



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: NPDES Number: Hillsborough 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 $(0.07 \mu g/L)$ (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 α , 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	Test Site
Organic Constituents (μg/L)		94.44 14.44		
Atrazine	-	0.16 I	-		-
Metals (ug/L)					
Aluminum	≤ 1,500 **	89 I	-	<u>-</u>	
Arsenic	≤ 50 **	30 U		<u>-</u>	-
Cadmium	≤ 1.81**c	0.35 A		-	<u> </u>
Chromium	≤ 337**c	7 U			-
Copper	≤ 19.7**c	8.2 A	-	_	-
lron	≤ 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	-	-	-
Nutrients (mg/L)					
Ortho-phosphate	-	2.9	0.055	0.13	0.13
l'otal 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
General Phys-Chem Pa	rameters 🦠				70.5
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 Ü
Tot.Residual Chlorine (mg/L)	≤ 0.01 *	0.03 U	-	-	-
Flow (MGD)	≤ 5.0 *	2.5	_	-	
Hardness (mg CaCO ₃)		181.4	-	-	-
AGP (mg dry wt/L)		20.9	6.3	5.0	5.6
Toxicity (48-hour static	screening bi	·	4.14.2 XXXXXX		in to Assign to
Bioassay - Fish	,	Not toxic		-	
Bioassay - Invertebrate		Not toxic	-	-	-
Microbiology (# counts	/100mL)				
	≤ 25 *	2 J	92 A	3 [91
Fecal Coliforms Total Coliforms	≥ 43	4 1	318 A	386 A	64

c - Value is calculated based on hardness

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

^{*} Permit limit

^{**} Class III water quality standard

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

Table 2. Benthic macroinvertebrate community structure.

Northwest Regional WWTP	Control Site	Test Site	Test Site
Macroinvertebrate Qualitative	77,778/19 A 18 A	encheriani	
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
Community Composition	43745 4304	sa taligata	
% 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
Functional Feeding Groups			
% Predators	22	17	15
% Surface Deposit Feeders	42	28	33
% Suspension Feeders/Filterers	10	6	12
% Scrapers	1	3	11
% Shredders	14	22	16
Macroinvertebrate Hester-Deno	ly *		
Number of Taxa	65	22	45
Florida Index	22	6	12
Shannon-Weaver Diversity	4.4	3	4
EPT Index	6	2	6
Community Composition			
% Diptera	58	93	85
% Ephemeroptera	13	3	3
% Gastropoda	18	4	4
% Trichoptera	6	0	4
% Other	5	0	4
Functional Feeding Groups		To Anna Sana	
% 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.

Northest Regional WWTP	Control Site	Test Site	Test Site 2
Phytoplankton Algae			. 40
Number of Taxa	18	10	6
Shannon-Weaver Diversity	2.6	1.9	0.9
Chlorophyll a (µg/L)	22	2 [1 I
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
Periphyton Algae			7100 3322
Number of Taxa	29	38	30
Shannon-Weaver Diversity	3.7	4.3	3
Chlorophyll a (mg/m2)	108	32	100
Algal Density (#/cm2)	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
AGP (mg dry wt/L)	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

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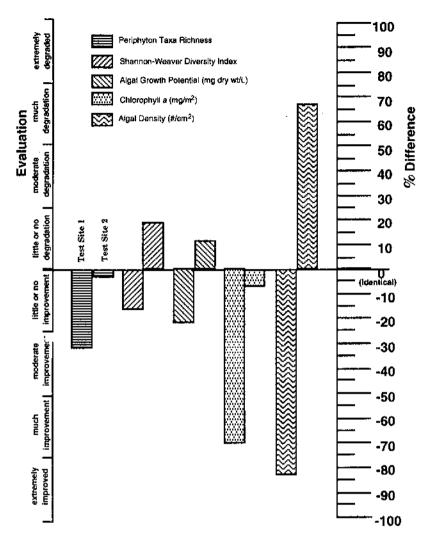


Figure 1. Effect of discharge on the algal community.

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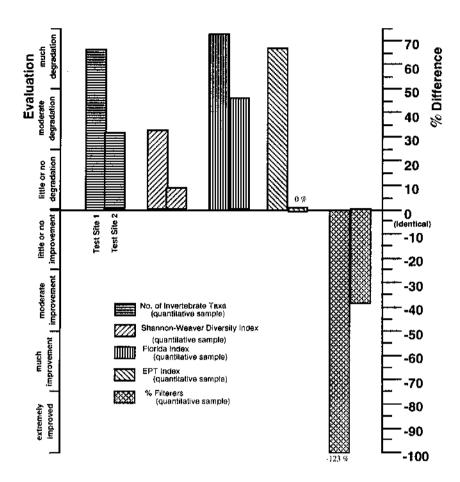


Figure 2. Effect of discharge on the macroinvertebrate community.

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

					TIC 1712						
Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%
STREAMS											
(1617 stations)											
Phytoplankton								-			
Chlorophyll a	0.22	0.52	0.94	1.60	3.02	4.63	6.72	9.87	14.68	27.35	48.70
Periphyton									17.00	70.51	(0.05
Chlorophyll a	0.31	0.43	0.77	1.04	2.16	2.94	6.45	10.51	17.00	39.51	60.85
H-D Diversity	0.84	2.12	2.48	2.74	2.88	3.09	3.25	3.40	3.52	3.76	3.90
Qualitative Taxa				20.00	22.00	24.50	26.00	20.00	21.00	37.00	53.00
Richness	9.00	12.00	17.00	20.00	22.00	24.50	26.00	28.00	31.00	37.00	33,00
H-D Taxa	6.00		0.00	11.50	12.00	15.00	17.00	21.50	26.00	29.00	32.00
Richness	6.00	6.50	9.00	11.50	13.00	15.00		21.50			2.80
TKN	0.30	0.39	0.56	0.73	0.87	1.00	1.11	1.26	1.49 0.20	1.93	0.60
Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	1.05
NO2-NO3	0.01	0.01	0.03	0.05	0.07	0.10	0.14	0.20	0.32	0.04	1.03
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	0.74	1.37
Ortho Phosphate	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17		10.45	16.30
Turbidity	0.60	0.90	1,20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	10.50
LAKES											
(477 stations)				<u></u>	·						
Phytoplankton			• • • •	4.50	10.00	12.40	20.00	20.10	47.20	65.44	113.90
Chlorophyll a	0.80	1.71	2.88	4.28	10.06	13.40	20.00	30.10			3.17
Dredge Diversity	0.71	0.97	1.43	1.74	1.98	2.12	2.21	2.59	2.85	3,15	5.17
Dredge Taxa	2.00	5.00	(50	7.00	9.00	10.00	11.00	13.00	15.00	17.00	21.00
Richness	3.00	5.00	6.50	7.00				1.51	1.68	2.11	3.46
TKN	0.36	0.49	0.67	0.83	1.08	1.26	1.40		0.15	0.21	0.28
NH3+NH4	0.01	0.02	0.02	0.03	0.04	0.06	0.08	0.12		0.21	0.23
NO2-NO3	0.00	0.00	0.01	0.01	0.01	0.02	0.04	0.05	0.10 0.14	0.14	0.42
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		26.00	40.00
Turbidity	1.00	1.25	1.55	2.05	2.75	4.50	6.45	9.60	14.10	20.00	40.00
ESTUARIES											
(690 stations)								,			
Phytoplankton					. oo		7.04	9.60	12.40	17.60	22.20
Chlorophyll a	2.14	3.28	4,49	5.13		6.93	7.94				4.98
Dredge Diversity	1.34	1.53	1.91	2.28	2.56	2.90	3.15	3,59	4.01	4.53	4.90
Dredge Taxa		6.00	0.00		15.00	10 50	25.00	35.00	41.00	62.00	90.00
Richness	4.00	6.00	9.00	11.00		18.50				1.30	1.49
TKN	0.26	0.34	0.42	0.50		0.69	0.76	0.82	0.95		0.28
NH3+NH4	0.01	0.02	0.03	0.04	0.05			0.09		0.22	
NO2-NO3	0.00	0.00	0.01	0.01	0.01	0.02		0.05		0.17	0.23
Total Phosphorus	0.01	0.02	0.06	0.07	0.10	0.11	0.14	0.17	<u> </u>	0.43	0.59
Ortho-Phosphate	0,01	0.02	0.03		0.04	0.05		0.09	0.12	0.21	0.44
Turbidity	3,50	4.00	4.50	5.05	5.40	5.60	6.30	6.80	8.00	11,40	11.75

Units:

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

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION FACILITY SUMMARY

deral Permit #FLOOU 1670 State GMS # and State expiration date: deral Permit #FLOOU 1670 State GMS # and State expiration date: nection of facility: Type 1 Donestic AwT ascription of treatment process: Oxidation direction of treatment process of the proce	Northwes	egional wwiTP	Date Summary	
deral Permit # FL 0041670 State GMS # and State expiration date: 12/14/02 State GMS # and State expiration date: 12/14/02 Municipal Federal Agricultural Municipal Federal Agricultur	ocation (attach detailed map):	1 -		District
deral Permit #FL0041670 dexpiration date: State GMS # and State expiration date: 12/10/02 State GMS # and State expiration date: 12/10/02 Inction of facility: Type 1 Donardic AwT asscription of treatment process: Oxidation directions with denity fication Through anoxic tanks and inhibitation. Flow then undergoes high level disinfection, dechlorination and aeralien ecceiving waters: Channel A to Classification: 1 !! (III) ceceiving waters: Channel A to Classification: 1 !! (III) ceceiving waters: Channel A to Classification: 1 !! (III) ceceiving waters: Channel A to Classification: 1 !! (III) ceceiving waters: Channel A to Classification: 1 !! (III) ceceiving waters: Channel A to Classification: 1 !! (III) ceceiving waters: Channel A to Classification: 1 !! (III) ceceiving waters: Channel A to Classification: 1 !! (III) ceceiving waters: Channel A to Classification: 1 !! (III) ceceiving waters: Channel A to Classification: 1 !! (III) ceceiving waters: Channel A to Classification: 1 !! (III) Flow during survey: 2.5 m. Flow during surv	•	Hulsborous	n	SW DISTRO
State expiration date: State expiration date: /3/1902 Other (list): nection of facility: Type 1 Donestic AwT escription of treatment process: Oxidation disches with denth fication through anoxic tanks and inhibitation. Flow then undergoes high level disinfection, dechlorination and aeration ecceiving waters: Channel A to Classification: 1 if (III) Could Tampa Bay ecciving waters: Channel A to Classification: 1 if (III) Could Tampa Bay ecciving waters: Channel A to Classification: 1 if (III) Could Tampa Bay ecciving waters: Channel A to Classification: 1 if (III) Ecciving waters: Channel A to Classification: 1 if (III) Ecciving waters: Channel A to Classification: 1 if (III) Ecciving waters: Channel A to Classification: 1 if (III) Ecciving waters: Channel A to Classification: 1 if (III) Ecciving waters: Channel A to Classification: 1 if (III) Ecciving waters: Channel A to Classification: 1 if (III) Ecciving waters: Channel A to Classification: 1 if (III) Ecciving waters: Channel A to Classification: 1 if (III) Ecciving waters: Channel A to Classification: 1 if (III) Ecciving waters: Channel A to Classification: 1 if (III) Ecciving waters: Channel A to Classification: 2 if (III) Ecciving waters: Channel A to Classification: 1 if (III) Ecciving waters: Channel A to Classification: 2 if (III) Ecciving waters: Channel A to Classification: 1 if (III) Ecciving waters: Channel A to Classification: 1 if (III) Ecciving waters: Channel A to Classification: 1 if (III) Ecciving waters: Channel A to Classification: 1 if (III) Ecciving waters: Channel A to Classification: 1 if (III) Ecciving waters: Channel A to Channel A to Classification: 1 if (III) Ecciving waters: Channel A to Channel A to Classification: 1 if (III) Ecciving waters: Channel A to C	1115			1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
escription of treatment process: Oxidation directions with denth fication through anoxic tanks and inhibitation. Flow then undergoes high level disinfection, dechlorination and aeration level disinfection, dechlorination and aeration secretiving waters: Channel A to Classification: Old Tompa Ban Selgin Flow: Mean Flow: 2.75 ** MDF MDD Flow during survey: 2.5 Milliother (describe) herefore, the best time to sample is: (facility has a mixing zone, give details (size, parameters affected, etc.): No mixing Zane List effluent limits (if necessary, attach relevant paperwork) Mean Flow: 2.5 Milliother (describe) herefore, the best time to sample is: (facility has a mixing zone, give details (size, parameters affected, etc.): No mixing Zane List effluent limits (if necessary, attach relevant paperwork) Mean Flow: 3.5 Milliother (describe) Mean Flow: 3	ederal Permit # FLOOG 16 70	State expiration dat	e: 12/14/02	
escription of Irealment process: Oxidation directes with dentry fication through anoxic tanks and inhibitation. Flow then undergoes high level disinfection, dechlorination and aeration ecciving waters: Channel A to Classification: I II (II) Classification: I II (III) Cla	in expiration date.	4029010857		Other (list):
Oxidation differs with dentification for an oxic tanks and inhibitation. Flow then undergoes high level disinfection, dechlorination and aerahan eeigin flow: Old Tampa Bay esign flow: Mean flow: 2.75 3-month SDF MED Flow during survey: 2.5 min sischarge is: Continuous (Intermittent) Seasonal Rainfall dependent Other (describe) herefore, the best time to sample is: I facility has a mixing zone, give details (size, parameters affected, etc.): No mixing Zone List effluent limits (if necessary, attach relevant paperwork) There are the process of the paper	unction of facility: Type 1	Domestic !	AWT	
esign Flow: 5.0 Mean Flow: 2.75 ADF M6D Flow during survey: 2.5 m. ADF M6D Flow during	Description of treatment process: Oxidation dutch anoxic tanks a high level dis	nes with nd inflormation infection, do	dentrific Ten Flor echlerinati	alian Through o then undergoes an and aeration
Mean Flow: Q 75 ADF MeD Discharge is: Continuous (Intermittent) Seasonal Rainfall dependent Dither (describe) herefore, the best time to sample is: I facility has a mixing zone, give details (size, parameters affected, etc.): No mixing zone List effluent limits (if necessary, attach relevant paperwork): Provide to the special permit conditions and permit modifications: Provide to the special permit conditions and permit modifications: Provide to the special permit conditions and permit modifications: Provide to the special permit modifications: Provide to the special permit modifications: Provide to the special permit modifications: Provide to the special permit modifications: Provide to the special permit modifications: Provide to the special permit modifications: Provide to the special permit modifications: Provide to the special permit modifications: Provide to the special permit modifications: Provide to the special permit p	Receiving waters: Channel	A 10	Classification:	
Discharge is: Continuous Intermittent Seasonal Rainfall dependent Other (describe) herefore, the best time to sample is: I facility has a mixing zone, give details (size, parameters affected, etc.): No mixing zone List effluent limits (if necessary, attach relevant paperwork): special permit conditions and permit modifications:	Jacian Flow	Mean Flow: 2.75	3-month ADF MGD	Flow during survey: $\sim 2.5 \text{MW}$
List effluent limits (if necessary, attach relevant paperwork) **RODDER FIGURY OR REGION TO WARE LIMITATIONS** Oeth Staff Names DOS! Part Staff Names DOS!	•		- Wooled old)	
Parameters		ietalis (size, paramete	ers affected, etc.,	:
Place Control Contro	if facility has a mixing zone, give o			
Maximum	If facility has a mixing zone, give one of the facility has a mixing zone, give one of the facility has a mixing zone, give one of the facility has a mixing zone, give one of the facility has a mixing zone, give one of the facility has a mixing zone, give one of the facility has a mixing zone, give one of the facility has a mixing zone, give one of the facility has a mixing zone, give one of the facility has a mixing zone, give one of the facility has a mixing zone, give one of the facility has a mixing zone, give one of the facility has a mixing zone, give one of the facility has a mixing zone, give one of the facility has a mixing zone, give one of the facility has a mixing zone, give one of the facility has a mixing zone, give one of the facility has a mixing zone, give one of the facility has a mixing zone, give one of the facility has a mixing zone.	mixing Zan	vork): Describe s	special permit conditions
Fian (rops)	List effluent limits (if necessary, a	mixing Zan	vork): Describe s	special permit conditions
TMADE Startum TMADE Startum S.C. 6.25 1.5 10.0	List effluent limits (if necessary, a special section Number Doors	ittach relevant paperv	vork): Describe s	special permit conditions
Observe Demand (C day) (cap)(1) Novement 5,0 6.25 7,3 10.0	List effluent limits (if necessary, a special series serie	Ittach relevant paperv	vork): Describe s	special permit conditions
Ferry Coliforn Bestelli (A-109)	List effluent limits (if necessary, a second	Ittach relevant paperv Intrations Ter Keckimed Water Limitations Teacher Weekly Steple Average Average Average Average Average Average Average Average Average Steple Talabel	vork): Describe s	special permit conditions
District on the part District of the part	List effluent limits (if necessary, a special sector secto	Illiach relevant papery Instantions To Recipied Water Limitations To Recipied Water Limitations To Average Average Average Sample TALADE 1.5 10 6 5.0 623 1.5 10 90 5.0 623 7.5 100	vork): Describe s	special permit conditions
Chest Section Cong. Marches 30 3.75 4.5 66 N. Cong. Total of N. Gregori, Total of N. Gregoria Marches 1.0 1.73 1.5 2.0 Procepturation, Total of N. Gregoria Maximum 1.0 1.73 1.5 2.0	List effluent limits (if necessary, a proposed structure of the constant of th	Intractions The Recipied Water Limitations That De Start S	vork): Describe s	special permit conditions
Proceptorous, Total as II (regit Alexander	List effluent limits (if necessary, a proposed provided to the proposed provided to the proposed provided to the provided to t	Ittach relevant paperv Intrations Ter Recipied Water Limitations Ter Recipied Water Limitat	vork): Describe s	special permit conditions
sec [1] See below	List effluent limits (if necessary, a property of the following state of the following stat	Ittach relevant paperv Intrations The Recipied Water Limitations Through Water Strape Source Average Average Strape Through So 623 1.5 10 e So 623 7.5 10 e See below (1) See below (1) 10 10 10 10 10 10 10 10 10	vork): Describe s	special permit conditions

(1) Forst Coliforn: Over a 30 day period, 75 percent of the feed enliform values (the 75th percent is value) shall be below the detection limits. Any one sample shall not exceed 75 feed.

