Biological Assessment of

IMC - Kingsford/Haynesworth/Big Four Mine Complex

Polk and Hillsborough Counties

NPDES #FL0000256

February 3 and 4, 2003

December 2003

Biology Section

Bureau of Laboratories

Division of Resource Assessment and Management

Quality Manual No. 870346G

NELAC Certification No. E31780

Florida Department of Environmental Protection

Fifth Year Inspection Summary

Discharger:	IMC – Kingsford/Haynesworth/Big Four Mine Complex
County:	Polk and Hillsborough
NPDES Number:	FL0000256
Permit Expiration:	May 4, 2003

Toxics Sampling Inspection **(XSI)**

Date Sampled: February 3 and 4, 2003

Results: Effluent metals complied with Class III Water Quality Criteria (FAC 62-302) at Outfalls 002 and 005. Aluminum, cadmium, chromium, selenium and iron were detected in the effluent from Outfall 005, but only aluminum and iron were present above the practical quantitation level (PQL). At Outfall 002, aluminum, iron and chromium were detected in the effluent, but chromium was detected at below the PQL. Iron levels in the effluent from Outfall 002 are a cause for concern. At an average of 976 μg/L, iron was just below the Class III Water Quality Criterion (62-302.530(39) F.A.C., 1,000 μg/L). No organic pollutants were detected in either effluent sample.

The level of combined radium $^{226 + 228}$ (13.3 pCi/L) exceeded the Class III Water Quality Criteria (52-302.530 (58)(b), 5.0 pCi/L) in the effluent sample from Outfall 005. This level of radium is a cause for concern and warrants additional monitoring.

Outfall 006 was scheduled to be sampled, but ceased discharging three days before the inspection.

Compliance Biomonitoring Inspection **(CBI)**

Date Sampled: February 3 and 4, 2003

Results: The effluent samples were not acutely toxic to the fish, *Cyprinella leedsi,* or to the water flea, *Ceriodaphnia dubia,* during 48-hour acute screening bioassays on effluent samples from Outfalls 002 and 005.

Water Quality Inspection **(WQI)**

Date Sampled: February 3 and 4, 2003

Results: Fecal and total coliform bacteria were not collected in this inspection. Dissolved oxygen levels were above saturation or close to supersaturated in both effluents and in Mizelle Creek (Test 002b) and the South Prong of the Alafia River (Test 006) in at least one reading from each site. Nutrient levels at both outfalls complied with permit limits.

Impact Bioassessment Inspection **(IBI)**

Date Sampled: February 3 and 4, 2003

Results: Although overall SCI scores were in the "good" or "excellent" category, there were signs of stress in benthic macroinvertebrate assemblages in the Alafia River. Nutrient levels were elevated upstream of Outfall 006 by other inputs. Overall diversity was low and the trichopteran, *Cheumatopsyche* sp., was the dominant taxa at both Control 006 and Test 006 sites in both dipnet and Hester-Dendy sampling. *Cheumatopsyche* sp. is often abundant in nutrient enriched streams. These data suggest additional monitoring may be warranted.

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 IMC - Kingsford/Haynesworth/Big Four Mine Complex Plant is located in Polk and Hillsborough Counties, Florida (Appendix 1). The Kingsford/Haynesworth/Big Four Mine operations include phosphate mining, beneficiation operations, phosphatic-clay settling areas, sand-tailings disposal areas, and a mine-water recirculation system (see Facility Summary in Appendix 2). The mined ore is made into a slurry in a pit and pumped to the beneficiation plant where the fine clays and sand are separated from the phosphate rock (product) by washing, screening, and double flotation. The generated wet phosphate rock is transported to another location for further processing. The separated clays are pumped to clay settling areas. Sand tailings are pumped to mined areas to be used as reclamation fill. Decanted water from the clay settling areas is returned to the beneficiation plant for reuse. This consolidated mine system discharges excess mine recirculation water, stormwater, and process wastewater from Outfalls: 001, 002, 003, 004, 005, 006, 007, 008 and 009. The effluent from Outfalls 001, 002, 004, 005, 006, and 007 is then discharged into either Lake Branch or Mizelle Creek before flowing into the South Prong of the Alafia River. The effluent from Outfalls 003, 008 and 009 is discharged into the North Prong of the Alafia River. The design flow of the wastewater system is dependent on the specific outfall. During the incubation of Hester-Dendy blocks and periphytometers, only Outfalls 002, 005 and 006 were flowing; Outfall 006 ceased discharging three days before sampling and the plant inspection. The flow during survey was 0.550 MGD from Outfall 002 and 14.706 MGD from Outfall 005 (B. Hall, FDEP Phosphate District, personal communication).

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 no plant upsets or permit violations in the last year (Appendix 2).

Methods

The purpose of this investigation was to determine the discharger's effects on the biota of the receiving waters. Chemical and biological comparisons were made between a control site and three test sites. The Control Site (hereafter Control 006) was located immediately upstream of Outfall 006 on the South Prong of the Alafia River. Three Test Sites were sampled: Test 006, located immediately below the 006 Outfall on the South Prong of the Alafia River, Test 002a, located in Mizelle Creek immediately below Outfall 002 and Test 002b, located approximately two miles downstream from the discharge (B. Hall, FDEP Phosphate District, personal communication). The second Test 002b Site was intended to test for downstream effects of the Outfall 002 discharge. Outfalls 002 and 005 were sampled for NPDES priority pollutants, metals, radium, nutrients and other physical and chemical characteristics. Outfall 006 was not sampled because it was not discharging at the time of the inspection. Benthic macroinvertebrates were sampled using dipnets at Outfalls 002 and 006, but not at Outfall 005. Hester-Dendy samplers were successfully incubated only at Control 006 and Test 006. Phytoplankton were collected from Outfalls 002 and 005 and the four study sites. Microbiological samples for fecal and total coliform bacteria were not collected in this inspection. Details of measurements and data interpretation are given in Appendix 3. Samples were collected on two days because the inspection could not be completed in a single day.

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

The following were involved in this investigation: Bonnie Hall and Brian Irsch (FDEP Phosphate District), and DEP Central Laboratory in Tallahassee. The report was reviewed by District representatives and the Point Source Studies Review Committee (Wayne Magley, Chuck Ziegmont and Michael Tanski).

Results and Discussion

- Specific chemical results are reported in Table 1 and a complete list of chemical analytes can be reviewed in Appendix 4. Overall, effluent metals complied with Class III Water Quality Criteria (FAC 62-302) at both outfalls. Several of the metals were detected above the method detection limit (MDL) but below the practical quantitation limit (PQL) (See Table 1). At an average concentration of 976 mg/L, iron was just below the Class III Water Quality Criterion (62-302.530(39) F.A.C., 1000 mg/L) and should continue to be monitored as a permit condition.
- No organic pollutants were detected in the effluent samples from Outfalls 002 and 005. Effluent conductivity (μmhos/cm), pH (Standard Units) and dissolved oxygen (mg/L) complied with Class III Water Quality Criteria (62-302 F.A.C.) and facility permit limits. Dissolved oxygen was supersaturated in the effluent from Outfall 005 and was almost 100% saturated in effluent from Outfall 002 (Table 2). These high oxygen saturation levels are a potential cause for concern.
- Both effluent samples had levels of gross alpha particle activity that

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

IMC Kingsford-Haynesworth-Big Four Mine Complex	Class III Criteria	Limits Outfall 002	Limits Outfall 005	Outfall 002	Outfall 005	Mizelle Cr Test 002a	Mizelle Cr. Test 002b	Alafia R. Test 006	Alafia R. Control 006
Organic Constituents (µg/L)									
none detected				-	-	-	-	-	-
Metals (µg/L unless otherwise noted, Class III Criteria are less than or equal to the value given)									
Aluminum	-	-	-	47 A	135	-	-	-	-
Arsenic	50	-	-	3 U	3 U	-	-	-	-
Cadmium	b	1.401 b	1.522 b	0.025 U	0.025 I	-	-	-	-
Calcium (mg/L)	-	-	-	27.5 A	35.5	-	-	-	-
Chromium	b	107.4 b	117.1 b	2.5 I	3.3 I	-	-	-	-
Copper	b	11.74 b	13 b	0.75 U	2 U	-	-	-	-
Iron	1000	-	-	976 A	106	-	-	-	-
Lead	b	4.5 b	5.13 b	0.1 U	0.24 U	-	-	-	-
Magnesium (mg/L)	-	-	-	15.1 A	13.8	-	-	-	-
Nickel	b	65 b	72 b	2 U	2 U	-	-	-	-
Selenium	5.0	-	-	1 U	1.1 I	-	-	-	-
Silver	0.07	-	-	0.02 U	0.02 U	-	-	-	-
Zinc	b	150 b	165 b	4 U	4 U	-	-	-	-
Nutrients (mg/L)									
Ortho-phosphate	-	report	report	0.12	0.16	0.16	0.54	1.5	1.5
Total Phosphorus	-	≤ 5s	≤ 5s	0.22 A	0.31	0.26 A	0.61	1.5	1.5
Ammonia	-	report	report	0.19	0.01 U	0.17	0.019 I	0.016 I	0.011 I
Un-ionized Ammonia	≤ 0.02 s	≤ 0.02 s	≤ 0.02 s	< 0.02	< 0.02	< 0.02	< 0.02	ND	ND
Nitrate and Nitrite	-	-	-	0.12	0.004 U	0.14	0.2	0.029	0.021
Total Kjeldahl Nitrogen	-	-	-	0.7 A	0.51	0.68 A	0.49	0.62	0.59
Organic Nitrogen	-	-	-	0.51	0.51	0.51	0.47	0.60	0.58
Total Nitrogen	-	≤ 3s	≤ 3s	0.82	0.51	0.82	0.69	0.65	0.61
General Physical and Chemical Parameters									
Habitat Assessment	-	-	-	-	-	116	109	107	133
Dissolved Oxygen (mg/L)	≥ 5.0 s	≥ 5.0 s	≥ 5.0 s	9.4	10.1	8.2	9.5	7.6	8.1
pH (SU)	6.0-8.5 s	6.0-8.5 s	6.0-8.5 s	6.9	7.2	7.3	7.7	ND	ND
Conductivity (µmhos/cm)	1275 s	1275 s	1275 s	346	545	300	249	592	592
Temperature (°C)	-	report	report	17.6	16.7	18.0	16.1	14.0	14.2
Color (Pt-Co)	-	-	-	60 A	20	60	70	30	30
Total Suspended Solids (mg/L)	-	≤ 60s	≤ 60s	4 U	5 I	5 I	4 U	4 U	4 U
Total Dissolved Solids (mg/L)	-	-	-	210	331	-	-	-	-
Turbidity (NTU)	29	-	-	9.1	3.8	10	6.7	0.7	0.75
Chlorophyll *a* (µg/L)	-	report	report	0.85 U	4	0.85 U	0.85 U	0.85 U	0.85 U
Phaeophytin (µg/L)	-	-	-	0.85 U	0	0.85 U	0.85 U	0.85 U	0.85 U
Fluoride (mg/L)	10	≤ 10s	≤ 10s	1	4.7	1	1.1	2.3	2.3
Sulfate (mg/L)	-	report	report	30	110	30	24 A	110	110
Flow (MGD)	-	report	report	0.550	14.706	-	-	-	-
Alpha, Total (pCi/L)	≤ 15s	≤ 15s	≤ 15s	0.8 U	12.7	-	-	-	-
Alpha-Counting Error (pCi/L)	-	-	-	0.5	1.2	-	-	-	-
Radium 226 (pCi/L)	-	-	-	0.4	9.6	-	-	-	-
Radium 226-Counting Error (pCi/L)	-	-	-	0.1	0.5	-	-	-	-
Radium 228 (pCi/L)	-	-	-	1 U	3.7	-	-	-	-
Radium 228-Counting Error (pCi/L)	-	-	-	0.6	0.9	-	-	-	-
Radium 226 and 228 (pCi/L)	≤ 5s			0.4	13.3	-	-	-	-
Hardness (mg $CaCO_3$)	-	-	-	130.85	145.47	-	-	-	-
Toxicity (48-hour static, screening bioassay, percent mortality in 100% effluent)									
Bioassay - Water flea	*			0%	0%	-	-	-	-
Bioassay - Fish	*			0%	0%	-	-	-	-

Value exceeds Class III Water Quality Criterion

For multiple outfalls Class III Criteria are shown under Effluent Limits.

* Class III Criteria: no acute or chronic toxicity (for definitions see 62.302.200 F.A.C.)

b - Value is calculated based on hardness

A - Value reported is the mean of two or more determinations

I - Value reported is < the minimum quantitation limit, and ≥ the minimum detection limit

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

s - Single sample

report - facility is required to report value

ND - No data.

Table 2. Percent saturation of dissolved oxygen* at study sites and in Outfall 002 and 005 effluents: IMC Kingsford/Haynesworth/Big Four Mine

Site	Date	Water temperature (°C)	Dissolved oxygen (mg/L)	Dissolved oxygen at saturation	Percent saturated
Test 002a	12/11/2002	20.1	7.78	9.07	85.7%
	2/4/2003	18.0	8.24	9.47	87.0%
Test 002b	9/9/2002	27.0	7.26	7.97	91.1%
	2/4/2003	16.1	9.50	9.85	96.5%
Control 006	12/11/2002	19.3	5.98	9.22	64.9%
	2/3/2003	14.2	7.82	10.26	76.2%
Test 006	12/11/2002	18.8	9.89	9.31	106.2%
	2/3/2003	14.0	7.54	10.31	73.1%
Outfall 002	2/3/2003	17.6	9.54	9.55	99.9%
Outfall 005	2/3/2003	16.7	10.04	9.73	103.2%

* Data are the mean of three replicates.

complied with Class III Water Quality Criteria. However, the level of combined radium $^{226+228}$ in the effluent sample from Outfall 005 was 13.3 pCi/L, which exceeded the Class III Water Quality Criteria (52-302.530 (58)(b), 5.0 pCi/L, Table 1). These levels are a cause for concern and warrant additional monitoring. Levels of combined radium $^{226+228}$ complied with Class III Water Quality Criteria in the effluent sample from Outfall 002.

- Habitat assessment scores ranged from 107 to 133 at the four study sites. The Control Site on the South Prong of the Alafia River upstream of Outfall 006 scored in the "Optimal" category while the three test sites scored in the "Suboptimal" category. The major difference among the sites was the increased smothering present at the three test sites compared to the Control Site (Table 1, data sheets in Appendix 8). Smothering was especially heavy immediately downstream of Outfall 006. A turbid effluent flow was noted during the reconnaissance visit and during deployment of samplers at this site (B. Hall, FDEP, personal observation). Iron/sulfur bacteria were abundant at both Outfall 002 test sites on Mizelle Creek. Iron in the Outfall 002 effluent sample was elevated and may have contributed to this pattern. All sites were moderately shaded.

- Dissolved oxygen (DO as mg/L), pH (Standard Units) and conductivity (µmhos/cm) at the Test and Control Sites complied with Class III Water Quality Criteria (Table 1, 62-302.530 F.A.C.). During the inspection, dissolved oxygen in the receiving water at Test 002b was close to 100% saturated (Table 2). During the reconnaissance on December 11, 2003, dissolved oxygen was supersaturated at the Test 006 site but was not supersaturated above Outfall 006 at Control Site 006 (Table 2).

- Turbidity in the South Prong of the Alafia River was <1 NTU (Table 1, Control 006, Test 006 data). In contrast, the water samples from Outfall 002 and the two test sites in Mizelle Creek (Test 002a and 002b) were more turbid than 80% of typical Florida streams (Table 1, Appendix 5). However, turbidity at all receiving water sites complied with Class III Water Quality Criteria.

- The effluent samples were not acutely toxic to the fish, *Cyprinella leedsi,* or to the water flea, *Ceriodaphnia dubia,* during 48-hour acute screening bioassays (See Table 1 for percent mortality and Appendix 7 for bioassay bench sheets).

- At Outfall 002, effluent total nitrogen concentration was 0.82 mg/L and total phosphorus was 0.22 mg/L (Table 1). Nutrient levels at Test 002a in Mizelle Creek below Outfall 002 were similar to those of the effluent. Nutrient levels in the Outfall 002 effluent complied with permit limits. Total phosphorus levels at downstream Test 002b were higher than those at Test 002a or in the Outfall 002 effluent, suggesting additional inputs between the two test sites or variable effluent quality. Total phosphorus levels at Test 002a were similar to those of the 70th percentile of typical Florida streams while those at Test 002b were similar to those at the 80th percentile of typical Florida streams. In contrast, total nitrogen dropped between Test 002a and Test 002b and the forms present shifted. Ammonia levels dropped by an order of magnitude

Table 3. Measured and predicted algal growth potential (AGP) for total soluble inorganic nitrogen (TSIN) limitation

Location		AGP (measured)	Predicted AGP (TSIN) ± 20%	Inorganic N:P ratio
Mizelle Cr. Test 002a	(mg dry wt/L)	9.76 JA	11.8 ± 2.4	1.94
Mizelle Cr. Test 002b	(mg dry wt/L)	5.35 J	8.3 ± 1.7	0.41
Alafia R. Test 006	(mg dry wt/L)	2.54 J	1.7 ± 0.3	0.03
Alafia R. Control 006	(mg dry wt/L)	2.3 J	1.2 ± 0.2	0.02
Outfall 002	(mg dry wt/L)	13.3 J	11.8 ± 2.4	2.58
Outfall 005	(mg dry wt/L)	0.568 J	0.4 ± 0.1	0.06

A - Value reported is the mean of two or more determinations
J - Estimated value

while there was an increase in the concentration of nitrate + nitrite. This suggests variable effluent quality or nutrient uptake and additional inputs between the two test sites. Total Kjeldahl nitrogen concentration was at or below the level at the lowest 20th percentile of typical Florida streams and nitrate + nitrite concentration was similar to that of the 60-70th percentile of typical Florida streams at both Test 002a and 002b. In contrast, ammonia at Test 002a was similar to that of the 70th percentile of typical Florida streams while at Test 002b, the ammonia level was similar to that at the lowest 5% of typical Florida streams.

