

Biological Assessment of

Florida Cities Gulf Gate WWTP

Sarasota County

NPDES #FL0032816

Sampled July 1991

February 1992

Biology Section
Division of Technical Services

Department of Environmental Regulation
Results of Fifth Year Inspections

Discharger: Florida Cities Gulf Gate WWTP
County: Sarasota
NPDES Number: FL0032808 32816
State Permit Expiration Date:

Toxics Sampling Inspection (XSI)	
Date Sampled:	23 July 1991
Results:	No organic priority pollutants were detected in the sample. Concentrations of metals were very low and did not violate Class III standards.

Compliance Biomonitoring Inspection (CBI)	
Date Sampled:	23 July 1991
Results:	Not toxic to the cladoceran, *Ceriodaphnia dubia*, or the fish, *Notropis leedsi*.

Impact Bioassessment Inspection (IBI)	
Date Sampled:	23 July 1991
Results:	Quantitative analysis of the benthic macroinvertebrates showed some signs of stress at the both the control and test sites. Neither site was inhabited by pollution sensitive species. Taxa richness and diversity was substantially reduced at the test site, leading to a biological integrity violation. However, evidence of widespead nutrient contamination suggests that the facility was not solely responsible for the observed disturbances, and that non-point source abatement should be addressed in this basin.

Water Quality Inspection (WQI)	
Date Sampled:	23 July 1991
Results:	The two stations in the vicinity of the outfall were similar with regard to the degree of enrichment exhibited. Ortho and total phosphorus and TKN values from these two sites were found to be greater than 90%, 88%, and 95% of all other Florida estuaries, respectively. In contrast, nitrate+nitrite and ammonia values detected at the sites were not unusually elevated. It appears that a portion of the nutrient enrichment observed in the receiving waters is from sources (*e.g.*, stormwater) other than the Gulf Gate discharge. According to the past year's MOR data, the facility has been within permit limits for all nutrient parameters.

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 Florida Cities Gulf Gate WWTP is a 1.8 MGD advanced wastewater treatment (AWT) plant located at 7302 Bounty Drive, Sarasota County. Wastewater is treated via activated sludge, nitrification/ denitrification, final clarification and filtering, chlorination and dechlorination prior to surface water discharge into Matheny Creek. Matheny Creek discharges into Little Sarasota Bay approximately 0.5 miles southwest of the facility.

Permit limits according to Grizzle-Figg legislation are as follows: BOD and TSS (5 mg/L annual average, 6.25 mg/L monthly average, 7.25 mg/L weekly average, and 10 mg/L maximum), fecal coliform bacteria (200 organisms/ 100 ml annual average and 800 organisms/ 100 ml monthly average), total nitrogen (3 mg/L), TKN (2.5 mg/L), total phosphorus (1.0 mg/L), dissolved oxygen (5.0 mg/L), flow (1.8 MGD maximum), and pH (6.0 to 8.5). The operation of the plant appears to have been satisfactory, having consistently met AWT permit limits for the past year. A WQBEL study was performed in 1976.

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 reference site (located upstream of the discharge site in Matheny Creek) and a test site (the area down gradient of the discharge) (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. Acute screening toxicity bioassays, using *Ceriodaphnia dubia* and *Notropis leedsi* as test organisms, were performed on an effluent sample (Weber 1991). The effluent was analyzed for metals and for organic constituents (base neutral and acid extractables, and pesticide extractables). Additionally, nutrient analyses were performed on reference and test sites. Methods used for all chemical analyses are on file at the Tallahassee DER Chemistry Laboratory.