STATE OF FLORIDA N

		SIMIE OF FLORIDA
Page 2 of	DEPA	RTMENT OF ENVIRONMENTAL REGULATION
Northwest	Regional: WWTP	FACILITY SUMMARY
(Facility)	-0	

Description of permitted outfall(s): Outfall to located in the from the warp to the	annel A. The pipeline e ontfall is 31/2 miles lang.
List permit violations (from MOR data or other source year: There have been no significant	and plant upsets that occurred within past excepances
Describe previous impact bioassessments, WQBEL'S A combined FY1-5 for and North west Regard in 1993 and 1996.	s, and previous or current enforcement actions: both Ruse Oaks wwith worths while conducted
Discuss comparability of MOR results to past DER redeclining) in the data set:	esults and whether there are trends (improving,
Additional information:	Stall contributing to this review (signature): Cardae a trainf, (Biologist) for Sinten (Inspector) (Engineer)

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-90)

SUBMITTING AGENCY CODE:	STORET STATION NUMBER:	Day alone Irus	[
SUBMITTING AGENCY NAME:	24030110	5/4/98 1150	RECEIVING BODY OF WATER:	
raining cloudy, Hills	LOCATION: North w	est Regional	FIELD IDMAKE:	Sita
RIPARIAN ZONETINSTREAM FEATURES	<u> Wu</u>	3119 4	Reference	
Predominant Land-Use in Watershed	(specify relative perce	nt in each category):	*	_
Forest/Natural Silviculture Field/	Pasture Agricultural		mercial Industrial C	Whor (Creek)
15 2		40 2		Other (Specify)
Local Watershed Erosion (check box):	None		derate Heavy	
Local Watershed NPS Pollution (check	box); No evidence	Slight Moder	ate potential [] bpviou	s sources 🔽
width of riparian vegetation (m) Li. on least buffered side: O.S.	st & map dominant	Typical Width (m)/De	pth (m) /Velocity (m/sec) T	ransect
Artificially Channelized no	едециол оп раск	0.09 m/s ↑		S m wide →
Artificially Impounded Vyes	egeome recovery mostly recove	red		13 m/s
High Water Mark: 0.3 +)·8 = 3·1	2.3 m deep	(A)	<u> </u>
	ntly Shaded (11-45%):			2 m deep
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			Shaded:
Sediment Odors: Normal: V Se		Chemical: Ana	erobig: [1] Other:	
Sediment Oils: Absent:	Slight: Moderate:	Profuse C		*
Sediment Beposition: Sluage: 15 Sac	d smothering none	moderal Silt emothering	none moderate	
Substrate Types // coverage #	times sampled to ameth	severe Substrate Tunés	% coverage # times sample	
Woody Debris (Snags)	0	Sand		
	<u></u>	Mud/Muck/Silt	70 2	Net
Aquatic Vegetation + 10 C.	1:15. 1, Net	Other:		100
Rock or Shell Rubble	0	Other:	0 0	-
Undercut banks/Roots		Draw aerial view ske	tch of habitats found in 10	0 m section
WATER QUALITY Depth (m): Temp. (°C): pH (su): 1 D.O.	(Cond. (umho/cm)		
Top 0.3 25.0	 _ `	or Salidity (ppt):		Secchi (m):
Mid-depth J.4 25-12	7.42 10			╣╻ _┺ ┈┈║
Bottom 2.8 467.23-76				1.5
System Type: Stream: (1st - 2nd ord	of 5th - 6th order) Lake: Wetland:	Estuary: Other:	
Water Odors (check box): Normal:			hemical: Other:	1
Water Surface Oils (check box): None:	Sheen:	Globs:	Slick:	
Clarity (check box): Clear:	Slightly turbid:	Turbid: V	Opaque:	
Color (check box): Tannic:	Green (algae):	Clear:	Other:	
Weather Conditions/Notes:		Abundance:	<u> </u>	Abundant
water flow direction	was	Periphyton		
South		Fish Aquatic Macrophyte		
		Iron/sulfur Bacteria		님
AMPLING TEAM:		SIGNATURE:	· <u> </u>	DATE:
Grainger, Poyne	o.r	Charea)	from lei	5/6/98

FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (v2)

SUBMITTING AGENCY CODE: SUBMITTING AGENCY NAME:	STORET STATION	ا نه نم ا	CEIVING BODY OF WATER:	
REMARKS: Windy, raine Cloudy	ing, LOCATION:	hover Resion	DELD IDMANE	ence Site
Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Bottom Substrate/ Available Cover	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs (partially decayed), undercut banks, rubble, or other stable habitat.	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags).	5% to 20% snags, logs, tree roots, emergent vegetation lear 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
Water Velocity	Max. observed: >0.25 m/sec. but < 2 m/sec	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
Artificial Channelization	20 19 1 8 17 16 No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 1 8 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	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 (3) 2 1
Deposition	Less than 20% of habitats affected by sand or silt accumulation	20%-50% of habitats affected by sand or silt accumulation	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1
Bank Stability	Stable. No evidence of erosion or bank failure Little potential for future problems. 20 19 18 17 16	Moderately stable.	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
Riparian Buffer Zone Width	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	Width of native vegetation 6 to 12 m, human activities still close to system	Less than 6 m of native buffer zone due to intensive human activities 5 4 3 2 11
Riparian Zone Vegetation Quality	Over 80% of streambank surfaces consist of native plants, including trees understory shrubs, or non-woody macrophytes. Plants growing naturally. 20 1918 17 16	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. Some disruption in community evident.	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 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.
to be	5 points if cross-sections > one square meter duri TAL SCORE	l area of flow is estimated ng periods of normal flow.	Comménts	
ANALYSIS DATE: 5/4/98	Graing	SIGNATURE:	dieafra	nge

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

SUBMITTING AGENCY CODE:		TUOE OPE		TE (MOV): TIME 14/98 1330	Chann	_				
remarks: ramme, wind cloudy	COUNTY:	LOCATION: North	west	Regimes	FIELD DANAMI TEST	E. Site 1				
RIPARIAN ZONE/INSTREA	M FEATURES	<u> </u>								
Predominant Land-Use	in Watershed	(specify relative	e percent i	n each category):						
Forest/Natural Silvicul	ture Field/Pa	sture Agric	ultural	Residential Co	mmercial Inc	dustrial Other (Sp	pecify)			
15 20 5 40 20										
Local Watershed Erosion (check box): None Slight Moderate Heavy										
Local Watershed NPS Po	ollution (check b	ox): No evide	ence 🔲	Slight Mod	erate potential [Obvious sourc	es 🛂			
Width of riparian vegetation least buffered side.		& map dom getation on b		Typical Width (m)/	Depth (m) /Velocit	ty (m/sec) Transect 45 m wi	ide _>			
Artificially Channelized	no D	some recovery mo		0.11 m/s	10-13 m/	s ↑ o · ც m,				
Artificially Impounded	yes	to the recovery mis-	nore sinuous	i			j			
High Water Mark: O ·		depth in m) = (m	3 · 3	2-3 m deep	√ 3 m c	deep 2.6 m d	leep			
		ly Shaded (11		Moderately Sh	aded (46-80%): [Heavily Shade				
SEDIMENT/SUBSTRATE		·								
Sediment Odors: No	ormal: 🗹 Sew	age: 🔲 Petr	oleum:	Chemical: A	.naerobic: 🔲 Ot	lher: 🔲				
Sediment Oils: Al	osent: 🛂 SI	light: Mo	derate:	Profuse:						
Sediment Deposition: Sk	udge: Sanc	smothering:	none mo	oderate Silt smothe	ring; none mode					
Substrate Types	% coverage # ti	mes sampled	method	Substrate Type			ethod			
Woody Debris (Snags)	0	0		Sand	65	2 N	D			
Leaf Packs or Mats	0	0		Mud/Muck/Silt	15	3 na	5			
Aquatic Vegetation	15	<u> </u>	net	Other:	0	0				
Rock or Shell Rubble	0	0		Other:	0	0				
Undercut banks/Roots				Oraw serial view .	sketch of habitats	found in 100 m sec	ction			
WATER QUALITY Depth (r	m): Temp. (°C)	: pH (SU):	D.O. (m	g/l): Cond. (µmho/los Salinity (ppt)	cm)	Secc	hi (m):			
.Top	25.54	7.25	4.6							
Mid-depth 1.5	25.54	7.24	4.5	4 571		1.	5			
Bottom 3	25 .49		4.6	7 571						
System Type : Stream:	1st - 2nd orde 3rd - 4th orde	r 7th order or		Lake: Wetland	: Estuary:	Other: 🗸 🕻	nal			
Water Odors (check box):	Normal: 🗶	Sewag	e: 📋	Petroleum:	Chemical:	Other:				
Water Surface Oils (check	(box): None: 🗶	Shee	n: 🔲	Globs:	Slick:					
Clarity (check box):	Clear:	Slightly	turbid:	Turbid: 🔽	Opaque:					
Color (check box):	Tannic:	Green (a	algae): 🔽	Clear:	← Other:					
Weather Conditions/Note:				Abundance:	Absent Ra		ndant			
water flow	direch	an wa	۵	Periphyton			_			
normeast				Fish Aquatic Macroph	ntes 🗀 🗀		\dashv \mid			
				Iron/sulfur Bacte	, —	յ Ա Ժ և] ∏ [뤽			
SAMPLING TEAM:			:	SKNATURE:		. D	ATE:			
Grainger	/ Pour	LOY		andre o	Jan	- d	/8/¶E			

FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (v2)