- Because Outfall 006 had ceased discharging three days before sampling, nutrient levels in the South Prong of the Alalfia River at the Control 006 and Test 006 Sites were representative of levels from inputs upstream of the outfall (Table 1). Total phosphorus was highly enriched, exceeding levels at 90% of typical Florida streams while different forms of nitrogen were comparable to levels at the lowest 20% or lower of typical Florida streams (Appendix 5).

- Outfall 005 had effluent total phosphorus of 0.31 mg/L and total nitrogen of 0.51 mg/L (Table 1). Approximately half the phosphorus present was in the form of orthophosphate while the only nitrogen compound detected was total Kjeldahl nitrogen. Nutrient levels in the Outfall 005 effluent complied with permit limits.

- Algal growth potential (AGP) is a measure of nutrients available for algal growth (Miller *et al.* 1978). Raschke and Shultz (1987) found that AGP values above 5.0 mg dry weight/L represent a "problem" threshold for fresh receiving waters, implying nutrient enrichment. AGP values from the two South Prong of the Alafia River sites were ~2.5 mg dry weight/L, slightly higher than expected (Table 3). In Mizelle Creek, the effluent sample from Outfall 002 produced 13.3 mg dry weight/L and Test 002a produced 9.76 mg dry weight/L, both above the suggested "problem" threshold. AGP results from the downstream Mizelle Creek Test 002b Site were lower (5.35 mg dry weight/L), but still above the "problem" threshold. This indicates nutrient enrichment related to the Outfall 002 discharge in these portions of Mizelle Creek. There was evidence of growth inhibition in AGP data only at Test 002b where ~30% less biomass was produced than expected based upon nutrient analyses (Table 3). The Outfall 005 effluent sample produced <1 mg dry weight/L and there was no evidence of growth inhibition (Table 3). Nitrogen-to-phosphorus ratios in all water samples were <3, suggesting algal growth was nitrogen-limited, and that any nitrogen inputs would increase the potential for algal blooms.

- Phytoplankton samples from all receiving water sites and from Outfall 002 had no detectable chlorophyll *a*, while 4 mg/L of chlorophyll *a* was found in the effluent sample from Outfall 005 (Table 4). Algal density was <1,000 units/L in all samples except those from Outfall 005 and Test 002a. A diverse assemblage of phytoplankton taxa was present in all samples, with diatoms, green algae, and blue-green algae comprising >70% of the samples, with smaller numbers of cryptomonads, euglenoids, and golden-brown algae. We note that nutrients in

Table 4. Phytoplankton composition at control and test sites.

IMC Kingsford-Haynesworth-Big Four Mine Complex	Mizelle Cr. Test 002a	Mizelle Cr. Test 002b	Alafia R. Test 006	Alafia R. Control 006	Outfall 002	Outfall 005
Number of Taxa	42	34	65	57	35	47
Shannon-Weaver Diversity	4.3	3.8	5.2	5.2	4.0	4.4
Chlorophyll *a* (ug/L)	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	4
Phaeophytin (ug/L)	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0
Algal Density (number/ml)	2,462	939	830	964	837	7,433
Percent Dominant Taxon	17.5	27.4	8.5	8.7	17.4	24.0
Dominant Taxon (name)	*Synura uvella*	*Navicula* sp.	*Rhabdogloea*	*Synedra fasciculata*	Chrysophyta	*Cyclotella*
Number of Algal Units Identified	308	303	305	310	305	304
Percentage Composition:						
Blue-green algae	11.7	5.9	27.2	14.5	14.4	11.2
Green algae	15.6	14.9	23.0	21.0	8.2	17.1
Diatoms	44.8	68.0	41.3	52.9	45.6	60.5
Cryptophycophyta	9.4	5.6	5.3	6.5	11.2	3.0
Chrysophyta	17.5	3.6	2.3	4.2	17.7	7.6
Euglenophycota	0.7	2.0	0.7	0.3	3.0	0.7
Other	0.3	0.0	0.3	0.7	0.0	0.0

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

Table 5. Macroinvertebrate Hester-Dendy Samples - Quantitative

IMC Kingsford-Haynesworth-Big Four Mine Complex	Alafia R. Control 006	Alafia R. Test 006
Summary Statistics		
Shannon-Weaver Diversity	1.8	1.7
Number of Taxa	26	30
Florida Index	17	13
Number of EPT Taxa	7	6
Percent Dominant Taxon	62.5	73.2
Dominant Taxon (name)	*Cheumatopsyche*	*Cheumatopsyche*
Total Number of Individuals	1700	1857
Community Composition: Percent of total		
Acariformes	0.2	0.3
Amphipoda	0.0	1.6
Coleoptera	0.7	0.3
Diptera	33.6	19.1
Ephemeroptera	1.7	1.7
Gastropoda	0.2	0.1
Odonata	0.0	0.1
Oligochaeta	0.0	0.4
Pelecypoda	0.1	0.1
Trichoptera	63.5	76.3
Other	0.0	0.1
Functional Feeding Groups: Percent of total		
Burrowing Deposit Feeders	0.0	0.1
Predators	2.6	3.9
Surface Deposit Feeders	15.7	9.3
Suspension Feeders	66.5	73.7
Scrapers	1.5	1.2
Shredders	12.3	7.5
Other	1.0	2.9
Unknown	0.5	1.4

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.

- Quantitative measures of benthic macroinvertebrate assemblages from Hester-Dendy samplers deployed in the South Prong of the Alafia River showed low and equivalent diversity at both Control 006 and Test 006 (Table 5, Appendix 10). The results placed these sites in the lowest 5% for diversity in typical Florida streams (Appendix 5). A bloom of *Cheumatopsyche* sp., which is often abundant in waters with high nutrient levels, comprised >60% of both macroinvertebrate samples.
- Qualitative measures of benthic macroinvertebrate assemblages from dipnet samples are summarized in Tables 6 and 7 and in Appendix 11. The Mizelle Creek Test 002a score of 27 and Test 002b score of 21 placed them in the "excellent" and "good" category, respectively. The South Prong of the Alafia River Control 006 SCI score of 31 and the South Prong of the Alafia River Test 006 Site SCI score of 21 placed them in the "excellent" and "good" category, respectively. The Control 006 sample contained 23 total taxa, five EPT taxa and 11 chironomid taxa, and had 14 Florida Index points. In contrast, the Test 006 sample had 16 total taxa, two EPT taxa and five chironomid taxa, and had four Florida Index points. The trichopteran, *Cheumatophsyche* sp., was the dominant taxa at both sites. These results suggest that benthic macroinvertebrate assemblages in the South Prong of the Alafia River downstream of Outfall 006 may have been stressed by the effluent. We note that the methods currently used by FDEP to evaluate benthic macroinvertebrate assemblages were not specifically designed to detect effects of eutrophication; these results may not adequately reflect the effects of excess nutrient inputs.

Summary

No organic pollutants were detected in either effluent. Effluent metals complied with Class III Water Quality Criteria (FAC 62-302). However, iron levels in the effluent from Outfall 002 were elevated (976 mg/L) and should be monitored. Levels of nutrients in both effluents complied with permit limits. Dissolved oxygen was at or above supersatuation in both effluents. The two effluent samples were not acutely toxic in 48-hour screening bioassays.

The level of combined radium $^{226 + 228}$ exceeded the Class III Water Quality Criteria (52-302.530 (58)(b) in the effluent sample from Outfall 005.

Although overall SCI scores were in the "good" or "excellent" category, there were signs of stress in benthic macroinvertebrate assemblages in the South Prong of the Alafia River.

Table 6. Macroinvertebrate Dipnet Samples - Qualitative

IMC Kingsford-Haynesworth-Big Four Mine Complex	Mizelle Cr. Test 002a	Mizelle Cr. Test 002b	Alafia R. Test 006	Alafia R. Control 006
Stream Condition Index (value)	27	21	21	31
Stream Condition Index (word)	Excellent	Good	Good	Excellent
Stream Condition Index Metrics				
Florida Index	14	9	3	14
Number of EPT Taxa	2	3	2	5
Number of Taxa	18	17	16	23
Number of Chironomid Taxa	12	5	5	11
Percent Dominant Taxon	16.2	54.6	46.3	28.2
Percent Dipterans	76.8	22.2	25.6	33.6
Percent Suspension Feeders and Filterers	20.7	14.1	50.0	35.5
Total Number of Individuals	99	99	121	110
Community Composition: Percent of total				
Dominant Taxon (name)	*Polypedilum convictum* grp.	*Microcylloepus pusillus*	*Cheumatopsyche*	*Cheumatopsyche*
Amphipoda	4.0	1.0	5.0	1.8
Coleoptera	13.1	56.6	0.0	8.2
Ephemeroptera	3.0	9.1	1.7	9.1
Pelecypoda	1.0	1.0	2.5	0.9
Diptera	76.8	22.2	25.6	33.6
Gastropoda	0.0	0.0	1.7	5.5
Odonata	0.0	1.0	0.0	0.0
Oligochaeta	1.0	0.0	7.4	0.9
Trichoptera	1.0	7.1	46.3	40.0
Other	0.0	2.0	9.9	0.0
Functional Feeding Groups: Percent of total				
Burrowing Deposit Feeders	0.0	0.0	0.8	0.9
Piercer	0.0	0.0	0.0	8.2
Predators	10.1	4.6	9.1	2.7
Surface Deposit Feeders	35.9	38.9	16.1	21.4
Suspension Feeders and Filterers	20.7	14.1	50.0	35.5
Scrapers	8.1	32.8	2.5	17.3
Shredders	15.2	3.5	13.2	9.6
Unknown	10.1	6.1	8.3	4.6

Nutrient levels were elevated upstream of Outfall 006 from sources other than the facility's discharge. Overall diversity was low and the trichopteran, *Cheumatopsyche*, was the dominant taxa at both Control 006 and Test 006 in both dipnet and Hester-Dendy sampling. Outfall 006 had ceased discharging three days before the inspection, so its discharge could not be evaluated; however, the effluent from Outfall 006 may have been responsible for habitat smothering and some degradation of macroinvertebrate communities.

Literature Cited

American Public Health Association (APHA). 1992. Standard methods for the examination of water and wastewater. 18th edition.

Barbour, M. T., J. Gerritsen, G. E. Griffith, R. Frydenborg, E. McCarron, J. S. White and M. L. Bastian. 1996a. A framework for biological criteria for Florida streams using benthic macroinvertebrates. J. N. Am. Benthol. Soc. 15(2): 185-211.

Barbour, M. T., J. Gerritsen, and J. S. White. 1996b. Development of the Stream Condition Index for Florida. Prepared for the Florida Department of Environmental Protection. 105 p.

Barbour, M. T. and J. B. Stribling. 1994. A technique for assessing stream habitat structure. In: Proceedings of Riparian Ecosystems in the Humid United States: Functions and Values. U. S. Dept. Agriculture. 15-18 March 1993, Atlanta, Ga. 22 pp.

Beck, W. M. Jr. 1954. Studies in stream pollution biology 1. A simplified ecological classification of

IMC Kingsford-Haynesworth-Big Four Mine Complex -- Mizelle Cr. Test 002a

Table 7a. Stream Condition Index Metrics: Peninsula, Winter Index					
Metric:	Value	5	3	1	Score
Total Number of Taxa	18	≥27	26-14	<14	3
Number of EPT Taxa	2	≥4	3-2	<2	3
Number of Chironomid Taxa	12	≥9	8-5	<5	5
Percent Contribution of Dominant Taxon	16.2	≤30	31-65	>65	5
Percent Diptera	76.8	-	≤52	>52	1
Florida Index	14	≥10	9-5	<5	5
Percent Suspension Feeders and Filterers	20.7	≥15	14-8	<8	5
Total Score		Test 002a			**27**
Interpretation of Scores		**Excellent**			**27-33**
		Good			21-26
		Poor			14-20
		Very Poor			7-13

IMC Kingsford-Haynesworth-Big Four Mine Complex -- Mizelle Cr. Test 002b

Table 7b. Stream Condition Index Metrics: Peninsula, Winter Index					
Metric:	Value	5	3	1	Score
Total Number of Taxa	17	≥27	26-14	<14	3
Number of EPT Taxa	3	≥4	3-2	<2	3
Number of Chironomid Taxa	5	≥9	8-5	<5	3
Percent Contribution of Dominant Taxon	54.6	≤30	31-65	>65	3
Percent Diptera	22.2	-	≤52	>52	3
Florida Index	9	≥10	9-5	<5	3
Percent Suspension Feeders and Filterers	14.1	≥15	14-8	<8	3
Total Score		Test 002b			**21**
Interpretation of Scores		Excellent			27-33
		Good			**21-26**
		Poor			14-20
		Very Poor			7-13

organisms. Quart. J. Fla. Acad. Sci. 17(4): 211-227.

EA Engineering, Science, and Technology and Tetra Tech, Inc. 1994. Bioassessment for the nonpoint source program (draft). Prepared for the Florida Department of Environmental Protection. Unpaginated.

FDEP. 1994. Lake bioassessments for the determination of nonpoint source impairment in Florida. Florida Department of Environmental Protection, Biology Section, Tallahassee, Fla. 73 p.

Magurran, A. E. 1988. Ecological diversity and its measurement. Princeton University Press, Princeton, New Jersey.

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

Plafkin, J. L., M. T. Barbour, K. D. Porter, S. K. Gross and R. M. Hughes. 1989. Rapid bioassessment protocols for use in streams and rivers: Benthic macroinvertebrates and fish. U. S. EPA, Office of Water Regulations and Standards, Washington D.C., EPA 440-4-89-001

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

Ross, L. T. 1990. Methods for aquatic biology. Florida Department of Environmental Regulation Technical Series 10(1): 1-47.

Sokal, R. R. and F. J. Rohlf. 1995. Biometry, Third edition. W. H. Freeman and Company, New York.

IMC Kingsford-Haynesworth-Big Four Mine Complex -- Alafia R. Control 006

Table 7c. Stream Condition Index Metrics: Peninsula, Winter Index					
Metric:	Value	5	3	1	Score
Total Number of Taxa	23	≥27	26-14	<14	3
Number of EPT Taxa	5	≥4	3-2	<2	5
Number of Chironomid Taxa	11	≥9	8-5	<5	5
Percent Contribution of Dominant Taxon	28.2	≤30	31-65	>65	5
Percent Diptera	33.6	-	≤52	>52	3
Florida Index	14	≥10	9-5	<5	5
Percent Suspension Feeders and Filterers	35.5	≥15	14-8	<8	5
Total Score		Control 006			**31**
Interpretation of Scores		**Excellent**			**27-33**
		Good			21-26
		Poor			14-20
		Very Poor			7-13

IMC Kingsford-Haynesworth-Big Four Mine Complex -- Alafia R. Test 006

Table 7d. Stream Condition Index Metrics: Peninsula, Winter Index					
Metric:	Value	5	3	1	Score
Total Number of Taxa	16	≥27	26-14	<14	3
Number of EPT Taxa	2	≥4	3-2	<2	3
Number of Chironomid Taxa	5	>9	8-5	<5	3
Percent Contribution of Dominant Taxon	46.3	≤30	31-65	>65	3
Percent Diptera	25.6	-	≤52	>52	3
Florida Index	3	≥10	9-5	<5	1
Percent Suspension Feeders and Filterers	50.0	≥15	14-8	<8	5
Total Score		Test 006			**21**
Interpretation of Scores		Excellent			27-33
		Good			**21-26**
		Poor			14-20
		Very Poor			7-13

Stevenson, R. J. and L. L. Bahls. 1999. Periphyton protocols. Pp. 6.1-6.22 in: Rapid bioassessment protocols for use in wadeable streams and rivers. 2nd edition. By: M. T. Barbour, J. Gerritsen, B. D. Snyder and J. B. Stribling. EPA 841-B-99-002. U. S. Environmental Protection Agency, Office of Water, Washington, D. C.

Wallace, J. B., J. W. Grubaugh and M. R. Whiles. 1996. Biotic indices and stream ecosystem processes: results from an experimental study. Ecol. Appl. 6(1): 140-151.

