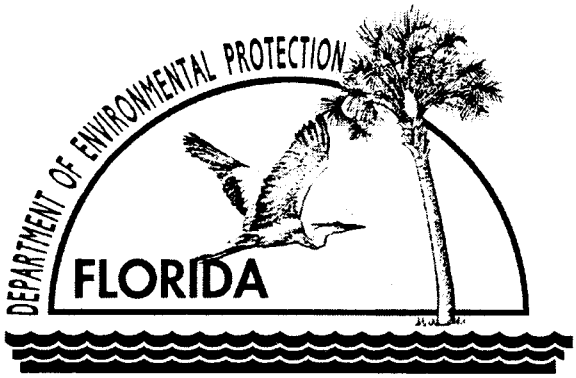


Biological Assessment of

Florida Power Corporation Bartow Plant

Pinellas County

NPDES #FL0000132

Sampled April and May 1999

February 2001

Biology Section

Bureau of Laboratories

Division of Resource Assessment and Management

Comprehensive Quality Assurance Plan No. 870346G

Department of Environmental Protection
Results of Fifth Year Inspections

Discharger:	FPC Bartow Power Plant
County:	Pinellas
NPDES Number:	FL0000132
Permit Expiration Date:	May 28, 2003

Toxics Sampling Inspection (**XSI**)	
Date Sampled:	30 April 1999
Results:	Copper and lead were detected in the effluent from Study Area A at levels that complied with Class III marine water quality standards. No organic pollutants were detected in either effluent sample.

Compliance Biomonitoring Inspection (**CBI**)	
Date Sampled:	30 April 1999
Results:	The Study Area A effluent (Outfall 001) sample was not toxic to the invertebrate, *Americamysis bahia,* or to the fish, *Menidia beryllina.*

Impact Bioassessment Inspection (**IBI**)	
Date Sampled:	30 April 1999
Results:	The Bartow Power Plant effluent did not appear to adversely affect the biological communities in either Study Area A or Study Area B. Macroinvertebrate taxa richness and diversity within Study Area A was similar among its control site and test site 1 but, test site 2 showed decreases in taxa richness, diversity, and polychaete taxa richness. The Study Area A control site was dominated by pollution-sensitive pelecypods and by pollution-tolerant polychaetes, *Capitella* sp., while both Study Area A test sites were dominated by pollution-sensitive cumaceans and amphipods. Most measures of invertebrate health in Study Area B were slightly better at the test site compared to the control site. The Study Area B control site was made up of mostly tubificid worms while the test site was dominated by the pollution-tolerant polychaete, *Capitella* sp.

Water Quality Inspection (**WQI**)	
Date Sampled:	30 April 1999
Results:	The effluent nutrients were low. Nutrient samples were not collected in the receiving waters. The effluent Algal Growth Potential (AGP) was below the 10 mg dry wt/L "problem threshold" at each outfall; no other samples were taken at the control or 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 is used in conjunction with other information concerning the facility discharge and the receiving water bodies to determine appropriate final permit conditions.

Introduction

The Florida Power Company Bartow Power Plant is a steam electric generating facility located in Pinellas County, Florida (see maps in Appendix). The Bartow Power Plant is permitted to discharge through three separate discharge outfalls. Intake cooling water, under ambient conditions, is taken from Old Tampa Bay and is used as once-through cooling water for three cooling units. This once-through cooling water is then discharged into a canal and returns to the Class III (marine) waters of Old Tampa Bay at Outfall 001. Intake screen wash water is discharged via a small ditch and enters Old Tampa Bay at Outfall 002. There is a storm water discharge for a dike-protected petroleum holding and handling area, it was not discharging during the collection periods for this investigation. Samples for this study were taken from Outfall 001 and Outfall 002. The average flow from Outfall 001 for the month preceding the sampling was 335 MGD; the maximum daily flow during the month preceding the sampling was 482 MGD.

State permit limits for the Bartow Power Plant are listed in Table 1. The plant has not experienced a permit violation or plant upset within the previous three years.

Methods

The focus of this investigation was to determine the discharge effects on the receiving waters in Old Tampa Bay. A comparison of biological community health was made among the control and test sites within the two discharging outfalls. For study purposes, the sampling sites around Outfall 001– which include a control site located in Master's Bayou along the north side of the facility and two test sites located in the discharge canal and bracketing the point of discharge (POD)– are noted as Study Area A. Study Area B encompasses the sampling sites around Outfall 002. There is a control site located within an area of mangroves on the south side of the facility, and there is a test site located at the mouth of the receiving water ditch.

A habitat assessment was performed in situ to establish comparability between sites within study areas. Supplemental physical and chemical data were collected from Study Area A on April 30, 1999 during a flood tide and from Study Area B on May 7, 1999 during an ebb tide. Effluent water from Outfall 001 was analyzed for nutrients, metals, organonitrogen and phosphorus pesticides. Effluent water from Outfall 002 was analyzed for nutrients, organonitrogen and phosphorus pesticides. Sediment samples from all study sites in Area A were analyzed for grain size, percent organic matter, and metals. Sediments from the Outfall at Study Area B were analyzed for grain size.

Acute screening toxicity bioassays, using the invertebrate, *Americamysis bahia,* and the fish, *Menidia beryllina,* as test organisms, were performed on effluent samples from Outfall 001. Algal Growth Potential (AGP) tests were

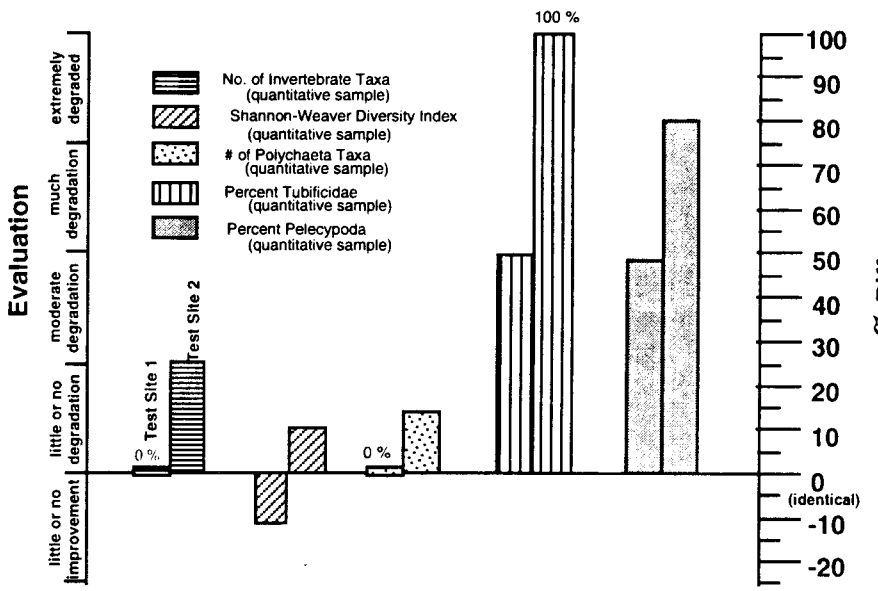


Figure 1. Effect of discharge on the macroinvertebrate community in Study Area A.

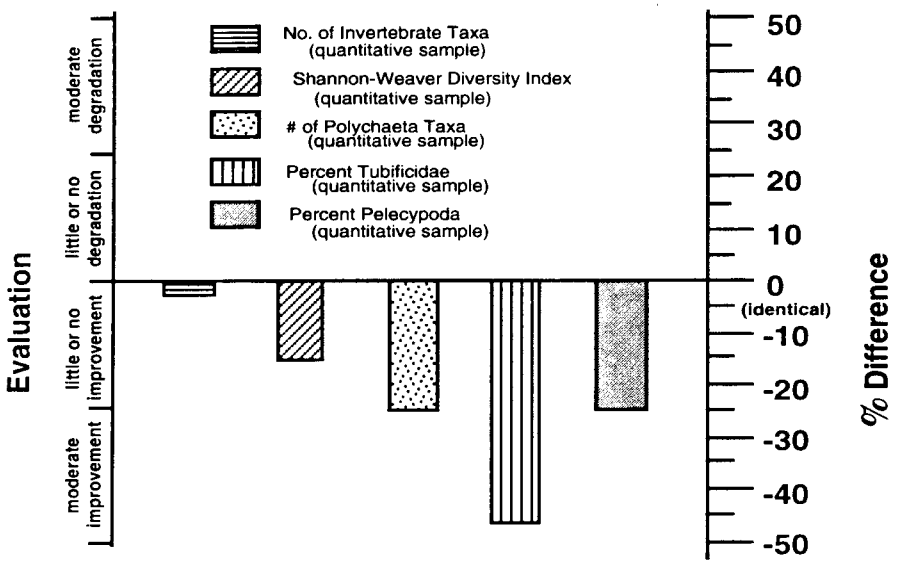


Figure 2. Effect of discharge on the macro-invertebrate community in Study Area B.

performed using *Dunaliella tertiolecta* as the test organism for the effluent site.

