</div> </div> <div> <div style="border: 1px solid black; padding: 2px;">m/s</div> <div style="border: 1px solid black; padding: 2px;">0.5m deep</div> </div> </div>			
Artificially Impounded <input checked="" type="checkbox"/> yes							
High Water Mark: <b>0.5</b> + <b>1.5</b> = <b>2.0</b>							
(m above present water level)		(present depth in m)		(m above bed)			
Canopy Cover %: Open: <input type="checkbox"/> Lightly Shaded (11-45%): <input checked="" type="checkbox"/> Moderately Shaded (46-80%): <input type="checkbox"/> Heavily Shaded: <input type="checkbox"/>							

**SEDIMENT/SUBSTRATE**

Sediment Odors: Normal: <input checked="" type="checkbox"/> Sewage: <input type="checkbox"/> Petroleum: <input type="checkbox"/> Chemical: <input type="checkbox"/> Anaerobic: <input type="checkbox"/> Other: <input type="checkbox"/>																																																			
Sediment Oils: Absent: <input checked="" type="checkbox"/> Slight: <input type="checkbox"/> Moderate: <input type="checkbox"/> Profuse: <input type="checkbox"/>																																																			
Sediment Deposition: Sludge: <input type="checkbox"/> Sand smothering: <input checked="" type="checkbox"/> Silt smothering: <input type="checkbox"/> Other: <input type="checkbox"/>																																																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Substrate Types</th> <th>% coverage</th> <th># times sampled</th> <th>method</th> <th>Substrate Types</th> <th>% coverage</th> <th># times sampled</th> <th>method</th> </tr> </thead> <tbody> <tr> <td>Woody Debris (Snags)</td> <td></td> <td></td> <td></td> <td>Sand</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Leaf Packs or Mats</td> <td></td> <td></td> <td></td> <td>Mud/Muck/Silt</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Aquatic Vegetation</td> <td></td> <td></td> <td></td> <td>Other:</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Rock or Shell Rubble</td> <td></td> <td></td> <td></td> <td>Other:</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Undercut banks/Roots</td> <td></td> <td></td> <td></td> <td colspan="4" style="text-align: center;">Draw aerial view sketch of habitats found in 100 m section</td> </tr> </tbody> </table>				Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method	Woody Debris (Snags)				Sand				Leaf Packs or Mats				Mud/Muck/Silt				Aquatic Vegetation				Other:				Rock or Shell Rubble				Other:				Undercut banks/Roots				Draw aerial view sketch of habitats found in 100 m section			
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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	<b>0.3</b>	<b>25.44</b>	<b>7.19</b>	<b>4.64</b>	<b>667</b>	<b>VOB</b>
Mid-depth	<b>0.7</b>	<b>25.39</b>	<b>7.19</b>	<b>4.60</b>	<b>667</b>	
Bottom	<b>1.5</b>	<b>25.26</b>	<b>7.18</b>	<b>4.13</b>	<b>670</b>	

System Type: Stream: <input checked="" type="checkbox"/> 1st - 2nd order (3rd - 4th order) 5th - 6th order 7th order or greater				Lake: <input type="checkbox"/> Welland: <input type="checkbox"/> Estuary: <input type="checkbox"/> Other: <input type="checkbox"/>			
Water Odors (check box): Normal: <input checked="" type="checkbox"/> Sewage: <input type="checkbox"/> Petroleum: <input type="checkbox"/> Chemical: <input type="checkbox"/> Other: <input type="checkbox"/>							
Water Surface Oils (check box): None: <input checked="" type="checkbox"/> Sheen: <input type="checkbox"/> Globbs: <input type="checkbox"/> Slick: <input type="checkbox"/>							
Clarity (check box): Clear: <input type="checkbox"/> Slightly turbid: <input checked="" type="checkbox"/> Turbid: <input type="checkbox"/> Opaque: <input type="checkbox"/>							
Color (check box): Tannic: <input type="checkbox"/> Green (algae): <input checked="" type="checkbox"/> Clear: <input type="checkbox"/> Other: <input type="checkbox"/>							

