

Biological Assessment of

Holiday Harbor WWTP

Duval County

NPDES #FL0023531

Sampled January 1992

September 1992

Biology Section
Division of Technical Services

Department of Environmental Regulation
Results of Fifth Year Inspections

Discharger: Holiday HarborWWTP
County: Duval
NPDES Number: FL0023531
State Permit Expiration Date:

Toxics Sampling Inspection (XSI)

Date Sampled: 14 January 1992

Results: Organic constituents in the effluent included low amounts of aliphatic hydrocarbons. The only metal detected in the effluent above quantitation limits was iron (34 µg/L). This value is within Class III standards.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 14 January 1992

Results: The full strength effluent sample was acutely toxic to the water flea, *Ceriodaphnia dubia*, and to the fish, *Notropis leedsi*. This is a violation of 17-302.510(3)(p) FAC, 17-302.500(1)(d) FAC, and 17-4.244(3)(a) FAC.

Impact Bioassessment Inspection (IBI)

Date Sampled: 14 January 1992

Results: Measurements of macroinvertebrate community health indicated that biota at Test Site 1 were degraded, as indicated by large reductions in taxa richness and Shannon-Weaver diversity, compared to the control. The reduction in diversity is a violation of 17-302.560(9) FAC. Biological recovery was seen at Test Site 2. Of the phytoplankton community parameters examined, only chlorophyll *a* levels indicated a disturbance associated with the discharge. The chlorophyll *a* measured at Test Site 2 was higher than approximately 70% of other estuaries, suggesting moderate eutrophication.

Water Quality Inspection (WQI)

Date Sampled: 14 January 1992

Results: Fecal and total coliform standards were violated both in the effluent sample and at Test Site 1. These are violations of 17-302.560(6) FAC. The discharge was responsible for the severe nutrient enrichment observed in the receiving waters. The concentrations of ammonia, TKN, nitrate-nitrite, and phosphorus species at Test Site 1 were virtually the same as those found in the effluent. These levels were much higher than those found in 95% of all other Florida estuaries. The TKN of the effluent exceeded the facility's permit limit. The unionized ammonia in the effluent, which was an order of magnitude higher than the Class III freshwater standard, probably contributed to the toxicity observed in bioassays, and to the biological degradation at the near-field test site.. The AGP measured at Test Site 1 was double the 5 mg dry wt/L, "problem threshold", above which the negative consequences associated with nutrient enrichment (D.O. depletion, algal blooms, fish kills) are probable.

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

Introduction

The Holiday Harbor Wastewater Treatment Plant is a 1.25 MGD domestic wastewater treatment facility located in Duval County (see maps in Appendix). The treatment system consists of two 0.5 MGD complete mix activated sludge units, one 0.25 MGD contact stabilization unit, a denitrification lagoon, an oxidation lagoon, tertiary filters, and chlorination. The final effluent is discharged through a ditch to a tributary of Hogpen Creek, and then to the Intracoastal Waterway, all Class III waters (see map in Appendix). The facility does not have a mixing zone.

State permit limits are as follows: flow (maximum of 1.25 MGD), BOD (maximum of 10 mg/L, annual average of 5 mg/L), TSS (maximum of 60 mg/L, annual average of 20 mg/L), TKN (maximum of 10.4 mg/L, annual average of 5.24 mg/L), pH (6 to 8.5), fecal coliform (maximum of 800 organisms/100 mL, average of 200 organisms/100 mL), and chlorine residual (minimum of 0.5 mg/L for disinfection, maximum of 0.01 mg/L at discharge). NPDES permit limits are similar (see Facility Summary in Appendix).

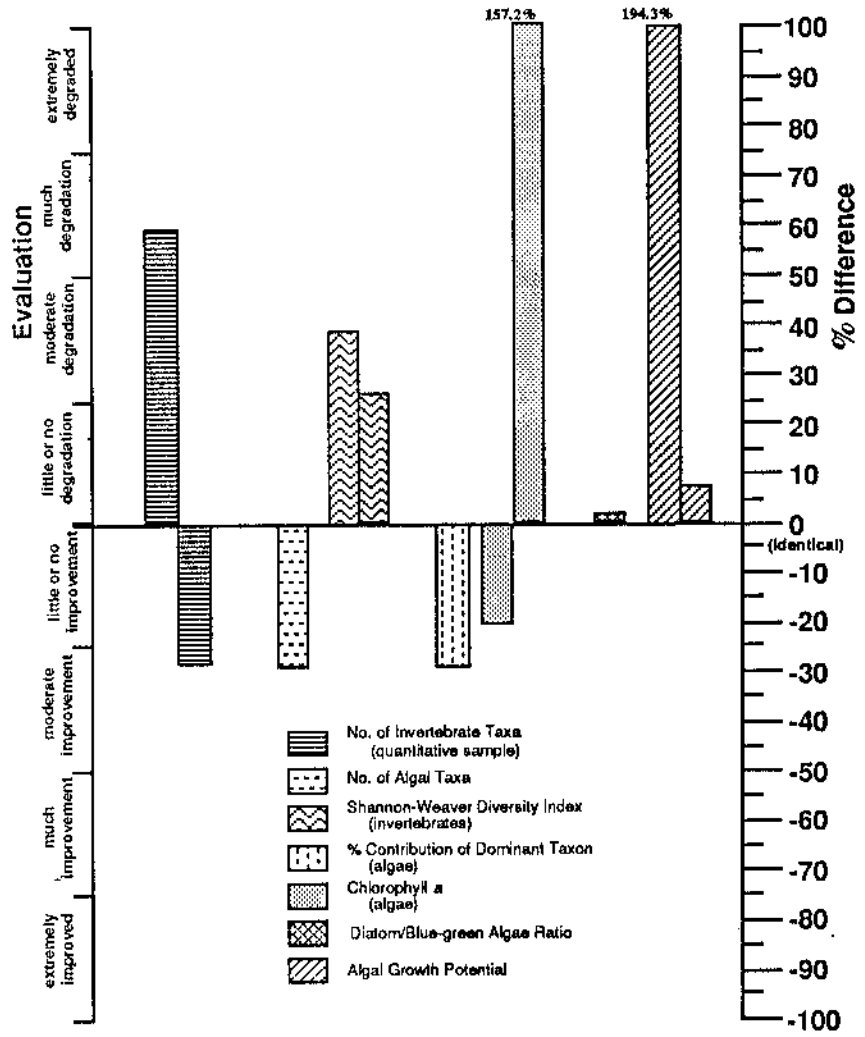
During the past two years, numerous problems with the plant have been documented, including chronic violations of the BOD and TKN limits, and violations of both chlorine residual and fecal coliform limits. Enforcement action by the Northeast District Office is underway. The facility was recently acquired by the City of Jacksonville, which is currently attempting to correct deficiencies.

Methods

The focus of this investigation was to determine the discharger's effects on the receiving waters. A comparison of biological community health was made between a reference site (located in Sombrero Creek, a tributary of the Tolomato River) and two test sites (one located downstream of the discharge in a tributary of Hogpen Creek, and the other located farther downstream of the plant in Hogpen Creek) (see maps in Appendix). A habitat assessment was performed *in situ* to establish comparability between sites. Supplemental physical/chemical data were also collected on the effluent and study sites. Acute toxicity bioassays, using Ceriodaphnia *dubia* and *Notropis leedsi* as the test organisms, were performed on an effluent sample (EPA 1988). The effluent was analyzed for metals and for organic constituents (base neutral and acid extractables, and pesticide extractables). Additionally, nutrient analyses were performed on effluent, reference, and test sites. Methods used for all chemical analyses are on file at the Tallahassee DER Chemistry Laboratory.

Major characteristics of community structure of control and test sites.