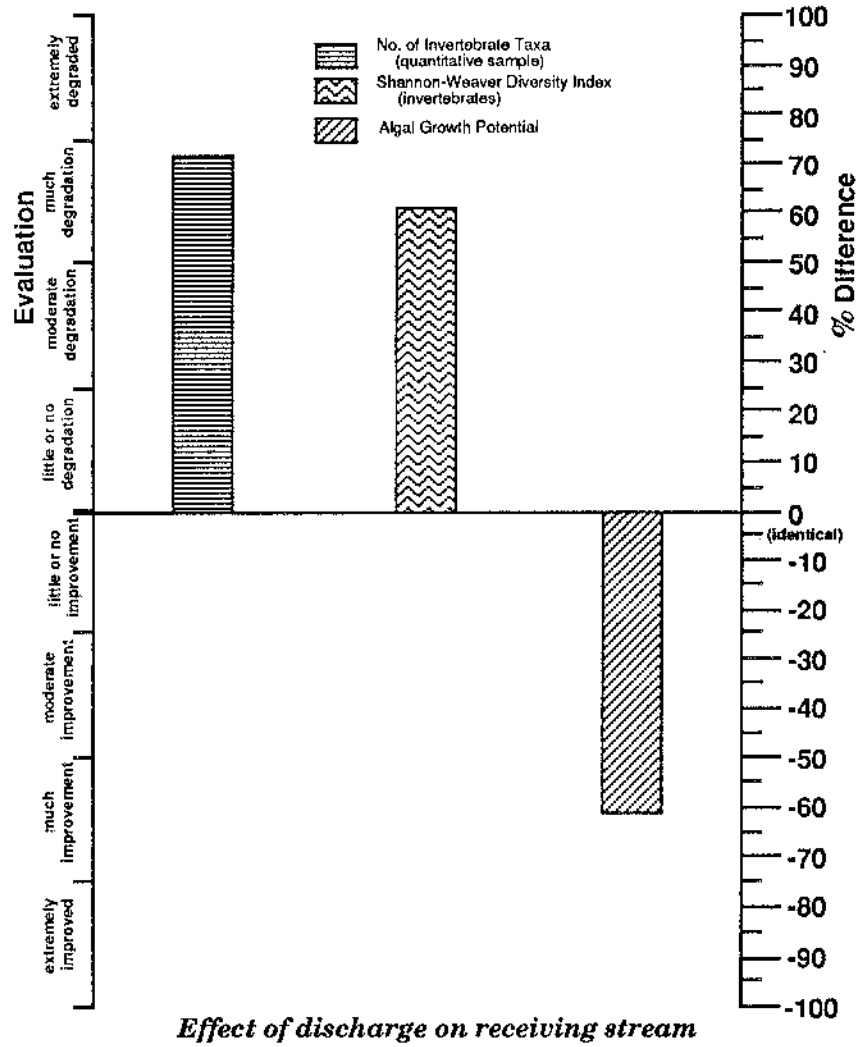
Benthic macroinvertebrate communities were evaluated at reference and test sites. The collection method consisted of 3 ponar grabs per site. Bacterial populations were analyzed for total and fecal coliforms following the methods of APHA (1989). Algal Growth Potential tests, using *Dunaliella tertiolecta* as the test organism, followed EPA (1974).

Explanation of Measurements of Community Health

Several different measurements of macroinvertebrate and algal community health have been employed. Many of these, such as the number of taxa and Shannon-Weaver Diversity Index are well known. Others are briefly explained here. The determination of the Quantitative Stability Index (for taxonomic % composition) is a two step process. First, the relative proportions of major taxonomic groups are calculated for each site. Then, the lesser of the two percentages for each discrete taxonomic group is totaled. A QSI (% composition) of 100% means that the two sites being compared are identical. This same type of procedure is used for calculating the QSI (functional feeding groups).

Major characteristics of community structure of control and test sites.

	Control Site	Test Site
Macroinvertebrate Ponar Grab		
Number of Taxa	7	2
Shannon-Weaver Diversity	2.6	1.0
% Pelecypoda	23.1	0
% Polychaeta	23.1	0
% Gastropoda	15.4	0
% Oligochaeta	15.4	50.0
% Diptera	15.4	0
% Malacostraca	7.7	50.0
% Predators	29.7	0
% Collector-Gatherers	18.1	100.0
% Collector-Filterers	29.7	0
% Scrapers	18.4	0
% Shredders	1.8	0
% Parasites	0	0
Algal Growth Potential (mg dry wt/l)	44.9	17.2



Effect of discharge on receiving stream
(measured as difference between control and test sites).

For graphical purposes, the percent differences between the control and test sites involving the number of taxa and the diversity index are measured as the control site minus test site divided by the control site. The percent differences between sites involving 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: Pat Fricano (DER SW District), Pam Fetterman, Ken Wall, Peter Mitchell, and Jerry Lee Thomas (Sarasota County Pollution Control), and Lyn Burton, Russel Frydenborg, Kathleen Lurding, and Sandy McClure (Tallahassee Biology Laboratory).

Results and Discussion

Matheny Creek is a tidally influenced system. Habitat quality at the test site (with 41 points) was better than that found at the control site (with only 14 points) (Appendix). Therefore, one would expect a superior biological community from the test site, which had slightly fewer littoral alterations and more community types. The shoreline at the reference site consisted almost entirely of vertical seawalls. The predominant surrounding land use for both sites was residential, although commercial land uses (30%) were also noted at the control site. The primary source of potential non-point source pollution in the area is stormwater run-off.

Low dissolved oxygen (0.7 mg/L at the bottom, 4.8 mg/L at the surface) was encountered at the reference site. Salinity (24.9 ppt upstream and 19.3 ppt downstream) reflected the marine influence.

The effluent was not toxic to the cladoceran, *Ceriodaphnia dubia*, or to the fish, *Notropis leedsi*, in 48 hour static bioassays.

