

Biological Assessment of

Mulberry WWTP

Polk County

NPDES #FL0020338

Sampled May 17, 2004

January 2005

Biology Section

Bureau of Laboratories

Division of Resource Assessment and Management

Quality Manual No. 870346G

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Florida Department of Environmental Protection

Fifth Year Inspection Summary

Discharger: Mulberry WWTP
County: Polk
NPDES Number: FL0020338
Permit Expiration: 3/13/05

Toxics Sampling Inspection **(XSI)**

Dates Sampled: 5/17/04, 5/19/04, and 5/21/04

Results: Aluminum (composite sample only), cadmium, copper, iron, lead, and zinc were detected in the effluent at levels above the practical quantitation limits (PQLs). Nickel (grab and composite effluent samples) and aluminum (effluent grab sample) were measured at levels above the method detection limit (MDL) and below the PQL. Effluent metals complied with Class III Water Quality Criteria (FAC 62-302). Bromodichloromethane, chloroform, and dibromochloromethane were detected in the effluent grab sample at levels above the PQL. These levels have not been reported to cause adverse effects on any aquatic animals according to the USEPA ECOTOX Database. Atrazine was detected in the effluent at a level above the MDL and below the PQL.

Compliance Biomonitoring Inspection **(CBI)**

Dates Sampled: 5/17/04, 5/19/04, and 5/21/04

Results: The effluent sample was not acutely or chronically toxic to the fish, *Pimephales promelas,* or to the water flea, *Ceriodaphnia dubia,* during the 7-day chronic screening bioassays. The “no observed effect concentration (NOEC)“ was 100% effluent for both species.

Water Quality Inspection **(WQI)**

Date Sampled: 5/17/04

Results: Fecal and total coliforms were not detected in the effluent, but were detected in the receiving waters at levels that did not exceed Class III Water Quality Criteria (62-302 F.A.C.). Effluent conductivity was 1112 umhos/cm, approaching the Class III Surface Water Quality Criterion (1,275 µmhos/cm, 62-302.530(23) F.A.C.). Dissolved oxygen and pH complied with Class III Water Quality Criteria (62-302 F.A.C.) and facility permit limits; however, dissolved oxygen levels at the Control and Test Sites (4.9 and 4.85 mg/L, respectively) were below the Class III Surface Water Quality Criterion (5.0 mg/L, 62-302.530(31) F.A.C.). The effluent total nitrogen concentration was 4.3 mg/L in the grab sample and 4.0 mg/L in the 24-hr. composite sample, complying with the facility’s single sample permit limit. Concentrations of nitrate+nitrite in water samples collected from both the

Control and Test Sites ranked in the 70th percentile when compared with levels typical of Florida streams (Appendix 5). Concentrations of ortho-phosphate and total phosphorus in both the Control and Test Site water samples ranked in the 95th percentile of typical values for Florida streams. The AGP values for the upstream Control Site (14.7 mg dry weight/L), the downstream Test Site (43.0 mg dry weight/L) and the effluent (15.2 mg dry weight/L) water samples were all above the "problem" threshold (5.0 mg dry weight/L), indicating nutrient enrichment.

Impact Bioassessment Inspection **(IBI)**

Date Sampled: 5/17/04

Results: Periphyton algal growth was higher at the Test Site compared to the Control Site (Table 3, Appendix 8). Periphyton chlorophyll-*a* concentration was 12 mg/m^2 at the Control Site and 45 mg/m^2 at the Test Site. Measures of benthic macroinvertebrate assemblages from Hester-Dendy and dipnet samples showed similar communities at the Test Site compared to the Control Site. The SCI score of 25 at the Control and Test Sites placed both sites in the "Good" category.

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 City of Mulberry Wastewater Treatment Plant (WWTP) is located in Polk County, Florida (Appendix 1). This facility is a sequencing batch reactor, domestic wastewater treatment plant (see Facility Summary in Appendix 2). The treatment components consist of: three batch reactors of 0.900 million total gallons, one traveling bridge filter with a total area of 280 square feet, two chlorine contact chambers of 30,997 total gallons each, a dechlorination system, one sludge digester tank, three sludge drying beds with a total area of 1,624 square feet, and one post aeration tank of 3,830 gallons. This facility is operated to achieve advanced treatment with high-level disinfection prior to discharge. The design flow of the wastewater system is 0.75 million gallons per day (MGD) as an annual average daily flow. The annual mean flow at the time of this survey was 0.486 MGD (Facility Summary in Appendix 2). The effluent is discharged into the Class III fresh waters of the North Prong of the Alafia River.

Surface Water Quality Criteria and facility permit limits are listed in Table 1. According to the facility's discharge monitoring reports, the plant has had numerous exceedances of monthly average and single sample permit limits for total nitrogen, total suspended solids, fecal coliform bacteria, total residual chlorine, CBOD, and pH (Facility Summary, Appendix 2). The City of Mulberry entered into a Consent Order, OGC File Number 02-0508, on April 23, 2003 to resolve the exceedances of the permit limits detailed in the Facility Summary, Appendix 2. The order required the City to construct a new headworks structure, implement a pretreatment program and enforce current City ordinances to regulate potential sources of pollutants that may pass through or otherwise interfere with the treatment process. The City was given an interim limit for the annual average Total Nitrogen of 4.0 mg/L, where the permit limit is 3.0 mg/L, through September 30, 2003. The March 2003 Fifth Year Inspection (FYI) showed that the effluent was chronically toxic to the fish species and the unionized ammonia concentration in the effluent exceeded the Class III Surface Water Quality Criterion. As of the January 2004 FYI, the facility had 21 total nitrogen exceedances: twelve of the monthly average (3.75 mg/L) and nine of the maximum single sample concentration (6.0 mg/L). Discharge monitoring data (Appendix 2) from March 2003 to July 2004 showed one exceedance (5.21 mg/L) of the total nitrogen monthly average permit limit (3.75 mg/L).

Two other investigations have been performed for this facility over the past 2 years, one in March 2003 and another in January 2004. For the March 2003 FYI, Stream Condition Index samples were not collected due to high water. The January 2004 investigation was a follow-up investigation due to toxic results reported from the March 2003 FYI; however the complete series of bioassay samples were not received and therefore the toxicity tests were incomplete. Also, Hester-Dendy samplers were disturbed in the field and therefore could not be evaluated. This May 2004 investigation was another attempt to collect all of the necessary data elements for a complete study.

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 the North Prong of the Alafia River approximately 6-7 meters upstream of the discharge) and a Test Site (located in the North Prong of the Alafia River approximately 10 meters downstream of the discharge). Detailed methods and their relationship to Florida Administrative Code are given in Appendix 3. Grab and 24-hour composite effluent samples were collected. Results discussed in this report reflect only samples collected on 5/17/04. For results from samples collected on 5/19/04 and 5/21/04, see Table 1 and Appendix 4. A field blank was not collected from the composite sampler during this sampling event.

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 DEP quality assurance/quality control standards (see http://www.floridadep.org/labs/qa/index.htm).

The following were involved in this investigation: Nahir Cornwell, Melissa Gunter, and Joe Squitieri (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, Shannan Gunnoe 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. Metals were analyzed from a grab and composite sample taken of the effluent. Aluminum (composite sample only), cadmium, copper, iron, lead, and zinc were detected in the effluent at levels above the practical quantitation limits (PQLs). Nickel (grab and composite effluent samples) and aluminum (effluent grab sample) were measured at levels above the method detection limit (MDL) and below the PQL. Levels of all metals detected in effluent samples complied with

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

Mulberry WWTP	Class III Stds	Effluent Limits	Effluent 24 Hour Composite 5/17/04	Effluent Grab Sample 5/17/04	Effluent Grab Sample 5/19/04	Effluent Grab Sample 5/21/04	Control Site	Test Site
Organic Constituents (µg/L)								
Atrazine	-	-	-	0.095 I	-	0.052 I	-	-
Bromodichloromethane	≤ 22 a	-	-	9.7	-	-	-	-
Chloroform	≤ 470.8 a	-	-	68	-	-	-	-
Dibromochloromethane	≤ 34 a	-	-	1.1	-	-	-	-
Metals (µg/L unless otherwise noted)								
Aluminum	-	-	20	19 I	21	24	-	-
Arsenic	≤ 50	-	14 U	5 U	5 U	5 U	-	-
Cadmium	≤ 1.8 b	-	1.2	0.22	0.26	0.31	-	-
Calcium (mg/L)	-	-	51.7	48.5	50.3	52.2	-	-
Chromium-III	≤ 141.4 b	-	2 U	2 U	2 U	2 U	-	-
Copper	≤ 15.6 b	-	4	8.3	5.7	9.6	-	-
Iron	≤ 1000	-	138	131	138	120	-	-
Lead	≤ 6.9 b	-	1.3	1.5	1.2	2.7	-	-
Magnesium (mg/L)	-	-	15.4	14.5	14.7	15.6	-	-
Nickel	≤ 87 b	-	3 I	2.9 I	3.1 I	2.2 I	-	-
Selenium	≤ 5	-	1 U	1 U	1 U	1 U	-	-
Silver	≤ 0.07	-	0.02 U	0.02 U	0.02 U	0.02 U	-	-
Zinc	≤ 199.9 b	-	128	119	117	140	-	-
Nutrients (mg/L)								
Ortho-phosphate	-	-	-	4.8	-	-	3.5	3.4
Total Phosphorus	-	-	4.6 A	5.2	-	-	4	4.1
Ammonia	-	-	0.57	0.058	0.041	0.044	0.049	0.05
Unionized Ammonia	≤ 0.02	-	≤ 0.02 c	≤ 0.02 c	-	-	≤ 0.02 c	≤ 0.02 c
Nitrate+Nitrite	-	-	1.9	3.2	-	-	0.2	0.2
Total Kjeldahl Nitrogen	-	-	2.1 A	1.1	-	-	0.65	0.64
Organic Nitrogen	-	-	1.53 c	1.04 c	-	-	0.6 c	0.59 c
Total Nitrogen	-	6.0 s	4 c	4.3 c	-	-	0.85 c	0.84 c
General Physical and Chemical Parameters								
Habitat Assessment	-	-	-	-	-	-	106	86
Total Suspended Solids	-	10.0 s	-	4 U	-	-	4 U	5 I
Dissolved Oxygen (mg/L)	≥ 5.0 s	≥ 5.5 s	-	6.4	-	-	4.9	4.85
pH (S.U.)	6.0-8.5 s	6.0-8.5 s	-	7.1	-	-	7	7
Conductivity (umhos/cm)	1275 s	-	-	1112	-	-	1186	1186
Organic Carbon	-	-	-	7.1 A	-	-	-	-
Turbidity (NTU)	-	-	-	1	-	-	4.2	5.4
Temperature (C)	-	-	-	28	-	-	24.8	24.7
CBOD (mg/L)	-	10.0 s	2.4	0.68 AI	-	-	0.2 U	0.2 U
Color (PCU)	-	-	-	5	-	-	40 A	40
Chlorophyll-a (ug/L)	-	-	-	0.85 U	-	-	0.85 U	0.85 U
Oil and Grease (mg/L)	≤ 5	-	-	1.9 I	-	-	-	-
Flow (MGD)	-	0.75 a	-	0.486a	-	-	-	-
Hardness (mg/L)	-	-	192.5 c	180.8 c	-	-	-	-
Microbiology (# counts/100ml)								
Fecal Coliforms-Membrane Filter	<800		-	1 K	-	-	10 BK	10 BK
Total Coliforms-Membrane Filter	<2400		-	1 K	-	-	150 BK	70 BK
Toxicology Bioassays (7-day chronic screening toxicity test, NOEC)								
Fish	-	-	100%	-	-	-	-	-
Water flea	-	-	100%	-	-	-	-	-

Value exceeds the Class III Water Quality Criteria

a - Annual average
b - Value is calculated based on hardness
c - Value is calculated.
s - Single sample

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
U - Material analyzed for but not detected; value reported is the minimum detection limit

NOEC - A no observed effect concentration less than 100% effluent will constitute a violation of this permit

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

Location	AGP (measured, mg drywt/L)	Predicted AGP (TSIN) ± 20%	Inorganic N:P ratio	Total N:P ratio
Effluent	15.2	123.8 ± 24.76	0.68	0.83
Control Site	14.7	9.46 ± 1.892	0.07	0.21
Test Site	43.0	9.5 ± 1.9	0.07	0.2

Class III Water Quality Criteria (FAC 62-302).

- Bromodichloromethane, chloroform, and dibromochloromethane were detected in the effluent at levels above the PQL, but below the Class III Water Quality Criteria (62-302.530 F.A.C.). These organic pollutants are by-products of the chlorination process at this facility and the levels detected have not been reported to produce adverse effects on any aquatic animals according to the USEPA ECOTOX Database. Atrazine was detected in the effluent at a level above the MDL and below the PQL. This is the third consecutive detection of atrazine in the effluent from this facility (Table 1 and Appendix 4).
- Effluent conductivity, pH, and dissolved oxygen complied with Class III Water Quality Criteria (62-302 F.A.C.) and facility permit limits (Table 1). The conductivity has been consistently high: 1,112 µmhos/cm (May 2004), 989 µmhos/cm (Jan. 2004), and 1,000 µmhos/cm (March 2003, average of 3 values). These values approach the Class III Surface Water Quality Criterion (1,275 µmhos/cm, 62-302.530(23) F.A.C.).
- Habitat assessment scores were 106 at the Control Site and 86 at the Test Site (Table 1, data sheets in Appendix 7). The Control Site had less habitat smothering and artificial channelization, as well as better bank stability and riparian buffer zones.
- Conductivity and pH at the Control and Test Sites complied with Class III Water Quality Criteria (Table 1, 62-302.530 F.A.C.), however, dissolved oxygen levels at these sites (4.9 and 4.85 mg/L, respectively) were below the Class III Surface Water Quality Criterion (5.0 mg/L, 62-302.530(31) F.A.C.). Conductivity levels at these sites reflect an influence from the effluent. This could be attributed to the close proximity of the sites to the outfall.
- The effluent sample was not acutely or chronically toxic to the fish, *Pimephales promelas*, or to the water flea, *Ceriodaphnia dubia*, during the 7-day chronic screening bioassays (See Table 1 for the no observed effect concentration and Appendix 6 for bioassay bench sheets). This complies with 62-302 F.A.C. and the facility's permit limits.
- Fecal and total coliforms were not detected in the effluent, but 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).
- The effluent total nitrogen concentration was 4.3 mg/L in the grab sample and 4.0 mg/L in the 24-hr. composite sample, complying with the facility's single sample permit limit (Table 1). Effluent nutrient levels were elevated and contributed to the already high nutrient levels in the receiving waters. Levels of total phosphorus, ortho-phosphate, nitrate+nitrite, total Kjeldahl nitrogen, and total ammonia were very similar at the Control and Test Sites (Table 1). Concentrations of nitrate+nitrite at the Control and Test Sites ranked in the 70th percentile when compared with levels typical of Florida streams (Appendix 5), while concentrations of ortho-phosphate and total phosphorus at the Control and Test Sites ranked in the 95th percentile of typical values for Florida streams, indicating that the receiving water body is already nutrient enriched prior to receiving this facility's effluent.
- 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 values at the upstream Control Site (14.7 mg dry wt/L), the downstream Test Site (43.0 mg dry wt/L), and the effluent (15.2 mg dry wt/L) were all above this threshold (Table 2). This indicates there is nutrient enrichment in this portion of the North Prong of the Alafia River and this condition is sustained by influence from the facility's discharge. There was some evidence of growth inhibition in the effluent AGP data. Differences between actual and predicted AGP values greater than an order of

magnitude (see Table 2) are considered sufficient evidence to warrant follow up testing with the algal growth inhibition bioassay. True algal growth inhibition can only be determined by performing an actual algal growth inhibition test. Should algal growth inhibition be suspected, the district should request that the algal growth inhibition test be performed as a follow-up to the inspection.