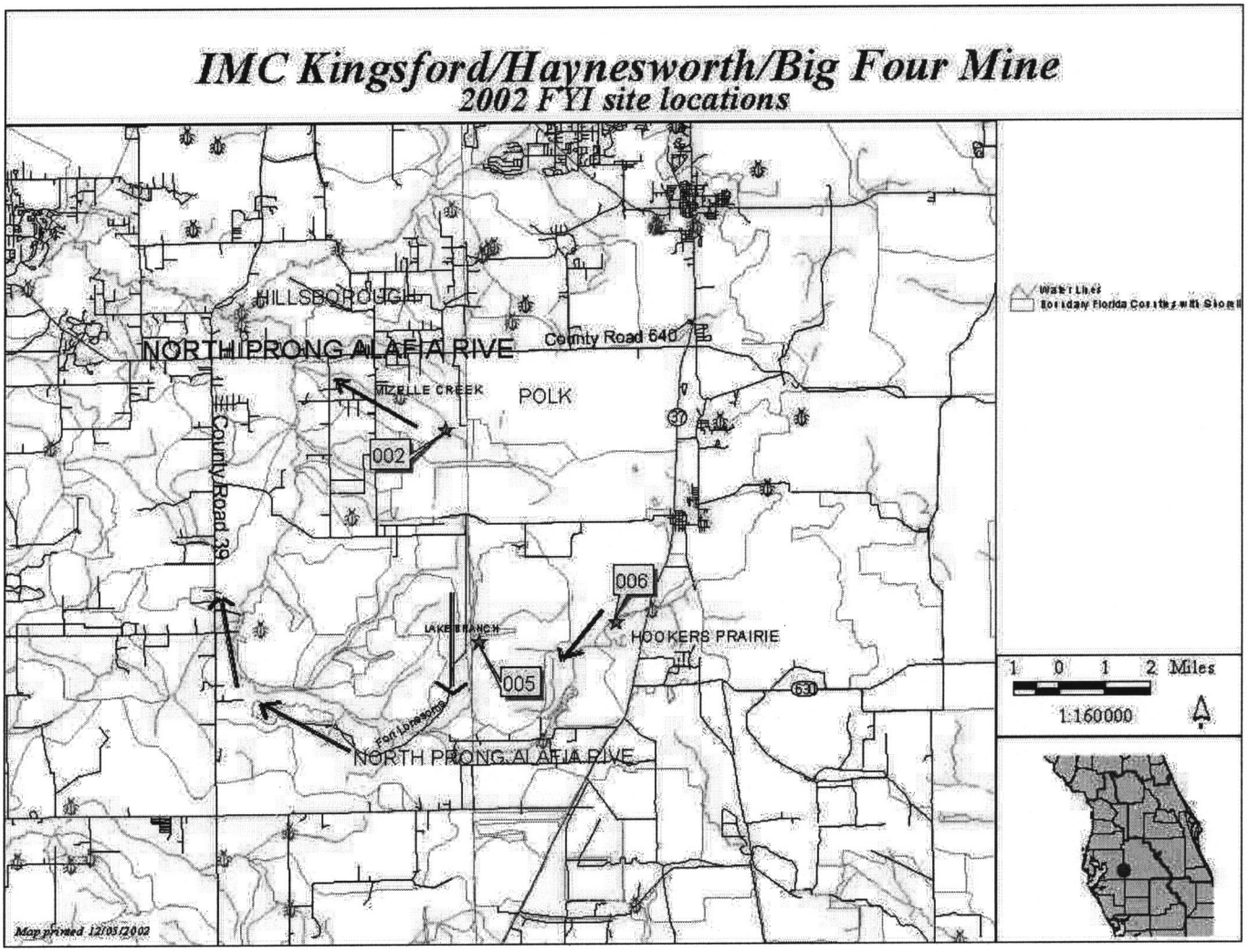
Weber, C. I. 1993. Methods for measuring the acute toxicity of effluents to freshwater and marine organisms. 4th edition. EPA/600/4-90/027. U. S. EPA, Cincinnati, Ohio. 216 pp.

USEPA. 2002. Short-term methods for estimating the chronic toxicity of effluents and receiving waters to freshwater organisms. 4th Edition. EPA-821-R-02-013

Appendices

- Appendix 1. Map of facility
- Appendix 2. Facility summary
- Appendix 3. Explanation of measurements and data interpretation
- 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. Phytoplankton: Taxa list and density (number of individuals per mL)
- Appendix 8b. Phytoplankton: 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


IMC Kingsford/Haynesworth/Big Four Mine
2002 FYI site locations
HILLSBOROUGH
NORTH PRONG ALAFIA RIVE
County Road 640
MIZELLE CREEK
POLK
002
County Road 39
006
HOOKERS PRAIRIE
005
NORTH PRONG ALAFIA RIVE
1 0 1 2 Miles
1:160000
Map printed 12/05/2002

State of Florida
Department of Environmental Protection
Facility Summary

Facility Name: IMC Phosphate Company		**Prepared By:** Brian Irsch
Location: Bradley Junction	**County**: Polk & Hillsborough	**District:** SWD
Federal Permit No.: FL0000256 **Expiration Date:** 5/04/2003	**State Permit No.:**FL0000256 **Expiration Date:** 5/04/2003	**Facility Type:** Industrial
Function of Facility: Phosphate Fertilizer & Chemical Manufacturing Plant		
Description of treatment process: This permit combines Big Four Outfall 001 with the outfalls for Kingsford into one permit under the Kingsford designation of FL0000256. Big Four Outfall 001 is now designated as Kingsford Outfall 007. The Kingsford Mine operations include phosphate mining, beneficiation operations, phosphatic clay settling areas, sandtailings disposal areas and a mine water recirculation system. The activities include mining of phosphate ore. The mined ore is slurried into a pit and pumped to the beneficiation plant where the fine clays and sand are separated from the phosphate rock (product) by washing, screening and double flotation. The generated wet phosphate rock is transported to another location for further processing. The separated clays are pumped to settling areas. Sand tailings are pumped to mined areas to be used as reclamation fill. Decanted water from the clay settling areas is returned to the beneficiation plant for reuse. This consolidated mine system discharges excess mine recirculation and process wastewater from Outfalls: 001, 002, 003, 004, 005, 006, & 007.		
Receiving Waters: Outfall 001,005 & 007 Lake Branch to South Prong a tributary of the Alafia River. Outfall 002 Mizelle Creek to South Prong. Outfall 003 Bird Branch to North Prong a tributary of the Alafia River. Outfall 004 & 006 South Prong.		**Classification:** III Fresh
Design Flow: N/A	**Mean Flow:** 001 2.0 MGD, 002 0.8 MGD, 003 0.2 MGD, 004 0.6 MGD, 005 6.7 MGD, 006 10.5 MGD, 007 3.3 MGD	**Flow During Survey:** 002 0.5 MGD, 005 16.1 MGD, 006 1.1 MGD
Discharge is: **Continuous** **Intermittent** **Seasonal** **Rainfall Dependent** **Other**		
Facility Mixing Zone Details: N/A		

List Effluent Limits:

Parameters (units)	Discharge Limitations			Monitoring Requirements	
	Daily Minimum	Monthly Average	Daily Maximum	Frequency	Sample Type
Flow (MGD)	N/A	Report	Report	Continuous	Recorder
Total Non-filterable Residue [TSS] (mg/l)	N/A	30.0	60.0	1/Week	Grab
Total Non-volatile, Non-filterable Residue [FS] (mg/l)	N/A	12.0	25.0	1/Week	Grab
Total Phosphorus [as P] * (mg/l)	N/A	3.0	5.0	1/Week	Grab
pH (standard units)	6.0	N/A	8.5	1/Week	Grab
Total Nitrogen [as N]** (mg/l)	N/A	N/A	3.0	1/Month	Grab
Specific Conductance (µmhos/centimeter)	N/A	N/A	See I.A.2	1/Month	Grab
Dissolved Oxygen (mg/l)	5.0	N/A	N/A	1/Month	Grab
Oil and Grease (mg/l)	N/A	N/A	5.0	1/Month	Grab

Temperature (°F)	N/A	N/A	Report	1/Month	Grab
Total Fluoride (mg/l)	N/A	N/A	10.0	1/Quarter	Grab
Total Sulfate (mg/l)	N/A	N/A	Report	1/Quarter	Grab
Toxicity	See	condition	I. 6.		
Chlorophyll-a (µg/l)	N/A	N/A	Report	1/Quarter	Grab

* Total phosphorus shall be for monitoring and reporting only, except: if monitoring data shows total phosphorus levels exceed 3 mg/l monthly average for more than one 30-day period per calendar year, the permittee, upon written noti-fication by the Department, shall prepare and file within 120 days (unless the time is extended by the Department) a study consisting of the following: (1) a chronology of at least one year's discharge data; (2) an assessment of the cause and origin of the phosphorus constituent of the discharge; (3) description of the discharger's current maintenance operation and management practices directly related to the control of phosphorus; (4) an evaluation of the environmental significance of the phosphorus levels; and (5) an identity of reasonable methods to abate, to the extent practicable, the influx of phosphorus into the discharge. Upon receipt of the report, the Department shall require the applicant to publish a public notice in a newspaper of general circulation in the affected area which states that the report was received and where it is available for public inspection. The Department shall evaluate the report and may amend the discharger's permit to reflect additional requirements (subject to administrative and judicial review), including the implementation of cost-effective management practices or technological advances which reduce or eliminate the phosphorus in the discharge to the maximum extent practicable.

** Total nitrogen shall be for monitoring and reporting only, except: if monitoring data shows total nitrogen levels exceed 3 mg/l monthly maximum for more than one 30-day period per calendar year, the permittee, upon written notification by the Department, shall prepare and file within 120 days (unless the time is extended by the Department) a study consisting of the following: (1) a chronology of at least one year's discharge data; (2) an assessment of the cause and origin of the nitrogen constituent of the discharge; (3) description of the discharger's current maintenance operation and management practices directly related to the control of nitrogen; (4) an evaluation of the environmental significance of the nitrogen levels; and (5) an identity of reasonable methods to abate, to the extent practicable, the influx of nitrogen into the discharge. Upon receipt of the report, the Department shall require the applicant to publish a public notice in a newspaper of general circulation in the affected area which states that the report was received and where it is available for public inspection. The Department shall evaluate the report and may amend the discharger's permit to reflect additional requirements (subject to administrative and judicial review), including the implementation of cost-effective management practices or technological advances which reduce or eliminate the nitrogen in the discharge to the maximum extent practicable.

1. During the period beginning on the effective date and lasting through the expiration date of this permit, the permittee is authorized to discharge process generated wastewater and mine dewatering discharges from the mining and beneficiation of phosphate rock, and storm water runoff from Outfalls 001, 002, 003, 004, 005, 006, & 007. Such discharge shall be monitored by the permittee as specified below. If there is no discharge from the facility on a day scheduled for sampling, the sample shall be collected on the day of the next discharge.
2. Specific Conductance shall not be increased more than 50% above background or to 1275 umhos/cm. whichever is greater.
3. The permittee shall ensure that the water quality standards for Class III surface waters as defined in Sections 62-302.500, 62-302.510 and 62-302.530, F.A.C., are not violated at the points of discharge.
4. There shall be no discharge of floating solids or visible foam in other than trace amounts.
5. The discharge shall not cause a visible sheen on the receiving water.

Description of permitted outfall: Outfall 002 is a 5 foot rectangular wier, and 005 and 006 consists of 3 structures each containing 14-27 inch wiers.

List permit violations (DMR data) and plant upsets that occurred at the plant within the last year: N/A

Describe previous impact bioassessments, WQBEL's, and previous or current enforcement actions: NA

Discuss MOR trends to prior data; is trend improving or declining: None available
Additional Information: Outfalls 008 and 009 are for emergency storm water.

Appendix 3

Explanation of Measurements and Data Interpretation

(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) 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).

(5) 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..

(6) 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..

(7) 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..

(8) 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 analyses of effluent and receiving water

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
2/4/2003 13:00	BLANK	Nutrients-Liquid	Ammonia-N	0.01	mg N/L	U	0.01	0.02
2/4/2003 13:00	BLANK	Nutrients-Liquid	Fluoride	0.1	mg F/L	U	0.1	0.2
2/4/2003 13:00	BLANK	Nutrients-Liquid	NO2NO3-N	0.004	mg N/L	U	0.004	0.01
2/4/2003 13:00	BLANK	Nutrients-Liquid	N_KJEL_TOT	0.06	mg N/L	U	0.06	0.4
2/4/2003 13:00	BLANK	Nutrients-Liquid	O-Phosphate-P	0.004	mg P/L	U	0.004	0.01
2/4/2003 13:00	BLANK	Nutrients-Liquid	Sulfate	0.2	mg SO4/L	U	0.2	0.5
2/4/2003 13:00	BLANK	Nutrients-Liquid	Total-P	0.015	mg P/L	U	0.015	0.04
2/4/2003 12:45	DOWNSTREAM CONTROL REP.1	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa		# Taxa			
2/4/2003 12:45	DOWNSTREAM CONTROL REP.2	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa		# Taxa			
2/4/2003 12:45	DOWNSTREAM CONTROL REP.3	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa		# Taxa			
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	1,2,4,5-Tetrachlorobenzene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	1,2,4-Trichlorobenzene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	1,2-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	1,3,5-Trinitrobenzene	3.8	ug/L	U	3.8	15
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	1,3-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	1,3-Dinitrobenzene	1.9	ug/L	U	1.9	7.6
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	1,4-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	1,4-Naphthoquinone	19	ug/L	UJ	19	76
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	1-Naphthylamine	9.5	ug/L	U	9.5	38
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	2,3,4,6-Tetrachlorophenol	1.9	ug/L	U	1.9	7.6
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	2,4,5-Trichlorophenol	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	2,4,6-Trichlorophenol	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	2,4-Dichlorophenol	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	2,4-Dinitrophenol	14	ug/L	U	14	57
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	2,4-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	2,6-Dichlorophenol	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	2,6-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	2-Acetylaminofluorene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	2-Chloronaphthalene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	2-Chlorophenol	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	11
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	2-Methylnaphthalene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	2-Naphthylamine	9.5	ug/L	U	9.5	38
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	2-Nitroaniline	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	2-Nitrophenol	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	2-Picoline	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	3,3'-Dimethylbenzidine	19	ug/L	U	19	76
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	3-Methylcholanthrene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	3-Nitroaniline	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.7
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.7
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.7
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	4-Aminobiphenyl	3.8	ug/L	U	3.8	15
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	4-Bromophenyl phenyl ether	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	4-Chloro-3-methylphenol	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	4-Chloroaniline	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.6

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	4-Nitroaniline	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	4-Nitrophenol	14	ug/L	U	14	57
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	5-Nitro-o-toluidine	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	7,12-Dimethylbenz(a)anthracene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Acenaphthene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Acenaphthylene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Acetophenone	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Aldrin	1.4	ug/L	U	1.4	5.7
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Aniline	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Anthracene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Azobenzene/1,2-Diphenylhydrazine	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Benzidine	95	ug/L	U	95	380
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Benzo(a)anthracene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Benzo(a)pyrene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Benzo(b)fluoranthene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Benzo(g,h,i)perylene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Benzo(k)fluoranthene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Benzyl alcohol	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Bis(2-chloroethoxy)methane	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Bis(2-chloroethyl)ether	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	11
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	57
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Chrysene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Di-n-octyl phthalate	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Dibenzo(a,h)anthracene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Dibenzofuran	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.7
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Diethyl phthalate	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Dimethylaminoazobenzene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Dinoseb	3.8	ug/L	U	3.8	15
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Diphenylamine	2.9	ug/L	U	2.9	11
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.7
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Endrin	1.4	ug/L	UJ	1.4	5.7
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Endrin aldehyde	3.8	ug/L	U	3.8	15
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Ethyl methanesulfonate	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Fluoranthene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Fluorene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.7
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.7
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Hexachlorobenzene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	11
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	U	2.9	11
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	11
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Hexachloropropene	1.9	ug/L	U	1.9	7.6
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Indeno(1,2,3-cd)pyrene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Isophorone	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Isosafrole	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Methapyrilene	3.8	ug/L	UJ	3.8	15
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Methyl methanesulfonate	0.95	ug/L	UJ	0.95	3.8

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	N-Nitrosodi-n-butylamine	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.6
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	N-Nitrosodiethylamine	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.6
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	U	2.9	11
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	N-Nitrosomethylethylamine	1.9	ug/L	U	1.9	7.6
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	N-Nitrosomorpholine	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	N-Nitrosopiperidine	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	N-Nitrosopyrrolidine	1.9	ug/L	U	1.9	7.6
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Naphthalene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.6
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Nitroquinoline-1-oxide	19	ug/L	U	19	76
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Pentachlorobenzene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Pentachloroethane	48	ug/L	U	48	190
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Pentachloronitrobenzene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Pentachlorophenol	2.9	ug/L	U	2.9	11
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Phenacetin	3.8	ug/L	U	3.8	11
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Phenanthrene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Phenol	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Pyrene	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Pyridine	3.8	ug/L	U	3.8	15
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	Safrole	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.7
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.7
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.7
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.7
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	m,p-Cresols	1.9	ug/L	U	1.9	7.6
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	o-Cresol	1.9	ug/L	U	1.9	7.6
2/3/2003 16:00	EQUIPMENT BLK	BNA-Water	o-Toluidine	0.95	ug/L	U	0.95	3.8
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Alachlor	0.57	ug/L	U	0.57	2.28
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Ametryn	0.048	ug/L	U	0.048	0.192
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Atrazine	0.048	ug/L	U	0.048	0.192
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Azinphos Methyl	0.048	ug/L	U	0.048	0.192
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Bromacil	0.19	ug/L	U	0.19	0.76
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Butylate	0.19	ug/L	U	0.19	0.76
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Chlorpyrifos Ethyl	0.048	ug/L	U	0.048	0.192
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Chlorpyrifos Methyl	0.095	ug/L	U	0.095	0.38
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Diazinon	0.048	ug/L	U	0.048	0.192
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Ethion	0.048	ug/L	U	0.048	0.192
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Ethoprop	0.095	ug/L	U	0.095	0.38
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Fenamiphos	0.19	ug/L	U	0.19	0.76
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Fonofos	0.095	ug/L	U	0.095	0.38
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Hexazinone	0.095	ug/L	U	0.095	0.38
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Malathion	0.14	ug/L	U	0.14	0.56
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Metalaxyl	0.24	ug/L	U	0.24	0.96
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Metolachlor	0.48	ug/L	U	0.48	1.92
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Metribuzin	0.095	ug/L	U	0.095	0.38
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Mevinphos	0.19	ug/L	U	0.19	0.76
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Naled	0.76	ug/L	U	0.76	3.04
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Norflurazon	0.095	ug/L	U	0.095	0.38
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Parathion Ethyl	0.14	ug/L	U	0.14	0.56
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Parathion Methyl	0.095	ug/L	U	0.095	0.38
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Phorate	0.048	ug/L	U	0.048	0.192

