

Biological Assessment of

City of Bowling Green WWTP

Hardee County

NPDES #FL0021423

Sampled April and May 1991

September 1991

Biology Section
Division of Technical Services

Department of Environmental Regulation

Results of Fifth Year Inspections

Discharger: Bowling Green WWTP
County: Hardee
NPDES Number: FL0021423
State Permit Expiration Date:

Toxics Sampling Inspection (XSI)	
Date Sampled:	30 April 1991
Results:	No problem levels of metals or organic priority pollutants found in the single grab sample discharge.

Compliance Biomonitoring Inspection (CBI)	
Date Sampled:	30 April 1991
Results:	Acutely toxic to *Ceriodaphnia dubia*, in both chlorinated and dechlorinated samples. Chlorinated sample killed 40% of the *Pimephales promelas* in full strength concentration.

Impact Bioassessment Inspection (IBI)	
Date Sampled:	30 April and 28 May, 1991
Results:	Macroinvertebrate community at the creek test site (located in the Paynes Creek State Historic Site) was very degraded, with violations of biological integrity, growth of nuisance species, and imbalances of aquatic fauna observed. Biota also degraded at the Peace River test site.

Water Quality Inspection (WQI)	
Date Sampled:	30 April 1991
Results:	Violations of dissolved oxygen and unionized ammonia standards occurred at the creek test site. This station also suffered from nutrient enrichment: OP = 5.7 mg/l; TP = 4.6 mg/l; NH_3 = 2.2 mg/l; NO_2NO_3 = 0.2 mg/l; TKN = 5.8 mg/l (effluent values were comparable). Nitrogen species concentrations at the river test site were double those upstream. Algal growth potential increased from 6.1 mg dry wt/l at the river control site to 14.4 mg dry wt/l at the river test site (values above 5 mg dry wt/l are considered troublesome). This indicates that the discharge exacerbated an existing problem of eutrophication in the Peace River.

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 City of Bowling Green WWTP is a 0.32 MGD Type II extended aeration sewage treatment plant located on Lake Branch Road (SR664A) in Bowling Green, Hardee County. The chlorinated effluent is post-aerated prior to discharge (via a ditch) into a natural creek which flows into the Peace River. On May 28,1991, the City of Bowling Green passed a sewer use ordinance requiring pre-treatment of non-domestic incoming waste streams. These include two recreational vehicle parks, a tomato and cucumber canning operation, and a laundry. Past problems associated with these dischargers included inputs of formaldahyde and exceptionally high BOD. Formaldahyde is an ingredient of deoderizers commonly used in RV parks. Of the 4700 linear feet of flowway between the treatment plant and the Peace River, approximately 3500 linear feet is through the Paynes Creek State Historic Site (a state park). The Peace River is an Outstanding Florida Water all along the park boundary, including the location where the effluent water reaches the Peace River.

Methods

The focus of this investigation was to determine the discharger's effects on the receiving waters. Data from four stations were examined (see maps in Appendix). A comparison of biological community health was made between a river control site (located in the Peace River above the unnamed creek receiving the WWTP discharge = Station 1) and a river test site (in the Peace River downstream of the unnamed creek receiving the discharge = Station 2). A creek test site (Station 3) was established in an unnamed creek within the boundaries of the Paynes Creek State Historic Site. Station 3 was located about half a mile below the Bowling Green WWTP discharge. Historical data from Hickory Creek (= Station 4), a nearby creek of similar size and habitat to the test creek, were used for reference purposes. These data were originally reported by Farrell and Billets (1987) and are representative of typical (not unusually pristine) small streams in the area. 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 *Pimephales promelas* as test organisms, were performed on an effluent sample (Peltier and Weber 1985, FDER 1985). The effluent was analyzed for organic constituents (base neutral and acid extractables, and pesticide extractables) 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.

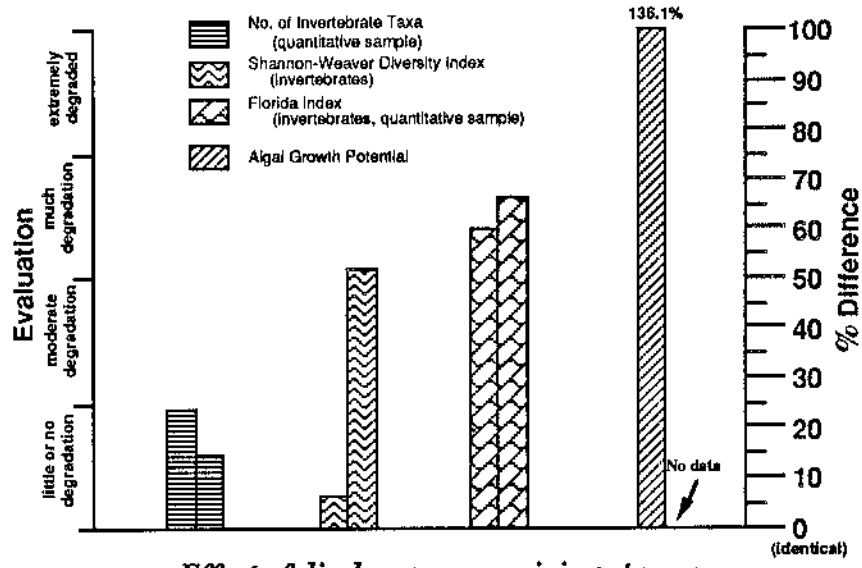
Benthic macroinvertebrate collections were conducted at the river control and two test sites. Collection methods consisted of a timed (one hour per site) multi-substrate (*e.g.*, snags, vegetation, sediment) semi-quantitative effort. Additional invertebrate collections were accomplished using Hester-Dendy multiplate samplers which were incubated for 28 days (Ross 1990). Periphyton was sampled at Stations 1 and 3 (other samplers were lost) by incubating glass microscope slides in a standard periphytometer for 28 days (Ross 1990). Although a direct comparison between these two stations is not meaningful, the data are included in this report. Chlorophyll *a* was also determined for periphyton communities (Ross 1990). Bacterial populations were analyzed for total and fecal coliforms following the methods of APHA (1989), although holding times were exceeded. Algal Growth Potential tests, using *Selenastrum capricornutum* as the test organism, followed Miller *et al.* (1978).

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. The Florida Index assigns points to stream-dwelling macroinvertebrates based on their sensitivity to pollution (see Ross 1990). A site with a high Florida Index score is considered healthy (*i.e.*, many clean-water organisms are present). 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

Major characteristics of community structure of control and test sites.

	Station 1	Station 2	Station 3	Station 4
Macroinvertebrate Qualitative				
Number of Taxa	48	44	14	
Florida Index	16	8	2	
% Contribution of Dominant Taxon	20.9	20.4	86.9	
% Odonata	5.0	2.3	0.4	
% Diptera	52.6	41.2	98.7	
% Pelecypoda	4.9	6.8	0	
% Gastropoda	23.6	31.9	0.3	
% Malacostraca	4.9	3.4	0	
% Coleoptera	3.9	8.8	0.2	
% Other	5.1	5.6	0.4	
% Predators	22.5	23.2	1.3	
% Collector-Gatherers	21.0	20.2	98.7	
% Collector-Filterers	18.7	40.1	0	
% Scrapers	23.3	41.5	0	
% Shredders	14.5	2.1	0	
Macroinvertebrate Hester-Dendy				
Number of Taxa	42	32	18	21
Florida Index	27	11	5	15
Shannon-Weaver Diversity	4.2	4.0	1.6	3.3
% Odonata	3.9	2.1	3.2	0.6
% Coleoptera	8.4	4.2	1.3	0
% Trichoptera	2.8	1.7	0	14.3
% Diptera	43.2	37.8	94.6	69.3
% Ephemeroptera	22.6	1.4	0	12.1
% Gastropoda	18.2	51.7	0.6	3.3
% Other	0.8	1.1	0.3	0.5
% Predators	9.5	5.7	3.6	5.4
% Collector-Gatherers	26.3	30.0	94.2	10.7
% Collector-Filterers	18.0	10.2	0.7	71.4
% Scrapers	42.7	53.0	1.2	9.4
% Shredders	3.5	1.1	0.3	3.1
Periphyton Algae				
Number of Taxa	19		27	
% Contribution of Dominant Taxon	54.8		49.3	
Chlorophyll a (mg/sq. m)	18.7		3.1	
Blue-green/Diatom Abundance Ratio	0.88		0.92	
% Blue-green	11.2		6.6	
% Chlorophytes	2.3		11.5	
% Diatoms	86.5		81.0	
Algal Growth Potential (mg dry wt/l)	6.1	14.4	18.5	No data



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

Left bar = Station 1 (river control site) vs. Station 2 (river test site)
Right bar = Station 3 (creek test site) vs. Station 4 (creek reference site)

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 Florida Index are measured as the reference site minus test site divided by the reference site. The percent difference between sites involving algal growth potential is measured as the test site minus reference site divided by the reference site.

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

Results

Habitat quality at the two Peace River stations was identical, with 76 points each. The Peace River is a 105 mile long blackwater system, originating in the Green Swamp, Polk County. The discharge from the Bowling Green WWTP is only one of the many potential pollution sources to the river. These include numerous domestic and industrial discharges, phosphate mine run-off, and urban and agricultural run-off.

The creek test site, located in the unnamed stream which receives the WWTP effluent, was given 81 points for habitat quality. This score was comparable to that of the creek reference site (Hickory Creek, with 79 points). Of the field parameters measured, only the low dissolved oxygen at the creek test site (3.5 to 4.0 mg/L) and the elevated conductivity (1259 μmhos/cm^2) were cause for concern. The dissolved oxygen level in the creek test site was in violation of 17-302.510(3)(g) FAC. The conductivity value was very close to the maximum allowed (1275 μmhos/cm^2) and was greater than 50% higher than the conductivities measured in adjacent streams in the Peace River drainage (Hand *et al.* 1990).

The sample of dechlorinated effluent was acutely toxic to the water flea, *Ceriodaphnia dubia*, producing 90% mortality in the full strength concentration. This is a violation of 17-4.244(3)(a), toxicity regulations. All *C. dubia* exposed to the chlorinated sample were killed within 24 hours. Fish were affected somewhat less, since none of the *Pimephales promelas* in the dechlorinated sample of Bowling Green effluent died, but 40% of the fish exposed to the chlorinated wastewater suffered morality.

No organic priority pollutants were detected in the grab sample of effluent, and only small amounts of aluminum and iron were found. The results of zinc analysis were invalidated due to contamination in the field blank. Fecal coliforms (1,500 org./100 mL) and total coliforms (5,000 org/100 mL) at the test site were both above water quality standards. However, holding times for bacterial analysis were exceeded.

