

Biological Assessment of

Auburndale Allred WWTP

Polk County

NPDES #FL0021466

November 3, 2003

April 2004

Biology Section

Bureau of Laboratories

Division of Resource Assessment and Management

Quality Manual No. 870346G

NELAC Certification No. E31780

Florida Department of Environmental Protection

Fifth Year Inspection Summary

Discharger:	Auburndale Allred WWTP
County:	Polk
NPDES Number:	FL0021466
Permit Expiration:	March 27, 2005

Toxics Sampling Inspection **(XSI)**

Date Sampled: 11/3/03

Results: Effluent metals complied with Class III Water Quality Criteria (FAC 62-302). The metals cadmium, copper and silver were found in the effluent grab sample at levels above the method detection limit (MDL) and below the practical quantitation limit (PQL) while aluminum, iron, lead and zinc were detected above the PQL. The organic pollutant diazinon was detected in the effluent grab sample at above the MDL but below the PQL. Oil and grease was detected in the effluent at a level that complied with Class III Fresh Water Quality Criteria. Effluent conductivity, pH and dissolved oxygen complied with Class III Water Quality Criteria (62-302 F.A.C.) and facility permit limits.

Compliance Biomonitoring Inspection **(CBI)**

Date Sampled: 11/3/03

Results: The effluent sample was not acutely toxic to the fish, *Cyprinella leedsi,* or to the water flea, *Ceriodaphnia dubia,* during the 48-hour acute screening bioassays.

Water Quality Inspection **(WQI)**

Date Sampled: 11/3/03

Results: Fecal coliforms were detected in the receiving water at levels that did not exceed Class III Water Quality Criteria or the facility's permit limits. Total coliforms were detected in the effluent and the receiving water at levels that did not exceed Class III Water Quality Criteria or the facility's permit limits. Conductivity and pH at the Test and Control Sites complied with Class III Water Quality Criteria. Dissolved oxygen at the Test Site complied with Class III Water Quality Criteria, but dissolved oxygen at the Control Site failed to meet the 5.0 mg/L criterion (62-302.530(31) F.A.C.). Effluent total nitrogen concentration was 1.18 mg/L and total phosphorus was 2.6 mg/L. Effluent total phosphorus (primarily ortho-phosphate) contributed to elevated levels at the Test Site (1.9 mg/L) compared with the Control Site (0.25 mg/L). Effluent total nitrogen was lower than levels at the Control Site (2.11 mg/L), and the effluent appeared to have diluted the nitrogen content of the receiving water.

Impact Bioassessment Inspection **(IBI)**

Date Sampled: 11/3/03

Results: Based on AGP data, Lake Lena Run had nutrient concentrations capable of fueling "problem" levels of algae before the facility's effluent was added, with results from the receiving water being more than nine times the "problem" threshold at both Test and Control Sites. Algal community composition from periphytometers was similar at Test and Control Sites. Quantitative measures of benthic macroinvertebrate assemblages from Hester-Dendy samplers showed higher Shannon-Weaver diversity at the Test Site compared to the Control Site. The high number of individuals recovered at both Test and Control Sites after a 28-day incubation period is suggestive of eutrophic conditions in Lake Lena Run. The Control Site Stream Condition Index (SCI) score of 19 placed it in the "Poor" category and the Test Site SCI score of 21 placed it in the "Good" category. The relatively poor condition at the Control Site compared with the Test Site may be related to low dissolved oxygen concentration at the Control Site. Results suggest that the facility's effluent is a source of additional phosphorus loading to Lake Lena Run, but that there were no strong negative effects detected in the biological data collected in this inspection.

Biological assessments are prepared by FDEP staff to provide information for review of NPDES permit renewal applications. Biological assessments, in conjunction with other information concerning the subject facility and its receiving-water body, are used to determine appropriate permit conditions.

Introduction

The Auburndale Allred Wastewater Treatment Plant is located in Polk County, Florida (Appendix 1). This facility is a 1.4 million gallon per day (MGD) annual average daily flow oxidation ditch wastewater treatment plant. Activities at this plant include manual bar screens with a velocity controlled grit chamber, one oxidation ditch of 1.58 million gallons, two clarifiers of 59,082 total gallons with a total surface area of 4,667 square feet, an eight-cell denitrification filter, two sludge digester tanks and wedgewire drying beds. Disinfection is performed using dual six-lamp ultraviolet radiation systems with a backup chlorination system. The facility is operated to achieve secondary treatment with basic disinfection for land application of effluent and/or advanced secondary treatment with basic disinfection and dechlorination (if used) prior to discharge (see Facility Summary in Appendix 2). The effluent that is not used in land application is discharged into the Class III fresh waters of Lake Lena Run, which then flow into the Peace River. The design flow of this wastewater system is 1.4 MGD. The permitted average monthly flow is 0.65 MGD to Lake Lena Run and the flow during this survey was 0.408 MGD (per J. Squitieri, FDEP Southwest District).

Surface Water Quality Criteria and facility permit limits are listed in Table 1. According to the facility's monthly discharge monitoring reports, the plant violated the maximum permitted flow for January, March, June and August 2003 (Appendix 2). In addition, the plant violated monthly and weekly limits for total nitrogen in June and September 2003 and monthly limits for total Kjeldahl nitrogen in June 2003.

Methods

The purpose of this investigation was to determine the potential effects of the facility's effluent on the biota of the receiving waters. Chemical and biological comparisons were made between a control site (located in Lake Lena Run 30 meters upstream of the facility) and a test site (located in Lake Lena Run approximately 50 meters downstream of the discharge). Detailed methods and their relationship to Florida Administrative Code are given in Appendix 3.

All field and laboratory biological methods followed Biology Section Standard Operating Procedures (SOPs, see http://www.floridadep.org/labs/qa/2002sops.htm for details) and met FDEP quality assurance/quality control standards (see http://www.floridadep.org/labs/qa/index.htm).

The following were involved in this investigation: Nahir Cornwell, Michelle Duggan, Lori Pillsbury, Joe Squitieri and Peggy Morgan (FDEP Southwest District), and FDEP Central Laboratory in Tallahassee. The report was reviewed by District representatives and the Point Source Studies Review Committee (Wayne Magley, Chuck Ziegmont and Michael Tanski).

Results and Discussion

- Specific chemical results are reported in Table 1 and a complete list of chemical analytes can be reviewed in Appendix 4. Results for 24-hour, flow proportioned, composite samples of effluent gave similar results when compared to grab samples; grab results are discussed in this report. The equipment blank associated with the composite sample was contaminated with copper, iron, lead, nickel and nitrate+nitrite; composite data should be interpreted cautiously (Appendix 4). The trip blank associated with the grab effluent samples was contaminated with nitrate+nitrite. Results from effluent samples were more than ten times the level detected in the trip blank and are used without qualification.
- Effluent metals from the grab samples complied with Class III Water Quality Criteria (FAC 62-302). Cadmium, copper and silver were found in the effluent at levels above the method detection limit and below the practical quantitation limit (PQL) while aluminum, iron, lead and zinc were detected above the PQL. The organic pollutant diazinon was detected in the effluent at a level that was below the PQL. Oil and grease was detected in the effluent at a level that complied with Class III Fresh Water Quality Criteria. Effluent conductivity, pH and dissolved oxygen complied with Class III Water Quality Criteria (62-302 F.A.C.) and facility permit limits.
- Habitat assessment scores were 70 at the Control Site and 76 at the Test Site (Table 1, data sheets in Appendix 7), indicating both sites contained suboptimal habitats for macroinvertebrates. Both sites were located in a channelized stream and contained large amounts of the exotic weed, *Hydrilla verticillata*. The canopy was open, and the area was surrounded by commercial and industrial buildings.
- Conductivity and pH at the Test and Control Sites complied with Class III Water Quality Criteria (Table 1). Dissolved oxygen at the Test Site complied with Class III Water Quality Criteria, but dissolved oxygen at the Control Site (2.2 mg/L) failed to meet the ≥5.0 mg/L criterion (62-302.530(31) F.A.C.).

Table 1. Effluent limits, Class III Criteria and chemical, microbiological and toxicological data.

Auburndale Allred WWTP	Class III Standards	Effluent Limits	Effluent Sample-Grab	Effluent Sample-Composite	Control Site	Test Site
Organic Constituents (µg/L)						
Diazinon	-	-	0.11 I	-	-	-
Metals (µg/L unless otherwise noted)						
Aluminum	-	-	43 A	27 I	-	-
Arsenic	≤50	-	7.7 U	6 U	-	-
Cadmium	≤1.2 b	-	0.072 I	0.063 I	-	-
Calcium (mg/L)	-	-	34.2 A	33.9	-	-
Chromium-III	≤93.5 b	-	3 U	6 U	-	-
Copper	≤10.2 b	-	3.5 I	2.9 I e	-	-
Iron	≤1000	-	65 A	53 I e	-	-
Lead	≤3.6 b	-	0.38 A	0.35 e	-	-
Magnesium (mg/L)	-	-	6.1 A	6.1	-	-
Nickel	≤56.8 b	-	3 U	3 U e	-	-
Selenium	≤5	-	1 U	1 U	-	-
Silver	≤0.07	-	0.023 I	0.02U	-	-
Zinc	≤130.4 b	-	72 A	60	-	-
Nutrients (mg/L)						
Total Organic Carbon	-	-	7.5	-	-	-
Ortho-phosphate	-	-	2.7	-	0.21	2
Total Phosphorus	-	Report	2.6	2.5	0.25 A	1.9
Ammonia	-	-	0.042 A	0.032 I	0.51	0.1
Unionized Ammonia	≤0.02	-	≤0.02 c	-	≤0.02 c	≤0.02 c
Nitrate+Nitrite	-	-	0.44	0.55 A e	0.71	0.78
Total Kjeldahl Nitrogen	-	2.2 w	0.74	0.62	1.4 A	0.9
Organic Nitrogen	-	-	0.7 c	0.588 c	0.89 c	0.8 c
Total Nitrogen	-	9.0 w	1.18 c	1.17 c	2.11 c	1.68 c
General Physical and Chemical Parameters						
Habitat Assessment	-	-	-	-	70	76
Dissolved Oxygen (mg/L)	≥5	≥7	7.6	7.6	2.2	7
pH (S.U.)	-	6.0-8.5	7.5	7.5	6.9	7.1
Conductivity (umhos/cm)	≤1275	-	600	600	367	545
Temperature (C)	-	-	25.4	25.7	23.7	25
TSS (mg/L)	-	60 s	2.0	1 U	5.0	7.0
CBOD	-	12.0 w	2 U	2 U	2 U	2 U
Oil and Grease (mg/L)	≤5	-	1.1 I	-	-	-
Flow (million gallons/day)	-	0.65	0.408	-	-	-
Turbidity (NTU)	-	-	1.1	-	3.1	3.2
Color (Pt-Co)	-	-	60	-	60	60
Alkalinity (mg/L)	-	-	107.3	-	118.9	116.9
Hardness (mg/L)	-	-	110.5 c	109.8	-	-
Chlorophyll a (µg/L)	-	-	0.85 U	-	0.85 U	0.85 U
Phaeophytin (µg/L)	-	-	0.85 U	-	0.85 U	0.85 U
Microbiology (# counts/100ml)						
Fecal Coliforms (1/12/2004)	≤800	800 s	1 K	-	90 BK	55 BK
Total Coliforms (1/12/2004)	≤2400	-	20 BK	-	780	400
Toxicity (48-hour static, screening bioassay, percent mortality in 100% effluent)						
Bioassay - Fish	LC50>100%	-	0%	-	-	-
Bioassay - Water flea	LC50>100%	-	5%	-	-	-

Value exceeds the Class III Water Quality Criteria

b - Value is calculated based on hardness
c - Value is calculated.
A - Value reported is the mean of two or more determinations
B - Results based on colony counts outside the acceptable range
I - Value reported is < the minimum quantitation limit, and ≥ the minimum detection limit
K - Actual value is known to be less than value given
L - Actual value is known to be greater than value given
U - Material analyzed for but not detected; value reported is the minimum detection limit
w - Limit is a weekly average.
e - Equipment blank for this analyte is contaminated.

- The effluent sample was not acutely toxic to the fish, *Cyprinella leedsi,* or to the water flea, *Ceriodaphnia dubia,* during 48-hour acute screening bioassays (See Table 1 for percent mortality and Appendix 6 for bioassay bench sheets).
- Fecal and total coliform samples collected in November 2003 were discarded due to laboratory problems with culture media; additional water samples of the effluent and from the Test and Control Sites were collected on January 12, 2004. Fecal coliforms were detected in the receiving waters at levels that did not exceed Class III Water Quality Criteria (See Table 1 for results and Appendix 6 for laboratory worksheets). Total coliforms were detected in the effluent and receiving waters at levels that did not exceed Class III Water Quality Criteria and facility permit limits.
- Effluent total nitrogen concentration was 1.18 mg/L and total phosphorus was 2.6 mg/L (Table 1). Effluent total phosphorus was primarily in the form of ortho-phosphate and contributed to elevated levels at the Test Site (1.9 mg/L) compared with the Control Site (0.25 mg/L). Effluent total nitrogen was lower than levels at the Control Site (2.11 mg/L), and the effluent appeared to have diluted nitrogen content of Lake Lena Run (Test Site total nitrogen 1.68 mg/L). Control Site levels of phosphorus compounds were similar to those of the 70th percentile of typical Florida streams, while Test Site levels were greater than those of the highest 95th percentile of typical Florida streams (Appendix 5). Nitrogen compounds at the Control Site were similar to the 70-90th percentile of typical Florida Streams, while Test Site results were similar to the 40-90th percentile. If the reported levels of total nitrogen and total Kjeldahl nitrogen are typical of the facility's current discharge, the plant discharge did not exceed permit limits on the date of sampling.

Table 2. Measured and predicted algal growth potential (AGP) for total soluble inorganic nitrogen (TSIN) limitation

Location	AGP (measured)	Predicted AGP (TSIN) ± 20%	Inorganic N:P ratio
Effluent Samples	13.7	18.3 ± 3.7	0.18
Control Site	59.8	46.4 ± 9.3	5.81
Test Site	45.7	33.4 ± 6.7	0.44

- Algal growth potential (AGP) is a measure of nutrients available for algal growth (Miller *et al.* 1978). Raschke and Shultz (1987) found that AGP above 5.0 mg dry wt/L represent a "problem" threshold for fresh receiving waters, implying nutrient enrichment. The AGP value at the upstream Control Site was 59.8 mg dry wt/L, more than 11 times the "problem" threshold (Table 2). The AGP values of the downstream Test Site (45.7 mg dry wt/L) and the effluent (13.7 mg dry wt/L) were also above this threshold. This indicates that Lake Lena Run is receiving nutrient inputs from sources other than the facility's effluent, with results from the receiving water being more than nine times the "problem" threshold at both sites. There was no evidence of growth inhibition in AGP data from the Test and Control Sites, but slightly less dry weight than expected was produced from the effluent sample (Table 2).
- Chlorophyll *a* was not detected in samples of the effluent or from the Test and Control Sites (Table 1). We note that nutrients in the water column may or may not fuel algal production immediately, depending upon the sum of environmental conditions that limit algal growth at the site (e.g. pH, shading, turbidity). Thus it is not necessarily contradictory for ambient nutrient levels to be high and for no chlorophyll to be detected in water samples.
- The algal community composition on periphytometers was similar at Test and Control Sites (Table 3, Appendix 8). Periphyton chlorophyll *a* concentration was 8.0 mg/m^2 at the Control Site and 6.8 mg/m^2 at the Test Site. A mix of diatoms, blue-green and green algae was found at both sites.
- Quantitative measures of benthic macroinvertebrate assemblages from Hester-Dendy samplers showed higher Shannon-Weaver diversity at the Test Site compared to the Control Site (Table 4, Appendix 9). Diptera dominated the benthic macroinvertebrate assemblages at both sites, but caddisflies and mayflies that were common at the Test Site may have been less abundant at the Control Site because of the low dissolved oxygen there. The high number of individuals recovered at both Test and Control Sites after the 28-day incubation period is an additional indicator that this portion of Lake Lena Run is eutrophic.
- Qualitative measures of benthic macroinvertebrate assemblages from dipnet samples are summarized

Table 3. Periphyton composition

Auburndale Allred WWTP	Control Site	Test Site
Number of Taxa	35	44
Shannon-Weaver Diversity	3.9	4.4
Chlorophyll a (mg/m²)	8.0	6.8
Phaeophytin (mg/m²)	0	0
Algal Density (number/cm²)	466,425	269,503
Percent Dominant Taxon	18.8	20.5
Dominant Taxon (name)	*Eunotia*	*Eunotia*
Number of Algal Units Identified	304	302
Percentage Composition		
Blue-green algae	12.2	10.3
Diatoms	77.6	81.7
Green algae	9.5	7.3
Other	0.7	0.7

Table 4. Macroinvertebrate Hester-Dendy Samples - Quantitative

Auburndale Allred WWTP	Control Site	Test Site
Summary Statisics		
Shannon-Weaver Diversity	1.82	3.37
Number of Taxa	20	29
Florida Index	3	15
Number of EPT Taxa	2	3
Percent Dominant Taxon	58.6	30.8
Dominant Taxon (name)	*Goeldichironomus carus*	*Polypedilum beckae*
Dominant Taxon (group)	Diptera	Diptera
Total Number of Individuals (counted)	3426	1227
Total Density of Individuals (#/m2)	9066	3248
Community Composition: Percent of total		
Amphipoda	2.8	8.3
Diptera	93.6	57.3
Ephemeroptera	0.2	8.1
Gastropoda	3.0	3.5
Odonata	0.0	2.4
Trichoptera	0.0	19.6
Other	0.4	0.8
Functional Feeding Groups: Percent of total		
Predators	0.8	7.6
Surface Deposit Feeders	90.0	53.7
Suspension Feeders	0.5	19.9
Scrapers	3.1	7.7
Shredders	5.1	10.7
Unknown	0.5	0.4

in Tables 5 and 6 and in Appendix 10. The Control Site SCI score of 19 placed it in the "Poor" category and the Test Site SCI score of 21 placed it in the "Good." category. Diptera were abundant at the Control Site (~80% of sample), while dipterans, caddisflies, mayflies and dragonflies each comprised 15% or more of the sample from the Test Site. These differences may have been due to low dissolved oxygen at the Control Site.