	Reference Site	Test Site 1	Test Site 2
Macroinvertebrate Ponar			
Number of Taxa	17	7	22
Shannon-Weaver Diversity	3.4	2.1	2.5
% Polychaeta	77.4	4.5	34.4
% Tanaidacea	0	0	53.4
% Diptera	0	34.1	0
% Malacostraca	3.2	18.2	9.3
% Hirudinea	0	11.4	0
% Oligochaeta	0	29.5	0
% Others	19.4	2.3	2.9
% Predators	6.3	18.2	35.4
% Collector-Gatherers	76.1	64.8	63.6
% Collector-Filterers	16.0	0	0
% Shredders	0	17.1	0
% Scrapers	1.6	0	1.0
Phytoplankton Algae			
Number of Taxa	17		22
% Contribution of Dominant Taxon	19.0		13.5
Chlorophyll a (µg/L)	3.5	2.9	9.0
Diatom/Blue-green Abund. Ratio	1.0		0.98
% Blue-green	0		1.4
% Pyrrophyta	1.7		5.4
% Diatoms	86.2		74.3
% Green	12.1		6.8
% Others	0		12.2
Algal Growth Potential (mg dry wt/l)	3.5	10.3	3.8



Effect of discharge on receiving water
(measured as difference between control and test sites).
(Left bar represents comparison between control site and test site 1; right bar represents comparison between control site and test site 2.)

Benthic macroinvertebrate communities were evaluated at the reference site and both test sites. Collection methods consisted of 3 Ponar grabs per site (Ross 1990). Phytoplankton was sampled at the reference site and at Test Site 2 via subsurface grabs (Ross 1990). Chlorophyll *a* was also determined for phytoplankton communities (Ross 1990). Bacterial populations were analyzed for total and fecal coliforms following the methods of APHA (1989). Algal Growth Potential tests, using *Selenastrum capricornutum* for freshwater samples and *Dunaliella tertiolecta* for the saline samples, followed Miller *et al.* (1978) and EPA (1974), respectively.

Explanation of Measurements of Community Health

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

For graphical purposes, the percent differences between the reference and test sites involving the number of taxa, the diversity index, and the diatom to blue-green algae ratio are measured as the reference site minus test site divided by the reference site. The percent differences between sites involving the percent contribution of dominant taxon, chlorophyll *a*, and algal growth potential are measured as the test site minus reference site divided by the reference site.

The following personnel were involved in this investigation: Scott Bulgrin (DER Northeast District), and Lyn Burton, Marshall Faircloth, Russel Frydenborg, Kathleen Lurding, Kim Pearce, and Sandy McClure (Tallahassee Biology Laboratory).

Results and Discussion

The study area is a *Cladium* and *Juncus* dominated, tidal estuary (Appendix). Both the Hogpen Creek test sites (with 63 and 69 points) and the Sombrero Creek reference site (with 76 points) were similar regarding habitat quality. It should be noted that low salinity conditions prevailed at Test Site 1 (conductivity was 1100 µmhos/cm), while both the reference site (34,900 µmhos/cm) and Test Site 2 (23,000 µmhos/cm) were more saline. The input of the freshwater effluent was probably responsible for the low salinity at Test Site 1. Other parameters were fairly consistent between sites, except that dissolved oxygen at Test Site 1 (6.0 mg/L), was 3 to 4 mg/L lower than the other sampling stations.

The full strength effluent sample was acutely toxic to the water flea, *Ceriodaphnia dubia*, and to the fish, *Notropis leedsi*, killing all the water fleas and 60% of the fish within 48 hours. This is a violation of 17-302.510(3)(p) FAC, 17-302.500(1)(d) FAC, and 17-4.244(3)(a) FAC.

Organic constituents in the effluent included aliphatic hydrocarbons at 46 µg/L. The only metal detected in the effluent above quantitation limits was iron (34 µg/L). This value is within Class III standards.

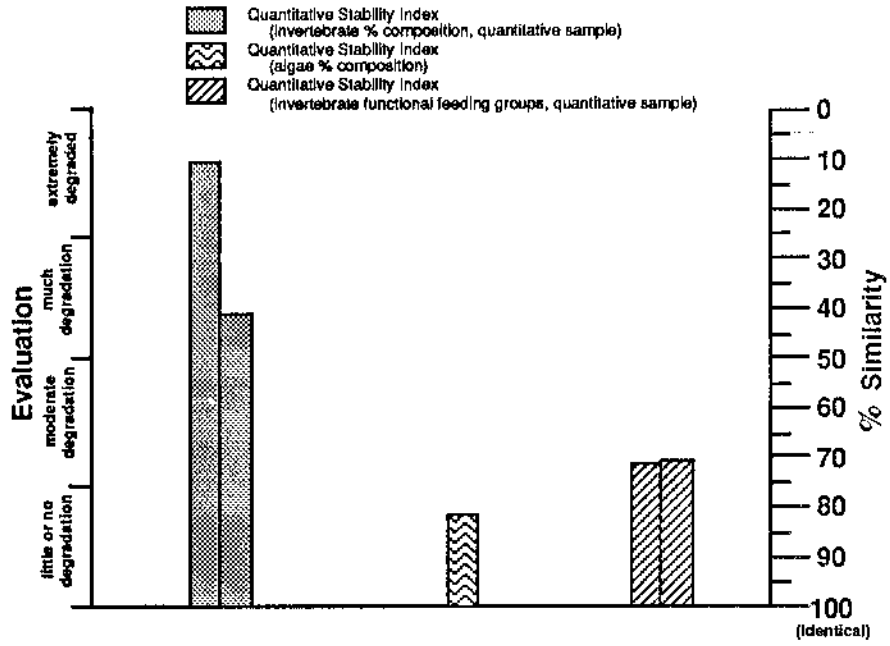
Concentrations of ammonia (18 mg/L), TKN (22 mg/L), nitrate-nitrite (0.65 mg/L), and phosphorus (ortho = 4.4 mg/L, total = 4.8 mg/L) measured in the effluent were particularly elevated. This TKN level exceeded the facility's permit limit. An unionized ammonia concentration of 0.21 mg/L was calculated for the effluent. This unionized ammonia, which is an order of magnitude higher than the Class III freshwater standard, probably contributed to the observed toxicity.

The concentrations of ammonia, TKN, nitrate-nitrite, and phosphorus species at Test Site 1 were virtually the same as those found in the effluent. These levels were much higher than those found in 95% of all other Florida estuaries (see Appendix). STORET data from 700 estuary stations, for the period of 1980 to 1989, have been compiled into a percentile distribution (Joe Hand, personal communication). Data from this present investigation were evaluated against this table (in Appendix). Nutrients at Test Site 2 were much reduced from the concentrations found at Test Site 1, yet nitrate-nitrite was still above the 95th percentile, and ammonia was above the 70th percentile. In contrast, nutrients detected at the reference site were low or typical of estuary systems.

Results of algal growth potential tests indicate that waters at Test Site 1 may be subject to eutrophication effects. The AGP measured at Test Site 1 (10.3 mg dry wt/L) was double the 5 mg dry wt/L, "problem threshold", above which the negative consequences associated with nutrient enrichment (D.O. depletion, algal blooms, fish kills) are probable (Raschke and Schultz 1987).

Fecal coliform standards were violated both in the effluent sample (1,100 organisms/100 mL) and at Test Site 1 (13,100 organisms/100 mL). Similarly, standards for total coliform bacteria were violated in the effluent (160,000 organisms/100 mL) and at Test Site 1 (30,000 organisms/100 mL). These are violations of 17-302.560(6) FAC.

Measurements of macroinvertebrate community health suggested that biota at Test Site 1 were degraded. The figure on p. 2 indicates the



Effect of discharge on receiving water
(measured as similarity between control and test sites).
(Left bar represents comparison between control site and test site 1; right bar represents comparison between control site and test site 2.)

degree of difference between the reference and test sites. Larger differences (that is, higher percentages) correspond with greater degrees of degradation. The figure on p. 3 summarizes similarities between the sites. Smaller similarities (lower percentages) generally correspond with greater degradation.

