

Biological Assessment of

Pensacola NAS Wastewater Treatment Plant

Escambia County, Florida

NPDES #FL0002500

Sampled 6 August, 1990

February, 1991

Biology Section
Division of Administrative and Technical Services

Introduction

The Pensacola Naval Air Station (NAS) WWTP has a design flow of 4.0 MGD into lower Pensacola Bay. The outfall is 732 meters offshore at a depth of 7.9 meters. The littoral zone ranges from 0.5 meters to 3.0 meters (approximately 720 meters from shore) then drops rapidly to 7.9 meters. The area has been dredged in the past to maintain the turning basin.

The high energy beach zone contains sparse strands of emergent vascular plants, namely *Spartina* sp. and *Phragmites* sp. No submerged sea grass beds were found in the outfall area or background transects. The low organic content in the outfall area appears to be a result of proper secondary treatment of the NAS 4.0 MGD wastewater discharge and good tidal exchange from the Gulf of Mexico. Maintenance dredging of the port turning basin probably removes organics and increases tidal scouring.

The Pensacola NAS treatment plant operates under a tight permit for TKN (3.0 mg/l max) and five excursions have been documented since August, 1989. The chlorinated effluent has been toxic to bioassay test organisms. However, the dechlorinated effluent was not toxic on the August 6, 1990 sampling. Chronic bioassays of the NAS wastewater are presently being conducted by EPA contract with ENSECO, Inc., Marblehead, Massachusetts.

The NAS outfall has a 100 foot diameter mixing zone surrounding the discharge boil in Pensacola Bay for Cu, Ni, Fe, Cd, Pb, Cr, and cyanide. Elevated copper, silver and mercury was found in the effluent on November 30, 1989. Industrial inspectors have found foam containing 1100 mg/l phenol flowing over the industrial plant clarifiers. Apparently the foam did not enter Pensacola Bay. Cyanide excursions have been documented by previous plant inspections. An oil and grease violation was reported on April 17, 1989. Recent operational changes at NAS resulted in improvements in effluent quality.

Past DER studies have not attributed biological problems to the NAS discharge.

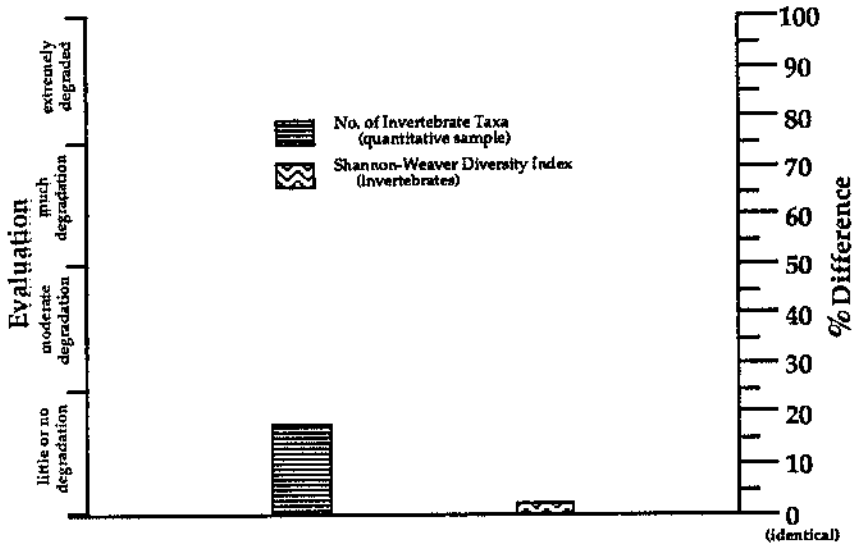
Methods

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 at Fair Point) and a test site (the area in the vicinity of the discharge). A habitat assessment was performed in situ to establish comparability between sites. Supplemental physical/chemical data were also collected on the effluent and study sites. Acute screening toxicity bioassays using *Ceriodaphnia dubia* and *Notropis leedsi* as test organisms were performed on an effluent sample (Peltier and Weber 1985, FDER 1985). A Microtox® test, using the bacterium, *Photobacterium phosphoreum*, to evaluate toxicity, was also performed. The effluent was analyzed for cyanide, nutrients, and metals. Additionally, nutrient analyses were performed on reference and test sites. Methods used for all chemical analyses are on file at the Tallahassee DER Chemistry Laboratory.

Benthic macroinvertebrate communities were evaluated at reference and test sites. Collection methods consisted of three ponar dredge grabs per station (Ross 1990). Bacterial populations were analyzed for total and fecal coliforms following the methods of APHA (1989). Algal Growth Potential tests, using *Selenastrum capricornutum* as the test organism, followed Miller *et al.* (1978). Sediment from reference and test sites was analyzed for grain size, percent organic matter and metals (Ross 1990).

Major characteristics of community structure of control and test sites.

	Control Site	Test Site
Macroinvertebrate Ponar		
Number of Taxa	50	41
Shannon-Weaver diversity	5.0	4.9
% Cephalochordata	7.0	10.1
% Malacostraca	12.2	13.8
% Polychaeta	51.7	35.2
% Synaptidae	0.6	6.9
% Pelecypoda	11.1	10.1
% Ophiuroidea	3.5	2.5
% Other	14	21.4
Algal Growth Potential (mg dry wt/l)	Not Sampled	94.2



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

Explanation of Measurements of Community Health

Several different measurements of macroinvertebrate community health have been employed. Many of these, such as the number of taxa and Shannon-Weaver Diversity Index are well known. Others are briefly explained here. Czekanowski's Similarity Index is a multivariate ordination procedure which compares organism abundance and taxonomic structure between sites. The determination of the Quantitative Similarity 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.

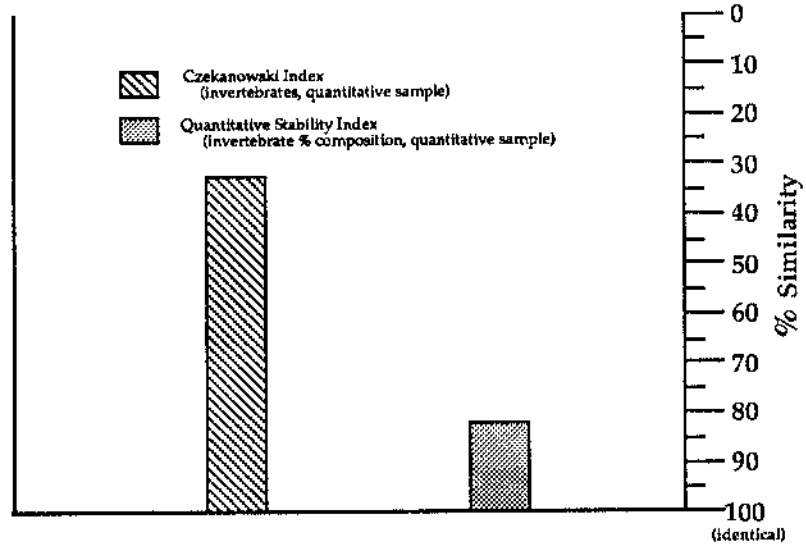
For graphical purposes, the percent differences between the reference and test sites involving the number of taxa and the diversity index are measured as the reference site minus test site divided by the reference site.

The following personnel were involved in this investigation: Glenn Butts (DER Northwest District) and Lyn Burton, Russel Frydenborg, Kathleen Lurding, and Sandy McClure (Tallahassee Biology Laboratory).