Summary

Seven metals were detected in the effluent at levels that complied with Class III Fresh Water Quality Criteria and facility permit limits.The organic pollutant diazinon was detected in the effluent. The effluent sample was not acutely toxic to the water flea or the fish in 48-hour acute screening bioassays. Fecal and total coliforms were detected in the effluent at levels that complied with Class III Fresh Water Quality Criteria and facility permit limits. Dissolved oxygen at the Control Site (but not the Test Site) failed to meet the ≥5.0 mg/L Class III Fresh Water Quality Criterion (62-302.530(31) F.A.C.).

Effluent total phosphorus contributed to elevated levels at the Test Site compared with the Control Site; these phosphorus releases are a cause for concern in a waterbody that is already high in nitrogen content. Algal growth potential was elevated to more than nine times the suggested problem threshold both above and below the facility, suggesting nutrient inputs are a problem in Lake Lena Run.

There were no major differences between Test and Control Sites in algal community composition from periphytometers. Quantitative measures of benthic macroinvertebrate assemblages from Hester-Dendy samplers showed higher Shannon-Weaver diversity at the

Test Site compared to the Control Site, but the high number of macroinvertebrates collected is suggestive of eutrophic conditions. The Control Site SCI score placed it in the "Poor" category and the Test Site SCI score placed it in the "Good." category. These results suggest that the facility's effluent is a source of additional phosphorus loading to Lake Lena Run, but that there were no strong negative effects detected in the biological data collected in this inspection.

Table 5. Macroinvertebrate Dipnet Samples - Qualitative

Auburndale Allred WWTP	**Control Site**	**Test Site**
Stream Condition Index (value)	19	21
Stream Condition Index (word)	Poor	Good
Stream Condition Index Metrics		
Number of Taxa	22	16
Florida Index	5	9
Number of EPT Taxa	5	3
Number of Chironomid Taxa	8	8
Percent Dominant Taxon	36.7	19.8
Percent Diptera	79.82	33.66
Percent Suspension Feeders and Filterers	5.96	1.98
Total Number of Individuals (counted)	109	101
Community Composition: Percent of total		
Dominant Taxon (name)	*Goeldichironomus carus*	*Caenis*
Dominant Taxon (group)	Diptera	Ephemeroptera
Amphipoda	0.9	3.9
Diptera	79.8	33.7
Ephemeroptera	4.6	21.8
Gastropoda	1.8	0.0
Lepidoptera	2.8	5.0
Odonata	4.6	17.8
Oligochaeta	2.8	2.0
Trichoptera	1.8	15.8
Other	0.9	0.0
Functional Feeding Groups: Percent of total		
Burrowing Deposit Feeders	2.8	2.0
Predators	6.0	27.2
Surface Deposit Feeders	73.4	37.1
Suspension Feeders and Filterers	6.0	2.0
Scrapers	3.2	10.9
Shredders	7.8	20.8
Unknown	0.9	0.0

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Table 6. Stream Condition Index Metrics: Peninsula, Winter Index

Control Site					
Metric:	**Value**	**5**	**3**	**1**	**Score**
Total Number of Taxa	22	≥27	26-14	< 14	3
Number of EPT Taxa	5	≥4	3-2	< 2	5
Number of Chironomid Taxa	8	≥9	8-5	< 5	3
Percent Contribution of Dominant Taxon	36.7	≤30	31-65	> 65	3
Percent Diptera	79.82	-	≤52	> 52	1
Florida Index	5	≥10	9-5	< 5	3
Percent Suspension Feeders and Filterers	5.96	≥15	14-8	< 8	1
Total Score		**Poor**			**19**
Interpretation of Scores		Excellent			27-33
		Good			21-26
		Poor			14-20
		Very Poor			7-13

Table 6. Stream Condition Index Metrics: Peninsula, Winter Index

Test Site					
Metric:	**Value**	**5**	**3**	**1**	**Score**
Total Number of Taxa	16	≥27	26-14	< 14	3
Number of EPT Taxa	3	≥4	3-2	< 2	3
Number of Chironomid Taxa	8	≥9	8-5	< 5	3
Percent Contribution of Dominant Taxon	19.8	≤30	31-65	> 65	5
Percent Diptera	33.66	-	≤52	> 52	3
Florida Index	9	≥10	9-5	< 5	3
Percent Suspension Feeders and Filterers	1.98	≥15	14-8	< 8	1
Total Score		**Good**			**21**
Interpretation of Scores		Excellent			27-33
		Good			21-26
		Poor			14-20
		Very Poor			7-13

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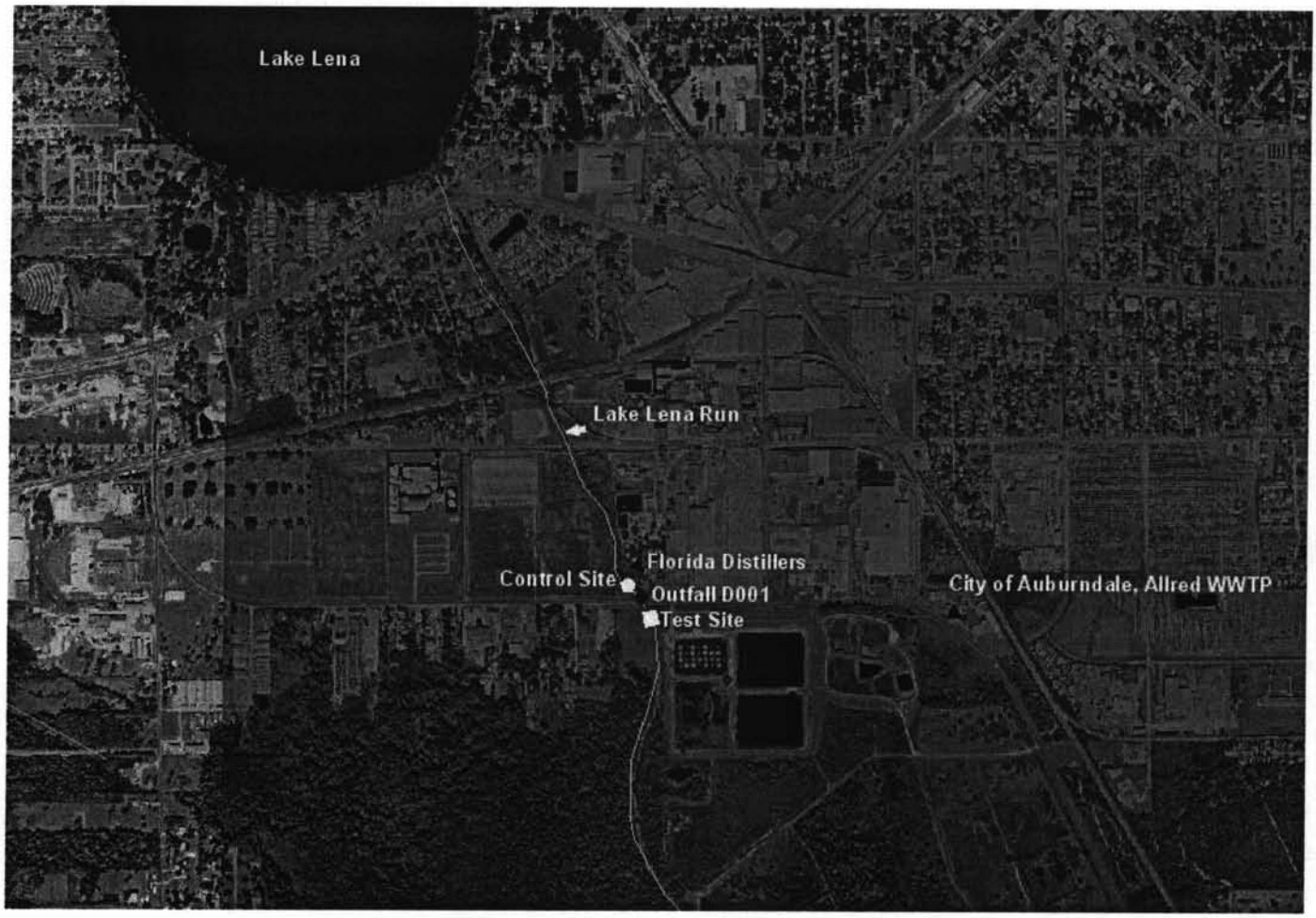
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Appendices

- Appendix 1. Map of facility
- Appendix 2. Facility summary and DMR data summary
- Appendix 3. Explanation of measurements
- Appendix 4. Chemical analyses of effluent and receiving water.
- Appendix 5. Typical values for selected parameters in Florida waters
- Appendix 6. Additional physical, chemical, toxicological and microbiological results
- Appendix 7. Habitat Assessment field sheets
- Appendix 8a. Periphyton: Taxa list and density (number of individuals per cm^2)
- Appendix 8b. Periphyton: Taxa list and number of individuals counted
- Appendix 9a. Hester-Dendy multi-plate samplers: Taxa list and macroinvertebrate density (average number of individuals per m^2)
- Appendix 9b. Hester-Dendy multi-plate samplers: Taxa list and total number of macroinvertebrates counted
- Appendix 10a. Dipnet samples: Taxa list and number of macroinvertebrates counted (collapsed)
- Appendix 10b. Dipnet samples: Taxa list and number of macroinvertebrates counted

Appendix 1

Auburndale, Allred, WWTP
Auburndale, Florida



Appendix 2

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENT PROECTION
FACILITY

Facility name: City of Auburndale, Allred

Date of Summary: October 15, 2003
Updated: March 12, 2004

Location (detailed ARC view map attached): County: Polk County District: SWD
Recker Highway, (S.R.655)
Polk County, Auburndale Fl. 33823
Latitude 28° 03' 3.5" N Longitude 81° 47' 29.8" W

NPDES Permit: FL0021466 State GMS # and State expiration date: 3/27/05 Facility Type: Domestic Waste

Function of facility: The facility is a 1.4 MGD Annual Average Daily Flow oxidation ditch Wastewater Treatment plant which discharges effluent into Lake Lena Run, a tributary of Lake Hancock, and into the Peace River, a Class III freshwater body.

Description of treatment process: manual bar screens with a velocity controlled grit chamber, one (1) oxidation ditch of 1.58 million gallons, two (2) clarifiers of 59, 082 total gallons with a total surface area of 4, 667 SF and eight (8) cell denitrification filter, dual six (6) lamp ultraviolet lamp radiation systems with a backup chlorination system, two (2) sludge digesters tanks and wedgewire drying beds. The facility is operated to achieve secondary treatment with basic disinfection for land application of effluent and/or advanced secondary with basic disinfection and dechlorination (if used) prior to discharge.

Receiving waters: Lake Lena Run into the Peace River Classification of water: III Freshwater

Design Flow: 1.4 Annual Average Daily Flow Mean Flow (monthly average): .65 MGD

Flow during survey:

Therefore, the best time to sample the outfall is: Sample during business hours.

If facility has a mixing zone proved details (size and parameters): No mixing zone

List effluent limits (add or remove rows and columns):

Parameter	Units	Ann. Avg	Mo. Avg	Wkly. Avg	Single Sample	Monitoring Frequency
CBOD5-Max	mg/L	-	8.0	12.0	-	Weekly
TSS-Max	mg/L	20.0	30.0	45.0	60.0	Weekly
Total residual chlorine (for disinfection)*-Min	mg/L	-	-	-	0.5	Continuous
Chlorine, Total Residual (For Dechlorination)*-Max	mg/L	-	-	-	0.01	Daily
Dissolved Oxygen-Min	mg/L	-	-	-	7.0	Daily
Coliform, Fecal	#/100 mL	See below				Weekly
TKN-Max	mg/L	--	1.5	2.2	-	Weekly
Ultimate Oxygen Demand-Max	Lbs/day	--	99.19	--	-	Weekly
pH	SU				6.0-8.5	Continuous
Total Nitrogen (N)-Max	mg/L	4.0	6.0	9.0		Weekly
Total Phosphorus-Report Only	mg/L	-	-	-	-	Monthly

* Limit is required at all times the backup chlorination system is actually in operation. Limit is not required during routine times the Ultraviolet Light disinfection system is in operation.

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-The arithmetic mean of the monthly fecal coliform values collected during an annual period shall not exceed 14 per 100 mL of effluent sample. Any one sample shall not exceed 800 fecal coliform values per 100 ml of sample.

Describe special permit conditions and permit modifications:
N/A

Description of permitted outfall(s):
An existing .65 MGD Monthly Average Daily Flow permitted discharge (D001) TO Lake Lena Run, and into the Peace River. The outfall discharges at a depth of approximately 2.0 feet. The point of discharge is located at lat. 28° 03' 3.52" N, long 81° 47' 29.89" W.

Land Application:
An existing 0.20 mgd rapid infiltration basin system (R003) consisting of four ponds totaling 9.36 acres. A proposed industrial reuse system, the Calpine Osprey Energy Center, to receive up to 1.4 mgd of reclaimed water for industrial cooling. A proposed 143-acre slow-rate restricted accesss sprayfield to receive up to 1.48 mgd of reclaimed water. A proposed slow-rate public-access system, Cemetery Spray Site, to receive up tp 0.26 mgd of reclaimed water.

List permit violations (form DMR data or other sources) and plant upsets that occurred within past year (s):
I have included a synopsis Mr. Joe Squitieri (Compliance/Enforcement DW Section) provided:

March 11, 2003 inspection
EFFLUENT QUALITY
The effluent appeared clear, with no visible foam or sheen. A review of the DMRs from April 2003 through July 2003 revealed exceedances of the limits for Total Nitrogen and TKN in June 2003. A value of 9.48 mg/L of Total Nitrogen exceeded the monthly and weekly average limits, and a value of 1.75 mg/L of TKN exceeded the monthly average limits.

According to the DMRs, routine bioassays were conducted in February, April, June, July and September 2003. Failures for *Ceriodaphnia dubia* were reported in these months, except April and September. The three additional tests conducted in June and July covered the February and June failures. Two of the three additional tests failed. Be aware that if any additional toxicity test confirms toxicity, a report must be submitted to the Department within 30 days indicating the City's plan to identify and eliminate the toxicity. This report is overdue.

June 19,2003 inspection
EFFLUENT QUALITY
The effluent appeared clear, with no visible foam or sheen. A review of the DMRs from January 2002 through March 2003 did not reveal any effluent quality excursions.

November 20, 2001 inspection
EFFLUENT QUALITY:
The effluent appeared clear, with no visible foam or sheen. A review of the DMRs for 2001 through September do not reveal any effluent quality excursions. The annual average flow to R001 was exceeded from July through September 2001.

Describe previous impact bioassessments, WQBELs, and previous or current enforcement actions:

The Department conducted a Fifth Year Inspection Bioassessment at the facility in February 02, 1998. A habitat assessment was performed to compare the control and test site. Physical/chemical parameters were collected at the effluent and study sites. Biological data was collected at the test sites. An acute screen toxicity bioassay using *Ceriodaphnia dubia* and *Cyprenella leedsi* was collected at the effluent.

The Biological Assessment report indicated that atrazine was detected in the effluent below toxic levels. Cadmium, copper, iron, lead and zinc were detected in the effluent at levels that complied with Class III Surface Water Quality Standards. The bioassay indicated that the effluent is not acutely toxic to the tests species at the times of sample collection. Total phosphorus (.34 mg/L), and nitrate-nitrite (.63 mg/L), resulted in elevated concentrations at the Lake Lena Run test site. AGP increased from 9.4 mg dry wt/L at the control site to 36.1 mg dry wt/L at the test site, both exceeding the 5 mg dry wt/L "threshold". Total residual chlorine (.03 mg/L) in the effluent exceeded the permit limit of .01 mg/L.