- Chlorophyll-*a* was not detected in the effluent or water samples from the Control and Test 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.
- Periphyton algal growth was higher at the Test Site compared to the Control Site (Table 3, Appendix 8). Algal density at the Test Site was two times that at the Control Site. Periphyton chlorophyll-*a* concentration was 12 mg/m^2 at the Control Site and 45 mg/m^2 at the Test Site. The difference in growth could be attributed to lower velocity at the Test Site and additional nutrient inputs from the facility. There are no other notable differences between the algal communities at the Control and Test Sites.
- Quantitative measures of benthic macroinvertebrate assemblages from Hester-Dendy samplers showed similar communities at the Test Site compared to the Control Site (Table 4, Appendix 9). Both sites were dominated by the Trichopteran, *Cheumatopsyche* sp. This organism was found in large numbers for this investigation and the one performed in March 2003. This organism tends to "bloom" or appear in large numbers, sometimes associated with high nutrient levels. These blooms can cause a reduction in diversity, which appears to be what occurred in March 2003. The diversity was not reduced in the current samples because there were numerous other organisms present in large numbers.
- Qualitative measures of benthic macroinvertebrate assemblages from dipnet samples are summarized in Tables 5 and 6 and in Appendix 10. The SCI score of 25 at the Control and Test Sites placed them both in the "Good" category. These samples showed similar macroinvertebrate assemblages.

Table 3. Periphyton composition

Mulberry WWTP	Control Site	Test Site
Number of Taxa	29	32
Shannon-Weaver Diversity	3.01	2.67
Chlorophyll a (mg/m²)	12	45
Phaeophytin (mg/m²)	0	0
Algal Density (number/cm²)	345,571	711,655
Percent Dominant Taxon	52.9	59.3
Dominant Taxon (name)	*Cocconeis scutellum*	*Cocconeis scutellum*
Number of Algal Units Identified	15	21
Percentage Composition		
Blue-green algae	5.4	4
Diatoms	92.9	95
Green algae	1.4	1
Other	0.3	0

Summary

Both DMR and FDEP data from this inspection indicate exceedances of the permit limit for total nitrogen by this facility. Concentrations measured for this investigation were 4.3 mg/L in the grab sample and 4.0 mg/L in the 24-hr. composite sample. If these values were typical for the effluent, the facility would exceed the annual average permit limit for total nitrogen (3.0 mg/L). The North Prong of the Alafia River is nutrient enriched and this condition is exacerbated by nutrients from this facility's effluent. The addition of nitrogen to existing levels of phosphorus in this portion of the Alafia River is a cause for concern. Reevaluation of the facility's total nitrogen permit limit may be warranted based on these results. The combination of these nutrients could lead to an imbalance of the flora or fauna. AGP values from the effluent and samples collected in the receiving waters exceeded the "problem" threshold. Periphyton algal growth was higher at the Test Site compared to the Control Site. Also, algal density and chlorophyll-*a* concentration were higher at the Test Site relative to the Control. Both sites ranked in the 95th percentile compared to typical values of orthophosphate and total phosphorus in Florida streams.

Dibromochloromethane, chloroform, and bromodichloromethane, by-products of the facility's chlorination process have been detected in the effluent during multiple investigations. The chlorination and dechlorination processes may need further scrutiny. However, if these values are typical of annual releases they comply with 62-302.530(36) F.A.C. The effluent sample was not acutely or chronically

Table 4. Macroinvertebrate Hester-Dendy Samples - Quantitative

Mulberry WWTP	Control Site	Test Site
Summary Statisics		
Shannon-Weaver Diversity	3.01	3.08
Number of Taxa	36	27
Florida Index	26	23
Number of EPT Taxa	9	9
Percent Dominant Taxon	43.5	38.3
Dominant Taxon (name)	*Cheumatopsyche* sp.	*Cheumatopsyche* sp.
Dominant Taxon (group)	Trichoptera	Trichoptera
Total Number of Individuals	2371	908
Community Composition: Percent of total		
Diptera	16.4	19.9
Ephemeroptera	17.4	24.6
Plecoptera	0	0
Trichoptera	62.7	53.2
Other	3.5	2.3
Functional Feeding Groups: Percent of total		
Piercers	6.1	5.4
Predators	5.4	3.5
Surface Deposit Feeders	21.9	26
Suspension Feeders	55.7	44
Scrapers	5.8	13.7
Shredders	5	7.2

toxic to the fish, *Pimephales promelas*, or to the water flea, *Ceriodaphnia dubia*, during the 7-day chronic screening bioassays.

The Control and Test Sites were very similar with respect to nutrient concentrations, field measurements, and macroinvertebrate assemblages. The similarities of the nutrients and field measurements show that the proximity of the Control Site to the outfall may have caused the Control Site to be influenced by the effluent. Hester-Dendy samplers showed similar macroinvertebrate communities between the Control and Test Sites, dominated by *Cheumatopsyche* sp. Stream Condition Index samples collected at these sites scored in the "Good" category; however this index is not designed to detect impacts due specifically to eutrophication.

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Table 5. Macroinvertebrate Dipnet Samples - Qualitative

Mulberry WWTP	**Control Site**	**Test Site**
Stream Condition Index (value)	25	25
Stream Condition Index (word)	Good	Good
Stream Condition Index Metrics		
Number of Taxa	19	25
Florida Index	9	8
Number of EPT Taxa	8	7
Number of Chironomid Taxa	1	4
Percent Dominant Taxon	23.8	19.4
Percent Diptera	2.75	6.48
Percent Suspension Feeders and Filterers	9.17	6.48
Total Number of Individuals	109	108
Community Composition: Percent of total		
Dominant Taxon (name)	*Hydroptila* sp.	*Pyrgophorus platyrachis*
Dominant Taxon (group)	Trichoptera	Gastropoda
Amphipoda	7.3	18.5
Coleoptera	19.3	7.4
Decapoda	0	1.9
Diptera	2.8	6.5
Ephemeroptera	29.4	17.6
Gastropoda	0.9	20.4
Odonata	2.8	4.6
Oligochaeta	0	7.4
Plecoptera	0	0
Trichoptera	36.7	13
Other	0.8	2.7
Functional Feeding Groups: Percent of total		
Burrowing Deposit Feeders	0	7.4
Parasites	0	1.9
Piercers	23.9	4.6
Predators	4.1	5.6
Surface Deposit Feeders	35.3	28.7
Suspension Feeders and Filterers	9.2	6.5
Scrapers	21.1	33.8
Shredders	4.6	10.2
Unknown	0.9	0

Table 6a. Stream Condition Index Metrics:
Mulberry WWTP Control Site

Metric:	Value	5	3	1	Score
Total Number of Taxa	19	≥ 26	25-14	<14	3
Number of EPT Taxa	8	≥ 4	3-2	<2	5
Number of Chironomid Taxa	1	≥ 7	6-4	<4	1
Percent Contribution of Dominant Taxon	23.85	≤ 29	30-64	>64	5
Percent Diptera	2.75	-	≤ 37	>37	3
Florida Index	9	≥ 7	6-4	<4	5
Percent Suspension Feeders and Filterers	9.17	-	≥ 7	<7	3
Total Score		**Good**			**25**
Interpretation of Scores		Excellent			26-31
		Good			20-25
		Poor			13-19
		Very Poor			7-12

Table 6b. Stream Condition Index Metrics:
Mulberry WWTP Test Site

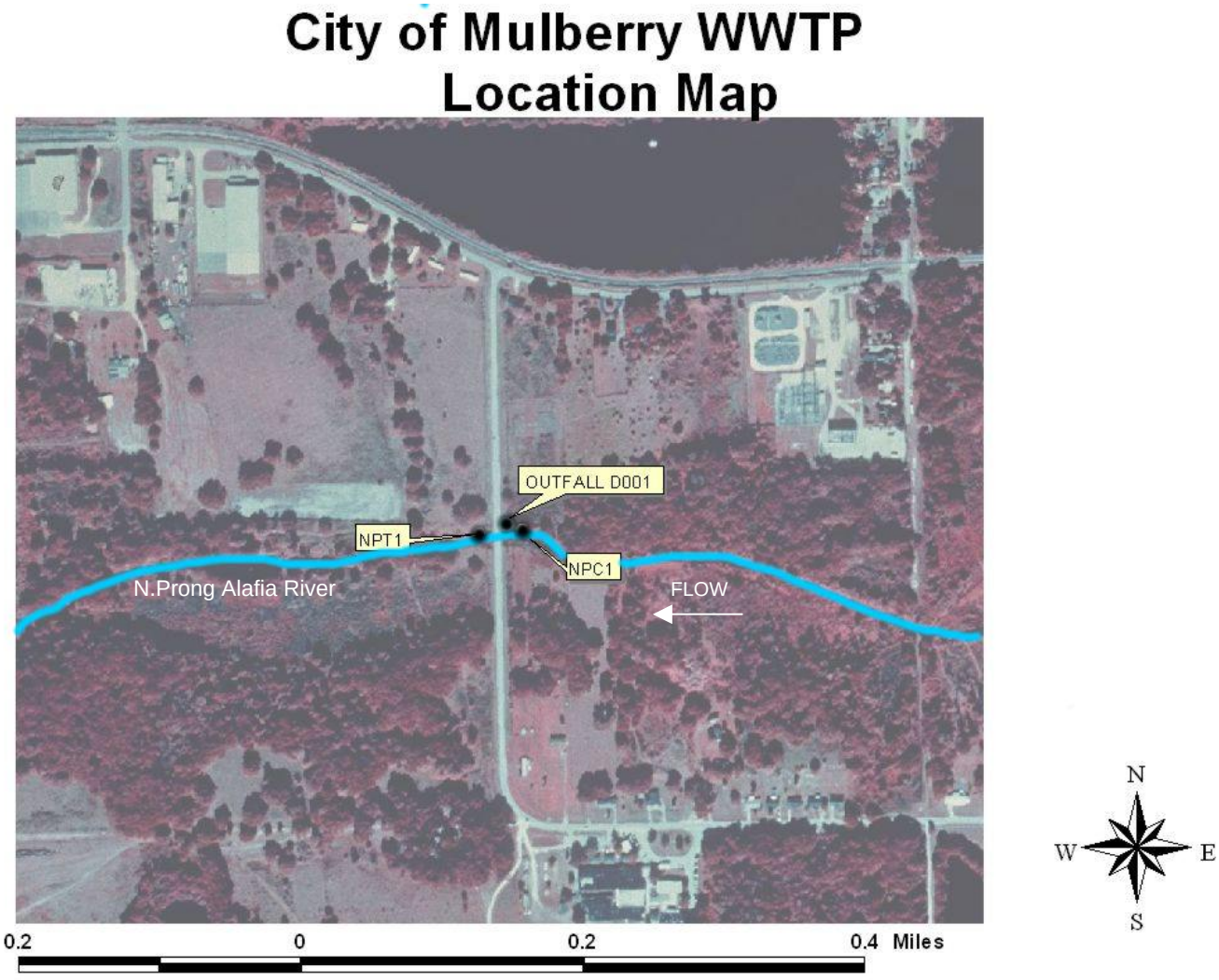
Metric:	Value	5	3	1	Score
Total Number of Taxa	25	≥ 26	25-14	<14	3
Number of EPT Taxa	7	≥ 4	3-2	<2	5
Number of Chironomid Taxa	4	≥ 7	6-4	<4	3
Percent Contribution of Dominant Taxon	19.44	≤ 29	30-64	>64	5
Percent Diptera	6.48	-	≤ 37	>37	3
Florida Index	8	≥ 7	6-4	<4	5
Percent Suspension Feeders and Filterers	6.48	-	≥ 7	<7	1
Total Score		**Good**			**25**
Interpretation of Scores		Excellent			26-31
		Good			20-25
		Poor			13-19
		Very Poor			7-12

Appendices

- Appendix 1. Map of facility
- Appendix 2. Facility 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

Map of facility



NPT1 – Test Site in the North prong of the Alafia River, approximately 10 meters downstream of the outfall

NPC1 – Control Site in the North prong of the Alafia River, approximately 6-7 meters upstream of the outfall

Appendix 2

Facility Summary

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENT PROECTION
FACILITY SUMMARY

Facility name: Mulberry WWTF

Date of Summary: 4/23/04

Location (detailed ARC view map attached):
500 Southwest Second Street
Polk County, Mulberry, FL 33860

County: Polk District: SWD

NPDES Permit: FL0020338 Facility Type: Domestic Waste State expiration date: 3/13/2005

Function of facility: treatment and disposal of domestic wastewater

Description of treatment process: An existing 0.75 MGD Annual Average Daily Flow (AADF) Sequencing Batch Reactor domestic wastewater treatment facility. The treatment component consists of: three batch reactors of 0.900 million total gallons, filtration and disinfection followed by reaeration and dechlorination prior to discharge.

Receiving waters: North Alafia Prong of the Alafia River Classification of water: III Freshwater

Design Flow: 0.75 MGD Mean Flow (12 month average): approx. 0.486 MGD

Permitted : 0.75 mgd

Discharge is: Batch sequencer (between every 2 to 6 hours)

Therefore, the best time to sample the outfall is: When the facility is discharging

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

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

Parameter	Annual Average	Monthly Average	Weekly Average	Single Sample
Flow (mgd)	0.75			
CBOD (mg/L)	5.0	6.25		10.0
TSS (mg/L)	5.0	6.25		10.0
PH (S.U.)				6.0 – 8.5
Fecal Coliform (CFUs/100ml)	*			25
TRC – disinfection (mg/L)				1.0
TRC – dechlorination (mg/L)				0.01
Total Nitrogen (mg/L)	3.0 **	3.75		6.0
Dissolved Oxygen (mg/L)				5.5
Chronic Toxicity –P. Promelas				100%
Chronic Toxicity – C. dubia				100%

* Over a 30 day period, 75% of the fecal coliform values (the 75th percentile) shall be below the detection limits. Any one sample shall not exceed 25 fecal coliform values per 100 mL of sample. Any one sample shall not exceed 5.0 milligrams per liter of total suspended (TSS) at a point before application of the disinfectant.
** The Consent Order allows for an interim limit of 4.0 mg/L of TN until September 30, 2003.

The City of Mulberry entered into a Consent Order, OGC File Number 02-0508, on April 23, 2003 to resolve the exceedances of the permit limits. The order required the City to construct a headworks structure, implement a pretreatment program and enforce current City ordinances to regulate potential sources of pollutants that may pass through or otherwise interfere with the treatment process. The City was given an interim limit for the annual average Total Nitrogen of 4.0 mg/L, where the permit limit is 3.0 mg/L, through September 30, 2003.

Page 1 of 4

Description of permitted outfall(s):
D001 – discharges into North Alafia Prong of the Alafia River.

List permit violations (from DMR data or other sources) and plant upsets that occurred within past year:
This facility is not meeting the annual and monthly averages and single sample permit limits of total nitrogen, and has had intermittent excursions for total suspended solids, fecal coliform, total residual chlorine after dechlorination, CBOD and pH. The table below shows the permit excursions for these parameters. The Department and the City entered into a consent order on April 28, 2003 to resolve the past effluent excursions. The order requires the City to install a new headworks, implement an industrial pretreatment program and provides an interim limit of 4.0 mg/L for TN on an annual average until September 30, 2003.