No organic priority pollutants were found in the grab sample of effluent and only a small amount of iron was present (35 µg/L). Fecal coliform (100 org/100 mL) and total coliform (800 org/100 mL) measured at the test site did not violate surface water quality standards.

The concentrations of ortho and total phosphorus and TKN at the stations near the Gulf Gate outfall were much higher than those found in typical Florida estuaries (see Appendix). STORET data from 1700 estuary stations, for the period of 1980 to 1989, have been compiled into a percentile distribution (Joe Hand, personal communication). Data from this present investigation were evaluated against these (see table in Appendix).

The two stations in the vicinity of the outfall were similar with regard to the degree of enrichment exhibited. Ortho and total phosphorus and TKN values from these two sites were found to be greater than 90%, 88%, and 95% of all other Florida estuaries, respectively. In contrast, nitrate+nitrite and ammonia values detected at the sites were not unusually elevated.

It appears that a portion of the nutrient enrichment observed in the receiving waters is from sources (*e.g.*,

stormwater) other than the Gulf Gate discharge. The facility has been within permit limits for all nutrient parameters during the past year.

Algal growth potential results (44.9 mg/dry wt/L at the test site and 17.2 mg/dry wt/L at the control) indicate that the waters near the Gulf Gate outfall may be subject to eutrophication effects. The problem level threshold for Dunaliella algal assays is 10 mg dry wt/L. That is, when this value is exceeded, the negative consequences associated with nutrient enrichment (D.O. depletion, algal blooms, fish kills) are likely to occur (Ron Raschke, personal communication).

As previously indicated, it appears that there are other nutrient sources in Matheny Creek upstream of the discharge, and that the effluent is not the sole contributor to the enrichment problem. According to the 1990 Florida Water Quality Assessment 305(b) Technical Appendix, Matheny Creek has a past history of low DO readings and nutrient loading. Agricultural and urban stormwater run-off is a recurrent problem in this basin (Sarasota Bay Basin) as a whole.

Quantitative measures of benthic macroinvertebrate community health indicated that both sites were depauperate, but some additional disturbance was evident downstream of the discharge. The figure on p. 2 indicates the degree of difference between the control and test sites. Larger differences (that is, higher percentages) correspond with greater degrees of degradation. Negative values mean that the test site is better than the control. The figure on this page summarizes similarities between the sites. Smaller similarities (lower percentages) generally correspond with greater degradation.

Taxa richness was reduced at the test site (compared to the control) by 71%. Additionally, a 61.5% decrease in the Shannon-Weaver diversity index at the test site constituted a violation of the biological integrity criterion (17.302.560(7) FAC). A comparison (between the control and test sites) of taxonomic differences and functional feeding group composition also indicated degraded conditions at the test site. Only two taxa, the oligochaete, *Limnodrilus hoffmeisteri*, and the malacostracan, *Tanais cavolini* were recovered from the test site. The control site possessed seven taxa, none of which were very pollution sensitive.

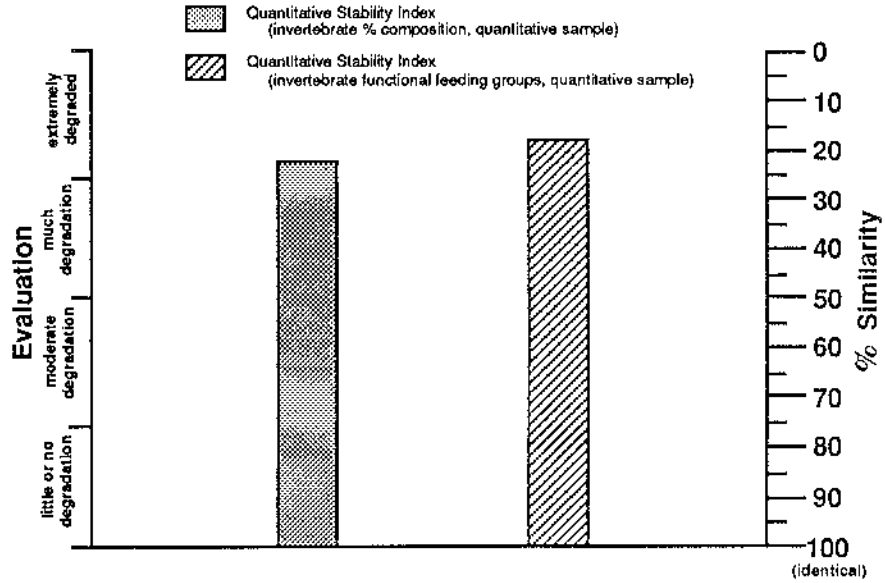
Without a much more intensive biological study, it would be difficult to differentiate between the potential causes (stormwater runoff, dredging, seawall constuction) for the observed biological disturbances. As noted earlier, elevated phosphorus levels were present at both the control and test sites. While effluent was not analyzed for phosphorus during this investigation, Monthly Operating Reports indicate compliance with the 1 mg/L permit limit. This suggests that non-point source pollution negatively influences the biota in the area, and that the facility (which generally has an acceptable effluent) may not be solely responsible for the observed degradation.