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Prometryn	0.14	ug/L	U	0.14	0.56
2/3/2003 16:00	EQUIPMENT BLK	GC-Water	Simazine	0.048	ug/L	U	0.048	0.192
2/3/2003 16:00	EQUIPMENT BLK	Metals-Water	Aluminum	10	ug/L	U	10	40
2/3/2003 16:00	EQUIPMENT BLK	Metals-Water	Arsenic	3	ug/L	U	3	12
2/3/2003 16:00	EQUIPMENT BLK	Metals-Water	Cadmium	0.025	ug/L	U	0.025	0.1
2/3/2003 16:00	EQUIPMENT BLK	Metals-Water	Calcium	0.05	mg/L	U	0.05	0.2
2/3/2003 16:00	EQUIPMENT BLK	Metals-Water	Chromium	2	ug/L	U	2	8
2/3/2003 16:00	EQUIPMENT BLK	Metals-Water	Copper	0.75	ug/L	U	0.75	3
2/3/2003 16:00	EQUIPMENT BLK	Metals-Water	Iron	7	ug/L	U	7	28
2/3/2003 16:00	EQUIPMENT BLK	Metals-Water	Lead	0.1	ug/L	U	0.1	0.4
2/3/2003 16:00	EQUIPMENT BLK	Metals-Water	Magnesium	0.01	mg/L	U	0.01	0.04
2/3/2003 16:00	EQUIPMENT BLK	Metals-Water	Nickel	2	ug/L	U	2	8
2/3/2003 16:00	EQUIPMENT BLK	Metals-Water	Selenium	1	ug/L	U	1	4
2/3/2003 16:00	EQUIPMENT BLK	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
2/3/2003 16:00	EQUIPMENT BLK	Metals-Water	Zinc	4	ug/L	U	4	16
2/3/2003 16:00	EQUIPMENT BLK	Nutrients-Liquid	Ammonia-N	0.01	mg N/L	U	0.01	0.02
2/3/2003 16:00	EQUIPMENT BLK	Nutrients-Liquid	Fluoride	0.1	mg F/L	U	0.1	0.2
2/3/2003 16:00	EQUIPMENT BLK	Nutrients-Liquid	NO2NO3-N	0.004	mg N/L	U	0.004	0.01
2/3/2003 16:00	EQUIPMENT BLK	Nutrients-Liquid	N_KJEL_TOT	0.06	mg N/L	U	0.06	0.4
2/3/2003 16:00	EQUIPMENT BLK	Nutrients-Liquid	O-Phosphate-P	0.004	mg P/L	U	0.004	0.01
2/3/2003 16:00	EQUIPMENT BLK	Nutrients-Liquid	Sulfate	0.2	mg SO4/L	U	0.2	0.5
2/3/2003 16:00	EQUIPMENT BLK	Nutrients-Liquid	Total-P	0.015	mg P/L	U	0.015	0.04
2/4/2003 12:45	ICM KINGSFORD DOWNSTREAM CONTROL	Bio-AGP/LimNut	Algal Growth Potential	5.35	mg DryWt/L	J	0.1	0.3
2/4/2003 12:45	ICM KINGSFORD DOWNSTREAM CONTROL	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton		mg/m2			
2/4/2003 12:45	ICM KINGSFORD DOWNSTREAM CONTROL	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
2/4/2003 12:45	ICM KINGSFORD DOWNSTREAM CONTROL	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton		mg/m2			
2/4/2003 12:45	ICM KINGSFORD DOWNSTREAM CONTROL	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
2/4/2003 12:45	ICM KINGSFORD DOWNSTREAM CONTROL	Bio-Invertebrates	Macroinvert-FW-Qual-Dipnetx20-# Taxa	17	# Taxa			
2/4/2003 12:45	ICM KINGSFORD DOWNSTREAM CONTROL	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa	19	#Taxa			
2/4/2003 12:45	ICM KINGSFORD DOWNSTREAM CONTROL	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa	9	#Taxa			
2/4/2003 12:45	ICM KINGSFORD DOWNSTREAM CONTROL	Bio-Peri/Phyto	Phytoplankton-Quantitative-# Wet Taxa	13	#Taxa			
2/4/2003 12:45	ICM KINGSFORD DOWNSTREAM CONTROL	Bio-Peri/Phyto	Phytoplankton-Quantitative-#Diatom Taxa	21	#Taxa			
2/4/2003 12:45	ICM KINGSFORD DOWNSTREAM CONTROL	Nutrients-Liquid	Ammonia-N	0.019	mg N/L	I	0.01	0.02
2/4/2003 12:45	ICM KINGSFORD DOWNSTREAM CONTROL	Nutrients-Liquid	Color	70	PCU		5	5
2/4/2003 12:45	ICM KINGSFORD DOWNSTREAM CONTROL	Nutrients-Liquid	Fluoride	1.1	mg F/L		0.1	0.2
2/4/2003 12:45	ICM KINGSFORD DOWNSTREAM CONTROL	Nutrients-Liquid	NO2NO3-N	0.2	mg N/L		0.004	0.01
2/4/2003 12:45	ICM KINGSFORD DOWNSTREAM CONTROL	Nutrients-Liquid	N_KJEL_TOT	0.49	mg N/L		0.06	0.4
2/4/2003 12:45	ICM KINGSFORD DOWNSTREAM CONTROL	Nutrients-Liquid	O-Phosphate-P	0.54	mg P/L		0.024	0.06
2/4/2003 12:45	ICM KINGSFORD DOWNSTREAM CONTROL	Nutrients-Liquid	Sulfate	24	mg SO4/L	A	0.2	0.5
2/4/2003 12:45	ICM KINGSFORD DOWNSTREAM CONTROL	Nutrients-Liquid	TSS	4	mg/L	U	4	16
2/4/2003 12:45	ICM KINGSFORD DOWNSTREAM CONTROL	Nutrients-Liquid	Total-P	0.61	mg P/L		0.015	0.04
2/4/2003 12:45	ICM KINGSFORD DOWNSTREAM CONTROL	Nutrients-Liquid	Turbidity	6.7	NTU		0.05	0.05
2/4/2003 15:00	ICM KINGSFORD TEST SITE	Bio-AGP/LimNut	Algal Growth Potential	9.76	mg DryWt/L	JA	0.1	0.3
2/4/2003 15:00	ICM KINGSFORD TEST SITE	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton		mg/m2			
2/4/2003 15:00	ICM KINGSFORD TEST SITE	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
2/4/2003 15:00	ICM KINGSFORD TEST SITE	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton		mg/m2			
2/4/2003 15:00	ICM KINGSFORD TEST SITE	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
2/4/2003 15:00	ICM KINGSFORD TEST SITE	Bio-Invertebrates	Macroinvert-FW-Qual-Dipnetx20-# Taxa	19	# Taxa			
2/4/2003 15:00	ICM KINGSFORD TEST SITE	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa	23	#Taxa			
2/4/2003 15:00	ICM KINGSFORD TEST SITE	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa	6	#Taxa			
2/4/2003 15:00	ICM KINGSFORD TEST SITE	Bio-Peri/Phyto	Phytoplankton-Quantitative-# Wet Taxa	16	#Taxa			
2/4/2003 15:00	ICM KINGSFORD TEST SITE	Bio-Peri/Phyto	Phytoplankton-Quantitative-#Diatom Taxa	25	#Taxa			
2/4/2003 15:00	ICM KINGSFORD TEST SITE	Nutrients-Liquid	Ammonia-N	0.17	mg N/L		0.01	0.02
2/4/2003 15:00	ICM KINGSFORD TEST SITE	Nutrients-Liquid	Color	60	PCU		5	5

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
2/4/2003 15:00	ICM KINGSFORD TEST SITE	Nutrients-Liquid	Fluoride	1	mg F/L		0.1	0.2
2/4/2003 15:00	ICM KINGSFORD TEST SITE	Nutrients-Liquid	NO2NO3-N	0.14	mg N/L		0.004	0.01
2/4/2003 15:00	ICM KINGSFORD TEST SITE	Nutrients-Liquid	N_KJEL_TOT	0.68	mg N/L	A	0.06	0.4
2/4/2003 15:00	ICM KINGSFORD TEST SITE	Nutrients-Liquid	O-Phosphate-P	0.16	mg P/L		0.008	0.02
2/4/2003 15:00	ICM KINGSFORD TEST SITE	Nutrients-Liquid	Sulfate	30	mg SO4/L		0.2	0.5
2/4/2003 15:00	ICM KINGSFORD TEST SITE	Nutrients-Liquid	TSS	5	mg/L	I	4	16
2/4/2003 15:00	ICM KINGSFORD TEST SITE	Nutrients-Liquid	Total-P	0.26	mg P/L	A	0.015	0.04
2/4/2003 15:00	ICM KINGSFORD TEST SITE	Nutrients-Liquid	Turbidity	10	NTU		0.05	0.05
2/3/2003 12:10	IMC KF CONTROL SITE FOR 006	Bio-AGP/LimNut	Algal Growth Potential	2.3	mg DryWt/L	J	0.1	0.3
2/3/2003 12:10	IMC KF CONTROL SITE FOR 006	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
2/3/2003 12:10	IMC KF CONTROL SITE FOR 006	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
2/3/2003 12:10	IMC KF CONTROL SITE FOR 006	Bio-Invertebrates	Macroinvert-FW-Qual-Dipnetx20-# Taxa	24	# Taxa			
2/3/2003 12:10	IMC KF CONTROL SITE FOR 006	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa		#Taxa			
2/3/2003 12:10	IMC KF CONTROL SITE FOR 006	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa		#Taxa			
2/3/2003 12:10	IMC KF CONTROL SITE FOR 006	Bio-Peri/Phyto	Phytoplankton-Quantitative-# Wet Taxa	25	#Taxa			
2/3/2003 12:10	IMC KF CONTROL SITE FOR 006	Bio-Peri/Phyto	Phytoplankton-Quantitative-#Diatom Taxa	32	#Taxa			
2/3/2003 12:10	IMC KF CONTROL SITE FOR 006	Nutrients-Liquid	Ammonia-N	0.011	mg N/L	I	0.01	0.02
2/3/2003 12:10	IMC KF CONTROL SITE FOR 006	Nutrients-Liquid	Color	30	PCU		5	5
2/3/2003 12:10	IMC KF CONTROL SITE FOR 006	Nutrients-Liquid	Fluoride	2.3	mg F/L		0.1	0.2
2/3/2003 12:10	IMC KF CONTROL SITE FOR 006	Nutrients-Liquid	NO2NO3-N	0.021	mg N/L		0.004	0.01
2/3/2003 12:10	IMC KF CONTROL SITE FOR 006	Nutrients-Liquid	N_KJEL_TOT	0.59	mg N/L		0.06	0.4
2/3/2003 12:10	IMC KF CONTROL SITE FOR 006	Nutrients-Liquid	O-Phosphate-P	1.5	mg P/L		0.032	0.08
2/3/2003 12:10	IMC KF CONTROL SITE FOR 006	Nutrients-Liquid	Sulfate	110	mg SO4/L		1	2.5
2/3/2003 12:10	IMC KF CONTROL SITE FOR 006	Nutrients-Liquid	TSS	4	mg/L	U	4	16
2/3/2003 12:10	IMC KF CONTROL SITE FOR 006	Nutrients-Liquid	Total-P	1.5	mg P/L		0.075	0.2
2/3/2003 12:10	IMC KF CONTROL SITE FOR 006	Nutrients-Liquid	Turbidity	0.75	NTU		0.05	0.05
2/3/2003 10:40	IMC KF T SITE FOR OUT FALL 006	Bio-AGP/LimNut	Algal Growth Potential	2.54	mg DryWt/L	J	0.1	0.3
2/3/2003 10:40	IMC KF T SITE FOR OUT FALL 006	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton		mg/m2			
2/3/2003 10:40	IMC KF T SITE FOR OUT FALL 006	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
2/3/2003 10:40	IMC KF T SITE FOR OUT FALL 006	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton		mg/m2			
2/3/2003 10:40	IMC KF T SITE FOR OUT FALL 006	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
2/3/2003 10:40	IMC KF T SITE FOR OUT FALL 006	Bio-Invertebrates	Macroinvert-FW-Qual-Dipnetx20-# Taxa	17	# Taxa			
2/3/2003 10:40	IMC KF T SITE FOR OUT FALL 006	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa		#Taxa			
2/3/2003 10:40	IMC KF T SITE FOR OUT FALL 006	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa		#Taxa			
2/3/2003 10:40	IMC KF T SITE FOR OUT FALL 006	Bio-Peri/Phyto	Phytoplankton-Quantitative-# Wet Taxa	29	#Taxa			
2/3/2003 10:40	IMC KF T SITE FOR OUT FALL 006	Bio-Peri/Phyto	Phytoplankton-Quantitative-#Diatom Taxa	37	#Taxa			
2/3/2003 10:40	IMC KF T SITE FOR OUT FALL 006	Nutrients-Liquid	Ammonia-N	0.016	mg N/L	I	0.01	0.02
2/3/2003 10:40	IMC KF T SITE FOR OUT FALL 006	Nutrients-Liquid	Color	30	PCU		5	5
2/3/2003 10:40	IMC KF T SITE FOR OUT FALL 006	Nutrients-Liquid	Fluoride	2.3	mg F/L		0.1	0.2
2/3/2003 10:40	IMC KF T SITE FOR OUT FALL 006	Nutrients-Liquid	NO2NO3-N	0.029	mg N/L		0.004	0.01
2/3/2003 10:40	IMC KF T SITE FOR OUT FALL 006	Nutrients-Liquid	N_KJEL_TOT	0.62	mg N/L		0.06	0.4
2/3/2003 10:40	IMC KF T SITE FOR OUT FALL 006	Nutrients-Liquid	O-Phosphate-P	1.5	mg P/L		0.032	0.08
2/3/2003 10:40	IMC KF T SITE FOR OUT FALL 006	Nutrients-Liquid	Sulfate	110	mg SO4/L		1	2.5
2/3/2003 10:40	IMC KF T SITE FOR OUT FALL 006	Nutrients-Liquid	TSS	4	mg/L	U	4	16
2/3/2003 10:40	IMC KF T SITE FOR OUT FALL 006	Nutrients-Liquid	Total-P	1.5	mg P/L		0.075	0.2
2/3/2003 10:40	IMC KF T SITE FOR OUT FALL 006	Nutrients-Liquid	Turbidity	0.7	NTU		0.05	0.05
2/3/2003 15:30	OUTFALL 002	BNA-Water	1,2,4,5-Tetrachlorobenzene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	1,2,4-Trichlorobenzene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	1,2-Dichlorobenzene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	1,3,5-Trinitrobenzene	3.8	ug/L	U	3.8	15
2/3/2003 15:30	OUTFALL 002	BNA-Water	1,3-Dichlorobenzene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	1,3-Dinitrobenzene	1.9	ug/L	U	1.9	7.7
2/3/2003 15:30	OUTFALL 002	BNA-Water	1,4-Dichlorobenzene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	1,4-Naphthoquinone	19	ug/L	UJ	19	77