Results and Discussion

Habitat quality at the test site (Habitat Score = 39) was 25% less suitable than that of the control site (Habitat Score = 52) (Appendix). Sediment particle size analyses indicated that while sediments at both sites consisted largely of coarse sand, the control site also had a sizable silt/clay fraction (the test site did not). Therefore, some of the changes observed in the benthic communities may be attributed to differences in habitat and sediment characteristics. Water at both sites was somewhat alkaline (pH at all stations = 8.0), fairly saline (between 25 ppt and 32 ppt) and adequately oxygenated (above 6.3 mg/l D.O.)

Cyanide measured in the effluent (0.021 ug/l) was not appreciably different from that found at the reference site (0.020 ug/l) or in the blank (0.017 ug/). With the exception of small amounts of iron, no metals were found at levels above detection limits in the effluent or at the reference site (Appendix). The nitrate-



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

nitrite concentration was elevated in the effluent (6.8 mg/l). Nitrogen in this form is readily available for algal growth. Consequently, the Algal Growth Potential (with EDTA spike) of the effluent was very high (94.2 mg algal dry wt/l). Without the EDTA chelating agent, the AGP of the effluent was only 0.4 mg algal dry wt/l. When a disparity such as this is observed, it generally indicates either metal toxicity or lack of small amounts of trace metal nutrients in the water sample tested. Since no problem concentrations of metals were detected, the latter option seems more likely. Presumably, when the freshwater effluent contacts the saline receiving waters, a shortage of trace metals will no longer be a factor. Therefore, the high AGP value suggests that it may be appropriate to control for nitate-nitrite, as well as TKN, in the Pensacola NAS WWTP effluent.

The discharge was not toxic to the fish, *Notropis leedsi*, or the water flea, *Ceriodaphnia dubia*, in 48 hour static acute bioassays. Probably due to the bioreactive nitrogen present in it, the discharge was stimulatory to the bacterium, *Photobacterium phosphoreum*.

Quantitative measures of benthic invertebrate community structure indicated that both the test and reference sites were very healthy. The upper left figure indicates the degree of difference between the control and test sites. Larger differences (that is, higher percentages) correspond with greater degrees of degradation. The lower right figure summarizes similarities between the sites. Smaller similarities (lower percentages) generally correspond with greater degradation.

Taxa richness was high at the reference site (50 total taxa found) and in the vicinity of the Pensacola NAS outfall (41 total taxa recovered). Shannon-Weaver diversity was very good at both sites (5.0 and 4.9, respectively). Epifaunal forms were well represented at both areas.

The Quantitative Stability Index for % composition was 81.6%, indicating that overall community structure was similar at the two sites. The somewhat lower similarity level determined from Czekanowski's Index may have been caused by the observed substrate and habitat differences, and in this case, does not suggest degradation at the test site.

Conclusions

The Pensacola NAS WWTP discharge was not harmful to receiving water invertebrate communities, nor did it contain deleterious amounts of cyanide or metals. The effluent was not toxic to water fleas or fish, and was stimulatory to bacteria. Although the facility was currently in compliance with its TKN requirement, the elevated nitrate-nitrite concentration measured in the discharge appeared to be responsible for high Algal Growth Potential results. This suggests that it may be appropriate to control for nitrite-nitrate, as well as for TKN.

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.

Florida Department of Environmental Regulation. 1985. Quality assurance manual for performing acute toxicity tests. 2nd edition. Fla. Dept. Environmental Regulation, Biology Section, Tallahassee. 53 pp.

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.

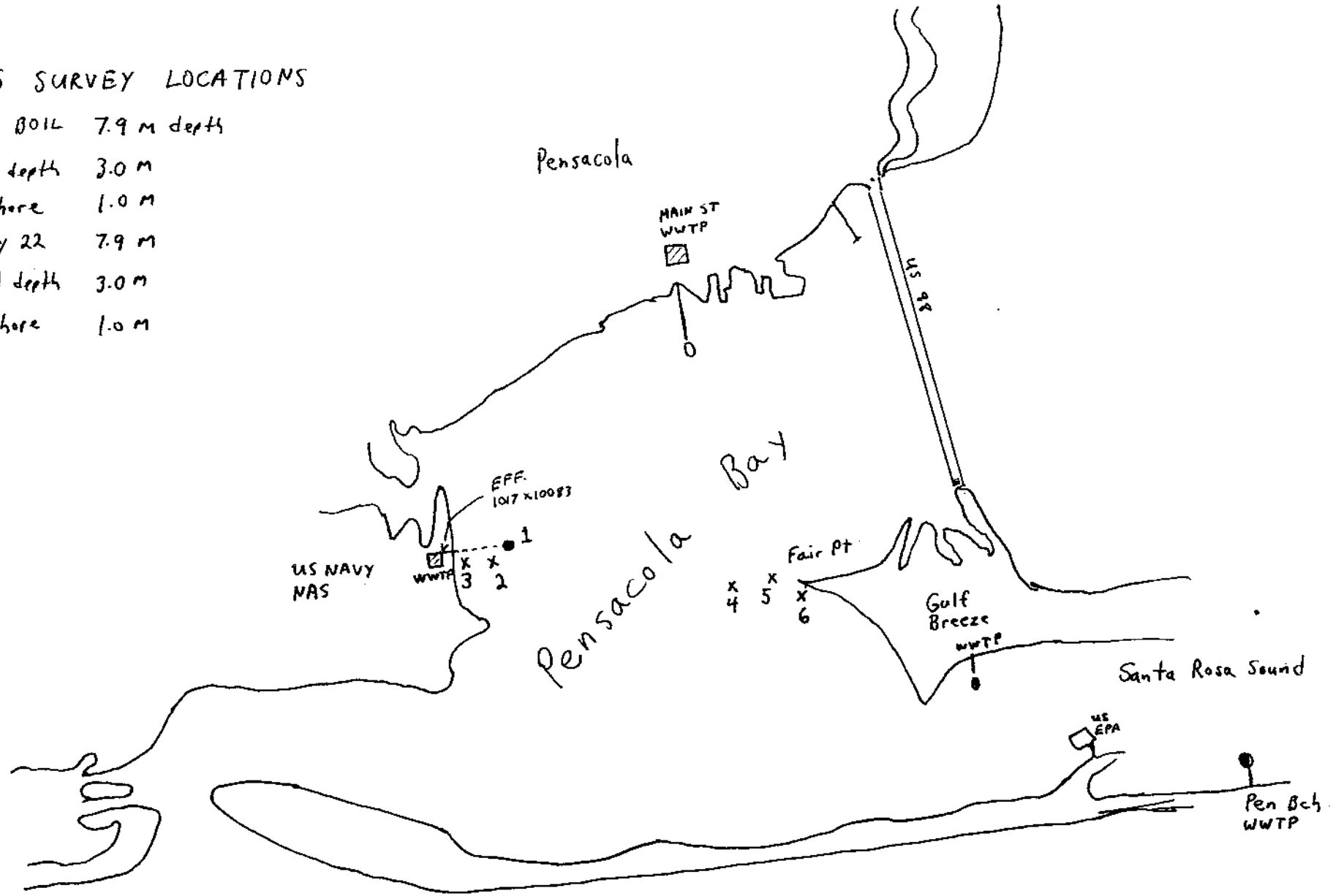
Peltier, W. H. and C. I. Weber. 1985. Methods for measuring the acute toxicity of effluents to freshwater and marine organisms. 3rd edition. EPA/600/4-85/013. U:. S. EPA, Cincinnati, Ohio. 216 pp.