SUBMITTING AGENCY CODE:	STC	PRET STATION	1		ceiving BODY O					
REMARKS; Whidy, ran	ung ₍	LOCATION: Nor	lh west	Regia	لعنا	FIELD IDANAME:	ع <i>ل</i> يلا	1		
Habitat Parameter	Opti	mal	Subopti	imal	Marg	inal	P	oor		
Bottom Substrate/ Available Cover	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs (partially decayed), undercut banks, rubble, or		20% to 40% stree roots, emvegetation, le etc. Adequat Some substrate new fall (fileaves or snap 15, 14, 13, 12	nergent af packs, e habitat. ites may resh gs).	vegetation etc. Less t desirable h frequently or removed	leaf packs, han abitat, disturbed	Less than 5% snags.			
Water Velocity	Max. observe m/sec. but < 2	2 m/sec	Max. obser 0.1 to 0.25 15 14 13(1)	m/sec		.I m/sec	occurrin	served; /sec, or spate lg; > 2 m/sec 4 3 2 1		
Artificial Channelization	20 19 18 1 No artificial channelization dredging. St. with normal, pattern 20 19 18 1	n or ream sinuous	May have bee channelized ir (>20 yrs), but recovered, fair sinuous patter 15 14 13 13	n n the past mostly rly good rn	Channeliz somewhat recovered 80% of are	t	Artificia channel banks, s instrean highly a	lly zed, box-cut traight, n habitat		
Deposition	Less than 20 habitats affe sand or silt accumulation 20, 19,1,8,1	% of cted by	20%-50% of habitats aff sand or silt accumulati	fected by	Smotherin 50%-80% o with sand shallow, fr	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement		ring of habitats ad or silt, a problem, esent 4 3 2 1		
Bank Stability	Stable. No everosion or backlittle potentifuture proble	vidence of nk failure. al for ms.	Moderately	stable. or small sion, ed over.	Moderate a erosion, hi potential d	y unstable. areas of gh erosion luring floods 8 7 6	areas. O'sloughin	%) raw, eroded bvious bank		
Riparian Buffer Zone Width	Width of nat vegetation (I buffered side greater than	ive east e) 18 m	Width of nat vegetation (I buffered side to 18 m 15_14_13_1	ive east e) 12 m	Width of r vegetation human ac close to sy	native n 6 to 12 m, tivities still	native b due to i human 5	an 6 m of ouffer zone outensive activities		
Riparian Zone Vegetation Quality	Over 80% of streambank consist of nat plants, inclu- understory s non-woody macrophytes	reambank surfaces onsist of native lants, including trees nderstory shrubs, or on-woody		over 80% of treambank surfaces onsist of native olants, including trees inderstory shrubs, or non-woody 50% to 80% of riparian zone is vegetated, but one class of plants is not represented. Some		of te is ut one its is not . Some	two classe are not rep Patches of closely cro	one is , but one or s of plants presented. I bare soil or	streamb are vege plant co- grass me exotics) Vegetati stubble	an 25% of ank surfaces tated. Poor mmunity (e.g. proculture or present. to removed to height of 2
5_	growing natu	17 16	community	12 11	obvious.	8 7 6	inches o	r less.)4 3 2 1		
5. Add to be	5 points if cros > one square n	s-sectional	area of flow is	estimated	Comm	ents	-			
52 TO	TAL SCO									
ANALYSIS DATE: 5/4/98	ANALYST:	amg	er s	IGNATURE:	dre	agre	<u></u>			

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

SUBMITTING AGENCY CODE:		STORET STATION HUM		TIME 135		annel	A			
The state of the s	HULS	LOCATION: North	سومۍ	Regime		est si	te 2			
RIPARIAN ZONEANSTREAM FE	ATURES				<u> </u>					
Predominant Land-Use in W	atershed	(specify relative	percent ir	n each category):						
Forest/Natural Silviculture	Field/F	asture Agric	ultural	Residential	Commercial	Industrial	Other (Specify)			
15	20	<u> </u>		40	20_		<u> </u>			
Local Watershed Erosion (check box): None Slight Moderate Heavy										
Local Watershed NPS Polluti	on (check	(box): No evide	nce 🗌	· —	Aoderate pote		vious sources			
Width of riparian vegetation (on least buffered side: • (st & map dom regetation on b		Typical Width (m)/Depth (m) /	Velocity (m/sec	4.5m wide			
Artificially Channelized 🔲	no 🖭			0-04 m/s	10	6 m/s	10:05 m/s			
Artificially Impounded yes	recent, sev	ere some recovery more	oce singone	1	į		· .			
High Water Mark: O·3	+ [ent depth in m) = (m	above bed)	2-3 m deep	<u> </u>	• 8 m deep	3 m deep			
Canopy Cover %: Open:	X Ligi	htly Shaded (11	-45%):	Moderately	Shaded (46-8	0%): Hea	avily Shaded:			
SEDIMENT/SUBSTRATE		·_			-1		· · · · · · · · · · · · · · · · · · ·			
Sediment Odors: Norma	al: 🖊 Se	ewage: Petr	oleum:	Chemical:	Anaerobic:	Other:				
Sediment Oils: Abser	ıt: 🔽	Slight: Mo	derate:	Profuse:						
Sediment Deposition: Sludge		nd smothering:	none mi slight s	oderate severe Sitt smo		severe C	ther:			
	overage #	times sampled	method			rage # times sa				
	0	0		Sand	65	2				
		0		Mud/Muck/Si		3	<u>rat</u>			
	5	15	net	Other:	0	0				
Rock or Shell Rubble			·	_	law alreadal and the	abitata (aund	In 100 m anglion			
Undercut banks/Roots		0		Uraw aeriai v.	iew sketch of t	BDREIS IOUNG	in 100 m section			
WATER QUALITY Depth (m):	Temp. (°	c): pH (su):	D.O. (n	ng/l): Cond. (μη or Calinity	nho/cm) (ppt) :		Secchi (m):			
Top 0.3	25.5	9 7.24	4.7	3 571						
Mid-depth 1-4	25.5		4.8		<u> </u>		ı·S			
Bottom 2.8	22.4		14.8							
System Type : Stream: (st - 2nd or 3rd - 4th or	der 7th order or	r greater /		land: Estu		"Xcanal			
Water Odors (check box):	Normal:	<u> </u>	e:	Petroleum:	Chemica		er:			
Water Surface Oils (check box	x): None:	X Shee	:n:	Globs:	Slic					
Clarity (check box):	Clear:	<u> </u>	turbid:	Turbid: 🔀	<u> </u>					
Color (check box):	Tannic:	Green (algae):		✓ Othe	———	Abundant			
Weather Conditions/Notes:	recti	ai nas		Abundano Periphyton	e: Abser	nt Rare Co	mmon Abundant			
north east				Fish	ronbidos III					
				Aquatic Mad Iron/sulfur E		- 🗍				
SAUPLING TEAM:				SIGNATURE:	1		DATE:			
Gramger /1	POUN	0 Y		canda	es fra	my	~ \\$\\\ \8\\\ 9\\\			

FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (v2)

SUBMITTING AGENCY CODE:SUBMITTING AGENCY NAME:	STORET STATE	ON NUMBER: DATE (MOM): RE-	CHAMLE A	+
remarks: raming, clos Windy	udy, LOCATION	therest Region	Test	Scte 2
Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Bottom Substrate/ Avaîlable Cover	Greater than 40% snags, logs, tree roots emergent vegetation, leaf packs (partially decayed), undercut banks, rubble, or other stable habitat. 20 19 1 8 17 16		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.
Water Velocity	Max. observed: >0.25 m/sec. but < 2 m/sec	Max. observed; 0.1 to 0.25 m/sec	Max. observed; 0.05 to 0.1 m/sec	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec 5 4 3 2 1
Artificial Channelization	20 19 1 8 17 16 No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	15 14 13 12 11 May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	10 9 8 7 6 Channelized, somewhat recovered, but > 80% of area affected	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4(3)2 1
Deposition	Less than 20% of habitats affected by sand or silt accumulation	20%-50% of habitats affected by sand or silt accumulation	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1
Bank Stability	Stable. No evidence erosion or bank failu Little potential for future problems. 20 19 1 8 17 16	of Moderately stable.	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
Riparian Buffer Zone Width	Width of native vegetation (least buffered side) greater than 18 m 20 19 1 8 17 16	Width of native vegetation (least buffered side) 12 m to 18 m 15 14 13 12 11	Width of native vegetation 6 to 12 m, human activities still close to system 10, 9, 8, 7, 6	Less than 6 m of native buffer zone due to intensive human activities 5 4 3 2 1
Riparian Zone Vegetation Quality	Over 80% of streambank surfaces consist of native plants, including treunderstory shrubs, on non-woody macrophytes. Plants growing naturally.	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. Some	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	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
5	20 19 1 8 17 16	15 14 13 12 11	obvious. 10 9 8 7 6	inches or less. 5 4 3 2 1
5 to be	> one square meter du	nal area of flow is estimated ring periods of normal flow.		
45 TO	TAL SCORE	SIGNATURE:		
5/4/98	Gram	er cano	ue fran	yer

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-90)