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
2/3/2003 15:30	OUTFALL 002	BNA-Water	1-Naphthylamine	9.6	ug/L	U	9.6	38
2/3/2003 15:30	OUTFALL 002	BNA-Water	2,3,4,6-Tetrachlorophenol	1.9	ug/L	U	1.9	7.7
2/3/2003 15:30	OUTFALL 002	BNA-Water	2,4,5-Trichlorophenol	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	2,4,6-Trichlorophenol	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	2,4-Dichlorophenol	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
2/3/2003 15:30	OUTFALL 002	BNA-Water	2,4-Dinitrophenol	14	ug/L	U	14	58
2/3/2003 15:30	OUTFALL 002	BNA-Water	2,4-Dinitrotoluene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	2,6-Dichlorophenol	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	2,6-Dinitrotoluene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	2-Acetylaminofluorene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	2-Chloronaphthalene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	2-Chlorophenol	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	12
2/3/2003 15:30	OUTFALL 002	BNA-Water	2-Methylnaphthalene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	2-Naphthylamine	9.6	ug/L	U	9.6	38
2/3/2003 15:30	OUTFALL 002	BNA-Water	2-Nitroaniline	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	2-Nitrophenol	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	2-Picoline	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
2/3/2003 15:30	OUTFALL 002	BNA-Water	3,3'-Dimethylbenzidine	19	ug/L	U	19	77
2/3/2003 15:30	OUTFALL 002	BNA-Water	3-Methylcholanthrene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	3-Nitroaniline	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	4-Aminobiphenyl	3.8	ug/L	U	3.8	15
2/3/2003 15:30	OUTFALL 002	BNA-Water	4-Bromophenyl phenyl ether	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	4-Chloro-3-methylphenol	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	4-Chloroaniline	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.7
2/3/2003 15:30	OUTFALL 002	BNA-Water	4-Nitroaniline	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	4-Nitrophenol	14	ug/L	U	14	58
2/3/2003 15:30	OUTFALL 002	BNA-Water	5-Nitro-o-toluidine	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	7,12-Dimethylbenz(a)anthracene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Acenaphthene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Acenaphthylene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Acetophenone	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Aldrin	1.4	ug/L	U	1.4	5.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Aniline	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Anthracene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Azobenzene/1,2-Diphenylhydrazine	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Benzidine	96	ug/L	U	96	380
2/3/2003 15:30	OUTFALL 002	BNA-Water	Benzo(a)anthracene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Benzo(a)pyrene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Benzo(b)fluoranthene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Benzo(g,h,i)perylene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Benzo(k)fluoranthene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Benzyl alcohol	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Bis(2-chloroethoxy)methane	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Bis(2-chloroethyl)ether	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	12
2/3/2003 15:30	OUTFALL 002	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	58
2/3/2003 15:30	OUTFALL 002	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
2/3/2003 15:30	OUTFALL 002	BNA-Water	Chrysene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
2/3/2003 15:30	OUTFALL 002	BNA-Water	Di-n-octyl phthalate	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Dibenzo(a,h)anthracene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Dibenzofuran	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Diethyl phthalate	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
2/3/2003 15:30	OUTFALL 002	BNA-Water	Dimethylaminoazobenzene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Dinoseb	3.8	ug/L	U	3.8	15
2/3/2003 15:30	OUTFALL 002	BNA-Water	Diphenylamine	2.9	ug/L	U	2.9	12
2/3/2003 15:30	OUTFALL 002	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
2/3/2003 15:30	OUTFALL 002	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
2/3/2003 15:30	OUTFALL 002	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Endrin	1.4	ug/L	UJ	1.4	5.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Endrin aldehyde	3.8	ug/L	U	3.8	15
2/3/2003 15:30	OUTFALL 002	BNA-Water	Ethyl methanesulfonate	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Fluoranthene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Fluorene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Hexachlorobenzene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	12
2/3/2003 15:30	OUTFALL 002	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	U	2.9	12
2/3/2003 15:30	OUTFALL 002	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	12
2/3/2003 15:30	OUTFALL 002	BNA-Water	Hexachloropropene	1.9	ug/L	U	1.9	7.7
2/3/2003 15:30	OUTFALL 002	BNA-Water	Indeno(1,2,3-cd)pyrene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Isophorone	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Isosafrole	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Methapyrilene	3.8	ug/L	UJ	3.8	15
2/3/2003 15:30	OUTFALL 002	BNA-Water	Methyl methanesulfonate	0.96	ug/L	UJ	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	N-Nitrosodi-n-butylamine	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.7
2/3/2003 15:30	OUTFALL 002	BNA-Water	N-Nitrosodiethylamine	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.7
2/3/2003 15:30	OUTFALL 002	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	U	2.9	12
2/3/2003 15:30	OUTFALL 002	BNA-Water	N-Nitrosomethylethylamine	1.9	ug/L	U	1.9	7.7
2/3/2003 15:30	OUTFALL 002	BNA-Water	N-Nitrosomorpholine	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	N-Nitrosopiperidine	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	N-Nitrosopyrrolidine	1.9	ug/L	U	1.9	7.7
2/3/2003 15:30	OUTFALL 002	BNA-Water	Naphthalene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.7
2/3/2003 15:30	OUTFALL 002	BNA-Water	Nitroquinoline-1-oxide	19	ug/L	U	19	77
2/3/2003 15:30	OUTFALL 002	BNA-Water	Pentachlorobenzene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Pentachloroethane	48	ug/L	U	48	190
2/3/2003 15:30	OUTFALL 002	BNA-Water	Pentachloronitrobenzene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Pentachlorophenol	2.9	ug/L	U	2.9	12
2/3/2003 15:30	OUTFALL 002	BNA-Water	Phenacetin	3.8	ug/L	U	3.8	12
2/3/2003 15:30	OUTFALL 002	BNA-Water	Phenanthrene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Phenol	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Pyrene	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	Pyridine	3.8	ug/L	U	3.8	15
2/3/2003 15:30	OUTFALL 002	BNA-Water	Safrole	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.8

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
2/3/2003 15:30	OUTFALL 002	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.8
2/3/2003 15:30	OUTFALL 002	BNA-Water	m,p-Cresols	1.9	ug/L	U	1.9	7.7
2/3/2003 15:30	OUTFALL 002	BNA-Water	o-Cresol	1.9	ug/L	U	1.9	7.7
2/3/2003 15:30	OUTFALL 002	BNA-Water	o-Toluidine	0.96	ug/L	U	0.96	3.8
2/3/2003 15:30	OUTFALL 002	Bio-AGP/LimNut	Algal Growth Potential	13.3	mg DryWt/L	J	0.1	0.3
2/3/2003 15:30	OUTFALL 002	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
2/3/2003 15:30	OUTFALL 002	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
2/3/2003 15:30	OUTFALL 002	Bio-Peri/Phyto	Phytoplankton-Quantitative-# Wet Taxa	21	#Taxa			
2/3/2003 15:30	OUTFALL 002	Bio-Peri/Phyto	Phytoplankton-Quantitative-#Diatom Taxa	14	#Taxa			
2/3/2003 15:30	OUTFALL 002	Bio-Toxicology	Bioassay-Acute-Screen-FW-C.dubia, LC50	100	LC50	L		
2/3/2003 15:30	OUTFALL 002	Bio-Toxicology	Bioassay-Acute-Screen-FW-Fish, LC50	100	LC50	L		
2/3/2003 15:30	OUTFALL 002	GC-Water	Alachlor	0.58	ug/L	U	0.58	2.32
2/3/2003 15:30	OUTFALL 002	GC-Water	Ametryn	0.048	ug/L	U	0.048	0.192
2/3/2003 15:30	OUTFALL 002	GC-Water	Atrazine	0.048	ug/L	U	0.048	0.192
2/3/2003 15:30	OUTFALL 002	GC-Water	Azinphos Methyl	0.048	ug/L	U	0.048	0.192
2/3/2003 15:30	OUTFALL 002	GC-Water	Bromacil	0.19	ug/L	U	0.19	0.76
2/3/2003 15:30	OUTFALL 002	GC-Water	Butylate	0.19	ug/L	U	0.19	0.76
2/3/2003 15:30	OUTFALL 002	GC-Water	Chlorpyrifos Ethyl	0.048	ug/L	U	0.048	0.192
2/3/2003 15:30	OUTFALL 002	GC-Water	Chlorpyrifos Methyl	0.097	ug/L	U	0.097	0.388
2/3/2003 15:30	OUTFALL 002	GC-Water	Diazinon	0.048	ug/L	U	0.048	0.192
2/3/2003 15:30	OUTFALL 002	GC-Water	Ethion	0.048	ug/L	U	0.048	0.192
2/3/2003 15:30	OUTFALL 002	GC-Water	Ethoprop	0.097	ug/L	U	0.097	0.388
2/3/2003 15:30	OUTFALL 002	GC-Water	Fenamiphos	0.19	ug/L	U	0.19	0.76
2/3/2003 15:30	OUTFALL 002	GC-Water	Fonofos	0.097	ug/L	U	0.097	0.388
2/3/2003 15:30	OUTFALL 002	GC-Water	Hexazinone	0.097	ug/L	U	0.097	0.388
2/3/2003 15:30	OUTFALL 002	GC-Water	Malathion	0.14	ug/L	U	0.14	0.56
2/3/2003 15:30	OUTFALL 002	GC-Water	Metalaxyl	0.24	ug/L	U	0.24	0.96
2/3/2003 15:30	OUTFALL 002	GC-Water	Metolachlor	0.48	ug/L	U	0.48	1.92
2/3/2003 15:30	OUTFALL 002	GC-Water	Metribuzin	0.097	ug/L	U	0.097	0.388
2/3/2003 15:30	OUTFALL 002	GC-Water	Mevinphos	0.19	ug/L	U	0.19	0.76
2/3/2003 15:30	OUTFALL 002	GC-Water	Naled	0.78	ug/L	U	0.78	3.12
2/3/2003 15:30	OUTFALL 002	GC-Water	Norflurazon	0.097	ug/L	U	0.097	0.388
2/3/2003 15:30	OUTFALL 002	GC-Water	Parathion Ethyl	0.14	ug/L	U	0.14	0.56
2/3/2003 15:30	OUTFALL 002	GC-Water	Parathion Methyl	0.097	ug/L	U	0.097	0.388
2/3/2003 15:30	OUTFALL 002	GC-Water	Phorate	0.048	ug/L	U	0.048	0.192
2/3/2003 15:30	OUTFALL 002	GC-Water	Prometryn	0.14	ug/L	U	0.14	0.56
2/3/2003 15:30	OUTFALL 002	GC-Water	Simazine	0.048	ug/L	U	0.048	0.192
2/3/2003 15:30	OUTFALL 002	Metals-Water	Aluminum	47	ug/L	A	10	40
2/3/2003 15:30	OUTFALL 002	Metals-Water	Arsenic	3	ug/L	U	3	12
2/3/2003 15:30	OUTFALL 002	Metals-Water	Cadmium	0.025	ug/L	U	0.025	0.1
2/3/2003 15:30	OUTFALL 002	Metals-Water	Calcium	27.5	mg/L	A	0.05	0.2
2/3/2003 15:30	OUTFALL 002	Metals-Water	Chromium	2.5	ug/L	I	2	8
2/3/2003 15:30	OUTFALL 002	Metals-Water	Copper	0.75	ug/L	U	0.75	3
2/3/2003 15:30	OUTFALL 002	Metals-Water	Iron	976	ug/L	A	7	28
2/3/2003 15:30	OUTFALL 002	Metals-Water	Lead	0.1	ug/L	U	0.1	0.4
2/3/2003 15:30	OUTFALL 002	Metals-Water	Magnesium	15.1	mg/L	A	0.01	0.04
2/3/2003 15:30	OUTFALL 002	Metals-Water	Nickel	2	ug/L	U	2	8
2/3/2003 15:30	OUTFALL 002	Metals-Water	Selenium	1	ug/L	U	1	4
2/3/2003 15:30	OUTFALL 002	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
2/3/2003 15:30	OUTFALL 002	Metals-Water	Zinc	4	ug/L	U	4	16
2/3/2003 15:30	OUTFALL 002	Nutrients-Liquid	Ammonia-N	0.19	mg N/L		0.01	0.02
2/3/2003 15:30	OUTFALL 002	Nutrients-Liquid	Color	60	PCU	A	5	5

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
2/3/2003 15:30	OUTFALL 002	Nutrients-Liquid	Fluoride	1	mg F/L		0.1	0.2
2/3/2003 15:30	OUTFALL 002	Nutrients-Liquid	NO2NO3-N	0.12	mg N/L		0.004	0.01
2/3/2003 15:30	OUTFALL 002	Nutrients-Liquid	N_KJEL_TOT	0.7	mg N/L	A	0.06	0.4
2/3/2003 15:30	OUTFALL 002	Nutrients-Liquid	O-Phosphate-P	0.12	mg P/L		0.008	0.02
2/3/2003 15:30	OUTFALL 002	Nutrients-Liquid	Sulfate	30	mg SO4/L		0.2	0.5
2/3/2003 15:30	OUTFALL 002	Nutrients-Liquid	TDS	210	mg/L		15	60
2/3/2003 15:30	OUTFALL 002	Nutrients-Liquid	TSS	4	mg/L	U	4	16
2/3/2003 15:30	OUTFALL 002	Nutrients-Liquid	Total-P	0.22	mg P/L	A	0.015	0.04
2/3/2003 15:30	OUTFALL 002	Nutrients-Liquid	Turbidity	9.1	NTU		0.05	0.05
2/3/2003 15:30	OUTFALL 002	Overflow	Alpha, Total	0.8	pCi/L	U		
2/3/2003 15:30	OUTFALL 002	Overflow	Alpha-Counting Error	0.5	pCi/L			
2/3/2003 15:30	OUTFALL 002	Overflow	Radium 226	0.4	pCi/L			
2/3/2003 15:30	OUTFALL 002	Overflow	Radium 226-Counting Error	0.1	pCi/L			
2/3/2003 15:30	OUTFALL 002	Overflow	Radium 228	1	pCi/L	U		
2/3/2003 15:30	OUTFALL 002	Overflow	Radium 228-Counting Error	0.6	pCi/L			
2/3/2003 14:20	OUTFALL 005	BNA-Water	1,2,4,5-Tetrachlorobenzene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	1,2,4-Trichlorobenzene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	1,2-Dichlorobenzene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	1,3,5-Trinitrobenzene	3.8	ug/L	U	3.8	15
2/3/2003 14:20	OUTFALL 005	BNA-Water	1,3-Dichlorobenzene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	1,3-Dinitrobenzene	1.9	ug/L	U	1.9	7.5
2/3/2003 14:20	OUTFALL 005	BNA-Water	1,4-Dichlorobenzene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	1,4-Naphthoquinone	19	ug/L	UJ	19	75
2/3/2003 14:20	OUTFALL 005	BNA-Water	1-Naphthylamine	9.4	ug/L	U	9.4	38
2/3/2003 14:20	OUTFALL 005	BNA-Water	2,3,4,6-Tetrachlorophenol	1.9	ug/L	U	1.9	7.5
2/3/2003 14:20	OUTFALL 005	BNA-Water	2,4,5-Trichlorophenol	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	2,4,6-Trichlorophenol	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	2,4-Dichlorophenol	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	2,4-Dimethylphenol	47	ug/L	U	47	190
2/3/2003 14:20	OUTFALL 005	BNA-Water	2,4-Dinitrophenol	14	ug/L	U	14	57
2/3/2003 14:20	OUTFALL 005	BNA-Water	2,4-Dinitrotoluene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	2,6-Dichlorophenol	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	2,6-Dinitrotoluene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	2-Acetylaminofluorene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	2-Chloronaphthalene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	2-Chlorophenol	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	2-Methyl-4,6-dinitrophenol	2.8	ug/L	U	2.8	11
2/3/2003 14:20	OUTFALL 005	BNA-Water	2-Methylnaphthalene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	2-Naphthylamine	9.4	ug/L	U	9.4	38
2/3/2003 14:20	OUTFALL 005	BNA-Water	2-Nitroaniline	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	2-Nitrophenol	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	2-Picoline	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
2/3/2003 14:20	OUTFALL 005	BNA-Water	3,3'-Dimethylbenzidine	19	ug/L	U	19	75
2/3/2003 14:20	OUTFALL 005	BNA-Water	3-Methylcholanthrene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	3-Nitroaniline	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.7
2/3/2003 14:20	OUTFALL 005	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.7
2/3/2003 14:20	OUTFALL 005	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.7
2/3/2003 14:20	OUTFALL 005	BNA-Water	4-Aminobiphenyl	3.8	ug/L	U	3.8	15
2/3/2003 14:20	OUTFALL 005	BNA-Water	4-Bromophenyl phenyl ether	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	4-Chloro-3-methylphenol	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	4-Chloroaniline	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.5

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
2/3/2003 14:20	OUTFALL 005	BNA-Water	4-Nitroaniline	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	4-Nitrophenol	14	ug/L	U	14	57
2/3/2003 14:20	OUTFALL 005	BNA-Water	5-Nitro-o-toluidine	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	7,12-Dimethylbenz(a)anthracene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Acenaphthene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Acenaphthylene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Acetophenone	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Aldrin	1.4	ug/L	U	1.4	5.7
2/3/2003 14:20	OUTFALL 005	BNA-Water	Aniline	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Anthracene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Azobenzene/1,2-Diphenylhydrazine	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Benzidine	94	ug/L	U	94	380
2/3/2003 14:20	OUTFALL 005	BNA-Water	Benzo(a)anthracene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Benzo(a)pyrene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Benzo(b)fluoranthene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Benzo(g,h,i)perylene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Benzo(k)fluoranthene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Benzyl alcohol	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Bis(2-chloroethoxy)methane	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Bis(2-chloroethyl)ether	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Bis(2-chloroisopropyl)ether	2.8	ug/L	U	2.8	11
2/3/2003 14:20	OUTFALL 005	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	57
2/3/2003 14:20	OUTFALL 005	BNA-Water	Butyl benzyl phthalate	4.7	ug/L	U	4.7	19
2/3/2003 14:20	OUTFALL 005	BNA-Water	Chrysene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Di-n-butyl phthalate	4.7	ug/L	U	4.7	19
2/3/2003 14:20	OUTFALL 005	BNA-Water	Di-n-octyl phthalate	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Dibenzo(a,h)anthracene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Dibenzofuran	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.7
2/3/2003 14:20	OUTFALL 005	BNA-Water	Diethyl phthalate	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Dimethyl phthalate	47	ug/L	U	47	190
2/3/2003 14:20	OUTFALL 005	BNA-Water	Dimethylaminoazobenzene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Dinoseb	3.8	ug/L	U	3.8	15
2/3/2003 14:20	OUTFALL 005	BNA-Water	Diphenylamine	2.8	ug/L	U	2.8	11
2/3/2003 14:20	OUTFALL 005	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
2/3/2003 14:20	OUTFALL 005	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
2/3/2003 14:20	OUTFALL 005	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.7
2/3/2003 14:20	OUTFALL 005	BNA-Water	Endrin	1.4	ug/L	UJ	1.4	5.7
2/3/2003 14:20	OUTFALL 005	BNA-Water	Endrin aldehyde	3.8	ug/L	U	3.8	15
2/3/2003 14:20	OUTFALL 005	BNA-Water	Ethyl methanesulfonate	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Fluoranthene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Fluorene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.7
2/3/2003 14:20	OUTFALL 005	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.7
2/3/2003 14:20	OUTFALL 005	BNA-Water	Hexachlorobenzene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Hexachlorobutadiene	2.8	ug/L	U	2.8	11
2/3/2003 14:20	OUTFALL 005	BNA-Water	Hexachlorocyclopentadiene	2.8	ug/L	U	2.8	11
2/3/2003 14:20	OUTFALL 005	BNA-Water	Hexachloroethane	2.8	ug/L	U	2.8	11
2/3/2003 14:20	OUTFALL 005	BNA-Water	Hexachloropropene	1.9	ug/L	U	1.9	7.5
2/3/2003 14:20	OUTFALL 005	BNA-Water	Indeno(1,2,3-cd)pyrene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Isophorone	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Isosafrole	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Methapyrilene	3.8	ug/L	UJ	3.8	15
2/3/2003 14:20	OUTFALL 005	BNA-Water	Methyl methanesulfonate	0.94	ug/L	UJ	0.94	3.8