Nutrient concentrations at Station 3 (creek test site) were elevated, and were almost the same as values determined for the effluent (see nutrient summary table in appendix). It appears that the unnamed stream flowing through the Paynes Creek

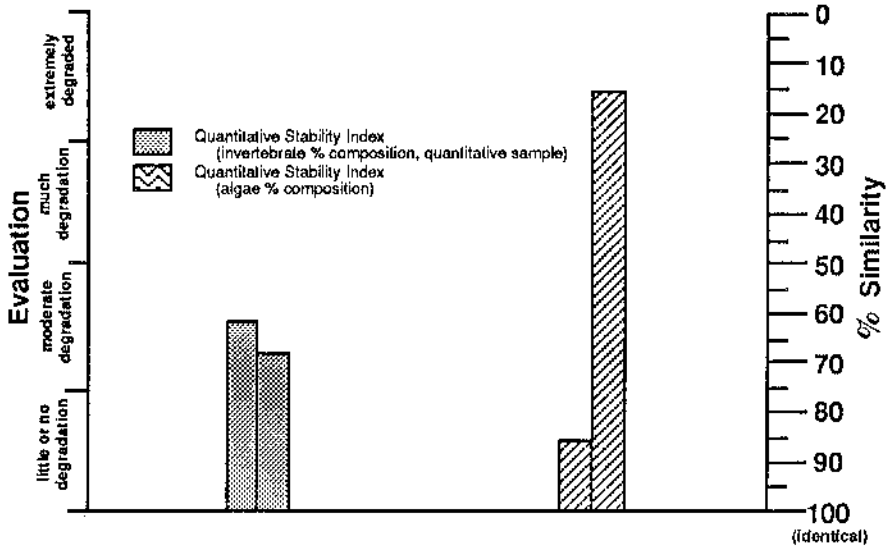
State Historic Site is dominated by the WWTP discharge. Unionized ammonia at Station 3 was calculated to be 0.03 mg/L. This is a violation of the unionized ammonia standard (17-302.560(3) FAC). Ammonia, nitrate-nitrite, and TKN concentrations in the Peace River at Station 2 (below the discharge) were nearly double those measured upstream at Station 1. AGP increased from 6.1 mg algal dry wt/l at Station 1 to 14.4 mg algal dry wt/l at Station 2. This is evidence to suggest that the discharge is having detrimental effects (contributing to eutrophication) in the Peace River. Raschke and Schultz (1987) report that AGP values above 5 mg dry wt/l generally coincide with symptoms of nutrient enrichment (algae blooms, fish kills). It should be noted that phosphorus levels and AGP at the control site were already indicative of enrichment. The WWTP discharge distinctly exacerbated the problem.

Quantitative measures of macroinvertebrate community health clearly showed that the creek test site was very degraded, while the river test site was moderately degraded (see Table and Figures). Although historical reference data were used for comparison with the creek test site, the biological condition of the creek test site was obviously different from that expected from a typical small stream in the area. Hickory Creek was chosen as the creek reference site because it was similar in size and habitat quality to the creek test site. The figure on p. 3 indicates the degree of difference between the control and test sites. Larger differences (that is, higher percentages) correspond to greater degrees of degradation. Negative values mean that the test site is better than the control. The figure on this page summarizes similarities between the sites. Smaller similarities (lower percentages) generally correspond to greater degradation.

Significant reductions in the Florida Index (by 66.7%) and Shannon-Weaver diversity index (by 51.5%) occurred at the creek test site as compared to the creek reference site. Additionally, the creek test site was completely dominated by two well known pollution tolerant nuisance organisms, *Chironomus decorus* grp. and *Goeldichironomus holoprasinus* (Beck and Beck 1969). The Quantitative Stability Indices for community composition and functional feeding groups indicated that the creek test site was moderately and extremely degraded, respectively. Therefore, violations of three type of biological criteria occurred at the creek test site due to the Bowling Green WWTP discharge: biological integrity (17-302.560(5) FAC), imbalances of fauna (17-302.560(19) FAC), and dominance of nuisance species (17-302.510(3)(q) FAC).

The benthic community at the river test site also showed signs of stress compared to the upstream control station. Taxa richness was reduced by 23.8%, the Florida Index was decreased by 59.3%, and the Quantitative Stability Index for community percent composition was a moderately low 66.2%. This is sufficient evidence to indicate that imbalances in fauna were occurring in the Peace River as well.

As previously mentioned, the loss of periphyton samplers at the river test site precluded any direct evaluation of possible problems in the algal community. One observation worth noting is that despite a high AGP (18.5 mg dry wt/l) measured at the creek test site, only 3.1 mg/m^2 (a low value) of chlorophyll *a* was found there. This suggests that some other factor (*e.g.* elevated conductivity equivalent to about 0.8 ppt salinity or light limitation, etc.) inhibited the growth of algae at the creek test site.



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

Left bar = Station 1 (river control site) vs. Station 2 (river test site)
Right bar = Station 3 (creek test site) vs. Station 4 (creek reference site)

Conclusions

Several environmental problems were associated with the Bowling Green WWTP discharge. The effluent (both chlorinated and dechlorinated) was acutely toxic to the water flea, *Ceriodaphnia dubia*. However, no metals or organic priority pollutants were found in the discharge sample. Violations of the following parameters occurred in the unnamed creek receiving the discharge: dissolved oxygen, unionized ammonia, biological integrity, growth of nuisance species, and imbalances of aquatic fauna. Although fecal and total coliforms were also above allowed limits, the samples exceeded the 6 hour holding time. Since the creek test site was located in the Paynes Creek State Historic Site, it is possible that the public may be inadvertently exposed to the negative effects of the discharge.

Nutrient enrichment and elevated algal growth potential was also observed in the Peace River below the discharge. Macroinvertebrate communities from this river test site were moderately degraded, a violation of imbalances of aquatic fauna.

Literature Cited

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Bowling Green STP Summary of Nutrient Data

Source	NH_3	NO_2NO_3	TKN	OP	TP
Effluent	2.2	0.2	2.7	2.6	5.5
Sta 1	0.07	0.3	0.3	2.1	1.9
Sta 2	0.12	0.6	0.64	2.5	2.4
Sta 3	2.2	0.1	5.8	5.7	4.6