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.

NAS SURVEY LOCATIONS

#1	NAS BOIL	7.9 m depth
2	mid depth	3.0 m
3	inshore	1.0 m
4	Buoy 22	7.9 m
5	mid depth	3.0 m
6	inshore	1.0 m



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

SUBMITTING AGENCY CODE: 9010 / SUBMITTING AGENCY NAME: NW DIST DER	STORET STATION NUMBER: 33.02.0K15	DATE (M/D/Y): 08-08-90	RECEIVING BODY OF WATER: PENSACOLA BAY

REMARKS:	LOCATION: FAIR POINT, GULF BREEZE SIDE OF BAY	FIELD ID/NAME:

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 15	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 comunities observed from those listed. **26-37 points**	One comunity observed from those listed. **13-25 points**	No comunities observed from those listed. **0-12 points**
Tidal Fluctuation 3	>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 11	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 52

COMMENTS: RETIDENTIAL AREA, PIERS, RIP RAP, EXCELLENT SEDIMENT QUALITY EXCEPT FOR NO GRASS BEDS.

ANALYSIS DATE:	ANALYST:	SIGNATURE:
08-08-90	Glenn Butts	Glenn L. Butts

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

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: NW DIST DER	STORET STATION NUMBER: 33.02.0L15	DATE (M/D/Y): 08-08-90	RECEIVING BODY OF WATER: PENSACOLA BAY

REMARKS:	LOCATION: US NAVY NAS OUTFALL	FIELD ID/NAME:

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations 3	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 10	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 comunities observed from those listed. **26-37 points**	One comunity observed from those listed. **13-25 points**	No comunities observed from those listed. **0-12 points**
Tidal Fluctuation 3	>0.75 m. **4-5 points**	0.5 - 0.75 m. **3 points**	0.25 - 0.5 m. **2 points**	<0.25 m. **0-1 point**
Freshwater Discharges/ Alterations 5	Only natural runoff.. **9-10 points**	Mostly natural runoff, but with a few, small stormwater sources. **6-8 points**	Considerable stormwater discharge from local roads, parking lots, etc. **3-5 points**	Extensive manmade discharges, especially from canals draining large tracts of land. **0-2 points**
Flow and Wave Action 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 9	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 39

COMMENTS: AREA DREDGED + MAINTAINED AS A PORT TURNING BASIN, GOOD GULF FLUSHING, LOW ORGANICS

ANALYSIS DATE:	ANALYST:	SIGNATURE:
08-08-90	Glenn Butts	Glenn Butts

#8

LAB ID: 2933

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
CENTRAL LABORATORY REPORT FORM

TIME A — GRAB SAMPLE: 1055
TIME B — COMPOSITE SAMPLE: BEGIN: ____ END: ____

SUBMITTING AGENCY CODE: 10 / SUBMITTING AGENCY NAME:	STORET STATION NUMBER: 33.02.0K1S	DATE (M/D/Y): 08/08/90	RECEIVING BODY OF WATER:	DEPTH, FEET: 25

REMARKS:

LOCATION: Tampa Bay near buoy 22

FIELD ID/NAME: 4

WATER: ☐ SURFACE (FRESH) ☐ GROUND ☒ SURFACE (SALT) ☐ EFFLUENT ☐ DRINKING ☐ TRIP BLANK ☐ FIELD BLANK ☐ EQUIPMENT BLANK

SOIL/SEDIMENT: ☐ SOIL ☐ FRESHWATER SEDIMENT ☑ MARINE SEDIMENT

TISSUE: ☐ PLANT ☐ FISH ☐ SHELLFISH ☐ OTHER

CHEMICAL WASTE: ☐

PROGRM. MOD. #: NPDES NUMBER: (required for all discharge related samples) WELL #:

FIELD PARAMETERS MEASURED BY (NAME):

(SIGNATURE):

SAMPLED BY (NAME): G. Burns

(SIGNATURE):

FIELD REPORT PREPARED BY (NAME): G. Burns

(SIGNATURE):

FIELD PARAMETERS	UNITS	CODE*	VALUE
CHLORINE, TOTAL RESIDUAL	mg/l	50060	
DISSOLVED OXYGEN (PROBE)	mg/l	00299	
pH	std. units	00400	
SALINITY	ppth	00480	
SECCHI DEPTH	m	00078	
SPECIFIC CONDUCTANCE	µmho/cm	00094	
TEMPERATURE	°C	00010	

✓	LAB PARAMETERS	UNITS	CODE	VALUE
	CHLOROPHYLL-a (CORRECTED)	µg/l	32223	
	CHLOROPHYLL-a (NON-CORRECTED)	µg/l	32219	
	CHLOROPHYLL-b	µg/l	32212	
	CHLOROPHYLL-c	µg/l	32214	
	PHAEOPHYTIN-a	µg/l	32218	
	BOD, 5-DAY CARBONACEOUS	mg/l	80082	
	BOD, 5-DAY N-INHIBITED	mg/l	00314	
	FECAL COLIFORMS, MEMBRANE	no./100 ml	31616	
	FECAL COLIFORMS, TUBE	no./100 ml	31615	
	TOTAL COLIFORMS, MEMBRANE	no./100 ml	31501	
	TOTAL COLIFORMS, TUBE	no./100 ml	31505	
	FECAL STREPTOCOCCI, MEMBRANE	no./100 ml	31673	
	HETEROTROPHIC PLATE COUNT	no./1 ml	31751	
✓	SEDIMENT PRTCL. SIZE, >2.0mm	%	80256	0,72
✓	SEDIMENT PRTCL SIZE, 0.5-2.0mm	%	80254	25.25
✓	SEDIMENT PRTCL SIZE, 0.125-0.5mm	%	46531	
✓	SEDIMENT PRTCL SIZE, 0.063-0.125mm	%	80251	3,24
✓	SEDIMENT PRTCL SIZE, <0.063mm	%	80250	9,27
✓	SEDIMENT PRTCL SIZE, 0.25-0.5mm	%	80253	53.24
✓	SEDIMENT PRTCL SIZE, 0.125-0.25mm	%	80252	8,28
✓	SEDIMENT ORGANIC FRACTION	%	80096	1,77
	ALGAL ASSAY, LIMITING NUTRIENT	—	—	REPORT

✓	LAB PARAMETERS	UNITS	CODE	VALUE
	ALGAL ASSAY, GROWTH POTENTIAL	mg/l	86209	
	INVERT, DIVERSITY INDX, ART SUBST	—	61455	
	INVERT, DI, AS, 95% CONF INT	—	61456	
	INVERT, DIVERSITY INDX, NAT SUBST	—	61453	
	INVERT, DI, NS, 95% CONF INT	—	61454	
	INVERT, ART SUBST, NO. SPP.	—	61457	
	INVERT, NAT SUBST, NO. SPP.	—	61458	
	INVERT, FLORIDA INDEX	—	—	
	INVERT, SPECIES ID/COUNT	—	—	REPORT
	PERIPHYTON, SPECIES ID/COUNT	—	—	REPORT
	PHYTOPLNKTN, SPECIES ID/COUNT	—	—	REPORT
	TOXICITY ASSAY, MICROTOX	—	—	REPORT
	TOXICITY ASSAY, ACUTE, SCRNG	—	—	REPORT
	TOXICITY ASSAY, ACUTE, DFNTV	—	—	REPORT
	TOXICITY ASSAY, FLOW-THROUGH	—	—	REPORT
	TOXICITY ASSAY, CHRONIC, SCRNG	—	—	REPORT
	TOXICITY ASSAY, CHRONIC, DFNTV	—	—	REPORT