Additional information

Staff contributing to this review:

Biologist: Nahir Cornwell

Inspector: Joe Squitieri

Engineer:

Grey line denotes that biologist should know data

Black line denotes that inspector or engineer should know data

DMR Summary Results: 12/1/2002 - 11/30/2003

Permit Number: FL0021466
Facility Name: AUBURNDALE STP

Outfall Indicator: 001-1

Monitoring Location Code: 1

Parameter Code	Description	Limit	Limit Effective Dates	Statistical Base	Units	AVG	MAX	MIN
P 00181	OXYGEN DEMAND, ULTIMATE	99.19	4/1/2000 to 3/31/2005	MO AVG	LBS/DY	32.865	66.92	18.5
P 00300	OXYGEN, DISSOLVED (DO)	7	4/1/2000 to 3/31/2005	MINIMUM	MG/L	7.1833	7.5	7
P 00400	PH	6	11/1/2001 to 3/31/2005	DAILY MN	SU	6.6	6.9	6.5
P 00400	PH	8.5	11/1/2001 to 3/31/2005	DAILY MX	SU	7.05	7.3	6.8
P 00530	SOLIDS, TOTAL SUSPENDED	30	11/1/2001 to 12/31/2002 1/1/2003 to 3/31/2005	MO AVG	MG/L	0.6417	1.36	0
P 00530	SOLIDS, TOTAL SUSPENDED	60	11/1/2001 to 12/31/2002 1/1/2003 to 3/31/2005	SINGSAMP	MG/L	1.3775	4.8	0
P 00530	SOLIDS, TOTAL SUSPENDED	45	11/1/2001 to 12/31/2002	WKLY AVG	MG/L	0.96	0.96	0.96
P 00530	SOLIDS, TOTAL SUSPENDED	DELMON	1/1/2003 to 3/31/2005		MG/L	0.702	1.23	0
P 00600	NITROGEN, TOTAL (AS N)	6	11/1/2001 to 3/31/2005	MO AVG	MG/L	3.915	9.48	0.62
P 00600	NITROGEN, TOTAL (AS N)	9	11/1/2001 to 3/31/2005	WKLY AVG	MG/L	3.915	9.48	0.62
P 00625	NITROGEN, KJELDAHL TOTAL (AS N)	1.5	11/1/2001 to 3/31/2005	MO AVG	MG/L	1.0458	1.75	0.46
P 00625	NITROGEN, KJELDAHL TOTAL (AS N)	2.2	11/1/2001 to 3/31/2005	WKLY AVG	MG/L	1.0458	1.75	0.46
P 00665	PHOSPHORUS, TOTAL (AS P)	ADDMON	11/1/2001 to 3/31/2005	MO AVG	MG/L	2.6975	4.6	1.04
P 50050	FLOW	ADDMON	6/1/2003 to 3/31/2005	ANNL AVG	MGD	0.7597	0.805	0.696
P 50050	FLOW	0.65	11/1/2001 to 5/31/2003 6/1/2003 to 3/31/2005	MO AVG	MGD	0.6284	0.896	0.4338
P 50060	CHLORINE, TOTAL RESIDUAL	DELMON	1/1/2003 to 3/31/2005			0	0	0
P 74055	COLIFORM, FECAL GENERAL	400	11/1/2001 to 3/31/2005	90TH %	#/ 100ML	3.3333	15	0
P 74055	COLIFORM, FECAL GENERAL	800	11/1/2001 to 3/31/2005	DAILY MX	#/ 100ML	7.8889	28	0
P 74055	COLIFORM, FECAL GENERAL	ADDMON	11/1/2001 to 3/31/2005	MO GEOMN	#/ 100ML	5.2922	28	0
P 80082	BOD, CARBONACEOUS 05 DAY, 20C	8	9/1/2001 to 3/31/2005	MO AVG	MG/L	0.6242	1.76	0
P 80082	BOD, CARBONACEOUS 05 DAY, 20C	12	9/1/2001 to 3/31/2005	WKLY AVG	MG/L	0.6242	1.76	0

Monitoring Location Code: A

Parameter Code	Description	Limit	Limit Effective Dates	Statistical Base	Units	AVG	MAX	MIN
P 50060	CHLORINE, TOTAL RESIDUAL	DELMON	4/1/2000 to 3/31/2005			0	0	0

Monitoring Location Code: Y

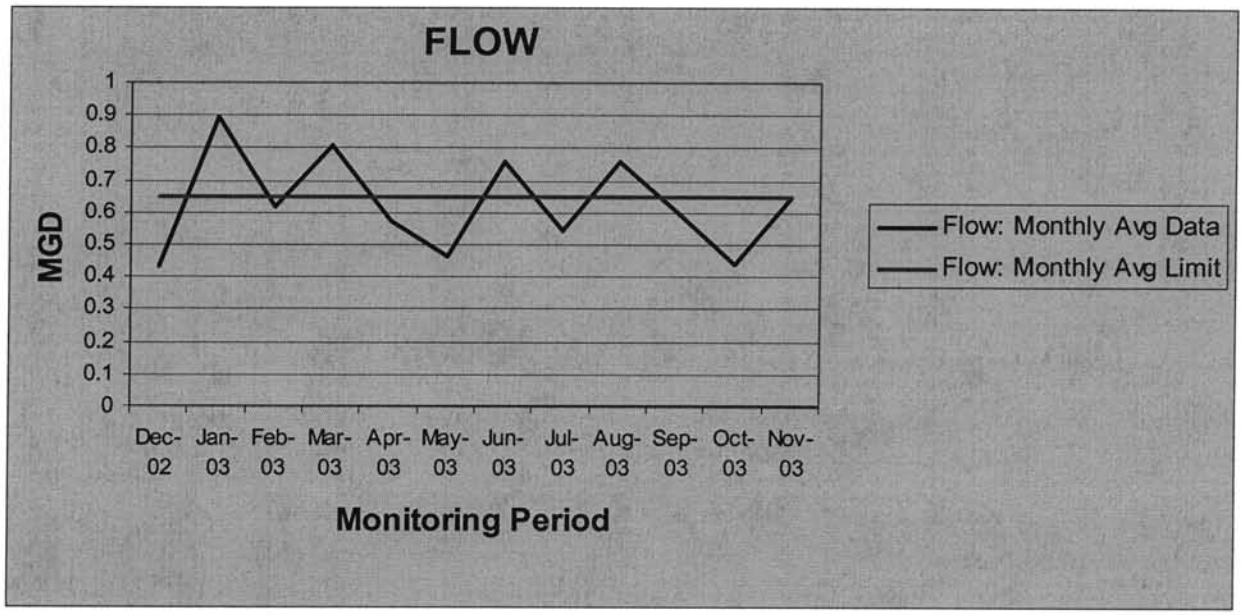
Parameter Code	Description	Limit	Limit Effective Dates	Statistical Base	Units	AVG	MAX	MIN
P 00530	SOLIDS, TOTAL SUSPENDED	20	11/1/2001 to 3/31/2005	ANNL AVG	MG/L	1.3473	2.82	0.561
P 00600	NITROGEN, TOTAL (AS N)	4	11/1/2001 to 3/31/2005	ANNL AVG	MG/L	2.079	3.91	0.79
P 50050	FLOW	DELMON	11/1/2001 to 3/31/2005			0.5131	0.5131	0.5131
P 74055	COLIFORM, FECAL GENERAL	200	11/1/2001 to 3/31/2005	ANNL AVG	#/ 100ML	8.4358	18.57	3.97

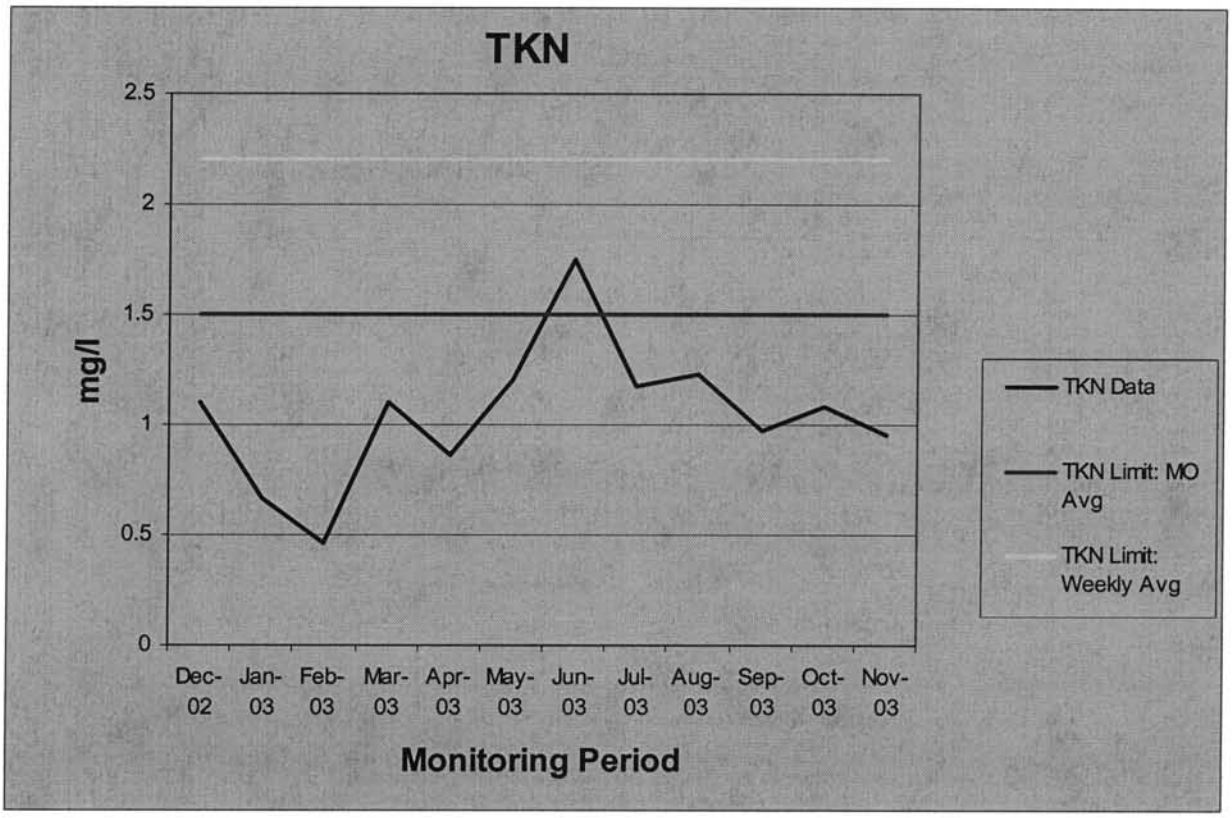
Outfall Indicator: 001-T
Monitoring Location Code: P

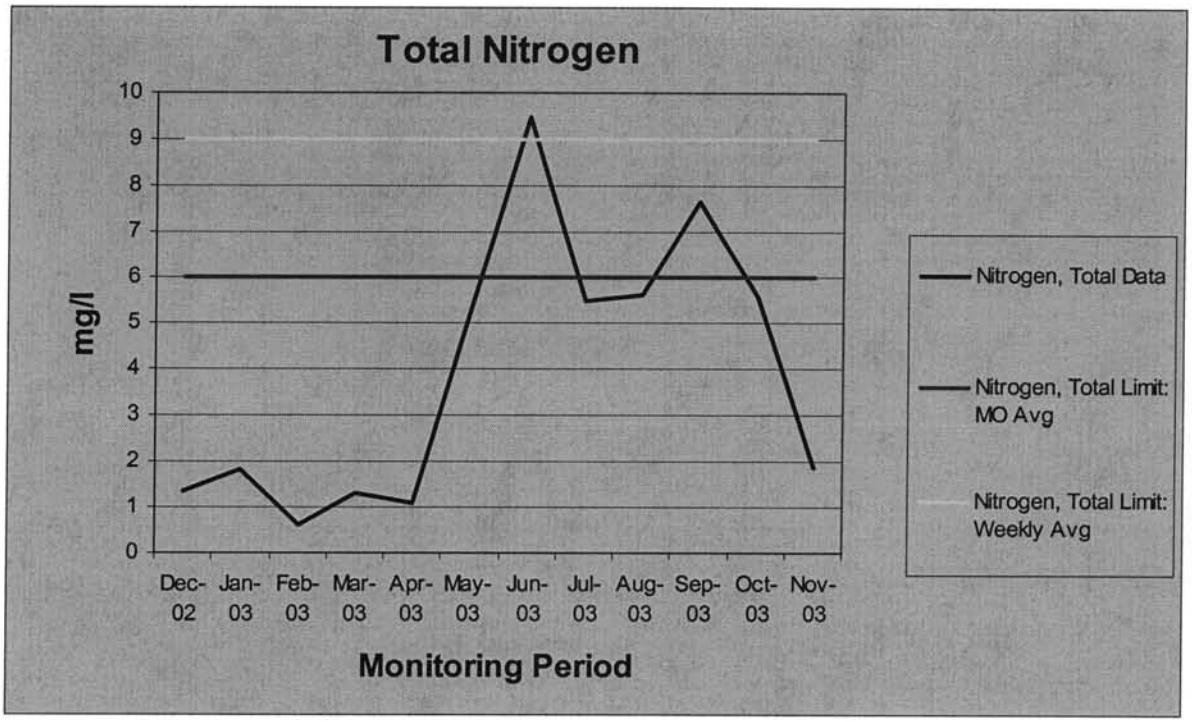
Parameter Code	Description	Limit	Limit Effective Dates	Statistical Base	Units	AVG	MAX	MIN
P TBP3B	NOEL STATRE 7DAY CHR CERIODAPHNIA	100	11/1/2001 to 3/31/2005	MINIMUM	PER- CENT	100	100	100

Exceedances, DMR reporting, 12/1/2002-11/30/2003

Facility ID	FL0021466	FL0021466	FL0021466	FL0021466	FL0021466	FL0021466	FL0021466	FL0021466	FL0021466
Facility Name	AUBURNDALE STP	AUBURNDALE STP	AUBURNDALE STP	AUBURNDALE STP	AUBURNDALE STP	AUBURNDALE STP	AUBURNDALE STP	AUBURNDALE STP	AUBURNDALE STP
District	TA	TA	TA	TA	TA	TA	TA	TA	TA
Facility Type	M	M	M	M	M	M	M	M	M
Major (M)	M	M	M	M	M	M	M	M	M
Outfall Type	EFFLUENT	EFFLUENT	EFFLUENT	EFFLUENT	EFFLUENT	EFFLUENT	EFFLUENT	EFFLUENT	EFFLUENT
Monitoring Date	1/31/2003	3/31/2003	6/30/2003	6/30/2003	6/30/2003	6/30/2003	8/31/2003	9/30/2003	9/30/2003
Outfall Indicator	001-1	001-1	001-1	001-1	001-1	001-1	001-1	001-1	001-1
Parameter Code	P 50050	P 50050	P 00600	P 00600	P 00625	P 50050	P 50050	P 00600	P 00600
Parameter Description	FLOW	FLOW	NITROGEN, TOTAL (AS N)	NITROGEN, TOTAL (AS N)	NITROGEN, KJELDAHL TOTAL (AS N)	FLOW	FLOW	NITROGEN, TOTAL (AS N)	NITROGEN, TOTAL (AS N)
Monitoring Location Code	1	1	1	1	1	1	1	1	1
Data	0.896	0.809	9.48	9.48	1.75	0.76	0.76	7.65	7.65
Limit	0.65	0.65	6	9	1.5	0.65	0.65	6	9
Statistical Base	MO AVG	MO AVG	MO AVG	WKLY AVG	MO AVG	MO AVG	MO AVG	MO AVG	WKLY AVG
Units	MGD	MGD	MG/L	MG/L	MG/L	MGD	MGD	MG/L	MG/L
No Data Indicator									


FLOW
MGD
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Dec-02
Jan-03
Feb-03
Mar-03
Apr-03
May-03
Jun-03
Jul-03
Aug-03
Sep-03
Oct-03
Nov-03
Monitoring Period
Flow: Monthly Avg Data
Flow: Monthly Avg Limit


TKN
mg/l
2.5
2
1.5
1
0.5
0
Dec-02
Jan-03
Feb-03
Mar-03
Apr-03
May-03
Jun-03
Jul-03
Aug-03
Sep-03
Oct-03
Nov-03
Monitoring Period
TKN Data
TKN Limit: MO Avg
TKN Limit: Weekly Avg


Total Nitrogen
mg/l
10
9
8
7
6
5
4
3
2
1
0
Dec-02
Jan-03
Feb-03
Mar-03
Apr-03
May-03
Jun-03
Jul-03
Aug-03
Sep-03
Oct-03
Nov-03
Monitoring Period
Nitrogen, Total Data
Nitrogen, Total Limit: MO Avg
Nitrogen, Total Limit: Weekly Avg

Appendix 3

Explanation of Measurements

(1) Quality Assurance and Quality Control

FDEP's quality assurance requirements for analytical laboratories and field activities are codified in Chapter 62-160, F.A.C., Quality Assurance (QA Rule) and in internal Standard Operating Procedures (FDEP SOPs). Methods for all analyses are on file at the FDEP Central Laboratory in Tallahassee and may be viewed on the web at http://www.floridadep.org/labs/sop/index.htm and/or http://www.floridadep.org/labs/qa/index.htm .

(2) Chemical Analyses of the Effluent

The effluent was analyzed for nutrients, metals, organic constituents (base, neutral, and acid extractables) and pesticides following FDEP SOPs. A list of the analytes tested for, results, data qualifiers, the minimum detection limit and the practical quantitation limit are given in Appendix 4. The results from these analyses were compared with Water Quality Criteria (62-302 F.A.C.) and facility permit limits (Table 1, Appendix 2). Exceedances of Water Quality Criteria may be violations of specific provisions of Chapter 62-302 (F.A.C.) and/ or facility permit limits.

(3) Toxicity Bioassays

Acute screening toxicity bioassays were performed on the effluent sample using the water flea, *Ceriodaphnia dubia,* and the fish, *Cyprinella leedsi* following FDEP SOPs TA07_01 and TA07_02. Failure of toxicity testing may constitute a violation of 62-302.520(21), 62-302.530(62) and/or facility permit limits.

(4) Bacteriological Testing

The effluent and water from control and test sites were analyzed for the presence and concentration of total and fecal coliform bacteria following FDEP SOPs MB1_0 and MB1_1. High levels of fecal or total coliform bacteria may constitute violation of 62-302.530(6), 62-302.530(7) and/or facility permit limits.

(5) Habitat Assessment

Habitat assessment is used to evaluate the physical structure and extent of disturbance in a waterbody. Eight aspects are ranked, with 20 possible points for each aspect (QA Rule SOP FT 3100). The Habitat Assessment score includes types and amounts of benthic substrates, water velocity, amount of sand or silt accumulation, extent of artificial channelization, bank stability, and riparian zone width and vegetation type. All scores are summed to yield an overall Habitat Assessment score. Habitat Assessment score ranges from 11-160 and overall habitat quality is assigned to one of four categories: Optimal (120-160 points), Suboptimal (80-119 points), Marginal (40-79 points), and Poor (11-39 points).