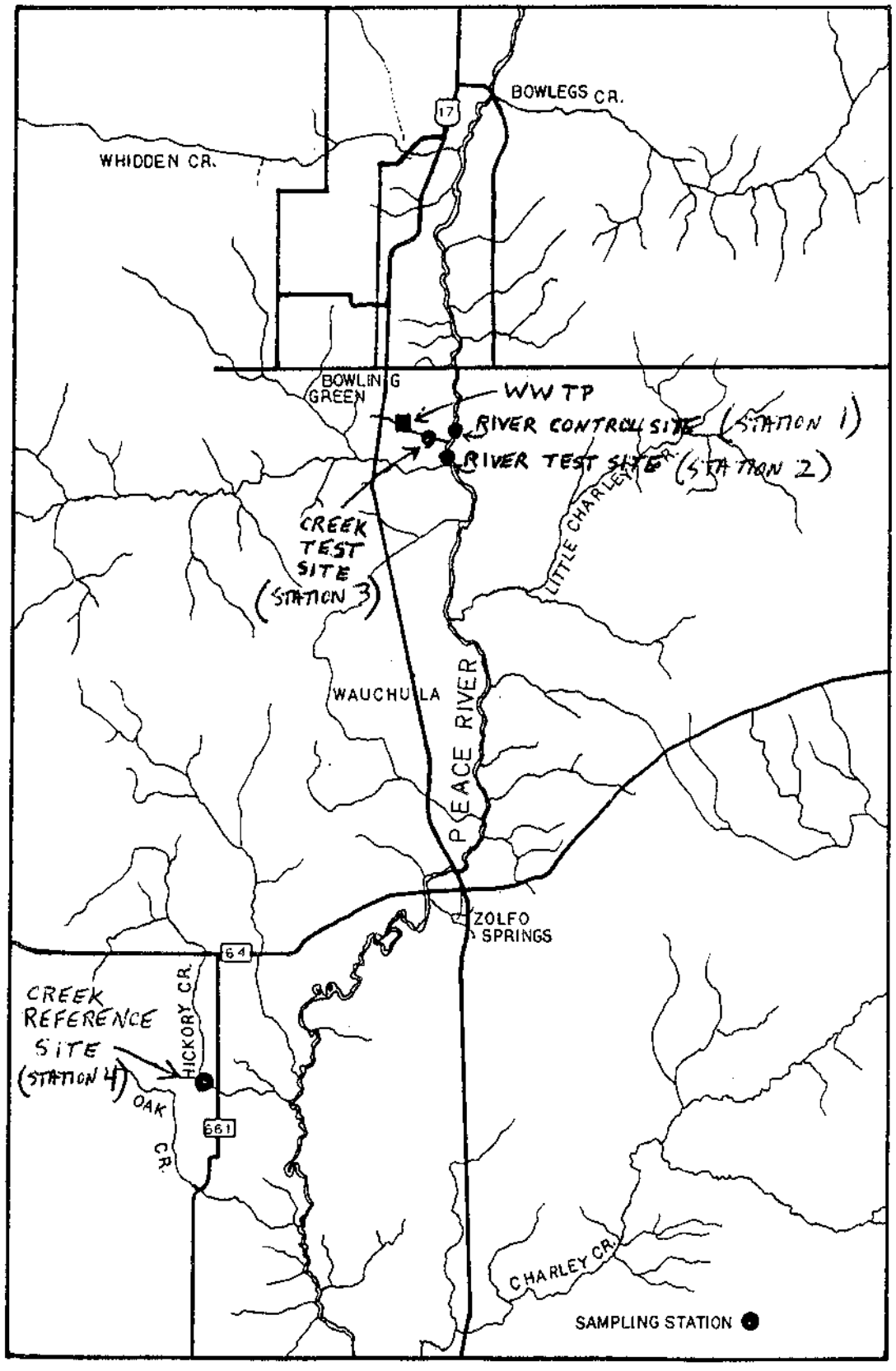
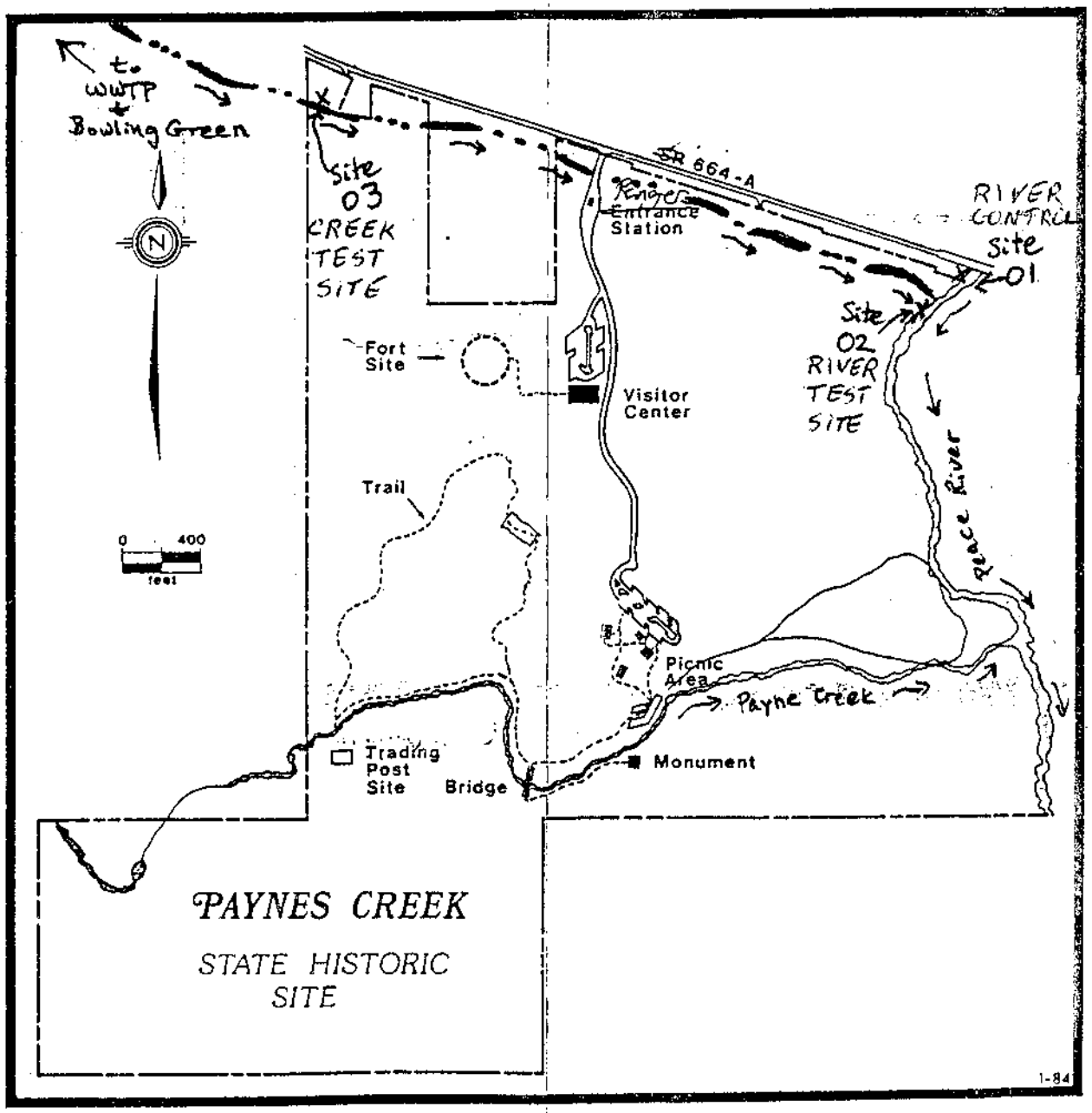
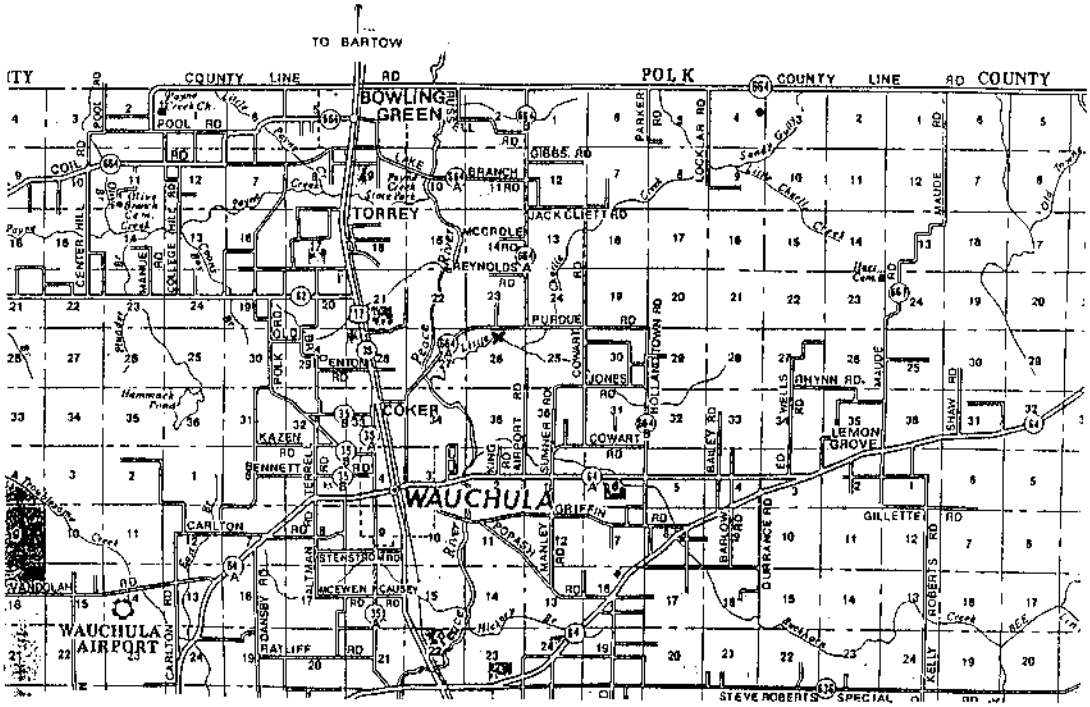
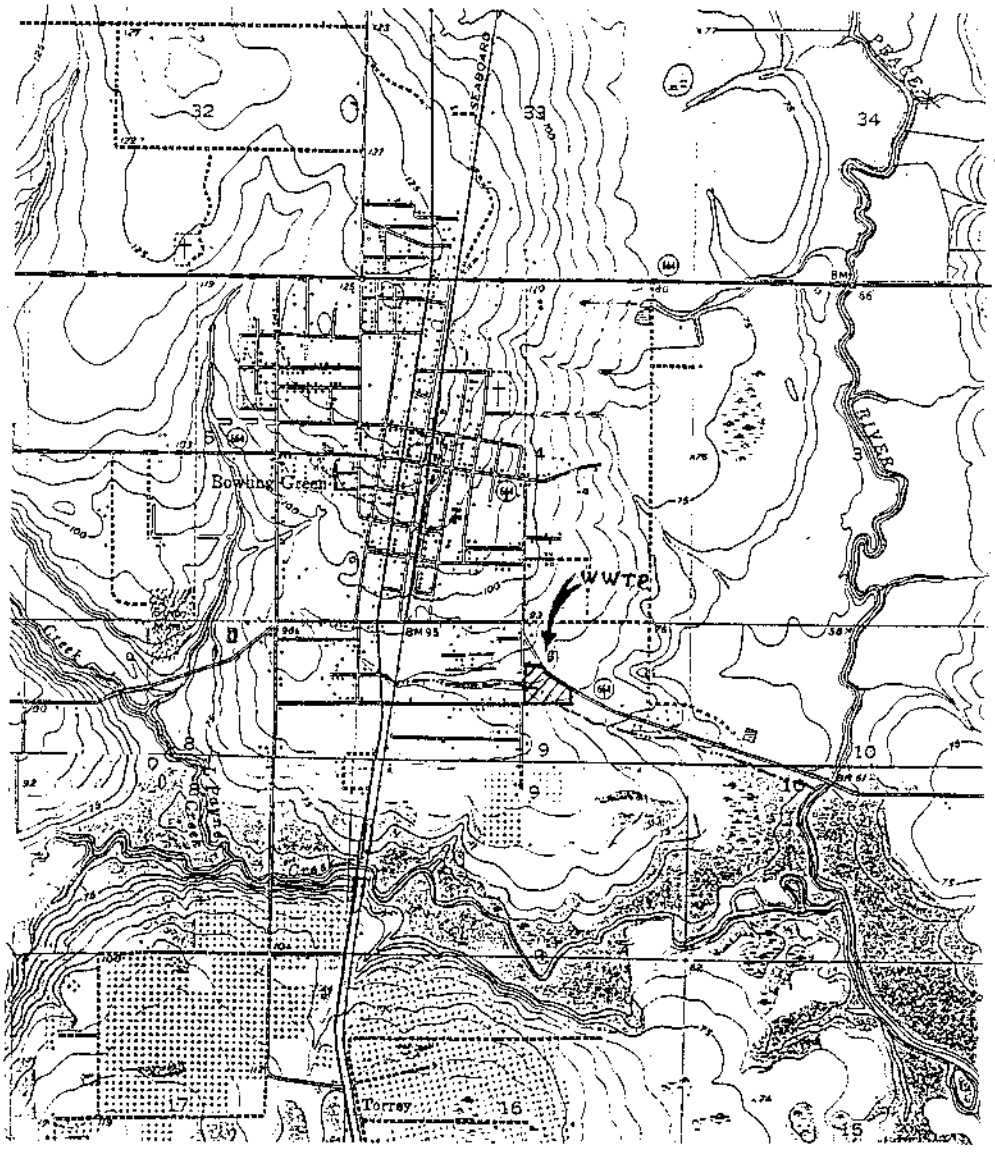


Figure 1. Location of sampling stations on the Peace River System, Polk/Hardee County, Florida.

STATION LOCATIONS (01, 02, 03)




TO BARTOW
COUNTY LINE RD
POLK
COUNTY LINE RD COUNTY
BOWLING GREEN
TORREY
COKER
WAUCHULA
LEMON GROVE
WAUCHULA AIRPORT
POOL RD
JACK CLIETT RD
PURDUE RD
JONES RD
COWART RD
GRIFFIN RD
GILLETTE RD
CARLTON RD
STEVE ROBERTS SPECIAL


SEABOARD
PEACE
RIVER
Bowling Green
WWTP
Torrey

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y): 4/30/91	RECEIVING BODY OF WATER: Peace River

REMARKS: Bowling Green STP	LOCATION: Above outfall Creek in Peace River	FIELD ID/NAME: 001

Habitat Parameter / score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover 20 pc	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs, undercut banks, rubble, or other stable habitat. **23-30 points**	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. **16-22 points**	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat. **8-15 points**	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious. **0-7 points**
Water Velocity 17	Max. observed; >0.3 m/sec. **23-30 points**	Max. observed; 0.1 to 0.3 m/sec **16-22 points**	Max. observed; 0.05 to 0.1 m/sec **8-15 points**	Max. observed; <0.05 m/sec **0-7 points**
Artificial Channel/ Flow Alteration 15	No artificial channelization. Little activity (impervious surface) in watershed which would cause scouring during spates. **12-15 points**	—	—	Artificially channelized, or scouring present during spates because of excess impervious surface in watershed. **0-3 points**
Bank Stability 9	Stable. No evidence of erosion or bank failure. Little potential for future problems. **9-10 points**	Moderately stable. Infrequent or small areas of erosion, mostly healed over. **6-8 points**	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. **3-5 points**	Unstable. Many raw, eroded areas. Obvious bank sloughing. **0-2 points**
Riparian Zone Vegetation Quality 10	Over 80% of streambank surfaces consist of native plants, classified as: bottomland hardwoods, understory shrubs, or non-woody macrophytes. **9-10 points**	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. **6-8 points**	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. **3-5 points**	Less than 25% of streambank surfaces are vegetated. Poor plant community (e.g. grass monoculture) present. **0-2 points**

Adjustments: 5	Add **5 points** if cross-sectional area of flow is estimated to be greater than one square meter during periods of normal flow.	TOTAL SCORE: 76

COMMENTS: Fish Seen Include minnow? largemouth Bass, Sunfish + Tilapia (one)

ANALYSIS DATE: April 30, 1991	ANALYST: Pat Fricano	SIGNATURE: Pat Fricano

STATE OF FLO
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET upstream Peace

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

REMARKS: Bowling Green STP	LOCATION: upstream of discharge to Peace River	FIELD ID/NAME: 001

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other
✓ 100%			✓			

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

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

Point-Source Pollution (list location and describe):

Bowling Green STP Phosphate Discharges: other STP's upstream

Estimated Stream Width (range, m): 20 m	Estimated Stream Depth (range, m): 2		yes
High Water Mark (m above bed): 3	Velocity (range, m/s): 0.125 m/s	Impounded ☐ Channelized ☐	

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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types (estimated % surface coverage):

Limestone:		Sand/Silt/Clay Mix:	
Consolidated Clay:		Clay/Silt (inorganic):	
Gravel/Shell	20	Coarse Organic Debris:	20
Sand:	40	Mud/Muck (organic):	

WATER QUALITY

	Temp. (°C):	D.O. (mg/l):		
Top	28.2	5.6	Secchi Depth (m):	Bot
Mid-depth	29.0	5.5	pH (SU):	7.1
Bottom	29.9	5.5	Conductivity (umho/cm):	433
			Other Parameters:	

Stream Type (check box): Blackwater: ☑ Deep Aquifer Fed: ☐ Surficial Aquifer Fed: ☐ Alluvial: ☐ 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: Sunny + Hot 90°+

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

ANALYSIS DATE:	ANALYST:	SIGNATURE:
April 30, 1991	Pat Fricano	Pat Fricano

STATE OF FLO[illegible]
DEPARTMENT OF ENVIRONMENTAL REGULATION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		4/30/91	Peace River