CITY OF MULBERRY - SYNOPSIS OF EFFLUENT VIOLATIONS

Month/ Year	Total N An. Avg. 3 mg/L	Total N Mo. Avg. 3.75 mg/L	Total N Max. 6.0 mg/L	TSS Max. 5.0 mg/L	Fecal Coli. Mo. Avg. <1 #/100ml	Fecal Coli. Max. 25 #/100ml	Residual Cl2 Max. 0.01 mg/L	CBOD Max. 10.0 mg/L	pH Range 6.0 – 8.5 SU
11/03					No report				
03/03		5.21							
12/02	3.05					28			
11/02	3.22								
10/02	No data								
9/02	3.49								
8/02	4.06				1				
7/02	4.13								
6/02	4.07			6.0					
5/02	4.42								
4/02	4.5								
3/02	4.6								
2/02	4.9	8.12	11.5, 7.39, 9.6						
1/02	4.57	5.1	6.48						
12/01	4.43								
11/01	No data			6.89					
10/01	4.6	4.87	7.43, 6.4		1				
9/01	4.06	8.8	13.3, 10.1, 6.6		1		0.05		
8/01	4.06			5.6	3				
7/01	4.04								
6/01	4.04	6.8	11.93, 7.48						
5/01	3.77				1	82			5.6, 5.9
4/01	3.76				7				
3/01	3.72	6.61	11.9, 8.8, 8.75						
2/01	3.44	4.14	7.31						
1/01	3.39								
12/00	3.33								
11/00	3.39								
10/00	3.52	4.53							
9/00	3.35								
8/00	3.34								
7/00	3.23	4.33	7.37, 6.58	32, 17					
6/00	3.23								
5/00	3.16						1.3		4.0
4/00	3.15			12				12.8	
3/00	3.17								
2/00	3.17			9		112, 79		10.3	
1/00	3.15								
12/99	3.08	3.96							
11/99	3.05	5.27	9.02, 8.6						

Describe previous impact bioassessments, WQBELs, and previous or current enforcement actions:
Impact Bioassessment Inspection (IBI) was conducted 03/15/2003. The XSI demonstrated that cadmium, copper, lead and zinc were detected in the effluent at levels that complied with surface water criteria. Aluminum, cadmium, chromium, iron, lead, knuckle and zinc were detected at test and control sites at levels that complied with surface water criteria. Atrazine was detected in the effluent in each sample. The CBI showed that the effluent was chronically toxic to *P. promelas*. The IBI indicated that algal growth potential at the control and test sites were above the suggested problem threshold of 5 mg dry wheight/L. AGP value at the test site was twice the value of the control site. Hester Dendy taxa richness was degraded at the test site in comparison to the control site. Shannon-Weaver diversity was lower at the test site in comparison to the control site. WQI indicated that fecal and total coliform bacteria were detected

in the effluent at levels that did not exceed water quality criteria. Unionized ammonia exceeded water quality criteria in all three samples collected from the effluent.

An FYI5 was conducted at the facility on January 26, 2004. The Hester Dendi block located at the downstream location (NPT1) was found along the stream bank. More than half of the block was exposed and the line that attached the HD to a tree was cut. Also, the collected effluent for the toxicity test (renewal) did not arrive within the allotted time to Tallahassee. The test was terminated at 96 hours. The XSI demonstrated Aluminum was detected in the effluent above the MDL but below the PQL. Cadmium, copper, lead and zinc were tetected in the effluent above the PQL. Atrazine was detected in the effluent above the MDL but below the PQL. Chloroform and bromodichloromethane were detected above the PQL. The WQI demonstrated nitrogen concentrations of 3.5mg/L and phosphorus concentrations f 3.2 mg/L. The IBI demonstrated AGP values at the test site was almost double the value of the control site.

Discuss comparability of DMR results to past DEP sampling results and whether there are trends (improving, declining) in the data set.
The facility has had total nitrogen exeedances (annual average of 3.0 mg/L) from November 1999 through December 2002. The FYI5 conducted January 26, 2004 demonstrated nitrogen concentrations in the effluent of 3.2 mg/L leading to believe that the facility would exceed the annual average permit limit of 3.0 mg/L. The facility also had twelve nitrogen exceedances for the monthly average of 3.75 mg/L and nine exceedances for the maximum single sample concentration of 6.0 mg/L.

Staff contributing to this review:
WRM: Lori Pillsbury, Nahir Cornwell
Inspector: Joe Squitieri

LOCATION MAP CITY OF MULBERRY WWTP
CONTROL SITE (NPC1), TEST SITE (NPT1) AND OUTFALL



City of Mulberry WWTP FYI-5 Test and Control Site Comparability Discussion

Table 1 shows the physical and chemical comparability between the test and control sites collected by DEP Southwest District Watershed Management on April 19, 2004, located at the North Prong of the Alafia River (WBID #1621E).

Table 1.

Parameter	NPC1 (4/19/04)			NPT1 (4/19/04)		
	Top	Mid	Bottom	Top	Mid	Bottom
Depth (m)[1]		.7			.6	
Dissolved oxygen (mg/L)[1]		6.01			6.12	
Specific conductance (uS/cm)[1]		1052			1049	
Temperature (·C)[1]		20.38			20.49	
pH (SU)[1]		7.18			7.22	
Latitude/longitude						
Least wide riparian side	6 to 12 m			6 to 12 m		
Artificially channelized	Yes, some recovery			Yes, some recovery		
Artificially impounded	No			No		
High water mark	1.5 m			1.5 m		
Canopy cover %	Moderately Shaded			Moderately Shaded		
Sediment odor	Normal			Normal		
Sediment oils	None			None		
Sediment deposition	Sand is moderate; Silt is slight			Sand Slight to Moderate; Silt Slight to moderate		
System type	3rd order			3rd Order		
Water odors	None			None		
Water surface oils	None			None		
Clarity	Some turbidity, mostly clear			Some turbidity		
Color	Clear			Clear		
Periphyton	Absent			Absent		
Fish	Common			Common		
Aquatic macrophytes	Rare			Rare		
Iron/sulfur bacteria	Absent			Absent		

DMR Summary Results

The date range you specified is: 03/01/2003 to 07/01/2004

Permit Number: FL0020338 **Outfall Indicator: 001-1**
Facility Name: MULBERRY STP **Monitoring Location Code: 1**

Parameter Code	Description	Limit	Limit Effective Dates	Statistical Base	Units	Average	Maximum	Minimum
P 00300	OXYGEN, DISSOLVED (DO)	5.5	3/1/2000 to 2/28/2005	DAILY MN	MG/L	5.5	5.5	5.5
P 00300	OXYGEN, DISSOLVED (DO)	DELMON	3/1/2000 to 2/28/2005		MG/L	5.5	5.5	5.5
P 00400	PH	8.5	3/1/2000 to 2/28/2005	MAXIMUM	SU	7.4562	8.1	7
P 00400	PH	6	3/1/2000 to 2/28/2005	MINIMUM	SU	6.3375	6.7	6
P 00530	SOLIDS, TOTAL SUSPENDED	10	3/1/2000 to 2/28/2005	MAXIMUM	MG/L	1.6263	2.56	1
P 00530	SOLIDS, TOTAL SUSPENDED	6.25	3/1/2000 to 2/28/2005	MO AVG	MG/L	0.3788	1.53	0
P 00600	NITROGEN, TOTAL (AS N)	3.75	1/1/2003 to 2/28/2005	MO AVG	MG/L	2.4531	5.21	1.4
P 00600	NITROGEN, TOTAL (AS N)	6	1/1/2003 to 2/28/2005	SINGSAMP	MG/L	3.2513	5.97	1.6
P 00610	NITROGEN, AMMONIA TOTAL (AS N)	DELMON	3/1/2000 to 2/28/2005			4.4813	23.6	1.46
P 50050	FLOW	ADDMON	3/1/2000 to 2/28/2005	MO AVG	MGD	0.4258	0.777	0.272
P 50050	FLOW	ADDMON	3/1/2000 to 2/28/2005	MO TOTAL	MGD	0.4444	0.662	0.313
P 50060	CHLORINE, TOTAL RESIDUAL	0.01	3/1/2000 to 2/28/2005	DAILY MX	MG/L	0.0006	0.01	0
P 74055	COLIFORM, FECAL GENERAL	0	3/1/2000 to 2/28/2005	75TH %	#/ 100ML	0	0	0
P 74055	COLIFORM, FECAL GENERAL	25	3/1/2000 to 2/28/2005	MAXIMUM	#/ 100ML	3.5	7	1
P 80082	BOD, CARBONACEOUS 05 DAY, 20C	10	3/1/2000 to 2/28/2005	MAXIMUM	MG/L	3.3344	5.5	2.1
P 80082	BOD, CARBONACEOUS 05 DAY, 20C	6.25	3/1/2000 to 2/28/2005	MO AVG	MG/L	0.8467	3.82	0

Permit Number: FL0020338 **Outfall Indicator: 001-1**
Facility Name: MULBERRY STP **Monitoring Location Code: A**

Parameter Code	Description	Limit	Limit Effective Dates	Statistical Base	Units	Average	Maximum	Minimum
P 50060	CHLORINE, TOTAL RESIDUAL	1	3/1/2000 to 2/28/2005	MINIMUM	MG/L	1.0076	1.04	1

Permit Number: FL0020338 **Outfall Indicator: 001-1**
Facility Name: MULBERRY STP **Monitoring Location Code: B**

Parameter Code	Description	Limit	Limit Effective Dates	Statistical Base	Units	Average	Maximum	Minimum
P 00530	SOLIDS, TOTAL SUSPENDED	5	3/1/2000 to 2/28/2005	MAXIMUM	MG/L	1.8011	4.44	1

Permit Number: FL0020338 **Outfall Indicator: 001-1**
Facility Name: MULBERRY STP **Monitoring Location Code: Y**

Parameter Code	Description	Limit	Limit Effective Dates	Statistical Base	Units	Average	Maximum	Minimum
P 00530	SOLIDS, TOTAL SUSPENDED	5	3/1/2000 to 2/28/2005	ANNL AVG	MG/L	1.0617	1.39	0.5
P 00530	SOLIDS, TOTAL SUSPENDED	DELMON	3/1/2000 to 2/28/2005		MG/L	1.24	1.24	1.24
P 00600	NITROGEN, TOTAL (AS N)	3	10/1/2003 to 2/28/2005	ANNL AVG	MG/L	2.258	2.4	2.1
P 00600	NITROGEN, TOTAL (AS N)	4	3/1/2003 to 9/30/2003	ANNL AVG	MG/L	2.4343	2.62	2.2
P 00610	NITROGEN, AMMONIA TOTAL (AS N)	DELMON	3/1/2000 to 2/28/2005			2.38	2.62	2.17
P 50050	FLOW	0.75	3/1/2000 to 2/28/2005	ANNL AVG	MGD	0.4692	0.519	0.407
P 80082	BOD, CARBONACEOUS 05 DAY, 20C	5	3/1/2000 to 2/28/2005	ANNL AVG	MG/L	1.15	1.3	1

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	REMARK	MDL	PQL
5/17/2004 7:00	Effluent-Composite	Bio-BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	2.4	mg/L			
5/17/2004 7:00	Effluent-Composite	Bio-Toxicology	Bioassay-Chronic-Scrn-FW-C.dubia, NOEC	100	NOEC	K		
5/17/2004 7:00	Effluent-Composite	Bio-Toxicology	Bioassay-Chronic-Scrn-FW-Fish, NOEC	100	NOEC			
5/17/2004 7:00	Effluent-Composite	Metals-Water	Aluminum	20	ug/L		5	20
5/17/2004 7:00	Effluent-Composite	Metals-Water	Arsenic	14	ug/L	U	14	56
5/17/2004 7:00	Effluent-Composite	Metals-Water	Cadmium	1.2	ug/L		0.025	0.1
5/17/2004 7:00	Effluent-Composite	Metals-Water	Calcium	51.7	mg/L		0.05	0.2
5/17/2004 7:00	Effluent-Composite	Metals-Water	Chromium	2	ug/L	U	2	8
5/17/2004 7:00	Effluent-Composite	Metals-Water	Copper	4	ug/L		0.75	3
5/17/2004 7:00	Effluent-Composite	Metals-Water	Iron	138	ug/L		5	20
5/17/2004 7:00	Effluent-Composite	Metals-Water	Lead	1.3	ug/L		0.05	0.2
5/17/2004 7:00	Effluent-Composite	Metals-Water	Magnesium	15.4	mg/L		0.02	0.08
5/17/2004 7:00	Effluent-Composite	Metals-Water	Nickel	3	ug/L	I	2	8
5/17/2004 7:00	Effluent-Composite	Metals-Water	Selenium	1	ug/L	U	1	4
5/17/2004 7:00	Effluent-Composite	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
5/17/2004 7:00	Effluent-Composite	Metals-Water	Zinc	128	ug/L		2	8
5/17/2004 7:00	Effluent-Composite	Nutrients-Liquid	Ammonia-N	0.57	mg N/L		0.02	0.04
5/17/2004 7:00	Effluent-Composite	Nutrients-Liquid	N_KJEL_TOT	2.1	mg N/L	A	0.06	0.2
5/17/2004 7:00	Effluent-Composite	Nutrients-Liquid	NO2NO3-N	1.9	mg N/L		0.04	0.1
5/17/2004 7:00	Effluent-Composite	Nutrients-Liquid	Total-P	4.6	mg P/L	A	0.4	1.2
5/17/2004 9:40	Field Blank-Grab	BNA-Water	1,2,4-Trichlorobenzene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	1,2-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	1,3-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	1,4-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	2,4,6-Trichlorophenol	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	2,4-Dichlorophenol	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
5/17/2004 9:40	Field Blank-Grab	BNA-Water	2,4-Dinitrophenol	14	ug/L	U	14	57
5/17/2004 9:40	Field Blank-Grab	BNA-Water	2,4-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	2,6-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	2-Chloronaphthalene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	2-Chlorophenol	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	11
5/17/2004 9:40	Field Blank-Grab	BNA-Water	2-Nitrophenol	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
5/17/2004 9:40	Field Blank-Grab	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.7
5/17/2004 9:40	Field Blank-Grab	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.7
5/17/2004 9:40	Field Blank-Grab	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.7
5/17/2004 9:40	Field Blank-Grab	BNA-Water	4-Bromophenyl phenyl ether	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	4-Chloro-3-methylphenol	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.6
5/17/2004 9:40	Field Blank-Grab	BNA-Water	4-Nitrophenol	14	ug/L	U	14	57
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Acenaphthene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Acenaphthylene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Aldrin	1.4	ug/L	U	1.4	5.7
5/17/2004 9:40	Field Blank-Grab	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.7
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Anthracene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Benzidine	95	ug/L	U	95	380
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Benzo(a)anthracene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Benzo(a)pyrene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Benzo(b)fluoranthene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Benzo(g,h,i)perylene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Benzo(k)fluoranthene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.7
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Bis(2-chloroethoxy)methane	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Bis(2-chloroethyl)ether	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	11
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	57
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19

DATE SAMPLED	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARK	MDL	PQL
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Chrysene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.7
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Dibenzo(a,h)anthracene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.7
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Diethyl phthalate	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Di-n-octyl phthalate	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.7
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Endrin	1.4	ug/L	UJ	1.4	5.7
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Endrin aldehyde	3.8	ug/L	UJ	3.8	15
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Fluoranthene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Fluorene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.7
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.7
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.7
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Hexachlorobenzene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	11
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	UJ	2.9	11
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	11
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Indeno(1,2,3-cd)pyrene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Isophorone	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Naphthalene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.6
5/17/2004 9:40	Field Blank-Grab	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.6
5/17/2004 9:40	Field Blank-Grab	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.6
5/17/2004 9:40	Field Blank-Grab	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	U	2.9	11
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Pentachlorophenol	2.9	ug/L	U	2.9	11
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Phenanthrene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Phenol	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	BNA-Water	Pyrene	0.95	ug/L	U	0.95	3.8
5/17/2004 9:40	Field Blank-Grab	GC-Water	Alachlor	0.58	ug/L	U	0.57692	2.31
5/17/2004 9:40	Field Blank-Grab	GC-Water	Ametryn	0.048	ug/L	U	0.048077	0.192
5/17/2004 9:40	Field Blank-Grab	GC-Water	Atrazine	0.048	ug/L	U	0.048077	0.192
5/17/2004 9:40	Field Blank-Grab	GC-Water	Azinphos Methyl	0.048	ug/L	U	0.048077	0.192
5/17/2004 9:40	Field Blank-Grab	GC-Water	Bromacil	0.19	ug/L	U	0.19231	0.769
5/17/2004 9:40	Field Blank-Grab	GC-Water	Butylate	0.19	ug/L	U	0.19231	0.769
5/17/2004 9:40	Field Blank-Grab	GC-Water	Chlorpyrifos Ethyl	0.048	ug/L	U	0.048077	0.192
5/17/2004 9:40	Field Blank-Grab	GC-Water	Chlorpyrifos Methyl	0.096	ug/L	U	0.096154	0.385
5/17/2004 9:40	Field Blank-Grab	GC-Water	Diazinon	0.048	ug/L	U	0.048077	0.192
5/17/2004 9:40	Field Blank-Grab	GC-Water	Ethion	0.048	ug/L	U	0.048077	0.192
5/17/2004 9:40	Field Blank-Grab	GC-Water	Ethoprop	0.096	ug/L	U	0.096154	0.385
5/17/2004 9:40	Field Blank-Grab	GC-Water	Fenamiphos	0.19	ug/L	U	0.19231	0.769
5/17/2004 9:40	Field Blank-Grab	GC-Water	Fonofos	0.096	ug/L	U	0.096154	0.385
5/17/2004 9:40	Field Blank-Grab	GC-Water	Hexazinone	0.096	ug/L	U	0.096154	0.385
5/17/2004 9:40	Field Blank-Grab	GC-Water	Malathion	0.14	ug/L	U	0.14423	0.577
5/17/2004 9:40	Field Blank-Grab	GC-Water	Metalaxyl	0.24	ug/L	UJ	0.24038	0.962
5/17/2004 9:40	Field Blank-Grab	GC-Water	Metolachlor	0.48	ug/L	U	0.48077	1.92
5/17/2004 9:40	Field Blank-Grab	GC-Water	Metribuzin	0.096	ug/L	U	0.096154	0.385
5/17/2004 9:40	Field Blank-Grab	GC-Water	Mevinphos	0.19	ug/L	U	0.19231	0.769
5/17/2004 9:40	Field Blank-Grab	GC-Water	Naled	0.77	ug/L	UJ	0.76923	3.08
5/17/2004 9:40	Field Blank-Grab	GC-Water	Norflurazon	0.096	ug/L	U	0.096154	0.385
5/17/2004 9:40	Field Blank-Grab	GC-Water	Parathion Ethyl	0.14	ug/L	UJ	0.14423	0.577
5/17/2004 9:40	Field Blank-Grab	GC-Water	Parathion Methyl	0.096	ug/L	U	0.096154	0.385
5/17/2004 9:40	Field Blank-Grab	GC-Water	Phorate	0.048	ug/L	U	0.048077	0.192
5/17/2004 9:40	Field Blank-Grab	GC-Water	Prometryn	0.14	ug/L	UJ	0.14423	0.577
5/17/2004 9:40	Field Blank-Grab	GC-Water	Simazine	0.048	ug/L	U	0.048077	0.192
5/17/2004 9:40	Field Blank-Grab	Metals-Water	Aluminum	5	ug/L	U	5	20
5/17/2004 9:40	Field Blank-Grab	Metals-Water	Arsenic	5	ug/L	U	5	20
5/17/2004 9:40	Field Blank-Grab	Metals-Water	Cadmium	0.025	ug/L	U	0.025	0.1
5/17/2004 9:40	Field Blank-Grab	Metals-Water	Calcium	0.05	mg/L	U	0.05	0.2
5/17/2004 9:40	Field Blank-Grab	Metals-Water	Chromium	2	ug/L	U	2	8
5/17/2004 9:40	Field Blank-Grab	Metals-Water	Copper	0.75	ug/L	U	0.75	3