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
U = MATERIAL WAS ANALYZED FOR BUT NOT DETECTED; THE NUMBER IS THE MINIMUM DETECTION LIMIT

ANALYST: L. Burton | QA VERIFIED BY: | LAB REPORT VERIFIED BY: | DATE: 9/21/90

*STORET CODES MAY ONLY APPLY TO FIELD MEASUREMENTS

SUBMITTING OFFICE FILL IN SHADED AREAS

✓ MARK DESIRED ANALYSES

#7

LAB ID: 2932

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
CENTRAL LABORATORY REPORT FORM

TIME A -- GRAB SAMPLE: 0840
TIME B -- COMPOSITE SAMPLE: BEGIN: ____ END: ____

SUBMITTING AGENCY CODE / NAME	STORET STATION NUMBER	DATE (M/D/Y)	RECEIVING BODY OF WATER	DEPTH: FEET
16	33,02,01,15	08/08/90		26

REMARKS:

LOCATION: Pensacola Bay at NAS outfall

FIELD ID/NAME: 1

WATER	SOIL/SEDIMENT	TISSUE	CHEMICAL WASTE
☐ SURFACE (FRESH)	☐ SOIL	☐ PLANT	☐
☐ GROUND	☐ FRESHWATER SEDIMENT	☐ FISH	
☒ SURFACE (SALT)	☑ MARINE SEDIMENT	☐ SHELLFISH	
☐ EFFLUENT		☐ OTHER	
☐ DRINKING			
☐ TRIP BLANK			
☐ FIELD BLANK			
☐ EQUIPMENT BLANK			

PROGRM: MOD. #:

NPDES NUMBER: (required for all discharge related samples)

WELL #:

FIELD PARAMETERS MEASURED BY: (NAME):

(SIGNATURE):

SAMPLED BY: (NAME): C. Butts

(SIGNATURE): C. Butts

FIELD REPORT PREPARED BY: (NAME): C. Butts

(SIGNATURE): C. Butts

FIELD PARAMETERS	UNITS	CODE*	VALUE
CHLORINE, TOTAL RESIDUAL	mg/l	50060	
DISSOLVED OXYGEN (PROBE)	mg/l	00299	
pH	stnd. units	00400	
SALINITY	PPTh	00480	
SECCHI DEPTH	m	00078	
SPECIFIC CONDUCTANCE	µmho/cm	00094	
TEMPERATURE	°C	00010	

✓	LAB PARAMETERS	UNITS	CODE	VALUE
	CHLOROPHYLL-a (CORRECTED)	µg/l	32220	
	CHLOROPHYLL-a (NON-CORRECTED)	µg/l	32210	
	CHLOROPHYLL-b	µg/l	32212	
	CHLOROPHYLL-c	µg/l	32214	
	PHAEOPHYTIN-a	µg/l	32218	
	BOD, 5-DAY CARBONACEOUS	mg/l	80082	
	BOD, 5-DAY N-INHIBITED	mg/l	00314	
	FECAL COLIFORMS, MEMBRANE	no./100 ml	31616	
	FECAL COLIFORMS, TUBE	no./100 ml	31615	
	FECAL COLIFORMS, MEMBRANE	no./100 ml	31691	
	TOTAL COLIFORMS, TUBE	no./100 ml	31505	
	FECAL STREPTOCOCCI, MEMBRANE	no./100 ml	31673	
	HETEROTROPHIC PLATE COUNT	no./1 ml	31751	
✓	SEDIMENT PRTCL SIZE, >2.0mm	%	80256	0,34
✓	SEDIMENT PRTCL SIZE, 0.5-2.0mm	%	80254	3,36
✓	SEDIMENT PRTCL SIZE, 0.125-0.5mm	%	46531	
✓	SEDIMENT PRTCL SIZE, 0.063-0.125mm	%	80251	0,11
✓	SEDIMENT PRTCL SIZE, <0.063mm	%	80250	5,49
✓	SEDIMENT PRTCL SIZE, 0.25-0.5mm	%	80253	70,18
✓	SEDIMENT PRTCL SIZE, 0.125-0.25mm	%	80252	20,52
✓	SEDIMENT ORGANIC FRACTION	%	00096	0,27
	ALGAL ASSAY, LIMITING NUTRIENT	—	—	REPORT

✓	LAB PARAMETERS	UNITS	CODE	VALUE
	ALGAL ASSAY, GROWTH POTENTIAL	mg/l	85209	
	INVERT, DIVERSITY INDX, ART SUBST	—	61455	
	INVERT, DI, AS, 95% CONF INT	—	61456	
	INVERT, DIVERSITY INDX, NAT SUBST	—	61453	
	INVERT, DI, NS, 95% CONF INT	—	61454	
	INVERT, ART SUBST, NO. SPP.	—	61457	
	INVERT, NAT SUBST, NO. SPP.	—	61458	
	INVERT, FLORIDA INDEX	—	—	
	INVERT, SPECIES ID/COUNT	—	—	REPORT
	PERIPHYTON, SPECIES ID/COUNT	—	—	REPORT
	PHYTOPLNKTN, SPECIES ID/COUNT	—	—	REPORT
	TOXICITY ASSAY, MICROTOX	—	—	REPORT
	TOXICITY ASSAY, ACUTE, SCRNG	—	—	REPORT
	TOXICITY ASSAY, ACUTE, DFNTV	—	—	REPORT
	TOXICITY ASSAY, FLOW-THROUGH	—	—	REPORT
	TOXICITY ASSAY, CHRONIC, SCRNG	—	—	REPORT
	TOXICITY ASSAY, CHRONIC, DFNTV	—	—	REPORT

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
U = MATERIAL WAS ANALYZED FOR BUT NOT DETECTED; THE NUMBER IS THE MINIMUM DETECTION LIMIT

ANALYST: T. Burton

QA VERIFIED BY:

LAB REPORT VERIFIED BY:

DATE: 9/21/90

*STORET CODES MAY ONLY APPLY TO FIELD MEASUREMENTS

SUBMITTING OFFICE FILL IN SHADED AREAS

✓ MARK DESIRED ANALYSES

Sample Number: 90-AUG-10-12-01 Sample Status: Authorized by Bill Coppenger
Sample Location: Pensacola Bay at US Navy NAS Outfall Boil Matrix: Salt Surf Water
Field ID: #1 Storet Station Number: 33020L15
Date/Time Collected: 8-AUG-1990 08:40:51.18
Comments:

Sample Number: 90-AUG-10-12-01 Test status: Authorized by Lei Wei
Analysis Id: W-CN Analysis Description: Distilation & analysis for cyanide in water

Storet Number	Analyte	Result	Units
00720	Cyanide	0.021	mg CN/L

Sample Number: 90-AUG-10-12-02 Sample Status: Authorized by Bill Coppenger
Sample Location: Pensacola Bay near buoy 22 Matrix: Salt Surf Water
Field ID: #4 Storet Station Number: 33020K15
Date/Time Collected: 8-AUG-1990 10:55:51.18
Comments:

Sample Number: 90-AUG-10-12-02 Test status: Authorized by Lei Wei
Analysis Id: W-CN Analysis Description: Distilation & analysis for cyanide in water

Storet Number	Analyte	Result	Units
00720	Cyanide	0.020	mg CN/L

Sample Number: 90-AUG-10-12-03 Sample Status: Authorized by Bill Coppenger
Sample Location: Pensacola FDER Chem Lab DI water Matrix: Trip Blank
Field ID: Cyanide Blank Storet Station Number:
Date/Time Collected: 8-AUG-1990 07:30:51.18
Comments:

Sample Number: 90-AUG-10-12-03 Test status: Authorized by Lei Wei
Analysis Id: W-CN Analysis Description: Distilation & analysis for cyanide in water

Storet Number	Analyte	Result	Units
00720	Cyanide	0.017	mg CN/L

---------- End of Report ----------

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 practice quantiation limit
U - Material was analyzed for but not detected; The value reported is the mimimum detection limit
N/A - Not applicable NR - Not requested

Sample Number: 90-AUG-10-13-01 Sample Status: Authorized by Tim Fitzpatrick
Sample Location: Pensacola Bay at NAS outfall Matrix: Marine Sediment
Field ID: #1 Storet Station Number: 33020L15
Date/Time Collected: 8-AUG-1990 08:40:45.30
Comments:

Sample Number: 90-AUG-10-13-01 Test status: Authorized by Tim Fitzpatrick
Analysis Id: VOL-RESDUE Analysis Description: Volatile Residue

Storet Number	Analyte	Result	Units
00505	Total Volatile Residue	1.77%	

OUTFALL METALS

Sample Number: 90-AUG-10-13-01 Test status: Authorized by Tim Fitzpatrick
Analysis Id: S-ICP-23 Analysis Description: ICP multielement analysis for soil samples

Storet Number	Analyte	Result	Units
01106	Aluminum	NR	ug/L
01002	Arsenic	NR	ug/L
01097	Antimony	NR	ug/L
01007	Barium	NR	ug/L
01012	Beryllium	NR	ug/L
01027	Cadmium	1.3 U	ug/L
00916	Calcium	NR	mg/L
01034	Chromium	10 U	ug/L
01037	Cobalt	NR	ug/L
01042	Copper	32 U	ug/L
01045	Iron	467	ug/L
01051	Lead	7.0 T	ug/L
00927	Magnesium	NR	mg/L
01055	Manganese	NR	ug/L
01067	Nickel	3 U	ug/L
00937	Potassium	NR	mg/L
01147	Selenium	NR	ug/L
01077	Silver	1.3 U	ug/L
00929	Sodium	NR	mg/L
01082	Strontium	NR	ug/L
01059	Thallium	NR	ug/L
01087	Vanadium	NR	ug/L
01092	Zinc	20 U	ug/L

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 practice quantiation limit
U - Material was analyzed for but not detected; The value reported is the mimimum detection limit
N/A - Not applicable NR - Not requested

Sample Number: 90-AUG-10-13-01 Test status: Authorized by Tim Fitzpatrick
Analysis Id: HG-H-S Analysis Description: Mercury in sediment by cold vapor system

Storet Number	Analyte	Result	Units
71921	Mercury	0.02 U	mg/kg

Sample Number: 90-AUG-10-13-02 Sample Status: Authorized by Tim Fitzpatrick
Sample Location: Pensacola Bay near buoy 22 Matrix: Marine Sediment
Field ID: #4 Storet Station Number: 33020K15
Date/Time Collected: 8-AUG-1990 08:40:45.30
Comments:

Sample Number: 90-AUG-10-13-02 Test status: Authorized by Tim Fitzpatrick
Analysis Id: VOL-RESDUE Analysis Description: Volatile Residue

Storet Number	Analyte	Result	Units
00505	Total Volatile Residue	1.41%	

Sample Number: 90-AUG-10-13-02 Test status: Authorized by Tim Fitzpatrick
Analysis Id: S-ICP-23 Analysis Description: ICP multielement analysis for soil samples

Storet Number	Analyte	Result	Units
01106	Aluminum	NR	ug/L
01002	Arsenic	NR	ug/L
01097	Antimony	NR	ug/L
01007	Barium	NR	ug/L
01012	Beryllium	NR	ug/L
01027	Cadmium	1.3 U	ug/L
00916	Calcium	NR	mg/L
01034	Chromium	10 U	ug/L
01037	Cobalt	NR	ug/L
01042	Copper	32 U	ug/L
01045	Iron	4170	ug/L
01051	Lead	7.5 T	ug/L
00927	Magnesium	NR	mg/L
01055	Manganese	NR	ug/L
01067	Nickel	2.9 T	ug/L
00937	Potassium	NR	mg/L
01147	Selenium	NR	ug/L
01077	Silver	1.3 U	ug/L
00929	Sodium	NR	mg/L

---------- Continued ----------

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 practice quantiation limit
U - Material was analyzed for but not detected; The value reported is the mimimum detection limit
N/A - Not applicable NR - Not requested

Cont. from previous page for Sample Number: 90-AUG-10-13-02 Analysis_id: S-ICP-23

01082	Strontium	NR	ug/L
01059	Thallium	NR	ug/L
01087	Vanadium	NR	ug/L
01092	Zinc	20 U	ug/L

Sample Number: 90-AUG-10-13-02 Test status: Authorized by Tim Fitzpatrick
Analysis Id: HG-H-S Analysis Description: Mercury in sediment by cold vapor system

Storet Number	Analyte	Result	Units
71921	Mercury	0.02 U	mg/kg

---------- End of Report ----------

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 practice quantiation limit
U - Material was analyzed for but not detected; The value reported is the mimimum detection limit
N/A - Not applicable NR - Not requested

Sample Number: 90-AUG-10-13-01 Sample Status: Authorized by Tim Fitzpatrick
Sample Location: Pensacola Bay at NAS outfall Matrix: Marine Sediment
Field ID: #1 Storet Station Number: 33020L15
Date/Time Collected: 8-AUG-1990 08:40:45.30
Comments: OUT FALL SEDIMENT

Sample Number: 90-AUG-10-13-01 Test status: Authorized by Tim Fitzpatrick
Analysis Id: VOL-RESDUE Analysis Description: Volatile Residue

Storet Number	Analyte	Result	Units
00505	Total Volatile Residue	1.77%	

Sample Number: 90-AUG-10-13-01 Test status: Authorized by Tim Fitzpatrick
Analysis Id: S-ICP-23 Analysis Description: ICP multielement analysis for soil samples

Storet Number	Analyte	Result	Units
01106	Aluminum	NR	ug/L
01002	Arsenic	NR	ug/L
01097	Antimony	NR	ug/L
01007	Barium	NR	ug/L
01012	Beryllium	NR	ug/L
01027	Cadmium	1.3 U	ug/L
00916	Calcium	NR	mg/L
01034	Chromium	10 U	ug/L
01037	Cobalt	NR	ug/L
01042	Copper	32 U	ug/L
01045	Iron	467	ug/L
01051	Lead	7.0 T	ug/L
00927	Magnesium	NR	mg/L
01055	Manganese	NR	ug/L
01067	Nickel	3 U	ug/L
00937	Potassium	NR	mg/L
01147	Selenium	NR	ug/L
01077	Silver	1.3 U	ug/L
00929	Sodium	NR	mg/L
01082	Strontium	NR	ug/L
01059	Thallium	NR	ug/L
01087	Vanadium	NR	ug/L
01092	Zinc	20 U	ug/L