REMARKS:	LOCATION:	FIELD ID/NAME:
Bartow Green STP	Below Outfall weir in Peace River	002

Habitat Parameter / score	Excellent	Good	Fair	Poor
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Artificial Channel/ Flow Alteration 15	No artificial channelization. Little activity (impervious surface) in watershed which would cause scouring during spates. **12-15 points**	—	—	Artificially channelized, or scouring present during spates because of excess impervious surface in watershed. **0-3 points**
Bank Stability 9	Stable. No evidence of erosion or bank failure. Little potential for future problems. **9-10 points**	Moderately stable. Infrequent or small areas of erosion, mostly healed over. **6-8 points**	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. **3-5 points**	Unstable. Many raw, eroded areas. Obvious bank sloughing. **0-2 points**
Riparian Zone Vegetation Quality 10	Over 80% of streambank surfaces consist of native plants, classified as: bottomland hardwoods, understory shrubs, or non-woody macrophytes. **9-10 points**	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. **6-8 points**	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. **3-5 points**	Less than 25% of streambank surfaces are vegetated. Poor plant community (e.g. grass monoculture) present. **0-2 points**

Adjustments		TOTAL SCORE
5	Add **5 points** if cross-sectional area of flow is estimated to be greater than one square meter during periods of normal flow.	76

COMMENTS: Fish seen include minnows, largemouth bass, sunfish + blue tilapia

ANALYSIS DATE:	ANALYST:	SIGNATURE:
April 30, 1991	Pat Friend	Pat Friend

DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET Peace Down

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

REMARKS	LOCATION:	FIELD ID/NAME:
Bowling Green STP	Downstream Discharge in Peace River	002

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other
100%						

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

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

Point-Source Pollution (list location and describe):
Bowling Green STP, Phosphate Discharges + Other STP's

Estimated Stream Width (range, m): 20m	Estimated Stream Depth (range, m): 2		yes
High Water Mark (m above bed): 3	Velocity (range, m/s): 0.125	Impounded ☐	
		Channelized ☐	

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

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☐ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☑ H_2S

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

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

Substrate Types (estimated % surface coverage):

Limestone:		Sand/Silt/Clay Mix:	30
Consolidated Clay:		Clay/Silt (inorganic):	
Gravel/Shell		Coarse Organic Debris:	
Sand:	40	Mud/Muck (organic):	70

WATER QUALITY

	Temp. (°C):	D.O. (mg/l):		
Top	21.6	5.3	Secchi Depth (m):	2+
Mid-depth	21.7	5.3	pH (SU):	7.2
Bottom	21.6	5.2	Conductivity (µmho/cm):	570
			Other Parameters:	

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

Water Odors (check box): Normal: ☑ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☑ H_2S

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

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

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

Weather Conditions:
Sunny + Hot 90° +

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

ANALYSIS DATE:	ANALYST:	SIGNATURE:
April 30, 1991	P. Ficano	

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

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		5/7/91	Peace River

REMARKS:	LOCATION:	FIELD ID/NAME:
See below	Bowling Green STP Intermittant Creek downstream of discharge	003

Habitat Parameter / score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover 28	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs, undercut banks, rubble, or other stable habitat. **23-30 points**	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. **16-22 points**	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat. **8-15 points**	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious. **0-7 points**
Water Velocity 22	Max. observed; >0.3 m/sec. **23-30 points**	Max. observed; 0.1 to 0.3 m/sec **16-22 points**	Max. observed; 0.05 to 0.1 m/sec **8-15 points**	Max. observed; <0.05 m/sec **0-7 points**
Artificial Channel/ Flow Alteration 14	No artificial channelization. Little activity (impervious surface) in watershed which would cause scouring during spates. **12-15 points**	Creek is channelized in headwaters upstream (near the STP). Creek is not channelized at sampling location.		Artificially channelized, or scouring present during spates because of excess impervious surface in watershed. **0-3 points**
Bank Stability 9	Stable. No evidence of erosion or bank failure. Little potential for future problems. **9-10 points**	Moderately stable. Infrequent or small areas of erosion, mostly healed over. **6-8 points**	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. **3-5 points**	Unstable. Many raw, eroded areas. Obvious bank sloughing. **0-2 points**
Riparian Zone Vegetation Quality 8	Over 80% of streambank surfaces consist of native plants, classified as: bottomland hardwoods, understory shrubs, or non-woody macrophytes. **9-10 points**	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. **6-8 points**	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. **3-5 points**	Less than 25% of streambank surfaces are vegetated. Poor plant community (e.g. grass monoculture) present. **0-2 points**

Adjustments		TOTAL SCORE
	Add 5 **points** if cross-sectional area of flow is estimated to be greater than one square meter during periods of normal flow.	81

COMMENTS: Only fish seen was Gambusia affinis. The stream sediments were loaded with chironomid larvae!

ANALYSIS DATE:	ANALYST:	SIGNATURE:
5/7/91	Fricano	Pat Fricano

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		5/7/91	Peace River

REMARKS:	LOCATION:	FIELD ID/NAME:
Sediment loaded with chironomid larvae.	Bowling Green STP. Intermittant Creek Downstream of discharge.	003

RIPARIAN ZONE/INSTREAM FEATURES

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

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

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):
Bowling Green STP discharge / Stormwater runoff from Hwy 17.

Estimated Stream Width (range, m):		Estimated Stream Depth (range, m): 0-0.6	yes
High Water Mark (m above bed): 1.3		Velocity (range, m/s): 0.3 m/s	Impounded ☐ Channelized ☐

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

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☐ Sewage: ☑ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☑ H_2S

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

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

Substrate Types (estimated % surface coverage):

Limestone:		Sand/Silt/Clay Mix:	
Consolidated Clay:		Clay/Silt (inorganic):	
Gravel/Shell		Coarse Organic Debris:	
Sand:	50%	Mud/Muck (organic):	50%

WATER QUALITY

	Temp. (°C):	D.O. (mg/l):		
Top	29.3	3.5-4.0	Secchi Depth (m):	Bottom
Mid-depth	N/A	N/A	pH (SU):	7.15
Bottom			Conductivity (µmho/cm):	1259
			Other Parameters: Salinity	0.1 ppt

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

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:
Partly Sunny
90° F

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

ANALYSIS DATE:	ANALYST:	SIGNATURE:
5/7/91	Fricano	Pat Fricano

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

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

REMARKS:	LOCATION:	FIELD ID/NAME:
	HICKORY CK WEST OF SR 661, HARDEE COUNTY	REFERENCE CREEK FOR BOWLING GREEN WWTP

Habitat Parameter / score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover 25	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs, undercut banks, rubble, or other stable habitat. **23-30 points**	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. **16-22 points**	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat. **8-15 points**	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious. **0-7 points**
Water Velocity 20	Max. observed; >0.3 m/sec. **23-30 points**	Max. observed; 0.1 to 0.3 m/sec **16-22 points**	Max. observed; 0.05 to 0.1 m/sec **8-15 points**	Max. observed; <0.05 m/sec **0-7 points**
Artificial Channel/ Flow Alteration 15	No artificial channelization. Little activity (impervious surface) in watershed which would cause scouring during spates. **12-15 points**	—	—	Artificially channelized, or scouring present during spates because of excess impervious surface in watershed. **0-3 points**
Bank Stability 9	Stable. No evidence of erosion or bank failure. Little potential for future problems. **9-10 points**	Moderately stable. Infrequent or small areas of erosion, mostly healed over. **6-8 points**	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. **3-5 points**	Unstable. Many raw, eroded areas. Obvious bank sloughing. **0-2 points**
Riparian Zone Vegetation Quality 10	Over 80% of streambank surfaces consist of native plants, classified as: bottomland hardwoods, understory shrubs, or non-woody macrophytes. **9-10 points**	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. **6-8 points**	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. **3-5 points**	Less than 25% of streambank surfaces are vegetated. Poor plant community (e.g. grass monoculture) present. **0-2 points**

Adjustments		TOTAL SCORE
0	Add **5 points** if cross-sectional area of flow is estimated to be greater than one square meter during periods of normal flow.	79

COMMENTS: THIS INFORMATION WAS RELATED BY DOUG FARRELL

ANALYSIS DATE:	ANALYST:	SIGNATURE:
	DOUG FARRELL	Doug Farrell for RBF

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Bowling Green
Address/City:
County: Hardee
Contact/District: PAT FRICANO / SW
NPDES Permit #: _____ **Outfall #:** _____

Sample Collection: Date 7/30/91 Time 1115
Test Beginning: Date 8/1/91 Time 1135
Test Ending: Date 8/2/91 Time 1000
Test Organism: C. dubia
Life Stage/Age: < 24 hours

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

Remarks: DECHLORINATED SAMPLE HERE, AT LAB. SAMPLE RECEIVED CHLORINATED. SWITCH

Instrument Calibrations:

	pH	DO	Cond	Temp
0 hr	7.0, 7.0, 7.0	8.2 @ 23°C	1410 @ 2480 / 1405	223 @ 24.5°C
24 hr	7.0, 7.0, 7.0	8.5 @ 21°C	1383 @ 2400 / 1381	21.6 @ 21.6°C
48 hr	7.0, 7.0, 7.0	8.6 @ 22°C	1376 @ 2420 / 1384	21.8 @ 23.3°C

Conc.	Chamber #	Number Live 0	24	48	DO (mg/l) 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	Cond. (µmhos/cm) 0	24	48
Control	A	5	5	4	8.6	8.8	8.7	8.3	8.2	8.3	21.2	21.2	21.4	180	255	395
Control	B	5	5	5												
Control	C	5	5	5												
Control	D	5	5	5												
100%	A	5	5	0	8.6	8.8	8.7	7.9	8.4	8.5	19.9	21.3	21.3	1084	1105	1134 MF
100%	B	5	5	2												1163
100%	C	5	1	0												
100%	D	5	5	0												
100%	A	5	0	—	8.5	8.8	8.7	7.9	8.4	8.5	19.2	21.3	21.3	1116	1135	1143
100%	B	5	0	—												
100%	C	5	0	—												
100%	D	5	0	—												
Measured/Loaded by:		MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF
Recorded by:		MF	MF	MF	KP	MF	MF	KP	MF	MF	KP	MF	MF	MF	MF	MF

Investigators' Signatures

Kim Pearce
Marshall Faircloth

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl:					
Lab Tot. Resid. Cl:			0.4 / <0.1	Hach Kit	RBF RBF
Alkalinity:	115	56	179	Hach	JMC
Hardness:	150	98	477	Hach	SMC
Total Ammonia:					

Ammonia meter slope: _____

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Reading Creek
Address/City:
County: Hardee
Contact/District: PAT FRICANO / SW
NPDES Permit #: _____ Outfall #: _____

Test Number: R of __ Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through

Remarks: RECEIVED CHLORINATED SAMPLE,

Sample Collection: Date 4/30/91 Time 1115
Test Beginning: Date 5/1/91 Time 1130
Test Ending: Date 5/3/91 Time 1000
Test Organism: C. vanuda
Life Stage/Age: 2 days