DATE SAMPLED	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARK	MDL	PQL
5/17/2004 9:40	Field Blank-Grab	Metals-Water	Iron	5	ug/L	U	5	20
5/17/2004 9:40	Field Blank-Grab	Metals-Water	Lead	0.05	ug/L	U	0.05	0.2
5/17/2004 9:40	Field Blank-Grab	Metals-Water	Magnesium	0.02	mg/L	U	0.02	0.08
5/17/2004 9:40	Field Blank-Grab	Metals-Water	Nickel	2	ug/L	U	2	8
5/17/2004 9:40	Field Blank-Grab	Metals-Water	Selenium	1	ug/L	U	1	4
5/17/2004 9:40	Field Blank-Grab	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
5/17/2004 9:40	Field Blank-Grab	Metals-Water	Zinc	2	ug/L	U	2	8
5/17/2004 9:40	Field Blank-Grab	Nutrients-Liquid	Ammonia-N	0.01	mg N/L	U	0.01	0.02
5/17/2004 9:40	Field Blank-Grab	Nutrients-Liquid	N_KJEL_TOT	0.06	mg N/L	U	0.06	0.2
5/17/2004 9:40	Field Blank-Grab	Nutrients-Liquid	NO2NO3-N	0.004	mg N/L	U	0.004	0.01
5/17/2004 9:40	Field Blank-Grab	Nutrients-Liquid	O-Phosphate-P	0.004	mg P/L	U	0.004	0.01
5/17/2004 9:40	Field Blank-Grab	Nutrients-Liquid	Organic Carbon	1	mg C/L	U	1	5
5/17/2004 9:40	Field Blank-Grab	Nutrients-Liquid	Total-P	0.02	mg P/L	U	0.02	0.06
5/17/2004 9:40	Field Blank-Grab	Nutrients-Liquid	TSS	4	mg/L	U	4	16
5/17/2004 9:40	Field Blank-Grab	Nutrients-Liquid	Turbidity	0.05	NTU	U	0.05	0.05
5/17/2004 9:40	Field Blank-Grab	Overflow	Oil and Grease	1.7	mg/l	I		
5/17/2004 9:40	Field Blank-Grab	VOC-Water	Bromodichloromethane	0.2	ug/L	U	0.2	1
5/17/2004 9:40	Field Blank-Grab	VOC-Water	Bromoform	0.5	ug/L	U	0.5	2
5/17/2004 9:40	Field Blank-Grab	VOC-Water	Chloroform	0.2	ug/L	U	0.2	1
5/17/2004 9:40	Field Blank-Grab	VOC-Water	Dibromochloromethane	0.2	ug/L	U	0.2	1
5/17/2004 10:00	NPC1 (CONTROL SITE)	Bio-Invertebrates	Macroinvert-FW-Qual-Dipnetx20-# Taxa	18	# Taxa			
5/17/2004 10:15	Effluent-Grab	Bio-AGP/LimNut	Algal Growth Potential	15.2	mg DryWt/L		0.1	0.3
5/17/2004 10:15	Effluent-Grab	Bio-BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	0.68	mg/L	AI		
5/17/2004 10:15	Effluent-Grab	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
5/17/2004 10:15	Effluent-Grab	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
5/17/2004 10:15	Effluent-Grab	BNA-Water	1,2,4-Trichlorobenzene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	1,2-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	1,3-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	1,4-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	2,4,6-Trichlorophenol	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	2,4-Dichlorophenol	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
5/17/2004 10:15	Effluent-Grab	BNA-Water	2,4-Dinitrophenol	14	ug/L	U	14	57
5/17/2004 10:15	Effluent-Grab	BNA-Water	2,4-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	2,6-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	2-Chloronaphthalene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	2-Chlorophenol	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	11
5/17/2004 10:15	Effluent-Grab	BNA-Water	2-Nitrophenol	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
5/17/2004 10:15	Effluent-Grab	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.7
5/17/2004 10:15	Effluent-Grab	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.7
5/17/2004 10:15	Effluent-Grab	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.7
5/17/2004 10:15	Effluent-Grab	BNA-Water	4-Bromophenyl phenyl ether	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	4-Chloro-3-methylphenol	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.6
5/17/2004 10:15	Effluent-Grab	BNA-Water	4-Nitrophenol	14	ug/L	U	14	57
5/17/2004 10:15	Effluent-Grab	BNA-Water	Acenaphthene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	Acenaphthylene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	Aldrin	1.4	ug/L	U	1.4	5.7
5/17/2004 10:15	Effluent-Grab	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.7
5/17/2004 10:15	Effluent-Grab	BNA-Water	Anthracene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	Benzidine	95	ug/L	U	95	380
5/17/2004 10:15	Effluent-Grab	BNA-Water	Benzo(a)anthracene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	Benzo(a)pyrene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	Benzo(b)fluoranthene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	Benzo(g,h,i)perylene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	Benzo(k)fluoranthene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.7
5/17/2004 10:15	Effluent-Grab	BNA-Water	Bis(2-chloroethoxy)methane	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	Bis(2-chloroethyl)ether	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	11
5/17/2004 10:15	Effluent-Grab	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	57
5/17/2004 10:15	Effluent-Grab	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19

DATE SAMPLED	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARK	MDL	PQL
5/17/2004 10:15	Effluent-Grab	BNA-Water	Chrysene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.7
5/17/2004 10:15	Effluent-Grab	BNA-Water	Dibenzo(a,h)anthracene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.7
5/17/2004 10:15	Effluent-Grab	BNA-Water	Diethyl phthalate	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
5/17/2004 10:15	Effluent-Grab	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
5/17/2004 10:15	Effluent-Grab	BNA-Water	Di-n-octyl phthalate	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
5/17/2004 10:15	Effluent-Grab	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
5/17/2004 10:15	Effluent-Grab	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.7
5/17/2004 10:15	Effluent-Grab	BNA-Water	Endrin	1.4	ug/L	UJ	1.4	5.7
5/17/2004 10:15	Effluent-Grab	BNA-Water	Endrin aldehyde	3.8	ug/L	UJ	3.8	15
5/17/2004 10:15	Effluent-Grab	BNA-Water	Fluoranthene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	Fluorene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.7
5/17/2004 10:15	Effluent-Grab	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.7
5/17/2004 10:15	Effluent-Grab	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.7
5/17/2004 10:15	Effluent-Grab	BNA-Water	Hexachlorobenzene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	11
5/17/2004 10:15	Effluent-Grab	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	UJ	2.9	11
5/17/2004 10:15	Effluent-Grab	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	11
5/17/2004 10:15	Effluent-Grab	BNA-Water	Indeno(1,2,3-cd)pyrene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	Isophorone	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	Naphthalene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.6
5/17/2004 10:15	Effluent-Grab	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.6
5/17/2004 10:15	Effluent-Grab	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.6
5/17/2004 10:15	Effluent-Grab	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	U	2.9	11
5/17/2004 10:15	Effluent-Grab	BNA-Water	Pentachlorophenol	2.9	ug/L	U	2.9	11
5/17/2004 10:15	Effluent-Grab	BNA-Water	Phenanthrene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	Phenol	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	BNA-Water	Pyrene	0.95	ug/L	U	0.95	3.8
5/17/2004 10:15	Effluent-Grab	GC-Water	Alachlor	0.58	ug/L	U	0.57692	2.31
5/17/2004 10:15	Effluent-Grab	GC-Water	Ametryn	0.048	ug/L	U	0.048077	0.192
5/17/2004 10:15	Effluent-Grab	GC-Water	Atrazine	0.095	ug/L	I	0.048077	0.192
5/17/2004 10:15	Effluent-Grab	GC-Water	Azinphos Methyl	0.048	ug/L	U	0.048077	0.192
5/17/2004 10:15	Effluent-Grab	GC-Water	Bromacil	0.19	ug/L	U	0.19231	0.769
5/17/2004 10:15	Effluent-Grab	GC-Water	Butylate	0.19	ug/L	U	0.19231	0.769
5/17/2004 10:15	Effluent-Grab	GC-Water	Chlorpyrifos Ethyl	0.048	ug/L	U	0.048077	0.192
5/17/2004 10:15	Effluent-Grab	GC-Water	Chlorpyrifos Methyl	0.096	ug/L	U	0.096154	0.385
5/17/2004 10:15	Effluent-Grab	GC-Water	Diazinon	0.048	ug/L	U	0.048077	0.192
5/17/2004 10:15	Effluent-Grab	GC-Water	Ethion	0.048	ug/L	U	0.048077	0.192
5/17/2004 10:15	Effluent-Grab	GC-Water	Ethoprop	0.096	ug/L	U	0.096154	0.385
5/17/2004 10:15	Effluent-Grab	GC-Water	Fenamiphos	0.19	ug/L	U	0.19231	0.769
5/17/2004 10:15	Effluent-Grab	GC-Water	Fonofos	0.096	ug/L	U	0.096154	0.385
5/17/2004 10:15	Effluent-Grab	GC-Water	Hexazinone	0.096	ug/L	U	0.096154	0.385
5/17/2004 10:15	Effluent-Grab	GC-Water	Malathion	0.14	ug/L	U	0.14423	0.577
5/17/2004 10:15	Effluent-Grab	GC-Water	Metalaxyl	0.24	ug/L	UJ	0.24038	0.962
5/17/2004 10:15	Effluent-Grab	GC-Water	Metolachlor	0.48	ug/L	U	0.48077	1.92
5/17/2004 10:15	Effluent-Grab	GC-Water	Metribuzin	0.096	ug/L	U	0.096154	0.385
5/17/2004 10:15	Effluent-Grab	GC-Water	Mevinphos	0.19	ug/L	U	0.19231	0.769
5/17/2004 10:15	Effluent-Grab	GC-Water	Naled	0.77	ug/L	UJ	0.76923	3.08
5/17/2004 10:15	Effluent-Grab	GC-Water	Norflurazon	0.096	ug/L	U	0.096154	0.385
5/17/2004 10:15	Effluent-Grab	GC-Water	Parathion Ethyl	0.14	ug/L	UJ	0.14423	0.577
5/17/2004 10:15	Effluent-Grab	GC-Water	Parathion Methyl	0.096	ug/L	U	0.096154	0.385
5/17/2004 10:15	Effluent-Grab	GC-Water	Phorate	0.048	ug/L	U	0.048077	0.192
5/17/2004 10:15	Effluent-Grab	GC-Water	Prometryn	0.14	ug/L	UJ	0.14423	0.577
5/17/2004 10:15	Effluent-Grab	GC-Water	Simazine	0.048	ug/L	U	0.048077	0.192
5/17/2004 10:15	Effluent-Grab	Metals-Water	Aluminum	19	ug/L	I	5	20
5/17/2004 10:15	Effluent-Grab	Metals-Water	Arsenic	5	ug/L	U	5	20
5/17/2004 10:15	Effluent-Grab	Metals-Water	Cadmium	0.22	ug/L		0.025	0.1
5/17/2004 10:15	Effluent-Grab	Metals-Water	Calcium	48.5	mg/L		0.05	0.2
5/17/2004 10:15	Effluent-Grab	Metals-Water	Chromium	2	ug/L	U	2	8