Taxa richness and Shannon-Weaver diversity were greatly reduced at Test Site 1, compared to the control. This station was dominated by organisms tolerant of organic enrichment, including oligochaetes and *Chironomus* sp. The reduction in diversity at this test site is a violation of 17-302.560(9) FAC. One confounding factor involved in this analysis was the large differences in salinity between the sites. However, corroborating data, such as the toxicity of the effluent and high ammonia at the test site, suggest that the facility is largely responsible for the poor conditions of the receiving waters. Biological improvement was seen at Test Site 2, shown by an increase in taxa richness and the presence of epibenthic crustaceans (considered more pollution sensitive). The relatively low diversity (2.5) at Test Site 2 was influenced by large numbers of *Leptochelia rapax*, an organism which is not generally associated with polluted conditions (Graham Lewis, Northwest Florida Water Management District, personal communication).

Phytoplankton were evaluated at Test Site 2 and the reference station. Of the phytoplankton community parameters examined, only chlorophyll *a* levels indicated a disturbance associated with the discharge. The chlorophyll *a* measured at Test Site 2 was higher than approximately 70% of other estuaries, suggesting moderate eutrophication.

Conclusions

The full strength effluent sample was acutely toxic to the water flea, *Ceriodaphnia dubia*, and to the fish, *Notropis leedsi*, killing all the water fleas and 60% of the fish within 48 hours. This is a violation of 17-302.510(3)(p) FAC, 17-302.500(1)(d) FAC, and 17-4.244(3)(a) FAC.

Organic constituents in the effluent included low amounts of aliphatic hydrocarbons. The only metal detected in the effluent above quantitation limits was iron (34 µg/L). This value is within Class III standards.

The discharge was responsible for the severe nutrient enrichment observed in the receiving waters. The concentrations of ammonia, TKN, nitrate-nitrite, and phosphorus species at Test Site 1 were virtually the same as those found in the effluent. These levels were much higher than those found in 95% of all other Florida estuaries. The TKN of the effluent exceeded the facility's permit limit. The unionized ammonia in the effluent, which was an order of magnitude higher than the Class III freshwater standard, probably contributed to the toxicity observed in bioassays, and to the biological degradation at the near-field test site.

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Of the phytoplankton community parameters examined, only chlorophyll *a* levels indicated a disturbance associated with the discharge. The chlorophyll *a* measured at Test Site 2 was higher than approximately 70% of other estuaries, suggesting moderate eutrophication.

Literature Cited

American Public Health Assoc., American Water Works Assoc., and Water Pollution Control Federation. 1989. Standard Methods for the Examination of Water and Wastewater, 17th ed. New York, N.Y. 1268 p.

Environmental Protection Agency. 1974. Marine algal assay procedure: Bottle test. Nat'l Environ. Res. Center, Office of Res. and Dev., U.S. EPA, Corvallis, Oregon. 43 p.

Miller, W. E., T. E. Maloney, and J. C. Greene. 1978. The *Selenastrum capricornutum* Printz algal assay bottle test. U. S. Environ. Prot. Agency, EPA-600/9-78-018. 126 p.

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

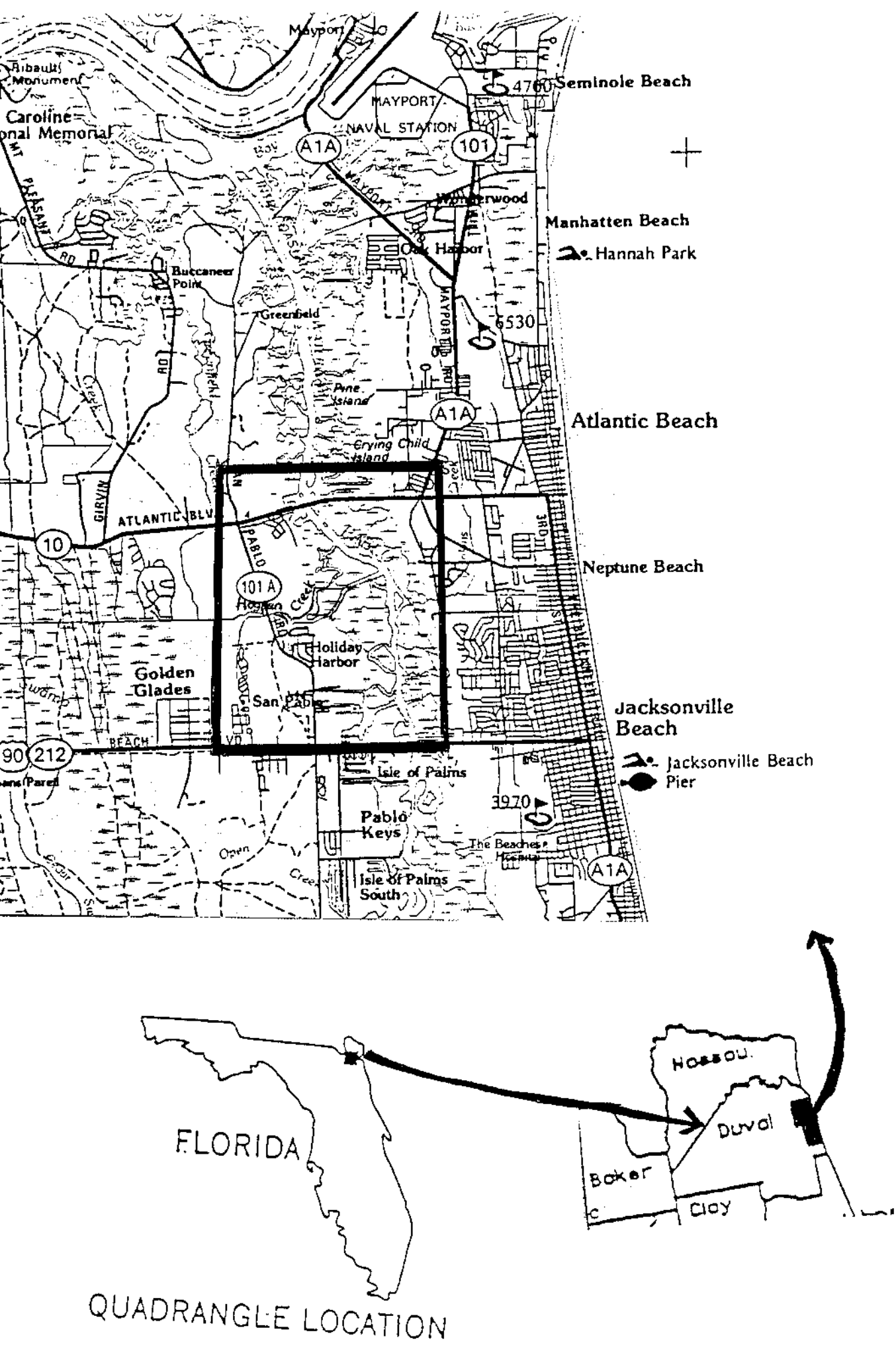
Ross, L. T. 1990. Methods for aquatic biology. Fla. Dept. Environ. Reg. Tech. Ser. 10(1): 1-47.