Instrument Calibrations:

	pH	DO	Cond	Temp
0 hr				
24 hr				
48 hr				

Conc.	Chamber #	Number Live 0	Number Live 24	Number Live 48	DO (mg/l) 0	DO (mg/l) 24	DO (mg/l) 48	pH 0	pH 24	pH 48	Temp. (°C) 0	Temp. (°C) 24	Temp. (°C) 48	Cond. (µmhos/cm) 0	Cond. (µmhos/cm) 24	Cond. (µmhos/cm) 48
CONTROL	48	5	5	5	8.5	7.8	7.9	7.9	8.1	8.3	24.2	24.4	24.0	240		
CONTROL	23	5	5	5	8.5	7.8	7.9	7.9	8.2	8.2	24.1	24.4		242	244	249
dec 100%	39	5	5	5	8.9	7.4	7.6	7.8	8.1	8.2	18.7	19.5	20.9			
rec 100%	67	5	5	5	8.9	7.5	7.6	7.9	8.1	8.2				1143	1145	1142
100%	163	5	5	4	8.9	7.7	7.4	7.8	8.1	8.2	18.2	20.0	21.0			
100%	16	5	5	2	8.9	7.5	6.5	7.8	8.1	8.2				1162	1165	1192
Measured/Loaded by:		TH	TH	TH	TH	TH	TH	TH	TH	TH	TH	TH	TH	TH	TH	TH
Recorded by:		TH	TH	TH	KP	TH	TH	KP	TH	TH	KP	TH	TH	KP	TH	TH

Investigators' Signatures

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: ____

Revised

FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION
CENTRAL LABORATORY
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

CHEMICAL ANALYSIS REPORT

Job ID: 91-MAY-02-04
Date Received: 2-MAY-1991
Authorized: 28-MAY-1991

Project: BIOASSAY
Customer ID: SW-TAM
By: Bill Coppenger

Submitted By: DER SOUTHWEST DISTRICT OFFICE
4520 Oak fair Boulevard
Tampa, Florida 33610-7347

BN/AE

For Additional Information, Please Contact
G. William Coppenger, Ph.D.
Yuh-Hsu Pan, Ph.D.
Suncom 277-2571
(904) 487-2571

Certified By: _____ Date: 28-91

Abbreviations & Storet Codes:

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 was analyzed for but not detected;
The value reported is the minimum detection limit
Q - Evidence that analyte was present in sample is equivocal
NA - Not applicable
NR - Not requested

Sample ID: 18408/91-MAY-02-04-01 Matrix: W-EFFLUENT
Location: Bowling Green STP to ditch
Field ID: Outfall
Collected: 30-APR-1991 17:00 By: Pat Fricano
Authorized: 27-MAY-1991 By: Liang T. Lin
Type: Grab Sample
Lab Comments:
Field Comments:

Analysis ID: W-BNA
base-neutral-acid water analysis
Analyzed: 10-MAY-1991 By: Laura Harrison
Authorized: 21-MAY-1991 By: Laura Harrison

Storet#	Analyte	Value	Units
34205	Acenaphthene	2 U	ug/L
34200	Acenaphthylene	2 U	ug/L
39330	Aldrin	3 U	ug/L
34220	Anthracene	2 U	ug/L
34526	Benzo(a)anthracene	2 U	ug/L
34230	Benzo(b)fluoranthene	2 U	ug/L
34242	Benzo(k)fluoranthene	2 U	ug/L
34247	Benzo(a)pyrene	4 U	ug/L
34521	Benzo(g,h,i)perylene	5 U	ug/L
34292	Benzyl butyl phthalate	2 U	ug/L
	a-BHC	3 U	ug/L
39337	b-BHC	3 U	ug/L
39340	d-BHC	3 U	ug/L
	g-BHC	3 U	ug/L
39120	Benzidine	25 U	ug/L
34273	Bis(2-chloroethyl)ether	2 U	ug/L
34278	Bis(2-chloroethoxy)methane	2 U	ug/L
34283	Bis(2-chloroisopropyl)ether	2 U	ug/L
39100	Bis(2-ethylhexyl)phthalate	2 U	ug/L
34636	4-Bromophenyl phenyl ether	2 U	ug/L
34581	2-Chloronaphthalene	2 U	ug/L
34641	4-Chlorophenyl phenyl ether	2 U	ug/L
34320	Chrysene	2 U	ug/L
39310	4,4'-DDD	3 U	ug/L
39320	4,4'-DDE	3 U	ug/L
39300	4,4'-DDT	3 U	ug/L
34556	Dibenzo(a,h)anthracene	5 U	ug/L
39110	Di-n-butyl phthalate	2 U	ug/L
34536	1,2-Dichlorobenzene	2 U	ug/L
34566	1,3-Dichlorobenzene	2 U	ug/L
34571	1,4-Dichlorobenzene	2 U	ug/L
34631	3,3'-Dichlorobenzidine	5 U	ug/L
39380	Dieldrin	3 U	ug/L
34336	Diethylphthalate	2 U	ug/L
34341	Dimethylphthalate	2 U	ug/L
34611	2,4-Dinitrotoluene	2 U	ug/L
34626	2,6-Dinitrotoluene	2 U	ug/L

Continued on Page 3

18408/91-MAY-02-04-01/W-BNA Continued from Page 2

Storet#	Analyte	Value	Units
34596	Di-n-octyl phthalate	2 U	ug/L
34361	Endosulfan-I	3 U	ug/L
34356	Endosulfan-II	3 U	ug/L
34351	Endosulfan-sulfate	3 U	ug/L
39390	Endrin	3 U	ug/L
34366	Endrin-aldehyde	3 U	ug/L
34376	Fluoranthene	2 U	ug/L
34381	Fluorene	2 U	ug/L
39410	Heptachlor	3 U	ug/L
39420	Heptachlor-epoxide	3 U	ug/L
39700	Hexachlorobenzene	2 U	ug/L
34391	Hexachlorobutadiene	2 U	ug/L
34396	Hexachloroethane	2 U	ug/L
34386	Hexachlorocyclypentadiene	5 U	ug/L
34403	Indeno(1,2,3-cd)pyrene	5 U	ug/L
34408	Isophorone	2 U	ug/L
34696	Naphthalene	2 U	ug/L
34447	Nitrobenzene	2 U	ug/L
34438	N-Nitrosodimethylamine	2 U	ug/L
34428	N-Nitrosodi-n-propylamine	2 U	ug/L
34433	N-Nitrosodiphenylamine	2 U	ug/L
34671	PCB-1016	1.0E+03 U	ug/L
39488	PCB-1221	1.0E+03 U	ug/L
39492	PCB-1232	1.0E+03 U	ug/L
39496	PCB-1242	1.0E+03 U	ug/L
39500	PCB-1248	1.0E+03 U	ug/L
39504	PCB-1254	1.0E+03 U	ug/L
39508	PCB-1260	1.0E+03 U	ug/L
	PCB-1262	1.0E+03 U	ug/L
34461	Phenanthrene	2 U	ug/L
34469	Pyrene	2 U	ug/L
39400	Toxaphene	1.0E+03 U	ug/L
34551	1,2,4-Trichlorobenzene	2 U	ug/L
34462	4-Chloro-3-methyl phenol	2 U	ug/L
34586	2-Chlorophenol	2 U	ug/L
34601	2,4-Dichlorophenol	2 U	ug/L
34606	2,4-Dimethylphenol	2 U	ug/L
34616	2,4-Dinitrophenol	15 U	ug/L
34657	2-Methyl-4,6-dinitrophenol	15 U	ug/L
34591	2-Nitrophenol	2 U	ug/L
34646	4-Nitrophenol	15 U	ug/L
39032	Pentachlorophenol	5 U	ug/L
34694	Phenol	2 U	ug/L
34621	2,4,6-Trichlorophenol	2 U	ug/L

Comments (1)
(2)
(3)
(4)
(5)
(6)

Sample ID: 18409/91-MAY-02-04-02 Matrix: W-FIELD-BK
Location: Bowling Green STP
Field ID: Blank
Collected: 30-APR-1991 17:00 By: Pat Fricano
Authorized: 27-MAY-1991 By: Liang T. Lin
Type: Grab Sample
Lab Comments:
Field Comments:

Analysis ID: W-BNA
base-neutral-acid water analysis
Analyzed: 10-MAY-1991 By: Laura Harrison
Authorized: 21-MAY-1991 By: Laura Harrison

Storet#	Analyte	Value	Units
34205	Acenaphthene	2 U	ug/L
34200	Acenaphthylene	2 U	ug/L
39330	Aldrin	3 U	ug/L
34220	Anthracene	2 U	ug/L
34526	Benzo(a)anthracene	2 U	ug/L
34230	Benzo(b)fluoranthene	2 U	ug/L
34242	Benzo(k)fluoranthene	2 U	ug/L
34247	Benzo(a)pyrene	4 U	ug/L
34521	Benzo(g,h,i)perylene	5 U	ug/L
34292	Benzyl butyl phthalate	2 U	ug/L
	a-BHC	3 U	ug/L
39337	b-BHC	3 U	ug/L
39340	d-BHC	3 U	ug/L
	g-BHC	3 U	ug/L
39120	Benzidine	25 U	ug/L
34273	Bis(2-chloroethyl)ether	2 U	ug/L
34278	Bis(2-chloroethoxy)methane	2 U	ug/L
34283	Bis(2-chloroisopropyl)ether	2 U	ug/L
39100	Bis(2-ethylhexyl)phthalate	87	ug/L
34636	4-Bromophenyl phenyl ether	2 U	ug/L
34581	2-Chloronaphthalene	2 U	ug/L
34641	4-Chlorophenyl phenyl ether	2 U	ug/L
34320	Chrysene	2 U	ug/L
39310	4,4'-DDD	3 U	ug/L
39320	4,4'-DDE	3 U	ug/L
39300	4,4'-DDT	3 U	ug/L
34556	Dibenzo(a,h)anthracene	5 U	ug/L
39110	Di-n-butyl phthalate	2 U	ug/L
34536	1,2-Dichlorobenzene	2 U	ug/L
34566	1,3-Dichlorobenzene	2 U	ug/L
34571	1,4-Dichlorobenzene	2 U	ug/L
34631	3,3'-Dichlorobenzidine	5 U	ug/L
39380	Dieldrin	3 U	ug/L
34336	Diethylphthalate	2 U	ug/L
34341	Dimethylphthalate	2 U	ug/L
34611	2,4-Dinitrotoluene	2 U	ug/L
34626	2,6-Dinitrotoluene	2 U	ug/L

Continued on Page 5

18409/91-MAY-02-04-02/W-BNA Continued from Page 4

Storet#	Analyte	Value	Units
34596	Di-n-octyl phthalate	2 U	ug/L
34361	Endosulfan-I	3 U	ug/L
34356	Endosulfan-II	3 U	ug/L
34351	Endosulfan-sulfate	3 U	ug/L
39390	Endrin	3 U	ug/L
34366	Endrin-aldehyde	3 U	ug/L
34376	Fluoranthene	2 U	ug/L
34381	Fluorene	2 U	ug/L
39410	Heptachlor	3 U	ug/L
39420	Heptachlor-epoxide	3 U	ug/L
39700	Hexachlorobenzene	2 U	ug/L
34391	Hexachlorobutadiene	2 U	ug/L
34396	Hexachloroethane	2 U	ug/L
34386	Hexachlorocyclypentadiene	5 U	ug/L
34403	Indeno(1,2,3-cd)pyrene	5 U	ug/L
34408	Isophorone	2 U	ug/L
34696	Naphthalene	2 U	ug/L
34447	Nitrobenzene	2 U	ug/L
34438	N-Nitrosodimethylamine	2 U	ug/L
34428	N-Nitrosodi-n-propylamine	2 U	ug/L
34433	N-Nitrosodiphenylamine	2 U	ug/L
34671	PCB-1016	1.0E+03 U	ug/L
39488	PCB-1221	1.0E+03 U	ug/L
39492	PCB-1232	1.0E+03 U	ug/L
39496	PCB-1242	1.0E+03 U	ug/L
39500	PCB-1248	1.0E+03 U	ug/L
39504	PCB-1254	1.0E+03 U	ug/L
39508	PCB-1260	1.0E+03 U	ug/L
	PCB-1262	1.0E+03 U	ug/L
34461	Phenanthrene	2 U	ug/L
34469	Pyrene	2 U	ug/L
39400	Toxaphene	1.0E+03 U	ug/L
34551	1,2,4-Trichlorobenzene	2 U	ug/L
34462	4-Chloro-3-methyl phenol	2 U	ug/L
34586	2-Chlorophenol	2 U	ug/L
34601	2,4-Dichlorophenol	2 U	ug/L
34606	2,4-Dimethylphenol	2 U	ug/L
34616	2,4-Dinitrophenol	15 U	ug/L
34657	2-Methyl-4,6-dinitrophenol	15 U	ug/L
34591	2-Nitrophenol	2 U	ug/L
34646	4-Nitrophenol	15 U	ug/L
39032	Pentachlorophenol	5 U	ug/L
34694	Phenol	2 U	ug/L
34621	2,4,6-Trichlorophenol	2 U	ug/L