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 practice quantiation limit
U - Material was analyzed for but not detected; The value reported is the mimimum detection limit
N/A - Not applicable NR - Not requested

Sample Number: 90-AUG-10-13-01 Test status: Authorized by Tim Fitzpatrick
Analysis Id: HG-H-S Analysis Description: Mercury in sediment by cold vapor system

Storet Number	Analyte	Result	Units
71921	Mercury	0.02 U	mg/kg

Sample Number: 90-AUG-10-13-02 Sample Status: Authorized by Tim Fitzpatrick
Sample Location: Pensacola Bay near buoy 22 Matrix: Marine Sediment
Field ID: #4 Storet Station Number: 33020K15
Date/Time Collected: 8-AUG-1990 08:40:45.30
Comments:

REFERENCE SITE SEDIMENT

Sample Number: 90-AUG-10-13-02 Test status: Authorized by Tim Fitzpatrick
Analysis Id: VOL-RESDUE Analysis Description: Volatile Residue

Storet Number	Analyte	Result	Units
00505	Total Volatile Residue	1.41%	

Sample Number: 90-AUG-10-13-02 Test status: Authorized by Tim Fitzpatrick
Analysis Id: S-ICP-23 Analysis Description: ICP multielement analysis for soil samples

Storet Number	Analyte	Result	Units
01106	Aluminum	NR	ug/L
01002	Arsenic	NR	ug/L
01097	Antimony	NR	ug/L
01007	Barium	NR	ug/L
01012	Beryllium	NR	ug/L
01027	Cadmium	1.3 U	ug/L
00916	Calcium	NR	mg/L
01034	Chromium	10 U	ug/L
01037	Cobalt	NR	ug/L
01042	Copper	32 U	ug/L
01045	Iron	4170	ug/L
01051	Lead	7.5 T	ug/L
00927	Magnesium	NR	mg/L
01055	Manganese	NR	ug/L
01067	Nickel	2.9 T	ug/L
00937	Potassium	NR	mg/L
01147	Selenium	NR	ug/L
01077	Silver	1.3 U	ug/L
00929	Sodium	NR	mg/L

---------- Continued ----------

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 practice quantiation limit
U - Material was analyzed for but not detected; The value reported is the mimimum detection limit
N/A - Not applicable Not requested

Cont. from previous page for Sample Number: 90-AUG-10-13-02 Analysis_id: S-ICP-23

01082	Strontium	NR	ug/L
01059	Thallium	NR	ug/L
01087	Vanadium	NR	ug/L
01092	Zinc	20 U	ug/L

Sample Number: 90-AUG-10-13-02 Test status: Authorized by Tim Fitzpatrick
Analysis Id: HG-H-S Analysis Description: Mercury in sediment by cold vapor system

Storet Number	Analyte	Result	Units
71921	Mercury	0.02 U	mg/kg

---------- End of Report ----------

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 practice quantiation limit
U - Material was analyzed for but not detected; The value reported is the mimimum detection limit
N/A - Not applicable NR - Not requested

Sample Number: 90-AUG-07-03-01 Sample Status: Authorized by Yuh-Hsu Pan
Sample Location: US Navy NAS WWTP Matrix: Effluent
Field ID: #1 Storet Station Number:
Date/Time Collected: 6-AUG-1990 10:00:53.42
Comments:

OUT FALL NUTRIENTS

Sample Number: 90-AUG-07-03-01 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-TOC Analysis Description: Total organic carbon

Storet Number	Analyte	Result	Units
00680	TOC	1 U	mg C/L

Sample Number: 90-AUG-07-03-01 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-TP Analysis Description: Analysis for total phosphorus in water

Storet Number	Analyte	Result	Units
00665	Total Phosphorus	0.33	mg P/L

Sample Number: 90-AUG-07-03-01 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-TKN Analysis Description: TKN for water sample

Storet Number	Analyte	Result	Units
00625	N KJEL TOT	0.79	mg N/L

Sample Number: 90-AUG-07-03-01 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-NO2NO3 Analysis Description: Analysis for nitrite+nitrate in water

Storet Number	Analyte	Result	Units
00630	Nitrate-Nitrite-N	6.8	mg N/L

Sample Number: 90-AUG-07-03-01 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-NH3 Analysis Description: Analysis for ammonia in water

Storet Number	Analyte	Result	Units
00610	Ammonia-N	0.020 U	mg N/L

---------- End of Report ----------

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 practice quantiation limit
U - Material was analyzed for but not detected; The value reported is the mimimum detection limit
N/A - Not applicable NR - Not requested

Sample Number: 90-AUG-10-14-01 Sample Status: Authorized by Yuh-Hsu Pan
Sample Location: Pensacola Bay at US Navy outfall boil Matrix: Salt Surf Water
Field ID: #1 Storet Station Number: 33020L15
Date/Time Collected: 8-AUG-1990 08:40:47.32
Comments:

Sample Number: 90-AUG-10-14-01 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-TOC Analysis Description: Total organic carbon

Storet Number	Analyte	Result	Units
00680	TOC	1 U	mg C/L

Sample Number: 90-AUG-10-14-01 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-TP Analysis Description: Analysis for total phosphorus in water

Storet Number	Analyte	Result	Units
00665	Total Phosphorus	0.14	mg P/L

Sample Number: 90-AUG-10-14-01 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-TKN Analysis Description: TKN for water sample

Storet Number	Analyte	Result	Units
00625	N KJEL TOT	0.040 U	mg N/L

Sample Number: 90-AUG-10-14-01 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-NO2NO3 Analysis Description: Analysis for nitrite+nitrate in water

Storet Number	Analyte	Result	Units
00630	Nitrate-Nitrite-N	0.020 U	mg N/L

Sample Number: 90-AUG-10-14-01 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-NH3 Analysis Description: Analysis for ammonia in water

Storet Number	Analyte	Result	Units
00610	Ammonia-N	0.020 U	mg N/L

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 practice quantiation limit
U - Material was analyzed for but not detected; The value reported is the mimimum detection limit
N/A - Not applicable NR - Not requested

Sample Number: 90-AUG-10-14-02 Sample Status: Authorized by Yuh-Hsu Pan
Sample Location: Pensacola Bay midway between NAS boil & shore Matrix: Salt Surf Water
Field ID: #2 Storet Station Number: 33020L19
Date/Time Collected: 8-AUG-1990 09:30:47.32
Comments:

Sample Number: 90-AUG-10-14-02 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-TOC Analysis Description: Total organic carbon

Storet Number	Analyte	Result	Units
00680	TOC	1 K	mg C/L

Sample Number: 90-AUG-10-14-02 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-TP Analysis Description: Analysis for total phosphorus in water

Storet Number	Analyte	Result	Units
00665	Total Phosphorus	0.16	mg P/L

Sample Number: 90-AUG-10-14-02 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-TKN Analysis Description: TKN for water sample

Storet Number	Analyte	Result	Units
00625	N KJEL TOT	0.040 U	mg N/L

Sample Number: 90-AUG-10-14-02 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-NO2NO3 Analysis Description: Analysis for nitrite+nitrate in water