SUBMITTING AGENCY CODE: SUBMITTING AGENCY NAME:		ORET STATION NUMBER:	DATE (MO 5/4/	*	Chame		
REMARKS:	COUNTY:	LOCATION: Northwe	. R	e u on a t	FIELD IDMAME:	Site	3
RIPARIAN ZONE/INSTREAM F	1.	100000			1231	2//~	
Predominant Land-Use in \		(specify relative per	cent in eac	h category):			
Forest/Natural Silviculture		· · · · · · · · · · · · · · · · · · ·		····	mercial Indu	ustrial Othe	er (Specify)
15	20	5	_ {	0			or (openly)
Local Watershed Erosion (c	heck box):	None	Slight	☐ Mo	oderate 🔽	Heavy [
Local Watershed NPS Pollu	tion (check t	oox): No evidence	Sli	ght 🔲 🛮 Moder	ate potential 🚺	Obvious s	sources 🔽
Width of riparian vegetation on least buffered side:		& map dominar getation on back		lcal Width (m)/De	pth (m) Nelocity	(m/sec) Tran	nsect m wide
Artificially Channelized	no 💟			- m/s 💠	↑ m/s	^	m/s
Artificially Impounded Lye	S recent, geven	some recovery mostly recovery mostly rec	Unone			i	
High Water Mark: 0.3	tor level) (presen	$\frac{7}{\text{depth in m}} = \frac{3 \cdot 6}{\text{(m above}}$	Dec()	m deep	√ m de	ер 🗀	m deep
Canopy Cover %: Open:	: 🖳 Light	ly Shaded (11-459	%):	Moderately Shad	led (46-80%): 🗌	Heavily S	haded: 🗔
SEDIMENT/SUBSTRATE							,
Sediment Odors: Norm	ial: Sew	age: Petroleu	m: Cl	nemical: An	aerobic: Oth	ier:	
Sediment Oils: Abse	nt: S	light: Modera	te: F	Profuse:			
Sediment Deposition: Sludg	e: Sand	smothering: non		Silt smotherin		e Other:	
· · · · · · · · · · · · · · · · · · ·	coverage # ti	mes sampled m		ubstrate Types	% coverage # ti	mes sampled	method
Woody Debris (Snags)			Sa		 -		
Leaf Packs or Mats				id/Muck/Silt			<u> </u>
Aquatic Vegetation Rock or Shell-Rubble				her:			
					entals at his blade	(a.u. d in 100]
Undercut banks/Roots		<u> </u>		W-aeriai view si	ketch of habitats	טטר חו מחטסו	m section
WATER QUALITY Depth (m):	Temp. (°C	pH (SU): D	.O. (mg/l);	Cond. (µmho/cr er Galinity (ppt):	n)		Secchi (m):
Top 0.3	25.34	7.34 5	·02	568			
Mid-depth 1.4	52.31		1.97	S68			1.5
Bottom 2.7	72.58		1.93	569			
System Type: Stream: (1st - 2nd orde 3rd - 4th orde	er 5th - 6th order er 7th order or grea	_{ater}) Lak	e: Wetland:	Estuary:	Other: 🗹	cana
Water Odors (check box):	Normal:	子 Sewage: [Pet	roleum:	Chemical:	Other:	
Water Surface Oils (check bo	×): None:	Sheen:]	Globs:	Slick:		
Clarity (check box):	Clear:	Slightly turb	id:	Turbid: 4	Opaque:		
Color (check box):	Tannic:	Green (alga	e): 🔃	Clear:	← Other: ☐ _		
Weather Conditions/Notes: Waler flow to east clin	was ection	shightly	Fi A	Abundance: eriphyton sh quatic Macrophy on/sulfur Bacteri		e Common	Abundant
SAUPLING TEAM: Cramer F	ogner	-	SIGNAT	TURE:	trans	-	SUBJAR

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-90)

SUBMITTING AGENCY CODE: STORET STATION NUMBER: DATE (MDM): TIME RECEIVING BODY OF WATER: SUBMITTING AGENCY NAME: 24030114 5/4/98 1240 Channel A
REMARKS: COUNTY: LOCATION: Northwest Regional FIELD IDNAME: Test Site 4
RIPARIAN ZONE/INSTREAM FEATURES
Predominant Land-Use in Watershed (specify relative percent in each category):
Forest/Natural Silviculture Field/Pasture Agricultural Residential Commercial Industrial Other (Specif
15 20 5 40 20
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) List & map dominant on least buffered side: 0.5 List & map dominant vegetation on back Vegetation on back
Artificially Channelized no land m/s
Artificially Impounded Lyes receivery mostly recovered more sinuous
High Water Mark: 0.3 + 3.2 = 3.5 m deep m deep m deep m deep
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 moderate severe Silt smothering: none moderate severe Other:
Substrate Types
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 Selficity-(ppt): Secchi (m
Top 3-20-31 24.99 7.30 4.93 568
Mid-depth 1-61.6 24.92 7.28 4.91 .568
Bottom 3.2 24.55 7.24 4.28 5.71 System Type: Streem: 1/1st - 2nd order 5th - 6th order 1 ake: Wetland: Estuany: Other: 1/4 a.a.
System Type: Stream: (1st - 2nd order 5th - 6th order 7th.order or greater) Lake: Wetland: Estuary: Other: Verne
Water Odors (check box): Normal: Sewage: Petroleum: Chemical: Other:
Water Surface Oils (check box): None: Sheen: Globs: Slick:
Clarity (check box): Clear: Slightly turbid: Turbid: Opaque:
Color (check box): Tannic: Green (algae): Clear: Clear: Other:
Weather Conditions/Notes: No noticeable flow Abundance: Absent Rare Common Abundance: Periphyton
SAMPLING TEAM: Corambo Payror Condrestron 5/6/

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

SUBMITTING AGENCY CODE: SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	5/4/48 TIME	Channel Channel	ER:
REMARKS: COUNTY	North we	of Regional	FIELD IDNAME:	Site 5
RIPARIAN ZONEANSTREAM FEATUR	ES			
Predominant Land-Use in Watersh	ed (specify relative perce	ont in each category):		
	d/Pasture Agricultura		mercial Industr	rial Other (Specify)
Local Watershed Erosion (check bo	s): None 🔲			Heavy [
Local Watershed NPS Pollution (ch	eck box): No evidence	<u> </u>	· —	Obvious sources 🖳
Width of riparian vegetation (m) on least buffered side:	List & map dominant vegetation on back	Typical Width (m)/Do	epth (m) /Velocity (m	vsec) Transect 45 m wide
tecent	sevens some recovery mostly reco	- m/s 1		↑ m/s
Artificially Impounded Fyes	more sinu	T T	į	! •
High Water Mark: O·3 +	$2 \cdot 8$ = $3 \cdot 1$	m deep	m deep	m deep
Canopy Cover %: Open:	ightly Shaded (11-45%): Moderately Shad	ded (46-80%):	Heavily Shaded: 🗔
SEDIMENT/SUBSTRATE				
Sediment Odors: Normal:	Sewage: Petroleun	n: 🔲 Chemical: 🔲 An	aerobic: 🔲 Other:	
Sediment Oils: Absent:	Slight: Moderate	: Profuse:		
	Sand smothering: none slight			Other:
	# times sampled met		% coverage # time	s sampled method
Woody Debris (Snags)		Sand	<u> </u>	
Leaf Packs or Mats		Mud/Muck/Silt		-
Aquatic Vegetation Rock or Shell Rubble		Other:		
Undercut banks/Roots			ketch of habitats fou	and in 100 m section
	(°C): pH (SU): D.C	Cond. (µmho/cr		Secchi (m):
<u> </u>		or gamme, (bbe):		
	·56 7·23 4 ·48 7·22 4	·76 581		
	38 7.21 4	·42 583		VOB
System Type: Stream: (1st - 2nd 3rd - 4th	order 5th - 6th order	\ Lates \ Wottendt	Estuary: 0	ther: 4 canal
	al: Sewage:		Chemical: (Other:
Water Surface Oils (check box): Non	e: Sheen:	e Globs:	Slick:	
Clarity (check box): Clea	ar: Slightly turbid	: Turbid:	Opaque:	
Color (check box): Tann	c: Green (algae)	: D Clear:	← Other:	
Weather Conditions/Notes: Flow was north	east	Abundance: Periphyton Fish Aquatic Macrophy Iron/sulfur Bacter		Common Abundant
SAMPLING TEAM: (Namles / Pou	ha/	SIGNATURE:	hara	86,79

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-90)

SUBMITTING AGENCY CODE: SUBMITTING AGENCY NAME:			ROCKY Creet.
REMARKS: COUNTY: HULS	Northwed	Regional	FIELD IDNAME: Test Site 6
RIPARIAN ZONEANSTREAM FEATURE	3		
Predominant Land-Use in Watershe	d (specify relative percent	t in each category):	
Forest/Natural Silviculture Field	/Pasture Agricultural	Residential Comm	ercial Industrial Other (Specify)
1S 2A6 3	20 5	40 20	
Local Watershed Erosion (check box)	: None 🔲 🤻	Slight Mode	erate 🔃 Heavy 🗌
Local Watershed NPS Pollution (che	ck box):No evidence 🔲	,	e potential 🔲 Obvious sources 🕟
Width of riparian vegetation (m) on least buffered side: 2	ist & map dominant vegetation on back	Typical Width (m)/Dept	th (m) /Velocity (m/sec) Transect 15 m wide
Artificially Channelized		- m/s 1	↑ m/s ↑ m/s
Artificially Impounded 🗹 yes	evere some recovery mostly recover more slauou		į
High Water Mark: 0.5 + [seent depth in m) = 2-0 (m above bed)	O-Sm deep	√ 1 m deep O•5m deep
Canopy Cover %: Open: L	ghtly Shaded (11-45%):	Moderately Shade	d (46-80%): Heavily Shaded: .
SEDIMENT/SUBSTRATE			
	Sewage: Petroleum:	<u> </u>	robic: Other:
Sediment Oils: Absent:	Slight: Moderate:		
,		moderate Silt smothering	Oldin Gottere
	# times sampled method		% coverage # times sampled method
Woody Debris (Snags)		Sand Mud/Muck/Silt	
Leaf Packs or Mats		Other:	
Aquatic Vegetation Rock or Shell-Rubble		Other:	
Undercut banks/Roots			tch of habitats found in 100 m section
Olideredt baliks/Noots	<u> </u>		7
WATER QUALITY Depth (m): Temp.		(mg/l): Cond. (µmho/cm) or Salinity-(ppt):	Secchi (m):
Top 0.3 25.		64 667	
Mid-depth 0.7 25.		60 667	V08
Bottom 1 - S 2 S -			
System Type: Stream: 4th System Type: Stream: Norma) Lake: Wetland: C	Estuary: Other: hemical: Other:
Water Surface Oils (check box): None		Globs:	Slick:
Clarity (check box): Clea	<u> </u>		Opaque:
Color (check box): Tannic	: Green (algae):	<u></u>	Other:
Weather Conditions/Notes:		Abundance: Periphyton	Absent Rare Common Abundant
of Channel A-	ly in direcha	Fish	
of Channel H-	_	Aquatic Macrophyte	
		Iron/sulfur Bacteria	
SAMPLING TEAM:		SIGNATURE:	DATE:

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

SUBMITTING AGENCY CODE:SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	• ' • ' <u> </u>	CEIVING BODY OF WATER:
REMARKS: COUNTY:	LOCATION: Northwes	t Regional	Test Site 7.
RIPARIAN ZONE/INSTREAM FEATURES	· · · · · · · · · · · · · · · · · · ·		
Predominant Land-Use in Watershed	specify relative perce	nt in each category):	
Forest/Natural Silviculture Field/	Pasture Agricultural	Residential Comme	rcial Industrial Other (Specify)
15 2	0 5	40 20	
Local Watershed Erosion (check box):	None	Slight Moder	rate 🔀 Heavy 🗌
Local Watershed NPS Pollution (ched	k box): No evidence	Slight Moderate	potential Obvious sources
	st & map dominant vegetation on back	Typical Width (m)/Depth	(m) Nelocity (m/sec) Transect 45 m wide
Artificially Channelized no L			↑ m/s ↑ m/s
Artificially Impounded Laryes	rere some recovery mostly recover more shows	red za	
High Water Mark: 0.3 + (mebove present water level) (pres	$\frac{0.7}{\text{eni depth in m}} = \frac{1.0}{\text{(m above bed)}}$	mdeep	√O.7m deep m deep
Canopy Cover %: Open: X Lig	htly Shaded (11-45%):	Moderately Shaded	(46-80%): Heavily Shaded:
SEDIMENT/SUBSTRATE			
Sediment Odors: Normal: Se	wage: Petroleum:	Chemical: Anaero	obic: Other:
·	Slight: Moderate:		
, 		moderate severe Silt smothering:	none moderate slight severe Other:
[times sampled meth		coverage # times sampled method
Woody Debris (Snags)		Sand	
Leaf Packs or Mats		Mud/Muck/Silt	
Aquatic Vegetation Rock or Shell-Rubble	·	Other:	
Undercut banks/Roots			h of habitat form t/2 t00 1/2
Site College Samontoots			h 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):
Тор			\\ap
Mid-depth 0.35 22.3	7 6.62 6.	77 279	VOB
Bottom System Type : Streem 1/1st - 2nd on			
System Type - Stream 3rd - 4th or	der 7th order or greater		Estuary: Other: Canal
Water Odors (check box): Normal:			emical: Other:
Water Surface Oils (check box): None:		Globs:	Slick:
Clarity (check box): Clear:	Slightly turbid:	Turbid: 🗾 Op	paque:
Color (check box): Tannic:	Green (algae):		Other:
Weather Conditions/Notes:		Abundance: A Periphyton	bsent Rare Common Abundant
Flow is towards	west	Fish	
, , , , , , , , , , , , , , , , , , , ,	•	Aquatic Macrophytes	
		Iron/sulfur Bacteria	
SAMPLING TEAM:	~ /	SKONATURE:	5/8/98
estate y		· · · · · ·	17am 10/0/10

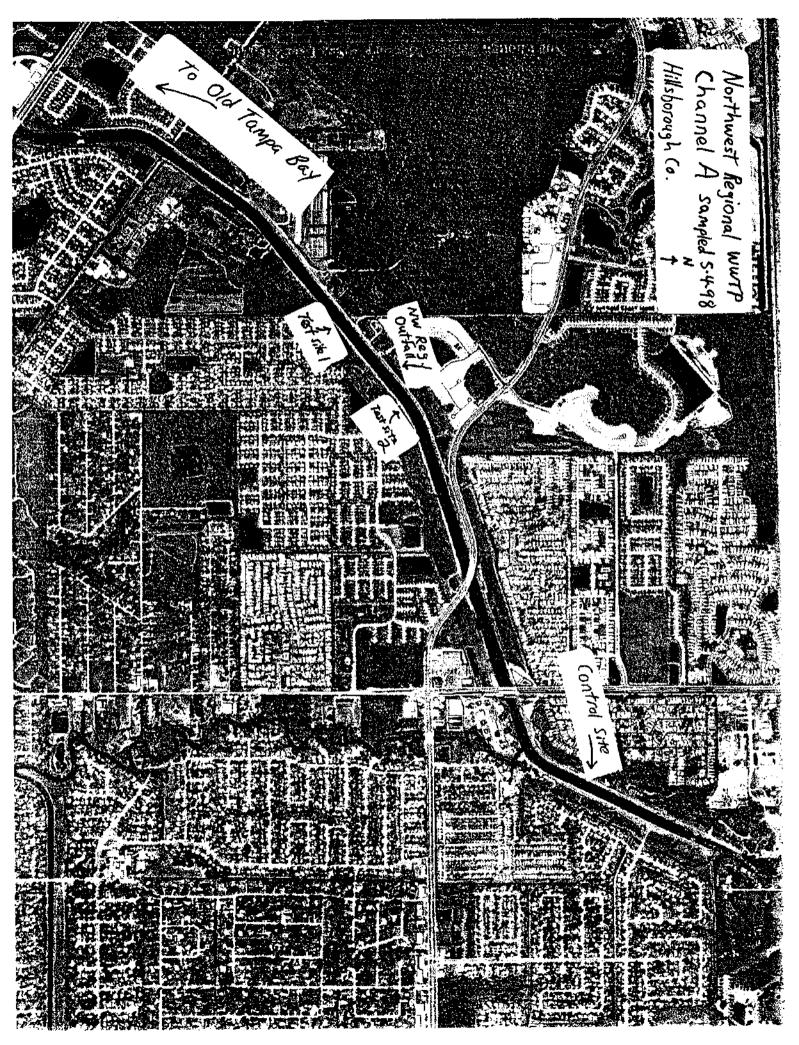
FDEP Biology Section - Acute Bioassay Bench Sheet Sample Source: Northwest Regional WWTP Sample Collection: Date 5/4/96 Time 16:20 County: Hilsborough Test Beginning: Date 3-3-48 Time 16:00 Test Ending: Date 5-7-98 Time 16:00 Andrea Granger / Southwest Contact / District: Organism Batch #: 21 Diluent Batch #: 21 Organism Age: 21/Juna NPDES Permit #: FL0041670 LIMS Sample #: 322006 LIMS Job #: 1918-05-05-18 Test Organism: Ceriolichia 6/1/94 00 sample log: .-Instrument Temperature °C D.O. mg/L Conductivity µmhos/cm Test Type: Screening Definitive Calibrations: pH Static | Static Renewal | Flow-through meter # 90H018262 G9005749 7851 90H018262 Temperature range: room 245-25,5°c incubator 23,4-24,4% Ohr 7.0@ 7.0 248 @ 24.9 8,1 @ 25.80 99.8 @ 926 9.0 @9.0 Test Number: / of 2 993 @ 1005 @25,1 °C Remarks: D = dead, M = missing Tration Sample Do was 3.4 mg/l, 24 hr 7.0 @ 7.0 24.2 @ 24.3 9.2@25.2°C 102.5 @ 97.6 Sough was arealed for 45 mmiles DO, = 8.4 mg/L. 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 UNCORRECTED Cond. (mmhos/cm) Temperature (°C) **D.O.** (mg/L) pΗ **Number Live** Cond. (µmhos/cm)) 0 hr | 24 h 48 h 24 h 0 hr 24 h 48 h 24 h 48 h 0 hr 24 h 48 h Conc. Chamber # 0 hr 48 h 0 hr 76/4654 195 (ontrol 1 5 4.0 24.5 165 8.1 40 254 175 4 24.5 Control B 7.6 5 5 4.3 5 180 5 24.5 Control C 8.4 7.6 3 185 245 5 8.4 Control o 5 D 885 5 8.0 245 81 100%A 5 76 24.0 5 245 895 2 4.0 100% B 5 6.0 5 7,7 wwith Conduction 1, 950 100% (745 in W. Column 980 4.0 5 24,5 100%0

Hecolded by.	
Investigators' Signatures	Salt Water Water Quality Parameters Verified by MF
Marshall Famility	Well Water (20% Min Wate) Sample Method Measured by
Caulem Hand Field Total Residual C12 (mg/L):	
Fran Wewld Lab Total Residual CI2 (mg/L):	
Alkalinity (mg/L as CaCO ₃)	70 65 HACK CH/DAW
Hardness (mg/L as CaCO ₃)	
Total ammonia (mg/L as N)	40.017 Whatever Oxion Fu
Ammonia Ammonia	Ammonia Control Sample
reviewer form updated 4/01/96 Meter #98136 Meter Slope:	58.6 Blank: 40-0/7 Salinity: O Salinity:

FW ME MI

Measured/Loaded by:

Sample Source: Month of Technology (1994) Countart (District: County) High to reach (District: County) High to reach (District: County) Contact (District: County) High to reach (District: County) Hi									cute	Bio	ass	ау В	enc	h Si	ieet			*
Counter! Context Context	Sample Sout	Sample Source: Northwest Regional WWTP Sample Collection: Date 5/4/98 Time 16:30									, 4							
Constitution Cons	Cou	nty:	Hillsburgh Test Beginning: Date 5-3-98 Time 1440															
NPDES Permit # FLOD 91/170 Normal		District: anchea Grainger / Southwest Organism Batch #: 32 Diluent Batch #: 400 by																
Temperature Color	NPDES Permit #: FL00 4//, 70 Organism Age: 1/4an S										. 2							
Temperature Color	LIMS Sample	#: <u>322</u>	<u>ю6</u> L	IMS Jo	6#: <u>*</u>	¥8-0-	<u>ک</u> 0-ک	-18		Test (Organ	ism:	Cyl	nin	Mark	leeds	ì	4
Test Type: **Generation Delicative ** **Static Distance Preventil Flow-through motion ** **Temperature Tange: room 21.5 21.0 c. 0 tr 22 = 7.0 24.1 = 29.9 91-018822 991-018822	sample l	log: <u>6/1/98 /</u>	01) <u> </u>			Instru	ıment						,					- `
Temperature range: room 243-23-24 core incubator 250-24-26 core incubat	Test Type: 🛇	creeni <u>ng</u> al D	etinitive	e Flow-th	rough								_				:m	
Tost Number: D = Gead, M = missing 24	Tomperature r	ander room	n 4.5	25,5 *										-			6	
Remarks: D = dead, M = missing 24 hr 20 @ 70 24.7 g = 27.3 g = 27.3 g = 27.5 g	Tank blombor	incub	ator 🚅	15.0-	26.00	c u				W <u></u>	- [1.]	<i></i>	<u> </u>					°C
Turnic Comple D.O. rea 34 mg/L Re = 110 Sample was acreated for 45 minutes 48 hr 20 = 70 253 = 251 \$1 = 251 \cdot \frac{125}{1200} \cdot \frac										2	24,7	42	a 25					- "
Number Live pH Temperature (°C) D.O. (mg/L) Cond. (mmhos/em)	To The I	الآمام المحدد	0 Wa	3,4,	مع الم	, 24	nr <u>7.6</u>	<u>/</u> @/.u) <u></u>			DI-L	@ <u>0</u> 2.	5 U 12 99	'0 a	9901	⊑_ ⊚ 255	, oc
Number Live pH Temperature (°C) D.O. (mg/L) Cond. (mmhos/em)	ه زهارزمید	ma a ara	+.16	5-45	min	يرطب	7.0	_@ <u>_7.C</u>	<u>/</u> > 25	7.0 -	ור ז	8.1	@ 2 C/	94	70 0	0107	<u></u>	_ 0
Number Live pH Temperature (°C) D.O. (mg/L) Cond. (mmhos/em)	Sample D	0.2.8.4.	m/L	•		48				<u></u> @		-5/1	@ <u>~~</u> ;	_	<u>04.0.</u>	9 <u>7 ()</u> 099	_ ര <i>ാട് (</i>	°C
Number Live	د بالإسود	,,,_	71-7				_7.0	7 @ <u>7/ (</u>	<u> </u>					_/				_
Number Live																		
Cont. A F 5 5 5 5 5 5 5 5 5			Nu	ımber L	ive		рН		Temp	erature	(°C)	D.	O. (mg	′L)				270
Co.t.d 5 F2 S S S N S S N S S N S S	Conc.	Chamber#	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	136
Catal 5 F2 S S S N S S S N S S		£ [-	5	ď	7.4	8.4	5.5	プしり	226	253	1 4	% ?	7.6	Zib	260H	215	W."
Control c		F2		5			8.4				25,5		36		260	100	270	in ic
MeasuredLoaded by: MF S S S S S S S S S	77.7	F3		5		7,4	8,4	8.5	26.0	28.7	25.5	1 9	_	7.6	260	+ - -	285	L'
100% A F 5 5 5 7.1. 17 79 A.1. 25 7.5 8.9 8.7 2.5 8.5 9.1 9.2 100% A F 5 5 5 7.1. 17 79 A.1. 25 7.5 8.9 8.7 2.5 8.5 9.1 9.2 100% A F 5 5 5 7.1. 17 79 A.1. 25 7.5 8.9 8.7 2.5 8.5 9.1 9.2 100% A F 5 5 5 7.1. 17 79 A.1. 25 7.5 8.9 8.7 2.5 8.5 9.1 9.2 100% A F 5 5 5 7.1. 17 79 A.1. 75 7.5 8.9 8.7 8.7 2.5 8.5 9.1 9.2 100% A F 5 5 5 7.1. 17 79 A.1. 75 7.5 8.9 8.7 8.7 2.5 8.5 9.1 9.2 100% A F 5 5 5 7.1. 17 79 A.1. 75 7.5 8.9 8.7 8.7 2.5 8.9 8.7 2.7 4 8.5 9.1 9.2 100% A F 5 5 5 7.1. 17 79 A.1. 75 7.5 8.9 8.9 8.7 2.7 4 8.5 9.1 9.2 100% A F 6 5 5 5 7.1. 17 79 A.1. 75 7.5 8.9 8.9 8.7 2.7 4 8.5 9.1 9.2 100% A F 6 5 5 5 7.1. 17 79 A.1. 75 7.5 8.9 8.9 8.7 2.7 4 8.5 9.1 9.2 100% A F 6 5 5 5 7.1. 17 79 A.1. 75 7.5 8.9 8.9 8.7 2.7 4 8.5 9.1 9.2 100% A F 6 5 5 5 7.1. 17 79 A.1. 75 7.5 8.9 8.9 8.7 2.7 4 8.5 9.1 9.2 100% A F 6 5 5 5 7.1. 17 79 A.1. 75 8.9 8.9 8.7 8.9 8.7 8.9 8.7 8.9 8.7 8.9 8.7 8.9 8.7 8.9 8.7 8.9 8.7 8.9 8.7 8.9 8.7 8.9 8.7 8.9 8.7 8.9 8.7 8.9 8.7 8.9 8.7 8.9 8.7 8.9 8.7 8.9 8.7 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.7 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.7 8.9 8.9 8.9 8.7 8.9 8.9 8.9 8.7 8.9 8.9 8.9 8.9 8.9 8.7 8.9 8.9 8.9 8.9 8.7 8.9 8.9 8.9 8.9 8.9 8.9 8.9 8.9 8.9 8.9	Control D	FY	5			7.8	84	8.5	260	25.6	25.4	18		+ · · · · · · · · ·		- 1 -		•
Measured/Loaded by: MF FW MT FW FW FW FW FW FW FW F			5													1		4: }
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Investigators' Signatures March Further Further			ME	rew	ns.	MF		MY	₩F_		MF	MF	Fu	mr	MT	CH	MF]
Well Water 20% Min Water Sample Method Measured by Cautery Head Field Total Residual Cl2 (mg/L): Lab Total Residual Cl2 (mg/L): Alkalinity (mg/L as CaCO ₃): 117 Hardness (mg/L as CaCO ₃): 125 Total ammonia (mg/L as N): 40.017 Ammonia Ammonia Control Sample			FW	Fu	ME	4+	CH	PW	L Z H	,	Wa	tor Ous	lity Pa	ramet	ers	101	1,20	
Field Total Residual Cl2 (mg/L): Lab Total Residual Cl2 (mg/L): Anot Measured Lab Total Residual Cl2 (mg/L): Alkalinity (mg/L as CaCO ₃): Hardness (mg/L as CaCO ₃): Total ammonia (mg/L as N): Ammonia Ammonia Ammonia Ammonia Ammonia Ammonia Anot Measured 20.03 DR-100 CH/Drive 155 Hach 155 Hach 157 Hach 157 Orlow Full Ammonia Control Sample		٠	M									Ver	Fred	by M	_	LAKon	nurad b	.,
Lab Total Residual Cl2 (mg/L): 40.03 20.03 DR-100 CH/DRW Alkalinity (mg/L as CaCO ₃): 117 65 Hach 1H/DRW Hardness (mg/L as CaCO ₃): 125 155 Hach 1H/DRW Total ammonia (mg/L as N): 40.017 674 684 684 685 685 685 685 685 685 685 685 685 685	Marsha	II rando	<u>{/`\</u>						veli Wai	er 20	% MIN	water				À	sui e u D	¥
Alkalinity (mg/L as CaCO ₃): 1/7 65 Hach 1H/DAW Hardness (mg/L as CaCO ₃): 125 155 Hach 1H/DAW Total ammonia (mg/L as N): 40.017 6/Facestall ORION FW Ammonia Ammonia Ammonia Control Sample	Caule	y Med	' 7//					_	(00)	2							Tora	ر
Hardness (mg/L as CaCO ₃): 12-5 50 Hat 0H DAW Total ammonia (mg/L as N): 40.017 00.000 FW Ammonia Ammonia Ammonia Control Sample	Lab Total Residual Cr2 (mg/L).																	
Total ammonia (mg/L as N) . 20.017 bif actual Orion Fur		<u> </u>											15	5 ''i	as la	NH I	DAU	1
Ammonia Ammonia Ammonia Control Sample	10017 by and prior fu																	
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	reviewer	form undated	4/01/98						58.6						nnt	•	<u>O_</u>	ppt



Northwest Regional WWTP Control Site

Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	5	3	1	Score
Total Number of Taxa	33	≥26	25-14	<14	5
EPT Index	l	<u>≥</u> 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]	19		
			Excellen	ıt	26-32
Interpretation of Scores			Good		20-25
•			Poor		13-19
			rely Deg		7-12

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

Northwest Regional WWTP Test Site 1

Morthwest Regional WWII Test Bite 1									
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	5	3	1	Score				
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]	23						
		Excellent							
Interpretation of Scores			Good		20-25				
			13-19						
		Seve	rely Deg	raded	7-12				

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

Northwest Regional WWTP Test Site 2

Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	5	3	1	Score	
Total Number of Taxa	30	≥26	25-14	<14	5	
EPT Index	2	<u>≥</u> 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			19			
			26-32			
Interpretation of Scores			Good		20-25	
		Poor				
		Seve	rely Deg	raded	7-12	

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

Periphyton taxa list and densities (#/cm²) for Northwest Regional WWTP, collected via glass microscope slides in Channel A, on 4 May, 1998.