(6) Algal Growth Potential (AGP)

The effluent and water from control and test sites are autoclaved, filtered (0.45μm), inoculated with the unicellular green alga, *Pseudokirchneriella subcapitata* (formerly *Selenastrum capricornutum,* USEPA 2002*),* and incubated for 14 days (FDEP SOP TA08_05). The algal growth potential (AGP) value is the peak growth of the alga within that 14-day period, recorded as mg dry weight/L. Raschke and Shultz (1987) found that an AGP above 5.0 mg dry weight/L represents a "problem" threshold for fresh receiving waters, implying nutrient enrichment. High AGP values may constitute one line of evidence for violation of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C. and/or 62-302.530(48)(b) F.A.C..

The concentration of nutrients in a water sample may be used to calculate the expected yield of AGP under the assumption that other required nutrients (e.g. silicon, micronutrients) are present in excess (Miller *et al.* 1978). The expected amount of production is calculated as 38 times the total soluble inorganic nitrogen (nitrate and nitrite plus ammonia) under nitrogen limitation or 430 times the ortho-phosphate (OP) concentration under phosphorus limitation with an error of ± 20%. When the ratio of nitrogen to phosphorus (N:P) is less than 10:1, nitrogen limitation of algal production is likely. When the N:P ratio is 20:1 or greater, phosphorus limitation is likely (USEPA 2000). For ratios in-between, co-limitation may occur. Production of lower biomass than expected may be evidence of growth inhibition related to toxic compounds present in the water sample tested and may be a violation of 62-302.530(62) F.A.C..

(7) Algal Phytoplankton and Periphyton Assemblages

Methods: Periphyton were sampled at both control and test sites by incubating glass microscope slides in a standard periphytometer for 28 days (QA Rule SOP FS7210). Phytoplankton were sampled using a 1 L grab sample (QA Rule SOP FS7100). Periphyton and phytoplankton were subsampled and identified to the lowest practical level, usually species (FDEP SOPs AB03, AB03_1 and AB05).

Chlorophyll *a* Content: Chlorophyll *a* content is measured in both phytoplankton and periphyton samples to estimate algal biomass (FDEP SOP BB05). High algal biomass implies nutrient stress (Stevenson and Bahls 1999) and may be a violation of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C. and/or 62-302.530(48)(b) F.A.C..

Algal Density: Algal density is estimated as number of natural units/ml for phytoplankton samples and number of natural units/cm^2 for periphyton samples. Although algal density of a single site is highly variable and depends on a number of factors, comparison of algal density at a control site to algal density at a related test site gives a partial comparison of algal biomass at the two sites (Stevenson and Smol 2003).

Taxa richness: Taxa richness is the number of distinct algal taxa present in a sample. Extreme nutrient enrichment tends to reduce the number of different types of algae present in a sample because a few tolerant taxa tend to reproduce rapidly and constitute the majority of the cells present. However, moderate nutrient enrichment of nutrient poor waters may sometimes be correlated with increased algal taxa richness (Stevenson and Bahls 1999) as the algal community begins to respond to the increased input of nutrients.

Community Composition: Shifts in relative proportions of major groups of algae downstream of a point source, compared to upstream, control conditions, may indicate negative effects of a discharge (Stevenson and Bahls 1999) and may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

Shannon-Weaver Diversity Index: This index is specified in the Florida Administrative Code 62-302 as a measure of biological integrity. Low diversity scores are undesirable. Where diversity is low, only a few taxa are abundant as compared to an area where many taxa are present with more equitable abundance among taxa (Magurran 1988). Low diversity scores related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

(8) Benthic Macroinvertebrate Assemblages

Methods: Benthic macroinvertebrates were collected using two methods. Quantitative samples were collected from Hester-Dendy multi-plate samplers incubated for 28 days (QA Rule SOP FS7430). Qualitative collections are made using 20 dipnet sweeps (QA Rule SOP FS7420). Benthic macroinvertebrates were sorted and identified to the lowest practical taxonomic level, usually species (FDEP SOP IZ06).

Taxa richness: Taxa richness is the number of distinct macroinvertebrate taxa present in a sample. Stress, habitat destruction and pollution tend to reduce the number of different types of organisms present (Karr and Chu 1998). Decreases in taxa richness related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

Percent Contribution of Dominant Taxon: Percent contribution of the dominant taxon is calculated by dividing the number of individuals in the most abundant taxa by the total number of individuals counted. Percent contribution of the dominant taxon tends to increase with increasing perturbation (Plafkin *et al.*, 1989). Increases in the percent contribution of the dominant taxon related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C. and/or 62-302.530(48)(b) F.A.C..

Shannon-Weaver Diversity Index: This index is specified in the Florida Administrative Code 62-302 as a measure of biological integrity. Low diversity scores are undesirable. Where diversity is low, only a few taxa are abundant as compared to an area where many taxa are present in equitable abundance among taxa (Magurran 1988). A difference of 25% in Shannon-Weaver diversity between results from Hester-Dendy multiplate samplers incubated for 28 days at test and control sites constitutes a violation of 62-302.530(11) F.A.C..

The Florida Index: Some organisms become rare or absent as the intensity or duration of disturbance increases. The Florida Index assigns points to stream-dwelling macroinvertebrates based on their ranked sensitivity to pollution (Beck 1954). A site with a high Florida Index score is considered healthy (Ross 1990). Decreases in Florida Index points related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

Ephemeroptera/Plecoptera/Trichoptera (EPT) Taxa: This value is the number of EPT taxa present. More EPT taxa are usually present in unpolluted waters (Plafkin *et al.*, 1989, Wallace *et al.*, 1996). Decreases in the number of EPT taxa related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

Community Composition: Shifts in proportions of major groups of organisms downstream of a point source, compared to upstream, control conditions, may indicate negative effects of a discharge (Karr and Chu 1998). Shifts in community composition related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

Functional Feeding Groups: Environmental degradation may differentially affect groups of invertebrates based on how the group feeds (e.g. predators, deposit feeders, etc.). In Florida, pollution may be responsible for reducing the numbers of filter feeders (FDEP 1994) and shredders (EA Engineering 1994). Changes in the proportions of functional feeding groups related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

The Stream Condition Index (SCI): The SCI is a composite macroinvertebrate metric developed for Florida. Using data from qualitative dipnet samples, the SCI assigns points to seven parameters, depending on how closely each parameter approaches an expected reference condition (QA Rule SOP LT 7200). Points are summed to yield a final SCI score (range 7-33, depending on region and index period). Included in the calculation of SCI are taxa richness, number of EPT taxa, number of Chironomid taxa, percent contribution of the dominant taxon, the Florida Index, percent contribution of Diptera, and the percent contribution of suspension and filter feeders. Scores are broken into four ordinal groups: Excellent, Good, Poor and Very Poor. A decrease in ordinal SCI score from the Control to the Test site may be evidence of degradation related to a facility's effluent. An SCI score of "Poor" or "Very Poor" related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

(9) Statistical Comparisons

Statistical comparisons of the proportions of taxa, major groups or feeding groups were made using 95% confidence intervals on proportions. A 95% confidence interval is the range of values above and below a given proportion that has a 95% chance of containing the true proportion (Sokal and Rohlf 1995). If the 95% confidence intervals for two proportions do not overlap, then the proportion of X in sample 1 is significantly different from the proportion of X in sample 2 at $p<0.05$. A "$p<0.05$" level of significance means that there is less than a 5% chance that the true proportions in the two samples are the same. All comparisons that are labeled as significant in the text have a probability <0.05 that the proportions are the same.

Appendix 4

Chemical analysis of effluent and receiving water

DATE SAMPLED	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARKS	MDL	PQL
11/3/2003 9:15	29320	Bio-AGP/LimNut	Algal Growth Potential	45.7	mg DryWt/L	J	0.1	0.3
11/3/2003 9:15	29320	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton	6.8	mg/m2		0.17	0.51
11/3/2003 9:15	29320	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
11/3/2003 9:15	29320	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton	0	mg/m2		0.17	0.51
11/3/2003 9:15	29320	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
11/3/2003 9:15	29320	Bio-Invertebrates	Macroinvert-FW-Qual-Dipnetx20-# Taxa	17	# Taxa			
11/3/2003 9:15	29320	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa	29	#Taxa			
11/3/2003 9:15	29320	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa	15	#Taxa			
11/3/2003 9:15	29320	Nutrients-Liquid	Ammonia-N	0.1	mg N/L		0.01	0.02
11/3/2003 9:15	29320	Nutrients-Liquid	NO2NO3-N	0.78	mg N/L		0.004	0.01
11/3/2003 9:15	29320	Nutrients-Liquid	N_KJEL_TOT	0.9	mg N/L		0.06	0.2
11/3/2003 9:15	29320	Nutrients-Liquid	O-Phosphate-P	2	mg P/L		0.08	0.2
11/3/2003 9:15	29320	Nutrients-Liquid	Total-P	1.9	mg P/L		0.16	0.48
11/3/2003 9:15	29320 REP 1	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	20	# Taxa			
11/3/2003 9:15	29320 REP 2	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	25	# Taxa			
11/3/2003 9:15	29320 REP 3	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	21	# Taxa			
11/3/2003 10:00	29321	BNA-Water	1,2,4,5-Tetrachlorobenzene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	1,2,4-Trichlorobenzene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	1,2-Dichlorobenzene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	1,3,5-Trinitrobenzene	4.4	ug/L	U	4.4	18
11/3/2003 10:00	29321	BNA-Water	1,3-Dichlorobenzene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	1,3-Dinitrobenzene	2.2	ug/L	U	2.2	8.9
11/3/2003 10:00	29321	BNA-Water	1,4-Dichlorobenzene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	1,4-Naphthoquinone	22	ug/L	U	22	89
11/3/2003 10:00	29321	BNA-Water	1-Naphthylamine	11	ug/L	UJ	11	44
11/3/2003 10:00	29321	BNA-Water	2,3,4,6-Tetrachlorophenol	2.2	ug/L	UJ	2.2	8.9
11/3/2003 10:00	29321	BNA-Water	2,4,5-Trichlorophenol	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	2,4,6-Trichlorophenol	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	2,4-Dichlorophenol	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	2,4-Dimethylphenol	56	ug/L	U	56	220
11/3/2003 10:00	29321	BNA-Water	2,4-Dinitrophenol	17	ug/L	U	17	67
11/3/2003 10:00	29321	BNA-Water	2,4-Dinitrotoluene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	2,6-Dichlorophenol	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	2,6-Dinitrotoluene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	2-Acetylaminofluorene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	2-Chloronaphthalene	1.1	ug/L	U	1.1	4.4

DATE SAMPLED	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARKS	MDL	PQL
11/3/2003 10:00	29321	BNA-Water	2-Chlorophenol	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	2-Methyl-4,6-dinitrophenol	3.3	ug/L	U	3.3	13
11/3/2003 10:00	29321	BNA-Water	2-Methylnaphthalene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	2-Naphthylamine	11	ug/L	U	11	44
11/3/2003 10:00	29321	BNA-Water	2-Nitroaniline	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	2-Nitrophenol	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	2-Picoline	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	3,3'-Dichlorobenzidine	44	ug/L	U	44	180
11/3/2003 10:00	29321	BNA-Water	3,3'-Dimethylbenzidine	22	ug/L	U	22	89
11/3/2003 10:00	29321	BNA-Water	3-Methylcholanthrene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	3-Nitroaniline	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	4,4'-DDD	1.7	ug/L	U	1.7	6.7
11/3/2003 10:00	29321	BNA-Water	4,4'-DDE	1.7	ug/L	U	1.7	6.7
11/3/2003 10:00	29321	BNA-Water	4,4'-DDT	1.7	ug/L	U	1.7	6.7
11/3/2003 10:00	29321	BNA-Water	4-Aminobiphenyl	4.4	ug/L	UJ	4.4	18
11/3/2003 10:00	29321	BNA-Water	4-Bromophenyl phenyl ether	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	4-Chloro-3-methylphenol	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	4-Chloroaniline	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	4-Chlorophenyl phenyl ether	2.2	ug/L	U	2.2	8.9
11/3/2003 10:00	29321	BNA-Water	4-Nitroaniline	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	4-Nitrophenol	17	ug/L	U	17	67
11/3/2003 10:00	29321	BNA-Water	5-Nitro-o-toluidine	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	7,12-Dimethylbenz(a)anthracene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Acenaphthene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Acenaphthylene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Acetophenone	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Aldrin	1.7	ug/L	UJ	1.7	6.7
11/3/2003 10:00	29321	BNA-Water	Aniline	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Anthracene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Azobenzene/1,2-Diphenylhydrazine	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Benzidine	110	ug/L	U	110	440
11/3/2003 10:00	29321	BNA-Water	Benzo(a)anthracene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Benzo(a)pyrene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Benzo(b)fluoranthene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Benzo(g,h,i)perylene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Benzo(k)fluoranthene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Benzyl alcohol	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Bis(2-chloroethoxy)methane	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Bis(2-chloroethyl)ether	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Bis(2-chloroisopropyl)ether	3.3	ug/L	U	3.3	13
11/3/2003 10:00	29321	BNA-Water	Bis(2-ethylhexyl)phthalate	17	ug/L	U	17	67
11/3/2003 10:00	29321	BNA-Water	Butyl benzyl phthalate	5.6	ug/L	U	5.6	22
11/3/2003 10:00	29321	BNA-Water	Chrysene	1.1	ug/L	U	1.1	4.4

DATE SAMPLED	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARKS	MDL	PQL
11/3/2003 10:00	29321	BNA-Water	Di-n-butyl phthalate	5.6	ug/L	U	5.6	22
11/3/2003 10:00	29321	BNA-Water	Di-n-octyl phthalate	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Dibenzo(a,h)anthracene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Dibenzofuran	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Dieldrin	1.7	ug/L	U	1.7	6.7
11/3/2003 10:00	29321	BNA-Water	Diethyl phthalate	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Dimethyl phthalate	56	ug/L	U	56	220
11/3/2003 10:00	29321	BNA-Water	Dimethylaminoazobenzene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Dinoseb	4.4	ug/L	UJ	4.4	18
11/3/2003 10:00	29321	BNA-Water	Diphenylamine	3.3	ug/L	U	3.3	13
11/3/2003 10:00	29321	BNA-Water	Endosulfan I	4.4	ug/L	U	4.4	18
11/3/2003 10:00	29321	BNA-Water	Endosulfan II	4.4	ug/L	U	4.4	18
11/3/2003 10:00	29321	BNA-Water	Endosulfan sulfate	1.7	ug/L	U	1.7	6.7
11/3/2003 10:00	29321	BNA-Water	Endrin	1.7	ug/L	U	1.7	6.7
11/3/2003 10:00	29321	BNA-Water	Endrin aldehyde	4.4	ug/L	U	4.4	18
11/3/2003 10:00	29321	BNA-Water	Ethyl methanesulfonate	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Fluoranthene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Fluorene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Heptachlor	1.7	ug/L	U	1.7	6.7
11/3/2003 10:00	29321	BNA-Water	Heptachlor epoxide	1.7	ug/L	U	1.7	6.7
11/3/2003 10:00	29321	BNA-Water	Hexachlorobenzene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Hexachlorobutadiene	3.3	ug/L	UJ	3.3	13
11/3/2003 10:00	29321	BNA-Water	Hexachlorocyclopentadiene	3.3	ug/L	UJ	3.3	13
11/3/2003 10:00	29321	BNA-Water	Hexachloroethane	3.3	ug/L	U	3.3	13
11/3/2003 10:00	29321	BNA-Water	Hexachloropropene	2.2	ug/L	UJ	2.2	8.9
11/3/2003 10:00	29321	BNA-Water	Indeno(1,2,3-cd)pyrene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Isophorone	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Isosafrole	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Methapyrilene	4.4	ug/L	U	4.4	18
11/3/2003 10:00	29321	BNA-Water	Methyl methanesulfonate	1.1	ug/L	UJ	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	N-Nitrosodi-n-butylamine	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	N-Nitrosodi-n-propylamine	2.2	ug/L	U	2.2	8.9
11/3/2003 10:00	29321	BNA-Water	N-Nitrosodiethylamine	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	N-Nitrosodimethylamine	2.2	ug/L	U	2.2	8.9
11/3/2003 10:00	29321	BNA-Water	N-Nitrosodiphenylamine	3.3	ug/L	UJ	3.3	13
11/3/2003 10:00	29321	BNA-Water	N-Nitrosomethylethylamine	2.2	ug/L	U	2.2	8.9
11/3/2003 10:00	29321	BNA-Water	N-Nitrosomorpholine	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	N-Nitrosopiperidine	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	N-Nitrosopyrrolidine	2.2	ug/L	U	2.2	8.9
11/3/2003 10:00	29321	BNA-Water	Naphthalene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Nitrobenzene	2.2	ug/L	U	2.2	8.9
11/3/2003 10:00	29321	BNA-Water	Nitroquinoline-1-oxide	22	ug/L	UJ	22	89
11/3/2003 10:00	29321	BNA-Water	Pentachlorobenzene	1.1	ug/L	U	1.1	4.4