DATE SAMPLED	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARK	MDL	PQL
5/17/2004 10:15	Effluent-Grab	Metals-Water	Copper	8.3	ug/L		0.75	3
5/17/2004 10:15	Effluent-Grab	Metals-Water	Iron	131	ug/L		5	20
5/17/2004 10:15	Effluent-Grab	Metals-Water	Lead	1.5	ug/L		0.05	0.2
5/17/2004 10:15	Effluent-Grab	Metals-Water	Magnesium	14.5	mg/L		0.02	0.08
5/17/2004 10:15	Effluent-Grab	Metals-Water	Nickel	2.9	ug/L	I	2	8
5/17/2004 10:15	Effluent-Grab	Metals-Water	Selenium	1	ug/L	U	1	4
5/17/2004 10:15	Effluent-Grab	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
5/17/2004 10:15	Effluent-Grab	Metals-Water	Zinc	119	ug/L		2	8
5/17/2004 10:15	Effluent-Grab	Nutrients-Liquid	Ammonia-N	0.058	mg N/L		0.01	0.02
5/17/2004 10:15	Effluent-Grab	Nutrients-Liquid	Color	5	PCU		5	5
5/17/2004 10:15	Effluent-Grab	Nutrients-Liquid	N_KJEL_TOT	1.1	mg N/L		0.06	0.2
5/17/2004 10:15	Effluent-Grab	Nutrients-Liquid	NO2NO3-N	3.2	mg N/L		0.04	0.1
5/17/2004 10:15	Effluent-Grab	Nutrients-Liquid	O-Phosphate-P	4.8	mg P/L		0.4	1
5/17/2004 10:15	Effluent-Grab	Nutrients-Liquid	Organic Carbon	7.1	mg C/L	A	1	5
5/17/2004 10:15	Effluent-Grab	Nutrients-Liquid	Total-P	5.2	mg P/L		0.4	1.2
5/17/2004 10:15	Effluent-Grab	Nutrients-Liquid	TSS	4	mg/L	U	4	16
5/17/2004 10:15	Effluent-Grab	Nutrients-Liquid	Turbidity	1	NTU		0.05	0.05
5/17/2004 10:15	Effluent-Grab	Overflow	Oil and Grease	1.9	mg/l	I		
5/17/2004 10:15	Effluent-Grab	VOC-Water	Bromodichloromethane	9.7	ug/L		0.2	1
5/17/2004 10:15	Effluent-Grab	VOC-Water	Bromoform	0.5	ug/L	U	0.5	2
5/17/2004 10:15	Effluent-Grab	VOC-Water	Chloroform	68	ug/L		0.2	1
5/17/2004 10:15	Effluent-Grab	VOC-Water	Dibromochloromethane	1.1	ug/L		0.2	1
5/17/2004 10:15	Trip Blank	VOC-Water	Bromodichloromethane	0.2	ug/L	U	0.2	1
5/17/2004 10:15	Trip Blank	VOC-Water	Bromoform	0.5	ug/L	U	0.5	2
5/17/2004 10:15	Trip Blank	VOC-Water	Chloroform	0.2	ug/L	U	0.2	1
5/17/2004 10:15	Trip Blank	VOC-Water	Dibromochloromethane	0.2	ug/L	U	0.2	1
5/17/2004 11:10	NPT1 (TEST SITE)	Bio-AGP/LimNut	Algal Growth Potential	43	mg DryWt/L		0.1	0.3
5/17/2004 11:10	NPT1 (TEST SITE)	Bio-BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	0.2	mg/L	U		
5/17/2004 11:10	NPT1 (TEST SITE)	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton	45	mg/m2		1.1	3.4
5/17/2004 11:10	NPT1 (TEST SITE)	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
5/17/2004 11:10	NPT1 (TEST SITE)	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton	0	mg/m2		1.1	3.4
5/17/2004 11:10	NPT1 (TEST SITE)	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
5/17/2004 11:10	NPT1 (TEST SITE)	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa	24	#Taxa			
5/17/2004 11:10	NPT1 (TEST SITE)	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa	8	#Taxa			
5/17/2004 11:10	NPT1 (TEST SITE)	Nutrients-Liquid	Ammonia-N	0.05	mg N/L		0.01	0.02
5/17/2004 11:10	NPT1 (TEST SITE)	Nutrients-Liquid	Color	40	PCU		5	5
5/17/2004 11:10	NPT1 (TEST SITE)	Nutrients-Liquid	N_KJEL_TOT	0.64	mg N/L		0.06	0.2
5/17/2004 11:10	NPT1 (TEST SITE)	Nutrients-Liquid	NO2NO3-N	0.2	mg N/L		0.004	0.01
5/17/2004 11:10	NPT1 (TEST SITE)	Nutrients-Liquid	O-Phosphate-P	3.4	mg P/L		0.08	0.2
5/17/2004 11:10	NPT1 (TEST SITE)	Nutrients-Liquid	Total-P	4.1	mg P/L		0.4	1.2
5/17/2004 11:10	NPT1 (TEST SITE)	Nutrients-Liquid	TSS	5	mg/L	I	4	16
5/17/2004 11:10	NPT1 (TEST SITE)	Nutrients-Liquid	Turbidity	5.4	NTU		0.05	0.05
5/17/2004 11:10	NPT1 (TEST SITE)	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	16	# Taxa			
5/17/2004 11:10	NPT1 (TEST SITE)	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	22	# Taxa			
5/17/2004 11:10	NPT1 (TEST SITE)	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	18	# Taxa			
5/17/2004 11:45	NPC1 (CONTROL SITE)	Bio-AGP/LimNut	Algal Growth Potential	14.7	mg DryWt/L		0.1	0.3
5/17/2004 11:45	NPC1 (CONTROL SITE)	Bio-BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	0.2	mg/L	U		
5/17/2004 11:45	NPC1 (CONTROL SITE)	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton	12	mg/m2		0.24	0.73
5/17/2004 11:45	NPC1 (CONTROL SITE)	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
5/17/2004 11:45	NPC1 (CONTROL SITE)	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton	0	mg/m2		0.24	0.73
5/17/2004 11:45	NPC1 (CONTROL SITE)	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
5/17/2004 11:45	NPC1 (CONTROL SITE)	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa	22	#Taxa			
5/17/2004 11:45	NPC1 (CONTROL SITE)	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa	7	#Taxa			
5/17/2004 11:45	NPC1 (CONTROL SITE)	Nutrients-Liquid	Ammonia-N	0.049	mg N/L		0.01	0.02
5/17/2004 11:45	NPC1 (CONTROL SITE)	Nutrients-Liquid	Color	40	PCU	A	5	5
5/17/2004 11:45	NPC1 (CONTROL SITE)	Nutrients-Liquid	N_KJEL_TOT	0.65	mg N/L		0.06	0.2
5/17/2004 11:45	NPC1 (CONTROL SITE)	Nutrients-Liquid	NO2NO3-N	0.2	mg N/L		0.004	0.01
5/17/2004 11:45	NPC1 (CONTROL SITE)	Nutrients-Liquid	O-Phosphate-P	3.5	mg P/L		0.2	0.5
5/17/2004 11:45	NPC1 (CONTROL SITE)	Nutrients-Liquid	Total-P	4	mg P/L		0.4	1.2
5/17/2004 11:45	NPC1 (CONTROL SITE)	Nutrients-Liquid	TSS	4	mg/L	U	4	16
5/17/2004 11:45	NPC1 (CONTROL SITE)	Nutrients-Liquid	Turbidity	4.2	NTU		0.05	0.05
5/17/2004 11:45	NPC1 (CONTROL SITE)	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	29	# Taxa			
5/17/2004 11:45	NPC1 (CONTROL SITE)	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	20	# Taxa			
5/17/2004 11:45	NPC1 (CONTROL SITE)	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	27	# Taxa			

DATE SAMPLED	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARK	MDL	PQL
5/17/2004 13:00	NPT1 (TEST SITE)	Bio-Invertebrates	Macroinvert-FW-Qual-Dipnetx20-# Taxa	25	# Taxa			
5/19/2004 10:55	Effluent-Grab	BNA-Water	1,2,4-Trichlorobenzene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	1,2-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	1,3-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	1,4-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	2,4,6-Trichlorophenol	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	2,4-Dichlorophenol	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
5/19/2004 10:55	Effluent-Grab	BNA-Water	2,4-Dinitrophenol	14	ug/L	U	14	57
5/19/2004 10:55	Effluent-Grab	BNA-Water	2,4-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	2,6-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	2-Chloronaphthalene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	2-Chlorophenol	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	11
5/19/2004 10:55	Effluent-Grab	BNA-Water	2-Nitrophenol	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
5/19/2004 10:55	Effluent-Grab	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.7
5/19/2004 10:55	Effluent-Grab	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.7
5/19/2004 10:55	Effluent-Grab	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.7
5/19/2004 10:55	Effluent-Grab	BNA-Water	4-Bromophenyl phenyl ether	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	4-Chloro-3-methylphenol	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.6
5/19/2004 10:55	Effluent-Grab	BNA-Water	4-Nitrophenol	14	ug/L	U	14	57
5/19/2004 10:55	Effluent-Grab	BNA-Water	Acenaphthene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	Acenaphthylene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	Aldrin	1.4	ug/L	U	1.4	5.7
5/19/2004 10:55	Effluent-Grab	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.7
5/19/2004 10:55	Effluent-Grab	BNA-Water	Anthracene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	Benzidine	95	ug/L	U	95	380
5/19/2004 10:55	Effluent-Grab	BNA-Water	Benzo(a)anthracene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	Benzo(a)pyrene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	Benzo(b)fluoranthene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	Benzo(g,h,i)perylene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	Benzo(k)fluoranthene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.7
5/19/2004 10:55	Effluent-Grab	BNA-Water	Bis(2-chloroethoxy)methane	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	Bis(2-chloroethyl)ether	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	11
5/19/2004 10:55	Effluent-Grab	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	57
5/19/2004 10:55	Effluent-Grab	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19
5/19/2004 10:55	Effluent-Grab	BNA-Water	Chrysene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.7
5/19/2004 10:55	Effluent-Grab	BNA-Water	Dibenzo(a,h)anthracene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.7
5/19/2004 10:55	Effluent-Grab	BNA-Water	Diethyl phthalate	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
5/19/2004 10:55	Effluent-Grab	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
5/19/2004 10:55	Effluent-Grab	BNA-Water	Di-n-octyl phthalate	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
5/19/2004 10:55	Effluent-Grab	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
5/19/2004 10:55	Effluent-Grab	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.7
5/19/2004 10:55	Effluent-Grab	BNA-Water	Endrin	1.4	ug/L	UJ	1.4	5.7
5/19/2004 10:55	Effluent-Grab	BNA-Water	Endrin aldehyde	3.8	ug/L	UJ	3.8	15
5/19/2004 10:55	Effluent-Grab	BNA-Water	Fluoranthene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	Fluorene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.7
5/19/2004 10:55	Effluent-Grab	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.7
5/19/2004 10:55	Effluent-Grab	BNA-Water	Heptachlor epoxide	1.4	ug/L	UJ	1.4	5.7
5/19/2004 10:55	Effluent-Grab	BNA-Water	Hexachlorobenzene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	11
5/19/2004 10:55	Effluent-Grab	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	UJ	2.9	11
5/19/2004 10:55	Effluent-Grab	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	11
5/19/2004 10:55	Effluent-Grab	BNA-Water	Indeno(1,2,3-cd)pyrene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	Isophorone	0.95	ug/L	U	0.95	3.8

DATE SAMPLED	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARK	MDL	PQL
5/19/2004 10:55	Effluent-Grab	BNA-Water	Naphthalene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.6
5/19/2004 10:55	Effluent-Grab	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.6
5/19/2004 10:55	Effluent-Grab	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.6
5/19/2004 10:55	Effluent-Grab	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	UJ	2.9	11
5/19/2004 10:55	Effluent-Grab	BNA-Water	Pentachlorophenol	2.9	ug/L	UJ	2.9	11
5/19/2004 10:55	Effluent-Grab	BNA-Water	Phenanthrene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	Phenol	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	BNA-Water	Pyrene	0.95	ug/L	U	0.95	3.8
5/19/2004 10:55	Effluent-Grab	GC-Water	Alachlor	0.58	ug/L	U	0.57692	2.31
5/19/2004 10:55	Effluent-Grab	GC-Water	Ametryn	0.048	ug/L	U	0.048077	0.192
5/19/2004 10:55	Effluent-Grab	GC-Water	Atrazine	0.048	ug/L	U	0.048077	0.192
5/19/2004 10:55	Effluent-Grab	GC-Water	Azinphos Methyl	0.048	ug/L	U	0.048077	0.192
5/19/2004 10:55	Effluent-Grab	GC-Water	Bromacil	0.19	ug/L	U	0.19231	0.769
5/19/2004 10:55	Effluent-Grab	GC-Water	Butylate	0.19	ug/L	U	0.19231	0.769
5/19/2004 10:55	Effluent-Grab	GC-Water	Chlorpyrifos Ethyl	0.048	ug/L	U	0.048077	0.192
5/19/2004 10:55	Effluent-Grab	GC-Water	Chlorpyrifos Methyl	0.096	ug/L	U	0.096154	0.385
5/19/2004 10:55	Effluent-Grab	GC-Water	Diazinon	0.048	ug/L	U	0.048077	0.192
5/19/2004 10:55	Effluent-Grab	GC-Water	Ethion	0.048	ug/L	U	0.048077	0.192
5/19/2004 10:55	Effluent-Grab	GC-Water	Ethoprop	0.096	ug/L	U	0.096154	0.385
5/19/2004 10:55	Effluent-Grab	GC-Water	Fenamiphos	0.19	ug/L	U	0.19231	0.769
5/19/2004 10:55	Effluent-Grab	GC-Water	Fonofos	0.096	ug/L	U	0.096154	0.385
5/19/2004 10:55	Effluent-Grab	GC-Water	Hexazinone	0.096	ug/L	U	0.096154	0.385
5/19/2004 10:55	Effluent-Grab	GC-Water	Malathion	0.14	ug/L	U	0.14423	0.577
5/19/2004 10:55	Effluent-Grab	GC-Water	Metalaxyl	0.24	ug/L	UJ	0.24038	0.962
5/19/2004 10:55	Effluent-Grab	GC-Water	Metolachlor	0.48	ug/L	U	0.48077	1.92
5/19/2004 10:55	Effluent-Grab	GC-Water	Metribuzin	0.096	ug/L	U	0.096154	0.385
5/19/2004 10:55	Effluent-Grab	GC-Water	Mevinphos	0.19	ug/L	U	0.19231	0.769
5/19/2004 10:55	Effluent-Grab	GC-Water	Naled	0.77	ug/L	UJ	0.76923	3.08
5/19/2004 10:55	Effluent-Grab	GC-Water	Norflurazon	0.096	ug/L	U	0.096154	0.385
5/19/2004 10:55	Effluent-Grab	GC-Water	Parathion Ethyl	0.14	ug/L	UJ	0.14423	0.577
5/19/2004 10:55	Effluent-Grab	GC-Water	Parathion Methyl	0.096	ug/L	U	0.096154	0.385
5/19/2004 10:55	Effluent-Grab	GC-Water	Phorate	0.048	ug/L	U	0.048077	0.192
5/19/2004 10:55	Effluent-Grab	GC-Water	Prometryn	0.14	ug/L	UJ	0.14423	0.577
5/19/2004 10:55	Effluent-Grab	GC-Water	Simazine	0.048	ug/L	U	0.048077	0.192
5/19/2004 10:55	Effluent-Grab	Metals-Water	Aluminum	21	ug/L		5	20
5/19/2004 10:55	Effluent-Grab	Metals-Water	Arsenic	5	ug/L	U	5	20
5/19/2004 10:55	Effluent-Grab	Metals-Water	Cadmium	0.26	ug/L		0.025	0.1
5/19/2004 10:55	Effluent-Grab	Metals-Water	Calcium	50.3	mg/L		0.05	0.2
5/19/2004 10:55	Effluent-Grab	Metals-Water	Chromium	2	ug/L	U	2	8
5/19/2004 10:55	Effluent-Grab	Metals-Water	Copper	5.7	ug/L		0.75	3
5/19/2004 10:55	Effluent-Grab	Metals-Water	Iron	138	ug/L		5	20
5/19/2004 10:55	Effluent-Grab	Metals-Water	Lead	1.2	ug/L		0.05	0.2
5/19/2004 10:55	Effluent-Grab	Metals-Water	Magnesium	14.7	mg/L		0.02	0.08
5/19/2004 10:55	Effluent-Grab	Metals-Water	Nickel	3.1	ug/L	I	2	8
5/19/2004 10:55	Effluent-Grab	Metals-Water	Selenium	1	ug/L	U	1	4
5/19/2004 10:55	Effluent-Grab	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
5/19/2004 10:55	Effluent-Grab	Metals-Water	Zinc	117	ug/L		2	8
5/19/2004 10:55	Effluent-Grab	Nutrients-Liquid	Ammonia-N	0.041	mg N/L		0.01	0.02
5/21/2004 10:45	Effluent-Grab	BNA-Water	1,2,4-Trichlorobenzene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	1,2-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	1,3-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	1,4-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	2,4,6-Trichlorophenol	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	2,4-Dichlorophenol	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
5/21/2004 10:45	Effluent-Grab	BNA-Water	2,4-Dinitrophenol	14	ug/L	U	14	57
5/21/2004 10:45	Effluent-Grab	BNA-Water	2,4-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	2,6-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	2-Chloronaphthalene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	2-Chlorophenol	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	11
5/21/2004 10:45	Effluent-Grab	BNA-Water	2-Nitrophenol	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150