Weather Conditions/Notes: <b>Flow was slightly in direction of Channel A.</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Abundance:</th> <th>Absent</th> <th>Rare</th> <th>Common</th> <th>Abundant</th> </tr> <tr> <td>Periphyton</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Fish</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Aquatic Macrophytes</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Iron/sulfur Bacteria</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	Abundance:	Absent	Rare	Common	Abundant	Periphyton	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Fish	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Aquatic Macrophytes	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Iron/sulfur Bacteria	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Abundance:	Absent	Rare	Common	Abundant																						
Periphyton	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																						
Fish	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																						
Aquatic Macrophytes	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																						
Iron/sulfur Bacteria	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																						

SAMPLING TEAM: <b>Granger / Poyner</b>	SIGNATURE: <b>Carolee Poyner</b>	DATE: _____
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STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: _____	STORET STATION NUMBER: <b>24030117</b>	DATE (M/D/Y): <b>5/8/98</b>	TIME: _____	RECEIVING BODY OF WATER: <b>Channel A</b>
SUBMITTING AGENCY NAME: _____				

REMARKS: _____	COUNTY: <b>Hill</b>	LOCATION: <b>Northwest Regional</b>	FIELD ID NAME: <b>Test Site 7.</b>
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**RIPARIAN ZONE/INSTREAM FEATURES**

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

Forest/Natural <b>15</b>	Silviculture 	Field/Pasture <b>20</b>	Agricultural <b>5</b>	Residential <b>40</b>	Commercial <b>20</b>	Industrial 	Other (Specify) 
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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: **0.5** List & map dominant vegetation on back

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

Artificially Impounded ☒ yes

High Water Mark: **0.3** + **0.7** = **1.0**  
(m above present water level) (present depth in m) (m above bed)

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: ☐ Proluse: ☐

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			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				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						<b>VOB</b>
Mid-depth	<b>0.35</b>	<b>22.37</b>	<b>6.62</b>	<b>6.77</b>	<b>279</b>	
Bottom						

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

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

Water Surface Oils (check box): None: ☒ Sheen: ☐ Globbs: ☐ Slick: ☐

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

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

Weather Conditions/Notes: <b>raining, cloudy Flow to towards west.</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Abundance:</th> <th>Absent</th> <th>Rare</th> <th>Common</th> <th>Abundant</th> </tr> <tr> <td>Periphyton</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Fish</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Aquatic Macrophytes</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Iron/sulfur Bacteria</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	Abundance:	Absent	Rare	Common	Abundant	Periphyton	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Fish	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Aquatic Macrophytes	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Iron/sulfur Bacteria	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Abundance:	Absent	Rare	Common	Abundant																						
Periphyton	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																						
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Iron/sulfur Bacteria	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																						

SAMPLING TEAM: <b>Crainger / Poyner</b>	SIGNATURE: <b>Candace Crainger</b>	DATE: <b>5/8/98</b>
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# FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Northwest Regional WWTP  
 County: Hillsborough  
 Contact / District: Andrea Granger / Southwest  
 NPDES Permit #: FL0041670  
 LIMS Sample #: 322006 LIMS Job #: 1998-05-05-18

Sample Collection: Date 5/4/98 Time 16:20  
 Test Beginning: Date 5-5-98 Time 16:00  
 Test Ending: Date 5-7-98 Time 1600  
 Organism Batch #: 21 Diluent Batch #: 21  
 Organism Age: < 24 hours  
 Test Organism: Ceriodaphnia dubia

sample log: 8/1 MF PL  
 Test Type: Screening Definitive  
Static Static Renewal I Flow-through  
 Temperature range: room 24.5-25.5°C  
 incubator 23.4-24.4°C  
 Test Number: 1 of 2

Remarks: D = dead, M = missing  
 Initial Sample D.O. was 3.4 mg/L,  
 Sample was aerated for 45 minutes  
 D.O. = 8.4 mg/L.