DATE SAMPLED	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARKS	MDL	PQL
11/3/2003 10:00	29321	BNA-Water	Pentachloroethane	56	ug/L	U	56	220
11/3/2003 10:00	29321	BNA-Water	Pentachloronitrobenzene	1.1	ug/L	UJ	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Pentachlorophenol	3.3	ug/L	UJ	3.3	13
11/3/2003 10:00	29321	BNA-Water	Phenacetin	4.4	ug/L	U	4.4	13
11/3/2003 10:00	29321	BNA-Water	Phenanthrene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Phenol	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Pyrene	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	Pyridine	4.4	ug/L	U	4.4	18
11/3/2003 10:00	29321	BNA-Water	Safrole	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	BNA-Water	alpha-BHC	1.7	ug/L	U	1.7	6.7
11/3/2003 10:00	29321	BNA-Water	beta-BHC	1.7	ug/L	U	1.7	6.7
11/3/2003 10:00	29321	BNA-Water	delta-BHC	1.7	ug/L	U	1.7	6.7
11/3/2003 10:00	29321	BNA-Water	gamma-BHC	1.7	ug/L	U	1.7	6.7
11/3/2003 10:00	29321	BNA-Water	m,p-Cresols	2.2	ug/L	U	2.2	8.9
11/3/2003 10:00	29321	BNA-Water	o-Cresol	2.2	ug/L	U	2.2	8.9
11/3/2003 10:00	29321	BNA-Water	o-Toluidine	1.1	ug/L	U	1.1	4.4
11/3/2003 10:00	29321	GC-Water	Alachlor	0.66	ug/L	U	0.66	2.64
11/3/2003 10:00	29321	GC-Water	Ametryn	0.055	ug/L	U	0.055	0.22
11/3/2003 10:00	29321	GC-Water	Atrazine	0.055	ug/L	U	0.055	0.22
11/3/2003 10:00	29321	GC-Water	Azinphos Methyl	0.055	ug/L	U	0.055	0.22
11/3/2003 10:00	29321	GC-Water	Bromacil	0.22	ug/L	U	0.22	0.88
11/3/2003 10:00	29321	GC-Water	Butylate	0.22	ug/L	U	0.22	0.88
11/3/2003 10:00	29321	GC-Water	Chlorpyrifos Ethyl	0.055	ug/L	U	0.055	0.22
11/3/2003 10:00	29321	GC-Water	Chlorpyrifos Methyl	0.11	ug/L	U	0.11	0.44
11/3/2003 10:00	29321	GC-Water	Diazinon	0.055	ug/L	U	0.055	0.22
11/3/2003 10:00	29321	GC-Water	Ethion	0.055	ug/L	U	0.055	0.22
11/3/2003 10:00	29321	GC-Water	Ethoprop	0.11	ug/L	U	0.11	0.44
11/3/2003 10:00	29321	GC-Water	Fenamiphos	0.22	ug/L	U	0.22	0.88
11/3/2003 10:00	29321	GC-Water	Fonofos	0.11	ug/L	U	0.11	0.44
11/3/2003 10:00	29321	GC-Water	Hexazinone	0.11	ug/L	U	0.11	0.44
11/3/2003 10:00	29321	GC-Water	Malathion	0.16	ug/L	U	0.16	0.64
11/3/2003 10:00	29321	GC-Water	Metalaxyl	0.27	ug/L	U	0.27	1.08
11/3/2003 10:00	29321	GC-Water	Metolachlor	0.55	ug/L	U	0.55	2.2
11/3/2003 10:00	29321	GC-Water	Metribuzin	0.11	ug/L	U	0.11	0.44
11/3/2003 10:00	29321	GC-Water	Mevinphos	0.22	ug/L	U	0.22	0.88
11/3/2003 10:00	29321	GC-Water	Naled	0.88	ug/L	U	0.88	3.52
11/3/2003 10:00	29321	GC-Water	Norflurazon	0.11	ug/L	U	0.11	0.44
11/3/2003 10:00	29321	GC-Water	Parathion Ethyl	0.16	ug/L	U	0.16	0.64
11/3/2003 10:00	29321	GC-Water	Parathion Methyl	0.11	ug/L	U	0.11	0.44
11/3/2003 10:00	29321	GC-Water	Phorate	0.055	ug/L	U	0.055	0.22
11/3/2003 10:00	29321	GC-Water	Prometryn	0.16	ug/L	U	0.16	0.64
11/3/2003 10:00	29321	GC-Water	Simazine	0.055	ug/L	U	0.055	0.22
11/3/2003 10:00	29321	Metals-Water	Aluminum	7	ug/L	U	7	28

DATE SAMPLED	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARKS	MDL	PQL
11/3/2003 10:00	29321	Metals-Water	Arsenic	7.7	ug/L	U	7.7	31
11/3/2003 10:00	29321	Metals-Water	Cadmium	0.025	ug/L	U	0.025	0.1
11/3/2003 10:00	29321	Metals-Water	Calcium	0.1	mg/L	U	0.1	0.4
11/3/2003 10:00	29321	Metals-Water	Chromium	3	ug/L	U	3	12
11/3/2003 10:00	29321	Metals-Water	Copper	1	ug/L	U	1	4
11/3/2003 10:00	29321	Metals-Water	Iron	15	ug/L	U	15	60
11/3/2003 10:00	29321	Metals-Water	Lead	0.05	ug/L	U	0.05	0.2
11/3/2003 10:00	29321	Metals-Water	Magnesium	0.02	mg/L	U	0.02	0.08
11/3/2003 10:00	29321	Metals-Water	Nickel	3	ug/L	U	3	12
11/3/2003 10:00	29321	Metals-Water	Selenium	1	ug/L	U	1	4
11/3/2003 10:00	29321	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
11/3/2003 10:00	29321	Metals-Water	Zinc	4	ug/L	U	4	16
11/3/2003 10:00	29321	Nutrients-Liquid	Ammonia-N	0.01	mg N/L	U	0.01	0.02
11/3/2003 10:00	29321	Nutrients-Liquid	NO2NO3-N	0.012	mg N/L		0.004	0.01
11/3/2003 10:00	29321	Nutrients-Liquid	N_KJEL_TOT	0.06	mg N/L	U	0.06	0.2
11/3/2003 10:00	29321	Nutrients-Liquid	O-Phosphate-P	0.004	mg P/L	U	0.004	0.01
11/3/2003 10:00	29321	Nutrients-Liquid	Total-P	0.02	mg P/L	U	0.02	0.06
11/3/2003 10:00	29321	Overflow	Oil and Grease	0.55	mg/L	U		
11/3/2003 10:00	29321	VOC-Water	Bromodichloromethane	0.2	ug/L	U	0.2	1
11/3/2003 10:00	29321	VOC-Water	Bromoform	0.2	ug/L	U	0.2	1
11/3/2003 10:00	29321	VOC-Water	Chloroform	0.5	ug/L	U	0.5	2.5
11/3/2003 10:00	29321	VOC-Water	Dibromochloromethane	0.2	ug/L	U	0.2	1
11/3/2003 10:30	29356	Metals-Water	Aluminum	7	ug/L	U	7	28
11/3/2003 10:30	29356	Metals-Water	Arsenic	6	ug/L	U	6	24
11/3/2003 10:30	29356	Metals-Water	Cadmium	0.025	ug/L	U	0.025	0.1
11/3/2003 10:30	29356	Metals-Water	Calcium	0.05	mg/L	U	0.05	0.2
11/3/2003 10:30	29356	Metals-Water	Chromium	6	ug/L	U	6	24
11/3/2003 10:30	29356	Metals-Water	Copper	2.6	ug/L	I	1	4
11/3/2003 10:30	29356	Metals-Water	Iron	101	ug/L		15	60
11/3/2003 10:30	29356	Metals-Water	Lead	0.091	ug/L	I	0.05	0.2
11/3/2003 10:30	29356	Metals-Water	Magnesium	0.02	mg/L	U	0.02	0.08
11/3/2003 10:30	29356	Metals-Water	Nickel	47	ug/L		3	12
11/3/2003 10:30	29356	Metals-Water	Selenium	1	ug/L	U	1	4
11/3/2003 10:30	29356	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
11/3/2003 10:30	29356	Metals-Water	Zinc	4	ug/L	U	4	16
11/3/2003 10:30	29356	Nutrients-Liquid	Ammonia-N	0.01	mg N/L	U	0.01	0.02
11/3/2003 10:30	29356	Nutrients-Liquid	NO2NO3-N	0.041	mg N/L		0.004	0.01
11/3/2003 10:30	29356	Nutrients-Liquid	N_KJEL_TOT	0.06	mg N/L	U	0.06	0.2
11/3/2003 10:30	29356	Nutrients-Liquid	O-Phosphate-P		mg P/L			
11/3/2003 10:30	29356	Nutrients-Liquid	Total-P	0.02	mg P/L	U	0.02	0.06
11/3/2003 10:35	29319	Bio-AGP/LimNut	Algal Growth Potential	59.8	mg DryWt/L	J	0.1	0.3
11/3/2003 10:35	29319	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton	8	mg/m2		0.17	0.51
11/3/2003 10:35	29319	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6

DATE SAMPLED	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARKS	MDL	PQL
11/3/2003 10:35	29319	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton	0	mg/m2		0.17	0.51
11/3/2003 10:35	29319	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
11/3/2003 10:35	29319	Bio-Invertebrates	Macroinvert-FW-Qual-Dipnetx20-# Taxa	22	# Taxa			
11/3/2003 10:35	29319	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa	21	#Taxa			
11/3/2003 10:35	29319	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa	14	#Taxa			
11/3/2003 10:35	29319	Nutrients-Liquid	Ammonia-N	0.51	mg N/L		0.02	0.04
11/3/2003 10:35	29319	Nutrients-Liquid	NO2NO3-N	0.71	mg N/L		0.004	0.01
11/3/2003 10:35	29319	Nutrients-Liquid	N_KJEL_TOT	1.4	mg N/L	A	0.06	0.2
11/3/2003 10:35	29319	Nutrients-Liquid	O-Phosphate-P	0.21	mg P/L		0.008	0.02
11/3/2003 10:35	29319	Nutrients-Liquid	Total-P	0.25	mg P/L	A	0.02	0.06
11/3/2003 10:35	29319 REP 1	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	18	# Taxa			
11/3/2003 10:35	29319 REP 2	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	11	# Taxa			
11/3/2003 10:35	29319 REP 3	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	10	# Taxa			
11/3/2003 10:35	TRIP BLANK	VOC-Water	1,1,1-Trichloroethane	0.2	ug/L	U	0.2	1
11/3/2003 10:35	TRIP BLANK	VOC-Water	1,1,2,2-Tetrachloroethane	0.2	ug/L	U	0.2	1
11/3/2003 10:35	TRIP BLANK	VOC-Water	1,1,2-Trichloroethane	0.2	ug/L	U	0.2	1
11/3/2003 10:35	TRIP BLANK	VOC-Water	1,1-Dichloroethane	0.2	ug/L	U	0.2	1
11/3/2003 10:35	TRIP BLANK	VOC-Water	1,1-Dichloroethene	0.5	ug/L	U	0.5	1
11/3/2003 10:35	TRIP BLANK	VOC-Water	1,2-Dichlorobenzene	0.2	ug/L	U	0.2	1
11/3/2003 10:35	TRIP BLANK	VOC-Water	1,2-Dichloroethane	0.2	ug/L	U	0.2	1
11/3/2003 10:35	TRIP BLANK	VOC-Water	1,2-Dichloropropane	0.2	ug/L	U	0.2	1
11/3/2003 10:35	TRIP BLANK	VOC-Water	1,3-Dichlorobenzene	0.2	ug/L	U	0.2	1
11/3/2003 10:35	TRIP BLANK	VOC-Water	1,4-Dichlorobenzene	0.2	ug/L	U	0.2	1
11/3/2003 10:35	TRIP BLANK	VOC-Water	2-Chloroethylvinyl ether	0.5	ug/L	U	0.5	2
11/3/2003 10:35	TRIP BLANK	VOC-Water	Benzene	0.5	ug/L	U	0.5	2
11/3/2003 10:35	TRIP BLANK	VOC-Water	Bromodichloromethane	0.2	ug/L	U	0.2	1
11/3/2003 10:35	TRIP BLANK	VOC-Water	Bromoform	0.2	ug/L	U	0.2	1
11/3/2003 10:35	TRIP BLANK	VOC-Water	Bromomethane	0.5	ug/L	U	0.5	2
11/3/2003 10:35	TRIP BLANK	VOC-Water	Carbon tetrachloride	0.5	ug/L	U	0.5	1
11/3/2003 10:35	TRIP BLANK	VOC-Water	Chlorobenzene	0.2	ug/L	U	0.2	1
11/3/2003 10:35	TRIP BLANK	VOC-Water	Chloroethane	0.5	ug/L	U	0.5	2
11/3/2003 10:35	TRIP BLANK	VOC-Water	Chloroform	0.2	ug/L	U	0.2	1
11/3/2003 10:35	TRIP BLANK	VOC-Water	Chloromethane	0.5	ug/L	U	0.5	2
11/3/2003 10:35	TRIP BLANK	VOC-Water	Dibromochloromethane	0.2	ug/L	U	0.2	1
11/3/2003 10:35	TRIP BLANK	VOC-Water	Ethylbenzene	0.5	ug/L	U	0.5	2
11/3/2003 10:35	TRIP BLANK	VOC-Water	Methylene chloride	2	ug/L	U	2	2
11/3/2003 10:35	TRIP BLANK	VOC-Water	Tetrachloroethene	0.5	ug/L	U	0.5	1
11/3/2003 10:35	TRIP BLANK	VOC-Water	Toluene	0.5	ug/L	U	0.5	2
11/3/2003 10:35	TRIP BLANK	VOC-Water	Trichloroethene	0.5	ug/L	U	0.5	1
11/3/2003 10:35	TRIP BLANK	VOC-Water	Trichlorofluoromethane	0.2	ug/L	U	0.2	1
11/3/2003 10:35	TRIP BLANK	VOC-Water	Vinyl chloride	0.5	ug/L	U	0.5	2
11/3/2003 10:35	TRIP BLANK	VOC-Water	cis-1,3-Dichloropropene	0.2	ug/L	U	0.2	1
11/3/2003 10:35	TRIP BLANK	VOC-Water	m,p-Xylene	0.5	ug/L	U	0.5	2

DATE SAMPLED	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARKS	MDL	PQL
11/3/2003 10:35	TRIP BLANK	VOC-Water	o-Xylene	0.5	ug/L	U	0.5	2
11/3/2003 10:35	TRIP BLANK	VOC-Water	trans-1,2-Dichloroethene	0.2	ug/L	U	0.2	1
11/3/2003 10:35	TRIP BLANK	VOC-Water	trans-1,3-Dichloropropene	0.2	ug/L	U	0.2	1
11/3/2003 11:35	29318	BNA-Water	1,2,4,5-Tetrachlorobenzene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	1,2,4-Trichlorobenzene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	1,2-Dichlorobenzene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	1,3,5-Trinitrobenzene	3.8	ug/L	U	3.8	15
11/3/2003 11:35	29318	BNA-Water	1,3-Dichlorobenzene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	1,3-Dinitrobenzene	1.9	ug/L	U	1.9	7.7
11/3/2003 11:35	29318	BNA-Water	1,4-Dichlorobenzene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	1,4-Naphthoquinone	19	ug/L	U	19	77
11/3/2003 11:35	29318	BNA-Water	1-Naphthylamine	9.6	ug/L	UJ	9.6	38
11/3/2003 11:35	29318	BNA-Water	2,3,4,6-Tetrachlorophenol	1.9	ug/L	UJ	1.9	7.7
11/3/2003 11:35	29318	BNA-Water	2,4,5-Trichlorophenol	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	2,4,6-Trichlorophenol	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	2,4-Dichlorophenol	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
11/3/2003 11:35	29318	BNA-Water	2,4-Dinitrophenol	14	ug/L	U	14	58
11/3/2003 11:35	29318	BNA-Water	2,4-Dinitrotoluene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	2,6-Dichlorophenol	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	2,6-Dinitrotoluene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	2-Acetylaminofluorene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	2-Chloronaphthalene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	2-Chlorophenol	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	12
11/3/2003 11:35	29318	BNA-Water	2-Methylnaphthalene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	2-Naphthylamine	9.6	ug/L	U	9.6	38
11/3/2003 11:35	29318	BNA-Water	2-Nitroaniline	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	2-Nitrophenol	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	2-Picoline	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
11/3/2003 11:35	29318	BNA-Water	3,3'-Dimethylbenzidine	19	ug/L	U	19	77
11/3/2003 11:35	29318	BNA-Water	3-Methylcholanthrene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	3-Nitroaniline	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.8
11/3/2003 11:35	29318	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.8
11/3/2003 11:35	29318	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.8
11/3/2003 11:35	29318	BNA-Water	4-Aminobiphenyl	3.8	ug/L	UJ	3.8	15
11/3/2003 11:35	29318	BNA-Water	4-Bromophenyl phenyl ether	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	4-Chloro-3-methylphenol	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	4-Chloroaniline	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.7
11/3/2003 11:35	29318	BNA-Water	4-Nitroaniline	0.96	ug/L	U	0.96	3.8

DATE SAMPLED	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARKS	MDL	PQL
11/3/2003 11:35	29318	BNA-Water	4-Nitrophenol	14	ug/L	U	14	58
11/3/2003 11:35	29318	BNA-Water	5-Nitro-o-toluidine	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	7,12-Dimethylbenz(a)anthracene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Acenaphthene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Acenaphthylene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Acetophenone	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Aldrin	1.4	ug/L	UJ	1.4	5.8
11/3/2003 11:35	29318	BNA-Water	Aniline	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Anthracene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Azobenzene/1,2-Diphenylhydrazine	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Benzidine	96	ug/L	U	96	380
11/3/2003 11:35	29318	BNA-Water	Benzo(a)anthracene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Benzo(a)pyrene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Benzo(b)fluoranthene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Benzo(g,h,i)perylene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Benzo(k)fluoranthene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Benzyl alcohol	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Bis(2-chloroethoxy)methane	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Bis(2-chloroethyl)ether	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	12
11/3/2003 11:35	29318	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	58
11/3/2003 11:35	29318	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19
11/3/2003 11:35	29318	BNA-Water	Chrysene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
11/3/2003 11:35	29318	BNA-Water	Di-n-octyl phthalate	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Dibenzo(a,h)anthracene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Dibenzofuran	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.8
11/3/2003 11:35	29318	BNA-Water	Diethyl phthalate	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
11/3/2003 11:35	29318	BNA-Water	Dimethylaminoazobenzene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Dinoseb	3.8	ug/L	UJ	3.8	15
11/3/2003 11:35	29318	BNA-Water	Diphenylamine	2.9	ug/L	U	2.9	12
11/3/2003 11:35	29318	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
11/3/2003 11:35	29318	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
11/3/2003 11:35	29318	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.8
11/3/2003 11:35	29318	BNA-Water	Endrin	1.4	ug/L	U	1.4	5.8
11/3/2003 11:35	29318	BNA-Water	Endrin aldehyde	3.8	ug/L	U	3.8	15
11/3/2003 11:35	29318	BNA-Water	Ethyl methanesulfonate	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Fluoranthene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Fluorene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.8
11/3/2003 11:35	29318	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.8

