Biological Assessment of

Clearwater East Wastewater Facility

Pinellas County

NPDES #FL0021865

Sampled November 1997

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DO NOT REMOVE

August 1998

Biology Section
Division of Administrative and Technical Services

Comprehensive Quality Assurance Plan No. 870346G

Department of Environmental Protection
Results of Fifth Year Inspections

Discharger:	Clearwater East WWTF
County:	Pinellas
NPDES Number:	FL0021865
State Permit Expiration Date:	30 September, 1998

Toxics Sampling Inspection (XSI)

Date Sampled: 4 November 1997

Results: The herbicide atrazine was detected in the effluent at non-problem levels. Effluent metals complied with the Class II marine water quality standards. Total residual chlorine (0.08 mg/L) exceeded Class II water quality standards (Rule 62-302.530 (19) FAC).

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 4 November 1997

Results: The effluent was not acutely toxic to the invertebrate, *Cerodaphnia dubia*, or to the fish, *Cyprinella leedsi*.

Impact Bioassessment Inspection (IBI)

Date Sampled: 4 November 1997

Results: Measures of invertebrate health at the test sites were similar to, or better than, the control site, suggesting the discharger was having no adverse effect on the receiving waters. Although Shannon-Weaver diversity was depressed at all three stations, a small number of pollution sensitive taxa were also present. The facility did not appear to be adversely affecting phytoplankton community health.

Water Quality Inspection (WQI)

Date Sampled: 4 November 1997

Results: Nutrients at all three study sites were higher than those found in approximately 85% of Florida's estuaries. Nutrient levels at the test sites were generally lower than those detected at the control site, suggesting that the effluent was not exacerbating the already enriched nutrient regime of Tampa Bay. Algal Growth Potential at the control site exceeded the 10 mg dry wt/L "problem threshold" for marine waters.

These fifth year inspections provide the necessary information to evaluate the facility's impact on its receiving waters and to provide the basis for specific condition recommendations for permit renewal.

Introduction

The Clearwater East Advanced Wastewater Treatment Facility is located in Pinellas County, Florida (see map in Appendix). Discharge from this facility also includes flow from the Clearwater Northeast Wastewater Treatment Facility. The design flow for the combined facilities is 18.5 MGD. Treatment at the Clearwater East facility consists of mechanical bar screening and grit removal, followed by a Bardenpho advanced wastewater treatment process. The Bardenpho process consists of primary anoxic treatment, aeration, secondary anoxic treatment, re-aeration, and clarification. The treated effluent is filtered (through a sand filter) and chlorinated for disinfection. The effluent from the Clearwater Northeast WWTF is discharged through a pipeline to the Clearwater East WWTF where the chlorinated effluents are combined, dechlorinated, and post-aerated prior to discharge into the Class II waters of Old Tampa Bay.

The state permit limits for the Clearwater East WWTF are listed in Table 1. Between May 1, 1997, and August 1, 1997, the WWTF failed to report elevated effluent Carbonaceous Biochemical Oxygen Demand on 25 separate occasions.

Methods

The focus of this investigation was to determine the discharger's effects on the receiving waters. A comparison of biological community health was made between a control site (located approximately 1,000 meters east of the discharge) and two test sites (bracketing the discharge within Old Tampa Bay) (see map in Appendix). A habitat assessment was performed *in situ* to establish comparability between sites. Supplemental physical/chemical data were also collected on the effluent and study sites.

The effluent was analyzed for metals and organic constituents (base, neutral, acid extractables and pesticide extractables). Additionally, nutrient analyses were performed on effluent, control, and test sites. Methods used for all chemical analyses are on file at the DEP Central Chemistry Laboratory in Tallahassee.

Acute screening toxicity bioassays, using the water flea, *Ceriodaphnia dubia*, and the fish, *Cyprinella leedsi*, as test organisms, were performed on an effluent sample. Algal Growth Potential (AGP) tests were performed using *Selenastrum capricornutum* as the test organism for the freshwater effluent, and *Dunaliella* tertiolecta for the marine receiving water sites. Phytoplankton was sampled at both control and test sites via subsurface grabs. Chlorophyll *a* was also determined for phytoplankton communities.

Benthic macroinvertebrate communities were evaluated at control and test sites. Invertebrates were collected using three replicate petite Ponar grabs. Sediment samples from the study sites were also collected for organic analyses. All biological field and lab procedures 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/biology/sops.htm

Explanation of Measurements of Community Health

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

Habitat Assessment: Six attributes known to have potential effects on the estuarine biota were evaluated and scored. Based on the sum of these individual scores, overall habitat quality is assigned to one of four categories: Excellent (81-100 points); Good (39-80 points); Fair (25-38 points); or Poor (0-24 points).

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

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

Numbers of pollution sensitive taxa: Some organisms become rare or absent as the intensity or duration of disturbance increases. Species sensitivity data from other sources, such Chang *et al.* (1992), Farrell (1992), Hudson *et al.* (1990), Lenat (1993), and Whitmore (1989), are used as appropriate.

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

systems, an increase in the % tubificid oligochaetes, a decrease in the % pelecypods, and a decrease in the number of polychaete taxa are all considered indicators of disturbance (Engel *et al.* 1994).

For graphical purposes, the percent differences between the control and test sites involving the number of taxa, the diversity, number of polychaete taxa and percent pelecypoda are measured as the control site minus test site divided by the control site. The percent differences between sites involving algal density, chlorophyll *a*, algal growth potential, and percent tubificidae are measured as the test site minus control site divided by the control site.

The following personnel were involved in this investigation: James Fine, Charles Kovach, Joe Squitieri, Neal Schobert (Southwest District), Jennifer Eichelberger, Ken Espy, Marshall Faircloth, Russel Frydenborg, Joy Jackson, Scott Lashbrook, Elizabeth Miller, Johnny Richardson, Urania Quintana, Lisa Tamburello, David Whiting, and Vicki Whiting (Tallahassee Biology Laboratory). The report was reviewed by the Point Source Studies Review Committee, consisting of Wayne Magley, Jan Mandrup-Poulsen, and Michael Tanski, as well as District representatives.