Conclusions

The effluent sample collected from Gulf Gate WWTP was not toxic to the cladoceran, *Ceriodaphnia dubia*, or the fish, *Notropis leedsi*.

No organic priority pollutants were detected in the sample. Concentrations of metals were very low and did not violate Class III standards.

The two stations in the vicinity of the outfall were similar with regard to the degree of enrichment exhibited. Ortho and total phosphorus and TKN values from these two sites



Effect of discharge on receiving stream
(measured as similarity between control and test sites).

were found to be greater than 90%, 88%, and 95% of all other Florida estuaries, respectively. In contrast, nitrate+nitrite and ammonia values detected at the sites were not unusually elevated. It appears that a portion of the nutrient enrichment observed in the receiving waters is from sources (*e.g.*, stormwater) other than the Gulf Gate discharge.

Quantitative analysis of the benthic macroinvertebrates showed some signs of stress at the both the control and test sites. Neither site was inhabited by pollution sensitive species. Taxa richness and diversity was substantially reduced at the test site, leading to a biological integrity violation. However, evidence of widespead nutrient contamination suggests that the facility was not solely responsible for the observed disturbances, and that non-point source abatement should be addressed in this basin.

Literature Cited

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Chemistry summary table for Fla. Cities Gulf Gate STP.

	Effluent	Control Site	Test Site
Organic Constituents (ug/L)			
	NONE DETECTED		
Metals (ug/L)			
Aluminum	30T		
Arsenic	20U		
Cadmium	0.2U		
Copper	5U		
Chromium	12U		
Iron	35		
Lead	18U		
Mercury	0.2K		
Nickel	6U		
Silver	0.2U		
Zinc	7T		
Nutrients (mg/L)			
Ortho-phosphorus		0.243A	0.306A
Total phosphorus	0.05U	0.37	0.54A
Ammonia		0.07A	0.06A
Nitrate+Nitrite	0.55A	0.20A	0.17A
TKN	1.9	1.8	1.3A
Other Parameters			
Habitat Assessment		6	37
D.O. (mg/L)		0.7 - 4.8	6.6 - 7.0
pH		7.5	7.7
Conductivity (umhos/cm)		39,300	31,000
Temperature (° C)		29.4	30.5
AGP (dry wt/L)		45.0	17.3
Bioassay Fish-Dechlorinated	not toxic		
Bioassay Invertebrate-Dechlorinated	not toxic		
Fecal coliform (org/100 ml)		<100	<100
Total coliform (org/100 ml)		575	800

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

K - Actual value is known to be less than value given

T - Value reported is less than the practical quantitation limit

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

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/DY): 7/23/91	RECEIVING BODY OF WATER: Little Sarasota Bay

REMARKS: Creek is like a canyon w/vertical retaining walls 10 feet high	LOCATION: Fla Cities Gulf Gate Mathemy Creek	FIELD ID/NAME: 001 upstream

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other
			70%	30%		

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

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

Point Source Pollution (list location and describe): Stormwater

Estimated Stream Width (range, m): 30ft	Estimated Stream Depth (range, m): 1.6		yes
High Water Mark (m above bed): 0.3	Velocity (range, m/s): 0.025	Impounded ☐	Channelized ☒

Canopy Cover % (check box): Open: ☑ Lightly Shaded: ☐ Moderately Shaded: ☐ Heavily Shaded: ☐

SEDIMENT/SUBSTRATE

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

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

Sediment Deposits: Sludge: ☐ Paper Fiber: ☐ Mud: ☑ Sand: ☑ Shell: ☐ Other: ☐

Substrate Types (estimated % surface coverage):

Limestone:		Sand/Silt/Clay Mix:	
Consolidated Clay:		Clay/Silt (inorganic):	
Gravel/Shell		Coarse Organic Debris:	
Sand	100	Mud/Muck (organic):	100 %

WATER QUALITY

	Temp. (°C):	D.O. (mg/l):		
Top	29.4	4.8	Secchi Depth (m):	0.7 m
Mid-depth	31.4	4.1	pH (SU):	7.5
Bottom	31.3	0.7	Conductivity (µmho/cm):	39,300
			Other Parameters:	Salinity 24.9

Stream Type (check box): Blackwater: ☑ Deep Aquifer Fed: ☐ Surficial Aquifer Fed: ☐ Alluvial: ☐ Other: ☑ Estuarine water

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

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

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

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

Weather Conditions: Sunny + Muggy Temp 93 Humidity 95%

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

ANALYSIS DATE: 7/23/91	ANALYST: Fricano	SIGNATURE: Pat Fricano

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 DAY): 7/23/91	RECEIVING BODY OF WATER: Little Sarasota Bay
REMARKS: Creek looks like a canyon w/vertical retaining walls 10 feet high.	LOCATION: Fla-Cities Golf Cse Matheny Creek	FIELD ID NAME: 661 upstream	

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations: 0	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: 0	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: 2	>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: 3	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: 9	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: 0	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: 14

COMMENTS: No vegetation. Fish seen include mullet, blue tilapia, killifish + needlefish.