Instrument  
 Calibrations: pH meter # 7851 Temperature °C 90H018262 D.O. mg/L 90H018262 Conductivity µmhos/cm G9005749  
 0 hr 7.0 @ 7.0 24.8 @ 24.9 8.1 @ 25.8°C 99.8 @ 97.6  
9.0 @ 9.0 993 @ 1005 @ 25.1 °C  
 24 hr 7.0 @ 7.0 24.2 @ 24.3 9.2 @ 25.2°C 102.5 @ 97.6  
9.0 @ 9.0 990 @ 999 @ 25.9 °C  
 48 hr 7.0 @ 7.0 25.3 @ 25.3 8.1 @ 25.6 °C 104.0 @ 97.6  
9.0 @ 9.0 1000 @ 999 @ 25.6 °C

Conc.	Chamber #	Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm)		
		0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Control A	A	5	5	5	8.1		8.0	25.1		24.5	8.0	7.6	165		195	
Control B	B	5	5	4			8.3			24.5		7.6			175	
Control C	C	5	5	5			8.4			24.5		7.6			180	
Control D	D	5	5	5			8.4			24.5		7.7			185	
100% A	A	5	5	5	7.6		8.0	24.0		24.5	8.1	7.7	815		885	
100% B	B	5	5	5			8.0			24.5		7.7			895	
100% C	C	5	5	5			8.0			24.5		7.7			950	
100% D	D	5	5	5			8.0			24.5		7.7			980	
Measured/Loaded by:		FW	FW	MF	MF		MF	MF		MF	MF		MF	MF		MF
Recorded by:		FW	FW	MF	CH		FW	CH		FW	CH		FW	CH		FW

Investigators' Signatures

Marshall Faircloth  
Candace Hawn  
Frank Wierwille

Salt Water  
 Well Water 20% Min Water  
 Field Total Residual Cl<sub>2</sub> (mg/L): 20.03  
 Lab Total Residual Cl<sub>2</sub> (mg/L): 20.03  
 Alkalinity (mg/L as CaCO<sub>3</sub>): 70  
 Hardness (mg/L as CaCO<sub>3</sub>): 65  
 Total ammonia (mg/L as N): 88  
 Ammonia Ammonia Ammonia  
 Meter #98136 Meter Slope: 58.6 Blank: 40.017 Salinity: 0 ppt  
 Water Quality Parameters  
 Verified by MF  
 Sample Method Measured by  
Not measured  
20.03 20.03 20.03 CH/DAW  
70 65 HACH CH/DAW  
88 185 HACH CH/DAW  
40.017 0.029 ORION FW  
 Affected? 20.017  
 Control  
 Sample Salinity: 0 ppt

reviewer

form updated 4/01/96

A waste collection time

Sample Collection: Date 5/4/98 Time 16:20  
 Test Beginning: Date 5-5-98 Time 16:00  
 Test Ending: Date 5-7-98 Time 1600  
 Organism Batch #: 32 Diluent Batch #: weil 140  
 Organism Age: 11 days  
 Test Organism: Cyprinella leedsi

## Instrument

**Calibrations:** pH

meter # 7851

0 hr 20 @ 70

9.0 @ 9.0

24 hr 7.42 @ 70

24 III 11 5 7.10  
10-10

48 hr 70 @ 70

9.0 @ 9.0

D.O. mg/L      Conductivity  $\mu\text{mhos/cm}$ 

H018262 G9005749

01 0268 957 @ 97 /

8.1 @ 220 °C      77.0 @ 77.6

993 @ 100.5 @ 251 °C

400 2570 1050 871

1.2 @ 25.5°C 102.5 @ 91.5

990 @ 997 @

9470 @ 10107

104.0 @ 97.6

270  
270  
Awt  
in v10  
280  
270  
- 417

## Salt Water

## Well Water

20% Min Water

## Method

Measured by
-------------

not measured

20.03	DR-100
-------	--------

65	Hach
----	------

155	Hall
-----	------

01/11/2011	0.029	ORION
------------	-------	-------

control

Salinity: 0 ppt Sa

Control

2 Salinity:

Sample

Salinity:

form updated 4/01/99

Blank: 4

2 Salinity:

Salinity:

0 FF



Northwest Regional WWP  
Channel A sampled 5-4-98  
Hillsborough Co.  
N  
↑

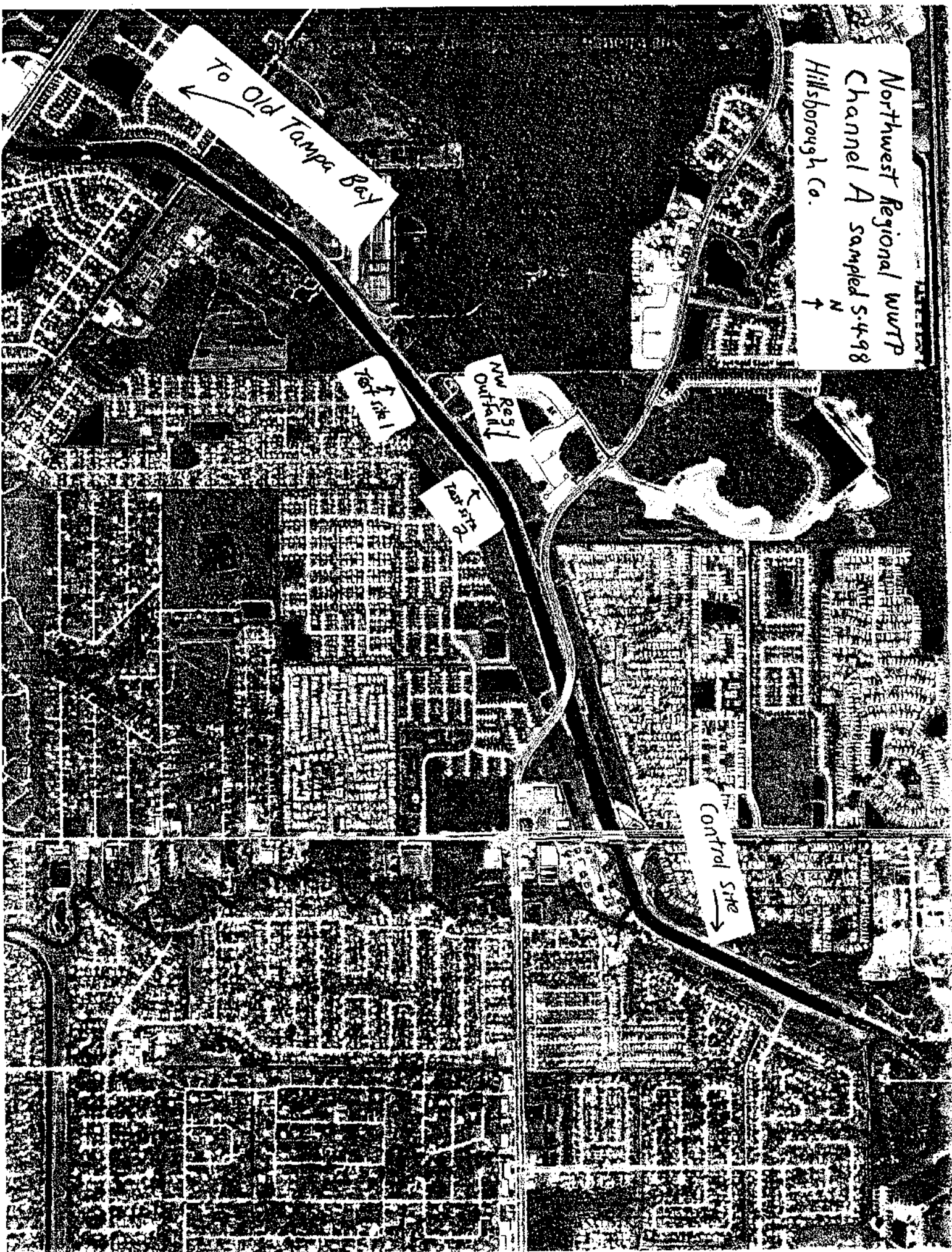
To Old Tampa Bay  
←

NW Reg  
Outfall

1 mile  
←

1 mile  
←

Control Site  
→



**Northwest Regional WWTP Control Site**

<b>Macroinvertebrate Dip Net (20 sweeps of most productive substrates)</b>	<b>Value</b>	<b>5</b>	<b>3</b>	<b>1</b>	<b>Score</b>
Total Number of Taxa	33	≥26	25-14	<14	5
EPT Index	1	≥4	3-2	<2	1
# Chironomid Taxa	1	≥7	6-4	<4	1
% Contribution of Dominant Taxon	15	≤29	30-64	>64	5
% Diptera	44	-	≤37	>37	1
Florida Index	5	≥7	6-4	<4	3
% Suspension feeders/Filterers	10	-	≥7	<7	3
Total Score		<b>Peninsula</b>			<b>19</b>
Interpretation of Scores		<b>Excellent</b>			26-32
		<b>Good</b>			20-25
		<b>Poor</b>			13-19
		<b>Severely Degraded</b>			7-12