Results and Discussion

The City of Clearwater East WWTF outfall is located in the high salinity waters of Old Tampa Bay, approximately 450 meters offshore at a depth of 1.3 meters. Habitat quality was within the "good" category at all three study sites (see Marine Habitat Assessment sheets in Appendix). Sediments at all three sites consisted mostly of sand, mud, muck, and silt. Physical/chemical parameters at the test sites were similar to those measured at the control site. For example, pH was 7.7 SU at all three stations, and dissolved oxygen ranged from 5.9 mg/L at the control site to 6.4 mg/L at test site 1. The water was slightly turbid at the receiving water sites due to heavy wave action from earlier inclement weather.

The herbicide, atrazine, was detected in the effluent (0.05 mg/L) at a concentration below chronically toxic levels (AQUIRE 1991). With the exception of zinc, which was found in the effluent at a concentration of 41 mg/L, other metals were very low or undetected. All metals complied with Class II water quality standards. The laboratory-determined total residual chlorine was 0.08 mg/L, a violation of Class II water quality standards (Rule 62-302.530(19) FAC).

The sample of effluent was not acutely toxic to the invertebrate, *Ceriodaphnia dubia,* or to the fish, *Cyprinella leedsi,* during the 48-hour bioassays (Appendix).

Nutrient levels at the test sites were generally lower than those detected at the control site, suggesting that the effluent was not exacerbating the already enriched nutrient regime of Tampa Bay. For example, ortho-phosphate levels at the control site (0.52 mg/L), test site 1 (0.38 mg/L) and test site 2 (0.26 mg/L), exceeded those values typically found in 95% of Florida's estuaries. Similarly, nitrate+nitrite concentrations at all three study sites were elevated, with the highest levels found at the control site (0.21 mg/L), decreasing to 0.12 mg/L and 0.063 mg/L at test sites 1 and 2, respectively.

Algal Growth Potential (AGP) results coincided with nutrient results. AGP at the control site (16.4 mg dry wt/L) exceeded the 10 mg dry wt/L "problem threshold" for marine waters (Ron Raschke, USEPA, personal communication). AGP values at both test sites were just below the "problem threshold" level with measurements of 9.4 mg dry wt/L at test site 1 and 7.4 mg dry wt /L at test site 2.

Phytoplankton communities at all three study sites were similar, each with low taxa richness, low diversity, and low to undetected chlorophyll *a* values. All three sites were dominated by the diatom, *Rhizosolenia* sp., which made up 72%, 89%, and 76% of the control site, test site 1, and test site 2 communities, respectively. Represented in smaller numbers at all three sites was the cryptophyte, *Chroomonas* sp., and the diatom, *Cylindrotheca closterium*. Although Figure 1 shows some large differences among the three study sites, this is actually an artifact of the low values being compared. When comparing the actual values, the discharge did not appear to be having any adverse effects on the algal communities in Old Tampa Bay.

Quantitative measures of benthic macroinvertebrate community health indicated that the discharge was not adversely affecting the receiving water communities. Figure 2 indicates the degree of difference between the invertebrate communities of the control and test sites. Larger degrees of differences (that is, higher percentages) correspond with greater degrees of degradation. Negative values mean the test site is better than the control.

Table 1. Effluent limits and summary of chemistry data.

City of Clearwater East W W TP	Effluent Limits	Effluent Sample	Control Site	Test Site 1	Test Site 2
Organic Constituents (µg/L)					
Atrazine	-	0.05 I	-	-	-
Metals (µg/L)					
Aluminum	-	40 I	-	-	-
Arsenic	-	40 U	-	-	-
Cadium	-	0.1 I	-	-	-
Chromium	-	10 U	-	-	-
Copper	-	10.4 J	-	-	-
Iron	-	20 I	-	-	-
Lead	-	0.74	-	-	-
Magnesium	-	7.05	-	-	-
Mercury	-	0.10 U	-	-	-
Nickel	-	7 U	-	-	-
Selenium	-	50 U	-	-	-
Silver	-	0.11	-	-	-
Zinc	-	41	-	-	-
Nutrients (mg/L)					
Ortho-phosphate	-	3.5 A	0.52	0.38 A	0.26
Total phosphorus	-	3.1	0.56	0.45	0.33
Ammonia	-	0.042 A	0.052	0.037 A	0.065
Nitrate+Nitrite	-	1.3 A	0.21	0.12	0.063
TKN	-	0.74	0.67	0.68	0.65
Total Nitrogen	3.0 *	2.04	0.88	0.80	0.71
General Phys-Chem Parameters					
Habitat Assessment	-	-	48	46	48
D.O. (mg/L)	4.0 *	-	5.9	6.4	6.0
pH (SU)	6.5 - 8.5 *	-	7.7	7.7	7.7
Conductivity (µmhos/cm)	-	-	28,527	27,850	29,087
Temperature (°C)	-	-	22.8	22.8	22.9
Flow (MGD)	18.5 *	-	-	-	-
Total Residual Chlorine (mg/L)	0.01 **	0.08			
AGP (mg dry wt/L)	-	71	16.4	9.4	7.4
Toxicity					
Bioassay Fish	-	Non-toxic	-	-	-
Bioassay Invertebrate	-	Non-toxic	-	-	-

* Permit limit
** Class II water quality standard
a - Annual average
c - Value is calculated based on hardness
A - Value reported is the mean of two or more determinations
I - Value reported is less than the minimum quantitation limit, and greater than or equal to the minimum detection limit
J - Estimated value
U - Material analyzed for but not detected; value reported is the minimum detection limit

Table 2. Major characteristics of community structure of control and test sites.