	Control Site	Test Site 1	Test Site 2
Bacillariophyceae			
Achnanthes exigua	52587	7319	93528
Achnanthes lanceolata	40636	122 0	28058
Achnanthes sp.	4781	915	
Amphora veneta	-	1220	
Bacillaria paradoxa		2440	51440
Capartogramma crucicula	4781	1220	9 353
Cocconeis placentula	16732		28058
Cyclotella sp.	4781	305	4676
Cymbella minuta	4781	_	4676
Fragilaria construens	_		4676
Gomphonema affine		305	-
Gomphonema parvulum	50197	6099	51440
Gomphonema truncatum	_	305	_
Melosira sp.	40636	_	9353
Navicula capitata	4781	3965	56117
Navicula confervacea	246204	14333	650019
Navicula constans	2390	_	_
Navicula gastrum	_	-	4676
Navicula heufleri	_	305	_
Navicula minima	14342	1525	18706
	_	1220	_
Navicula pupula	_	305	_
Navicula rhynchocephala		915	9353
Navicula sp.	$\frac{-}{7171}$	6099	23382
Navicula viridula	23903	3355	37411
Nitzschia amphibia	21513	7014	42088
Nitzschia filiformis	21010	1220	9353
Nitzschia fonticola	_	3660	9353
Nitzschia obtusa	19123	2440	14029
Nitzschia palea	19123	915	14029
Nitzschia sp.		5489	9353
Pennales sp.	11952 2390	305	_
Surirella linearis	2350	000	9353
Synedra rumpens	_	_	4676
Synedra sp.	_		28058
Synedra ulna		1000	20000
Chlorophyceae	FOEDT		9353
$Characium ext{ sp.}$	52587	_	<i>3</i> 000
Chlorococcum sp.	2390	205	
Cladophora sp.	_	305	
Cosmarium sp.	2390	005	
Gloeocystis sp.	_	305	— 4070
Microspora sp.	23903	305	4676

Mougeotia sp.	_	1830		
Nephrocytium sp.	_	305	-	
Scenedesmus sp.	23903	1830	18706	
Stigeoclonium sp.	28684	5489	4676	
Tetrastrum sp.	_	_	4676	
Undetermined Chlorophyceae	4781	2135	_	
Cyanophyceae				
Aphanocapsa sp.	2390	_	_	
Calothrix sp.	<u> </u>	1830	_	
Chrococcus sp.	_	3355	_	
Dactylococcopsis sp.	4781			
Lyngbya contorta		_	4676	
Lyngbya sp.	2390	9454	_	
Merismopedia sp.	4781	_	_	
Microcoleus sp.	_	915	_	
Oscillatoria sp.	16732	21348	4676	
Rhabdoderma sp.		610	_	
Synechococcus sp.	7171	3050	<u></u>	
Dinophyceae	, _ , _			
Chroomonas sp.	_	610	9353	
Citi comonac ap.				

Benthic macroinvertebrate taxa list for Northwest Regional WWTP, collected via Hester-Dendy artificial substrates in Channel A, on 4 May, 1998. Densities, in number/m², represent the mean of three replicates.

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

Parachironomus supparilis	6	4874	-
Pentaneura inconspicua	10	-	
Polypedilum fallax	2	-	-
Polypedilum halterale grp.	$ar{4}$	14	2
Polypedilum illinoense grp.	56	_	4
Polypedilum illinoense	10	_	-
Polypedilum scalaenum grp.	18	_	•
Polypedilum sp. A Epler	$\overline{2}$	_	-
Polypedilum tritum	$\overline{2}$	_	5
Procladius sp.	$rac{2}{2}$	_	
Pseudochironomus sp.	-	2	-
Stenochironomus sp.	4	2	
Tanytarsus sp. A Epler	$\hat{32}$	_	-
Tanytarsus sp. C Epler	14	10	(
Tanytarsus sp. E Epler	$\overline{4}$	_	
Tanytarsus sp. F Epler	_	_	
Tanytarsus sp. G Epler	10	16	
Tanytarsus sp. L Epler	$\frac{1}{2}$	_	I
Tanytarsus sp. M Epler	$\frac{2}{2}$	_	
Tanytarsus sp. T Epler	_	6	
Tanytarsus sp. 1 Epici Tanytarsus sp.	26	$\overset{\circ}{2}$	
Tipulidae	$\frac{2}{2}$	_	
	10	_	
Tribelos fuscicornis Ephemeroptera	1.0		
Ephemeropæra Baetidae	40		
Baetis sp.	-1 0	10	,
Caenis sp.	10	$\tilde{6}$	
	149	_	
Callibactis floridanus	2	_	
Callibactis pretiosus	8	_	
Callibaetis sp.	$\overset{\mathtt{o}}{2}$	_	
Heptageniidae	4	_	
Stenacron floridense	6	_	
Stenacron sp.	U		
Tricorythodes albilineatus	_		
Gastropoda	16	4	
Amnicola dalli johnsoni	20	4	
Amnicola dalli	$\frac{20}{2}$	'' —	
Amnicola sp.	2 46	_ 	
Ancylidae		⊶	
Hebetancylus excentricus	192	4	
Hydrobiidae	2	4	
Micromenetus sp.	4	$\frac{-}{2}$	
Planorbella duryi	 0	Z	
Pseudosuccinea columella	2	_	
Pyrogophorus platyrachis	10	$\frac{-}{4}$	
Undetermined Gastropoda	12	4	
Hemiptera	•		
Merragata sp.	$\frac{2}{2}$	_	
Saldidae	2	_	

Undetermined Hemiptera	2		2
Hirudinea			
Desserobdella phalera	4	_	_
Glossiphoniidae	2	_	_
Lepidoptera			
Noctuidae	-	_	2
Odonata			
Coenagrionidae	16	2	2
Ischnura sp.	4	***	4
Oligochaeta			
Dero digitata	6	-	4847
Slavina appendiculata	2	_	_
Stylaria lacustris	2	_	_
Trichoptera			
Hydroptilidae	10	-	_
Orthotrichia sp.	2		28
Oxyethira sp.	91	_	6
Undetermined Trichoptera	-		2
Trombidiformes			
Limnesia sp.	4	_	2
Limnochares sp.	_	_	2
Oxus sp.	4		_
Piona 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
Amphipoda			
Hyalella azteca	20	10	3
Coleoptera			-
Chrysomelidae	4	_	5
Curculionidae	f 2	_	_
Dubiraphia vittata	2		_
Elmidae	1	_	_
Enochrus sp.	1	_	_
Collembola			
Undetermined Collembola	_	_	3
Decapoda			
Decapoda	2	_	-
Palaemonetes sp.	2	_	3
Palaemonetes paludosus	3	14	_
Diptera			
Ablabesmyia mallochi	3	_	_
Ceratopogonidae	1		_
Chironomidae	7	_	5
Chironomus sp.	2	_	2
Cladotanytarsus sp.	_	1	1
Clinotanypus sp.	_		2
Cricotopus sylvestris	-	2	
Cryptochironomus sp.	6	1	6
Cryptotendipes sp.	7	3	5
Culicidae	1	_	
Dicrotendipes modestus	39	1	17
Dicrotendipes sp.		_	1
Endochironomus nigricans		7	_
Endochironomus sp.	_	1	_
Endotribelos hesperium		_	1
Parachironomus sp.	-	1	- 27
Polypedilum halterale grp.	34	12	
Polypedilum illinoense grp.	6	8	3
Polypedilum scalaenum grp.	1	_	_ 1
Polypedilum scalaenum		$\frac{\overline{1}}{1}$	1
Polypedilum tritum	-	1	
Procladius sp.	_	<u> </u>	2
Sciomyzidae Tanytarsus sp. A Epler	<u> </u>		***
Tanytarsus sp. A Epler Tanytarsus sp. G Epler	4	1	3
Tanytarsus sp. G Epler Tanytarsus sp. L Epler	3	_	ĭ
Tanytarsus sp. T Epler	_	_	ī
Tanytarsus sp. 1 Epiei Tanytarsus sp.	4	1	3
I wie yewi awa ap.	•	⊸	_

Ephemeroptera			
Baetidae	****	2	_
Baetis sp.		_	4
Caenis sp.		1	_
Callibaetis floridanus	26	1	-
Callibaetis sp.	15	-	
Tricorythidae	-	EEF+	1
Gastropoda			
Amnicola dalli johnsoni	6	-	
Hebetancylus excentricus		2	-
Hydrobiidae	_	-	4
Micromenetus dilatatus avus	1		_
Physella sp.		-	1 6 2
Pyrogophorus platyrachis	1	_	6
Undetermined Gastropoda	-	1	2
Hemiptera			
Ambrysus sp.	2	_	_
Undetermined Hemiptera	-	6	_
Mesovelia sp.	11	-	$\frac{-}{2}$
Naucoridae	_	1	1
Ranatra sp.	1	_	_
Lepidoptera			
Undetermined Lepidoptera	1	4	_
Nemertea			
Prostoma rubrum	1	_	_
Odonata			
Argia sp.		2	_
Coenagrionidae	32	_	1
Corduliidae		1	-
Enallagma sp.	3	_	_
Libellulidae	-	1	
Undetermined Odonata	<u></u>	1	
Zygoptera	_	-	1
Oligochaeta			
Aulodrilus pigueti	4	1	1
Dero vaga	6		2
Haber speciosus	_	1	_
Limnodrilus hoffmeisteri	6	9	12
Pristina synclites	ĭ	<u>-</u>	_
Pelecypoda	•		
Corbicula sp.	-	4	3
Trichoptera		-	_
Oecetis inconspicua emplx.	_	1	_
	_	3	***
Oxyethira sp. Trombidiformes	•	J	
	_	1	1
Arrenurus sp.		î	_
Limnesia sp.		-	