Storet Number	Analyte	Result	Units
00630	Nitrate-Nitrite-N	0.020 U	mg N/L

Sample Number: 90-AUG-10-14-02 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-NH3 Analysis Description: Analysis for ammonia in water

Storet Number	Analyte	Result	Units
00610	Ammonia-N	0.020 U	mg N/L

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 practice quantiation limit
U - Material was analyzed for but not detected; The value reported is the mimimum detection limit
N/A - Not applicable NR - Not requested

Sample Number: 90-AUG-10-14-03 Sample Status: Authorized by Yuh-Hsu Pan
Sample Location: Pensacola Bay inshore from NAS outfall Matrix: Salt Surf Water
Field ID: #3 Storet Station Number: 33020L11
Date/Time Collected: 8-AUG-1990 10:05:47.32
Comments:

Sample Number: 90-AUG-10-14-03 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-TOC Analysis Description: Total organic carbon

Storet Number	Analyte	Result	Units
00680	TOC	1 U	mg C/L

Sample Number: 90-AUG-10-14-03 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-TP Analysis Description: Analysis for total phosphorus in water

Storet Number	Analyte	Result	Units
00665	Total Phosphorus	0.050 U	mg P/L

Sample Number: 90-AUG-10-14-03 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-TKN Analysis Description: TKN for water sample

Storet Number	Analyte	Result	Units
00625	N KJEL TOT	0.040 U	mg N/L

Sample Number: 90-AUG-10-14-03 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-NO2NO3 Analysis Description: Analysis for nitrite+nitrate in water

Storet Number	Analyte	Result	Units
00630	Nitrate-Nitrite-N	0.020 U	mg N/L

Sample Number: 90-AUG-10-14-03 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-NH3 Analysis Description: Analysis for ammonia in water

Storet Number	Analyte	Result	Units
00610	Ammonia-N	0.020 U	mg N/L

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 practice quantiation limit
U - Material was analyzed for but not detected; The value reported is the mimimum detection limit
N/A - Not applicable NR - Not requested

Sample Number: 90-AUG-10-14-04 Sample Status: Authorized by Yuh-Hsu Pan
Sample Location: Pensacola Bay near buoy 22 Matrix: Salt Surf Water
Field ID: #4 Storet Station Number: 33020K15
Date/Time Collected: 8-AUG-1990 10:55:47.32
Comments:

Sample Number: 90-AUG-10-14-04 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-TOC Analysis Description: Total organic carbon

Storet Number	Analyte	Result	Units
00680	TOC	1 K	mg C/L

Sample Number: 90-AUG-10-14-04 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-TP Analysis Description: Analysis for total phosphorus in water

Storet Number	Analyte	Result	Units
00665	Total Phosphorus	0.14	mg P/L

Sample Number: 90-AUG-10-14-04 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-TKN Analysis Description: TKN for water sample

Storet Number	Analyte	Result	Units
00625	N KJEL TOT	0.040 U	mg N/L

Sample Number: 90-AUG-10-14-04 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-NO2NO3 Analysis Description: Analysis for nitrite+nitrate in water

Storet Number	Analyte	Result	Units
00630	Nitrate-Nitrite-N	0.020 U	mg N/L

Sample Number: 90-AUG-10-14-04 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-NH3 Analysis Description: Analysis for ammonia in water

Storet Number	Analyte	Result	Units
00610	Ammonia-N	0.020 U	mg N/L

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 practice quantiation limit
U - Material was analyzed for but not detected; The value reported is the mimimum detection limit
N/A - Not applicable NR - Not requested

DER Biology Section — Acute Bioassay Data Sheet

Sample Source: Pensacola NAS
Address/City: PENSACOLA
County: ESCAMBIA
Contact/District: GLEN BUTTS
NPDES Permit #: _____ **Outfall #:** 001

Sample Collection: 8-6-90 Time 1000
Test Beginning: Date 8-7-90 Time 0920
Test Ending: Date 8-9-90 Time 1000
Test Organism: N. LEEDSI
Life Stage/Age: 17 DAYS

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

Remarks:

Instrument Calibrations:

	pH	DO	Cond	Temp
0 hr	7 at 7.0	8.5 @ 23.6°	1386 @ 24.0° / @ 1391	23.6 @ 23.6
24 hr	7.1; 7.1	8.5 @ 24°C	1381 @ 1394	24 @ 23.9°C
48 hr				

Conc	Chamber #	Number Live 0	24	48	DO (mg/l) 0	24	48	pH 0	24	48	Temp (°C) 0	24	48	Cond. (µmhos/cm) 0	24	48
CONT.	94	5	5	5	7.8	7.4	8.0	7.8	8.3	8.4	23.0	25.6	24.6	370		370
"	164	5	5	5	7.7	7.7	7.9	7.8	8.3	8.4	23.6			370		370
100%	19	5	5	5	7.2	7.5	7.5	7.1	7.6	7.8	23.0	25.2	25.0	690		690
"	13	5	5	5	7.3	7.8	7.7	7.1	7.6	7.8	23.0			690		690
Measured/Loaded by:		RFLB	MF LB SMC	LB		SMC	LB		SMC	LB		SMC	LB	SMC		SMC
Recorded by:		RF	MF	LB	SMC	MF	SMC		MF	SMC		MF	SMC	SMC		SMC

Investigators' Signatures

Sandra G. McCune
R. Lynne Burton
Marshall Faircloth

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:					
Lab Tot. Resid. Cl2:					
Alkalinity:					
Hardness:					
Total Ammonia:					

Ammonia meter slope:

DER Biology Section — Acute / Toxicity Data Sheet

Sample Source: Pensacola NAS effluent
Address/City: Pensacola
County: Escambia
Contact/District: Glen Butts
NPDES Permit #: _____ **Outfall #:** _____

Sample Collection: Date 8/6/90 Time 10:00
Test Beginning: Date 8/7/90 Time 10:00
Test Ending: Date 8.9.90 Time 10:00
Test Organism: C. DUBIA
Life Stage/Age: NEONATES

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

Remarks:

Instrument Calibrations:

	pH	DO	Cond	Temp
0 hr	7.0 / 9.0			
24 hr				
48 hr				

Conc.	Chamber #	Number Live 0	24	48	DO (mg/l) 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	Cond. (µmhos/cm) 0	24	48
CONT	1	5	4	4	8.2		8.0	8.5		8.5	23.5		23.0	330		
"	2	5	5	4	8.2		8.2	8.5		8.5	23.5			327		
"	3	5	5	5	8.1		8.2	8.5		8.5	23.6			326		
"	4	5	5	5	8.1		8.2	8.5		8.5	23.5			335		
100%	5	5	5	5	8.3		8.4	7.2		8.2	23.1		23.4	490		345
"	6	5	5	5	8.3		8.4	7.2		8.1	23.0			491		
"	7	5	5	5	8.4		8.3	7.2		8.0	23.0			488		
"	8	5	5	4	8.5		8.3	7.2		8.0	23.0			502		480
Measured/Loaded by		LB	LB	SMC	LB		LB	SMC		LB	RF		LB	RF		
Recorded by		MF	MF	SMC	SMC		SMC	SMC		SMC	SMC		SMC	SMC		

Investigators' Signatures

Sandy McCown
Marshall Faulkner
_____
_____
Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:					
Lab Tot. Resid. Cl2:					
Alkalinity:					
Hardness:					
Total Ammonia:					