City of Clearwater East WWTP	Control Site	Test Site 1	Test Site 2
Macroinvertebrate Qualitative			
Number of Taxa	19	20	18
Shannon-Weaver Diversity	0.8	1.5	0.9
No. Polychaete Taxa	5	8	10
Community Composition			
% Amphipoda	94	91	95
% Cumacea	1	0.0	2
% Decapoda	0.0	0.5	0.0
% Gastropoda	0.3	0.0	0.0
% Pelecypoda	3	3	2
% Polychaeta	0.8	5	1
% Other	0.9	0.5	0.0
Functional Feeding Groups			
% Browser-grazers	47	45	48
% Predators/Carnivores	0.8	1	0.5
% Scavengers	47	46	48
% Scrapers	0.3	0.0	0.1
% Surface Deposit Feeders	0.3	2	0.4
% Suspension Feeders	5	5	4
% Unknown	0.0	1	1
Phytoplankton Algae			
Number of Taxa	8	4	5
Shannon-Weaver Diversity	1.43	0.64	1.07
Chlorophyll a (µg/L)	1 U	2 I	1 U
Algal Density (#/mL)	2,313	2,230	2,298
% Blue-green	1	0.0	0.0
% Cryptophytes	14	6	17
% Diatoms	82	93	83
% Chlorophyceae	2	0.0	1
% Dinoflagellates	1	1	0.0

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

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

Taxa richness was similar at all three study sites, with 19 taxa at the control site, 20 taxa at test site 1, and 18 taxa at test site 2 (Table 2). Although Shannon-Weaver diversity was depressed at all three sites, it was highest at test site 1 (1.5), intermediate at test site 2 (0.9), and lowest at the control site (0.8). The number of polychaete taxa increased from 5 at the control site to 8 and 10 at test site 1 and test site 2, respectively. With the exception of *Ceratonereis* sp., found at test site 2, and *Parahesione luteola*, found at the control site, most of the polychaete taxa found at the three study sites were pollution-tolerant. All three study sites were dominated by the relatively common amphipods, *Ampelisca abdita* and *Grandidierella bonnieroides*, which made up approximately 90% of the total community. Additionally, several pollution sensitive amphipods, including *Baeta catharinensis* (at test sites 1 and 2) and *Rudilemboides nagl*, (found at the control site and test site 2), were also present. Pelecypods (mostly *Mactra fragilis)* made up only 3% of the community sampled at the control site and test

site 1, and 2% of the community sampled at test site 2.

Conclusions

The herbicide atrazine was detected in the effluent at non-problem levels. Effluent metals complied with the Class II marine water quality standards. The laboratory-determined total residual chlorine was 0.08 mg/L, a violation of Class II water quality standards (Rule 62-302.530(19) FAC).

The sample of effluent was not acutely toxic to the invertebrate, *Ceriodaphnia dubia,* or to the fish, *Cyprinella leedsi.*

Nutrient levels at the test sites were generally lower than those detected at the control site, suggesting that the effluent was not exacerbating the already enriched nutrient regime of Tampa Bay. Algal growth potential at the control site exceeded the 10 mg dry wt/L "problem threshold" for marine waters.

The discharge did not appear to be having any adverse effects on the algal communities in Old Tampa Bay.

Measures of invertebrate health at the test sites were similar to, or better than, the control site, suggesting the discharger was having no adverse effect on the receiving waters. Although Shannon-Weaver diversity was depressed at all three stations, a small number of pollution-sensitive taxa were also present.

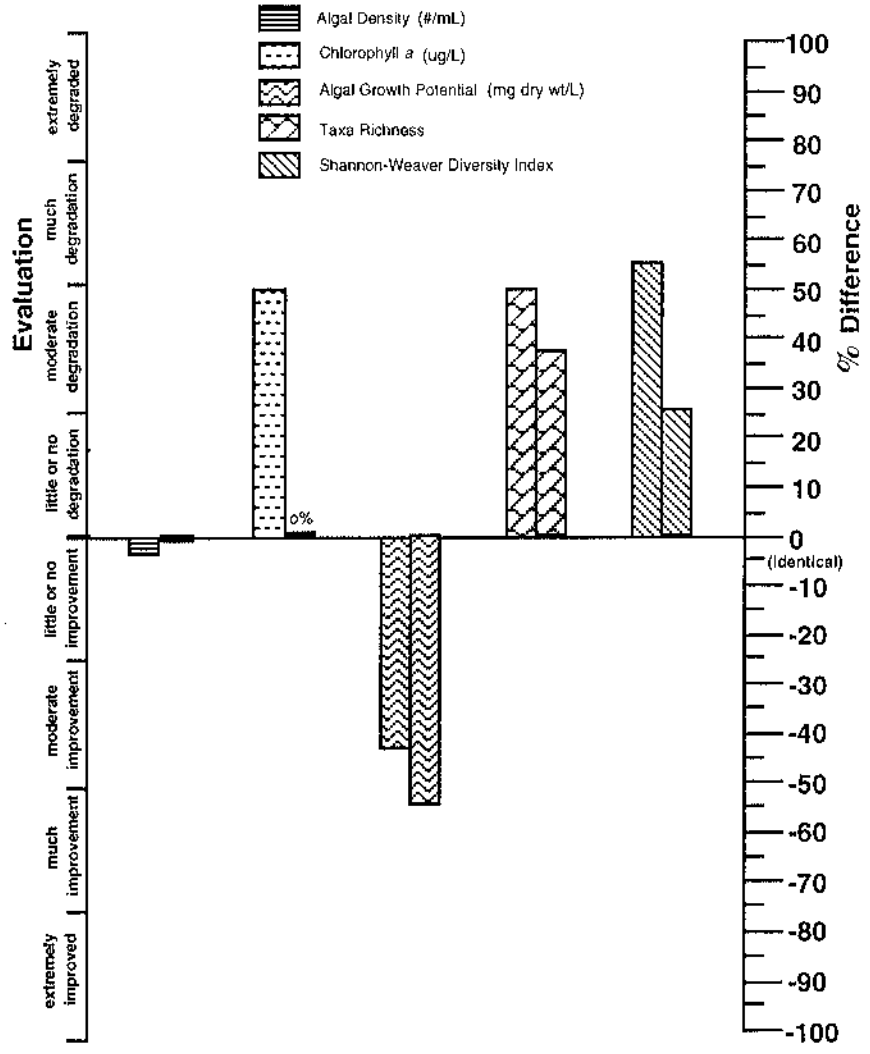


Figure 1. Effect of discharge on the phytoplankton community.