ANALYSIS DATE:	ANALYST:	SIGNATURE:
7/23/91	P. Fricano	P. Fricano

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y): 7/23/91	RECEIVING BODY OF WATER: Little Sarasota Bay

REMARKS: Seawalled, Residential Tidal Creek	LOCATION: Fla. Cities Gulf Gate Mathery Creek	FIELD ID NAME: C02 Downstream

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other
			100%			

Local Watershed Erosion (check box): None [ ] Moderate [X] Heavy [ ]

Local Watershed NPS Pollution (check box): No evidence [ ] Some potential sources [ ] Obvious sources [X]

Point Source Pollution (list location and describe):
Fla Cities Gulf Gate STP, Stormwater

Estimated Stream Width (range, m): 75 ft	Estimated Stream Depth (range, m): 1 m	yes
High Water Mark (m above bed): 0.6	Velocity (range, m/s): 0.025	Impounded [ ] Channelized [X]

Canopy Cover % (check box): Open: [X] Lightly Shaded: [ ] Moderately Shaded: [ ] Heavily Shaded: [ ]

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: [ ] Sewage: [ ] Petroleum: [ ] Chemical: [ ] Anaerobic: [ ] Other: [X] H_2S

Sediment Oils: Absent: [X] Slight: [ ] Moderate: [ ] Profuse: [ ]

Sediment Deposits: Sludge: [ ] Paper Fiber: [ ] Mud: [X] Sand: [ ] Shell: [ ] Other: [ ]

Substrate Types (estimated % surface coverage):

Limestone:		Sand/Silt/Clay Mix:	
Consolidated Clay:		Clay/Silt (inorganic):	
Gravel/Shell		Coarse Organic Debris:	
Sand		Mud/Muck (organic)	100%

WATER QUALITY

	Temp. (°C):	D.O. (mg/l):		
Top	30.5	6.6	Secchi Depth (m):	.66 m
Mid-depth	31.6	7.8	pH (SU):	7.7
Bottom	31.6	7.0	Conductivity (µmho/cm):	31002
			Other Parameters:	Salinity 19.3 ppt

Stream Type (check box): Blackwater: [ ] Deep Aquifer Fed: [ ] Surficial Aquifer Fed: [ ] Alluvial: [ ] Other: [ ]

Water Odors (check box): Normal: [X] Sewage: [ ] Petroleum: [ ] Chemical: [ ] Other: [ ]

Water Surface Oils (check box): Slick: [ ] Sheen: [ ] Globs: [ ] None: [X]

Clarity (check box): Clear: [ ] Slightly turbid: [X] Turbid: [ ] Opaque: [ ]

Color (check box): Tannic: [X] Green (algae): [ ] Clear: [ ] Other: [ ]

Weather Conditions:
Sunny & Muggy
Temp 93 Humidity 95%

Abundance:	Absent	Rare	Common	Abundant
Periphyton	[ ]	[ ]	[ ]	[ ]
Fish	[ ]	[ ]	[X]	[ ]
Aquatic Macrophytes	[ ]	[ ]	[X]	[ ]
Iron/sulfur Bacteria	[X]	[ ]	[ ]	[ ]

ANALYSIS DATE: 7/23/91	ANALYST: FRIANO	SIGNATURE: Pat Friano

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 DD YY)	RECEIVING BODY OF WATER
		7/23/91	Little Sarasota Bay

REMARKS	LOCATION	FIELD NAME
	Fla. Cities Toll Gate Mathieny Creek	C-62 downstream

Habitat Parameter score	Excellent	Good	Fair	Poor
Littoral Alterations 4	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 20	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 2	>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 3	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 9	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 41

COMMENTS: Black Mangroves along non-seawalled portion of shoreline. Fish seen were killifish.