DATE SAMPLED	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARK	MDL	PQL
5/21/2004 10:45	Effluent-Grab	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.7
5/21/2004 10:45	Effluent-Grab	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.7
5/21/2004 10:45	Effluent-Grab	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.7
5/21/2004 10:45	Effluent-Grab	BNA-Water	4-Bromophenyl phenyl ether	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	4-Chloro-3-methylphenol	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.6
5/21/2004 10:45	Effluent-Grab	BNA-Water	4-Nitrophenol	14	ug/L	U	14	57
5/21/2004 10:45	Effluent-Grab	BNA-Water	Acenaphthene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	Acenaphthylene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	Aldrin	1.4	ug/L	U	1.4	5.7
5/21/2004 10:45	Effluent-Grab	BNA-Water	Anthracene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	Benzidine	95	ug/L	U	95	380
5/21/2004 10:45	Effluent-Grab	BNA-Water	Benzo(a)anthracene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	Benzo(a)pyrene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	Benzo(b)fluoranthene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	Benzo(g,h,i)perylene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	Benzo(k)fluoranthene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	Bis(2-chloroethoxy)methane	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	Bis(2-chloroethyl)ether	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	11
5/21/2004 10:45	Effluent-Grab	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	57
5/21/2004 10:45	Effluent-Grab	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19
5/21/2004 10:45	Effluent-Grab	BNA-Water	Chrysene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
5/21/2004 10:45	Effluent-Grab	BNA-Water	Di-n-octyl phthalate	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	Dibenzo(a,h)anthracene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.7
5/21/2004 10:45	Effluent-Grab	BNA-Water	Diethyl phthalate	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
5/21/2004 10:45	Effluent-Grab	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
5/21/2004 10:45	Effluent-Grab	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
5/21/2004 10:45	Effluent-Grab	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.7
5/21/2004 10:45	Effluent-Grab	BNA-Water	Endrin	1.4	ug/L	UJ	1.4	5.7
5/21/2004 10:45	Effluent-Grab	BNA-Water	Endrin aldehyde	3.8	ug/L	UJ	3.8	15
5/21/2004 10:45	Effluent-Grab	BNA-Water	Fluoranthene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	Fluorene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.7
5/21/2004 10:45	Effluent-Grab	BNA-Water	Heptachlor epoxide	1.4	ug/L	UJ	1.4	5.7
5/21/2004 10:45	Effluent-Grab	BNA-Water	Hexachlorobenzene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	11
5/21/2004 10:45	Effluent-Grab	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	UJ	2.9	11
5/21/2004 10:45	Effluent-Grab	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	11
5/21/2004 10:45	Effluent-Grab	BNA-Water	Indeno(1,2,3-cd)pyrene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	Isophorone	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.6
5/21/2004 10:45	Effluent-Grab	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.6
5/21/2004 10:45	Effluent-Grab	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	UJ	2.9	11
5/21/2004 10:45	Effluent-Grab	BNA-Water	Naphthalene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.6
5/21/2004 10:45	Effluent-Grab	BNA-Water	Pentachlorophenol	2.9	ug/L	UJ	2.9	11
5/21/2004 10:45	Effluent-Grab	BNA-Water	Phenanthrene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	Phenol	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	Pyrene	0.95	ug/L	U	0.95	3.8
5/21/2004 10:45	Effluent-Grab	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.7
5/21/2004 10:45	Effluent-Grab	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.7
5/21/2004 10:45	Effluent-Grab	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.7
5/21/2004 10:45	Effluent-Grab	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.7
5/21/2004 10:45	Effluent-Grab	GC-Water	Alachlor	0.58	ug/L	U	0.58	2.32
5/21/2004 10:45	Effluent-Grab	GC-Water	Ametryn	0.048	ug/L	U	0.048	0.192
5/21/2004 10:45	Effluent-Grab	GC-Water	Atrazine	0.052	ug/L	I	0.048	0.192
5/21/2004 10:45	Effluent-Grab	GC-Water	Azinphos Methyl	0.048	ug/L	U	0.048	0.192
5/21/2004 10:45	Effluent-Grab	GC-Water	Bromacil	0.19	ug/L	U	0.19	0.76
5/21/2004 10:45	Effluent-Grab	GC-Water	Butylate	0.19	ug/L	U	0.19	0.76
5/21/2004 10:45	Effluent-Grab	GC-Water	Chlorpyrifos Ethyl	0.048	ug/L	U	0.048	0.192

DATE SAMPLED	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARK	MDL	PQL
5/21/2004 10:45	Effluent-Grab	GC-Water	Chlorpyrifos Methyl	0.096	ug/L	U	0.096	0.384
5/21/2004 10:45	Effluent-Grab	GC-Water	Diazinon	0.048	ug/L	UJ	0.048	0.192
5/21/2004 10:45	Effluent-Grab	GC-Water	Ethion	0.048	ug/L	U	0.048	0.192
5/21/2004 10:45	Effluent-Grab	GC-Water	Ethoprop	0.096	ug/L	U	0.096	0.384
5/21/2004 10:45	Effluent-Grab	GC-Water	Fenamiphos	0.19	ug/L	U	0.19	0.76
5/21/2004 10:45	Effluent-Grab	GC-Water	Fonofos	0.096	ug/L	U	0.096	0.384
5/21/2004 10:45	Effluent-Grab	GC-Water	Hexazinone	0.096	ug/L	U	0.096	0.384
5/21/2004 10:45	Effluent-Grab	GC-Water	Malathion	0.14	ug/L	U	0.14	0.56
5/21/2004 10:45	Effluent-Grab	GC-Water	Metalaxyl	0.24	ug/L	U	0.24	0.96
5/21/2004 10:45	Effluent-Grab	GC-Water	Metolachlor	0.48	ug/L	U	0.48	1.92
5/21/2004 10:45	Effluent-Grab	GC-Water	Metribuzin	0.096	ug/L	U	0.096	0.384
5/21/2004 10:45	Effluent-Grab	GC-Water	Mevinphos	0.19	ug/L	U	0.19	0.76
5/21/2004 10:45	Effluent-Grab	GC-Water	Naled	0.77	ug/L	UJ	0.77	3.08
5/21/2004 10:45	Effluent-Grab	GC-Water	Norflurazon	0.096	ug/L	U	0.096	0.384
5/21/2004 10:45	Effluent-Grab	GC-Water	Parathion Ethyl	0.14	ug/L	U	0.14	0.56
5/21/2004 10:45	Effluent-Grab	GC-Water	Parathion Methyl	0.096	ug/L	U	0.096	0.384
5/21/2004 10:45	Effluent-Grab	GC-Water	Phorate	0.048	ug/L	U	0.048	0.192
5/21/2004 10:45	Effluent-Grab	GC-Water	Prometryn	0.14	ug/L	U	0.14	0.56
5/21/2004 10:45	Effluent-Grab	GC-Water	Simazine	0.048	ug/L	U	0.048	0.192
5/21/2004 10:45	Effluent-Grab	Metals-Water	Aluminum	24	ug/L		5	20
5/21/2004 10:45	Effluent-Grab	Metals-Water	Arsenic	5	ug/L	U	5	20
5/21/2004 10:45	Effluent-Grab	Metals-Water	Cadmium	0.31	ug/L		0.025	0.1
5/21/2004 10:45	Effluent-Grab	Metals-Water	Calcium	52.2	mg/L		0.05	0.2
5/21/2004 10:45	Effluent-Grab	Metals-Water	Chromium	2	ug/L	U	2	8
5/21/2004 10:45	Effluent-Grab	Metals-Water	Copper	9.6	ug/L		0.75	3
5/21/2004 10:45	Effluent-Grab	Metals-Water	Iron	120	ug/L		5	20
5/21/2004 10:45	Effluent-Grab	Metals-Water	Lead	2.7	ug/L		0.05	0.2
5/21/2004 10:45	Effluent-Grab	Metals-Water	Magnesium	15.6	mg/L		0.02	0.08
5/21/2004 10:45	Effluent-Grab	Metals-Water	Nickel	2.2	ug/L	I	2	8
5/21/2004 10:45	Effluent-Grab	Metals-Water	Selenium	1	ug/L	U	1	4
5/21/2004 10:45	Effluent-Grab	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
5/21/2004 10:45	Effluent-Grab	Metals-Water	Zinc	140	ug/L		2	8
5/21/2004 10:45	Effluent-Grab	Nutrients-Liquid	Ammonia-N	0.044	mg N/L		0.01	0.02

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	**12**
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	**3.01**
Hester-Dendy Taxa Richness	6	6.5	9	11.5	13	15	17	21.5	26	29	32	**36**
Dipnet Taxa Richness	9	12	17	20	22	24.5	26	28	31	37	53	**19**
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	**0.65**
Total Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60	**0.049**
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	**0.2**
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	0.74	1.51	**4**
Orthophosphate	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	0.59	1.37	**3.5**
Turbidity (NTU)	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30	**4.2**

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	**45**
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	**3.08**
Hester-Dendy Taxa Richness	6	6.5	9	11.5	13	15	17	21.5	26	29	32	**27**
Dipnet Taxa Richness	9	12	17	20	22	24.5	26	28	31	37	53	**25**
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	**0.64**
Total Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60	**0.05**
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	**0.2**
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	0.74	1.51	**4.1**
Orthophosphate	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	0.59	1.37	**3.4**
Turbidity (NTU)	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30	**5.4**

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 Disctrict Chemistry Laboratory Report **3804 Coconut Palm Dr.**
Phone # 813-744-6100 DEP CompQAP # 880078 NELAP # E34886 **Tampa, FL 33619**

Project: FYI5 *Type: City of Mulberry* *Requested by:*

Site	*Time*	*Date*	*Analysis Date/Time*	*Log*	*Samplers*	*RQ#*	*Notes*
Effluent	1015	5/17/2004	05-17-04/1400	30255	CORNWELL,GUNTER	2004-05-17-27	
NPC1	1145			30256			
NPT1	1110			30257			
FIELD BLANK	0940			30258			

Code	*parameter*	*units*	*EFFLUENT*	*NPC1*	*NPT1*	*FB*	*site:*	*site:*	*site:*
29	log#	log	30255	30256	30257	30258			
10	water temp.	deg C							
78	secchi	meters							
94	conductivity	umho/cm							
299	diss.Oxygen	mg/l							
301	diss.Oxygen	%							
406	pH	units							
480	salinity	0/00							
82903	total depth	meters							
31501	t-coliforms	#/100ml	1K	150BK	70BK	1K			
31616	f-coliforms	#/100ml	1K	10BK	10BK	1K			
4192	sample depth	meters							

A denotes 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.

Sample Source: City of Mulberry
Address: 2nd Stop South of S.R. 60, Mulberry
County: Polk
NPDES Permit # FL0020338
Contact/District: Mt. Gunter / Southwest
Start Date 5-18-04 Time 1330 End Date: [illegible] Time [illegible]
LIMS uploaded: 6-14-04 Verified: 6/14/04 CAP
Incubator # 3 Temperature Range: 23.5-25.0°C
Room B246 Temperature Range: 24-25.0°C
SOP#: TA07_05
Light Intensity: 50 - 100 ft. candles (yes) no
Photoperiod : 16 light 8 dark (yes) no
Chamber size : 30 ml
Sample volume : 20 ml
Feeding: Daily
YCT#: 2
Algae#: 24

State of Florida
Department of Environmental Protection
Biology Laboratory Chronic Screening Bioassay
Ceriodaphnia dubia Bench Sheet - Chemistry

Sample	Collection Date	Received Date
1	5-17-04 / 0700	5/18/04 / 1056
2	5-19-04 / 0700	5-20-04 / 1035
3	5-21-04 / 1045	5-22-04 / 1020

Organism batch #: 17 Organism age : <24 hours

Comments: Sample #1 aerated for 30 minutes to decrease dissolved oxygen from 9.6mg/L to 8.0mg/L. Sample #2 and #3 aerated for ≈ 30 minutes to decrease dissolved oxygen to ~7.0mg/L.

Test Day		Conc.	New Sample pH (su)	Temp (°C)	DO (mg/L)	Cond (µmhos/cm)	Old Sample pH (su)	DO (mg/L)
Day 0	sample:	Control	7.8	24.2	7.9	180		
	1	100%	7.7	24.9	8.4	1155		
	Measured by:		MF	MF	MA	MA		
	Recorded by:		MF	MF	MF	MF		
Day 1	sample:	Control	7.8	24.0	7.9	170	7.8	8.0
	1	100%	7.6	24.8	7.9	1030	8.2	8.0
	Measured by:		CAP	CAP	CAP	CAP	CAP	CAP
	Recorded by:		CAP	CAP	CAP	CAP	CAP	CAP
Day 2	sample:	Control	8.1	24.2	8.2	180	7.9	8.0
	2	100%	7.9	24.6	8.5	1105	8.1	7.9
	Measured by:		DN	CAP	DN	DN	CAP	CAP
	Recorded by:		CAP	CAP	CAP	CAP	CAP	CAP
Day 3	sample:	Control	8.3	24.6	8.3	183	8.0	8.2
	2	100%	7.9	25.0	8.6	1082	8.5	8.1
	Measured by:		SP	CAP	CAP	SP	DN	DN
	Recorded by:		SP	CAP	CAP	SP	DN	DN

Test Day		Conc.	New Sample pH (su)	Temp (°C)	DO (mg/L)	Cond (µmhos/cm)	Old Sample pH (su)	DO (mg/L)
Day 4	sample:	Control	8.3	24.0	7.5	185	8.1	7.5
	3	100%	8.0	24.2	7.9	1095	8.5	7.4
	Measured by:		MF	MF	MF	MF	MF	MF
	Recorded by:		MF	MF	MF	MF	MF	MF
Day 5	sample:	Control	8.2	24.1	8.1	185	8.2	8.0
	3	100%	8.0	24.0	8.1	1135	8.5	7.8
	Measured by:		MF	MF	MF	MF	MF	MF
	Recorded by:		MF	MF	MF	MF	MF	MF
Day 6	sample:	Control	8.1	24.1	7.9	190	8.3	7.7
	3	100%	8.4	24.2	7.9	1130	8.5	7.8
	Measured by:		MF	MF	MF	MF	MF	MF
	Recorded by:		MF	MF	MF	MF	MF	MF
Day 7	sample:	Control	old → 250		old → 190		8.0	8.2
	3	100%	old → 257		old → 1280		8.4	7.7
	Measured by:			MF		MF	MF	MF
	Recorded by:			MF		MF	MF	MF
Day 8	sample:	Control	[redacted]					
	3	100%						
	Measured by:							
	Recorded by:							

Diluent/ Batch #	Days Used
DMW/#18 (CAP)	8

Water Quality Parameters

Sample #:	Field Chlorine mg/L 1	2	3	Lab Chlorine mg/L 1	2	3	Alkalinity mg/L as $CaCO_3$ 1	2	3	Hardness mg/L as $CaCO_3$ 1	2	3	Ammonia mg/L 1	2	3
Sample:	not measured			<0.03	<0.03	<0.03	205	211	215 (A)	176	181	187 (A)	0.501	<0.017	<0.017
Diluent/Control:	[redacted]			<0.03	<0.03	<0.03	174 (A)	78	78	87	87	87	<0.017	<0.017	<0.017
Method:	—	—	—	Hach	Hach	Hach	Hach	Hach	Hach	Hach	Hach	Hach	Denver	Denver	Denver
Measured by:	—	—	—	SP	DN	MF	CAP	CAP	DN	CAP	CAP	DN	MF	MF	MF
Verified by:	CAP	CAP	CAP	MF	MF	CAP	MF	MF	MF	MF	MF	MF	CAP	CAP	CAP

(A) 78 (A) 215

Sample#:	Conductivity µmhos/cm 1	2	3	Salinity ‰ 1	2	3
Sample:	1160	1190	1275	<1	<1	<1
Diluent/Control:	180	170	180	<1	<1	<1
Method:	YSI	YSI	YSI	Conv.	Conv.	Conv.
Measured by:	CAP	DN	MF	MF	MF	MF
Verified by:	MF	MF	CAP	CAP	CAP	CAP

conv. = conversion

Investigators' signatures
Christa Levine
Marshall Faircloth
Jared Pinchuck
Deena Nicholson

reviewer
Julie Espy

Test Day 0	Sample: 1	LIMS #: 754782	Job #: TLH-2004-05-18-28
Test Day 2	Sample: 2	LIMS #: 755588	Job #: TLH-2004-05-20-38
Test Day 4	Sample: 3	LIMS #: 756179	Job #: TLH-2004-05-24-04

revised 1/14/04 JA

000007

Facility: City of Mulberry

Begin Test:
Date: 5-18-04 Time: 1330

End Test:
Date: 5/25/04 Time: 1300

State of Florida
Department of Environmental Protection
Biology Laboratory Chronic Screening Bioassay
Ceriodaphnia dubia Bench Sheets - Reproduction

LIMS Sample # 754782 for sample #1.