Comments (1)
(2)
(3)
(4)
(5)
(6)

********** END OF REPORT **********

FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION
CENTRAL LABORATORY
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

CHEMICAL ANALYSIS REPORT

Job ID: 91-MAY-02-03
Date Received: 2-MAY-1991
Authorized: 5-JUL-1991

Project: BIOASSAY
Customer ID: SW-TAM
By: Bill Coppenger

Submitted By: DER SOUTHWEST DISTRICT OFFICE
4520 Oak fair Boulevard
Tampa, Florida 33610-7347

For Additional Information, Please Contact
G. William Coppenger, Ph.D.
Yuh-Hsu Pan, Ph.D.
Suncom 277-2571
(904) 487-2571

Certified By: _____ Date: 7-8-91

Abbreviations & Storet Codes:

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 was analyzed for but not detected;
The value reported is the minimum detection limit
Q - Evidence that analyte was present in sample is equivocal
NA - Not applicable
NR - Not requested

Sample ID: 18406/91-MAY-02-03-01 Matrix: W-EFFLUENT
Location: Bowling Green STP to ditch
Field ID: Outfall
Collected: 30-APR-1991 00:00 By: Pat Fricano
Authorized: 5-JUL-1991 By: Tim Fitzpatrick
Type: Grab Sample
Lab Comments:
Field Comments:

Analysis ID: AG-G-W
Silver in water by furnace AA
Analyzed: 7-JUN-1991 By: Jack Merritt
Authorized: 14-JUN-1991 By: Tim Fitzpatrick

Storet#	Analyte	Value	Units
01077	Silver	0.1 U	ug/L

Analysis ID: CD-G-W
Cadmium by graphite furnace for water samples
Analyzed: 10-JUN-1991 By: Jack Merritt
Authorized: 14-JUN-1991 By: Tim Fitzpatrick

Storet#	Analyte	Value	Units
01027	Cadmium	0.3 U	ug/L

Analysis ID: HG-H-W
Mercury by cold vapor using hydride sys.-water
Analyzed: 17-MAY-1991 By: Laurie Roughton
Authorized: 21-MAY-1991 By: Tim Fitzpatrick

Storet#	Analyte	Value	Units
71900	Mercury	0.2 K	ug/L

Analysis ID: SE-G-W
Selenium in water by furnace AA
Analyzed: 20-JUN-1991 By: Kate Brackett
Authorized: 24-JUN-1991 By: Tim Fitzpatrick

Storet#	Analyte	Value	Units
01147	Selenium	5 U (HYD.)	ug/L

18406/91-MAY-02-03-01 Continued from Page 2

Analysis ID: W-ICP-23
ICP multielement analysis for water samples
Analyzed: 7-JUN-1991 By: Kate Brackett
Authorized: 5-JUL-1991 By: Tim Fitzpatrick

Storet#	Analyte	Value	Units
01106	Aluminum	52	ug/L
01002	Arsenic	20 U	ug/L
01097	Antimony	NR	ug/L
01007	Barium	NR	ug/L
01012	Beryllium	NR	ug/L
01027	Cadmium	3 U	ug/L
00916	Calcium	NR	mg/L
01034	Chromium	10 U	ug/L
01037	Cobalt	NR	ug/L
01042	Copper	5 U	ug/L
01045	Iron	69	ug/L
01051	Lead	15 U	ug/L
00927	Magnesium	NR	mg/L
01055	Manganese	NR	ug/L
01067	Nickel	5 U	ug/L
00937	Potassium	NR	mg/L
01147	Selenium	30 U	ug/L
01077	Silver	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	373 J	ug/L
Comment	NONE		

Sample ID: 18407/91-MAY-02-03-02 Matrix: W-FIELD-BK
Location: Bowling Green STP
Field ID: Blank
Collected: 30-APR-1991 00:00 By: Pat Fricano
Authorized: 5-JUL-1991 By: Tim Fitzpatrick
Type: Grab Sample
Lab Comments:
Field Comments:

18407/91-MAY-02-03-02 Continued on Page 4

18407/91-MAY-02-03-02 Continued from Page 3

Analysis ID: AG-G-W
Silver in water by furnace AA
Analyzed: 7-JUN-1991 By: Jack Merritt
Authorized: 14-JUN-1991 By: Tim Fitzpatrick

Storet#	Analyte	Value	Units
01077	Silver	0.1 U	ug/L

Analysis ID: CD-G-W
Cadmium by graphite furnace for water samples
Analyzed: 10-JUN-1991 By: Jack Merritt
Authorized: 14-JUN-1991 By: Tim Fitzpatrick

Storet#	Analyte	Value	Units
01027	Cadmium	0.3 U	ug/L

Analysis ID: HG-H-W
Mercury by cold vapor using hydride sys.-water
Analyzed: 17-MAY-1991 By: Laurie Roughton
Authorized: 21-MAY-1991 By: Tim Fitzpatrick

Storet#	Analyte	Value	Units
71900	Mercury	0.2 K	ug/L

Analysis ID: SE-G-W
Selenium in water by furnace AA
Analyzed: 20-JUN-1991 By: Kate Brackett
Authorized: 24-JUN-1991 By: Tim Fitzpatrick

Storet#	Analyte	Value	Units
01147	Selenium	5 U (HYD.)	ug/L

18407/91-MAY-02-03-02 Continued on Page 5

18407/91-MAY-02-03-02 Continued from Page 4

Analysis ID: W-ICP-23
ICP multielement analysis for water samples
Analyzed: 7-JUN-1991 By: Kate Brackett
Authorized: 5-JUL-1991 By: Tim Fitzpatrick

Storet#	Analyte	Value	Units
01106	Aluminum	50 U	ug/L
01002	Arsenic	20 U	ug/L
01097	Antimony	NR	ug/L
01007	Barium	NR	ug/L
01012	Beryllium	NR	ug/L
01027	Cadmium	3 U	ug/L
00916	Calcium	NR	mg/L
01034	Chromium	10 U	ug/L
01037	Cobalt	NR	ug/L
01042	Copper	5 U	ug/L
01045	Iron	3 T	ug/L
01051	Lead	15 U	ug/L
00927	Magnesium	NR	mg/L
01055	Manganese	NR	ug/L
01067	Nickel	5 U	ug/L
00937	Potassium	NR	mg/L
01147	Selenium	30 U	ug/L
01077	Silver	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	488 J	ug/L
Comment	NONE		

********** END OF REPORT **********

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
CENTRAL LABORATORY SAMPLE SUBMITTAL FORM
PAGE 2

✓	LAB PARAMETERS	UNITS	CODE	VALUE	✓	LAB PARAMETERS	UNITS	CODE	VALUE
	CHLOROPHYLL-a (CORRECTED)	µg/l	32223			ALGAL ASSAY, GROWTH POTENTIAL	mg/l	85209	
	CHLOROPHYLL-a (NON-CORRECTED)	µg/l	32210			INVERT, DIVERSITY INDX, ART SUBST	—	61455	
	CHLOROPHYLL-b	µg/l	32212			INVERT, DI, AS, 95% CONF INT	—	61456	
	CHLOROPHYLL-c	µg/l	32214			INVERT, DIVERSITY INDX, NAT SUBST	—	61453	
	PHAEOPHYTIN-a	µg/l	32218			INVERT, DI, NS, 95% CONF INT	—	61454	
	BOD, 5-DAY CARBONACEOUS	mg/l	80082			INVERT, ART SUBST, NO. SPP.	—	61457	
	BOD, 5-DAY N-INHIBITED	mg/l	00314			INVERT, NAT SUBST, NO. SPP.	—	61458	
✓	FECAL COLIFORMS, MEMBRANE	no./100 ml	31616	1,500		INVERT, FLORIDA INDEX	—	—	
	FECAL COLIFORMS, TUBE	no./100 ml	31615			INVERT, SPECIES ID/COUNT	—	—	REPORT
✓	TOTAL COLIFORMS, MEMBRANE	no./100 ml	31501	5,000		PERIPHYTON, SPECIES ID/COUNT	—	—	REPORT
	TOTAL COLIFORMS, TUBE	no./100 ml	31505			PHYTOPLNKTN, SPECIES ID/COUNT	—	—	REPORT
	FECAL STREPTOCOCCI, MEMBRANE	no./100 ml	31673			TOXICITY ASSAY, MICROTOX	—	—	REPORT
	HETEROTROPHIC PLATE COUNT	no./1 ml	31751			TOXICITY ASSAY, ACUTE, SCRNG	—	—	REPORT
	SEDIMENT PRTCL SIZE, >2.0mm	%	80256			TOXICITY ASSAY, ACUTE, DFNTV	—	—	REPORT
	SEDIMENT PRTCL SIZE, 0.5-2.0mm	%	80254			TOXICITY ASSAY, FLOW-THROUGH	—	—	REPORT
	SEDIMENT PRTCL SIZE, 0.125-0.5mm	%	46531			TOXICITY ASSAY, CHRONIC, SCRNG	—	—	REPORT
	SEDIMENT PRTCL SIZE, 0.063-0.125mm	%	80251			TOXICITY ASSAY, CHRONIC, DFNTV	—	—	REPORT
	SEDIMENT PRTCL SIZE, <0.063mm	%	80260						
	SEDIMENT PRTCL SIZE, 0.25-0.5mm	%	80253						
	SEDIMENT PRTCL SIZE, 0.125-0.25mm	%	80252						
	SEDIMENT ORGANIC FRACTION	%	80096						
	ALGAL ASSAY, LIMITING NUTRIENT	—	—	REPORT					

REMARKS: DOWNSTREAM OF BOWLING GREEN WWTP

ANALYST(S): [signature] DATE(S): 5/7/91

REVIEWED BY: [signature] DATE: 5/10/91

PLEASE TYPE OR PRINT CLEARLY

JOB ID: _____

SAMPLE ID: _____

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
CENTRAL LABORATORY SAMPLE SUBMITTAL FORM
PAGE 1

COLLECTION TIME A — GRAB SAMPLE

COLLECTION TIME B — COMPOSITE SAMPLE
BEGIN: _____
END: _____

SUBMITTING AGENCY CODE:	SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	COLLECTION DATE (M/D/Y):	DEPTH, FEET:
			5/7/91	

COUNTY OF SAMPLE ORIGIN:	SAMPLE LOCATION:	FIELD ID/NAME:
Bowling Green STP	Downstream	

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

SOIL/SEDIMENT
- ☐ SOIL
- ☐ FRESHWATER SEDIMENT
- ☐ MARINE SEDIMENT
- ☐ SLUDGE

TISSUE
- ☐ PLANT
- ☐ FISH
- ☐ SHELLFISH
- ☐ OTHER

CHEMICAL WASTE
- ☐

PROGRM. MCD. #	NPDES NUMBER (& OUTFALL NO., IF APPLICABLE): (required for all discharge related samples)