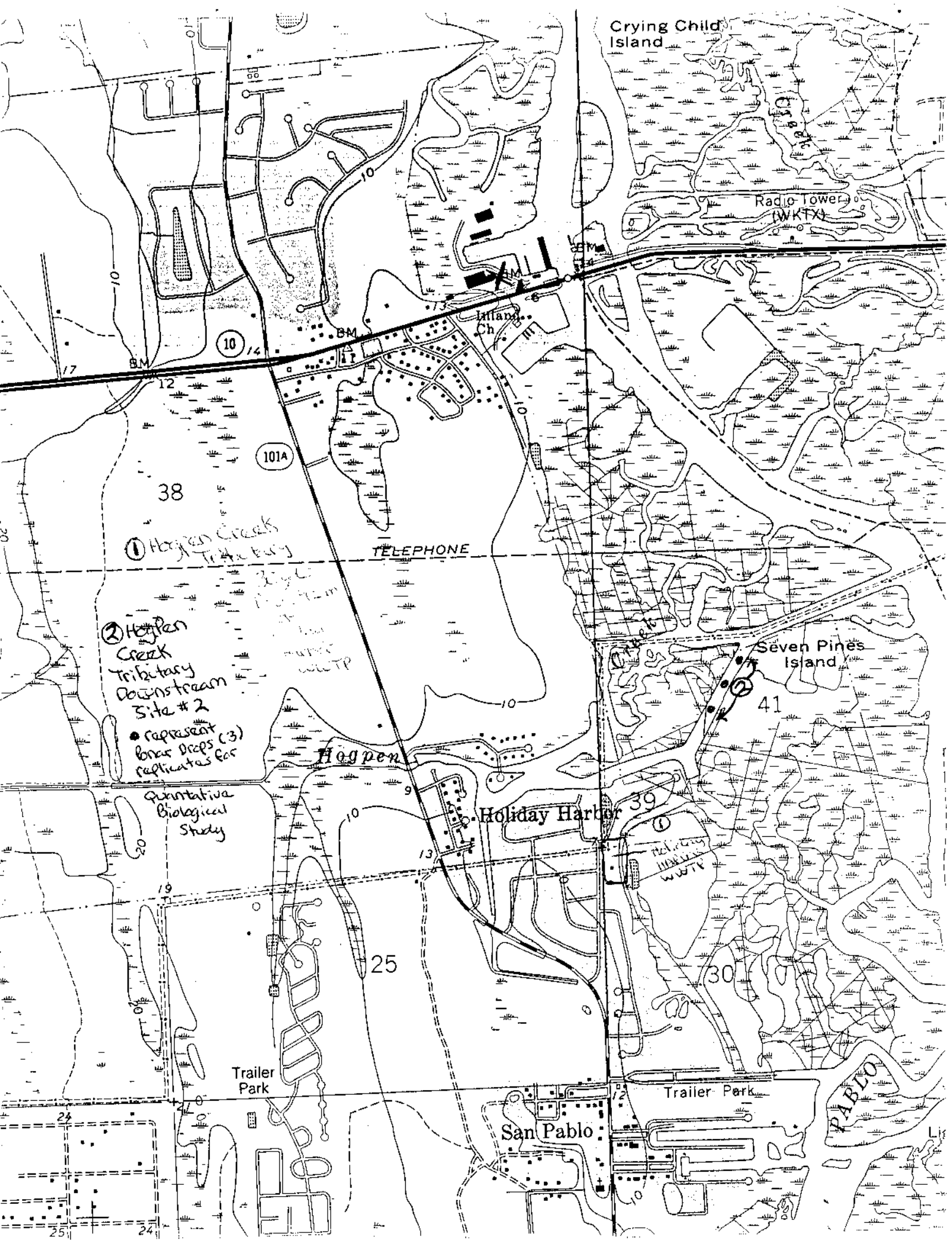
Weber, C. I. 1991. Methods for measuring the acute toxicity of effluents to freshwater and marine organisms. 4th edition. EPA/600/4-90/027. U. S. EPA, Cincinnati, Ohio. 216 p.

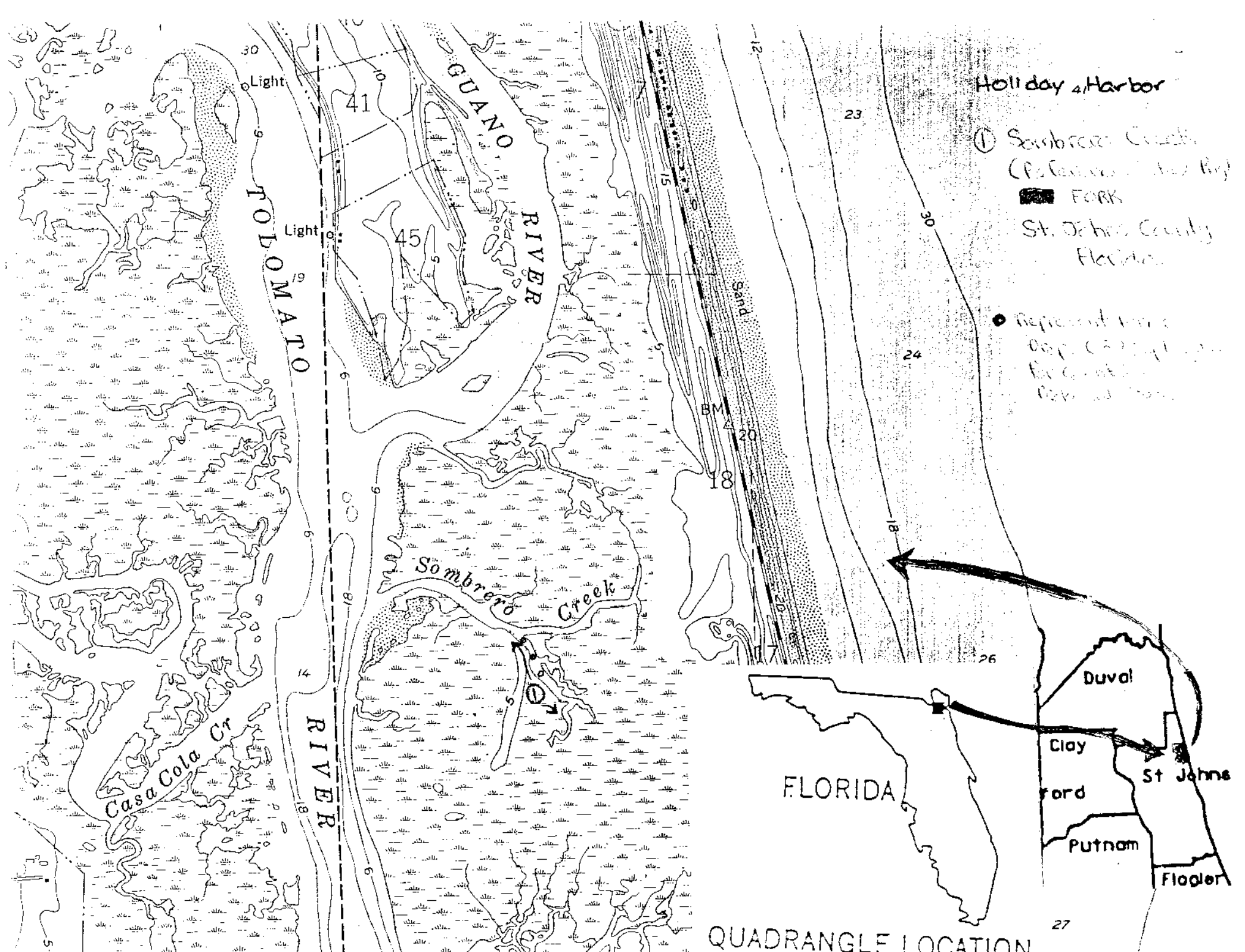
Chemistry summary table for Holiday Harbor WWTP .

	Effluent	Reference Site	Test Site 1	Test Site 2
Organic Constituents (ug/L)				
Aliphatics	46			
Metals (ug/L)				
Aluminum	21 T			
Arsenic	20 U			
Cadmium	0.07 U			
Copper	5 U			
Chromium	10 U			
Iron	34			
Lead	15 U			
Mercury	0.1 U			
Nickel	5 U			
Silver	0.07 U			
Zinc	10 T			
Nutrients (mg/L)				
Ortho-phosphorus	4.4		4.5	0.09
Total phosphorus	4.8	0.07	5.1	0.11
Ammonia	18	0.05	18	0.10
Nitrate+Nitrite	0.65	0.04	0.71	0.86
TKN	22	0.9	23	0.79
Other Parameters				
Habitat Assessment		76	63	69
D.O. (mg/L)		9.2	6.0	10.2
pH (SU's)		7.7	7.3	7.7
Conductivity (µmhos/cm)		34,900	1100	23,000
Temperature (°C)		12.0	20.0	14.0
TSS (mg/L)	2	16	4	15
BOD (mg/L)	5	1.2	5.7	0.3
Turbidity (NTU)	1.1	4.0	1.3	3.4
Bioassay Fish-Unchlorinated	Toxic			
Bioassay Invertebrate-Unchlorinated	Toxic			
Fecal coliform (org/100 ml)	1,100	130	13,000	80
Total coliform (org/100 ml)	160,000 L	230	30,000	130
AGP (mg dry wt/L)	5.7	3.5	10.3	3.8