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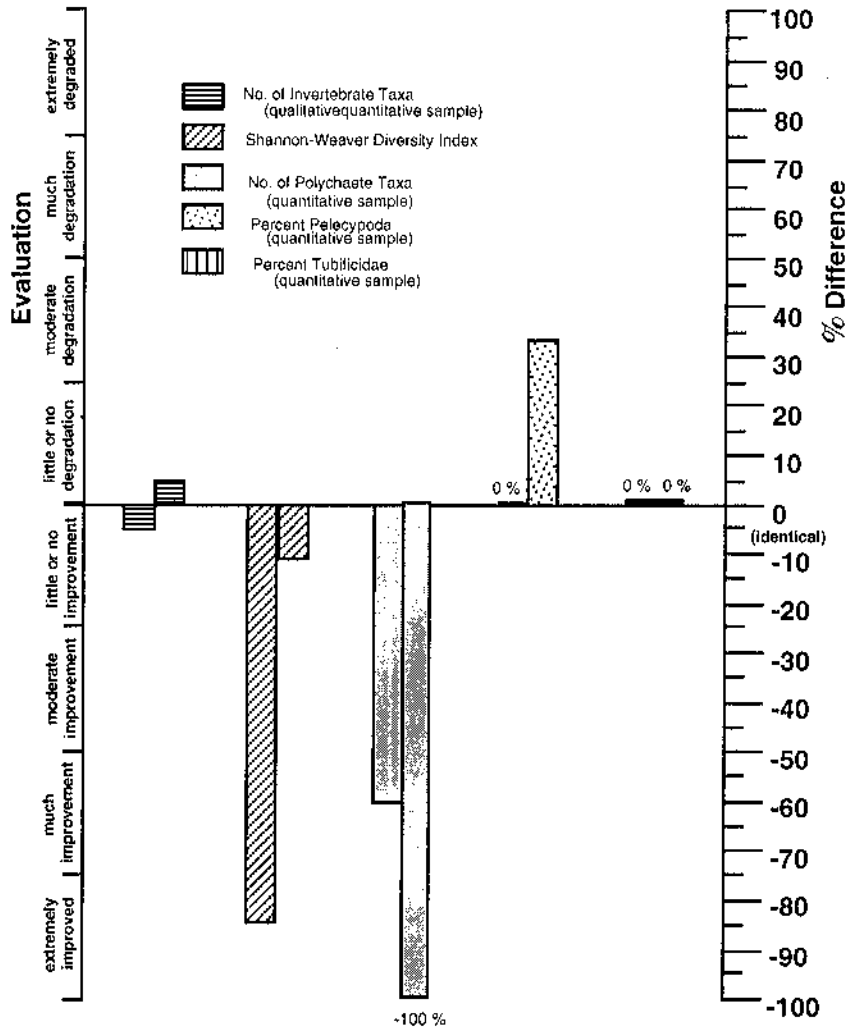


Figure 2. Effect of discharge on the benthic macroinvertebrate community.

Typical Values for Selected Parameters in Florida Waters

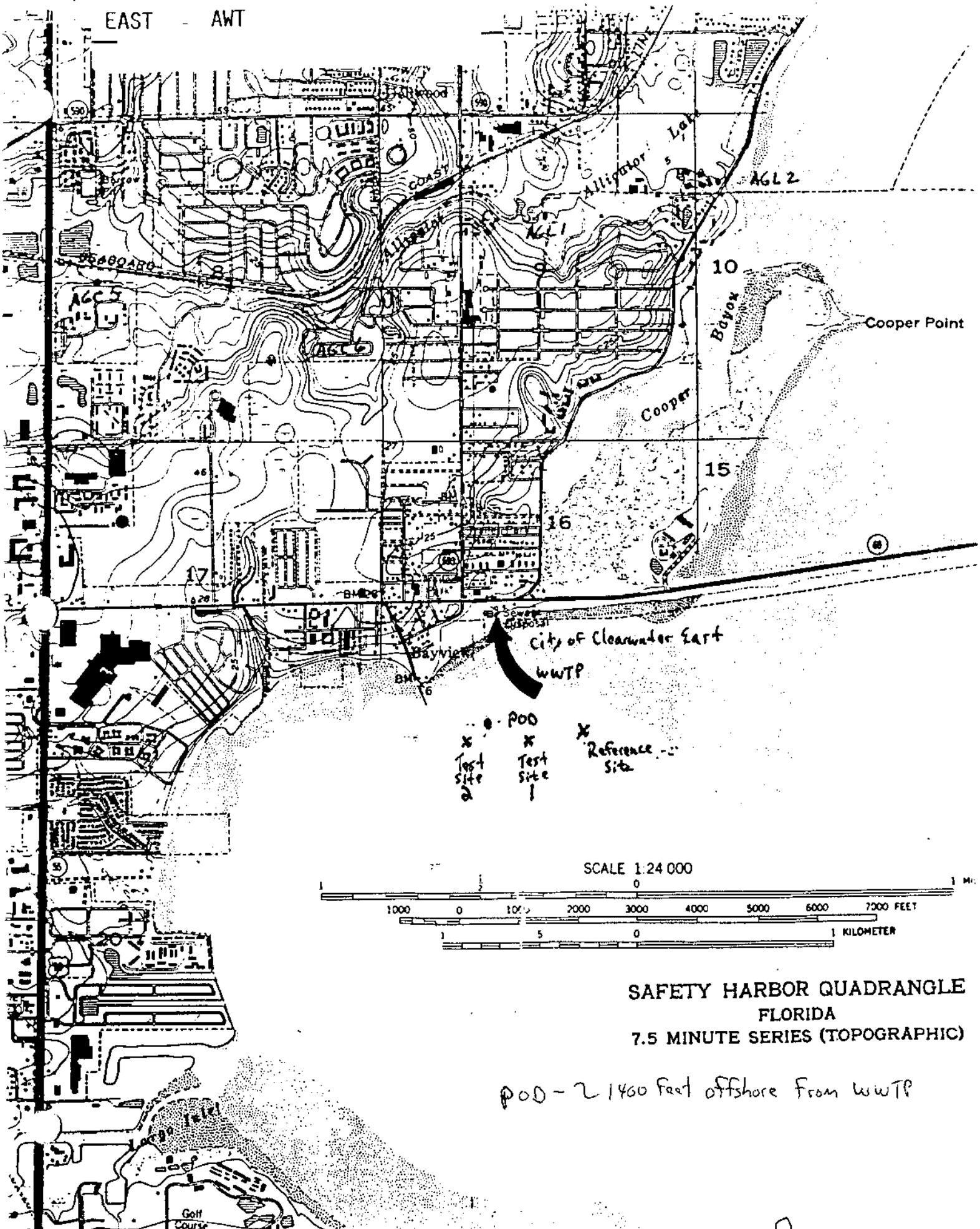
Adapted from Joe Hand, FDER, personal communication, 1991
(data was collected between 1980 and 1989)