FIELD PARAMETERS MEASURED BY (NAME):

(SIGNATURE):

SAMPLED BY (NAME): R. Fryglendorf

(SIGNATURE):

FIELD REPORT, IF ANY, PREPARED BY (NAME):

(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	

ANALYSIS/METHOD REQUESTED	SAMPLE CONTAINER DESCRIPTION	NO. OF CONTAINERS SUBMITTED	PRESERVATIVE USED

NOTE, FILL OUT PAGE 2 (REVERSE) IF ANY LAB PARAMETERS LISTED THERE ARE DESIRED

SEND COPIES OF ANALYSIS REPORT TO:
- ☐ SUBMITTING AGENCY
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

*STORET CODES MAY ONLY APPLY TO FIELD MEASUREMENTS

☐ SUBMITTING OFFICE FILL IN SHADED AREAS

PLEASE TYPE OR PRINT CLEARLY

Sample ID: 18401/91-MAY-02-01-02 Matrix: W-SURF-FRH
Location: Below STP discharge in Peace River
Field ID: 002
Collected: 30-APR-1991 00:00 By: Pat Fricano
Authorized: 1-JUL-1991 By: Yuh-Hsu Pan
Type: Grab Sample
Lab Comments:
Field Comments: Downstream

Analysis ID: W-NH3
Analysis for ammonia in water
Analyzed: 15-MAY-1991 By: John Montana
Authorized: 1-JUL-1991 By: Yuh-Hsu Pan

Storet#	Analyte	Value	Units
00610	Ammonia-N	0.12	mg N/L

Analysis ID: W-NO2NO3
Analysis for nitrite+nitrate in water
Analyzed: 20-MAY-1991 By: Tim Fitzpatrick
Authorized: 1-JUL-1991 By: Yuh-Hsu Pan

Storet#	Analyte	Value	Units
00630	NO2NO3-N	0.60 A	mg N/L

Analysis ID: W-TKN
TKN for water sample
Analyzed: 26-JUN-1991 By: John Montana
Authorized: 1-JUL-1991 By: Yuh-Hsu Pan
Sample exceeded holding time prior to analysis.

Storet#	Analyte	Value	Units
00625	N_KJEL_TOT	0.64 A	mg N/L

18401/91-MAY-02-01-02 Continued on Page 4

18401/91-MAY-02-01-02 Continued from Page 3

Analysis ID: W-TP
Analysis for total phosphorus in water
Analyzed: 26-JUN-1991 By: John Montana
Authorized: 1-JUL-1991 By: Yuh-Hsu Pan
Sample exceeded holding time prior to analysis.

Storet#	Analyte	Value	Units
00665	Total-P	2.4	mg P/L

Sample ID: 18402/91-MAY-02-01-03 Matrix: W-EFFLUENT
Location: Bowling Green STP to ditch
Field ID: Outfall
Collected: 30-APR-1991 00:00 By: Pat Fricano
Authorized: 1-JUL-1991 By: Yuh-Hsu Pan
Type: Grab Sample
Lab Comments:
Field Comments:

Analysis ID: W-NH3
Analysis for ammonia in water
Analyzed: 24-MAY-1991 By: John Montana
Authorized: 1-JUL-1991 By: Yuh-Hsu Pan

Storet#	Analyte	Value	Units
00610	Ammonia-N	2.23	mg N/L

Analysis ID: W-NO2NO3
Analysis for nitrite+nitrate in water
Analyzed: 21-MAY-1991 By: Tim Fitzpatrick
Authorized: 1-JUL-1991 By: Yuh-Hsu Pan

Storet#	Analyte	Value	Units
00630	NO2NO3-N	0.21 A	mg N/L

18402/91-MAY-02-01-03 Continued on Page 5

18402/91-MAY-02-01-03 Continued from Page 4

Analysis ID: W-TKN
TKN for water sample
Analyzed: 26-JUN-1991 By: John Montana
Authorized: 1-JUL-1991 By: Yuh-Hsu Pan
Sample exceeded holding time prior to analysis.

Storet#	Analyte	Value	Units
00625	N_KJEL_TOT	2.71	mg N/L

Analysis ID: W-TP
Analysis for total phosphorus in water
Analyzed: 26-JUN-1991 By: John Montana
Authorized: 1-JUL-1991 By: Yuh-Hsu Pan
Sample exceeded holding time prior to analysis.

Storet#	Analyte	Value	Units
00665	Total-P	5.5	mg P/L

********** END OF REPORT **********

FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION
CENTRAL LABORATORY
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

CHEMICAL ANALYSIS REPORT

Job ID: 91-MAY-02-02
Date Received: 2-MAY-1991
Authorized: 1-JUL-1991

Project: BIOASSAY
Customer ID: BIOLOGY
By: Yuh-Hsu Pan

Submitted By: DER Biology Lab

For Additional Information, Please Contact
G. William Coppenger, Ph.D.
Yuh-Hsu Pan, Ph.D.
Suncom 277-2571
(904) 487-2571

Certified By: YHP Date: 7-1-91

Abbreviations & Storet Codes:

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
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T - Value reported is less than the practical quantitation limit
U - Material was analyzed for but not detected;
The value reported is the minimum detection limit
Q - Evidence that analyte was present in sample is equivocal
NA - Not applicable
NR - Not requested

Sample ID: 18403/91-MAY-02-02-01 Matrix: W-SURF-FRH
Location: Above STP discharge in Peace River
Field ID: 001
Collected: 30-APR-1991 00:00 By: Pat Fricano
Authorized: 1-JUL-1991 By: Yuh-Hsu Pan
Type: Grab Sample
Lab Comments:
Field Comments: Upstream

Analysis ID: W-PO4
Orthophosphate analysis for water samples
Analyzed: 8-MAY-1991 By: Foster Parks Kirby
Authorized: 24-JUN-1991 By: Tim Fitzpatrick
Sample exceeded holding time prior to analysis.

Storet#	Analyte	Value	Units
70507	O-Phosphate-P	2.1 A	mg P/L

Sample ID: 18404/91-MAY-02-02-02 Matrix: W-SURF-FRH
Location: Below STP discharge in Peace River
Field ID: 002
Collected: 30-APR-1991 00:00 By: Pat Fricano
Authorized: 1-JUL-1991 By: Yuh-Hsu Pan
Type: Grab Sample
Lab Comments:
Field Comments: Downstream

Analysis ID: W-PO4
Orthophosphate analysis for water samples
Analyzed: 8-MAY-1991 By: Foster Parks Kirby
Authorized: 24-JUN-1991 By: Tim Fitzpatrick
Sample exceeded holding time prior to analysis.

Storet#	Analyte	Value	Units
70507	O-Phosphate-P	2.5 A	mg P/L

Sample ID: 18405/91-MAY-02-02-03 Matrix: W-EFFLUENT
Location: Bowling Green STP to ditch
Field ID: Outfall
Collected: 30-APR-1991 00:00 By: Pat Fricano
Authorized: 1-JUL-1991 By: Yuh-Hsu Pan
Type: Grab Sample
Lab Comments:
Field Comments:

18405/91-MAY-02-02-03 Continued on Page 3

18405/91-MAY-02-02-03 Continued from Page 2

Analysis ID: W-PO4
Orthophosphate analysis for water samples
Analyzed: 8-MAY-1991 By: Foster Parks Kirby
Authorized: 24-JUN-1991 By: Tim Fitzpatrick
Sample exceeded holding time prior to analysis.

Storet#	Analyte	Value	Units
70507	O-Phosphate-P	2.6 A	mg P/L

********** END OF REPORT **********

FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION
CENTRAL LABORATORY
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

CHEMICAL ANALYSIS REPORT

Job ID: 91-MAY-02-01
Date Received: 2-MAY-1991
Authorized: 1-JUL-1991

Project: BIOASSAY
Customer ID: BIOLOGY
By: Yuh-Hsu Pan

Submitted By: DER Biology Lab

For Additional Information, Please Contact
G. William Coppenger, Ph.D.
Yuh-Hsu Pan, Ph.D.
Suncom 277-2571
(904) 487-2571

Certified By: Yhan Date: 7-1-91

Abbreviations & Storet Codes:

A - Value reported is the mean of two or more determinations
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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 was analyzed for but not detected; The value reported is the minimum detection limit
Q - Evidence that analyte was present in sample is equivocal
NA - Not applicable
NR - Not requested

Sample ID: 18400/91-MAY-02-01-01 Matrix: W-SURF-FRH
Location: Above STP discharge in Peace River
Field ID: 001
Collected: 30-APR-1991 00:00 By: Pat Fricano
Authorized: 1-JUL-1991 By: Yuh-Hsu Pan
Type: Grab Sample
Lab Comments:
Field Comments: Upstream

Analysis ID: W-NH3
Analysis for ammonia in water
Analyzed: 15-MAY-1991 By: John Montana
Authorized: 1-JUL-1991 By: Yuh-Hsu Pan

Storet#	Analyte	Value	Units
00610	Ammonia-N	0.07	mg N/L

Analysis ID: W-NO2NO3
Analysis for nitrite+nitrate in water
Analyzed: 20-MAY-1991 By: Tim Fitzpatrick
Authorized: 1-JUL-1991 By: Yuh-Hsu Pan

Storet#	Analyte	Value	Units
00630	NO2NO3-N	0.27 A	mg N/L

Analysis ID: W-TKN
TKN for water sample
Analyzed: 26-JUN-1991 By: John Montana
Authorized: 1-JUL-1991 By: Yuh-Hsu Pan
Sample exceeded holding time prior to analysis.

Storet#	Analyte	Value	Units
00625	N_KJEL_TOT	0.32	mg N/L

Analysis ID: W-TP
Analysis for total phosphorus in water
Analyzed: 26-JUN-1991 By: John Montana
Authorized: 1-JUL-1991 By: Yuh-Hsu Pan
Sample exceeded holding time prior to analysis.

Storet#	Analyte	Value	Units
00665	Total-P	1.9	mg P/L

Sample ID: 18572/91-MAY-08-13-01 Matrix: W-EFFLUENT
Location: Bowling Green Dwnstream of discharge in creekk
Field ID: 003
Collected: 8-MAY-1991 00:00 By: Pat Fricano
Authorized: 3-JUL-1991 By: Tim Fitzpatrick
Type: Grab Sample
Lab Comments:
Field Comments:

Analysis ID: W-NH3
Analysis for ammonia in water
Analyzed: 24-MAY-1991 By: John Montana
Authorized: 6-JUN-1991 By: Tim Fitzpatrick

Storet#	Analyte	Value	Units
00610	Ammonia-N	2.22	mg N/L

Analysis ID: W-NO2NO3
Analysis for nitrite+nitrate in water
Analyzed: 21-MAY-1991 By: Tim Fitzpatrick
Authorized: 3-JUL-1991 By: Tim Fitzpatrick

Storet#	Analyte	Value	Units
00630	NO2NO3-N	0.11 A	mg N/L

Analysis ID: W-TKN
TKN for water sample
Analyzed: 26-JUN-1991 By: John Montana
Authorized: 27-JUN-1991 By: Tim Fitzpatrick
Sample exceeded holding time prior to analysis.

Storet#	Analyte	Value	Units
00625	N_KJEL_TOT	5.8	mg N/L

Analysis ID: W-TP
Analysis for total phosphorus in water
Analyzed: 12-JUN-1991 By: John Montana
Authorized: 20-JUN-1991 By: Tim Fitzpatrick
Sample exceeded holding time prior to analysis.