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11/3/2003 11:35	29318	BNA-Water	Hexachlorobenzene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Hexachlorobutadiene	2.9	ug/L	UJ	2.9	12
11/3/2003 11:35	29318	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	UJ	2.9	12
11/3/2003 11:35	29318	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	12
11/3/2003 11:35	29318	BNA-Water	Hexachloropropene	1.9	ug/L	UJ	1.9	7.7
11/3/2003 11:35	29318	BNA-Water	Indeno(1,2,3-cd)pyrene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Isophorone	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Isosafrole	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Methapyrilene	3.8	ug/L	U	3.8	15
11/3/2003 11:35	29318	BNA-Water	Methyl methanesulfonate	0.96	ug/L	UJ	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	N-Nitrosodi-n-butylamine	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.7
11/3/2003 11:35	29318	BNA-Water	N-Nitrosodiethylamine	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.7
11/3/2003 11:35	29318	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	UJ	2.9	12
11/3/2003 11:35	29318	BNA-Water	N-Nitrosomethylethylamine	1.9	ug/L	U	1.9	7.7
11/3/2003 11:35	29318	BNA-Water	N-Nitrosomorpholine	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	N-Nitrosopiperidine	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	N-Nitrosopyrrolidine	1.9	ug/L	U	1.9	7.7
11/3/2003 11:35	29318	BNA-Water	Naphthalene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.7
11/3/2003 11:35	29318	BNA-Water	Nitroquinoline-1-oxide	19	ug/L	UJ	19	77
11/3/2003 11:35	29318	BNA-Water	Pentachlorobenzene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Pentachloroethane	48	ug/L	U	48	190
11/3/2003 11:35	29318	BNA-Water	Pentachloronitrobenzene	0.96	ug/L	UJ	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Pentachlorophenol	2.9	ug/L	UJ	2.9	12
11/3/2003 11:35	29318	BNA-Water	Phenacetin	3.8	ug/L	U	3.8	12
11/3/2003 11:35	29318	BNA-Water	Phenanthrene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Phenol	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Pyrene	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	Pyridine	3.8	ug/L	U	3.8	15
11/3/2003 11:35	29318	BNA-Water	Safrole	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.8
11/3/2003 11:35	29318	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.8
11/3/2003 11:35	29318	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.8
11/3/2003 11:35	29318	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.8
11/3/2003 11:35	29318	BNA-Water	m,p-Cresols	1.9	ug/L	U	1.9	7.7
11/3/2003 11:35	29318	BNA-Water	o-Cresol	1.9	ug/L	U	1.9	7.7
11/3/2003 11:35	29318	BNA-Water	o-Toluidine	0.96	ug/L	U	0.96	3.8
11/3/2003 11:35	29318	Bio-AGP/LimNut	Algal Growth Potential	13.7	mg DryWt/L		0.1	0.3
11/3/2003 11:35	29318	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
11/3/2003 11:35	29318	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
11/3/2003 11:35	29318	Bio-Toxicology	Bioassay-Acute-Screen-FW-C.dubia, LC50	100	LC50	L		

DATE SAMPLED	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARKS	MDL	PQL
11/3/2003 11:35	29318	Bio-Toxicology	Bioassay-Acute-Screen-FW-Fish, LC50	100	LC50	L		
11/3/2003 11:35	29318	GC-Water	Alachlor	0.58	ug/L	U	0.58	2.32
11/3/2003 11:35	29318	GC-Water	Ametryn	0.048	ug/L	U	0.048	0.192
11/3/2003 11:35	29318	GC-Water	Atrazine	0.048	ug/L	U	0.048	0.192
11/3/2003 11:35	29318	GC-Water	Azinphos Methyl	0.048	ug/L	U	0.048	0.192
11/3/2003 11:35	29318	GC-Water	Bromacil	0.19	ug/L	U	0.19	0.76
11/3/2003 11:35	29318	GC-Water	Butylate	0.19	ug/L	U	0.19	0.76
11/3/2003 11:35	29318	GC-Water	Chlorpyrifos Ethyl	0.048	ug/L	U	0.048	0.192
11/3/2003 11:35	29318	GC-Water	Chlorpyrifos Methyl	0.096	ug/L	U	0.096	0.384
11/3/2003 11:35	29318	GC-Water	Diazinon	0.11	ug/L	I	0.048	0.192
11/3/2003 11:35	29318	GC-Water	Ethion	0.048	ug/L	U	0.048	0.192
11/3/2003 11:35	29318	GC-Water	Ethoprop	0.096	ug/L	U	0.096	0.384
11/3/2003 11:35	29318	GC-Water	Fenamiphos	0.19	ug/L	U	0.19	0.76
11/3/2003 11:35	29318	GC-Water	Fonofos	0.096	ug/L	U	0.096	0.384
11/3/2003 11:35	29318	GC-Water	Hexazinone	0.096	ug/L	U	0.096	0.384
11/3/2003 11:35	29318	GC-Water	Malathion	0.14	ug/L	U	0.14	0.56
11/3/2003 11:35	29318	GC-Water	Metalaxyl	0.24	ug/L	U	0.24	0.96
11/3/2003 11:35	29318	GC-Water	Metolachlor	0.48	ug/L	U	0.48	1.92
11/3/2003 11:35	29318	GC-Water	Metribuzin	0.096	ug/L	U	0.096	0.384
11/3/2003 11:35	29318	GC-Water	Mevinphos	0.19	ug/L	U	0.19	0.76
11/3/2003 11:35	29318	GC-Water	Naled	0.77	ug/L	U	0.77	3.08
11/3/2003 11:35	29318	GC-Water	Norflurazon	0.096	ug/L	U	0.096	0.384
11/3/2003 11:35	29318	GC-Water	Parathion Ethyl	0.14	ug/L	U	0.14	0.56
11/3/2003 11:35	29318	GC-Water	Parathion Methyl	0.096	ug/L	U	0.096	0.384
11/3/2003 11:35	29318	GC-Water	Phorate	0.048	ug/L	U	0.048	0.192
11/3/2003 11:35	29318	GC-Water	Prometryn	0.14	ug/L	U	0.14	0.56
11/3/2003 11:35	29318	GC-Water	Simazine	0.048	ug/L	U	0.048	0.192
11/3/2003 11:35	29318	Metals-Water	Aluminum	43	ug/L	A	7	28
11/3/2003 11:35	29318	Metals-Water	Arsenic	7.7	ug/L	U	7.7	31
11/3/2003 11:35	29318	Metals-Water	Cadmium	0.072	ug/L	I	0.025	0.1
11/3/2003 11:35	29318	Metals-Water	Calcium	34.2	mg/L	A	0.05	0.2
11/3/2003 11:35	29318	Metals-Water	Chromium	3	ug/L	U	3	12
11/3/2003 11:35	29318	Metals-Water	Copper	3.5	ug/L	I	1	4
11/3/2003 11:35	29318	Metals-Water	Iron	65	ug/L	A	15	60
11/3/2003 11:35	29318	Metals-Water	Lead	0.38	ug/L	A	0.05	0.2
11/3/2003 11:35	29318	Metals-Water	Magnesium	6.1	mg/L	A	0.02	0.08
11/3/2003 11:35	29318	Metals-Water	Nickel	3	ug/L	U	3	12
11/3/2003 11:35	29318	Metals-Water	Selenium	1	ug/L	U	1	4
11/3/2003 11:35	29318	Metals-Water	Silver	0.023	ug/L	I	0.02	0.08
11/3/2003 11:35	29318	Metals-Water	Zinc	72	ug/L	A	4	16
11/3/2003 11:35	29318	Nutrients-Liquid	Ammonia-N	0.042	mg N/L	A	0.01	0.02
11/3/2003 11:35	29318	Nutrients-Liquid	Color		PCU			
11/3/2003 11:35	29318	Nutrients-Liquid	NO2NO3-N	0.44	mg N/L		0.004	0.01

DATE SAMPLED	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARKS	MDL	PQL
11/3/2003 11:35	29318	Nutrients-Liquid	N_KJEL_TOT	0.74	mg N/L		0.06	0.2
11/3/2003 11:35	29318	Nutrients-Liquid	O-Phosphate-P	2.7	mg P/L		0.08	0.2
11/3/2003 11:35	29318	Nutrients-Liquid	Organic Carbon	7.5	mg C/L		1	5
11/3/2003 11:35	29318	Nutrients-Liquid	TSS		mg/L			
11/3/2003 11:35	29318	Nutrients-Liquid	Total-P	2.6	mg P/L		0.4	1.2
11/3/2003 11:35	29318	Nutrients-Liquid	Turbidity		NTU			
11/3/2003 11:35	29318	Overflow	Oil and Grease	1.1	mg/L	I		
11/3/2003 11:35	29318	VOC-Water	Bromodichloromethane	0.2	ug/L	U	0.2	1
11/3/2003 11:35	29318	VOC-Water	Bromoform	0.2	ug/L	U	0.2	1
11/3/2003 11:35	29318	VOC-Water	Chloroform	0.5	ug/L	U	0.5	2.5
11/3/2003 11:35	29318	VOC-Water	Dibromochloromethane	0.2	ug/L	U	0.2	1
11/4/2003 12:40	29357	Metals-Water	Aluminum	27	ug/L	I	7	28
11/4/2003 12:40	29357	Metals-Water	Arsenic	6	ug/L	U	6	24
11/4/2003 12:40	29357	Metals-Water	Cadmium	0.063	ug/L	I	0.025	0.1
11/4/2003 12:40	29357	Metals-Water	Calcium	33.9	mg/L		0.05	0.2
11/4/2003 12:40	29357	Metals-Water	Chromium	6	ug/L	U	6	24
11/4/2003 12:40	29357	Metals-Water	Copper	2.9	ug/L	I	1	4
11/4/2003 12:40	29357	Metals-Water	Iron	53	ug/L	I	15	60
11/4/2003 12:40	29357	Metals-Water	Lead	0.35	ug/L		0.05	0.2
11/4/2003 12:40	29357	Metals-Water	Magnesium	6.1	mg/L		0.02	0.08
11/4/2003 12:40	29357	Metals-Water	Nickel	3	ug/L	U	3	12
11/4/2003 12:40	29357	Metals-Water	Selenium	1	ug/L	U	1	4
11/4/2003 12:40	29357	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
11/4/2003 12:40	29357	Metals-Water	Zinc	60	ug/L		4	16
11/4/2003 12:40	29357	Nutrients-Liquid	Ammonia-N	0.032	mg N/L	I	0.02	0.04
11/4/2003 12:40	29357	Nutrients-Liquid	NO2NO3-N	0.55	mg N/L	A	0.04	0.1
11/4/2003 12:40	29357	Nutrients-Liquid	N_KJEL_TOT	0.62	mg N/L		0.06	0.2
11/4/2003 12:40	29357	Nutrients-Liquid	O-Phosphate-P		mg P/L			
11/4/2003 12:40	29357	Nutrients-Liquid	Total-P	2.5	mg P/L		0.2	0.6

Field ID	Sampling Location
29318	Effluent
29319	Control Site
29320	Test Site
29321	Field Blank
29356	Field Blank
29357	Composite effluent sample

Appendix 5

Typical Values for Selected Parameters in Florida Waters

Percentile Distribution (1617 stations)

CONTROL SITE

Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%	Measured
Periphyton Chlorophyll *a* (mg/m^2)	0.31	0.43	0.77	1.04	2.16	2.94	**6.45**	10.51	17.00	39.51	60.85	**8.00**
Hester-Dendy Diversity	**0.84**	2.12	2.48	2.74	2.88	3.09	3.25	3.40	3.52	3.76	3.90	**1.82**
Hester-Dendy Taxa Richness	6	6.5	9	11.5	13	15	**17**	21.5	26	29	32	**20**
Dipnet Taxa Richness	9	12	17	20	**22**	24.5	26	28	31	37	53	**22**
Total Kjeldahl Nitrogen	0.30	0.39	0.56	0.73	0.87	1.00	1.11	**1.26**	1.49	1.93	2.80	**1.40**
Total Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	0.11	0.14	0.20	**0.34**	0.60	**0.51**
Nitrate plus Nitrite	0.01	0.01	0.03	0.05	0.07	0.10	0.14	0.20	0.32	**0.64**	1.05	**0.71**
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	**0.25**	0.39	0.74	1.51	**0.25**
Orthophosphate	0.01	0.01	0.03	0.04	0.05	0.08	0.11	**0.17**	0.27	0.59	1.37	**0.21**
Turbidity (NTU)	0.60	0.90	1.20	1.45	2.10	**2.80**	3.60	4.50	6.65	10.45	16.30	**3.10**

TEST SITE

Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%	Measured
Periphyton Chlorophyll *a* (mg/m^2)	0.31	0.43	0.77	1.04	2.16	2.94	**6.45**	10.51	17.00	39.51	60.85	**6.80**
Hester-Dendy Diversity	0.84	2.12	2.48	2.74	2.88	**3.09**	3.25	3.40	3.52	3.76	3.90	**3.37**
Hester-Dendy Taxa Richness	6	6.5	9	11.5	13	15	17	21.5	26	**29**	32	**29**
Dipnet Taxa Richness	9	**12**	17	20	22	24.5	26	28	31	37	53	**16**
Total Kjeldahl Nitrogen	0.30	0.39	0.56	0.73	**0.87**	1.00	1.11	1.26	1.49	1.93	2.80	**0.90**
Total Ammonia	0.02	0.02	0.04	0.05	0.06	**0.08**	0.11	0.14	0.20	0.34	0.60	**0.10**
Nitrate plus Nitrite	0.01	0.01	0.03	0.05	0.07	0.10	0.14	0.20	0.32	**0.64**	1.05	**0.78**
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	0.74	**1.51**	**1.90**
Orthophosphate	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	0.59	**1.37**	**2.00**
Turbidity (NTU)	0.60	0.90	1.20	1.45	2.10	**2.80**	3.60	4.50	6.65	10.45	16.30	**3.20**

Taxa richness and diversity values are for benthic macroinvertebrates. Hester-Dendy sample= benthic macroinvertebrates collected from a standardized multi-plate sampler. Dipnet taxa richness = number of taxa collected in standardized dipnet sweep samples. Diversity = Shannon-Weaver H'. NTU = Nephelometric turbidity units. Adapted from Joe Hand, FDER, personal communication, 1991 (data collected 1980-1989). ND = No data.

Appendix 6

Additional physical, chemical, toxicological and microbiological results

FL DEP SW District Chemistry Laboratory
3804 Coconut Palm Drive
Tampa, FL 33619
ph # 813-744-6100 DEP CompQAP # 880078

Project: AUBURNDALE ALLIED Type: WWTP Requested By: CORNWELL

Site	Date	Time	Depth	Log	Samplers
EFFLUENT	11/03/03	1135		29318	CORNWELL, PILLSBURY

NOTE: RQ# 2003-11-03-16

Code	Parameter	Units	Site ID EFFLUENT
00029	Log Number	LOG	29318
10	WATER TEMP	deg C	25.371D
80	COLOR	Pt-Co	60
94	CONDUCTIVITY (FIELD)	umho/cm	600
299	DISS. OXYGEN (PROBE)	mg/l	7.55D
301	DISS. OXYGEN(%SAT)	%	91.5
314	CBOD5	mg/l	2U
406	pH (FIELD)	units	7.48
410	ALKALINITY	mg/l	107.3
480	SALINITY	0/00	.29D
530	TSS-RESIDUE, NONFILT.	mg/l	2.0
4192	SAMPLE DEPTH	METERS	.2
31501	TOTAL COLIFORM	#/100ml	1K
31616	FECAL COLIFORM	#/100ml	540BL
82079	TURBIDITY	NTU	1.1

Results for NELAP accredited tests contained in this report meet the requirements specified for the National Environmental Laboratory Accreditation Program.
Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published test performance acceptance criteria.

A denotes mean, B counts unacceptable, J estimate, K less than
L greater than, OO data lost, P too numerous to count, Q out of holding time, T value below detection limit, U not detected

FL DEP SW District Chemistry Laboratory
3804 Coconut Palm Drive
Tampa, FL 33619
ph # 813-744-6100 DEP CompQAP # 880078

Project: AUBURNDALE ALLIED Type: WWTP Requested By: CORNWELL

Site	Date	Time	Depth	Log	Samplers
LLRC1	11/03/03	1035		29319	CORNWELL, PILLSBURY

Code	Parameter	Units	Site ID LLRC1
00029	Log Number	LOG	29319
10	WATER TEMP	deg C	23.70D
80	COLOR	Pt-Co	60
94	CONDUCTIVITY (FIELD)	umho/cm	367
299	DISS. OXYGEN (PROBE)	mg/l	2.17D
301	DISS. OXYGEN(%SAT)	%	25.7
314	CBOD5	mg/l	2U
406	pH (FIELD)	units	6.85
410	ALKALINITY	mg/l	118.9
480	SALINITY	0/00	.17D
530	RESIDUE, NONFILT.	mg/l	5.0
4192	SAMPLE DEPTH	METERS	.2
31501	TOTAL COLIFORM	#/100ml	1K
31616	FECAL COLIFORM	#/100ml	85K
82079	TURBIDITY	NTU	3.1

Results for NELAP accredited tests contained in this report meet the requirements specified for the National Environmental Laboratory Accreditation Program.
Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published test performance acceptance criteria.