Benthic macroinvertebrate communities were sampled at both study areas using three replicate Petite ponar grabs. Several different measures of macroinvertebrate community health are used to determine the effects of effluent discharged in the receiving water. These measurements include: taxa richness, Shannon-Weaver Diversity Index, community composition, functional feeding groups, and algal biomass. For a discussion of each of these measures see the *Explanation of Measurements of Community Health* in the Appendix. All field and laboratory methods followed the Bureau's Standard Operating Procedures, and can be viewed on our web site at www.floridadep.org/labs/sops.htm.

The following personnel were involved in this investigation: Andrea Grainger, Wendy Hershfeld and Charles Kovach (DEP SW District), and Ken Espy, Marshall Faircloth, Russel Frydenborg, Joy Jackson, Michael Heyn, Vicki McGee, Elizabeth Miller, Urania Quintana, Johnny Richardson, Julie Riley, Lisa Tamburello, Amy Weaver, Steve Wolfe, and David Whiting (DEP Central Biology Laboratory in Tallahassee). The Point Source Studies Review Committee, consisting of Wayne Magley, Chuck Ziegmont, and Michael Tanski, as well as District representatives, reviewed the report.

Results

Habitat types at the Study Area A control site were mangroves, seagrasses, and oyster beds (see Habitat Assessment Field Data Sheets in Appendix). The shorelines at the two test sites in Study Area A were identical and consisted mostly of sand and shell, or vertical seawalls. The substrate at all Area A sites consisted of sand and oyster shells, though there was much more substrate compaction at Area A test sites. Sediment particle size distribution was similar among sites at Area A (Table 1c).

Habitat types at the Area B control site were mangroves, oyster beds, seagrass meadows, and sandy beach. The test site habitat types consisted primarily of macroalgae, with some mangroves and sandy beach. The substrate at the Area B control site was mainly sand with some areas of muck, the test site was mostly muck. No sediment analyses were done on Study Area B substrate. Habitat scores at both study areas were ranked as 'optimal' to 'suboptimal', ranging from 63 points at the test sites in Study Area A, to 83 points at the control site 2 in Study Area B. The remaining results are summarized in Tables 1 and 2.

Discussion

Copper and lead were detected in the discharge from Outfall 001 at levels that complied with Class III marine water quality standards (Table 1). No organic constituents were detected in the effluent samples taken from either Outfall 001 or from Outfall 002.

Effluent nutrients at both outfall sites are listed in Table 1. Nutrient samples were not collected at the receiving water sites. AGP, which measures bioavailable nutrients via algal response, was below the 10 mg dry wt/L "problem threshold" (R Raschke, USEPA, pers. comm.) at both outfall sites (Table 1). AGP tests were not performed on the receiving water sites. The effluent sample from Outfall 001 was not toxic to the fish, *Menidia beryllina,* or to the invertebrate, *Americamysis ba-*

Table 1a. Effluent limits and summary of water chemistry data for Study Area A.

FPC Bartow Power Plant	Effluent Limits	Outfall Site 001	Control Site 1	Test Site 1	Test Site 2
Sample dates	-	April 30, 1999	April 30, 1999	April 30, 1999	April 30, 1999
Organics (mg/L) - Water Sample					
None Detected	-	-	-	-	-
Metals (mg/L) - Water Sample					
Aluminum	< 1500 **	1000 U	-	-	-
Arsenic	< 50 **	80 U	-	-	-
Cadmium	< 9.3 **	2.0 U	-	-	-
Chromium	< 50 **	40 U	-	-	-
Copper	< 2.9 **	1.1 I	-	-	-
Iron	< 300 **	300 U	-	-	-
Lead	< 5.6 **	2.6 I	-	-	-
Mercury	< 0.025 **	0.1 U	-	-	-
Nickel	< 8.3 **	60 U	-	-	-
Selenium	< 71 **	50 U	-	-	-
Silver	< 0.07 **	0.8 U	-	-	-
Zinc	< 86 **	140 U	-	-	-
Nutrients (mg/L)					
Ortho-phosphate	-	0.1	-	-	-
Total phosphorus	-	0.21	-	-	-
Ammonia	-	0.057	-	-	-
Nitrate+Nitrite	-	0.02 U	-	-	-
TKN	-	0.6	-	-	-
Organic Nitrogen	-	0.54	-	-	-
Total Nitrogen	-	0.62	-	-	-
AGP (mg dry wt/L)	-	2.9	-	-	-
General Phys-Chem Parameters					
Habitat Assessment	-	-	80	63	63
DO (mg/L) - top	> 5.0 *	5.0	-	4.8	5.0
DO (mg/L) - mid	-	4.9	-	4.9	5.1
DO (mg/L) - bottom	-	4.9	-	4.4	4.9
pH (SU) - top	6.5 - 8.5 *	7.7	-	7.7	7.7
pH (SU) - mid	-	7.7	-	7.7	7.7
pH (SU) - bottom	-	7.7	-	7.7	7.7
Conductivity (mmhos/cm) - top	-	39,900	-	31,890	40,100
Conductivity (mmhos/cm) - mid	-	39,900	-	39,800	40,000
Conductivity (mmhos/cm) - bottom	-	39,900	-	39,900	40,000
Temperature (°C) - top	-	32.3	27.8	31.9	30.0
Temperature (°C) - mid	-	32.3	27.8	31.8	30.1
Temperature (°C) - bottom	-	32.3	27.7	31.8	30.1
Toxicity (48-hour static, screening bioassay)					
Bioassay - Fish	NOEC	Not Toxic	-	-	-
Bioassay - Invertebrate	NOEC	Not Toxic	-	-	-

a- Annual average
b- Daily average
c- Hourly average
* Permit Limit
** Class III water quality standard
I - Value reported is < the minimum quantitation limit, and = the minimum detection limit
J - Estimated value
U - Material analyzed for but not detected; value reported is the minimum detection limit
NOEC - No observable effects concentration

Table 1b. Effluent limits and summary of water chemistry data for Study Area B.

FPC Bartow Power Plant	Effluent Limits	Outfall site 002	Control Site 2	Test Site 002
Sample dates		May 7, 1999	May 7, 1999	May 3, 1999
Organics (mg/L) - Water Sample				
None Detected	-	-	-	-
Metals (mg/L) - Water Sample				
Aluminum	1500 **	-	-	-
Arsenic	50 **	-	-	-
Cadmium	9.3 **	-	-	-
Chromium	50 **	-	-	-
Copper	2.9 **	-	-	-
Iron	300 **	-	-	-
Lead	5.6 **	-	-	-
Mercury	0.025 **	-	-	-
Nickel	8.3 **	-	-	-
Selenium	71 **	-	-	-
Silver	0.07 **	-	-	-
Zinc	86 **	-	-	-
Nutrients (mg/L)				
Ortho-phosphate	-	0.12	-	-
Total phosphorus	-	0.2	-	-
Ammonia	-	0.13	-	-
Nitrate+Nitrite	-	0.053	-	-
TKN	-	0.68	-	-
Organic Nitrogen	-	0.55	-	-
Total Nitrogen	-	0.73	-	-
AGP (mg dry wt/L)	-	6.5	-	-
General Phys-Chem Parameters				
Habitat Assessment	-	-	83	72
DO (mg/L) - top	5.0 *	-	4.3	-
DO (mg/L) - mid	-	5.1	4.3	> 14.0
DO (mg/L) - bottom	-	-	3.9	-
pH (SU) - top	6.5 - 8.5 *	-	7.6	-
pH (SU) - mid	-	7.6	7.6	8.3
pH (SU) - bottom	-	-	7.6	-
Conductivity (mmhos/cm) - top	-	-	41,600	-
Conductivity (mmhos/cm) - mid	-	41,000	41,800	38,200
Conductivity (mmhos/cm) - bottom	-	-	41,800	-
Temperature (°C) - top	-	-	26.4	-
Temperature (°C) - mid	-	25.7	26.4	24.0
Temperature (°C) - bottom	-	-	26.0	-
Toxicity (48-hour static, screening bioassay)				
Bioassay - Fish	NOEC	-	-	-
Bioassay - Invertebrate	NOEC	-	-	-

I - Value reported is < the minimum quantitation limit, and = the minimum detection limit
J - Estimated value
U - Material analyzed for but not detected; value reported is the minimum detection limit
NOEC - No observable effects concentration

Table 1c. Effluent limits and summary of sediment chemistry data.