ANALYSIS DATE	ANALYST	SIGNATURE
7/23/91	P. Fricano	P. Fricano

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: FLORIDA CITIES/GULF GATE
Address/City:
County: SARASOTA
Contact/District: PAT FRICANO / SWD
NPDES Permit #: Outfall #:

Sample Collection: Date 7/23/91 Time 1620
Test Beginning: Date 7/24/91 Time 1130
Test Ending: Date Time
Test Organism: C. dubia
Life Stage/Age: <24 HRS

Test Number: 1 of 2 Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through

Remarks:

Instrument Calibrations:

	pH	DO	Cond	Temp
0 hr	7@7.96 9	9.2@20.0	1323@22.3	19.0@21.9
24 hr	10@7.96 9	9.2@20	1345@22.9	20.0@22
48 hr	10@7.27	9.0@21°C	1350@23°C@1336	20.3@22

Conc.	Chamber #	Number Live 0	24	48	DO (mg/l) 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	Cond. (umhos/cm) 0	24	48
control	A	5	5	5	8.7		8.4	8.1		8.2	19.5		20.5	162		181
control	B	5	5	5			8.5			8.2						
control	C	5	5	5			8.5			8.2						
control	D	5	5	5			8.5			8.2						
100%	A	5	5	5	7.8		8.5	7.3		8.4	20.0		20.5	701		760
100%	B	5	5	5			8.5			8.4						
100%	C	5	5	5			8.5			8.4						
100%	D	5	5	5			8.5			8.4						
Measured/Loaded by:		MF	AJ	MF	AJ		KP	AJ		KP	AJ		KP	AJ		KP
Recorded by:		KP	AJ	MF	KP		KP	KP		KP	KP		KP	KP		KP

Investigators' Signatures

Kim Pearce
Marshall Faircloth

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			0.3	Hach	PF
Lab Tot. Resid. Cl2:			0.0	Hach	MF
Alkalinity:	120	70	105	Hach	AJ
Hardness:	120	85	230	Hach	AJ
Total Ammonia:	0.0	0.0	0.48	Hach	KP

Ammonia meter slope:

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: FLORIDA CITIES / GULF GATE
Address/City:
County: SARASOTA
Contact/District: PAT FRICANO / SW
NPDES Permit #: Outfall #:

Sample Collection: Date 7/23/91 Time 1630
Test Beginning: Date 7/24/91 Time 1130
Test Ending: Date Time
Test Organism: N. Arenaceodentata
Life Stage/Age: 9 DA-15

Test Number: 2 of 2 Test Type: Screening / Definitive
Static / Static Renewal / Flow-through

Remarks:

Instrument Calibrations:

	pH	DO	Cond	Temp
0 hr	7.0, 7.0	9.2 @ 20	1320 @ 22.3	9.2 @ 21.9
24 hr	7.0, 7.0	9.2 @ 20	1320 @ 22.9	9.2 @ 22.5
48 hr	7.0, 7.0	9.2 @ 21	1320 @ 23	9.2 @ 22

Conc.	Chamber #	Number Live 0	24	48	DO (mg/l) 0	24	48	pH 0	24	48	Temp (°C) 0	24	48	Cond. (µmhos/cm) 0	24	48
Control	190	5	5	5	8.6	8.4	8.5	7.9	8.1	8.3	20.0	19.5	20.0			
Control	75	5	5	5	8.6	8.9	8.6	7.9	8.1	8.3				240	248	248
100%	23	5	5	5	7.2	8.2	8.2	7.2	7.8	8.0	21.0	19.5	20.0			
100%	1	5	5	5	7.1	8.3	8.3	7.2	7.8	8.0				790	776	792
Measured/Loaded by:		MF	KP	MK	AJ		KP	AJ		KP	AJ		KP	AJ		KP
Recorded by:		KP	KP	AF	KP		KP	KP		KP	KP		KP	KP		KP