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

**Northwest Regional WWTP Test Site 1**

<b>Macroinvertebrate Dip Net (20 sweeps of most productive substrates)</b>	<b>Value</b>	<b>5</b>	<b>3</b>	<b>1</b>	<b>Score</b>
Total Number of Taxa	30	≥26	25-14	<14	5
EPT Index	4	≥4	3-2	<2	5
# Chironomid Taxa	1	≥7	6-4	<4	1
% Contribution of Dominant Taxon	13	≤29	30-64	>64	5
% Diptera	38	-	≤37	>37	1
Florida Index	11	≥7	6-4	<4	5
% Suspension feeders/Filterers	6	-	≥7	<7	1
Total Score		<b>Peninsula</b>			<b>23</b>
Interpretation of Scores		<b>Excellent</b>			26-32
		<b>Good</b>			20-25
		<b>Poor</b>			13-19
		<b>Severely Degraded</b>			7-12

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

**Northwest Regional WWTP Test Site 2**

<b>Macroinvertebrate Dip Net (20 sweeps of most productive substrates)</b>	<b>Value</b>	<b>5</b>	<b>3</b>	<b>1</b>	<b>Score</b>
Total Number of Taxa	30	≥26	25-14	<14	5
EPT Index	2	≥4	3-2	<2	3
# Chironomid Taxa	1	≥7	6-4	<4	1
% Contribution of Dominant Taxon	20	≤29	30-64	>64	5
% Diptera	59	-	≤37	>37	1
Florida Index	3	≥7	6-4	<4	1
% Suspension feeders/Filterers	12	-	≥7	<7	3
Total Score		<b>Peninsula</b>			<b>19</b>
Interpretation of Scores		<b>Excellent</b>			26-32
		<b>Good</b>			20-25
		<b>Poor</b>			13-19
		<b>Severely Degraded</b>			7-12

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

Periphyton taxa list and densities (#/cm<sup>2</sup>) for Northwest Regional WWTP, collected via glass microscope slides in Channel A, on 4 May, 1998.

	Control Site	Test Site 1	Test Site 2
<b>Bacillariophyceae</b>			
<i>Achnanthes exigua</i>	52587	7319	93528
<i>Achnanthes lanceolata</i>	40636	1220	28058
<i>Achnanthes</i> sp.	4781	915	—
<i>Amphora veneta</i>	—	1220	—
<i>Bacillaria paradoxa</i>	—	2440	51440
<i>Capartogramma crucicula</i>	4781	1220	9353
<i>Cocconeis placentula</i>	16732	—	28058
<i>Cyclotella</i> sp.	4781	305	4676
<i>Cymbella minuta</i>	4781	—	4676
<i>Fragilaria construens</i>	—	—	4676
<i>Gomphonema affine</i>	—	305	—
<i>Gomphonema parvulum</i>	50197	6099	51440
<i>Gomphonema truncatum</i>	—	305	—
<i>Melosira</i> sp.	40636	—	9353
<i>Navicula capitata</i>	4781	3965	56117
<i>Navicula confervacea</i>	246204	14333	650019
<i>Navicula constans</i>	2390	—	—
<i>Navicula gastrum</i>	—	—	4676
<i>Navicula heufleri</i>	—	305	—
<i>Navicula minima</i>	14342	1525	18706
<i>Navicula pupula</i>	—	1220	—
<i>Navicula rhynchocephala</i>	—	305	—
<i>Navicula</i> sp.	—	915	9353
<i>Navicula viridula</i>	7171	6099	23382
<i>Nitzschia amphibia</i>	23903	3355	37411
<i>Nitzschia filiformis</i>	21513	7014	42088
<i>Nitzschia fonticola</i>	—	1220	9353
<i>Nitzschia obtusa</i>	—	3660	9353
<i>Nitzschia palea</i>	19123	2440	14029
<i>Nitzschia</i> sp.	19123	915	14029
<i>Pennales</i> sp.	11952	5489	9353
<i>Surirella linearis</i>	2390	305	—
<i>Synedra rumpens</i>	—	—	9353
<i>Synedra</i> sp.	—	—	4676
<i>Synedra ulna</i>	—	1830	28058
<b>Chlorophyceae</b>			
<i>Characium</i> sp.	52587	—	9353
<i>Chlorococcum</i> sp.	2390	—	—
<i>Cladophora</i> sp.	—	305	—
<i>Cosmarium</i> sp.	2390	—	—
<i>Gloeocystis</i> sp.	—	305	—
<i>Microspora</i> sp.	23903	305	4676