FPC Bartow Power Plant	Area B Outfall	Area A Outfall	Area A Control Site	Area A Test Site 1	Area A Test Site 2
Sample dates	May 7, 1999	April 30, 1999	April 30, 1999	April 30, 1999	April 30, 1999
Organics (mg/kg) - Sediment Sample					
Flouranthene	-	86 I	-	-	-
Phenol	-	170 I	-	-	-
Metals (mg/kg) - Sediment Sample					
Aluminum_308	-	1250	838	531	489
Arsenic	-	0.53 I	0.58	0.55	0.55
Cadmium	-	0.15 U	0.18	0.16	0.17
Chromium	-	6.15	1.87	2.33	1.5
Copper	-	11.2 J	1.7	1.5	1.1
Iron_271	-	1260	295	324	276
Lead	-	4.4	0.67	1.2	1.3
Manganese	-	220	302	407	393
Nickel	-	9.2	1.6	1.5	1.5
Selenium	-	0.59 U	0.68	0.64	0.64
Silver	-	0.13 U	0.16	0.15	0.15
Zinc	-	17 U	19	18	18.4
Sediment Particle size (% vol < 2mm)					
< 0.063	12.0	13.9	5.4	6.24	6.0
0.063 - 0.125	16.4	10.6	8.35	8.95	8.33
0.125 - 0.25	55.3	46.3	64.7	64.2	64.4
0.25 - 0.5	10.1	16.6	19.6	19.0	19.5
0.5 - 2.0	6.14	12.6	1.92	1.52	1.78
> 2.0	0.5	6.1	0.0	0.0	0.0
% Organic	1.83	2.3	0.35	0.4	0.39

I - Value reported is < the minimum quantitation limit, and = the minimum detection limit
J - Estimated value
U - Material analyzed for but not detected; value reported is the minimum detection limit

hia, during the 48-hour acute toxicity bioassay (Appendix).

Most of the macroinvertebrate community measures at the study sites in Area A were similar. Test site 2, however, had somewhat lower taxa richness, diversity, and polychaete taxa richness than the control site or test site 1. Test site 2 had a 25% reduction in taxa richness, with 21 taxa compared to the control site and test site 1 with 28 taxa each. Diversity values showed similar results. Test site 1 had the highest diversity value (3.86), an 11% increase over the control site (3.49), and test site 2 (3.13) showed an 11% decrease compared to the control site. The control site within Area A was dominated both by pelecypods, typically indicators of 'good water quality', and by capitellid polychaetes which are pollution-tolerant organisms. In contrast, the Area A test site 1 was dominated by the genus *Cyclaspis* which is a pollution–sensitive cumacean, and Area A test site 2 was dominated by *Ampelisca cristata* a pollution–sensitive amphipod (Table 2).

In Study Area B, the community measures were the same or slightly improved at the test site compared to the control site (Table 2). There were 30 and 31 taxa at the control and test site, respectively. Diversity scores at Area B were 13% higher at the test site (3.4) compared to the control site (3.0). Both sites were dominated by pollution-tolerant organisms, such as tubificid worms at the control site and *Capitella* species at the test site. The discharger does not appear to have had an adverse effect on the benthic communities. However, test site 2 in Study Area A shows initial signs of impairment

Table 2. Community structure of control and test sites.

FPC Bartow Power Plant	Study Area A			Study Area B	
	Control Site 1	Test Site 1	Test Site 2	Control Site 2	Test Site 002
Macroinvertebrate Quantitative					
Number of Taxa	28	28	21	30	31
Shannon-Weaver diversity	3.49	3.86	3.13	2.96	3.4
No. Polychaete Taxa	7	7	6	8	10
Community Composition					
% Amphipoda	12.8	28.3	59.1	31	25.5
% Cumacea	9.1	31.5	4.6	0	0
% Gastropoda	6.0	5.7	6.8	3.4	3.3
% Mysidaceae	0.8	5.0	1.5	0	0
% Nemertea	2.3	2.0	8.3	1.1	0.6
% Pelecypoda	34.3	17.6	6.8	1.3	2.8
% Polychaeta	32.1	8.2	9.9	17.9	40.5
% Tanaidacea	1.5	0.0	0.0	1.7	1.8
% Tubificidae	0.4	0.6	0.8	39.7	21
% Other	1.7	1.1	2.3	3.9	4.5
Functional Feeding Groups					
% Browsers-grazers	3.7	6.0	11.7	13.9	13.5
% Burrowing Deposit Feeders	23.8	4.4	1.5	50.4	49.7
% Predators/Carnivores	6.2	4.4	11.4	7.1	7.4
% Scavengers	3.9	6.3	11.7	13.9	14.3
% Scrapers	4.5	3.1	0.0	3.1	3
% Surface Deposit Feeders	2.6	2.0	3.4	3.6	5.3
% Suspension Feeders	48.7	55.0	16.3	7.7	6
% Unknown	6.6	18.8	44.0	0.3	0.8

and should be monitored for further degradation.

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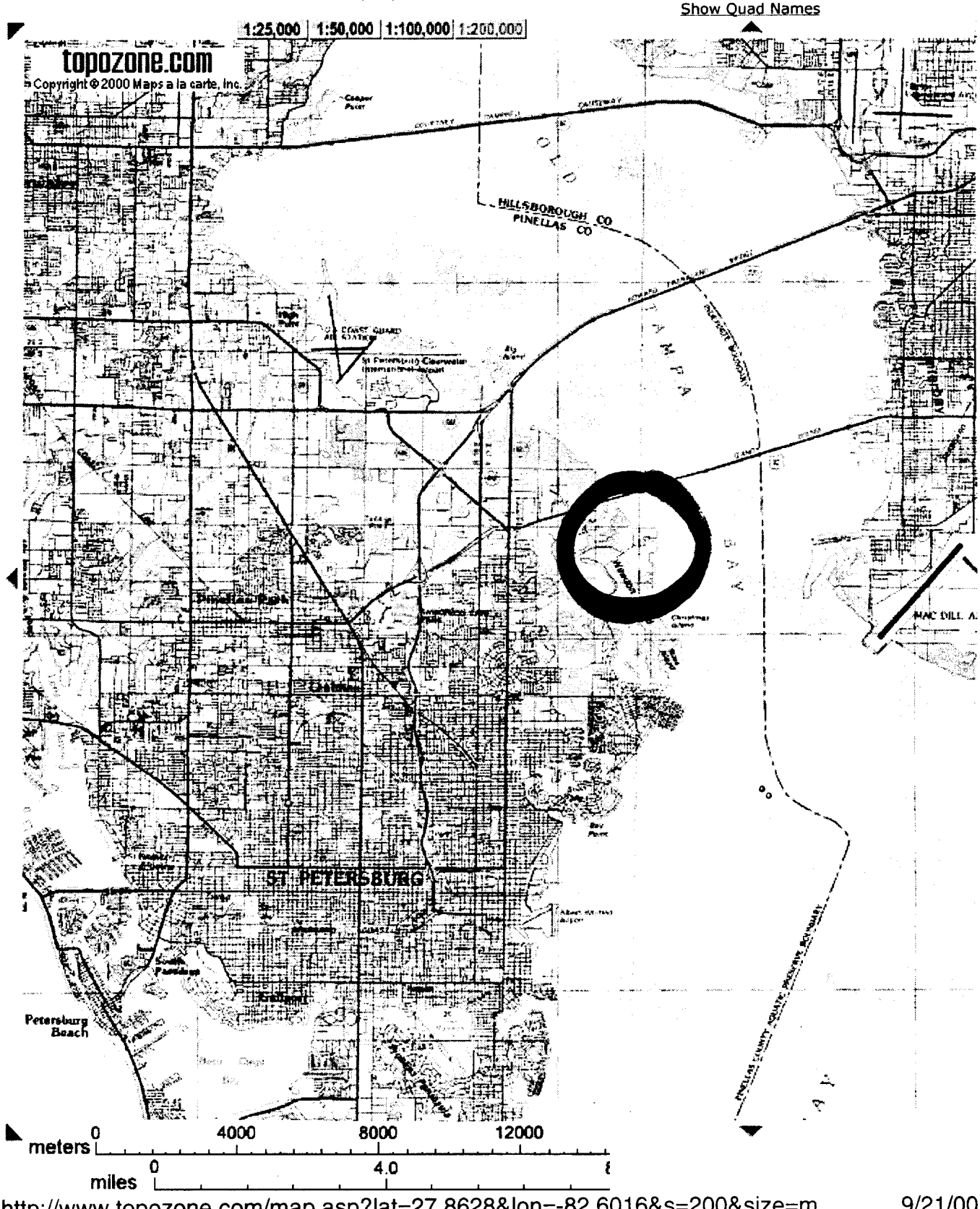
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BARTOW Facility Locus Map