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	total # young	# original organisms	young per adult
Control	0*	[redacted]										[redacted]	10	[redacted]
	1	[redacted]										[redacted]	10	[redacted]
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	3	4	0	0	7	10	0.7
	4	0	4	4	0	4	4	0	0	5	4	25	10	2.5
	5	5	0	8	6	6	9	7	10	0	1	~~46~~ 52	10	~~4.6~~ 5.2 (CAP)
	6	3	5	0	0	0	0	0	13	8	7	36	10	3.4
	7	9	7	6	4	8	12	11	0	8	11	76	10	7.6
	8													
	Total	17	16	18	10	18	25	21	27	21	23	196	10	19.6
100%	0*	[redacted]										[redacted]	10	[redacted]
	1	[redacted]										[redacted]	10	[redacted]
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	X	3	0	0	3	~~5~~	5	0	0	8	10	0.8
	4	0	1	1	0	0	0	0	0	0	0	1	(9) 10	0.1
	5	5	1	0	7	0	0	1	8	2	0	23	(9) 10	2.3
	6	0	1	0	0	0	0	14	13	0	0	27	(9) 10	2.7
	7	6	1	0	4	0	0	0	0	0	0	10	10	1.0
	8													
	Total	11	0	1	11	0	3	15	26	2	0	69	8 (mort)	6.9 8.6

*Day 0 = equals test initiation day.

Day	**Counted by:
0	CAP
1	CAP
2	CAP
3	SP
4	MF
5	MF
6	MF
7	MF
8	—

**Initials-signatures on Chemistry page.

Comments: counted by MF
counts A1, A3, A11, A6, A7, A8, A10 A11, A12, A16

A 100% replicate 7 should be 0

DAY 7 100% Rep # 5 ~~10~~ 9 Eaten or Male MF 5/25/04

→ Total young divided by 8 adults permitted MF 6/12/04

T-test Value 2.79304
T-Table Value 1.943 df = 16

reproduction	
LOEC =	100%
NOEC =	—

Test acceptability
Mean control reproduction 15/female : (yes) no
Third Brood ≥8 in 60% of surviving females: (yes) no
Temperature range ≤3°: (yes) no
Control survival ≥80%: (yes) no

revised 1/14/04 JA

Page

[illegible]08

Sample Source: City of Mulberry
Address: 3rd St South of S.R.60, Mulberry
County: Polk
NPDES Permit #: FL0020338
Contact/District: M. Gantt / Southwest
Start Date: 5-18-04 Time: 1300 End Date: 5-25-04 Time: 1300
LIMS uploaded: 6-14-04 MF verified: 6/14/04 CAP
Incubator #: 3 Temperature Range: 23.5-25.0°C
Room B246 Temperature Range: 24-25.0°C
SOP#: TA07_09
Light Intensity: 50 - 100 fl. candles (yes) no
Photoperiod: 16 light 8 dark (yes) no
Chamber size: 1 L
Sample volume: 500 ml
Feeding: 2 X Daily
Artemia Lot#: 0940625G
Organism batch #: 15
Organism age: 24hrs

State of Florida
Department of Environmental Protection
Biology Laboratory Chronic Screening Bioassay
P. promelas and M. beryllina Bench Sheet
Chemistry - Survival - Weight

Sample	Collection Date/Time	Received Date/Time
1	5-17-04 / 0700	5-18-04 / 1056
2	5-19-04 / 0700	5-20-04 / 1035
3	5-21-04 1045	5-22-04 1020

Parkwood Fish Hatchery

Comments: Sample #1 aerated for ~30 minutes to decrease dissolved oxygen from ~9.6mg/L to ~7mg/L. Sample #2 and #3 aerated for ~30 minutes also to decrease dissolved oxygen to ~8.0mg/L.

	Ctl	100%
mean fish wt -	0.68500	0.67925

T-test 0.18446
table 1.94300 DF6

Water Quality Parameters

Sample #	Field Chlorine mg/L 1	2	3	Lab Chlorine mg/L 1	2	3	Alkalinity mg/L as CaCO3 1	2	3	Hardness mg/L as CaCO3 1	2	3	Ammonia mg/L 1	2	3
Sample:	NA	NA	NA	<0.03	<0.03	<0.03	235	211	215	176	181	187	0.501	<0.017	<0.017
Diluent/Control:				<0.03	<0.03	<0.03	76	71	71	98	98	98	<0.017	<0.017	<0.017
Method:	—	—	—	Hach	Hach	Hach	Hach	Hach	Hach	Hach	Hach	Hach	Denver	Denver	Denver
Measured by:	—	—	—	SP	DN	MF	CAP	CAP	DN	CAP	CAP	DN	MF	MF	MF
Verified by:	CAP	CAP	CAP	CAP	MF	CAP	MF	MF	MF	MF	MF	MF	CAP	CAP	CAP

71 @

Sample#	Conductivity µmhos-cm 1	2	3	Salinity ‰ 1	2	3
Sample:	1160	1190	1275	<1	<1	<1
Diluent/Control:	320	320	320	<1	<1	<1
Method:	YSI	YSI	YSI	Conv.	Conv.	Conv.
Measured by:	CAP	CAP	MF	MF	MF	MF
Verified by:	MF	MF	CAP	CAP	CAP	CAP

conv. = conversion

[redacted]	NOEC	LOEC
Survival	100%	—
Growth	100%	—

[redacted]	%CV	PMSD
Control	—	—

Diluent Batch #:	Days Used
MHW# 13	7
mean wt = fish wt divided by 10	
convert g to mg: move decimal	
3 places to right	

Concentration	Replicate	Test Day 0	1	2	3	4	5	6	7	Pan #	Pan wt. g	Pan + fish g	Growth Fish wt. g	Mean wt. mg
Control	A	10	10	10	10	10	10	10	10	96	0.02828	0.03498	0.00670	0.670
	B	10	10	10	10	10	10	10	10	97	0.02490	0.03197	0.00707	0.707
	C	10	10	10	10	10	10	10	10	98	0.02734	0.03395	0.00661	0.661
	D	10	10	10	10	10	10	10	10	99	0.02356	0.03058	0.00702	0.702
100%	A	10	10	10	10	10	10	10	10	100	0.02699	0.03415	0.00716	0.716
	B	10	10	10	10	10	10	10	10	101	0.02898	0.03534	0.00636	0.636
	C	10	10	10	9 10	9	9	9	9	102	0.02733	0.03357	0.00624	0.624
	D	10	10	10	10	10	10	10	10	103	0.02595	0.03336	0.00741	0.741
	A													
	B													
	C													
	D													
Loaded by: JJ	Checked by: [redacted]	CAP	CAP	JJ	MF	MF	CAP	CAP	—					
Verified by: MAO										weighed by:	DN	DN		

Investigators' signatures
Christa Lovins
Marshall Faircloth
Jonas Daniel
Ideal Pinchard
Desmond Nicholson

reviewer

Drying	
Temperature:	105
Hours:	6
Final Weighing Date:	05/27/04

S-weights at tare	0.03999 @0.04000 0.01003 @0.01000
S-weights at final	0.01000 @0.01000 0.04000 @0.04000

Tare Pan 1 after Pan 5: 0.02829 @0.02828 — Final Pan 1 after Pan 5: 0.03500 @0.03498
Tare Pan 1 after Pan 8: 0.02830 @0.02828 — Final Pan 1 after Pan 8: 0.03500 @0.03498

Test Day 0	Sample: 1	LIMS #: 754782	Job #: TLH-2004-05-18-28
Test Day 2	Sample: 2	LIMS #: 755582	Job #: TLH-2004-05-20-28
Test Day 4	Sample: 3	LIMS #: 756174	Job #: TLH-2004-05-24-04

revised 1/14/04 JA

State of Florida
Department of Environmental Protection
Biology Laboratory Chronic Screening Bioassay
P. promelas and *M. beryllina* **Bench Sheet - Chemistry**

Sample Source: City of Mulberry

Start Date: 5-18-04 Time: 1300

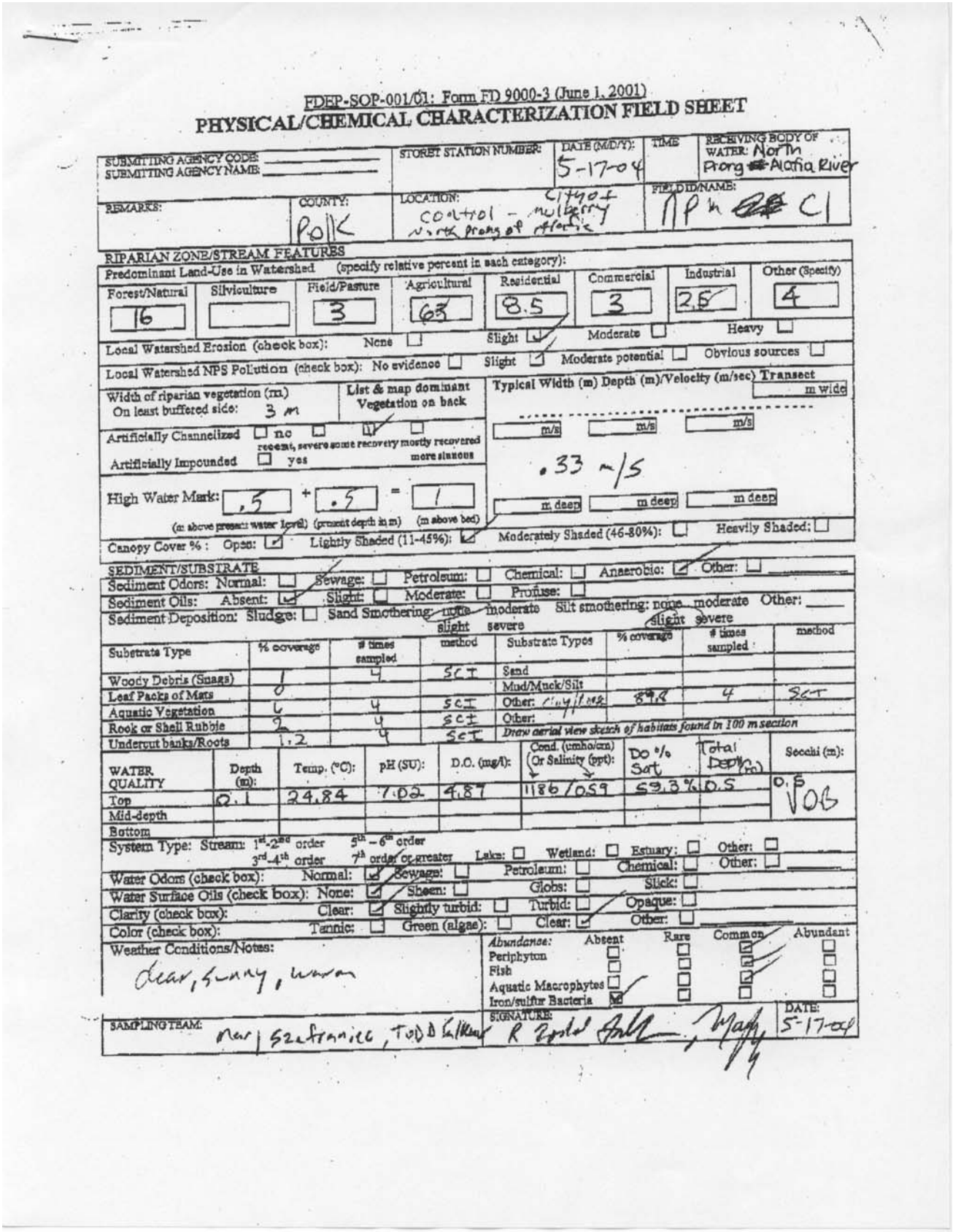
End Date: 5-25-04 Time: 1245

Test Day ↓		Conc.	New Sample: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Cond (µmhos/cm)	Old Sample: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Cond (µmhos/cm)
Day 0	sample:	Control	A	7.8	24.3	8.3	320					
	1	100%	A	7.7	25.3	8.4	1165					
	Measured by:			MF	MF	MF	MF					
	Recorded by:			MF	MF	MF	MF					
Day 1	sample:	Control	B	7.6	24.4	8.1	315	B	7.8	24.4	7.1	310
	1	100%	B	7.6	24.3	8.0	1142	B	7.8	24.7	7.0	1090
	Measured by:			MF	CAP	CAP	MF/cap		CAP	CAP	CAP	CAP
	Recorded by:			MF	CAP	CAP	MF/cap		CAP	CAP	CAP	CAP
Day 2	sample:	Control	C	8.0	24.8	8.6	340	C	7.9	24.2	7.9	335
	2	100%	C	8.0	25.4	8.3	1145	C	8.1	24.4	7.3	1125
	Measured by:			DN	DN	DN	DN		DN	CAP	DN	DN
	Recorded by:			CAP	CAP	CAP	CAP		CAP	CAP	CAP	CAP
Day 3	sample:	Control	D	8.1	24.4	8.7	320	D	7.8	24.6	8.0	325
	2	100%	D	7.8	8.4	8.3	1110	D	8.0	24.6	7.6	1105
	Measured by:			DN	DN	DN	DN		DN	DN	DN	DN
	Recorded by:			DN	DN	DN	DN		DN	DN	DN	DN
Day 4	sample:	Control	A	7.9	24.0	7.8	315	A	7.9	24.9	7.1	355
	3	100%	A	8.0	24.6	7.9	1165	A	8.1	24.5	6.3	1100
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF
Day 5	sample:	Control	B	7.9	24.4	8.0	320	B	7.9	24.2	7.1	335
	3	100%	B	8.1	24.5	8.4	1150	B	8.2	24.2	7.1	1130
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF
Day 6	sample:	Control	C	7.7	24.5	6.6	310	C	7.9	24.7	7.0	320
	3	100%	C	8.3	25.4	6.6	1105	C	8.1	25.3	6.5	1180
	Measured by:			CAP	CAP	CAP	CAP		CAP	CAP	CAP	CAP
	Recorded by:			CAP	CAP	CAP	CAP		CAP	CAP	CAP	CAP
Day 7	sample:	Control						D	7.5	25.0	6.6	320
	3	100%						D	8.1	24.3	6.5	1180
	Measured by:								CAP	CAP	CAP	CAP
	Recorded by:								CAP	CAP	CAP	CAP

Test Rep. = Replicate

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:

DATE (M/D/Y): 5-17-04

TIME:

RECEIVING BODY OF WATER: North Prong Alafia River

REMARKS:

COUNTY: Polk

LOCATION: control - mulberry north prong of Alafia City of

FIELD ID/NAME: NP n C1

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)
16		3	63	8.5	3	2.5	4

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: 3 m

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 m wide

m/s m/s m/s

.33 m/s

High Water Mark: .5 + .5 = 1

(m above present water level) (present depth in m) (m above bed)

m deep m deep 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 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)	1	4	SCI	Sand			
Leaf Packs of Mats	0			Mud/Muck/Silt			
Aquatic Vegetation	4	4	SCI	Other: rip/run	89.8	4	SCI
Rock or Shell Rubble	2	4	SCI	Other:			
Undercut banks/Roots	1.2	4	SCI	*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):	Do % Sat	Total Depth (m)	Secchi (m):
Top	0.1	24.84	7.02	4.87	1186/0.59	59.3%	0.5	0.5 VOB
Mid-depth								
Bottom								

System Type: Stream: 1st-2nd order ☐ 3rd-4th order ☐ 5th-6th order ☐ 7th order or greater ☐ Lakes: ☐ 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:

clear, sunny, warm

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

SAMPLING TEAM: Mary Szetranics, Todd Falkner

SIGNATURE: R Todd Falkner, Mary

DATE: 5-17-04

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:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		5-17-04	North Prong Alafia River

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Polk	City of Mulberry - control site N. Prong of Alafia River	NP-C1

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components Substrate Diversity 16	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 8	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 19	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 spots occurring: > 1 m/sec 5 4 3 2 1
Habitat Smothering 14 Primary Score 57	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 9	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 7	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 9	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 6 Left Bank 3 Secondary Score 49	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. 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

106 TOTAL SCORE

ANALYSIS DATE:	ANALYST:	SIGNATURE:
5-17-04	M. Strafrauler T. Falkner	

DEP-SOP-001/01: Form FD 9000-3 (June 20 2001)

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD SHEET

SUBMITTING AGENCY CODE:
SUBMITTING AGENCY NAME:

STORET STATION NUMBER:

DATE (MM/DD/YY): 5-17-04

TIME: 1300

RECEIVING BODY OF WATER: North Prong of Alafia River

REMARKS:

COUNTY: Polk

LOCATION: City of Mulberry T&S ST SITE

FIELD ID/NAME: MPT-1

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)
16		3	63 ✓	8.5 ✓	3	2.5	4

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: 16

LIST & MAP DOMINANT VEGETATION ON BACK

TYPICAL WIDTH (M) DEPTH (M)/VELOCITY (M/SEC) TRANSECT: 4 m wide

ARTIFICIALLY CHANNELIZED ☐ no ☐ recent, severe ☑ some recovery ☐ mostly recovered, more sinuous

ARTIFICIALLY IMPOUNDED ☐ yes

m/s	m/s	m/s
	0.25 m/S	

HIGH WATER MARK: 1.5 ÷ 1.6 = 1.1

(m above present water level) (present depth in m) (m above bed)

m deep	0.5 m deep	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: ☑ WWTP-G

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)		3.5	SC	SAND			
LEAF PACKS OR MATS		4	SC	MUD/MUCK/SILT		4	SC
AQUATIC VEGETATION		4	SC	OTHER:			
ROCK OR SHELL RUBBLE				OTHER:			
UNDERCUT BANKS/ROOTS		4	SC	DRAW AERIAL VIEW SKETCH OF HABITATS FOUND IN 100 M SECTION			

WATER QUALITY	DEPTH (M):	TEMP. (°C):	PH (SU):	D.O. (MG/L):	COND. (UMHOS/CM) OR SALINITY (PPT):	DO % SAT	DO (MG/L)	SECCHI (M):
TOP	0.1	24.70	7.02	4.85	1186/0.59	58.5	0.6	0.6 VOB
MID-DEPTH								
BOTTOM								

SYSTEM TYPE: STREAM: 1ST-2ND ORDER ☐ 3RD-4TH ORDER ☐ 5TH 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: Sunny, Warm.