<i>Mougeotia</i> sp.	—	1830	—
<i>Nephrocytium</i> sp.	—	305	—
<i>Scenedesmus</i> sp.	23903	1830	18706
<i>Stigeoclonium</i> sp.	28684	5489	4676
<i>Tetrastrum</i> sp.	—	—	4676
Undetermined Chlorophyceae	4781	2135	—
<b>Cyanophyceae</b>			
<i>Aphanocapsa</i> sp.	2390	—	—
<i>Calothrix</i> sp.	—	1830	—
<i>Chroococcus</i> sp.	—	3355	—
<i>Dactylococcopsis</i> sp.	4781	—	—
<i>Lyngbya contorta</i>	—	—	4676
<i>Lyngbya</i> sp.	2390	9454	—
<i>Merismopedia</i> sp.	4781	—	—
<i>Microcoleus</i> sp.	—	915	—
<i>Oscillatoria</i> sp.	16732	21348	4676
<i>Rhabdoderma</i> sp.	—	610	—
<i>Synechococcus</i> sp.	7171	3050	—
<b>Dinophyceae</b>			
<i>Chroomonas</i> sp.	—	610	9353

Benthic macroinvertebrate taxa list for Northwest Regional WWTP, collected via Hester-Dendy artificial substrates in Channel A, on 4 May, 1998. Densities, in number/m<sup>2</sup>, represent the mean of three replicates.

	Control Site	Test Site 1	Test Site 2
<b>Amphipoda</b>			
<i>Hyalella azteca</i>	22	—	22
Undetermined Amphipoda	—	—	2
<b>Coleoptera</b>			
<i>Hydrochus</i> sp.	2	—	—
<i>Liodessus</i> sp.	—	—	2
<b>Collembola</b>			
Undetermined Collembola	2	—	—
<b>Diptera</b>			
<i>Ablabesmyia mallochi</i>	2	2	4
<i>Ablabesmyia rhamphe</i> grp.	2	—	6
<i>Apedilum</i> sp.	—	—	2
<i>Asheum beckae</i>	113	18	60
<i>Beardius truncatus</i>	—	2	—
Ceratopogonidae	12	—	—
Chironomidae	117	32	67
<i>Chironomus</i> sp.	6	52	42
<i>Cladopelma</i> sp.	2	—	—
<i>Cladotanytarsus</i> sp.	—	—	2
<i>Cricotopus silvestris</i> grp.	6	—	—
<i>Cricotopus sylvestris</i>	24	—	6
<i>Cryptochironomus</i> sp.	—	2	4
<i>Dasyhelea</i> sp.	2	—	2
<i>Dicrotendipes modestus</i>	310	236	276
<i>Dicrotendipes simpsoni</i>	18	16	44
<i>Dicrotendipes</i> sp.	2	2	2
<i>Endochironomus nigricans</i>	46	28	163
<i>Endotribelos hesperium</i>	—	—	6
<i>Glyptotendipes</i> sp.	12	14	48
<i>Goeldichironomus holoprasinus</i>	6	—	4
<i>Goeldichironomus natans</i>	—	2	—
<i>Goeldichironomus</i> sp.	8	2	4
<i>Kiefferulus</i> sp.	4	—	—
<i>Labrundinia neopilosella</i>	2	—	—
<i>Labrundinia pilosella</i>	2	—	—
<i>Microtendipes pedellus</i> grp.	2	—	—
<i>Nanocladius</i> sp.	6	—	12
Orthoclaadiinae	2	—	8
<i>Palpomyia/bezzia</i> grp.	6	—	—
<i>Parachironomus carinatus</i>	4	—	—
<i>Parachironomus directus</i>	2	—	2
<i>Parachironomus hirtalatus</i>	6	—	2
<i>Parachironomus</i> sp.	10	—	4