Percentile Distribution

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

Units:

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



SAFETY HARBOR QUADRANGLE
FLORIDA
7.5 MINUTE SERIES (TOPOGRAPHIC)

POD - ~1460 feet offshore from WWTP

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Facility Name: City of Clearwater East

Date Summary Prepared: 10/23/97

Location (attach detailed map):

County: Pinellas

District: SWD

Federal Permit # and expiration date: FL0021865

State GMS # and State expiration date:

Facility Type: Industrial (Municipal) Federal Agricultural Other (list):

Function of facility: Domestic Wastewater Treatment Plant.

Description of treatment process: AWT
East Plant is 5.0 MGD Type I Extended aeration activated sludge treatment using a five stage Bardenpho. Advanced Wastewater Treatment (AWT) process. Effluent is filtered & chlorinated prior to combining with the effluent from the Northeast Plant. Combined effluents are dechlorinated and aerated prior to discharge to Old Tampa Bay. Northeast is 13.5 MGD. (Bardenpho stages: Fermentation, Anoxic, Oxidation, Second Anoxic, Reaeration.)

Receiving waters: Old Tampa Bay

Classification: I (II) III

Design Flow: 18.5 MGD

Mean Flow:

Flow during survey:

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

therefore, the best time to sample is:

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

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

Parameter	Limit (units)
See attached sheet	

Describe special permit conditions and permit modifications:

Discharge from this site includes flow from Clearwater Northeast.

5 MGD + 13.5 MGD = 18.5 MGD

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Page 2 of
City Clearwater East
(Facility)

Description of permitted outfall(s):
Effluent is discharged from WWTP thru a pipe that is ~1200 - 1400 feet in length and discharges into Old Tampa Bay.

List permit violations (from MOR data or other source) and plant upsets that occurred within past year: $CBOD_5$, failure to report. 25 times May 1, 1997 - Aug 1, 1997

Describe previous impact bioassessments, WQBEL's, and previous or current enforcement actions:
No enforcement initiated to date.

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):
(Biologist)
Neal R. Skobeat (Inspector)
(Engineer)
( )
( )
( )

Mar 12 98 10:19 No.002 P.04
WASTE MGT TAMPA SWDIST TEL:813-744-6125

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS - Final

1. During the period beginning on the effective date and lasting through the expiration date of this permit, the permittee is authorized to discharge from outfall 001, sanitary wastewater.

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

PARAMETERS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS		
	Annual Average	Monthly Average	Weekly Average	Daily Maximum	Measurement Frequency	Sample Type	Sampling Point
Flow, MGD	Report	Report	Report	Report	Continuous	Recording flowmeter & totalizer	Effluent
Carbonaceous Biochemical Oxygen Demand, mg/l	5.0	6.25	7.5	--	Daily	24-hr Comp	Effluent
Total Suspended Solids, mg/l	5.0	6.25	7.5	--	Daily	24-hr Comp	Effluent
Total Nitrogen (as N), mg/l	3.0	3.75	4.5	--	Daily	24-hr Comp	Effluent
Fecal Coliform Bacteria, N/100 ml	(See Item 3 on Page I-2.)				Daily	Grab	Effluent
pH, Standard Units	(See Item 4 on Page I-2.)				Daily	Grab	Effluent
Total Residual Chlorine, mg/l	(See Item 8 on Page I-3.)				7/week	Grab	Effluent
Dissolved Oxygen	(See Item 10 on Page I-3.)				7/week	Grab	Effluent
[redacted] Whole Effluent Toxicity	(See Item 9, page I-3.)				See Part IV	Grab	Effluent

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		11/04/17	1130	Old Tampa Bay

REMARKS:	LOCATION:	FIELD ID/NAME:
Incoming Tide.	City of Clearwater - East	Reference Site

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
				10	10		80 Adjacent Bridge

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

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

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

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect (draw cross-section & provide at least 3 velocity & depth values)

Artificially Channelized ☒ no ☐ ☐ ☐ Artificially Impounded ☐ yes (recent, severe / some recovery / mostly recovered, more sinuous)

High Water Mark (m above bed): 4.5

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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt	100	3	Ponar
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Shorezone (Roots/Veg.)				*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	.3	22.84	7.74	5.86	28527			1.0
Mid-depth	.8	22.64	7.73	5.21	30247			
Bottom	1.2	22.62	7.71	5.15	30270			

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

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

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

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

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

Weather Conditions/Notes: Previous weeks weather was Severe so water was Slightly turbid.