Ammonia meter slope: _____

Pg 117 Glen Butts NW
Escambia

MICROTOX™ Data Reduction Sheet

SOURCE: Pensacola NAS

GRAPH CALC EC _____ (_____ MIN, _____ ° C) = _____ %SAMPLE mg/L

SAMPLE DATA:

SAMPLE TYPE (EFFLUENT, LEACHATE, ETC.):

DATE ASSAYED: 8/7/90 TIME: 9:20 AM

VISUAL COLOR: clear CORRECTION REQUIRED: YES NO

VISUAL TURBIDITY: SEPARATION REQUIRED: YES NO

INITIAL pH: pH ADJUSTED TO: WITH:

OSMOTICALLY ADJUSTED WITH: MOAS DRY NaCl OTHER

PRIMARY DILUTION OF SAMPLE:

OPERATOR: MeBCampos REAGENT VIAL LOT NO. M- NLW

REMARKS:

MICROTOX™ TEST

SAMPLE CUVETTE	% SAMPLE	READINGS 5 MIN	READINGS 15 MIN	I5	I15	NOTES Io
A1	0	55	32	X	X	82
B1		53	31			77
C1		61	35			79
A2	12.38	55	31		.08	78
B2		51	30			74
C2		57	30			72
A3	24.75	57	33		-.03	80
B3		55	34			84
C3		59	34			82
A4	49.5	56	33		-.05	81
B4		52	33			77
C4		58	35			87
A5	99	57	35		-.09	80
B5		63	36			82
C5		57	37			81
EC_{50} (MIN, ° C)					stimulatory	

REVIEWED BY:
DATE: 2/6/91

Macroinvertebrate taxa list for Pensacola US Naval Air Station Waste Water Treatment Plant, Escambia County, Florida, collected via ponar dredge at a reference site (Fair Point) and in the vicinity of the discharge, on August 8, 1990.

	Test Site			Reference Site		
	Deep	Mid	Shallow	Deep	Mid	Shallow
Brachiopoda						
Undetermined Brachiopoda	–	–	–	–	+	–
Cephalochordata						
Brachiostoma caribaeum	+	+	+	–	+	+
Cumacea						
Oxyurostylis smithi	–	+	+	–	+	+
Decopoda						
Callinectes sapidus	–	–	–	–	–	+
Pagurus sp.	+	–	–	–	–	–
Pinnixa cylindrica	–	–	–	+	–	–
Processa sp.	–	–	–	+	–	–
Processa vinica	+	–	–	–	–	–
Gastropoda						
Haminoea succinea	+	+	–	–	–	–
Nassarius vibex	–	–	–	–	–	+
Olivella mutica	–	–	–	+	–	–
Polinices sp.	–	–	–	–	+	–
Retusa (acteocina) sp.	–	–	–	–	+	–
Malacostraca						
Cyathura sp.	–	–	+	–	–	–
Acanthohaustorius millsi	–	–	–	–	+	–
Ampelisca sp.	+	+	+	+	+	–
Grandidierella bonnieroides	–	–	+	–	–	–
Lembos sp.	–	–	+	–	+	–
Synchelidium americanum	–	–	–	–	+	–
Bowmaniella floridana	–	–	+	–	–	–
Bowmaniella sp.	–	+	–	–	–	–
Mysidopsis bahia	–	–	+	–	–	–
Mysidopsis bigelowi	–	–	–	–	+	–
Nemertea						
Carinoma tremaphoros	–	–	+	+	–	–
Tetrastemma candidum	–	–	–	–	–	+
Tetrastemma sp.	–	–	+	–	–	–
Naididae						
Undetermined Naididae sp.	–	–	–	+	+	–
Ophiuroidea						
Ophioderma brevisspina	+	–	–	+	+	–
Pelecypoda						
Anomalocardia cuneimeris	–	–	–	–	+	–
Laevicardium mortoni	+	+	+	–	+	–
Lucina sp.	–	–	–	+	–	–

Lysonia floridana	+	–	–	–	+	–
Mulinia lateralis	–	–	–	–	+	–
Nuculana concentrica	–	–	–	+	–	–
Parvilucina multilineata	+	–	–	–	–	–
Tellina tampaensis	+	–	–	–	–	–
Tellina texana	–	–	–	+	–	–
Platyhelminthes						
Stylochus ellipticus	+	–	+	–	+	–
Polychaeta						
Anaitides madeirensis	–	–	–	+	–	–
Capitella capitata	+	–	–	–	+	+
Ceratonereis sp.	–	+	–	–	–	–
Chone americana	+	–	–	–	+	–
Cossura delta	–	–	–	+	–	–
Eteone heteropoda	–	+	+	–	–	–
Glycera americana	+	–	–	–	–	–
Glycera sp.	–	–	–	–	+	–
Harmothoe sp.	–	+	–	–	–	–
Laeonereis culveri	–	+	+	–	–	+
Lumbrineris sp. a	–	–	–	+	–	–
Lumbrineris sp. b	–	–	–	+	+	–
Microspio pigmentata	+	–	–	–	–	–
Neanthes acuminata	–	+	–	–	–	–
Neanthes microma	–	–	–	+	–	–
Neanthes succinea	–	–	+	–	–	–
Nephtys picta	–	–	–	+	–	–
Nereis falsa	–	–	+	–	–	+
Paraprionospio pinnata	+	–	+	+	+	–
Pectinaria gouldii	–	–	–	+	+	–
Pista palmata	–	–	–	+	+	–
Poecilochaetus johnsoni	+	–	–	–	–	–
Polyodontes lupinus	+	–	–	–	–	–
Prionospio fallax	+	+	–	–	+	–
Prionospio heterobranchia	–	+	+	–	+	+
Progoniada sp.	–	–	–	+	–	–
Scoloplos sp.	–	–	–	+	–	–
Scolelepis squamata	–	+	+	–	+	–
Sigambra tentaculata	–	–	–	+	–	–
Spiophanes bombyx	+	–	–	–	–	–
Sthenelais sp.	–	–	–	+	–	–
Tharyx annulosus	+	–	–	+	–	–
Synaptidae						
Leptosynapta tennis	–	+	+	–	–	+
Tanaidae						
Tanais sp.	+	+	–	–	–	–
Total per Station	**22**	**16**	**20**	**24**	**27**	**10**
Cummulative Total per Site		**41**			**50**	

Department of Environmental Regulation

Results of Fifth Year Inspections

Discharger:	**Pensacola NAS WWTP**
County:	**Escambia**
NPDES Number:	**FL0002500**
State Permit Expiration Date:	**May, 1991**

Toxics Sampling Inspection (**XSI**)	
Date Sampled:	August 8, 1990
Results:	No deleterious levels of cyanide or metals detected.

Compliance Biomonitoring Inspection (**CBI**)	
Date Sampled:	August 6, 1990
Results:	Not toxic to *Ceriodaphnia dubia* or *Notropis leedsi*. Stimulatory to *Phytobacterium phosphoreum* (which generally indicates nitrogen enrichment).

Impact Bioassessment Inspection (**IBI**)	
Date Sampled:	August 8, 1990
Results:	Macroinvertebrate communities were healthy in vicinity of outfall. Elevated nitrate-nitrite in effluent (6.8 mg/l) appeared to be responsible for high algal growth potential results. This suggests that it may be appropriate to control for nitrate-nitrite, in addition to the current 3.0 mg/l limit on TKN.

Water Quality Inspection (**WQI**)	
Date Sampled:	
Results:	

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