A - Value reported is the mean of two or more determinations
E - Scientific notation
J - Estimated value
K - Actual value is known to be less than value given
L - Actual value is known to be greater than value given
N - Not analyzed for this compound
T - Value reported is less than the practical quantitation limit
U - Material analyzed for but not detected; value reported is the minimum detection limit
Q - Evidence that analyte is present in sample is equivocal
NA - Not applicable
NR - Not requested


Mayport
Ribault Monument
Caroline Memorial
MAYPORT NAVAL STATION
A1A
101
4760
Seminole Beach
Wonderwood
Manhatten Beach
Hannah Park
Oak Harbor
Buccaneer Point
Greenfield
6530
Pine Island
Crying Child Island
Atlantic Beach
GIRVIN
ATLANTIC BLVD
10
PABLO
101 A
Neptune Beach
Holiday Harbor
Golden Glades
San Pablo
Jacksonville Beach
Jacksonville Beach Pier
90
212
Isle of Palms
3970
Pablo Keys
The Beaches Hospital
Isle of Palms South
FLORIDA
Nassau
Duval
Baker
Clay
QUADRANGLE LOCATION


Crying Child Island
Radio Tower (WKTX)
BM
Inland Ch
10
14
17
12
101A
38
TELEPHONE
Hogpen Creek Tributary
Hogpen Creek Tributary Downstream Site #2
represent three Drops for replicates for
Quantative Biological Study
Hogpen
Holiday Harbor
39
Seven Pines Island
41
30
25
Trailer Park
Trailer Park
San Pablo
PABLO


Holiday Harbor
FORK
Light
Light
TOLOMATO
RIVER
GUANO
RIVER
Sombrero Creek
Casa Cola Cr
Sand
BM
41
45
18
FLORIDA
Duval
Clay
St Johns
Ford
Putnam
Flagler
QUADRANGLE LOCATION

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

FACILITY SUMMARY

Facility Name:		Prepared by: Date:
Location (attach detailed map):	County	District
Federal Permit # FL0023531 and expiration date: September 30, 1994	State GMS # and State expiration date:	Facility Type: Industrial Municipal Federal Agricultural Other (list):

Function of facility:

Description of treatment process: Operation of a 1.250 MGD Sewage Treatment Plant consisting of two 0.500 MGD complete mix activated sludge plants and one 0.250 MGD aerobic stabilization plant, with denitrification lagoon, aeration lagoon, tertiary filters and chlorination.

Receiving waters:	Classification:
Design Flow: 1.25 MGD	Actual Mean Flow:

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

therefore, the best time to sample is:

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

Facility has no mixing zone

List effluent limits:

Parameter	Limit (units)
See Attached Sheets A. NPDES B. State Permit	

Describe special permit conditions and permit modifications:

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

FACILITY SUMMARY

Ft. [illegible] Harbor WWTP
(Facility)

Description of permitted outfall(s): Effluent from the Ft. [illegible] leaves the facility discharging [illegible] Tributary) through a Sulfi Mason to Hogfarm Creek to the Intracoastal waterway.

List permit violations (from MOR data or other source) and plant upsets that occurred within past year: MOR violations are included in the attached memos Non-compliance notification letter Part II. [illegible] includes TKN violations Permit violations have been TRC, Fecal Coliform Frequent, and combined with declines in the [illegible] operation, this plant has not been running [illegible]

Describe previous impact bioassessments, WQBEL's, and previous or current enforcement actions:
A warning letter No. WL91-CO330W16NED [illegible] for on-going effluent limit violations.
Nov. 90 thru Oct. 91 TKN annual average 9.1 mg/L exceeds limit of 7.5 mg/L
Oct. 90 thru Sept. 91 TKN annual average 8.5 mg/L exceeds limit of 7.5 mg/L
Dec. 31, 90 Chlorine residual of 0 mg/L minimum [illegible]
Dec. 27, 90 Total Residual Chlorine of 0.2C [illegible]
Dec. 26, 90 Fecal Coliform of 1600/100 ml exceeds limit of [illegible]
Dec. 24, 90 Total Residual Chlorine of 0.15 mg/L exceeds limit [illegible]

Discuss comparability of MOR results to past DER results and whether there are trends (improving, declining) in the data set: The trends in the MORs [illegible] is declining violations of weekly and monthly [illegible] for BOD5 and TKN have been consistant since January 1991. Most flow is a be taken on the [illegible] flow, combined with heavy rains hinders plant [illegible] Equipment problems have also contributed [illegible]

Additional information: Attached is a memo outlining the [illegible] effluent violations at this facility. The waste load allocation for this plant is 324.2 lbs/day UCO (Ultimate Oxygen Demand). Facility is now owned by the City of Jacksonville, although transfer of ownership has not been accomplished in accordance with Part II C. 3 of the NPDES permit (I can't find anything in our files!). A letter from the City of Jacksonville states that Wastewater Division is working diligently to correct any problems/deficiencies observed. They [illegible] to reduce the waste load and bring discharge [illegible]

A. NPDES Effluent Limits

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginnign of the effective date and lasting through the term of this permit, the permitee is authorized to discharge from outfall serial number 001, sanitary wastewater.

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

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS		
	Annual Average	Monthly Average	Daily Maximum	Sampling Frequency	Sample Type	Sampling Point
Flow, MGD	REPORT	REPORT	REPORT	5dys/Week	Elapsed Time Measurement	Effluent
Biochemical Oxygen Demand (5 day)	11 mg/l	13.75 mg/l	22 mg/l	1/Week	24-hour Composite	Effluent
Total Suspended Solids	20 mg/l	30 mg/l	60 mg/l	1/Week	24-hr Composite	Effluent
Total Kjeldahl Nitrogen	7.9 mg/l	--	--	1/Week	24-hour Composite	Effluent
Fecal Coliform Bacteria, #/100ml	200	--	800	1/Month	Grab	Effluent
pH	(See Item 2, page I-2 for effluent limit.)			5dys/Week	Grab	Effluent
Total Residual Chlorine	(See Item 6 page I-2 for interim monitoring and final effluent limits and approved testing procedures. See Page I-3 compliance schedule and compliance dates.)			1/Week	Grab	Effluent

PART I (CONTINUATION)
EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

2. The pH of the effluent shall not be less than 6.0 standard units nor greater than 8.5 standard units.

3. There shall be no discharge of floating solids or visible foam in other than trace amounts.

4. The effluent shall not cause a visible sheen on the receiving water.

5. Any bypass of the treatment facility which is not included in the effluent monitoried above, is to be monitored for flow and reported on a Discharge Monitoring Report (DMR) Form (3320-1).

6. INTERIM TOTAL RESIDUAL CHLORINE (TRC) LIMIT: The daily maximum concentration of TRC in the final effluent shall be reported beginning the effective date of this permit through the operational level of the final TRC limit.

   FINAL TRC LIMIT: The daily maximum concentration of total residual chlorine (TRC) in the final effluent shall not exceed 0.01 mg/l and shall be achieved no later than two years from the effective date of this permit. This limit is included to prevent toxic effects from chlorine in the receiving waters. This compliance schedule allows the permittee time to apply for a mixing zone for TRC from Florida Department of Environmental Regulation (FDER), if the permitttee determines such to be a benefit. If a mixing zone for TRC is granted by FDER and concurred in by EPA, the permittee may apply for a modification of the above TRC limit from EPA.

   Testing for this parameter shall be conducted according to either the amperometric titration method or the DPD colorimetric method as specified in Sections 408(C) or (E), Standard Methods for the Examination of Water and Wasterwater, 16th edition. If chlorine is not detected using one of these methods, the permittee shall report on the discharge monitoring report form, the analytical results for chlorine as being measured at less than the detection level for the test method selected; the test method shall also be reported. The permittte shall then be considered to be in compliance with the above daily maximum concentration limit for TRC.

7. The effluent shall not be chronically toxic to, or produce adverse physiological or behavioral responses in, aquatic animals. An effluent no observalbe effect level (NOEL) of less than 100% will constitute a violation of Florida Administrative Code (FAC) Section 17-3.061(3)(p) and the terms of this permit. The testing for this requirement must conform with Part IV of this permit.