<i>Parachironomus supparilis</i>	6	—	—
<i>Pentaneura inconspicua</i>	10	—	—
<i>Polypedilum fallax</i>	2	—	—
<i>Polypedilum halterale</i> grp.	4	14	22
<i>Polypedilum illinoense</i> grp.	56	—	4
<i>Polypedilum illinoense</i>	10	—	—
<i>Polypedilum scalaenum</i> grp.	18	—	—
<i>Polypedilum</i> sp. A Epler	2	—	—
<i>Polypedilum tritum</i>	2	—	2
<i>Procladius</i> sp.	2	—	—
<i>Pseudochironomus</i> sp.	—	2	4
<i>Stenochironomus</i> sp.	4	2	12
<i>Tanytarsus</i> sp. A Epler	32	—	—
<i>Tanytarsus</i> sp. C Epler	14	10	6
<i>Tanytarsus</i> sp. E Epler	4	—	6
<i>Tanytarsus</i> sp. F Epler	—	—	2
<i>Tanytarsus</i> sp. G Epler	10	16	8
<i>Tanytarsus</i> sp. L Epler	2	—	6
<i>Tanytarsus</i> sp. M Epler	2	—	—
<i>Tanytarsus</i> sp. T Epler	—	6	—
<i>Tanytarsus</i> sp.	26	2	4
Tipulidae	2	—	—
<i>Tribelos fuscicornis</i>	10	—	4
<b>Ephemeroptera</b>			
Baetidae	40	—	2
<i>Baetis</i> sp.	—	10	—
<i>Caenis</i> sp.	10	6	14
<i>Callibaetis floridanus</i>	149	—	6
<i>Callibaetis pretiosus</i>	2	—	—
<i>Callibaetis</i> sp.	8	—	—
Heptageniidae	2	—	—
<i>Stenacron floridense</i>	—	—	2
<i>Stenacron</i> sp.	6	—	—
<i>Tricorythodes albilineatus</i>	—	—	8
<b>Gastropoda</b>			
<i>Amnicola dalli johnsoni</i>	16	4	10
<i>Amnicola dalli</i>	20	4	—
<i>Amnicola</i> sp.	2	—	8
Ancylidae	46	—	2
<i>Hebetancylus excentricus</i>	192	—	—
Hydrobiidae	2	4	8
<i>Micromenetus</i> sp.	4	—	—
<i>Planorbella duryi</i>	—	2	—
<i>Pseudosuccinea columella</i>	2	—	—
<i>Pyrogophorus platyrachis</i>	—	—	10
Undetermined Gastropoda	12	4	2
<b>Hemiptera</b>			
<i>Merragata</i> sp.	2	—	—
Saldidae	2	—	—

Undetermined Hemiptera	2	—	2
<b>Hirudinea</b>			
<i>Desserobdella phalera</i>	4	—	—
Glossiphoniidae	2	—	—
<b>Lepidoptera</b>			
Noctuidae	—	—	2
<b>Odonata</b>			
Coenagrionidae	16	2	2
<i>Ischnura</i> sp.	4	—	4
<b>Oligochaeta</b>			
<i>Dero digitata</i>	6	—	—
<i>Slavina appendiculata</i>	2	—	—
<i>Stylaria lacustris</i>	2	—	—
<b>Trichoptera</b>			
Hydroptilidae	10	—	—
<i>Orthotrichia</i> sp.	2	—	28
<i>Oxyethira</i> sp.	91	—	6
Undetermined Trichoptera	—	—	2
<b>Trombidiformes</b>			
<i>Limnesia</i> sp.	4	—	2
<i>Limnochara</i> sp.	—	—	2
<i>Oxus</i> sp.	4	—	—
<i>Piona</i> sp.	2	—	—

Benthic macroinvertebrate taxa list for Northwest Regional WWTP, collected via 20 discrete dip net sweeps in Channel A, on 4 May, 1998.