Map target is 27.8628°N, 82.6016°W - UTM Zone 17, N 3082863, E 342313

Exact center of display is UTM Zone 17, N 3081528, E 345440

Show Quad Names



http://www.topozone.com/map.asp?lat=27.8628&lon=-82.6016&s=200&size=m 9/21/00

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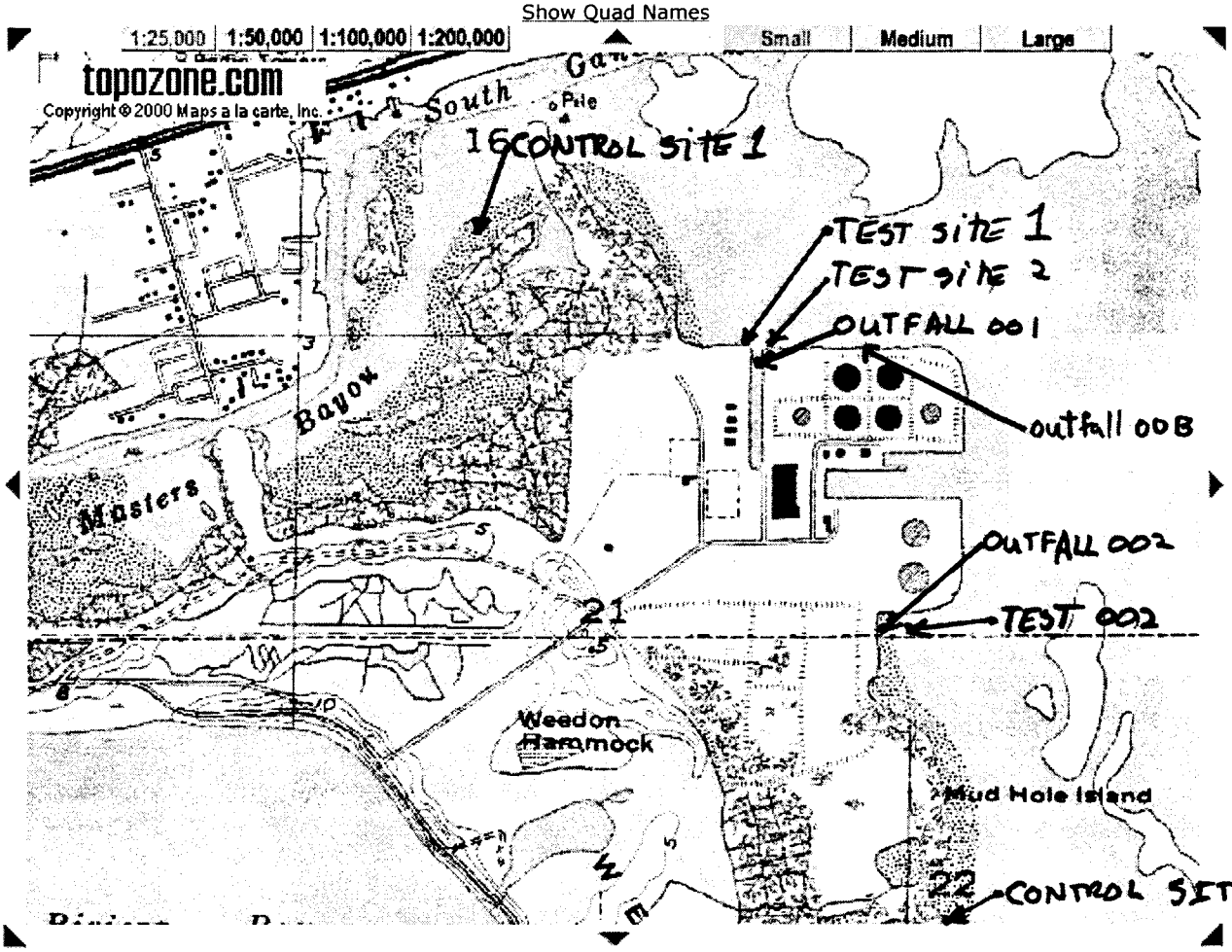
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Map target is 27.8628°N, 82.6016°W - UTM Zone 17, N 3082863, E 342313

Exact center of display is UTM Zone 17, N 3082671, E 341884

Show Quad Names

1:25,000 | 1:50,000 | 1:100,000 | 1:200,000 Small | Medium | Large



Show Quad Names

meters 0 500 1000 1500 2000

miles 0 0.5 1.0

Click anywhere on the map to recenter the map on that point.

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FPC - Bartow facility

Typical Values for Selected Parameters in Florida Estuaries

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%
(690 stations)											
Phytoplankton Chlorophyll *a*	2.1	3.28	4.49	5.13	6	6.93	7.94	9.6	12.4	17.6	22.2
Dredge Diversity	1.3	1.53	1.91	2.28	2.56	2.9	3.15	3.59	4.01	4.53	4.98
Dredge Taxa Richness	4	6	9	11	15	18.5	25	35	41	62	90
TKN	0.3	0.34	0.42	0.5	0.59	0.69	0.76	0.82	0.95	1.3	1.49
NH3+NH4	0	0.02	0.03	0.04	0.05	0.06	0.08	0.09	0.13	0.22	0.28
NO2-NO3	0	0	0.01	0.01	0.01	0.02	0.03	0.05	0.08	0.17	0.23
Total Phosphorus	0	0.02	0.06	0.07	0.1	0.11	0.14	0.17	0.23	0.43	0.59
Ortho-Phosphate	0	0.02	0.03	0.04	0.04	0.05	0.07	0.09	0.12	0.21	0.44
Turbidity	3.5	4	4.5	5.05	5.4	5.6	6.3	6.8	8	11.4	11.8

Units:
Phytoplankton Chlorophyll *a* (ug/L)
Periphyton Chlorophyll a (mg/m2)
Nutrients (mg/L)
Turbidity (NTU)
Taxa richness and diversity values are for macroinvertebrates

Explanation of Measurements of Community Health

Different measurements of macroinvertebrate and algal community health are used to determine the biotic effects of a discharge. The measurements are briefly discussed here.

Taxa richness: Environmental stressors tend 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. Excessive numerical dominance of a single type of organism (a high % contribution of the dominant taxon) is a related measure that is also associated with disturbance.

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 as Chang *et al.* (1992), Farrell (1992), Hudson *et al.* (1990), Hulbert (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

Functional feeding groups/feeding guilds: Disturbance can shift the feeding strategies of invertebrates. In Florida for example, pollution may be responsible for reducing the numbers of filter-feeders (FDEP 1994) and shredders (EA Engineering 1994).

Algal Growth Potential: *Selenestrum* sp, *Duniella* sp.

Algal biomass: High algal biomass (algal density or chlorophyll *a*) implies nutrient stress. A decreased diatom to blue-green algae ratio (calculated by dividing the number of individuals in the Bacillariophyta by the number of individuals in the Bacillariophyta + Cyanophyta) is often indicative of nutrient enriched conditions in flowing streams.

FACILITY SHEET FOR FYI-5

Facility Name: FPC Bartow Power Plant

Date Summary Prepared: May 11, 1999

Location: Weedon Island Drive, St. Petersburg

County: Pinellas

District: SW District

Function of Facility: Steam electric power generating facility

Description of Treatment Process: Ambient water from the bay is used as once thro cooling water for three units. The cooling water is then discharged into the discharge canal and enters into the bay at Outfall 001. The intake screen washwater is discharge via Outfall 002 and Outfall 00B is a stormwater discharge for diked petroleum holding and handling area.

Receiving Waters: Old Tampa Bay

Water Classification: Class III Marine

Mean flow from Outfall 001 from March 1998 to July 1998 ranged from 462 mgd to 554.81 mgd.
Maximum flow from Outfall 001 from March 1998 to July 1998 ranged from 561 mgd to 562 mgd.
Mean temperature from Outfall 001 from March 1998 to July 1998 ranged from 78.5 °F to 100.7 °F.
Maximum temperature from Outfall 001 from March 1998 to July 1998 ranged from 88.1 °F to 104.5 °F.

The Discharge is Continuous

Does facility have a mixing zone: No mixing zone

Permit Effluent Limits:

Parameter	Monthly Ave	Daily Max	Measurement Frequency
Flow (mgd)	Report	Report	1/day
Temperature (°F)	Report	Report	Continuous/hourly
Temperature Rise (°F)	Report	Report	Continuous/hourly
Intake Temperature (°F)	Report	Report	Calculation
Total Residual Oxidants (mg/L)	N/A	0.01	1/week
Free Available Oxidants (mg/L)	N/A	Report	1/week
Time of Chlorine addition minutes/unit/day	N/A	120	1/day
pH (SU)	6.5 SU to 8.5 SU		Quarterly
Dissolve oxygen (mg/L)	Not less than 5 mg/L		Quarterly

Description of permitted outfall(s): Outfall 001 is located on the north side of the facility. It is located in a discharge canal and is located at the point the canal enters the bay. This outfall discharges cooling water used in the 3 units. Outfall 009 is located south east side of the facility. It is a 36 inch concrete pipe that discharges intake screen wash water. Outfall 00B is located on the north side of the facility and is approximately 800 feet east of Outfall 001. It discharges stormwater from a diked petroleum storage and handling areas.

List permit violations and plant upsets that occurred within past 3 years: None.

Describe previous impact bioassessments, WQBELs, and previous and current enforcement actions: This is the first FYI-5 conducted at this facility by district staff. Dr. Norman Blake of USF conducted a study on the effects of thermal water from FPC Bartow Power Plant to seagrasses and macroinvertebrates in the early seventies. A copy of this paper in included.