Permittee:

H. R. James, President
Holiday Harbor

I.D. Number: 3116P00488
Permit/Certification Number: DO16-137673
Date of Issue: October 21, 1987
Expiration Date: September 15, 1992

SPECIFIC CONDITIONS:

15. The monitoring requirements and effluent limitations for this plant are as follows:

PARAMETER	EFFLUENT LIMIT	MINIMUM FREQUENCY	SAMPLE TYPE	SAMPLE LOCATION
Flow	1.250 MGD	Continuous	Recording meter	Influent
BOD_5	(a) mg/l	weekly	16-hr. composite	Influent/ Effluent
TSS	(a) mg/l	weekly	16-hr. composite	Influent/ Effluent
TKN	(a) mg/l	weekly	16-hr. composite	Effluent
pH units	6.0 to 8.5	daily	continuous(d)	Effluent
Chlorine Residual	Min. 0.5 mg/l Max. (c)	daily	continuous	Effluent
Fecal Coliform	Avg. 200/100 ml Max. 800/100 ml	weekly	grab(b)	Effluent

(a) Limits (mg/l)

	annual	monthly	weekly	one time grab max
BOD_5	5	6.3	7.5	10
TSS	20	30	45	60
TKN	5.24	6.8	7.9	10.4

(b) Grab samples will be collected during periods of minimal treatment plant pollutant removal efficiencies, or maximum organic loading in the effluent.

(c) For the period from the date of issue until two years from the date of issue, the maxima for chlorine residual are: Annual - 1.0 mg/l; monthly 1.3 mg/l; weekly - 1.5 mg/l; one time grab sample - 2.0 mg/l. Beginning two years from the date of issue of this permit, the permittee shall either:

(1) Complete and have in operation dechlorination facilities which reduce the total residual chlorine (TRC) content of the effluent to below 0.01 mg/l, or

(2) Apply for a mixing zone for TRC in the receiving stream pursuant to the Department's applicable mixing zone regulations. The Department's mixing zone regulations are contained in Florida Administrative Code Rule Section 17-4.244.

(d) Hourly measurements during period of required operator attendence may be substituted for recording devices, if such devices are not available.

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

For Routing To Other Than The Addressee
To: _____ Location: _____
To: _____ Location: _____
To: _____ Location: _____
From: _____ Date: _____

Interoffice Memorandum

December 19, 1991

TO: Ernest Frey, P.E.

THROUGH: Jerry Owen, P.E.
Charles Houriet, P.E.

FROM: Deryle Calhoun DC

RE: Holiday Harbor WWTP - City of Jacksonville
Proposed Enforcement Action

Attached is the Warning Letter outlining the on-going effluent violations at the referenced facility. Also, I have attached memos concerning phase-out and the previous meeting we had with City representatives for Ernie's review.

The City obtained this WWTP and the Arbor Pointe facility about November 1990. Soon after, the Arbor Pointe facility was abandoned and its flow diverted to Holiday Harbor. Effluent violations at Holiday Harbor have been consistent since January 1991.

Outlined below are state permit limitations and effluent violations during the past twelve months for which data is on file (November 1990 - October 1991). Each percent figure (%) represents one violation of a particular limit and these have been used to calculate a rather large penalty as outlined in the Civil Penalty Authorization memo to Secretary Browner.

Permit Limitations - Weekly sample requirement.

Parameter	Annual	Monthly	Weekly	Maximum
BOD_5	5	6.3	7.5	10
TSS	20	30	45	60
TKN	5.24	6.8	7.9	10.4
UOD	-	-	-	324.2

Current annual averages for BOD_5 and TKN, November 1990 - October 1991, are 8.8 ppm and 9.1 ppm, respectively.

November 1990 - MOR from the former private utility. No violations

December 1990 - No data during the first 2 weeks. I assume the private utility didn't provide the data to the City or the City operator didn't want to sign for the data on his MOR. No violations

% REPRESENTS PERCENTAGE OVER A PERMITTED LIMIT

January 1991 -
- BOD_5 max - 130%, 20%
- BOD_5 monthly - 59%
- UOD - 43%, 11%

February 1991 -
- BOD_5 max - 40%, 10%, 20%
- BOD_5 monthly - 75%
- UOD - 21%, 49%, 56%
- TKN monthly - 10%

March 1991 -
- BOD_5 monthly - 27%
- TKN max - 26%
- TKN monthly - 35%
- UOD - 38%, 45%, 80%

April 1991 -
- BOD_5 max - 20%
- BOD_5 monthly - 59%
- TKN max - 16%, 40%, 52%, 79%
- TKN monthly - 125%
- UOD - 67%, 158%, 138%, 184%

May 1991 -
- BOD_5 max - 80%, 50%, 80%
- BOD_5 weekly - 120%
- BOD_5 monthly - 122%
- TKN max - 61%, 45%, 31%, 31%, 27%
- TKN weekly - 101%, 70%
- TKN monthly - 112%
- UOD - 185%, 147%, 155%, 142%

June 1991 -
- BOD_5 max - 20%
- BOD_5 monthly - 43%
- TKN max - 7%
- TKN monthly - 48%
- UOD - 69%, 37%, 82%

July 1991 -
- BOD_5 max - 20%
- BOD_5 monthly - 27%
- TKN max - 30%, 36%, 17%, 14%, 12%
- TKN monthly - 87%
- UOD - 87%, 119%, 109%, 50%, 48%

August 1991 -

BOD_5 max - 10%
BOD_5 monthly - 11%
TKN max - 24%, 41%, 38%, 38%
TKN monthly - 107%
UOD - 92%, 70%, 85%, 94%

September 1991 -

TKN max - 32%
TKN monthly - 46%
UOD - 103%, 78%, 34%, 10%

October 1991 -

BOD_5 max - 30%
BOD_5 monthly - 68%
UOD - 12%, 7%, 45%, 3%, 69%

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 3)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:

REMARKS:	LOCATION:	FIELD ID/NAME: Holiday Harbor

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)

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

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

Point-Source Pollution (list location and describe):

Estimated System Width (range, m): 10-12	Estimated System Depth (range, m):	yes
High Water Mark (m above bed): 1.5	Velocity (range, m/s):	Impounded ☐ Channelized ☒

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 Deposits: Sludge: ☐ Paper Fiber: ☐ Mud: ☒ Sand: ☒ Shell: ☒ Other: ☐

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Rock or Shell Rubble			
Leaf Packs				Sand			
Aquatic Vegetation				Mud/Muck			
Submerged Roots				Other:			
Undercut Banks	10	2		Other:			

WATER QUALITY

	Temp. (°C):	D.O. (mg/l):	pH (SU):	Cond. (µmho/cm):				Secchi (m):
Top								
Mid-depth								
Bottom								

System Type : Stream: ☐ (Surficial Aquifer Fed / Deep Aquifer Fed / Alluvial / Blackwater) Lake: ☐ Wetland: ☐ Estuary: ☒ Other: ☐

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

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

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

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

Weather Conditions: 30

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

ANALYSIS DATE:	ANALYST:	SIGNATURE:

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:

REMARKS:	LOCATION:	FIELD ID/NAME:
		Holiday Harbor

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations 10	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 17	At least four communities observed from the following list: mangrove swamp, marsh, oyster bar, grass bed, reef, saltern, natural beach, or tidal creek. **38-50 points**	Two or three communities observed from those listed. **26-37 points**	One community observed from those listed. **13-25 points**	No communities observed from those listed. **0-12 points**
Tidal Fluctuation 5	>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 10	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 10	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 4	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 76

COMMENTS:

ANALYSIS DATE:	ANALYST:	SIGNATURE:

DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 3)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:

REMARKS:	LOCATION:	FIELD ID/NAME:

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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

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

Point-Source Pollution (list location and describe):

Estimated System Width (range, m): 1 10	Estimated System Depth (range, m):	yes	
High Water Mark (m above bed): 1 10	Velocity (range, m/s):	Impounded ☐	
		Channelized ☐	