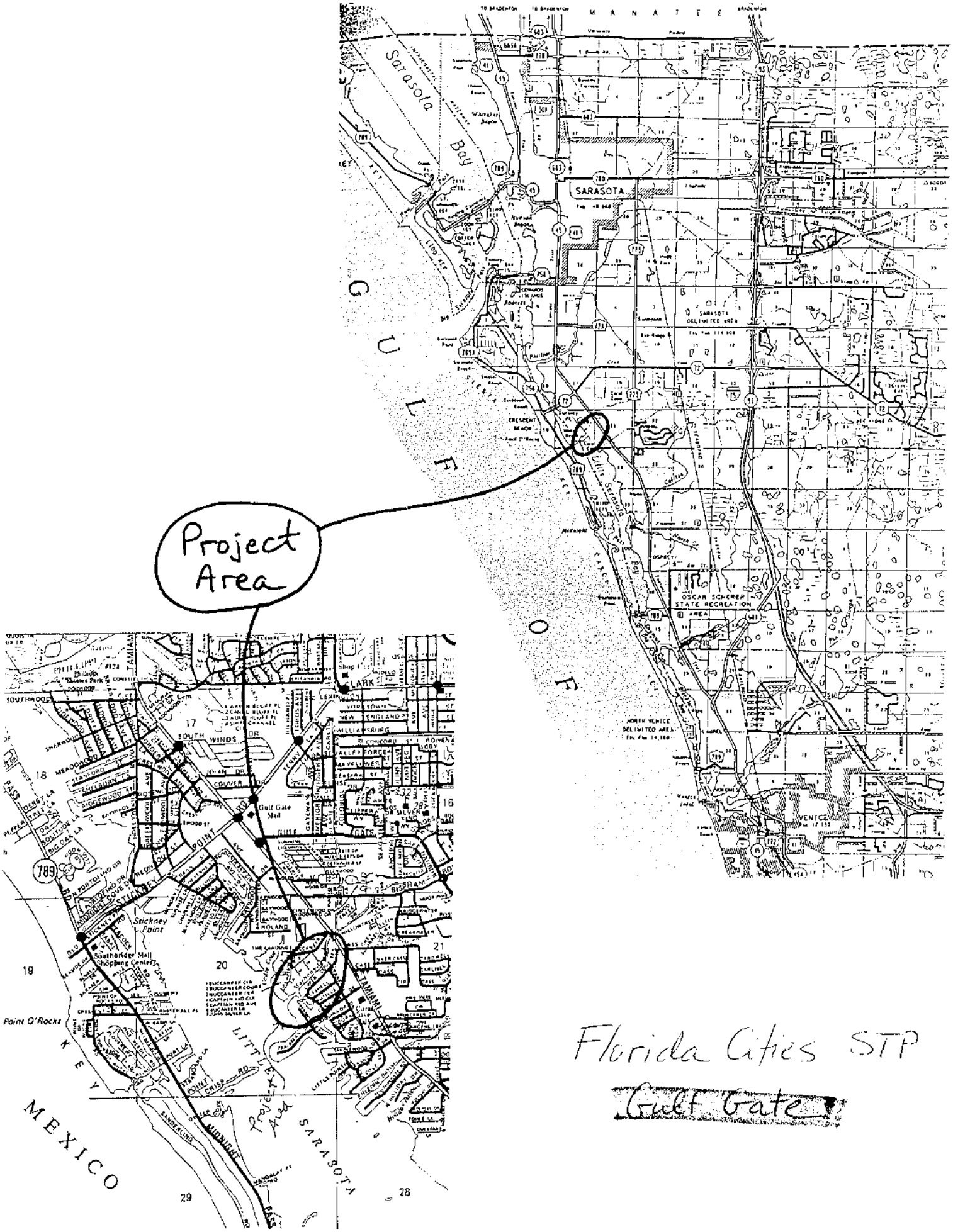
Investigators' Signatures

Kim Pearce

Karl D Fandt

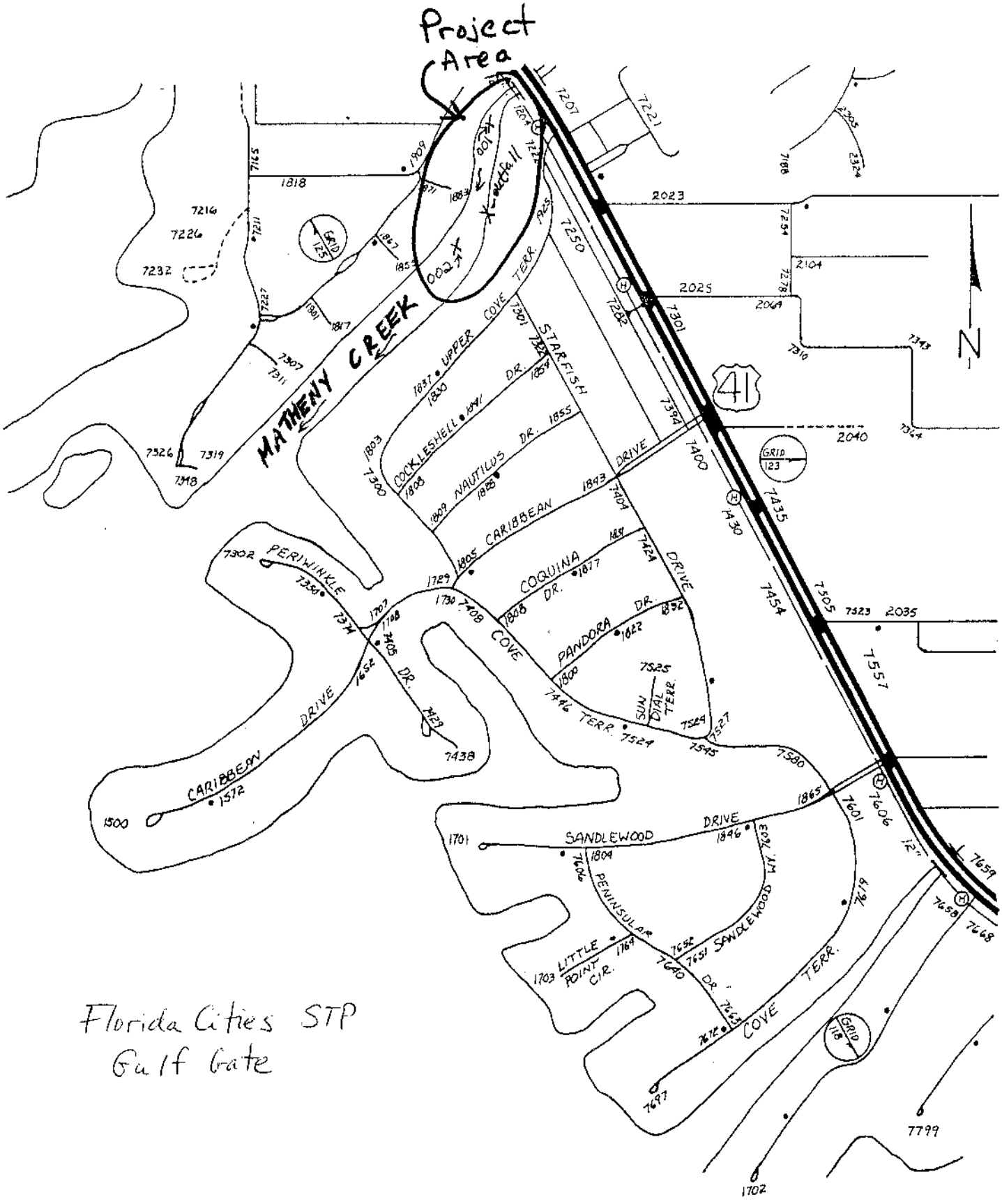
Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			0.3	Hach	DF
Lab Tot. Resid. Cl2:			0.0	Hach	ME
Alkalinity:	120	70	105	Hach	AJ
Hardness:	120	85	230	Hach	AJ
Total Ammonia:	0.0	0.0	0.48	Hach	KP



Florida Cities STP

Gulf Gate



Florida Cities STP
Gulf Gate

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Facility Name:	Prepared by: + Joe Sparks Date:	
Location (attach detailed map):	County	District
Federal Permit #	State GMS #	Facility Type: Industrial Municipal Federal Agricultural Other (list):

Function of facility:

Description of treatment process:

Receiving waters:	Classification:
Design Flow:	Actual Mean Flow:

Discharge is: Continuous Intermittant Seasonal Rainfall dependant Other (describe)

therefore, the best time to sample is:

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

List effluent limits, special permit conditions, and permit modifications:

Parameter	Unit	Minimum	Maximum	Type Sample	Frequency
BOD & Suspended Solids	mg/l	0	5 annual avg. 6.25 monthly avg. 7.25 weekly avg. 10 any one sample	16 hr Composite	Weekly
Fecal coliform	#/100	0	200 annual avg. 800 monthly avg.	grab	Weekly
Total N	mg/L	0	3	16 hr Composite	Weekly
Total Kjeldahl Nitrogen		0	2.5	Grab	Weekly
Total P	mg/L	0	1	16 hr. Composite	Weekly