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
2/3/2003 14:20	OUTFALL 005	BNA-Water	N-Nitrosodi-n-butylamine	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.5
2/3/2003 14:20	OUTFALL 005	BNA-Water	N-Nitrosodiethylamine	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.5
2/3/2003 14:20	OUTFALL 005	BNA-Water	N-Nitrosodiphenylamine	2.8	ug/L	U	2.8	11
2/3/2003 14:20	OUTFALL 005	BNA-Water	N-Nitrosomethylethylamine	1.9	ug/L	U	1.9	7.5
2/3/2003 14:20	OUTFALL 005	BNA-Water	N-Nitrosomorpholine	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	N-Nitrosopiperidine	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	N-Nitrosopyrrolidine	1.9	ug/L	U	1.9	7.5
2/3/2003 14:20	OUTFALL 005	BNA-Water	Naphthalene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.5
2/3/2003 14:20	OUTFALL 005	BNA-Water	Nitroquinoline-1-oxide	19	ug/L	U	19	75
2/3/2003 14:20	OUTFALL 005	BNA-Water	Pentachlorobenzene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Pentachloroethane	47	ug/L	U	47	190
2/3/2003 14:20	OUTFALL 005	BNA-Water	Pentachloronitrobenzene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Pentachlorophenol	2.8	ug/L	U	2.8	11
2/3/2003 14:20	OUTFALL 005	BNA-Water	Phenacetin	3.8	ug/L	U	3.8	11
2/3/2003 14:20	OUTFALL 005	BNA-Water	Phenanthrene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Phenol	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Pyrene	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	Pyridine	3.8	ug/L	U	3.8	15
2/3/2003 14:20	OUTFALL 005	BNA-Water	Safrole	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.7
2/3/2003 14:20	OUTFALL 005	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.7
2/3/2003 14:20	OUTFALL 005	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.7
2/3/2003 14:20	OUTFALL 005	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.7
2/3/2003 14:20	OUTFALL 005	BNA-Water	m,p-Cresols	1.9	ug/L	U	1.9	7.5
2/3/2003 14:20	OUTFALL 005	BNA-Water	o-Cresol	1.9	ug/L	U	1.9	7.5
2/3/2003 14:20	OUTFALL 005	BNA-Water	o-Toluidine	0.94	ug/L	U	0.94	3.8
2/3/2003 14:20	OUTFALL 005	Bio-AGP/LimNut	Algal Growth Potential	0.568	mg DryWt/L	J	0.1	0.3
2/3/2003 14:20	OUTFALL 005	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	4	ug/L		0.85	2.6
2/3/2003 14:20	OUTFALL 005	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0	ug/L		0.85	2.6
2/3/2003 14:20	OUTFALL 005	Bio-Peri/Phyto	Phytoplankton-Quantitative-# Wet Taxa	22	#Taxa			
2/3/2003 14:20	OUTFALL 005	Bio-Peri/Phyto	Phytoplankton-Quantitative-#Diatom Taxa	26	#Taxa			
2/3/2003 14:20	OUTFALL 005	Bio-Toxicology	Bioassay-Acute-Screen-FW-C.dubia, LC50	100	LC50	L		
2/3/2003 14:20	OUTFALL 005	Bio-Toxicology	Bioassay-Acute-Screen-FW-Fish, LC50	100	LC50	L		
2/3/2003 14:20	OUTFALL 005	GC-Water	Alachlor	0.62	ug/L	U	0.62	2.48
2/3/2003 14:20	OUTFALL 005	GC-Water	Ametryn	0.052	ug/L	U	0.052	0.208
2/3/2003 14:20	OUTFALL 005	GC-Water	Atrazine	0.052	ug/L	U	0.052	0.208
2/3/2003 14:20	OUTFALL 005	GC-Water	Azinphos Methyl	0.052	ug/L	U	0.052	0.208
2/3/2003 14:20	OUTFALL 005	GC-Water	Bromacil	0.21	ug/L	U	0.21	0.84
2/3/2003 14:20	OUTFALL 005	GC-Water	Butylate	0.21	ug/L	U	0.21	0.84
2/3/2003 14:20	OUTFALL 005	GC-Water	Chlorpyrifos Ethyl	0.052	ug/L	U	0.052	0.208
2/3/2003 14:20	OUTFALL 005	GC-Water	Chlorpyrifos Methyl	0.1	ug/L	U	0.1	0.4
2/3/2003 14:20	OUTFALL 005	GC-Water	Diazinon	0.052	ug/L	U	0.052	0.208
2/3/2003 14:20	OUTFALL 005	GC-Water	Ethion	0.052	ug/L	U	0.052	0.208
2/3/2003 14:20	OUTFALL 005	GC-Water	Ethoprop	0.1	ug/L	U	0.1	0.4
2/3/2003 14:20	OUTFALL 005	GC-Water	Fenamiphos	0.21	ug/L	U	0.21	0.84
2/3/2003 14:20	OUTFALL 005	GC-Water	Fonofos	0.1	ug/L	U	0.1	0.4
2/3/2003 14:20	OUTFALL 005	GC-Water	Hexazinone	0.1	ug/L	U	0.1	0.4
2/3/2003 14:20	OUTFALL 005	GC-Water	Malathion	0.15	ug/L	U	0.15	0.6
2/3/2003 14:20	OUTFALL 005	GC-Water	Metalaxyl	0.26	ug/L	U	0.26	1.04
2/3/2003 14:20	OUTFALL 005	GC-Water	Metolachlor	0.52	ug/L	U	0.52	2.08
2/3/2003 14:20	OUTFALL 005	GC-Water	Metribuzin	0.1	ug/L	U	0.1	0.4

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
2/3/2003 14:20	OUTFALL 005	GC-Water	Mevinphos	0.21	ug/L	U	0.21	0.84
2/3/2003 14:20	OUTFALL 005	GC-Water	Naled	0.82	ug/L	U	0.82	3.28
2/3/2003 14:20	OUTFALL 005	GC-Water	Norflurazon	0.1	ug/L	U	0.1	0.4
2/3/2003 14:20	OUTFALL 005	GC-Water	Parathion Ethyl	0.15	ug/L	U	0.15	0.6
2/3/2003 14:20	OUTFALL 005	GC-Water	Parathion Methyl	0.1	ug/L	U	0.1	0.4
2/3/2003 14:20	OUTFALL 005	GC-Water	Phorate	0.052	ug/L	U	0.052	0.208
2/3/2003 14:20	OUTFALL 005	GC-Water	Prometryn	0.15	ug/L	U	0.15	0.6
2/3/2003 14:20	OUTFALL 005	GC-Water	Simazine	0.052	ug/L	U	0.052	0.208
2/3/2003 14:20	OUTFALL 005	Metals-Water	Aluminum	135	ug/L		10	40
2/3/2003 14:20	OUTFALL 005	Metals-Water	Arsenic	3	ug/L	U	3	12
2/3/2003 14:20	OUTFALL 005	Metals-Water	Cadmium	0.025	ug/L	I	0.025	0.1
2/3/2003 14:20	OUTFALL 005	Metals-Water	Calcium	35.5	mg/L		0.05	0.2
2/3/2003 14:20	OUTFALL 005	Metals-Water	Chromium	3.3	ug/L	I	2	8
2/3/2003 14:20	OUTFALL 005	Metals-Water	Copper	2	ug/L	U	0.75	3
2/3/2003 14:20	OUTFALL 005	Metals-Water	Iron	106	ug/L		7	28
2/3/2003 14:20	OUTFALL 005	Metals-Water	Lead	0.24	ug/L	U	0.1	0.4
2/3/2003 14:20	OUTFALL 005	Metals-Water	Magnesium	13.8	mg/L		0.01	0.04
2/3/2003 14:20	OUTFALL 005	Metals-Water	Nickel	2	ug/L	U	2	8
2/3/2003 14:20	OUTFALL 005	Metals-Water	Selenium	1.1	ug/L	I	1	4
2/3/2003 14:20	OUTFALL 005	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
2/3/2003 14:20	OUTFALL 005	Metals-Water	Zinc	4	ug/L	U	4	16
2/3/2003 14:20	OUTFALL 005	Nutrients-Liquid	Ammonia-N	0.01	mg N/L	U	0.01	0.02
2/3/2003 14:20	OUTFALL 005	Nutrients-Liquid	Color	20	PCU		5	5
2/3/2003 14:20	OUTFALL 005	Nutrients-Liquid	Fluoride	4.7	mg F/L		0.1	0.2
2/3/2003 14:20	OUTFALL 005	Nutrients-Liquid	NO2NO3-N	0.004	mg N/L	U	0.004	0.01
2/3/2003 14:20	OUTFALL 005	Nutrients-Liquid	N_KJEL_TOT	0.51	mg N/L		0.06	0.4
2/3/2003 14:20	OUTFALL 005	Nutrients-Liquid	O-Phosphate-P	0.16	mg P/L		0.008	0.02
2/3/2003 14:20	OUTFALL 005	Nutrients-Liquid	Sulfate	110	mg SO4/L		2	5
2/3/2003 14:20	OUTFALL 005	Nutrients-Liquid	TDS	331	mg/L		15	60
2/3/2003 14:20	OUTFALL 005	Nutrients-Liquid	TSS	5	mg/L	I	4	16
2/3/2003 14:20	OUTFALL 005	Nutrients-Liquid	Total-P	0.31	mg P/L		0.015	0.04
2/3/2003 14:20	OUTFALL 005	Nutrients-Liquid	Turbidity	3.8	NTU		0.05	0.05
2/3/2003 14:20	OUTFALL 005	Overflow	Alpha, Total	12.7	pCi/L			
2/3/2003 14:20	OUTFALL 005	Overflow	Alpha-Counting Error	1.2	pCi/L			
2/3/2003 14:20	OUTFALL 005	Overflow	Radium 226	9.6	pCi/L			
2/3/2003 14:20	OUTFALL 005	Overflow	Radium 226-Counting Error	0.5	pCi/L			
2/3/2003 14:20	OUTFALL 005	Overflow	Radium 228	3.7	pCi/L			
2/3/2003 14:20	OUTFALL 005	Overflow	Radium 228-Counting Error	0.9	pCi/L			
2/3/2003 10:40	REP -1	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	19	# Taxa			
2/3/2003 12:10	REP-1	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	20	# Taxa			
2/3/2003 10:40	REP-2	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	20	# Taxa			
2/3/2003 12:10	REP-2	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	18	# Taxa			
2/3/2003 10:40	REP-3	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	23	# Taxa			
2/3/2003 12:10	REP-3	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	14	# Taxa			
2/4/2003 15:00	TEST SITE REP.1	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa		# Taxa			
2/4/2003 15:00	TEST SITE REP.2	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa		# Taxa			
2/4/2003 15:00	TEST SITE REP.3	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa		# Taxa			

Appendix 5

Typical Values for Selected Parameters in Florida Waters

Percentile Distribution (1617 stations)

MIZELLE CREEK TEST 002a

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	**ND**
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	**ND**
Hester-Dendy Taxa Richness	6	6.5	9	11.5	13	15	17	21.5	26	29	32	**ND**
Dipnet Taxa Richness	9	12	**17**	20	22	24.5	26	28	31	37	53	**18**
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	**0.68 A**
Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	0.11	**0.14**	0.20	0.34	0.60	**0.17**
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	**0.14**
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	**0.25**	0.39	0.74	1.51	**0.26 A**
Orthophosphate	0.01	0.01	0.03	0.04	0.05	0.08	**0.11**	0.17	0.27	0.59	1.37	**0.16**
Turbidity (NTU)	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	**6.65**	10.45	16.30	**10**

MIZELLE CREEK TEST 002b

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	**ND**
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	**ND**
Hester-Dendy Taxa Richness	6	6.5	9	11.5	13	15	17	21.5	26	29	32	**ND**
Dipnet Taxa Richness	9	12	**17**	20	22	24.5	26	28	31	37	53	**17**
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	**0.49**
Ammonia	**0.02**	0.02	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60	**0.019 I**
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	**0.61**
Orthophosphate	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	**0.27**	0.59	1.37	**0.54**
Turbidity (NTU)	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	**6.65**	10.45	16.30	**6.7**

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.

A - Value reported is the mean of two or more determinations
I - Value reported is < the minimum quantitation limit, and ≥the minimum detection limit

Typical Values for Selected Parameters in Florida Waters

Percentile Distribution (1617 stations)

SOUTH PRONG OF THE ALAFIA RIVER CONTROL 006

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	**ND**
Hester-Dendy Diversity	**0.84**	2.12	2.48	2.74	2.88	3.09	3.25	3.40	3.52	3.76	3.90	**1.8**
Hester-Dendy Taxa Richness	6	6.5	9	11.5	13	15	17	21.5	**26**	29	32	**26**
Dipnet Taxa Richness	9	12	17	20	**22**	24.5	26	28	31	37	53	**23**
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	**0.59**
Ammonia	**0.02**	0.02	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60	**0.011 I**
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	**0.021**
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	**0.74**	1.51	**1.5**
Orthophosphate	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	0.59	**1.37**	**1.5**
Turbidity (NTU)	**0.60**	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30	**0.75**

SOUTH PRONG OF THE ALAFIA RIVER TEST 006

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	**ND**
Hester-Dendy Diversity	**0.84**	2.12	2.48	2.74	2.88	3.09	3.25	3.40	3.52	3.76	3.90	**1.7**
Hester-Dendy Taxa Richness	6	6.5	9	11.5	13	15	17	21.5	26	**29**	32	**30**
Dipnet Taxa Richness	9	**12**	17	20	22	24.5	26	28	31	37	53	**16**
Total Kjeldahl Nitrogen	0.30	0.39	**0.56**	0.73	0.87	1.00	1.11	1.26	1.49	1.93	2.80	**0.62**
Ammonia	**0.02**	0.02	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60	**0.016 I**
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	**0.029**
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	**0.74**	1.51	**1.5**
Orthophosphate	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	0.59	**1.37**	**1.5**
Turbidity (NTU)	**0.60**	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30	**0.7**

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.

I - Value reported is < the minimum quantitation limit, and ≥the minimum detection limit

Appendix 6

Additional physical, chemical, toxicological and microbiological results

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the IMC Phosphate-Kingsford/Haynesworth/Big Four Mine Complex (Outfall 002), Doc Durrance Road, Mulberry, Polk and Hillsborough Counties, Florida, NPDES# FL0000256, performed from 4 to 6 February 2003.

Facility:	**IMC Phosphate-Kingsford (Outfall 002)**		**NPDES #:**	**FL0000256**	Facility Type:	**Phosphate Mine**	**Analysts:** Jacquelyn Brynda
Location:	Doc Durrance Road, Mulberry		Contact/District:	Irsch/SW			Joshua Ayres
County:	Polk and Hillsborough		Test type:	static acute screen			James Daniels
Sample Collection Date:	2/3/2003	Time: 1530	# tests:	4	Receiving Water:	Mizelle Creek to South Prong	Travis Hill
Test Beginning Date:	2/4/2003	Time: 1500	Chlorination Type:	non-chlorinated		to Aflafia River	
Test Ending Date:	2/6/2003	Time: 1430	FDEP SOP#:	TA07_01/02		**Page 1 of 2**	**Reviewer:** Rob Buda

Organism: ***Ceriodaphnia dubia*** Life stage: <24 hours [B]Feeding: YCT/Algae Chamber size: 30mL

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[A]			Dissolved Oxygen			Conductivity Uncorrected µmhos/cm	
Concentrations	Volume(mL)	0 hr	24 hr	48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control A	0/20	5	5	5	8.1	-	7.9	25.4	-	25.1	8.0	-	7.5	180	200
Control B	0/20	5	5	5	-	-	8.0	-	-	25.1	-	-	7.5	-	205
Control C	0/20	5	5	5	-	-	8.0	-	-	25.1	-	-	7.6	-	200
Control D	0/20	5	5	5	-	-	8.0	-	-	25.2	-	-	7.6	-	210
100% A	20/0	5	5	5	7.7	-	8.3	24.9	-	25.2	8.0	-	7.7	340	375
100% B	20/0	5	5	5	-	-	8.3	-	-	25.2	-	-	7.7	-	380
100% C	20/0	5	5	5	-	-	8.3	-	-	25.2	-	-	7.8	-	375
100% D	20/0	5	5	5	-	-	8.3	-	-	25.2	-	-	7.4	-	380

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 25.0-26.5°C.
Incubator #3 temperature range for the test period was 25.0-25.5°C.