Staff contributing to this review:

Andrea Grainger (Biologist)
Jeff Hilton (Inspector)

4/30/99

1 of 2

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		4/30/99	1020	Old Tampa Bay

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Sampling from boat	Pinellas	FPC - Barlow Power Plant	Outfall

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
90						10	

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

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

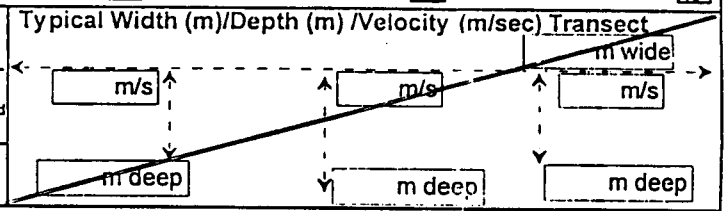
Width of riparian vegetation (m) on least buffered side: | *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

High Water Mark: 0.5 (m above present water level) + 2.5 (present depth in m) = 3.0 (m above bed)

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots							

Draw aerial view sketch of habitats found in 100 m section

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0	32.26	7.71	4.98	39,900			2.3
Mid-depth	1.25	32.27	7.71	4.93	39,900			
Bottom	2.5	32.25	7.71	4.87	39,900			

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

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:
Incoming tide. Cloudy and high chop - Wind NW 2-4 knots.
Sampling at compliance pt 001

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Cramer / Kovach / Hershfeld	Cindrea	5/5/99

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	24040701	4/30/99	1040	Old Tampa Bay

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Sampling from boat	Pinellas	FPC - Bartow Power Plant	Test Site 1

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
90						10	

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

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

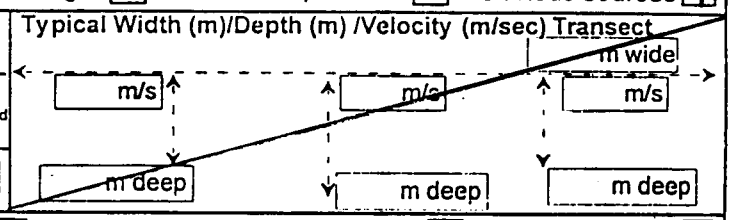
Width of riparian vegetation (m) on least buffered side: *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

High Water Mark: 0.5 (m above present water level) + 1.0 (present depth in m) = 1.5 (m above bed)

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.1	31.98	7.69	4.75	31,890			VOB
Mid-depth	0.5	31.79	7.69	4.91	39,800			
Bottom	1.0	31.79	7.68	4.39	39,900			

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

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: windy, cloudy. Sampling started on NW side of discharge canal approx. 15 meters waterward of shore line.

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Cranage/Kovach/Hershfeld	Andrea Cranage	5/10/99

70% oyster rubble

25% sand.

5% Halodule.

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		4/30/99	Old Tampa Bay

REMARKS:	LOCATION:	FIELD ID/NAME:
low tide	FPC - Barlow Power Plant	Test Site 1

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations 6	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 26	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 Oyster mangrove Seagrass	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 8	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 12	Combination of sand, gravel, and shell. 12-15 points predominately shell hash	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 63

COMMENTS: Sediments were 75% oyster hash + 25% sand. 5% Halodule present.

ANALYSIS DATE:	ANALYST:	SIGNATURE:
Sept 30, 1999	Howard / Grange	

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	24040702	4/30/99	1117	Old Tampa Bay

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Sample from boat	Pinellas	FPC - Bartow Power Plant	Test Site 2

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
90						10	

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

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

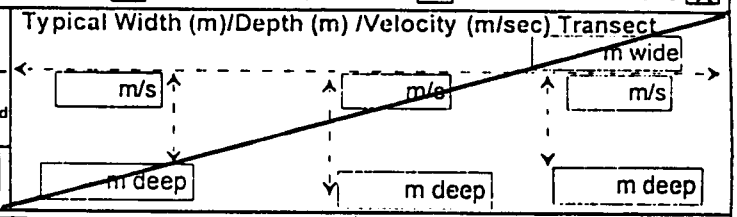
Width of riparian vegetation (m) on least buffered side: | *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

High Water Mark: _____ (m above present water level) + 0.75 (present depth in m) = _____ (m above bed)

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.1	30.01	7.74	4.95	40,100			VOB
Mid-depth	0.4	30.06	7.73	5.08	40,000			
Bottom	0.75	30.06	7.72	4.87	40,000			

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

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: Windy, Cloudy. Sampling started north east side of discharge canal approx. 15 meters waterward of shoreline

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Granger / Kovach / Hershfeld	Andrea	5/10/99

70% oyster rubble

25% sand.

5% Halodule.

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y): 4/30/99	RECEIVING BODY OF WATER: Old Tampa Bay
REMARKS: low tide Sampling from boat.	LOCATION: FPC Barlow Power Plant		FIELD ID/NAME: Test Site 2

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations: 6	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: 26	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 Oysters mangroves sea grasses	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: 8	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: 12	Combination of sand, gravel, and shell. 12-15 points 70% Shell hash	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 63

COMMENTS: Sediments 70% oyster shells + 30% sand. 5% area had Halodule Sp.

ANALYSIS DATE: 4/30/99	ANALYST: Karen Kramer	SIGNATURE: Karen Kramer

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		4/30/99	1205	Old Tampa Bay

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Sample Crew boat	Pinellas	FPC Barbow Power Plant	Intake

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
90						10	

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

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

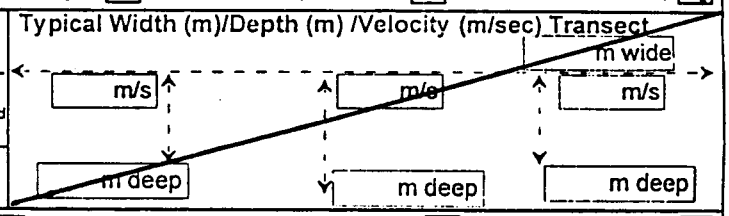
Width of riparian vegetation (m) on least buffered side: | *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

High Water Mark: _____ (m above present water level) + _____ (present depth in m) = _____ (m above bed)

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.1	26.43	7.79	5.82	39,800			
Mid-depth								
Bottom	<10 m	26.80	7.71	3.85	41,300			

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

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:
Cloudy, windy. Sampling occured in front of floating next to intake.

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Cramer/Kovach/Hershfeld	[signature]	5/10/99

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	24040705	4/30/99	1211	Old Tampa Bay

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Sample from boat	Pinellas	FPC - Bartow Power Plant	Test Site 5

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
90						10	

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

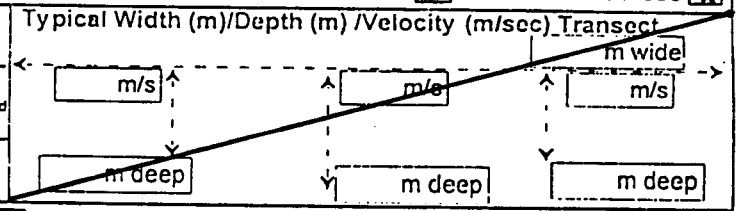
Local Watershed NPS Pollution (check box): No evidence ☐ Slight ☐ Moderate potential ☐ Obvious sources ☒

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

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

High Water Mark: 0.5 (m above present water level) + 0.75 (present depth in m) = 1.25 (m above bed)

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.1	26.3	7.81	5.53	39,900			VOB
Mid-depth								
Bottom	0.75	26.29	7.81	5.52	40,200			

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

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: windy, cloudy. Sampling started 15 meters Westward of the north side of intake canal

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Cramer/Kovach/Hershfeld	Candace A	5/10/99

80% sand
10% Halodule
10% oystershell

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	24040709	4/30/99	1300	Old Tampa Bay

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
sampling from boat	Pinellas	FPC - Bartow Power Plant	Test Site 8

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
90						10	

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

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

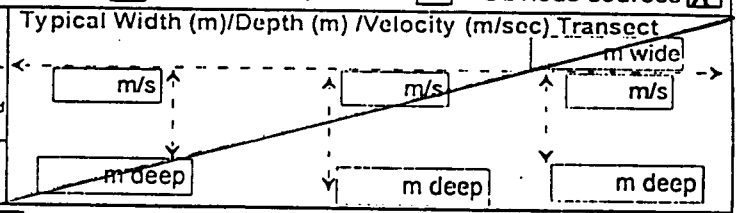
Width of riparian vegetation (m) on least buffered side: | *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

High Water Mark: 0.5 (m above present water level) + 0.75 (present depth in m) = 1.25 (m above bed)

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.1	26.51	7.82	5.66	39,900			VOB
Mid-depth								
Bottom	0.75	26.52	7.81	5.55	40,000			

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

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: Cloudy, light chop. Sampling started 15 feet westward of south side of Intake Canal

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Granger/Kovach/Hershfeld	candace granger	5/10/99

There was 80% sand and 20%.
Halodule.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	24040700	4/30/99	1525	Old Tampa Bay

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Sampling on boat in bay.	Pinellas	FPC - Bartow Power Plant	Reference Site 1

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
90						10	

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

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

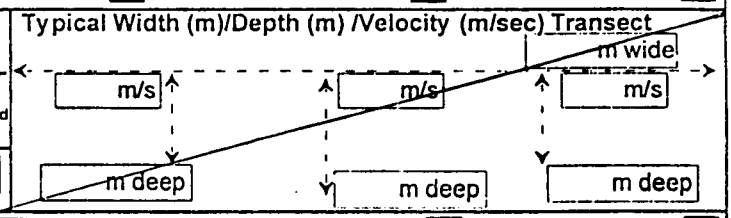
Width of riparian vegetation (m) on least buffered side: | *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

High Water Mark: 0.5 (m above present water level) + 1.0 (present depth in m) = 1.5 (m above bed)

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.1	27.77						VOB
Mid-depth	0.5	27.77				%		
Bottom	1.0	27.71						

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

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:
Cloudy, windy
This site is located 3 meters off shore near a mangrove fringe.