ABUNDANCE:	ABSENT	RARE	COMMON	ABUNDANT
PERIPHYTON	☐	☐	☑	☐
FISH	☐	☐	☑	☐
AQUATIC MACROPHYTES	☐	☐	☐	☑
IRON/SULFUR BACTERIA	☑	☐	☐	☐

SAMPLING TEAM: M Szafraniec, T. Falkner

SIGNATURE:

DATE: 5-17-04

DEP-SOP-001/01: Form FD 9000-5 (December 11, 2001)

STATE OF FLORIDA, DEPARTMENT OF ENVIRONMENTAL PROTECTION
STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (MM/DD/YY): 5-17-04	RECEIVING BODY OF WATER: North Prong Alafia River
REMARKS:	COUNTY: Polk	LOCATION: City of Mulberry TEST SITE	FIELD ID/NAME: NPT1

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components Substrate Diversity 16	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 11	Greater than 30% productive habitat present in site 20 19 18 17 16	16% to 30% productive habitat, by areal 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 15	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 none occurring; > 1 m/sec 5 4 3 2 1
Habitat Smothering 6 Primary Score 48	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 6	No artificial channelization or dredging. Stream with normal sinuous pattern 20 19 18 17 16	May 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 6 Left Bank 7	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 5 Left Bank 4	Width of native vegetation (most buffered side) greater than 18 m 10 9	Width of native vegetation (least buffered side) 12 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 5 Left Bank 5 Secondary Score 38	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. 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 zone 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 stream bank 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

86 TOTAL SCORE

ANALYSIS DATE: 5-17-04	ANALYST: M. Szaconies, T. Falkner	SIGNATURE:

Appendix 8a

Taxa list and density (number/cm^2) for periphyton collected from glass microscope slides incubated for 28 days upstream and downstream of City of Mulberry WWTP facility discharge, May 17, 2004.

	Control Site	Test Site
Bacillariophyta		
Achnanthes sp.	23,722	6,981
Achnanthes exigua	14,233	-
Achnanthes hungarica	4,744	9,308
Achnanthes lanceolata	28,466	10,472
Achnanthes rupestoides	-	1,164
Cocconeis placentula	2,372	32,578
Cocconeis scutellum	422,249	182,670
Planothidium delicatulum	2,372	-
Bacillaria paxillifer	14,233	3,491
Nitzschia sp.	40,327	12,799
Tryblionella levidensis	-	1,164
Bacillariophyceae	2,372	3,491
Encyonema sp.	-	1,164
Gomphonema sp.	35,583	3,491
Gomphonema parvulum	11,861	1,164
Eunotia sp.	11,861	3,491
Gyrosigma sp.	-	1,164
Hippodonta capitata	-	1,164
Navicula sp.	23,722	13,962
Navicula minima	11,861	-
Naviculaceae	7,117	4,654
Pinnularia sp.	2,372	1,164
Surirella sp.	2,372	-
Amphora sp.	7,117	-
Terpsinoe musica	2,372	-
Melosira sp.	-	2,327
Fragilaria brevistriata	-	6,981
Fragilaria delicatissima	2,372	-
Fragilariaceae	-	10,472
Synedra fasciculata	-	3,491
Synedra ulna	2,372	2,327
Chlorophycota		
Chlorella sp.	2,372	3,491
Chlorococcum sp.	2,372	-
Scenedesmus arcuatus	2,372	-
Mougeotia sp.	-	1,164
Cryptophycophyta		
Cryptomonas sp.	-	1,164
Cyanophycota		
Chroococcus minutus	-	6,981
Cyanobium plancticum	-	3,491
Synechocystis sp.	7,117	1,164
Pseudanabaena sp.	2,372	-
Jaaginema sp.	9,489	5,818
Planktolyngbya sp.	9,489	1,164

Appendix 8b

Taxa list and number of individuals counted for periphyton collected from glass microscope slides incubated for 28 days upstream and downstream of City of Mulberry WWTP facility discharge, May 17, 2004.

	Control Site	Test Site
Bacillariophyta		
Achnanthes sp.	10	6
Achnanthes exigua	6	-
Achnanthes hungarica	2	8
Achnanthes lanceolata	12	9
Achnanthes rupestoides	-	1
Cocconeis placentula	1	28
Cocconeis scutellum	178	157
Planothidium delicatulum	1	-
Bacillaria paxillifer	6	3
Nitzschia sp.	17	11
Tryblionella levidensis	-	1
Bacillariophyceae	1	3
Encyonema sp.	-	1
Gomphonema sp.	15	3
Gomphonema parvulum	5	1
Eunotia sp.	5	3
Gyrosigma sp.	-	1
Hippodonta capitata	-	1
Navicula sp.	10	12
Navicula minima	5	-
Naviculaceae	3	4
Pinnularia sp.	1	1
Surirella sp.	1	-
Amphora sp.	3	-
Terpsinoe musica	1	-
Melosira sp.	-	2
Fragilaria brevistriata	-	6
Fragilaria delicatissima	1	-
Fragilariaceae	-	9
Synedra fasciculata	-	3
Synedra ulna	1	2
Chlorophycota		
Chlorella sp.	1	3
Chlorococcum sp.	1	-
Scenedesmus arcuatus	1	-
Mougeotia sp.	-	1
Cryptophycophyta		
Cryptomonas sp.	-	1
Cyanophycota		
Chroococcus minutus	-	6
Cyanobium plancticum	-	3
Synechocystis sp.	3	1
Pseudanabaena sp.	1	-
Jaaginema sp.	4	5
Planktolyngbya sp.	4	1

Appendix 9a

Benthic macroinvertebrates collapsed taxa list and density (average number of individuals/m^2 rounded to the nearest individual, n = 3 samples) from Hester-Dendy artificial substrates incubated for 28 days upstream and downstream of the City of Mulberry WWTP facility and collected May 17, 2004. See SOP LT 7100 sect. 4.2.1 for method on collapsing taxa.

	Control Site	Test Site
Annelida		
Hirudinea		
Desserobdella phalera	-	3
Arthropoda		
Arachnida		
Acariformes		
Atractides sp.	8	-
Crustacea		
Amphipoda		
Hyalella azteca	8	-
Insecta		
Coleoptera		
Dineutus sp.	5	-
Dubiraphia vittata	3	-
Microcylloepus pusillus	35	8
Stenelmis sp.	90	24
Diptera		
Corynoneura sp.	19	5
Cricotopus bicinctus	3	3
Endotribelos hesperium	3	-
Hemerodromia sp	130	50
Pentaneura inconspicua	201	38
Polypedilum flavum	335	133
Polypedilum illinoense grp.	3	-
Polypedilum scalaenum grp.	8	-
Psectrocladius sp.	8	-
Rheocricotopus robacki	38	14
Rheotanytarsus exiguus grp.	8	8
Rheotanytarsus pellucidus	19	11
Stenochironomus sp.	234	190
Tanytarsus sp. A Epler	7	8
Tanytarsus sp. C Epler	7	-
Thienemanniella xena	8	16
Ephemeroptera		
Baetis intercalaris	225	386
Caenis sp.	177	19
Tricorythodes albilineatus	690	185
Megaloptera		
Corydalus cornutus	-	8
Odonata		
Enallagma cardenium	35	8
Hetaerina titia	27	-
Undetermined Zygoptera	3	-

Appendix 9a continued

Trichoptera		
Cheumatopsyche sp.	2728	922
Hydropsyche sp.	732	111
Hydroptila sp.	380	131
Mayatrichia ayama	5	-
Neotrichia sp.	83	106
Oecetis sp.	3	8
Polycentropodidae	-	3
Mollusca		
Gastropoda		
Amnicola sp.	-	3
Ancylidae	-	3
Laevapex sp.	3	-
Pyrgophorus platyrachis	5	-

Appendix 9b

Benthic macroinvertebrates taxa list and counts (number of individuals counted, n = 3 samples) from Hester-Dendy artificial substrates incubated for 28 days upstream and downstream of the City of Mulberry WWTP facility and collected May 17, 2004.

	Control Site	Test Site
Annelida		
Hirudinea		
Desserobdella phalera	-	1
Arthropoda		
Arachnida		
Acariformes		
Atractides sp.	3	-
Crustacea		
Amphipoda		
Hyalella azteca	3	-
Insecta		
Coleoptera		
Dineutus sp.	2	-
Dubiraphia vittata	1	-
Microcylloepus pusillus	13	3
Stenelmis sp.	34	9
Diptera		
Chironomidae	5	4
Corynoneura sp.	7	2
Cricotopus bicinctus	1	1
Endotribelos hesperium	1	-
Hemerodromia sp.	49	19
Pentaneura inconspicua	75	14
Polypedilum flavum	125	49
Polypedilum illinoense grp.	1	-
Polypedilum scalaenum grp.	3	-
Psectrocladius sp.	3	-
Rheocricotopus sp.	2	2
Rheocricotopus robacki	12	3
Rheotanytarsus exiguus grp.	3	3
Rheotanytarsus pellucidus	7	4
Stenochironomus sp.	87	70
Tanytarsus sp.	1	1
Tanytarsus sp. A Epler	2	2
Tanytarsus sp. C Epler	2	-
Thienemanniella sp.	1	2
Thienemanniella xena	2	4
Ephemeroptera		
Baetis sp.	8	-
Baetis intercalaris	77	146
Caenis sp.	67	7
Tricorythodes albilineatus	261	70
Megaloptera		
Corydalus cornutus	-	3
Odonata		
Coenagrionidae	11	1
Enallagma cardenium	2	2
Hetaerina sp.	1	-
Hetaerina titia	9	-
Undetermined Zygoptera	1	-

Appendix 9b continued

Trichoptera		
Cheumatopsyche sp.	921	289
Hydropsyche sp.	247	35
Hydropsychidae	139	66
Hydroptila sp.	141	47
Hydroptilidae	3	4
Mayatrichia ayama	2	-
Neotrichia sp.	31	38
Oecetis sp.	1	3
Polycentropodidae	-	1
Undetermined Trichoptera	1	1
Mollusca		
Gastropoda		
Ancylidae sp.	-	1
Laevapex sp.	1	-
Amnicola sp.	-	1
Pyrgophorus platyrachis	2	-

Appendix 10a

Qualitative benthic macroinvertebrate collections (n = 20 discrete dipnet sweeps) upstream and downstream of the City of Mulberry WWTP facility (May 17, 2004). 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		
Hirudinea		
Desserobdella phalera	-	2
Oligochaeta		
Limnodrilus sp.	-	3
Nais communis complex	-	2
Eclipidrilus palustris	-	3
Arthropoda		
Crustacea		
Amphipoda		
Hyalella azteca	8	20
Decapoda		
Cambaridae	-	1
Palaemonetes sp.	-	1
Isopoda		
Caecidotea sp.	1	-
Insecta		
Coleoptera		
Dubiraphia vittata	9	3
Hydrophilidae	1	-
Stenelmis sp.	11	5
Diptera		
Chironomidae	1	-
Cricotopus bicinctus	-	1
Hemerodromia sp.	2	-
Stelechomyia perpulchra	-	2
Tanytarsus sp. A Epler	-	2
Tanytarsus sp. T Epler	-	2
Ephemeroptera		
Baetis sp.	-	6
Baetis intercalaris	12	-
Caenis sp.	6	7
Tricorythodes	-	6
Tricorythodes albilineatus	14	-
Odonata		
Argia sp.	1	3
Enallagma cardenium	1	-
Hetaerina sp.	1	-
Libellulidae	-	2
Trichoptera		
Cheumatopsyche sp.	7	4
Hydropsyche sp.	3	-
Hydroptila sp.	26	5
Neotrichia sp.	3	4
Oecetis sp.	-	1
Triaenodes sp.	1	-
Mollusca		
Bivalvia		
Sphaeriidae(mollusca)	-	1
Gastropoda		
Ancylidae sp.	-	1
Pyrgophorus platyrachis	1	21

Appendix 10b

Qualitative benthic macroinvertebrate collections (n = 20 discrete dipnet sweeps) upstream and downstream of the City of Mulberry WWTP (May 17, 2004). Taxa list and number of individuals counted.

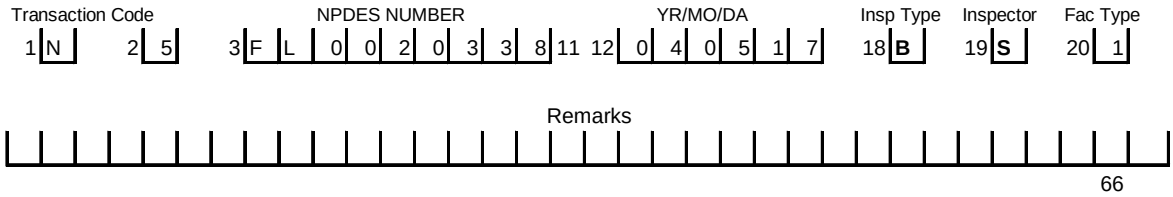
	Control Site	Test Site
Annelida		
Hirudinea		
Desserobdella phalera	-	2
Oligochaeta		
Limnodrilus sp.	-	3
Nais communis complex	-	2
Eclipidrilus palustris	-	3
Arthropoda		
Crustacea		
Amphipoda		
Hyalella azteca	8	20
Decapoda		
Cambaridae	-	1
Palaemonetes sp.	-	1
Isopoda		
Caecidotea sp.	1	-
Insecta		
Coleoptera		
Dubiraphia vittata	8	3
Elmidae	2	-
Hydrophilidae	1	-
Stenelmis sp.	10	5
Diptera		
Chironomidae	1	3
Cricotopus bicinctus	-	1
Hemerodromia sp.	2	-
Stelechomyia perpulchra	-	1
Tanytarsus sp. A Epler	-	1
Tanytarsus sp. T Epler	-	1
Ephemeroptera		
Baetidae	11	-
Baetis sp.	-	6
Baetis intercalaris	1	-
Caenis sp.	6	7
Tricorythodes sp.	-	6
Tricorythodes albilineatus	14	-
Odonata		
Argia sp.	1	1
Coenagrionidae	-	2
Enallagma cardenium	1	-
Hetaerina sp.	1	-
Libellulidae	-	2
Trichoptera		
Cheumatopsyche sp.	7	4
Hydropsyche	3	-
Hydroptila sp.	26	5
Neotrichia sp.	3	4
Oecetis sp.	-	1
Triaenodes sp.	1	-

Appendix 10b continued

Mollusca		
Bivalvia		
Sphaeriidae	-	1
Gastropoda		
Ancylidae	-	1
Pyrgophorus platyrachis	1	21

The Bioassay of the City of Mulberry WWTP effluent sampled on May 17, 19, & 21, NPDES #FL0020338.

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



The Priority Pollutants Analysis for Bioassay of the City of Mulberry WWTP effluent sampled on May 17, 19, & 21, NPDES #FL0020338.

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