[B] Organisms fed prior to testing.

Organism: ***Pimephales promelas*** Life stage: 9 days [D]Feeding: artemia Chamber size: 1L

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[C]			Dissolved Oxygen			Conductivity Uncorrected µmhos/cm	
Concentrations	Volume(mL)	0 hr	24 hr	48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control A	0/500	5	5	5	8.2	8.0	8.0	24.9	24.5	27.4	8.1	7.6	7.3	320	385
Control B	0/500	5	5	5	8.2	8.0	8.0	24.9	25.2	26.1	8.3	7.7	7.5	315	370
Control C	0/500	5	5	5	8.2	8.0	8.0	24.8	25.9	25.8	8.5	7.7	7.6	315	370
Control D	0/500	5	5	5	8.2	8.0	8.1	24.8	25.7	25.0	8.5	7.8	7.7	315	370
100% A	500/0	5	5	5	7.6	8.1	8.2	25.6	24.8	24.5	8.3	7.8	7.7	345	370
100% B	500/0	5	5	5	7.6	8.2	8.2	25.6	26.2	24.4	8.4	7.6	7.6	350	390
100 % C	500/0	5	5	5	7.6	8.2	8.2	25.6	24.0	26.2	8.4	7.6	7.4	350	385
100% D	500/0	5	5	5	7.6	8.2	8.2	25.7	24.4	27.6	8.3	7.7	7.0	350	400

[C] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 25.0-26.5°C.
Incubator #3 temperature range for the test period was 25.0-25.5°C.

[D] Organisms fed prior to testing.

LIMS	
Job number:	TLH-2003-02-04-22
sample number:	651086

Data Transcription Verification	
date:	4/29/2003
by:	Cathy Oaks
	Brad Richardson

Total Residual CL2	mg/L	Method
Field:	-	-
Lab:	<0.03	Hach

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

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water (fish):	140	130
Control water (water flea):	82	80
100% Sample:	128	127

Light Intensity during the test was 50-100 foot candles. Photoperiod during the test was 16 hours of light : 8 hours of dark.

Continued

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the IMC Phosphate-Kingsford/Haynesworth/Big Four Mine Complex (Outfall 005), Doc Durrance Road, Mulberry, Polk and Hillsborough Counties, Florida, NPDES# FL0000256, performed from 4 to 6 February 2003.
Concluded

Facility:	**IMC Phosphate-Kingsford (Outfall 005)**	**NPDES #:**	**FL0000256**	Facility Type:	**Phosphate Mine**	**Analysts:**	Jacquelyn Brynda
Location:	Doc Durrance Road, Mulberry	Contact/District:	Irsch/SW				Joshua Ayres
County:	Polk and Hillsborough	Test type:	static acute screen				James Daniels
Sample Collection Date:	2/3/2003 Time: 1420	# tests:	4	Receiving Water:	Lake Branch to South Prong		Travis Hill
Test Beginning Date:	2/4/2003 Time: 1500	Chlorination Type:	non-chlorinated		to Aflafia River		
Test Ending Date:	2/6/2003 Time: 1430	FDEP SOP#:	TA07_01/02		**Page 2 of 2**	**Reviewer:**	Rob Buda

Organism: ***Ceriodaphnia dubia*** Life stage: <24 hours [B]Feeding: YCT/Algae
Chamber size: 30mL

Concentrations	Sample/Diluent Volume(mL)	SURVIVAL # Alive 0 hr	24 hr	48 hr	pH 0 hour	24 hour	48 hour	Temperature[A] 0 hour	24 hour	48 hour	Dissolved Oxygen 0 hour	24 hour	48 hour	Conductivity Uncorrected µmhos/cm 0 hour	48 hour
Control A	0/20	5	5	5	8.1	-	8.1	25.1	-	25.3	7.7	-	7.7	180	205
Control B	0/20	5	5	5	-	-	8.1	-	-	25.3	-	-	7.7	-	200
Control C	0/20	5	5	5	-	-	8.1	-	-	25.3	-	-	7.7	-	195
Control D	0/20	5	5	5	-	-	7.7	-	-	25.4	-	-	7.7	-	200
100% A	20/0	5	5	5	7.8	-	8.3	25.1	-	25.3	7.7	-	7.6	530	570
100% B	20/0	5	5	5	-	-	8.3	-	-	25.3	-	-	7.7	-	580
100% C	20/0	5	5	5	-	-	8.3	-	-	25.4	-	-	7.7	-	560
100% D	20/0	5	5	5	-	-	8.3	-	-	25.3	-	-	7.7	-	570

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 25.0-26.5°C.
Incubator #3 temperature range for the test period was 25.0-25.5°C.

[B] Organisms fed prior to testing.

Organism: ***Pimephales promelas*** Life stage: 9 days [D]Feeding: artemia
Chamber size: 1L

Concentrations	Sample/Diluent Volume(mL)	SURVIVAL # Alive 0 hr	24 hr	48 hr	pH 0 hour	24 hour	48 hour	Temperature[C] 0 hour	24 hour	48 hour	Dissolved Oxygen 0 hour	24 hour	48 hour	Conductivity Uncorrected µmhos/cm 0 hour	48 hour
Control A	0/500	5	5	5	8.1	7.9	8.0	24.9	24.0	25.4	8.2	7.7	7.5	315	365
Control B	0/500	5	5	5	8.1	7.9	8.0	24.9	24.4	26.4	8.1	7.7	7.5	315	385
Control C	0/500	5	5	5	8.1	7.9	8.0	24.9	25.7	26.6	8.1	7.6	7.4	315	390
Control D	0/500	5	5	5	8.1	7.9	8.0	24.8	25.2	28.1	8.2	7.7	7.1	315	400
100% A	500/0	5	5	5	7.8	8.3	8.3	25.9	26.3	25.2	8.3	7.5	7.3	545	580
100% B	500/0	5	5	5	7.8	8.3	8.3	25.9	24.7	26.4	8.5	7.5	7.3	550	600
100 % C	500/0	5	5	5	7.8	8.2	8.3	25.8	25.1	24.4	8.6	7.6	7.5	550	575
100% D	500/0	5	5	5	7.8	8.3	8.3	25.8	24.4	24.6	8.6	7.6	7.8	550	590

[C] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 25.0-26.5°C.
Incubator #3 temperature range for the test period was 25.0-25.5°C.

[D] Organisms fed prior to testing.

LIMS	
Job number:	TLH-2003-02-04-22
sample number:	651085

Data Transcription Verification	
date:	4/29/2003
by:	Cathy Oaks
	Brad Richardson

Total Residual CL2	mg/L	Method
Field:	-	-
Lab:	<0.03	Hach

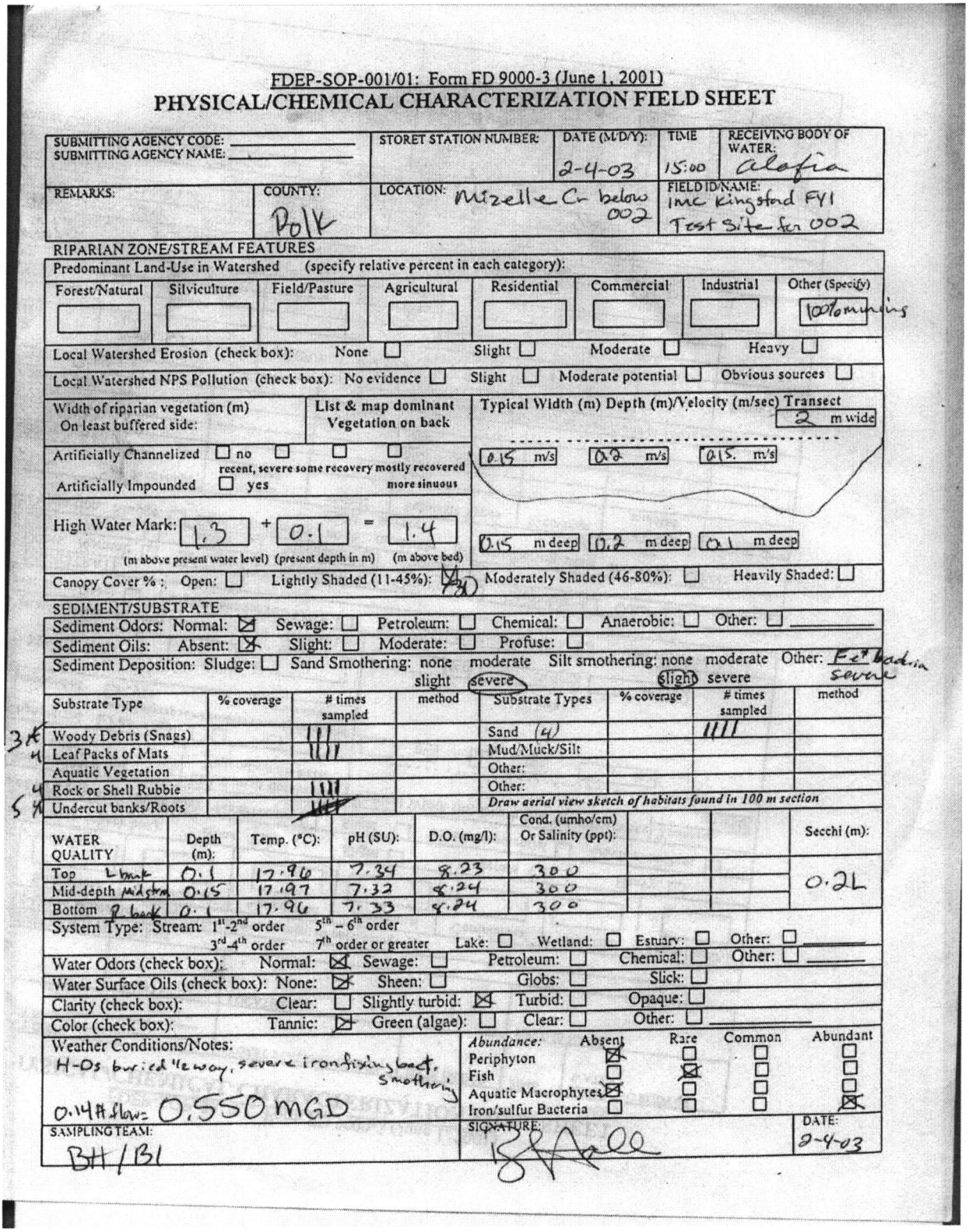
Ammonia	Total (mg/L)	Unionized (mg/L)
Control water (fish):	<0.017	<0.017
Control water (water flea):	<0.017	<0.017
100% Sample:	<0.017	<0.017

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water (fish):	140	130
Control water (water flea):	82	80
100% Sample:	139	139

Light Intensity during the test was 50-100 foot candles.
Photoperiod during the test was 16 hours of light : 8 hours of dark.

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):	TIME	RECEIVING BODY OF WATER:
		2-4-03	15:00	Alafia

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Polk	Mizelle Cr below 002	IMC Kingsford FY1 Test Site for 002

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)
							100% mining

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: | List & map dominant Vegetation on back

Typical Width (m) Depth (m)/Velocity (m/sec) Transect: 2 m wide

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

Artificially Impounded ☐ yes more sinuous

0.15 m/s | 0.2 m/s | 0.15 m/s

High Water Mark: 1.3 (m above present water level) + 0.1 (present depth in m) = 1.4 (m above bed)

0.15 m deep | 0.2 m deep | 0.1 m deep

Canopy Cover %: Open: ☐ Lightly Shaded (11-45%): ☒ 30 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 (severe) Silt smothering: none (slight) severe Other: Fe* bacteria severe

Substrate Type	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
3 Woody Debris (Snags)		III		Sand (4)		IIII	
4 Leaf Packs of Mats		III		Mud/Muck/Silt			
Aquatic Vegetation				Other:			
4 Rock or Shell Rubbie		III		Other:			
5 4 Undercut banks/Roots		III		*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (umho/cm) Or Salinity (ppt):			Secchi (m):
Top L bank	0.1	17.96	7.34	8.23	300			0.2L
Mid-depth Midstrm	0.15	17.97	7.32	8.24	300			
Bottom R bank	0.1	17.96	7.33	8.24	300			

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

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

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

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

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

Weather Conditions/Notes:

H-Os buried 4 way, severe iron fixing bact. smothering

0.14# flow: 0.550 MGD

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

SAMPLING TEAM: BH / BI

SIGNATURE:

DATE: 2-4-03

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

STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		12-11-02	S. Prong Alafia R

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Hillsborough	Mizelle Cr. below 002	IMC-Kingsford FY1 002 Trst Site

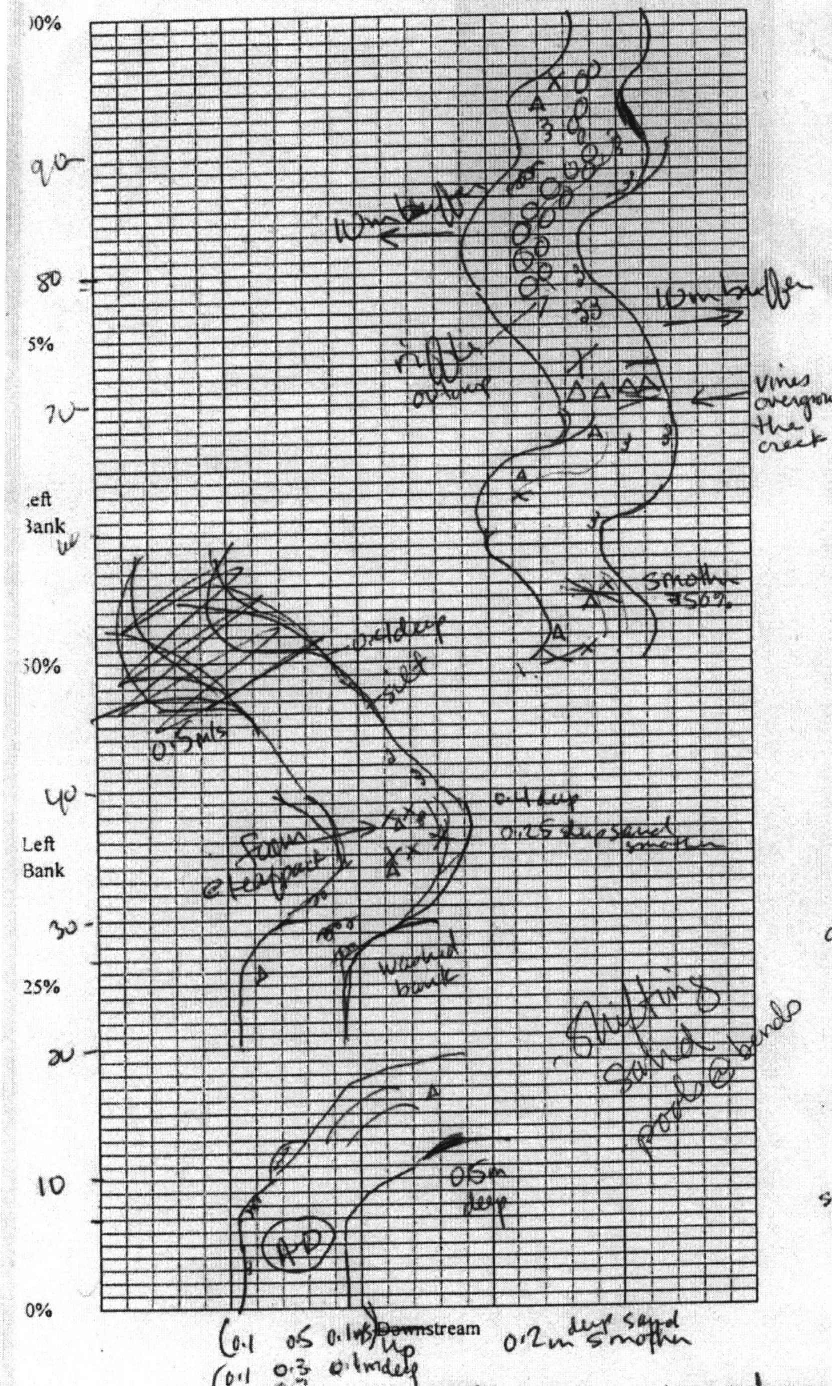
Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** 16	Four or more productive habitats present (snags, tree roots/undercut banks, aquatic vegetation, leaf packs (partially decayed), rock). 20 19 18 17 16	Three productive habitats present. Adequate habitat. 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 12	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 17	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec. Or spate occurring: > 1 m/sec 5 4 3 2 1
Habitat Smothering 8 Primary Score (53)	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** 20	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 8	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 5	Width of native vegetation (least buffered side) greater than 18 m 10 9	Width of native vegetation (least buffered side) 12m to 18 m 8 7 6	Width of native vegetation 6 to 12 m. human activities still close to system 5 4	Less than 6 m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 8 Left Bank 8 Secondary Score (63)	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody machrophytes. Normal, expected plant community for given sunlight & habitat conditions. 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian ozone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (e.g. grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 3 2 1

(116) **TOTAL SCORE**

ANALYSIS DATE:	ANALYST:	SIGNATURE:
12-11-02	Bonnie Hall	B Hall

Mizelle Cr below 002, test site

Stream/River Habitat Sketch Sheet, Form FD 9000-4 (June 1, 2001)
Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).