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Cramger, Kovach, Hershfeld	Conrad	5/5/99

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

SUBMITTING AGENCY CODE: _____ SUBMITTING AGENCY NAME: _____	STORET STATION NUMBER:	DATE (M/D/Y): 4/30/99	RECEIVING BODY OF WATER: Old Tampa Bay

REMARKS: High tide	LOCATION: FPC - Bartow Power Plant	FIELD ID/NAME: Reference Site

Habitat Parameter score	Excellent	Good	Fair	Poor
Littoral Alterations 9	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 37	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 mangroves oyster grass beds	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 8	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 15	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 80

COMMENTS: bottom had 80% Sand, 20% shell and Halodule

ANALYSIS DATE: 4/30/1999	ANALYST: Kovach / Grampp	SIGNATURE: C Grampp

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	24CA06 99	5/3/99	1040	Old Tampa Bay

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Pinellas	FPC - Bartow Power Plant	Area near 002

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
90							10

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

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

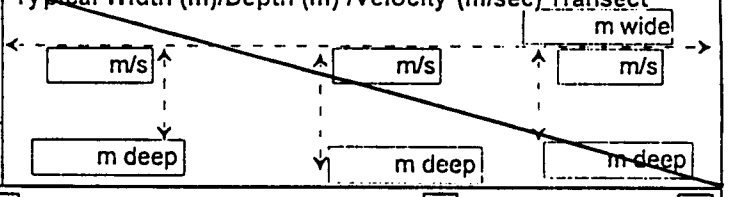
Width of riparian vegetation (m) on least buffered side: | *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

High Water Mark: 0.3 (m above present water level) + 0.4 (present depth in m) = 0.7 (m above bed)

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top								
Mid-depth	0.2	24.03	8.31	>14.0	38,200			VOB
Bottom								

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

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: Sunny, clear, calm
Sampling began 50 ft waterward of OW fall 002. Us reference site is "Reference 2".

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Granger, Kovach, Hershfield	Candace Granger	5/5/99

Ulva 90%

Gracilaria
Laurencia } 10%
Hypnea

There were numerous dead horseshoe crabs in this area and next to Outfall 002.

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/DD/Y):	RECEIVING BODY OF WATER:
		5/3/99	Old Tampa Bay

REMARKS:	LOCATION:	FIELD ID/NAME:
Slack high tide	FPC - Barton Power Plant	Area near 002

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations 8	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 38	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 macroalgae not seagrass	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 8	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 7	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 72

COMMENTS: Sand mixed with mud. The macroalgae was dense. 90% Ulva and 10% Gracilaria, Laurencia + Hypnea sp.

ANALYSIS DATE:	ANALYST:	SIGNATURE:
5/3/99	Karen/Grant	

* There were high number of dead horse shoe [illegible] Water was saturated DX

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		5/3/99	1040	Old Tampa Bay

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Sampling from boat	Pinellas	FPC - Bartow Power Plant	Outfall 002

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
90						10	10

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

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

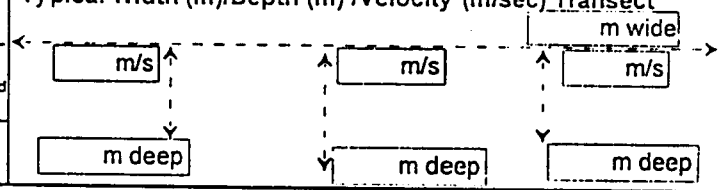
Width of riparian vegetation (m) on least buffered side: 4 | *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

High Water Mark: 0.5 (m above present water level) + 0.3 (present depth in m) = ____ (m above bed)

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top								
Mid-depth		22.22	7.85	5.65	38,400			
Bottom								

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:
The new permit calls this Outfall 009.

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Granger / Kovach / Hershfeld	Conrad	5/10/99

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	24040707	5/3/99	1120	Old Tampa Bay

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Sampling in bay on a boat.	Pinellas	FPC - Bartow Power Plant	Test Site 7

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
90						10	

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

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

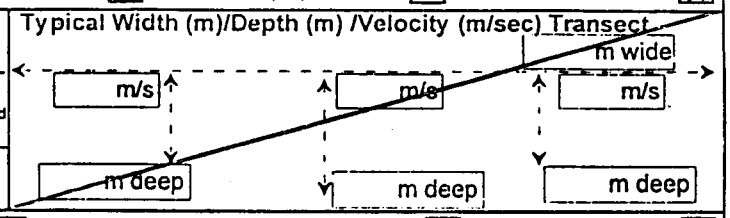
Width of riparian vegetation (m) on least buffered side: | *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

High Water Mark: _____ (m above present water level) + 0.75 (present depth in m) = _____ (m above bed)

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.1	22.26	8.04	9.65	31,000			V.O.B.
Mid-depth	0.3	22.24	8.03	9.43	38,700			
Bottom	0.75	22.24	8.00	9.22	38,700			

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

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:
Clear, sunny, calm.
Location is 330 meters off the shore, south side of intake canal

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Granger / Kovach / Hershfeld	Andrea Granger	5/5/99

There was 20% sand.

10% Acanthophora ~~Laurencia~~ sp.

Hypnea sp.

Caulerpa sp.

Gracilaria (long thin, and attached

60% Thalassia sp.

10% Halodule sp. (located around the fringes of Thalassia).

patchy Syringodium in the Thalassia

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	24040706	5/3/99	1152	Old Tampa Bay

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Sampling from boat	Pinellas	FPC - Bartow Power Plant	Test Site 6

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
90						10	

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

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

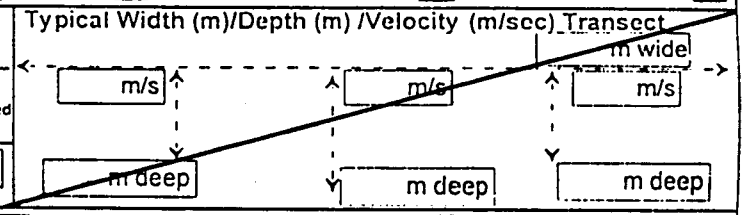
Width of riparian vegetation (m) on least buffered side: | *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

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

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots							

Draw aerial view sketch of habitats found in 100 m section

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.1	22.40	7.89	6.85	38,500			VOB
Mid-depth	0.5	21.68	7.86	6.87	38,700			
Bottom	1.0	21.66	7.85	6.93	38,800			

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

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: Sunny, clear, calm. Sampling started 330 meters northward from the north side of intake canal.

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Granger/Kovach/Hershfield	[signature]	5/10/99

40% Sand
60% Syringodium

some Gracilaria (long thin form attached).

5/3/99

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		5/3/99	1224	Old Tampa Bay

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Pinellas	FPC - Barlow Power Plant	Intake

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
90						10	

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

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

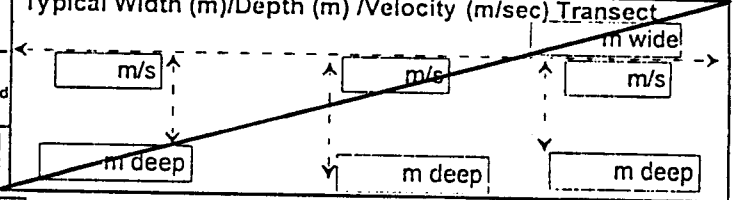
Width of riparian vegetation (m) on least buffered side: | *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes ☐ more sinuous

High Water Mark: ____ (m above present water level) + ____ (present depth in m) = ____ (m above bed)

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.1	22.03	7.83	6.03	39,600			2.4
Mid-depth	4.0	21.94	7.87	5.79	39,200			
Bottom	8.0	22.79	7.96	6.58	38,500			

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

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:
Sunny, ~~std~~ calm.
Sampling occurred next to south wall of intake canal.

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Cramer/Kovach/Hershfield	Candrea	5/10/99

5/3/99

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		5/3/99	1334	Old Tampa Bay

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Sampling from boat	Pinellas	FPC - Bartow Power Plant	Outfall

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
90						10	

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

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

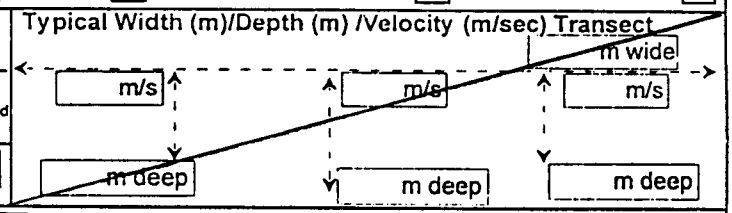
Width of riparian vegetation (m) on least buffered side: | *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes ☐ more sinuous

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

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.1	26.45	7.86	6.10	38,500			
Mid-depth	1.5	26.35	7.86	6.13	38,500			
Bottom	2.8	26.34	7.85	5.96	38,500			

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

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:
Sunny, warm, calm. Sampling at compliance point 001.