	Control Site	Test Site 1	Test Site 2
<b>Amphipoda</b>			
<i>Hyalella azteca</i>	20	10	3
<b>Coleoptera</b>			
Chrysomelidae	4	—	5
Curculionidae	2	—	—
<i>Dubiraphia vittata</i>	2	—	—
Elmidae	1	—	—
<i>Enochrus</i> sp.	1	—	—
<b>Collembola</b>			
Undetermined Collembola	—	—	3
<b>Decapoda</b>			
Decapoda	2	—	—
<i>Palaemonetes</i> sp.	2	—	3
<i>Palaemonetes paludosus</i>	3	14	—
<b>Diptera</b>			
<i>Ablabesmyia mallochi</i>	3	—	—
Ceratopogonidae	1	—	—
Chironomidae	7	—	5
<i>Chironomus</i> sp.	2	—	2
<i>Cladotanytarsus</i> sp.	—	1	1
<i>Clinotanypus</i> sp.	—	—	2
<i>Cricotopus sylvestris</i>	—	2	—
<i>Cryptochironomus</i> sp.	6	1	6
<i>Cryptotendipes</i> sp.	7	3	5
Culicidae	1	—	—
<i>Dicrotendipes modestus</i>	39	1	17
<i>Dicrotendipes</i> sp.	—	—	1
<i>Endochironomus nigricans</i>	—	7	—
<i>Endochironomus</i> sp.	—	1	—
<i>Endotribelos hesperium</i>	—	—	1
<i>Parachironomus</i> sp.	—	1	—
<i>Polypedilum halterale</i> grp.	34	12	27
<i>Polypedilum illinoense</i> grp.	6	8	3
<i>Polypedilum scalaenum</i> grp.	1	—	—
<i>Polypedilum scalaenum</i>	—	—	1
<i>Polypedilum tritum</i>	—	1	—
<i>Procladius</i> sp.	—	1	—
Sciomyzidae	—	—	2
<i>Tanytarsus</i> sp. A Epler	5	—	—
<i>Tanytarsus</i> sp. G Epler	4	1	3
<i>Tanytarsus</i> sp. L Epler	3	—	1
<i>Tanytarsus</i> sp. T Epler	—	—	1
<i>Tanytarsus</i> sp.	4	1	3



<b>Ephemeroptera</b>			
Baetidae	—	2	—
<i>Baetis</i> sp.	—	—	4
<i>Caenis</i> sp.	—	1	—
<i>Callibaetis floridanus</i>	26	1	—
<i>Callibaetis</i> sp.	15	—	—
Tricorythidae	—	—	1
<b>Gastropoda</b>			
<i>Amnicola dalli johnsoni</i>	6	—	—
<i>Hebetancylus excentricus</i>	—	2	—
Hydrobiidae	—	—	4
<i>Micromenetus dilatatus avus</i>	1	—	—
<i>Physella</i> sp.	—	—	1
<i>Pyrogophorus platyrachis</i>	1	—	6
Undetermined Gastropoda	—	1	2
<b>Hemiptera</b>			
<i>Ambrysus</i> sp.	2	—	—
Undetermined Hemiptera	—	6	—
<i>Mesovelis</i> sp.	11	—	2
Naucoridae	—	1	1
<i>Ranatra</i> sp.	1	—	—
<b>Lepidoptera</b>			
Undetermined Lepidoptera	1	4	—
<b>Nemertea</b>			
<i>Prostoma rubrum</i>	1	—	—
<b>Odonata</b>			
<i>Argia</i> sp.	—	2	—
Coenagrionidae	32	—	1
Corduliidae	—	1	—
<i>Enallagma</i> sp.	3	—	—
Libellulidae	—	1	—
Undetermined Odonata	—	1	—
Zygoptera	—	—	1
<b>Oligochaeta</b>			
<i>Aulodrilus pigueti</i>	4	1	1
<i>Dero vaga</i>	6	—	2
<i>Haber speciosus</i>	—	1	—
<i>Limnodrilus hoffmeisteri</i>	6	9	12
<i>Pristina synclites</i>	1	—	—
<b>Pelecypoda</b>			
<i>Corbicula</i> sp.	—	4	3
<b>Trichoptera</b>			
<i>Oecetis inconspicua</i> cmplx.	—	1	—
<i>Oxyethira</i> sp.	—	3	—
<b>Trombidiformes</b>			
<i>Arrenurus</i> sp.	—	1	1
<i>Limnesia</i> sp.	—	1	—

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

Transaction Code			NPDES NUMBER							YR/MO/DA				Insp Type	Inspector	Fac Type												
1	N	2	5	3	F	L	0	0	4	1	6	7	0	11	12	0	2	1	2	1	4	17	18	X	19	S	20	1

Remarks

21

66

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

Transaction Code			NPDES NUMBER							YR/MO/DA				Insp Type	Inspector	Fac Type												
1	N	2	5	3	F	L	0	0	4	1	6	7	0	11	12	0	2	1	2	1	4	17	18	B	19	S	20	1

Remarks

21

66