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 Deposits: Sludge: ☐ Paper Fiber: ☐ Mud: ☒ Sand: ☒ Shell: ☐ Other: ☒

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	5			Rock or Shell Rubble			
Leaf Packs	2			Sand			
Aquatic Vegetation				Mud/Muck			
Submerged Roots	2			Other:			
Undercut Banks	10			Other:			

WATER QUALITY

	Temp. (°C):	D.O. (mg/l):	pH (SU):	Cond. (µmho/cm):				Secchi (m):
Top								
Mid-depth								
Bottom								

System Type : Stream: ☐ (Surficial Aquifer Fed / Deep Aquifer Fed / Alluvial / Blackwater) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☒

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

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

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

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

Weather Conditions:

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

ANALYSIS DATE:	ANALYST:	SIGNATURE:

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

SUBMITTING AGENCY CODE: EC 51 SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:

REMARKS:	LOCATION:	FIELD ID/NAME:

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 27	At least four communities observed from the following list: mangrove swamp, marsh, oyster bar, grass bed, reef, saltern, natural beach, or tidal creek. **38-50 points**	Two or three communities observed from those listed. **26-37 points**	One community observed from those listed. **13-25 points**	No communities observed from those listed. **0-12 points**
Tidal Fluctuation 5	>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 6	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 10	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 6	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 63

COMMENTS:

ANALYSIS DATE:	ANALYST:	SIGNATURE:

DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 3)

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FL DER Northwest District	STORET STATION NUMBER:	DATE (M/D/Y): 01/27/92	TIME: 1200	RECEIVING BODY OF WATER: Hoglen Creek Tributary to Intracoastal Waterway

REMARKS: Tidal Creek, Marsh area. Seven Pine Island Residential Development Nearby.	LOCATION: Hoglen Creek Tributary Downstream #2	FIELD ID/NAME: (Downstream Site #2)

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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

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

Point-Source Pollution (list location and describe): Holiday Harbor WWTP effluent
Some residential runoff.

Estimated System Width (range, m): 8-9 m	Estimated System Depth (range, m): 1.0 m low tide 2.0-2.5	NATURALLY yes
High Water Mark (m above bed): 2.0	Velocity (range, m/s): incoming 0.1	Impounded [X] Channelized [X]

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

SEDIMENT/SUBSTRATE

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

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

Sediment Deposits: Sludge: [ ] Paper Fiber: [ ] Mud: [X] Sand: [X] (Slight) Shell: [ ] Other: [X] Detritus

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Rock or Shell Rubble			
Leaf Packs				Sand	3	1	DIP NET
Aquatic Vegetation				Mud/Muck	55	6	DIP NET
Submerged Roots	8	4	DIP NET	Other: OYSTER BAR	2	2	DIP NET
Undercut Banks	10	3	DIP NET	Other: MARSH Plants	20	4	DIP NET

WATER QUALITY

	Temp. (°C):	D.O. (mg/l):	pH (SU):	Cond. (µmho/cm):	SALINITY			Secchi (m):
Top	14	10.2	7.70	23000	17 °/oo			0.6L
Mid-depth	14	10.2	7.70	23000	17			
Bottom	14	10.2	7.70	23000	17			

System Type: Stream: [ ] (Surficial Aquifer Fed / Deep Aquifer Fed / Alluvial / Blackwater) Lake: [ ] Wetland: [ ] Estuary: [ ] Other: [X] SALT MARSH Tidal Creek

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

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

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

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

Weather Conditions: Sunny, high 60°, low tide but started incoming. Not much wind.

Abundance:	Absent	Rare	Common	Abundant
Periphyton	[ ]	[ ]	[ ]	[ ]
Fish	[ ]	[ ]	[X] Mullet, Killifish	[ ]
Aquatic Macrophytes	[ ]	[ ]	[X] Saltmarsh Plants	[ ]
Iron/sulfur Bacteria	[X]	[ ]	[ ]	[ ]

ANALYSIS DATE: 01/27/92	ANALYST: SCOTT BULGRIN	SIGNATURE: Scott Bulgrin

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

SUBMITTING AGENCY CODE: 8031 / SUBMITTING AGENCY NAME: FLA DER NorthEast District	STORET STATION NUMBER:	DATE (M/D/Y): 01/27/92	RECEIVING BODY OF WATER: Hoglen Creek Tributary to Intracoastal waterway

REMARKS: Tidal Creek, marsh area. Seven Pine Island development nearby	LOCATION: Hoglen Creek Tributary Downstream #2	FIELD ID/NAME: (Downstream Site #2)

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations 10	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 35	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** Tidal Creek Marsh Some oyster bars	One community observed from those listed. **13-25 points**	No communities observed from those listed. **0-12 points**
Tidal Fluctuation 5	>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 6	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 10	Light to moderate wave action present except under the harshest weather conditions. Flow unrestricted by manmade structures. **9-10 points**	—	—	Heavy wave action sometimes present even during average weather conditions, or flow restricted by manmade structures so that velocities are very high. **0-2 points**
Sediment Type 3	Combination of sand, gravel, and shell. **12-15 points**	Primarily sand, with small areas of mud. **8-11 points**	Mixture of sand and mud, or well-aerated mud only. **4-7 points**	Anaerobic mud. **0-3 points**

TOTAL SCORE 69

COMMENTS: Low Tide at time of sampling but incoming by the end (1400 hour). Boat Slips and residential development nearby. Marsh Area nearby. Holiday Harbor WWTP Flows into Tributary. Muddy bottom

ANALYSIS DATE:	ANALYST:	SIGNATURE:
01/27/92	SCOTT BULGRIN	Scott Bulgrin

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Holiday Harbor WWTP
Address/City:
County: Duval
Contact/District: Scott Bolgrin / NE
NPDES Permit #: FL00 Outfall #:

Sample Collection: Date 1/14/92 Time
Test Beginning: Date 1/15/92 Time 1400
Test Ending: Date 1/17/92 Time 1050
Test Organism: N. Arcelsi
Life Stage/Age: 24 days

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

27554

Remarks:

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7@7@9	8.6@23.5	22.9@23.1	1357@23.4
24 hr	7.9@7.9	8.6@23.5°C	22.5@22.5°C	1332@21.8°C@1347
48 hr	7@7@9	8.7@23.0°C	21.0@21.3	1304@21.8°C@1321

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	DO (mg/L) 0	24	48	Cond. (µmhos/cm) 0	24	48
Control	190	5	5	5	7.7	8.1	8.0	20.7	21.3	20.5	9.7	8.4	8.5			
Control	70	5	5	5	7.7	8.1	8.1				9.7	8.4	8.5	230	237	236
100%	163	5	3	2	7.4	8.1	8.2	22.2	21.3	20.2	8.8	8.4	8.7			
100%	18	5	5	2	7.4	8.1	8.2				8.8	8.4	8.7	1162	1129	1134
																1113
Measured/Loaded by:		MF	AP	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF
Recorded by:		MF	AP	AP	AP	AP	AP	AP	AP	AP	AP	AP	AP	AP	AP	AP

At Work Park Control in this space 1/17/92.