A denotes mean, B counts unacceptable, J estimate, K less than
L greater than, OO data lost, P too numerous to count, Q out of holding time, T value below detection limit, U not detected

FL DEP SW District Chemistry Laboratory
3804 Coconut Palm Drive
Tampa, FL 33619
ph # 813-744-6100 DEP CompQAP # 880078

Project: AUBURNDALE ALLIED Type: WWTP Requested By: CORNWELL

Site	Date	Time	Depth	Log	Samplers
LLRT1	11/03/03	0915		29320	CORNWELL, PILLSBURY

Code	Parameter	Units	Site ID LLRT1
00029	Log Number	LOG	29320
10	WATER TEMP	deg C	25.05D
80	COLOR	Pt-Co	60
94	CONDUCTIVITY (FIELD)	umho/cm	545
299	DISS. OXYGEN (PROBE)	mg/l	6.97D
301	DISS. OXYGEN(%SAT)	%	84.6
314	CBOD5	mg/l	2U
406	pH (FIELD)	units	7.06
410	ALKALINITY	mg/l	116.9
480	SALINITY	0/00	.26D
530	RESIDUE, NONFILT.	mg/l	7.0
4192	SAMPLE DEPTH	METERS	.2
82079	TURBIDITY	NTU	3.2

Results for NELAP accredited tests contained in this report meet the requirements specified for the National Environmental Laboratory Accreditation Program.
Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published test performance acceptance criteria.

A denotes mean, B counts unacceptable, J estimate, K less than
L greater than, OO data lost, P too numerous to count, Q out of
holding time, T value below detection limit, U not detected

FL DEP SW District Chemistry Laboratory
3804 Coconut Palm Drive
Tampa, FL 33619
ph # 813-744-6100 DEP CompQAP # 880078

Project: AUBURNDALE ALLIED Type: WWTP Requested By: CORNWELL

Site	Date	Time	Depth	Log	Samplers
LLRT1	11/03/03	1015		29322	CORNWELL, PILLSBURY

Code	Parameter	Units	Site ID LLRT1
00029	Log Number	LOG	29322
31501	TOTAL COLIFORM	#/100ml	1K
31616	FECAL COLIFORM	#/100ml	60K

Results for NELAP accredited tests contained in this report meet the requirements specified for the National Environmental Laboratory Accreditation Program.

Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published test performance acceptance criteria.

A denotes mean, B counts unacceptable, J estimate, K less than
L greater than, OO data lost, P too numerous to count, Q out of
holding time, T value below detection limit, U not detected

FL DEP SW District Chemistry Laboratory
3804 Coconut Palm Drive
Tampa, FL 33619
ph # 813-744-6100 DEP CompQAP # 880078

Project: AUBURNDALE ALLIED Type: WWTP Requested By: CORNWELL

Site	Date	Time	Depth	Log	Samplers
FIELD BLANK	11/03/03	1000		29321	CORNWELL, PILLSBURY

Code	Parameter	Units	Site ID FIELD BLANK
00029	Log Number	LOG	29321
80	COLOR	Pt-Co	<5
314	CBOD5	mg/l	2U
410	ALKALINITY	mg/l	1.4
530	RESIDUE, NONFILT.	mg/l	1U
82079	TURBIDITY	NTU	.1U

Results for NELAP accredited tests contained in this report meet the requirements specified for the National Environmental Laboratory Accreditation Program.
Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published test performance acceptance criteria.

A denotes mean, B counts unacceptable, J estimate, K less than L greater than, OO data lost, P too numerous to count, Q out of holding time, T value below detection limit, U not detected

FL DEP SW District Chemistry Laboratory
3804 Coconut Palm Drive
Tampa, FL 33619
ph # 813-744-6100 DEP CompQAP # 880078

Project: AUBURNDALE ALLIED Type: WWTP Requested By: CORNWELL

Site	Date	Time	Depth	Log	Samplers
FIELD BLANK	11/03/03	1016	-	29323	CORNWELL, PILLSBURY

Code	Parameter	Units	Site ID FIELD BLANK
00029	Log Number	LOG	29323
31501	TOTAL COLIFORM	#/100ml	1K
31616	FECAL COLIFORM	#/100ml	1K

Results for NELAP accredited tests ... this report meet the ... specified for the National Environmental ... Accreditation Program.

Uncertainty ... the analytical results ... ained in this report ... reported ... surance results and from published ... criteria.

A denotes mean, B counts unacceptable, J estimate, K less than
L greater than, OO data lost, P too numerous to count, Q out of
holding time, T value below detection limit, U not detected

FL DEP SW District Chemistry Laboratory
3804 Coconut Palm Drive
Tampa, FL 33619
ph # 813-744-6100 DEP CompQAP # 880078

Project: CITY OF AUBURNDALE Type: DW Requested By: SQUITIERI

Site	Date	Time	Depth	Log	Samplers
EQUIP. BLANK	11/03/03	1030		29356	SQUITIERI
NOTE: RQ#2003-11-03-16					
EFFLUENT	11/03/03	1240		29357	SQUITIERI

Code	Parameter	Units	Site ID EQUIP. BLANK	Site ID EFFLUEN T
00029	Log Number	LOG	29356	29357
314	CBOD5	mg/l	2U	2U
530	RESIDUE, NONFILT.	mg/l	1U	1U
82079	TURBIDITY	NTU		

Temp - 25.71
Cond. 600
Salinity - .29
DO - 7.55
pH - 7.48

Results for NELAP accredited tests contained in this report meet the requirements specified by the National Environmental Laboratory Accreditation Program
Uncertainty associated with the analytical results contained in this report can be estimated from historical reported quality assurance results and from published test performance acceptance criteria.

A denotes mean, B counts unacceptable, J estimate, K less than L greater than, QQ data lost, P too numerous to count, Q out of holding time, T value below detection limit, U not detected

TOTAL P.02

FL DEP SW District Chemistry Laboratory Report
Phone # 813-744-6100 DEP CompQAP # 880078 NELAP # E34886

3804 Coconut Palm Dr.
Tampa, FL 33619

Project: FY15 *Type:* AUBURNDALE *Requested by:* PILLSBURY

Site	*Time*	*Date*	*Log*	*Samplers*	*RQ#*	*Notes*
LLRT 1- TEST SITE	1120	1/12/2004	29542	PILLSBURY, CORNWELL	2003-11-03-16	
LLRC1- CONTROL SITE	1115	1/12/2004	29543	PILLSBURY, CORNWELL	2003-11-03-16	
EFFLUENT	1110	1/12/2004	29544	PILLSBURY, CORNWELL	2003-11-03-16	

Code	*parameter*	*units*	*site: LLRT1*	*site: LLRC1*	*site: EFFLU*	*site:*	*site:*	*site:*	*site:*
29	log#	log	29542	29543	29544				
10	water temp.	deg C							
78	secchi	meters							
80	color	Pt-Co							
94	conductivity	umho/cm							
299	diss.Oxygen	mg/l							
301	diss.Oxygen	%							
314	cbod5	mg/l							
406	pH	units							
410	alkalinity	mg/l							
480	selinity	0/00							
530	tss	mg/l							
4192	sample depth	meters							
31501	f-coliforms	#/100ml	400	780	20BK				
31616	f-coliforms	#/100ml	55BK	90BK	1K				
82079	turbidity	NTU							
82903	total depth	meters							

A decios mean, B counts unacceptable, J estimate, K less than, L greater than, O data lost, Q out of holding time, T value is less than MDL, U not detected, V analyte detected in blank, Y improperly preserved, Z too numerous to count, D field measurement

Results for NELAP accredited tests contained in this report meet the requirements specified for the National Environmental Laboratory Accreditation Program. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published test performance acceptance criteria.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the City of Auburndale Allred, Recker Highway SR 655, Polk County, Auburndale, Florida, NPDES# FL0021466, performed from 4 to 6 November, 2003.

Facility:	**City of Auburndale, Allred**		**NPDES #:**	**FL0021466**	Facility Type: **WWTP**	**Analysts:**	Christa Pierini
Location:	Recker Highway SR 655		Contact/District:	Lori Pillsbury/Southwest			James Daniels
County:	Polk		Test type:	static acute screen			Marshall Faircloth
Sample Collection Date:	11/3/2003	Time: 1135	# tests:	2	Receiving Water: Class III freshwater		Josh Ayres
Test Beginning Date:	11/4/2003	Time: 1345	Chlorination Type:	chlorinated	Lake Lena Run into the Peace River		
Test Ending Date:	11/6/2003	Time: 1310	FDEP SOP#:	TA07_01 / 02	**Page 1 of 1**	**Reviewer:**	Julie Espy

Organism: ***Ceriodaphnia dubia*** (water flea) Life stage: <24 hours Chamber size: 30 mL [A] Feeding: YCT/Algae Food Batch #: YCT 3/P. sub. 20

	Sample/Diluen	SURVIVAL # Alive			pH			Temperature (C)			Diss. Oxygen (mg/L)			[B] Conductivity	
Concentrations	Volume(mL)	0 hr	24 hr	48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control A	0/20	5	5	5	8.2		8.1	24.7		24.0	8.2		8.0	180	250
Control B	0/20	5	5	5			8.2			24.0			8.1		210
Control C	0/20	5	5	5			8.3			24.0			8.3		230
Control D	0/20	5	5	5			8.2			24.0			8.3		230
100% A	20/0	5	5	5	7.7		8.5	25.9		24.0	8.1		8.2	560	705
100% B	20/0	5	5	4			8.5			24.0			8.2		850
100% C	20/0	5	5	5			8.6			24.0			8.3		890
100% D	20/0	5	5	5			8.6			24.0			8.3		900

[A] Organisms fed prior to testing.

Temperatures of room and test incubator were continuously recorded on a strip chart recorder.

Room Temperature range for the test period was 23.5 - 24.0°C.

Incubator #3 temperature range for the test period was 24.0 - 25.0°C.

Light Intensity during the test was 50-100 foot candles.

Photoperiod during the test was 16 hours of light : 8 hours of dark.

[B] Conductivity value is uncorrected μmhos/cm.

LIMS	
Job number:	TLH-2003-11-04-24
sample number:	714303

Data Transcription Verification
date: 1/30/04
by: Josh Ayres/James Daniels

Total Residual CL2	mg/L	Method
Field 100% sample:	-	-
Lab 100% sample:	0.02	Hach
Control water (water flea):	0.01	Hach
Control water: (fish):	0.01	Hach

Ammonia	Total (mg/L)	Unionized (mg/L)
Control water: (water flea):	<0.017	<0.017
Control water (fish):	<0.017	<0.017
100% Sample:	<0.017	<0.017

Organism: ***Pimephales promelas*** (fish) Life stage: 12 days Chamber size: 1000 mL [C] Feeding: *Artemia* Food Batch #: 0194025G

	Sample/Diluen	SURVIVAL # Alive			pH			Temperature (C)			Diss. Oxygen (mg/L)			[D] Conductivity	
Concentrations	Volume(mL)	0 hr	24 hr	48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control A	0/500	5	5	5	8.0	8.0	7.9	24.0	24.6	24.6	8.4	8.1	7.9	285	330
Control B	0/500	5	5	5	8.1	8.0	8.0	24.0	24.6	24.3	8.4	8.0	7.9	295	340
Control C	0/500	5	5	5	8.1	8.0	8.0	24.0	24.7	24.2	8.3	7.9	8.0	295	330
Control D	0/500	5	5	5	8.1	8.0	7.9	24.0	25.0	24.0	8.3	7.8	8.0	290	330
100% A	500/0	5	5	5	7.7	8.2	8.2	25.9	24.7	24.3	8.4	7.6	8.0	555	535
100% B	500/0	5	5	5	7.6	8.2	8.2	25.9	24.9	24.3	8.5	7.7	7.9	610	535
100 % C	500/0	5	5	5	7.7	8.2	8.3	25.8	24.4	24.5	8.8	7.6	7.9	620	555
100% D	500/0	5	5	5	7.7	8.2	8.3	25.9	25.1	24.5	8.8	7.7	7.9	620	540

[C] Organisms fed prior to testing.

Temperatures of room and test incubator were continuously recorded on a strip chart recorder.

Room Temperature range for the test period was 23.5 - 24.0°C.

Incubator #3 temperature range for the test period was 24.0 - 25.0°C.

Light Intensity during the test was 50-100 foot candles.

Photoperiod during the test was 16 hours of light : 8 hours of dark.

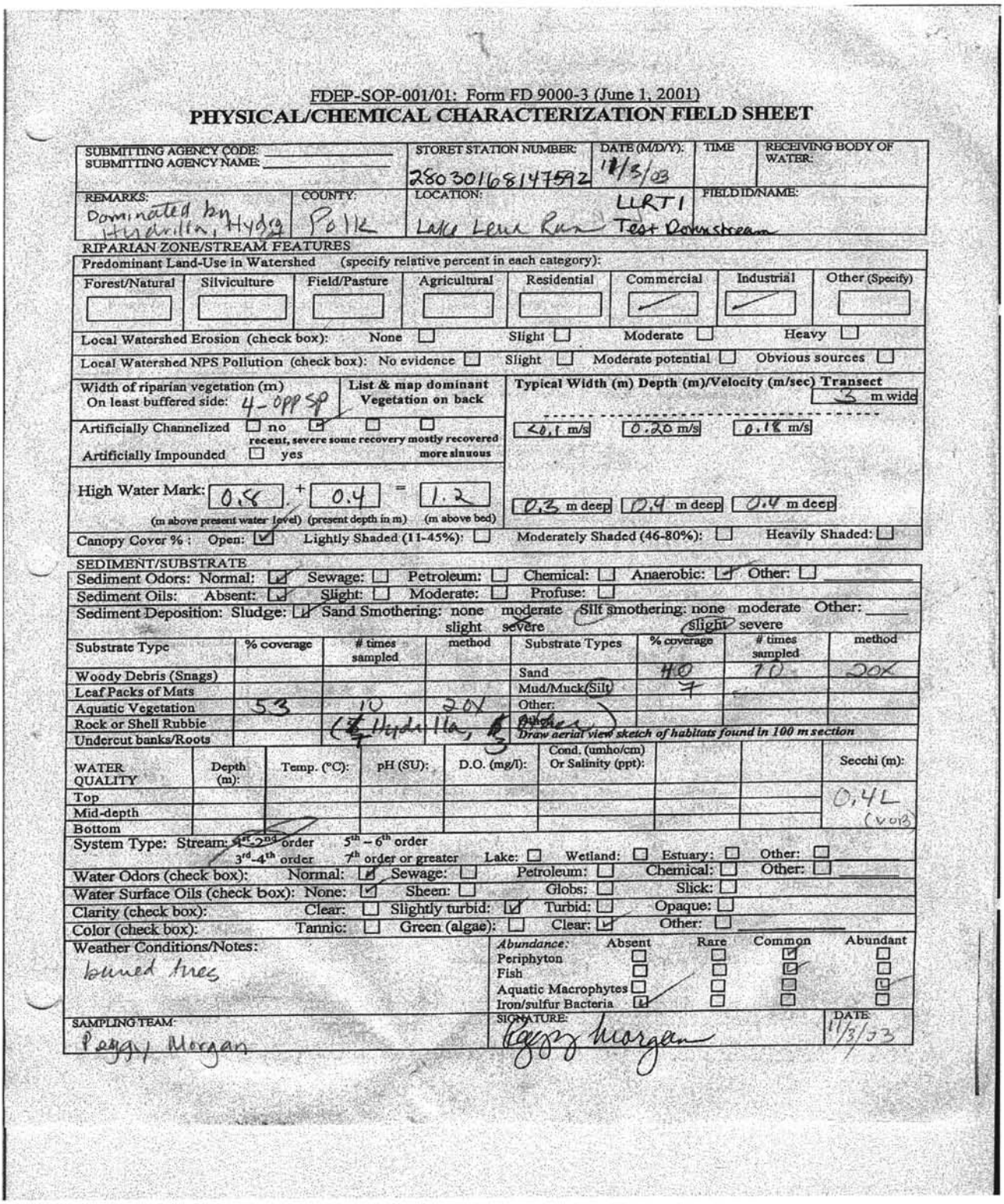
[D] Conductivity value is uncorrected μmhos/cm.

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water: (water flea):	81	89
Control water: (fish)	71	84
100% Sample:	125	110

Mortality	Percent
Control water (water flea):	0%
100% (water flea):	5%
Control water (fish):	0%
100 % (fish):	0%

Appendix 7

Habitat Assessment Field Sheets.