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

SAMPLING TEAM:	SIGNATURE:	DATE:
James Fine / Charles Keough	James Fine	11/04/17

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (MO/DY):	RECEIVING BODY OF WATER:
		11/04/97	Old Tampa Bay

REMARKS:	LOCATION:	FIELD ID/NAME:
Incoming Tide	City of Clearwater - East	Reference Site

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations — 5	None—Unaltered shoreline. 9-10 points	Mostly natural shoreline, but with occasional riprap. 6-8 points	Shoreline consisting mostly of riprap and vertical seawalls. 3-5 points	Shoreline consisting almost entirely of vertical seawalls. 0-2 points
Community Types Observed — 30	At least four communities observed from the following list: mangrove swamp, marsh, oyster bar, grass bed, reef, saltern, natural beach, or tidal creek. 38-50 points	Two or three communities observed from those listed. 26-37 points	One community observed from those listed. 13-25 points	No communities observed from those listed. 0-12 points
Tidal Fluctuation — 4	>0.75 m. 4-5 points	0.5 - 0.75 m. 3 points	0.25 - 0.5 m. 2 points	<0.25 m. 0-1 point
Freshwater Discharges/ Alterations — 5	Only natural runoff. 9-10 points	Mostly natural runoff, but with a few, small stormwater sources. 6-8 points	Considerable stormwater discharge from local roads, parking lots, etc. 3-5 points	Extensive manmade discharges, especially from canals draining large tracts of land. 0-2 points
Flow and Wave Action — 1	Light to moderate wave action present except under the harshest weather conditions. Flow unrestricted by manmade structures. 9-10 points	—	—	Heavy wave action sometimes present even during average weather conditions, or flow restricted by manmade structures so that velocities are very high. 0-2 points
Sediment Type — 3	Combination of sand, gravel, and shell. 12-15 points	Primarily sand, with small areas of mud. 8-11 points	Mixture of sand and mud, or well-aerated mud only. 4-7 points	Anaerobic mud. 0-3 points

Area has been dredged within last 5 years for Bridge construction

TOTAL SCORE 48

COMMENTS:

ANALYSIS DATE:	ANALYST:	SIGNATURE:
11/04/97	James Fine	

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		11/04/97	1030	Old Tampa Bay

REMARKS:	LOCATION:	FIELD ID/NAME:
Incoming Tide	City of Clearwater - East	Test Site 1

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
				10	10		80 Adjacent Bridge

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

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

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

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect (draw cross-section & provide at least 3 velocity & depth values)

Artificially Channelized ☒ no ☐ ☐ ☐
Artificially Impounded ☐ yes — recent, severe / some recovery / mostly recovered, more sinuous

High Water Mark (m above bed): 4

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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt	100	3	Ponar
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Shorezone (Roots/Veg.)				*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	.3	22.77	7.68	6.40	27850			1.0
Mid-depth	1	22.62	7.70	5.40	30212			
Bottom	1.3	22.60	7.69	5.13	30202			

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

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

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

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

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

Weather Conditions/Notes: Previous weeks weather was severe so bottom was stirred up and water was slightly turbid.

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

SAMPLING TEAM:	SIGNATURE:	DATE:
James Fine / Charles Kovach	James Fine	11/07/97

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/DY):	RECEIVING BODY OF WATER:
		11/04/97	Old Tampa Bay

REMARKS:	LOCATION:	FIELD ID/NAME:
Incoming Tide	City of Clearwater - East	Test Site 1

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations: 5	None—Unaltered shoreline. 9-10 points	Mostly natural shoreline, but with occasional riprap. 6-8 points	Shoreline consisting mostly of riprap and vertical seawalls. 3-5 points	Shoreline consisting almost entirely of vertical seawalls. 0-2 points
Community Types Observed: 28	At least four communities observed from the following list: mangrove swamp, marsh, oyster bar, grass bed, reef, saltern, natural beach, or tidal creek. 38-50 points	Two or three communities observed from those listed. 26-37 points	One community observed from those listed. 13-25 points	No communities observed from those listed. 0-12 points
Tidal Fluctuation: 4	>0.75 m. 4-5 points	0.5 - 0.75 m. 3 points	0.25 - 0.5 m. 2 points	<0.25 m. 0-1 point
Freshwater Discharges/ Alterations: 5	Only natural runoff.. 9-10 points	Mostly natural runoff, but with a few, small stormwater sources. 6-8 points	Considerable stormwater discharge from local roads, parking lots, etc. 3-5 points	Extensive manmade discharges, especially from canals draining large tracts of land. 0-2 points
Flow and Wave Action: 1	Light to moderate wave action present except under the harshest weather conditions. Flow unrestricted by manmade structures. 9-10 points	—	—	Heavy wave action sometimes present even during average weather conditions, or flow restricted by manmade structures so that velocities are very high. 0-2 points
Sediment Type: 3	Combination of sand, gravel, and shell. 12-15 points	Primarily sand, with small areas of mud. 8-11 points	Mixture of sand and mud, or well-aerated mud only. 4-7 points	Anaerobic mud. 0-3 points

TOTAL SCORE: 46

COMMENTS:

ANALYSIS DATE:	ANALYST:	SIGNATURE:
11/04/97	James Fine	

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		11/04/97	1200	Old Tampa Bay

REMARKS:	LOCATION:	FIELD ID/NAME:
Incoming Tide	City of Clearwater East	Test Site 2

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
				10	10		80 Alsaua Bridge

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

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

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

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect (draw cross-section & provide at least 3 velocity & depth values)

Artificially Channelized ☒ no ☐ ☐ ☐ ☐ Artificially Impounded ☐ yes (recent, severe / some recovery / mostly recovered, more sinuous)

High Water Mark (m above bed): 4

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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt	100	3	Ponar
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Shorezone (Roots/Veg.)				*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	.3	22.90	7.72	5.99	29087			1.0
Mid-depth	1	22.49	7.68	4.97	29803			
Bottom	2	22.40	7.76	4.88	30100			

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

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

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

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

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

Weather Conditions/Notes: Water was slightly turbid due to previous weeks inclement weather.