Investigators' Signatures

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			.1K	HACH	SB
Lab Tot. Resid. Cl2:	0.0	0.0	0.0	hach	MF
Alkalinity:	130	70	225	HACH	MF
Hardness:	130	85	225	HACH	AP
Total Ammonia:	0	0	26.4	HACH	AP

Ammonia Meter Slope: _____ Ammonia Blank: 0 Salinity Sample: _____ ppt

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Holiday Harbor
Address/City:
County: Duval
Contact/District: Scott Bulgrin / NE
NPDES Permit #: FL00 Outfall #:

Sample Collection: Date 1/14/92 Time
Test Beginning: Date 1/15/92 Time 1400
Test Ending: Date 1/17/92 Time 1150
Test Organism: C. dubia
Life Stage/Age: <24 hrs

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

Remarks:

27554

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7@7.09	8.6@23.5	22.5@23.1	1359@23.4
24 hr	7@7.09	8.6@23.5	22.5@22.5C	1333@22.8C@1347
48 hr	7@7.09	8.7@23.0	21.0@21.3	1304@21.8C@1321

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	DO (mg/L) 0	24	48	Cond. (µmhos/cm) 0	24	48
Control		5	5	5	8.1		8.1	22.0		22.7	9.4		9.2	145		157
Control		5	5	5	8.1		8.2						9.2			
Control		5	5	5			8.2						9.2			
Control		5	5	5			8.2						9.2			
10%		5	5	0	7.5		8.6	21.8		23.5	8.9		9.1	1090		1172
100%		5	5	0			8.6						9.1			
100%		5	4	0			8.6						9.1			
100%		5	3	0			8.6						9.1			
Measured/Loaded by:		AJ	AJ	MF	MF		MF	MF		MF	MF		MF	MF		MF
Recorded by:		MF	MF	MF	AJ		AJ	AJ		AJ	AJ		AJ	AJ		AJ

Investigators' Signatures

Alison Jost
Mark Faucette

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			.1K	Hach	S.B
Lab Tot. Resid. Cl2:	0.0	0.0	0.0	HACH	MF
Alkalinity:	130	70	225	HACH	AJ
Hardness:	138	85	225	HACH	AJ
Total Ammonia:	0	0	26.4	hach	AJ

Ammonia Meter Slope:

Ammonia Blank: 0

Salinity

Typical Values for Selected Parameters in Florida Waters

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

Percentile Distribution

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

Units:

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

Phytoplankton taxa list for Holiday Harbor Subdivision, Duval County, collected 15 January 1992.

	Reference Site	Test Site
Diatoms		
Achnanthes sp.	–	75
Amphora sp.	25	25
Asterionella japonica	76	25
Chaetoceros sp.	25	75
Corethron sp.	25	–
Coscinodiscus sp.	25	–
Cyclotella sp.	152	125
Cymatosira sp.	–	25
Delphineis sp.	–	25
Diploneis sp.	76	25
Ditylum sp.	25	–
Gyrosigma sp.	25	25
Leptocylindrus sp.	–	75
Navicula sp.	126	251
Nitzschia sp.	–	75
Nitzschia sp. 1	278	–
Nitzschia sp. 2	152	201
Nitzschia sp. 3	25	–
Nitzschia sp. 4	–	25
Rhizosolenia sp.	25	–
Skeletonema sp.	–	100
Thalassionema sp.	51	–
Thalassiosira sp.	–	151
Unidentified pennate diatom	152	75
Chlorophyta		
Unidentified chlorophyte flagellate	177	125
Cryptophyta		
Cryptomonas sp.	–	100
Cyanophyta		
Chroococcus sp.	–	25
Euglenophyta		
Euglena sp.	–	125
Pyrrhophyta		
Gymnodinium sp.	–	75
Prorocentrum micans	25	25

Taxa list for Holiday Harbor WWTP, collected on 14 January, 1992, via the Ponar dredge (3 replicates). The Test Sites were located in Hog Pen Creek and the Reference Site was located in Sombrero Creek.

	Test Site 1	Test Site 2	Reference Site
Cumacea			
Cyclaspis varians	–	12	12
Diptera			
Chironomus sp.	187	–	–
Gastropoda			
Betusa canaculata	–	–	12
Elysia sp. 1 Farrell	–	12	–
Ilyanassa obsoleta	–	12	–
Hirudinea			
Mooreobdella tetragon	62	–	–
Malacostraca			
Acuminodeutopus nagleyi	–	37	–
Cerapus sp. 1 Farrell	–	12	–
Corophium lacustre	–	150	25
Cyathura polita	–	50	–
Gammarus tigrinus	12	–	–
Grandidierella bonnieroides	–	12	–
Hyalella azteca	75	–	–
Monoculoides sp. 1 Farrell	–	12	–
Sphaeroma tenebrans	12	–	–
Nemertea			
Amphipora sp. 1 Farrell	–	37	–
Tubuliarus sp. 1 Farrell	–	12	–
Odonata			
Ischnura hastata	12	–	–
Oligochaeta			
Undetermined marine Oligochaeta	162	–	–
Pelecypoda			
Abra aequalis	–	–	25
Chione cancellata	–	–	25
Mercenaria mercenaria	–	–	12
Tellina agilis	–	–	37
Tellina texana	–	–	25
Polychaeta			
Armandia agilis	–	–	12
Capitella capitata	–	25	162
Glycera americana	–	–	12
Goniada littorea	–	–	25
Isolda puchella	–	25	–
Laeonereis culveri	25	–	–
Marphysa sp.1 Farrell	–	12	–
Mediomastus ambiseta	–	25	87

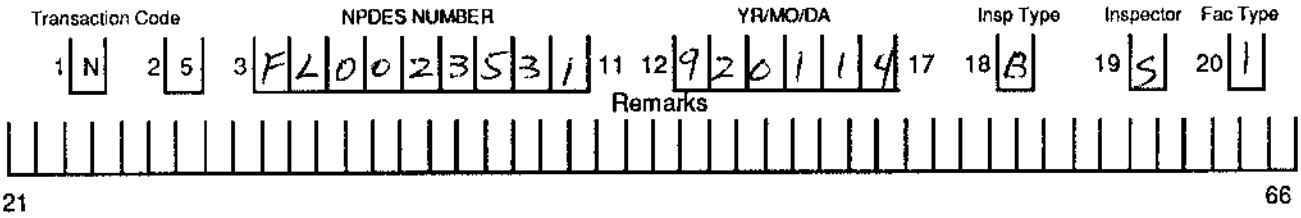
Neanthes succinea	–	150	–
Paraprionospio pinnata	–	12	100
Podarke obscura	–	25	–
Polydora commensalis	–	75	–
Polydora ligni	–	–	25
Polydora websteri	–	112	–
Scoloplos sp.1 Farrell	–	–	12
Streblospio benedicti	–	561	162
Tanaidacea			
Leptochelia rapax	–	1584	–

Taxa list for Holiday Harbor WWTP, collected on 14 January, 1992, via the Ponar dredge (3 replicates). The Test Sites were located in Hog Pen Creek and the Reference Site was located in Sombrero Creek.

	Test Site 1	Test Site 2	Reference Site
Cumacea			
Cyclaspis varians	–	12	12
Diptera			
Chironomus sp.	187	–	–
Gastropoda			
Retusa canaliculata	–	–	12
Elysia sp. 1 Farrell	–	12	–
Ilyanassa obsoleta	–	12	–
Hirudinea			
Mooreobdella tetragon	62	–	–
Malacostraca			
Acuminodeutopus nagleyi	–	37	–
Cerapus sp. 1 Farrell	–	12	–
Corophium lacustre	–	150	25
Cyathura polita	–	50	–
Gammarus tigrinus	12	–	–
Grandidierella bonnieroides	–	12	–
Hyalella azteca	75	–	–
Monoculoides sp. 1 Farrell	–	12	–
Sphaeroma tenebrans	12	–	–
Nemertea			
Amphiporus sp. 1 Farrell	–	37	–
Tubuliarus sp. 1 Farrell	–	12	–
Odonata			
Ischnura hastata	12	–	–
Oligochaeta			
Undetermined marine oligochaete	162	–	–
Pelecypoda			
Abra aequalis	–	–	25
Chione cancellata	–	–	25
Mercenaria mercenaria	–	–	12
Tellina agilis	–	–	37
Tellina texana	–	–	25
Polychaeta			
Armandia agilis	–	–	12
Capitella capitata	–	25	162
Glycera americana	–	–	12
Goniada littorea	–	–	25
Isolda pulchella	–	25	–
Laeonereis culveri	25	–	–
Marphysa sp.1 Farrell	–	12	–
Mediomastus ambiseta	–	25	87

Neanthes succinea	–	150	–
Paraprionospio pinnata	–	12	100
Podarke obscura	–	25	–
Polydora commensalis	–	75	–
Polydora ligni	–	–	25
Polydora websteri	–	112	–
Scoloplos sp.1 Farrell	–	–	12
Streblospio benedicti	–	561	162
Tanaidacea			
Leptochelia rapax	–	1584	–

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



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