FDEP-SOP-001/01: Form FD 9000-3 (June 1, 2001)

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER: 28030168147592	DATE (M/D/Y): 11/3/03	TIME	RECEIVING BODY OF WATER:
REMARKS: Dominated by Hydrilla, Hydro	COUNTY: Polk	LOCATION: LRT1 Lake Lena Run Test Downstream		FIELD ID/NAME:

RIPARIAN ZONE/STREAM FEATURES

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

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

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

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

Width of riparian vegetation (m) On least buffered side: 4-Opp SP

List & map dominant Vegetation on back

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

Artificially Impounded ☐ yes more sinuous

Typical Width (m) Depth (m)/Velocity (m/sec) Transect: 3 m wide

<0.1 m/s	0.20 m/s	0.18 m/s
0.3 m deep	0.4 m deep	0.4 m deep

High Water Mark: 0.8 (m above present water level) + 0.4 (present depth in m) = 1.2 (m above bed)

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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Type	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand	40	10	20X
Leaf Packs of Mats				Mud/Muck (Silt)	7		
Aquatic Vegetation	53	10	20X	Other:			
Rock or Shell Rubble		(7 Hydrilla, 3		Other:			
Undercut banks/Roots							

Draw aerial view sketch of habitats found in 100 m section

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (umho/cm) Or Salinity (ppt):			Secchi (m):
Top								0.4L (VOB)
Mid-depth								
Bottom								

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

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

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

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

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

Weather Conditions/Notes: burned trees

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

SAMPLING TEAM: Peggy Morgan

SIGNATURE: Peggy Morgan

DATE: 11/3/03

FDEP-SOP-001/01: Form FD 9000-5 (June 1, 2001)

STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER: 28030168147592	DATE (M/D/Y): 10/3/03	RECEIVING BODY OF WATER:

REMARKS:	COUNTY: Polk	LOCATION: LLRT1 Lake Lena Run Test	FIELD ID/NAME:

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** 5	Four or more productive habitats present (snags, tree roots/undercut banks, aquatic vegetation, leaf packs (partially decayed), rock). 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	One or less productive habitat. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Substrate Availability 20	Greater than 30% productive habitat present at site. 20 19 18 17 16	16% to 30% productive habitat, by aerial extent. 15 14 13 12 11	6% to 15% productive habitat 10 9 8 7 6	Less than 5% productive habitat. 5 4 3 2 1
Water Velocity 13	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec. Or spate occurring: > 1 m/sec 5 4 3 2 1
Habitat Smothering 8 PM Primary Score 46 PM	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 16	20%-50% of habitats affected by sand or silt accumulation 15 14 13 12 11	Smothering of 50%-80% of the habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, as severe problem, pools absent 5 4 3 2 1
Secondary Habitat Components **Artificial Channelization** 5	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	Many have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Bank Stability Right Bank 9 Left Bank 9	Stable. No evidence of erosion or bank failure. Little potential for future problems. 10 9	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 8 7 6	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 5 4	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 3 2 1
Riparian Buffer Zone Width Right Bank 2 Left Bank 3	Width of native vegetation (least buffered side) greater than 18 m 10 9	Width of native vegetation (least buffered side) 12m to 18 m 8 7 6	Width of native vegetation 6 to 12 m. human activities still close to system 5 4	Less than 6 m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 1 Left Bank 1 Secondary Score 30 PM 28	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody machrophytes. Normal, expected plant community for given sunlight & habitat conditions. 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian ozone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (e.g. grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 3 2 1

PM (76) 78 **TOTAL SCORE**

ANALYSIS DATE: 11-3-03	ANALYST: Peggy Morgan	SIGNATURE: Peggy Morgan

FDEP-SOP-001/01: Form FD 9000-3 (June 1, 2001)

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER: 28030858148024	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
REMARKS: Sweeps taken from lower 40m	COUNTY: ~~2005085~~ Polk	LOCATION: LLRC1 Lake Lena Run Control		FIELD ID/NAME:

RIPARIAN ZONE/STREAM FEATURES

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

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

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

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

Width of riparian vegetation (m) On least buffered side: Opp. 10 / 7

List & map dominant Vegetation on back

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

Artificially Impounded ☐ yes

Typical Width (m) Depth (m)/Velocity (m/sec) Transect 3.5 m wide

<0.1 m/s | 0.2 m/s | 0.2 m/s

High Water Mark: 0.5 (m above present water level) + 0.05 (present depth in m) = 0.55 (m above bed)

0.05 m deep | 0.05 m deep | 0.1 m deep

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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Type	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand	8	10	20X
Leaf Packs of Mats				Mud/Muck/Silt	5		
Aquatic Vegetation	20%	10 (8 Hydrilla 2 other)	20X	Other: unprod.	63		
Rock or Shell Rubbie				Other: Veg hab			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (umho/cm) Or Salinity (ppt):			Secchi (m):
Top								0,1L
Mid-depth								
Bottom								

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

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

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

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

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

Weather Conditions/Notes: PC - windy FL. Distillers FYI

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

SAMPLING TEAM: Peggy Morgan, Lori Pillsbury, Nahin Cornwell

SIGNATURE: Peggy Morgan

DATE: 11/3/03

FDEP-SOP-001/01: Form FD 9000-5 (June 1, 2001)

STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER: 280308581/8024	DATE (M/D/Y):	RECEIVING BODY OF WATER:

REMARKS: Ft Distillers FY1	COUNTY:	LOCATION: LLRC1 Lake Lena Run Control	FIELD ID/NAME:

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** 4	Four or more productive habitats present (snags, tree roots/undercut banks, aquatic vegetation, leaf packs (partially decayed), rock). 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	One or less productive habitat. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Substrate Availability 14	Greater than 30% productive habitat present at site. 20 19 18 17 16	16% to 30% productive habitat, by aerial extent. 15 14 13 12 11	6% to 15% productive habitat 10 9 8 7 6	Less than 5% productive habitat. 5 4 3 2 1
Water Velocity 13	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec. Or spate occurring: > 1 m/sec 5 4 3 2 1
Habitat Smothering 6 Primary Score 37	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 16	20%-50% of habitats affected by sand or silt accumulation 15 14 13 12 11	Smothering of 50%-80% of the habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, as severe problem, pools absent 5 4 3 2 1
Secondary Habitat Components **Artificial Channelization** 5	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	Many have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Bank Stability Right Bank 9 Left Bank 9	Stable. No evidence of erosion or bank failure. Little potential for future problems. 10 9	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 8 7 6	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 5 4	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 3 2 1
Riparian Buffer Zone Width Right Bank 3 3 Left Bank 5 5	Width of native vegetation (least buffered side) greater than 18 m 10 9	Width of native vegetation (least buffered side) 12m to 18 m 8 7 6	Width of native vegetation 6 to 12 m. human activities still close to system 5 4	Less than 6 m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 1 Left Bank 1 Secondary Score 33 40 **TOTAL SCORE**	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody machrophytes. Normal, expected plant community for given sunlight & habitat conditions. 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian ozone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (e.g. grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 3 2 1

ANALYSIS DATE:	ANALYST:	SIGNATURE:
11-3-03	Peggy Morgan	Peggy Morgan

Appendix 8a

Taxa list and density (number/cm^2) for periphyton collected from glass microscope slides incubated for 28 days upstream and downstream of Auburndale Allred WWTP facility discharge, 11/3/03.

	Control Site	Test Site
Bacillariophyta		
Achnanthes sp.	1,534	-
Achnanthes exigua	39,892	11,601
Achnanthes hungarica	-	2,677
Achnanthes lanceolata	-	1,785
Aulacoseira sp.	32,220	18,740
Aulacoseira granulata	81,317	10,709
Capartogramma crucicula	-	892
Cocconeis placentula	1,534	19,633
Coscinodiscophyceae	1,534	892
Cyclotella sp.	13,809	7,139
Cyclotella meneghiniana	6,137	8,924
Diadesmis confervacea	65,975	33,911
Encyonopsis microcephala	-	892
Eunotia sp.	87,455	55,328
Fragilaria sp.	-	892
Fragilaria bidens	-	892
Fragilariaceae	7,671	3,570
Gomphonema sp.	1,534	2,677
Gomphonema augur	1,534	-
Gomphonema gracile	1,534	-
Gomphonema parvulum	3,069	7,139
Hippodonta sp.	6,137	2,677
Hippodonta capitata	1,534	-
Navicula sp.	1,534	6,247
Navicula clementis	-	892
Navicula cryptocephala	1,534	8,924
Navicula minima	-	2,677
Nitzschia sp.	-	5,354
Nitzschia frustulum	-	892
Nitzschia palea	-	892
Pinnularia sp.	-	892
Sellaphora sp.	3,069	1,785
Synedra ulna	1,534	892
Chlorophycota		
Characium sp.	1,534	2,677
Chlorella sp.	7,671	1,785
Chlorococcum sp.	3,069	-
Closterium sp.	-	892
Cosmarium sp.	-	892
Cryptomonas sp.	3,069	892
Cyanobium parvum	10,740	8,032
Cyanobium plancticum	9,206	-
Jaaginema sp.	19,946	10,709
Micractinium pusillum	3,069	-
Oedogonium sp.	-	892
Oocystis sp.	3,069	-
Planktolyngbya sp.	4,603	-
Planktothrix sp.	-	2,677
Pseudanabaena sp.	4,603	1,785
Scenedesmus bijuga	-	2,677
Scenedesmus quadricauda	7,671	2,677
Stigeoclonium sp.	18,412	7,139
Synechocystis sp.	7,671	4,462
Euglenophycota		
Trachelomonas sp.	-	892

Appendix 8b

Taxa list and number of individuals counted for periphyton collected from glass microscope slides incubated for 28 days upstream and downstream of Auburndale Allred WWTP facility discharge, 11/3/03.

	Control Site	Test Site
Bacillariophyta		
Achnanthes sp.	1	-
Achnanthes exigua	26	13
Achnanthes hungarica	-	3
Achnanthes lanceolata	-	2
Aulacoseira sp.	21	21
Aulacoseira granulata	53	12
Capartogramma crucicula	-	1
Cocconeis placentula	1	22
Coscinodiscophyceae	1	1
Cyclotella sp.	9	8
Cyclotella meneghiniana	4	10
Diadesmis confervacea	43	38
Encyonopsis microcephala	-	1
Eunotia sp.	57	62
Fragilaria sp.	-	1
Fragilaria bidens	-	1
Fragilariaceae	5	4
Gomphonema sp.	1	3
Gomphonema augur	1	-
Gomphonema gracile	1	-
Gomphonema parvulum	2	8
Hippodonta sp.	4	3
Hippodonta capitata	1	-
Navicula sp.	1	7
Navicula clementis	-	1
Navicula cryptocephala	1	10
Navicula minima	-	3
Nitzschia sp.	-	6
Nitzschia frustulum	-	1
Nitzschia palea	-	1
Pinnularia sp.	-	1
Sellaphora sp.	2	2
Synedra ulna	1	1
Chlorophycota		
Characium sp.	1	3
Chlorella sp.	5	2
Chlorococcum sp.	2	-
Closterium sp.	-	1
Cosmarium sp.	-	1
Cryptomonas sp.	2	1
Cyanobium parvum	7	9
Cyanobium plancticum	6	-
Jaaginema sp.	13	12
Micractinium pusillum	2	-
Oedogonium sp.	-	1
Oocystis sp.	2	-
Planktolyngbya sp.	3	-
Planktothrix sp.	-	3
Pseudanabaena sp.	3	2
Scenedesmus bijuga	-	3
Scenedesmus quadricauda	5	3
Stigeoclonium sp.	12	8
Synechocystis sp.	5	5
Euglenophycota		
Trachelomonas sp.	-	1

Appendix 9a

Benthic macroinvertebrates collected from Hester-Dendy artificial substrates incubated upstream and downstream of the Auburndale Allred WWTP facility for 28 days (11/3/03). Taxa collected and density (average number of individuals/m^2) rounded to the nearest individual (n = 3 samples). See SOP LT 7100 sect. 4.2.1 for method on collapsing taxa.

	Control Site	Test Site
Annelida		
Hirudinea		
Haemopidae	-	3
Helobdella fusca	3	-
Helobdella stagnalis	21	13
Arthropoda		
Crustacea		
Amphipoda		
Hyalella azteca	257	270
Insecta		
Diptera		
Ablabesmyia rhamphe grp.	-	51
Chironomus sp.	30	-
Cryptochironomus sp.	-	3
Glyptotendipes sp.	593	66
Goeldichironomus carus	5,310	86
Goeldichironomus cf. natans	33	9
Goeldichironomus holoprasinus	3	-
Kiefferulus sp.	-	3
Pentaneura inconspicua	44	114
Polypedilum beckae	2,298	1,001
Polypedilum flavum	-	6
Polypedilum illinoense grp.	3	117
Polypedilum scalaenum grp.	72	163
Rheotanytarsus exiguus grp.	-	6
Rheotanytarsus pellucidus	-	9
Stenochironomus sp.	-	71
Tanytarsus sp. E Epler	94	29
Thienemanniella sp. C Epler	-	128
Ephemeroptera		
Baetidae	3	-
Caenis sp.	16	262
Odonata		
Aeshnidae	3	-
Boyeria vinosa	-	3
Enallagma cardenium	-	35
Ischnura ramburi	-	31
Nehalennia sp.	8	10
Trichoptera		
Cheumatopsyche sp.	-	619
Oxyethira sp.	-	19
Mollusca		
Gastropoda		
Amnicola sp.	-	3
Ancylidae	-	116
Ferrissia hendersoni	162	-
Hebetancylus excentricus	110	-
Physella sp.	3	-
Nemertea		
Undetermined Nemertea	-	3

Appendix 9b

Benthic macroinvertebrates collected from Hester-Dendy artificial substrates incubated upstream and downstream of the Auburndale Allred WWTP facility for 28 days (11/3/03). Taxa collected and total number of individuals counted (n = 3 samples).

	Control Site	Test Site
Annelida		
Hirudinea		
Haemopidae	-	1
Helobdella fusca	1	-
Helobdella stagnalis	8	5
Arthropoda		
Crustacea		
Amphipoda		
Hyalella azteca	97	102
Insecta		
Diptera		
Ablabesmyia rhamphe grp.	-	19
Chironomus sp.	11	-
Cryptochironomus sp.	-	1
Glyptotendipes sp.	224	25
Goeldichironomus carus	2008	32
Goeldichironomus cf. natans	13	3
Goeldichironomus holoprasinus	1	-
Kiefferulus sp.	-	1
Pentaneura inconspicua	17	43
Polypedilum beckae	868	380
Polypedilum flavum	-	2
Polypedilum illinoense grp.	1	44
Polypedilum scalaenum grp.	27	61
Rheotanytarsus exiguus grp.	-	2
Rheotanytarsus pellucidus	-	3
Stenochironomus sp.	-	27
Tanytarsus sp. E Epler	35	11
Thienemanniella sp. C Epler	-	49
Ephemeroptera		
Baetidae	1	-
Caenis sp.	6	99
Odonata		
Aeshnidae	1	-
Boyeria vinosa	-	1
Enallagma cardenium	-	13
Ischnura ramburi	-	12
Nehalennia sp.	3	4
Trichoptera		
Cheumatopsyche sp.	-	234
Oxyethira sp.	-	7
Mollusca		
Gastropoda		
Amnicola sp.	-	1
Ancylidae	-	44
Ferrissia hendersoni	61	-
Hebetancylus excentricus	42	-
Physella sp.	1	-
Nemertea		
Undetermined Nemertea	-	1

Appendix 10a

Qualitative benthic macroinvertebrate collections (n = 20 discrete dipnet sweeps) upstream and downstream of Auburndale Allred WWTP facility (11/3/03). Taxa list and number of individuals counted (collapsed). See SOP LT 7100 sect. 4.2.1 for method on collapsing taxa.

	Control Site	Test Site
Annelida		
Oligochaeta		
Limnodrilus sp.	3	1
Nais communis complex	-	1
Arthropoda		
Crustacea		
Amphipoda		
Hyalella azteca	1	4
Insecta		
Diptera		
Chironomus sp.	16	-
Dasyhelea sp.	1	-
Goeldichironomus carus	40	-
Goeldichironomus cf. natans	1	-
Parachironomus sp.	-	1
Pentaneura inconspicua	-	1
Polypedilum beckae	4	1
Polypedilum illinoense grp.	9	16
Polypedilum scalaenum grp.	1	12
Rheotanytarsus exiguus grp.	-	1
Rheotanytarsus pellucidus	-	1
Tanytarsus sp. E Epler	11	-
Thienemanniella sp. C Epler	4	1
Ephemeroptera		
Baetidae	-	2
Caenis sp.	3	20
Callibaetis sp.	1	-
Pseudocloeon sp.	1	-
Heteroptera		
Mesovelia sp.	1	-
Lepidoptera		
Pyralidae	3	5
Odonata		
Coenagrionidae	-	18
Enallagma sp.	3	-
Ischnura sp.	2	-
Trichoptera		
Hydropsychidae	1	-
Oxyethira sp.	1	16
Mollusca		
Gastropoda		
Ancylidae	1	-
Hydrobiidae	1	-

Appendix 10b

Qualitative benthic macroinvertebrate collections (n = 20 discrete dipnet sweeps) upstream and downstream of Auburndale Allred WWTP facility (11/3/03). Taxa list and number of individuals counted.

	Control Site	Test Site
Annelida		
Oligochaeta		
Limnodrilus sp.	3	1
Nais communis complex	-	1
Arthropoda		
Crustacea		
Amphipoda		
Hyalella azteca	1	4
Insecta		
Diptera		
Chironomidae	2	8
Chironomus sp.	16	-
Dasyhelea sp.	1	-
Goeldichironomus carus	38	-
Goeldichironomus cf. natans	1	-
Parachironomus sp.	-	1
Pentaneura inconspicua	-	1
Polypedilum beckae	4	1
Polypedilum illinoense grp.	9	11
Polypedilum scalaenum grp.	1	9
Rheotanytarsus exiguus grp.	-	1
Rheotanytarsus pellucidus	-	1
Tanytarsus sp. E Epler	11	-
Thienemanniella sp. C Epler	4	1
Ephemeroptera		
Baetidae	-	2
Caenis sp.	3	20
Callibaetis sp.	1	-
Pseudocloeon sp.	1	-
Heteroptera		
Mesovelia sp.	1	-
Lepidoptera		
Pyralidae	3	5
Odonata		
Coenagrionidae	2	18
Enallagma sp.	2	-
Ischnura sp.	1	-
Trichoptera		
Hydropsychidae	1	-
Oxyethira sp.	1	16
Mollusca		
Gastropoda		
Ancylidae	1	-
Hydrobiidae	1	-

The Bioassay of Auburndale Allred WWTP effluent sampled on November 3, 2003, NPDES #FL0021466.

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 F L 0 0 2 1 4 6 6 11	12 0 3 1 1 0 3	18 B	19 S	20 1

Remarks

The Priority Pollutants Analysis for Bioassay of Auburndale Allred WWTP effluent sampled on November 3, 2003, NPDES #FL0021466.

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 F L 0 0 2 1 4 6 6 11	12 0 3 1 1 0 3	18 X	19 S	20 1

Remarks