Dissolved Oxygen		5.0	N/A	Grab	Weekly
Flow	mgd	.0000	1.8	Continuous Recording Metered flowmeter and totalizer	
pH	STD UN	6.00	8.50	Metered Continous	

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Description of permitted outfall(s):
List permit violations (from MOR data or other source) and plant upsets that occurred within past year:
Describe previous impact bioassessments, WQBEL's, and previous or current enforcement actions:
Discuss comparability of MOR results to past DER results and whether there are trends (improving, declining) in the data set:
Additional information:

Macroinvertebrate taxa list for Florida Cities Gulf Gate STP, Sarasota County, Florida, collected via 3 ponar grabs (per site) upstream and downstream of the facility in Matheny Creek on 20 August, 1991.

	Control Site	Test Site
Diptera		
Chironomus decorus grp	12	0
Dicrotendipes lobus	12	0
Gastropoda		
Neritina reclivata	62	0
Malacostraca		
Corophium sp.	12	0
Tanais cavolini	0	12
Oligochaeta		
Limnodrilus hoffmeisteri	25	12
Undetermined Tubificid	12	0
Pelecypoda		
Brachidontes sp.	100	0
Polychaeta		
Laeonereis culveri	100	0

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N	2 5	3 FL0032816 11	12 910723 17	18 X	19 5	20 1

Remarks

21 66

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N	2 5	3 FL0032816 11	12 910723 17	18 B	19 5	20 1

Remarks

21 66