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

SAMPLING TEAM:	SIGNATURE:	DATE:
James Fine / Charles Kovach	James Fine	11/07/97

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		11/04/97	Old Tampa Bay

REMARKS:	LOCATION:	FIELD ID/NAME:
Incoming Tide	City of Clearwater - East	Test Site 2

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations: 5	None—Unaltered shoreline. 9-10 points	Mostly natural shoreline, but with occasional riprap. 6-8 points	Shoreline consisting mostly of riprap and vertical seawalls. 3-5 points	Shoreline consisting almost entirely of vertical seawalls. 0-2 points
Community Types Observed: 30	At least four communities observed from the following list: mangrove swamp, marsh, oyster bar, grass bed, reef, saltern, natural beach, or tidal creek. 38-50 points	Two or three communities observed from those listed. 26-37 points	One community observed from those listed. 13-25 points	No communities observed from those listed. 0-12 points
Tidal Fluctuation: 4	>0.75 m. 4-5 points	0.5 - 0.75 m. 3 points	0.25 - 0.5 m. 2 points	<0.25 m. 0-1 point
Freshwater Discharges/ Alterations: 5	Only natural runoff. 9-10 points	Mostly natural runoff, but with a few, small stormwater sources. 6-8 points	Considerable stormwater discharge from local roads, parking lots, etc. 3-5 points	Extensive manmade discharges, especially from canals draining large tracts of land. 0-2 points
Flow and Wave Action: 1	Light to moderate wave action present except under the harshest weather conditions. Flow unrestricted by manmade structures. 9-10 points	—	—	Heavy wave action sometimes present even during average weather conditions, or flow restricted by manmade structures so that velocities are very high. 0-2 points
Sediment Type: 3	Combination of sand, gravel, and shell. 12-15 points	Primarily sand, with small areas of mud. 8-11 points	Mixture of sand and mud, or well-aerated mud only. 4-7 points	Anaerobic mud. 0-3 points

TOTAL SCORE: 48

COMMENTS:

ANALYSIS DATE:	ANALYST:	SIGNATURE:
11/04/97	James Fin	James Lin

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: City of Clearwater EAST WWTF
County: Pinellas
Contact / District: James Fine / Southwest
NPDES Permit #: FL0021865
LIMS Sample #: 198538 LIMS Job #: 97-OCT-29-11
sample log: 11-3-97 DW
Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through
Temperature range: room 24.0°C - 25.0°C
incubator 25.0°C - 26.0°C
Test Number: 1 of 2
Remarks: D = dead, M = missing

Sample Collection: Date 10-28-97 Time 0925
Test Beginning: Date 10-29-97 Time 1440
Test Ending: Date 10-31-97 Time 1400
Organism Batch #: 44 Diluent Batch #: 42
Organism Age: < 24 hours
Test Organism: Ceriodaphnia dubia

Instrument Calibrations:	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	22.8 @ 22.9	8.2 @ 25.1 °C	111.1 @ 101.3 MF 10/30/97 106.9 @ 1005 @ 25.1 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	22.9 @ 22.9	8.2 @ 25.1 °C	106.4 @ 101.3 993 @ 1005 @ 24.9 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	22.9 @ 23.0	8.2 @ 25.2 °C	111.0 @ 101.3 996 @ 1005 @ 24.7 °C

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) (µmhos/cm) 0 hr	UNCORRECTED Cond. (µmhos/cm) 24 h	UNCORRECTED Cond. (µmhos/cm) 48 h
Control A	A	5	5	5	7.7		7.9	23.9		25.1	7.8		7.5	165		245
Control B	B	5	5	5			8.1			24.6			7.5			220
Control C	C	5	5	5			8.3			24.1			7.7			205
Control D	D	5	5	5			8.3			23.9			7.7			205
100% A	A	5	5	5	7.7		8.7	24.0		25.1	7.8		7.8	990		950
100% B	B	5	5	5			8.7			25.1			7.8			970
100% C	C	5	5	5			8.7			24.2			7.9			1050
100% D	D	5	5	5			8.7			23.9			7.9			1005
Measured/Loaded by:		MF	MF	MF	MF		MF	MF		MF	MF		MF	MF		MF
Recorded by:		ND	MF	ND	ND		ND	ND		ND	ND		ND	ND		ND

Investigators' Signatures
Mark Knight
Marshall Faircloth

Water Quality Parameters verified by MF

	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			0	—	James Fine
Lab Total Residual Cl2 (mg/L):		<0.03	0.08	DR-100	ND
Alkalinity (mg/L as $CaCO_3$):		70	190	Hach	ND
Hardness (mg/L as $CaCO_3$):		85	218	Hach	ND
Total ammonia (mg/L as N):		<0.017	<0.017	Orion	ND

Ammonia Meter #98136 Ammonia Meter Slope: -59.9
Ammonia Blank: <0.017
Control Salinity: <1 ppt
Sample Salinity: <1 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: City of Clearwater East WWTP
County: Pinellas
Contact / District: James Fine / Southwest
NPDES Permit #: FL0021865
LIMS Sample #: 198538 LIMS Job #: 97-OCT-29-11
sample log: 11-3-97 ow

Sample Collection: Date 10-28-97 Time 0925
Test Beginning: Date 10-29-97 Time 1445
Test Ending: Date 11-3-97 Time 1120
Organism Batch #: 82 Diluent Batch #: well H2O
Organism Age: 12 days
Test Organism: Cyprinella leedsi