Storet#	Analyte	Value	Units
00665	Total-P	4.6	mg P/L

FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION
CENTRAL LABORATORY
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

CHEMICAL ANALYSIS REPORT

Job ID: 91-MAY-08-14
Date Received: 8-MAY-1991
Authorized: 18-JUN-1991

Project: OTHER
Customer ID: SW-TAM
By: Bill Coppenger

Submitted By: DER SOUTHWEST DISTRICT OFFICE
4520 Oak fair Boulevard
Tampa, Florida 33610-7347

BOWLING GREEN

For Additional Information, Please Contact
G. William Coppenger, Ph.D.
Yuh-Hsu Pan, Ph.D.
Suncom 277-2571
(904) 487-2571

Certified By: _____ Date: 6-20-91

Abbreviations & Storet Codes:

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 was analyzed for but not detected;
The value reported is the minimum detection limit
Q - Evidence that analyte was present in sample is equivocal
NA - Not applicable
NR - Not requested

Sample ID: 18575/91-MAY-08-14-01 Matrix: W-EFFLUENT
Location: Bowling Green Dwnstream of discharge in creek
Field ID: 003
Collected: 8-MAY-1991 12:30 By: Pat Fricano
Authorized: 18-JUN-1991 By: Tim Fitzpatrick
Type: Grab Sample
Lab Comments:
Field Comments:

Analysis ID: W-PO4
Orthophosphate analysis for water samples
Analyzed: 3-JUN-1991 By: Foster Parks Kirby
Authorized: 18-JUN-1991 By: Tim Fitzpatrick
Sample exceeded holding time prior to analysis.

Storet#	Analyte	Value	Units
70507	O-Phosphate-P	5.7 A	mg P/L

********** END OF REPORT **********

Taxa list for Bowling Green Wastewater Treatment Plant, collected via Hester-Dendy samplers on 28 May, 1991. Station 1 is the upstream Peace River control site, Station 2 is the Peace river test site, Station 3 is the creek (unnamed) test site located downstream of the WWTP discharge, and Station 4 is a creek reference site located nearby in Hickory Creek.

	Station 1	Station 2	Station 3	Station 4
Coleoptera				
Dineutus sp.	1	0	0	0
Stenelmis convexula	0	0	6	0
Stenelmis hungerfordi	6	0	0	0
Stenelmis sp.	23	12	1	0
Collembola				
Undetermined entomobryidae	1	0	0	0
Diptera				
Ablabesmyia mallochi	0	1	0	0
Ablabesmyia rhamphe grp.	0	1	0	0
Asheum beckae	0	0	7	0
Beardius sp.	1	4	0	0
Chironomus decorus grp.	0	0	368	0
Cricotopus bicinctus	1	0	0	0
Dicrotendipes modestus	3	1	0	0
Dicrotendipes neomodestus	13	10	0	0
Endotribelos hesperium	0	1	0	0
Fittkauimyia serta	0	1	0	0
Goeldichironomus amazonicus	0	0	1	0
Goeldichironomus carus	0	0	20	0
Goeldichironomus holoprasinus	0	0	106	0
Hemerodromia sp.	1	0	0	0
Larsia sp.	0	0	2	0
Meropelopia sp.	1	0	0	0
Micropsectra sp.		0	0	20
Nilothauma sp.	0	1	0	0
Palpomyia grp. sp.	7	0	0	0
Parachironomus monochromus	0	1	0	0
Pentaneura inconspicua	3	0	0	3
Polypedilum convictum grp.		0	0	10
Polypedilum fallax grp.	0	0	0	5
Polypedilum halterale grp.	0	1	0	0
Polypedilum illinoense	6	0	1	2
Polypedilum scalaenum	6	9	0	0
Pseudochironomus sp.	0	16	0	0
Paratanytarsus sp.	1	0	0	0
Undetermined dipteran pupae	4	2	1	0
Rheocricotopus robacki	2	0	0	0
Rheotanytarsus distinctissimus grp.	10	0	0	0
Rheotanytarsus exiguus grp.		1	0	58
Stilocladius sp.	1	0	0	0
Stenochironomus sp.	45	33	0	1

Stelechomyia perpulchra	8	3	0	0
Tanytarsus sp.	6	16	4	26
Tanytarsini type 1	0	1	0	0
Thienemaniella fusca	3	0	0	0
Thienemanniella xena	0	0	0	1
Tribelos fuscicorne	2	5	0	0
Ephemeroptera				
Acerpenna pygmaeus	0	0	0	2
Baetis ephippiatus	0	0	0	7
Baetis frondalis	0	0	0	2
Baetis intercalaris	0	0	0	2
Caenis sp.	2	0	0	5
Stenonema exiguum	7	0	0	0
Stenacron floridense	1	0	0	0
Stenacron interpunctatum	1	0	0	4
Tricorythodes albilineatus	70	4	0	0
Gastropoda				
Amnicola dalli johnseni	36	27	0	0
Cincinnatia sp.	1	0	0	0
Gyraulus parvus	0	0	0	2
Hebetancyclus excentricus	10	86	0	1
Laevapex fuscus	0	0	0	3
Micromenetus dilatus	0	1	0	0
Micromenetes floridensis	0	1	0	0
Physella heterostropha pomila	3	0	1	0
Physella sp.	0	3	2	0
Planorbella duryi	0	5	0	0
Pyrogophorus platyrachis	14	25	0	0
Hirudinea				
Batracobdella phalera	0	1	0	0
Helobdella sp.	0	2	0	0
Malacostraca				
Hyalella azteca	0	0	1	1
Megaloptera				
Corydalus cornutus	2	0	0	0
Odonata				
Argia moesta	8	0	0	0
Argia sedula	1	6	9	0
Argia sp.	3	0	1	1
Enallagma cardenium	1	0	7	0
Hetaerina titia	1	0	0	0
Oligochaeta				
Limnodrilus hoffmeisteri	0	0	1	0
Trichoptera				
Cheumatopsyche sp.		0	0	24
Chimarra sp.	0	0	0	2
Cyrnellus fraternus	4	3	0	0
Polycentropus sp.	1	1	0	0
Undetermined trichoptera pupa	0	1	0	0

Macroinvertebrate taxa list for Bowling Green WWTP, collected via timed qualitative methods on 30 April, 1991 and 7 May, 1991.

	Station 1	Station 2	Station3
Coleoptera			
Undetermined Curculionidae	2	0	0
Dineutus sp.	3	0	0
Dubiraphia bivittata	0	1	0
Dubiraphia sp.	2	0	0
Hydaticus sp.	0	0	1
Hydrocanthus elongaus	1	0	0
Stenelmis hungerfordi	6	1	0
Stenelmis sp.	10	28	1
Tropisternus sp.	0	0	1
Diptera			
Ablabesmyia mallochi	4	37	0
Ablabesmyia rhamphe grp.	0	3	0
Beardius sp.	4	0	0
Chironomini Genus B Roback	0	1	0
Chironomus decorus grp.	0	0	1296
Clinotanypus sp.	0	4	0
Cricotopus bicinctus	128	6	0
Cricotopus/Orthocladius grp. sp.	12	0	0
Cryptotendipes sp.	0	2	0
Dicrotendipes modestus	0	3	0
Dicrotendipes neomodestus	4	1	0
Hemerodromia sp.	4	0	0
Palpomyia grp. sp.	20	16	0
Parachironomus schneideri	0	1	0
Pentaneura inconspicua	36	9	0
Parakiefferiella sp.	4	0	0
Polypedilum convictum grp.	4	0	0
Polypedilum halterale grp.	0	10	0
Polypedilum illinoense	16	1	0
Procladius sp.	0	1	0
Pseudochironomus fulviventris	8	21	0
Pseudochironomus sp.	0	0	16
Undetermined dipteran pupae	7	9	160
Simulium sp.	1	0	0
Tanytarsus sp.	68	15	0
Undetermined tipulidae	1	0	0
Ephemeroptera			
Brachycercus maculatus	0	1	0
Caenis sp.	0	1	0
Callibaetis floridanus	1	4	0
Stenonema exiguum	0	1	0
Tricorythodes albilineatus	2	3	0

Gastopoda			
Amnicola dalli johnsoni	62	69	0
Hebetancyclus excentricus	14	10	0
Micromenetus dilatus	10	0	0
Micromenetes floridensis	17	4	1
Physella heterostropha pomila	0	0	4
Physella sp.	5	3	0
Planorbella duryi	3	0	0
Pomacea paludosa	0	1	0
Pseudosuccinea columella	2	0	0
Pyrogophorus platyrachis	31	21	0
Hemiptera			
Belostoma testaceum	0	0	1
Ranatra nigra	6	5	0
Hirudinea			
Helobdella elongata	1	0	0
Helobdella sp.	1	0	0
Helobdella stagnalis	1	0	0
Mooreobdella tetragon	0	0	2
Undetermined hirudinean sp.	0	0	1
Malacostraca			
Asellus sp.	1	5	0
Gammarus sp.	0	1	0
Procambarus sp.	29	4	0
Odonata			
Argia sedula	12	1	1
Argia sp.	0	2	0
Dromogomphus spinosus	0	1	0
Enallagma cardenium	15	1	5
Epitheca princeps	0	2	0
Gomphus dilitatus	1	0	0
Ischnura posita	2	0	0
Macromia georgiana	1	1	0
Oligochaeta			
Allonais inaequalis	1	0	0
Limnodrilus hoffmeisteri	1	0	0
Stylaria lacustrus	4	0	0
Undetermined Tubificid w/o capilliform setae	1	0	0
Pelecypoda			
Corbicula manilensis	28	23	0
Sphaerium or *Musculium* sp.	2	0	0
Platyhelminthes			
Dugesia sp.	0	0	1
Rhyncocoela			
Prostoma rubra	9	0	0
Trichoptera			
Hydroptila sp.	0	2	0
Oecetis sp.	0	1	0
Oxyethira sp.	1	2	0
Undetermined trichoptera pupa	1	0	0

Periphyton taxa list and abundances for Bowling Green STP, Hardee County, Florida, collected from a reference site in the Peace River and below the outfall in an unnamed creek on 29 May, 1991, and 4 June, 1991, respectively.

	Reference Site	Impact Creek
Diatoms		
Achnanthes clevei	–	8
A. exigua	201	562
A. hungarica	94	–
A. hustedtii	429	76
A. lanceolata	228	6
A. lanceolata v. *apiculata*	–	3
Amphora veneta	54	–
Cocconeis placentula	2279	22
Cyclotella meneghiniana	121	22
Eunotia pectinalis	–	3
Gomphonema affine	13	–
G. parvulum	–	110
Gyrosigma acuminatum	13	–
Navicula pupula	–	3
N. radiosa	27	3
N. viridula	13	3
Nitzschia amphibia	13	28
N. palea	–	51
Pinnularia sp.	–	25
Pleurosigma salinarum	40	–
Synedra ulna	67	–
Chlorophyta		
Characium sp.	–	98
Cladophora sp.	–	17
Closterium sp.	13	–
Gloeocystis sp.	–	3
Oedogonium sp.	13	–
Protoderma sp.	67	8
Scenedesmus sp.	–	3
Cyanophyta		
Aphanocapsa sp.	–	53
Chroococcus sp.	442	8
Lyngbya sp.	–	3
Merismopedium sp.	27	–
Oscillatoria sp.	–	3
Stigonema sp.	–	8
Euglenophyta		
Euglena sp.	–	8
Phacus sp.	–	3

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 FL0021423 11	12 910430 17	18 X	19 S	20 1

Remarks

21 66

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 FL0021423 11	12 910430 17	18 B	19 S	20 1

Remarks

TOXIC TO CLADOCERA

21 66