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Gramzer / Kovach / Hershfeld	Andrea Gramzer	5/5/99

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		5/7/99	1145	Old Tampa Bay

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Tide incoming	Pinellas	FPC - Bartow Power Plant	Outfall 002

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
90						10	

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

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

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

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

Artificially Impounded ☐ yes

High Water Mark: _____ (m above present water level) + _____ (present depth in m) = _____ (m above bed)

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

m/s _____ m deep | m/s _____ m deep | m/s _____ 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 ☐ slight ☐ moderate ☐ severe ☐ Silt smothering: none ☐ slight ☐ moderate ☐ severe ☐ Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top								
Mid-depth		25.68	7.55	5.08	41,000			
Bottom								

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:

The new permit calls this outfall 009

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

SAMPLING TEAM: Granger/Rovach/Hershfield | SIGNATURE: [signature] | DATE: 5/10/99

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	24040699	5/7/99	1215	Old Tampa Bay

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Sampling from boat	Pinellas	FPC - Barlow Power Plant	Area near 002

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
90						10	

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

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

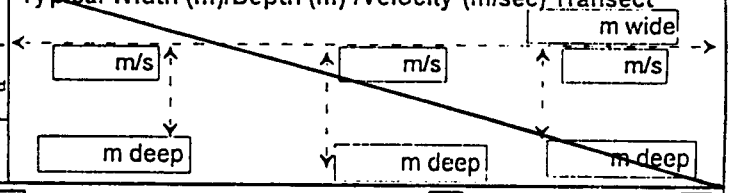
Width of riparian vegetation (m) on least buffered side: | *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

High Water Mark: 0.3 (m above present water level) + 0.15 (present depth in m) = 0.45 (m above bed)

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top								
Mid-depth	0.15	5.55	7.57	5.55	41,000			VOB
Bottom								

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

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: Clear, calm
Sampling began 50 ft waterward of OW fall 002. Us reference site is "Reference 2"

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Granger, Kovach, Hershfield	Candace Granger	5/11/99

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	24040699	5/7/99	1215	Old Tampa Bay

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Sampling from boat	Pinellas	FPC - Barlow Power Plant	Area near 002

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
90						10	

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

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

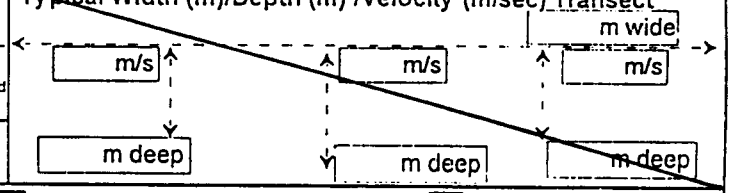
Width of riparian vegetation (m) on least buffered side: | *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

High Water Mark: 0.3 (m above present water level) + 0.15 (present depth in m) = 0.45 (m above bed)

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top								
Mid-depth	0.15	5.55	7.57	5.55	41,000			VOB
Bottom								

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

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: Clear, calm
Sampling began 50 ft waterward of OW fall 002. Us reference site is "Reference 2"

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Granger, Kovach, Hershfield	Candace Granger	5/11/99

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	21040710	5/7/99	1330	Old Tampa Bay

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Sampling Crab boat	Pinellas	FPC- Bartow Power Plant	Reference 2

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
90						10	

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

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

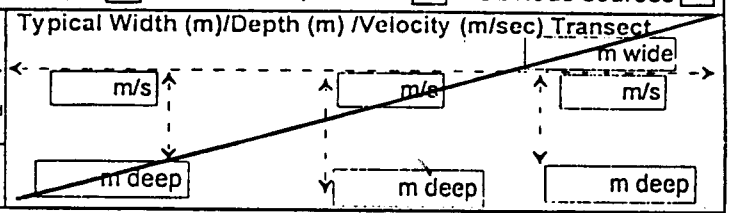
Width of riparian vegetation (m) on least buffered side: | *List & map dominant vegetation on back*

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

Artificially Impounded ☐ yes

High Water Mark: 0.9 (m above present water level) + 0.4 (present depth in m) = 1.3 (m above bed)

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



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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs or Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.1	26.4	7.63	4.34	41,600			VOB
Mid-depth	0.5	26.41	7.63	4.25	41,800			
Bottom	0.9	25.95	7.61	3.92	41,800			

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

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:
Sunny, clear, calm. Sampling began 25 ft water ward of mangroves. This is a reference site for area near 002

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Cranger, Rovach, Hershfield	[signature]	5/11/99

cat Reference 2:

Hypnea	60%
Laurencia	10%
Ulva	10%
Base muck	20%

Approximately 300 feet east of sampling site "Reference 2" There was the following aquatic vegetation:

90% Ulva.

10% Hypnea, Laurencia and Gracilaria

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Barton Power Plant (FPC)
County: Pinellas
Contact / District: Charlie Kovach / SouthWest
NPDES Permit #: FL00
LIMS Sample #: 383345 LIMS Job #: TLH-1999-05-04-26-01
sample log
Test Type: (Screening) / Definitive
(Static) / Static Renewal / Flow-through
Test Number: 2 of 2

Sample Collection: Date 5/3/99 Time 14:35
Test Beginning: Date 5/4/99 Time 1500
Test Ending: Date 5/6/99 Time 1580
Organism Batch #: 16 Diluent Batch #: NSW
Organism Age: 12 days SRT toxicant batch #:
Test organism: Menidia beryllina

Remarks: Control is NSW diluted with well water to 25.4‰ salinity.

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	24 h	48 h
Ctl A	D13	5	5	5	8.1	8.2	8.2	24.4	23.9	25.2	6.8	6.4	6.3	36.8	37.2	42.2
Ctl B	D14	5	5	5	8.1	8.2	8.2	24.2	23.8	25.6	6.8	6.4	6.4	37.5	38.8	41.8
Ctl C	D15	5	5	5	8.1	8.2	8.2	24.1	24.0	26.0	6.8	6.5	6.3	37.8	38.5	42.0
Ctl D	D16	5	5	5	8.1	8.2	8.2	24.0	24.0	25.5	6.8	6.5	6.2	37.8	38.3	41.2
100% A	D17	5	5	5	8.2	8.2	8.3	24.9	24.1	25.2	6.9	6.6	6.7	40.8	41.4	45.6
100% B	D18	5	5	5	8.2	8.2	8.3	25.0	24.2	25.2	6.8	6.6	6.7	38.8	40.7	43.8
100% C	D19	5	5	5	8.2	8.2	8.3	24.9	24.1	25.2	6.8	6.5	6.5	40.8	40.8	43.9
100% D	D20	5	5	5	8.2	8.2	8.3	24.8	24.0	25.4	6.7	6.5	6.6	40.7	41.1	44.3
measured by:		FW	CO	CH	CH	MF	MF	CH	MF	MF	CH	MF	MF	CH	MF	MF
recorded by:		CH	CO	CH	FW	CH	CH	FW	CH	CH	FW	CH	CH	FW	CH	CH

Investigators' Signatures

Test Room Temp Range 20.5-26.5°C
Incubator #3 Temp Range 25.0-27.0°C

(Salt Water) Well Water / 20% Min Water

Water Quality Parameters	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):	not measured			MF
Lab Total Residual Cl2 (mg/L): 0.03	<0.03	DR-100	CH	MF
Alkalinity (mg/L as $CaCO_3$): not measured	149	Hach	CH	MF
Hardness (mg/L as $CaCO_3$): not measured	not measured Hach		c 5/11/99	
Total ammonia (mg/L as N): 0.017	<0.017	Dawnis	MF	MF
Salinity: 25.4	25.6‰	YSI	FW	MF

reviewer

form updated 5/22/98

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Bartow Power Plant (FPC)
County: Pinellas
Contact / District: Charles Kovach / Southwest
NPDES Permit #: FL00
LIMS Sample #: 383345 LIMS Job #: TLH-1999-05-04-26-01
sample log ____
Test Type: (Screening) I Definitive
(Static) I Static Renewal I Flow-through
Test Number: 1 of 2

Sample Collection: Date 5/3/99 Time 14:35
Test Beginning: Date 5/4/99 Time 1515
Test Ending: Date 5/6/99 Time 1510
Organism Batch #: 108 Diluent Batch #: NSW
Organism Age: 4 days SRT toxicant batch #: ____
Test organism: Americamysis bahia
Remarks: Control is NSW diluted with well water to 25‰ salinity