Test Type: (Screening) / Definitive
(Static) / Static Renewal / Flow-through
Temperature range: room 24.0°-25.0°C
incubator 25.0-26.0°C
Test Number: 2 of 2
Remarks: D = dead, M = missing

Instrument Calibrations:	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	22.8 @ 22.9	8.2 @ 25.1 °C	111.1 @ 101.3 990 @ 1005 @ 25.1 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	22.9 @ 22.9	8.2 @ 25.1 °C	106.4 @ 101.3 993 @ 1005 @ 24.9 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	22.9 @ 23.0	8.2 @ 25.2 °C	111.0 @ 101.3 996 @ 1005 @ 24.7 °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
ctl A	C1	5	5	5	7.3	7.9	8.4	25.3	25.0	25.0	7.2	7.1	7.3	260	260	265
ctl B	C2	5	5	5	7.3	7.9	8.4	25.3	24.9	24.8	7.2	7.2	7.3	260	260	260
ctl C	C3	5	5	5	7.3	7.9	8.4	25.3	24.8	24.7	7.3	7.3	7.5	260	260	260
ctl D	C4	5	5	5	7.3	7.9	8.4	25.3	24.9	24.8	7.3	7.3	7.7	260	260	260
100% A	C5	5	5	5	7.6	8.0	8.5	24.6	25.1	24.8	7.8	7.3	7.6	975	990	995
100% B	C6	5	5	5	7.6	8.0	8.5	24.4	25.2	24.8	7.9	7.4	7.5	975	1005	1005
100% C	C7	5	5	5	7.6	8.0	8.5	24.4	24.8	24.7	8.1	7.3	7.8	975	995	1005
100% D	C8	5	5	5	7.6	8.0	8.5	24.4	24.8	24.9	8.1	7.3	7.9	980	1000	1015
Measured/Loaded by:		MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF
Recorded by:		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Investigators' Signatures

Water Quality Parameters (unless noted by MF)

	Salt Water (Well Water)	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			0	—	James Fine
Lab Total Residual Cl2 (mg/L):	<0.03		0.08	DR-100	ND
Alkalinity (mg/L as $CaCO_3$):	120		190	Hach	ND
Hardness (mg/L as $CaCO_3$):	130		218	Hach	ND
Total ammonia (mg/L as N):	<0.017		<0.017	Orion	ND

Ammonia Meter #98136 Ammonia Meter Slope: −59.9 Ammonia Blank: <0.017 Control Salinity: 21 ppt Sample Salinity: 21 ppt

reviewer

Phytoplankton taxa list and densities (#/mL) for City of Clearwater East WWTP facility, collected via subsurface grabs in receiving water, on 4 November, 1997.

	Control Site	Test Site 1	Test Site 2
Bacillariophyceae			
Cylindrotheca closterium	113	74	132
Nitzschia sp.	65	–	17
Pennales	49	19	–
Rhizosolenia sp.	1666	1989	1753
Chlorophyceae			
Cosmarium sp.	–	–	17
Undetermined Chlorophyceae	49	–	–
Cryptophyceae			
Chroomonas sp.	324	130	380
Cyanophyceae			
Lyngbya sp.	16	–	–
Merismopedia sp.	16	–	–
Dinophyceae			
Peridinium sp.	16	19	–

Benthic macroinvertebrate taxa list for City of Clearwater East WWTP facility, collected via Ponar grab samples in receiving water, on 4 November, 1997. Densities, in number/m^2, represent the mean of three replicates.

	Control Site	Test Site 1	Test Site 2
Amphipoda			
Ampelisca sp.	14	–	–
Ampelisca abdita	24097	17958	15111
Batea catharinensis	–	111	14
Corophium sp.	–	14	–
Grandidierella bonnieroides	1361	2278	1625
Lysianopsis alba	–	14	–
Melita sp.	14	1028	–
Paraphoxus sp.	–	56	–
Rudilemboides naglei	69	–	28
Undetermined Amphilochidae	–	14	–
Undetermined Bateidae	–	–	28
Cumacea			
Cyclaspis varians	347	–	319
Spilocuma sp.	42	–	83
Decapoda			
Pinnixa sp.	–	56	–
Undetermined Xanthidae	–	69	–
Echinoderm			
Actiniaria	–	83	–
Undetermined Amphiuridae	14	–	–
Gastropoda			
Acteocina canaliculata	14	–	14
Haminoea succinea	28	–	–
Nassarius vibex	14	–	–
Undetermined Gastropoda	28	–	–
Nemertea			
Undetermined Nemertea	56	–	–
Pelecypoda			
Amygdalum papyrium	28	–	–
Corbula contracta	69	–	–
Mactra fragilis	778	764	278
Polychaeta			
Ceratonereis sp.	–	–	14
Diopatra cuprea	–	–	14
Eteone heteropoda	–	–	14
Glycinde sp.	–	–	28
Glycinde solitaria	14	–	–
Heteropodarke sp.	–	194	–
Laeonereis culveri	28	–	–
Minuspio sp.	–	514	14
Nereis sp.	56	28	14

Nereis acuminata	–	28	14
Nereis succinea	69	167	28
Parahesione luteola	42	–	–
Paraprionospio pinnata	–	69	–
Polydora sp.	–	–	14
Prionospio sp.	–	42	–
Sigambra tentaculata	–	28	–
Streblospio benedicti	–	111	14
Undetermined Goniadidae	14	–	–
Undetermined Hesionidae	–	14	–
Undetermined Spionidae	–	14	–
Websterinereis tridentata	–	–	14

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

1	2	3	11	12	17	18	19	20
Transaction Code		NPDES NUMBER		YR/MO/DA		Insp Type	Inspector	Fac Type
N	5	FL0021865		971104		B	S	1

Remarks

21 66

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

1	2	3	11	12	17	18	19	20
Transaction Code		NPDES NUMBER		YR/MO/DA		Insp Type	Inspector	Fac Type
N	5	FL0021865		971104		X	S	1

Remarks

21 66