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) 0 hr	UNCORRECTED Cond. (mmhos/cm) 24 h	UNCORRECTED Cond. (mmhos/cm) 48 h
Ctl A	D1	5	5	5	8.1	8.1	8.2	24.0	24.0	26.7	6.6	6.2	6.0	37.7	37.3	44.6
Ctl B	D2	5	5	5	8.1	8.1	8.2	24.0	24.1	25.5	6.6	6.2	6.1	37.8	38.7	43.1
Ctl C	D3	5	5	5	8.1	8.2	8.2	24.0	24.2	26.0	6.7	6.2	6.3	37.5	38.8	42.8
Ctl D	D4	5	5	5	8.1	8.2	8.2	24.2	24.2	26.0	6.9	6.3	6.2	37.7	38.7	42.8
100% A	D5	5	5	5	8.1	8.2	8.2	24.2	24.3	25.9	7.0	6.3	6.2	40.4	41.0	44.6
100% B	D6	5	5	5	8.2	8.2	8.2	24.2	24.8	26.4	7.0	6.3	6.3	40.3	42.4	46.8
100% C	D7	5	5	5	8.2	8.2	8.2	24.2	24.4	26.4	6.8	6.3	6.1	40.4	42.4	46.1
100% D	D8	5	5	5	8.2	8.2	8.2	24.0	24.2	25.6	6.7	6.2	6.0	39.9	40.8	44.3
measured by:		FW	CO	CH	CH	MF	MF	CH	MF	MF	CH	MF	MF	CH	MF	MF
recorded by:		CH	CO	CH	FW	CH	CH	FW	CH	CH	FW	CH	CH	FW	CH	CH

Investigators' Signatures

Room Temperature Range 20.5-26.5°C
Incubator #3 Temperature Range 25.0-27.0°C

Salt Water: Well Water / 20% Min Water

Water Quality Parameters	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):	not measured			MF
Lab Total Residual Cl2 (mg/L): <0.03	<0.03	DR-100	CH	MF
Alkalinity (mg/L as $CaCO_3$): not measured	149	Hach	CH	MF
Hardness (mg/L as $CaCO_3$): not measured	not measured			
Total ammonia (mg/L as N): <0.017	<0.017	Denver ISE	MF	MF
Salinity: 25.4	25.6‰	YSI	FW	MF

Countertop Head
Marshall Faircloth
A H Wolfe
reviewer

form updated 5/22/98

Benthic macroinvertebrate taxa list for FPC Bartow Plant, collected via Ponar grab samples in Old Tampa Bay, on 30 April 1999 and 7 May 1999. Densities, in number/m2, represent the mean of three replicates.

	Test Area 002	Control 1	Control 2	Test 1	Test 2
Amphipoda					
Ampelisca abdita	889	56	2069	–	–
Ampelisca cristata	–	167	–	264	625
Ampelisca sp.	–	28	69	97	14
Ampeliscidae	–	–	14	–	14
Ampithoe sp.	14	–	–	–	–
Ampithoidae	–	–	14	–	–
Aoridae	14	139	–	–	111
Corophiidae	–	–	42	–	–
Corophium simile	56	–	–	–	–
Corophium sp.	–	14	375	–	–
Corophium volutator	28	–	–	–	–
Ericthonius sp.	14	–	–	–	–
Gammarus mucronatus	181	–	28	–	–
Grandidierella bonnieroides	611	42	153	–	–
Listriella barnardi	–	–	–	28	–
Rudilemboides naglei	–	28	–	236	319
Cumaceae					
Cyclaspis sp.	–	14	–	403	69
Cyclaspis varians	–	–	–	–	–
Oxyurostylis sp.	–	319	–	292	14
Decapoda					
Paguridae	42	–	–	–	–
Penaeus sp.	28	–	56	–	–
Undetermined Decapoda	–	–	14	–	42
Xanthidae	125	–	–	–	–
Echinodermata					
Amphiuridae	–	14	–	14	–
Holothuroidea	–	–	–	14	–
Gastropoda					
Acteocina canaliculata	–	–	–	56	–
Acteocina sp.	–	125	139	–	–
Cerithium muscarum	14	–	–	–	–
Cerithium sp.	–	–	14	–	–
Mitrella lunata	139	–	14	–	–
Muricidae	–	–	–	–	14
Nassarius vibex	–	–	–	–	–
Natica sp.	–	–	–	14	–
Odostomia sp.	–	42	–	14	69
Olividae	–	–	–	42	–
Pyramidella sp.	–	–	–	–	42
Undetermined Gastropoda	83	56	139	–	–
Isopoda					
Edotea montosa	111	–	42	–	–
Erichsonella filiformis	–	–	14	–	–
Exosphaeroma sp.	–	–	14	–	–
Mysidacea					
Americamysis almyra	–	14	–	–	–
Americamysis bahia	–	14	–	–	14
Americamysis bigelowi	–	–	–	14	–

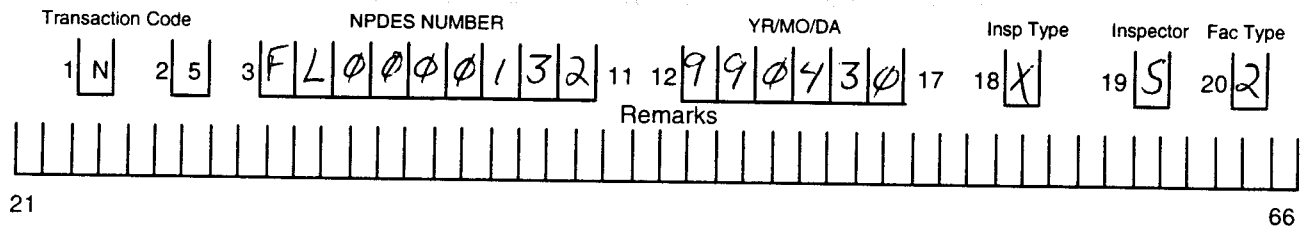
Benthic macroinvertebrate taxa list for FPC Bartow Plant, collected via Ponar grab samples in Old Tampa Bay, on 30 April 1999 and 7 May 1999. Densities, in number/m2, represent the mean of three replicates.

	Test Area 002	Control 1	Control 2	Test 1	Test 2
Bowmaniella brasiliensis	–	–	–	69	–
Bowmaniella sp.	–	–	–	14	14
Taphromysis sp.	–	–	–	14	–
Nemertea					
Tubulanus sp.	–	14	–	–	–
Undetermined Nemertea	42	69	97	42	153
Pelecypoda					
Amygdalum papyrium	14	14	14	28	–
Cardiidae	–	–	–	42	28
Glycymerididae	–	14	–	–	–
Lyonsia sp.	–	14	–	–	–
Parastarte triquetra	153	1028	42	28	–
Sphenia antillensis	–	–	14	–	–
Tagelus sp.	–	–	14	–	–
Tellina lineata	–	–	–	28	14
Tellina sp.	14	–	–	28	42
Tellina versicolor	–	–	28	83	14
Tellinidae	–	56	–	–	–
Undetermined Pelecypoda	14	56	–	153	28
Veneridae	–	83	–	–	–
Polychaeta					
Ampharetidae	–	–	28	14	–
Aricidea philbinae	–	28	–	28	–
Boccardia sp.	–	–	–	–	14
Capitella capitata	1264	–	–	–	–
Capitella sp.	681	486	528	–	–
Capitellidae	–	153	14	28	14
Chaetopteridae	–	–	–	–	–
Eteone heteropoda	69	97	194	–	–
Glycera sp.	–	–	–	–	14
Glycinde sp.	–	–	–	–	14
Goniadidae	–	–	–	–	14
Hesionidae	–	–	28	–	–
Laeonereis culveri	583	–	472	14	–
Leitoscoloplos fragilis	14	125	208	14	–
Leitoscoloplos sp.	69	28	–	14	–
Marphysa sp.	14	–	–	–	–
Minuspio longibranchiata	–	–	–	–	14
Mooreonuphis pallidula	14	–	–	–	–
Nereidae	–	–	14	–	–
Nereis succinea	69	–	–	–	–
Orbiniidae	–	14	56	–	–
Paraonidae	–	28	–	–	–
Phyllodoce mucosa	–	14	–	–	–
Phyllodoce sp.	–	14	–	42	–
Polydora ligni	14	–	–	–	–
Polydora sp.	14	–	–	–	–
Prionospio heterobranchia	–	167	–	–	14
Prionospio sp.	–	–	–	–	42
Scolelepis sp.	–	–	–	–	–
Scolelepis squamata	–	–	14	14	–

Benthic macroinvertebrate taxa list for FPC Bartow Plant, collected via Ponar grab samples in Old Tampa Bay, on 30 April 1999 and 7 May 1999. Densities, in number/m2, represent the mean of three replicates.

	Test Area 002	Control 1	Control 2	Test 1	Test 2
Spionidae	–	28	–	14	42
Stenoninereis martini	42	–	–	–	–
Streblospio benedicti	14	–	28	–	–
Undetermined Polychaeta	–	–	14	–	–
Sipuncula					
Undetermined Sipuncula	–	–	139	–	–
Tanaidaceae					
Hargeria rapax	125	56	153	–	–
Tubificidae					
Undetermined Tubificidae	1486	14	3542	14	14
Turbellaria					
Stylochidae	–	–	14	–	–
Stylochus sp.	–	14	–	–	–
Undetermined Turbellaria	14	–	56	–	–

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



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