Substrates: Code key, draw proportionate habitat abundance.

- Snags
- Roots/undercut banks 3
- Leaf Packs (or mats) 3
- Macrophytes
- cobble <10

Velocity: 0.5 m/s at top
Note where velocity measures were taken.

Habitat Smothering:
Note areas (on map) where sand or silt is something substrates, limiting habitability.

Bank Stability: 9 / 8
Note areas (on map) with unstable, eroding banks.

Riparian Buffer Width:
Note areas (on map) where natural vegetation is altered or eliminated.

Plants observed/other notes:

0.3, 0.5 m
turbid from 4" rain this wk
p. ivy
bacchavis palmetto elm
willow fern palm
titi canopy low, few big trees
sweetbay water oak
smilax vine

outfall/weir 002 staff read 0.56 = 4.327 MGD

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):	TIME	RECEIVING BODY OF WATER:
		2-4-03	1245	Alafia R.

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Polk	Mizelle Cr @ Keysville Rd	IMC Kingsford F41 Downstream Control for 002

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)
5	5	30		10			50 mined

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:

List & map dominant Vegetation on back

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

Artificially Impounded ☐ yes more sinuous

Typical Width (m) Depth (m)/Velocity (m/sec) Transect: 2 m wide

0.2 m/s | 0.2 m/s | 0.2 m/s

0.15 m deep | 0.1 m deep | 0.3 m deep

High Water Mark: 1.3 (m above present water level) + 0.1 (present depth in m) = 1.4 (m above bed)

Canopy Cover %: Open: ☐ Lightly Shaded (11-45%): ☒ 35 Moderately Shaded (46-80%): ☐ Heavily Shaded: ☐

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☐ _____

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

Sediment Deposition: Sludge: ☐ Sand Smothering: none slight (moderate) severe Silt smothering: none moderate (slight) severe Other: _____

	Substrate Type	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
5	Woody Debris (Snags)		III		Sand (5)		IIII	
5	Leaf Packs of Mats		IIII		Mud/Muck/Silt			
	Aquatic Vegetation				Other:			
	Rock or Shell Rubbie				Other:			
5	Undercut banks/Roots		IIII		*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (umho/cm) Or Salinity (ppt):			Secchi (m):
Top Lbank	0.05	16.11	7.69	9.50	249			0.2L
Mid-depth Mid	0.1	16.11	7.68	9.50	260			
Bottom Rbank	0.025	16.13	7.68	9.51	255			

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

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

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

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

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

Weather Conditions/Notes: DRAGONFLY AT H.D. LOCATION | SLIGHT FOAM

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

SAMPLING TEAM: BH/BJ

SIGNATURE: B Hall

DATE: 2-4-03

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

STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

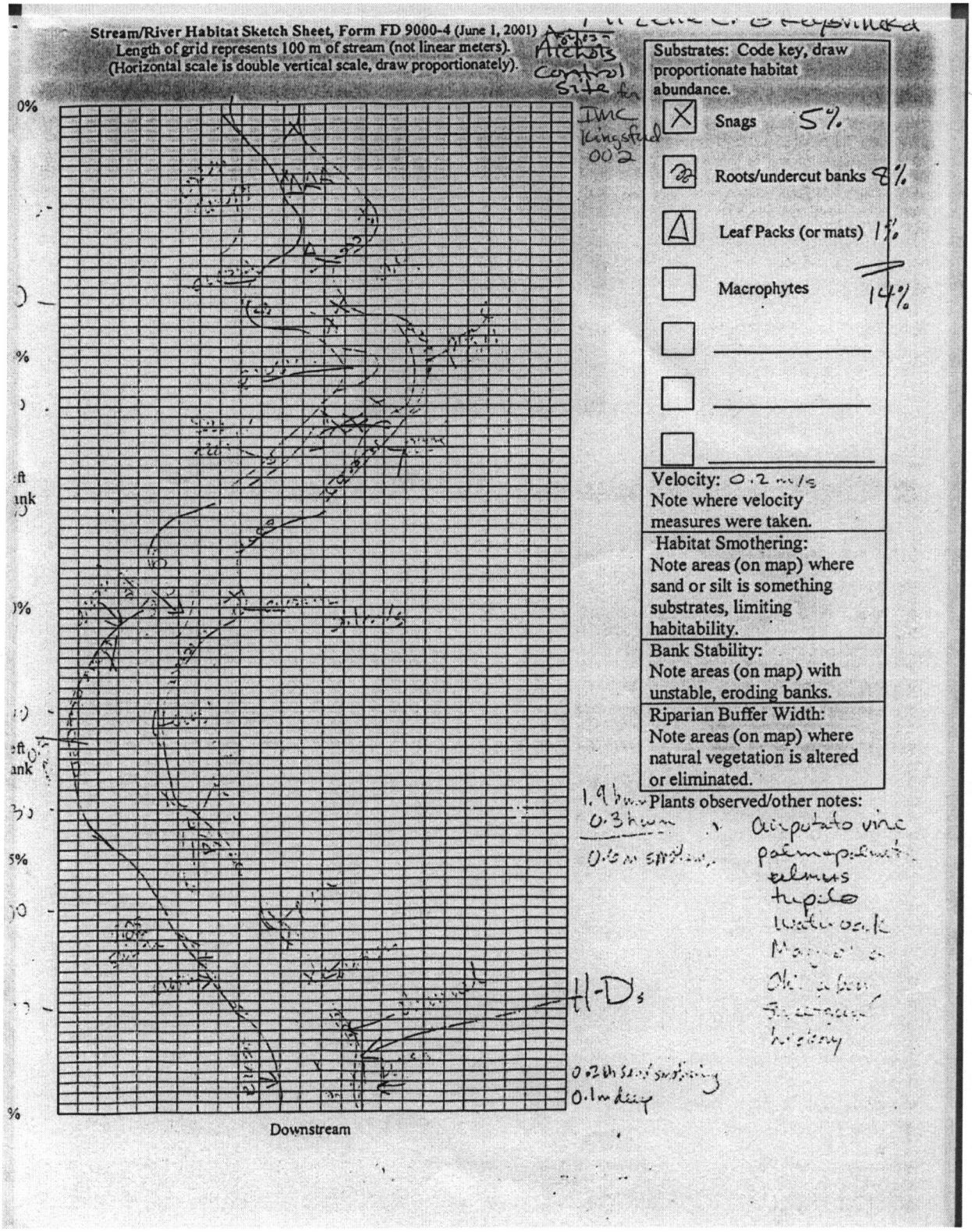
SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		7-29-02	N. Prong Alafia R.

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
Time Tchefuncte 002	Hillsborough	Mizelle Cr @ Keysville Rd	~~Agrifos Artesian Control Site~~

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** 11	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 9	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 14	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 0.2 15 (14) 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec. Or spate occurring: > 1 m/sec 5 4 3 2 1
Habitat Smothering 12 Primary Score 46	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 ~~45%~~ 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** 20	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 5 Left Bank 5	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 8 Left Bank 10	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 8 Left Bank 7 Secondary Score 63	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody machrophytes. Normal, expected plant community for given sunlight & habitat conditions. 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian ozone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (e.g. grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 3 2 1

(109) **TOTAL SCORE**

ANALYSIS DATE:	ANALYST:	SIGNATURE:
7-29-02		BH


Stream/River Habitat Sketch Sheet, Form FD 9000-4 (June 1, 2001)
Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).
Substrates: Code key, draw proportionate habitat abundance.
Snags 5%
Roots/undercut banks 8%
Leaf Packs (or mats) 1%
Macrophytes 14%
Velocity: 0.2 m/s
Note where velocity measures were taken.
Habitat Smothering:
Note areas (on map) where sand or silt is something substrates, limiting habitability.
Bank Stability:
Note areas (on map) with unstable, eroding banks.
Riparian Buffer Width:
Note areas (on map) where natural vegetation is altered or eliminated.
Plants observed/other notes:
Downstream

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):	TIME	RECEIVING BODY OF WATER:
		2-3-03	10:40	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Polk	S. Prong Alafia below ODC	IMC Kingsford F41 Test Site for ODC outfall

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)
							100% mined

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

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

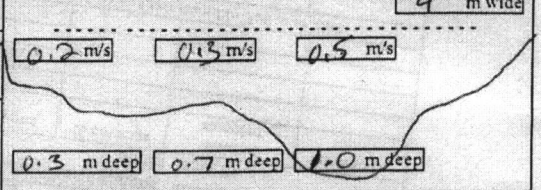
Width of riparian vegetation (m) On least buffered side: 18

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



High Water Mark: 0.8 (m above present water level) + 0.7 (present depth in m) = 1.5 (m above bed)

Canopy Cover % : Open: ☐ Lightly Shaded (11-45%): ☒ 38 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
(4)	Woody Debris (Snags)		IIII		Sand (4)		IIII	
(4)	Leaf Packs of Mats		IIII		Mud/Muck/Silt			
(4)	Aquatic Vegetation		IIII		Other:			
(4)	Rock or Shell Rubbie		IIII		Other:			
	Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	~~Cond~~ pH (SU):	D.O. (mg/l):	~~Cond. (umho/cm) Or~~ Salinity (ppt): pH? Estimated			Secchi (m):
~~Top~~ Lbank	0.23	14.02	592	7.56	7.33			0.7L
Mid-depth Middle	0.34	14.01	592	7.34	7.29			
~~Bottom~~ Rbank	0.5	14.01	592	7.71	7.30			

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

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

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

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

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

Weather Conditions/Notes: pH meter malfunction Outfall discharge stopped 3 days ago

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

SAMPLING TEAM: BH/BT/DM

SIGNATURE: [signature]

DATE: 2-3-03

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

STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		12-11-02	Alafia R.

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Polk	S Prong Alafia, below OOle	Imc-Kingsford FY1-0006 tst site

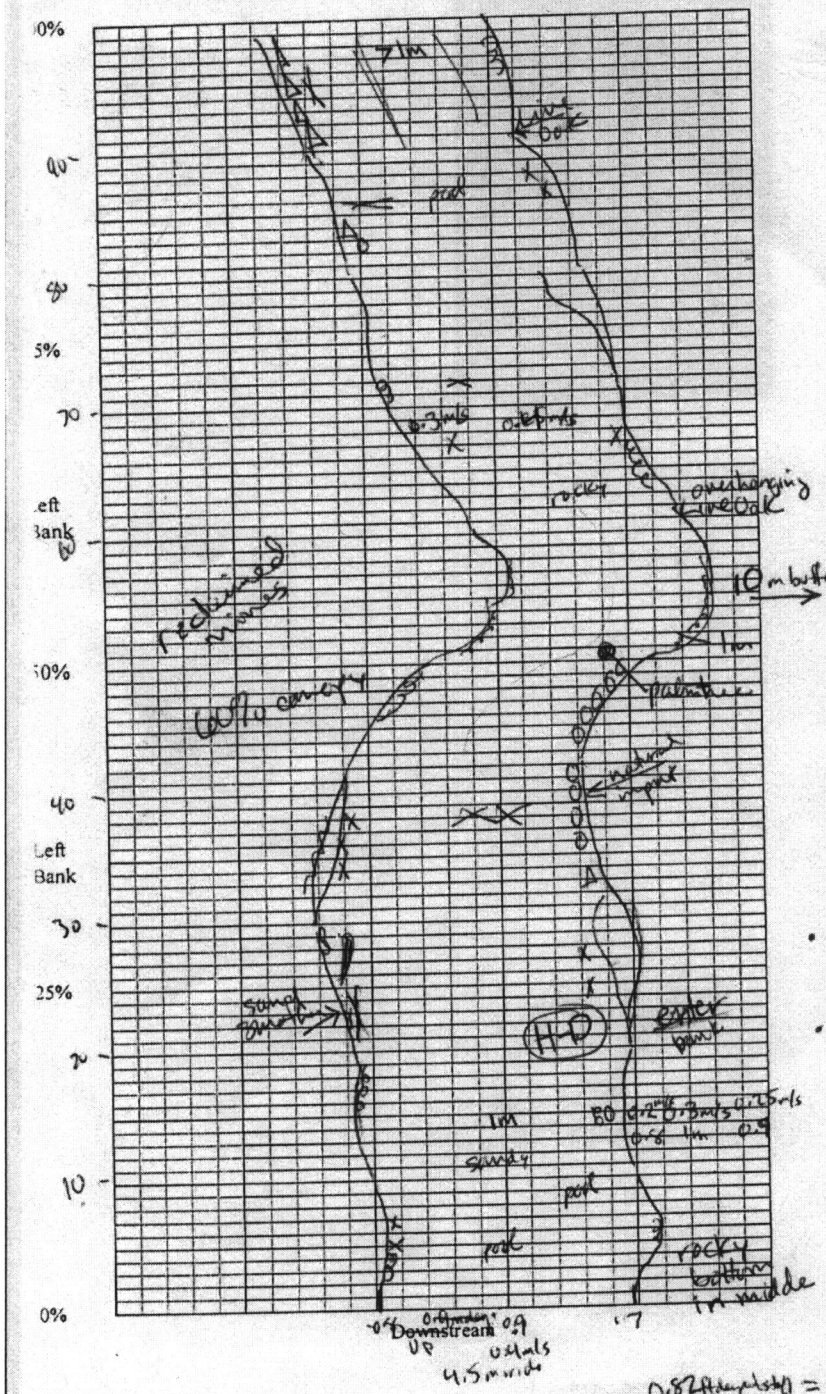
Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** 16	Four or more productive habitats present (snags, tree roots/undercut banks, aquatic vegetation, leaf packs (partially decayed), rock). 20 19 18 17 16	Three productive habitats present. Adequate habitat. 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 17	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec. Or spate occurring: > 1 m/sec 5 4 3 2 1
Habitat Smothering 7 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** 10	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	Many have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Bank Stability Right Bank 9 Left Bank 9	Stable. No evidence of erosion or bank failure. Little potential for future problems. 10 9	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 8 7 6	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 5 4	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 3 2 1
Riparian Buffer Zone Width Right Bank 8 Left Bank 5	Width of native vegetation (least buffered side) greater than 18 m 10 9	Width of native vegetation (least buffered side) 12m to 18 m 8 7 6	Width of native vegetation 6 to 12 m. human activities still close to system 5 4	Less than 6 m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 9 Left Bank 9 Secondary Score (59)	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody machrophytes. Normal, expected plant community for given sunlight & habitat conditions. 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian ozone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (e.g. grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 3 2 1

(107) **TOTAL SCORE**

ANALYSIS DATE:	ANALYST:	SIGNATURE:
12-11-02	B. Hall	

Stream/River Habitat Sketch Sheet, Form FD 9000-4 (June 1, 2001)
Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).

below Ore



Substrates: Code key, draw proportionate habitat abundance.	
X	Snags 4
rrr	Roots/undercut banks 4
Δ	Leaf Packs (or mats) 1
O	Macrophytes 3
Velocity: Note where velocity turbid measures were taken.	
Habitat Smothering: Note areas (on map) where sand or silt is something substrates, limiting habitability.	
Bank Stability: good Note areas (on map) with unstable, eroding banks.	
Riparian Buffer Width: Note areas (on map) where natural vegetation is altered or eliminated.	

0.2m human waterline is up 4 grass thatch

Plants observed/other notes:

- confluence of turbid green effluent w/ tanic/clear River @ beginning of stretch
- mostly sand bottom w/ little habitat

scouring

ferns maple sweet gum elms oaks palmetto poison ivy grass wild citrus pine palm

0.82 ft/sec/sta) = 44.4 MGD

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):	TIME	RECEIVING BODY OF WATER:
		2-3-03	12:10	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Polk	S. Prong Alafia R above 006	IMC Kingsford FY1 006 Background Site

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)
							100% mined

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

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

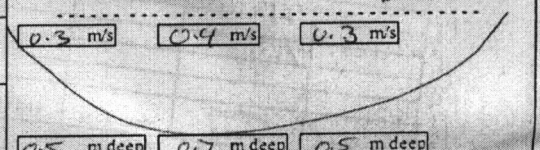
Width of riparian vegetation (m) On least buffered side: 18

List & map dominant Vegetation on back

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

Artificially Impounded ☐ yes more sinuous

Typical Width (m) Depth (m)/Velocity (m/sec) Transect: 4.5 m wide



High Water Mark: 0.8 (m above present water level) + 0.7 (present depth in m) = 1.5 (m above bed)

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

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☐ _____

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

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

	Substrate Type	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
4	Woody Debris (Snags)		////		Sand (4)		////	
4	Leaf Packs of Mats		////		Mud/Muck/Silt			
4	Aquatic Vegetation	##	////		Other:			
	Rock or Shell Rubble		/		Other:			
	Undercut banks/Roots		///		*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU): ~~estimate~~	D.O. (mg/l):	Cond. (umho/cm) Or Salinity (ppt):			Secchi (m):
~~Top~~ L bank	0.5	14.22	7.33	8.08	592			0.6L
~~Mid-depth~~ Middle	0.815	14.21	7.32	7.69	592			
Bottom R bank	0.815	14.21	7.31	7.68	592			

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

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

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

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

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

Weather Conditions/Notes: Periphyton Rack out of water - not used

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

SAMPLING TEAM: BH/BI/JM

SIGNATURE: [signature]

DATE: 2-3-03

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

STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

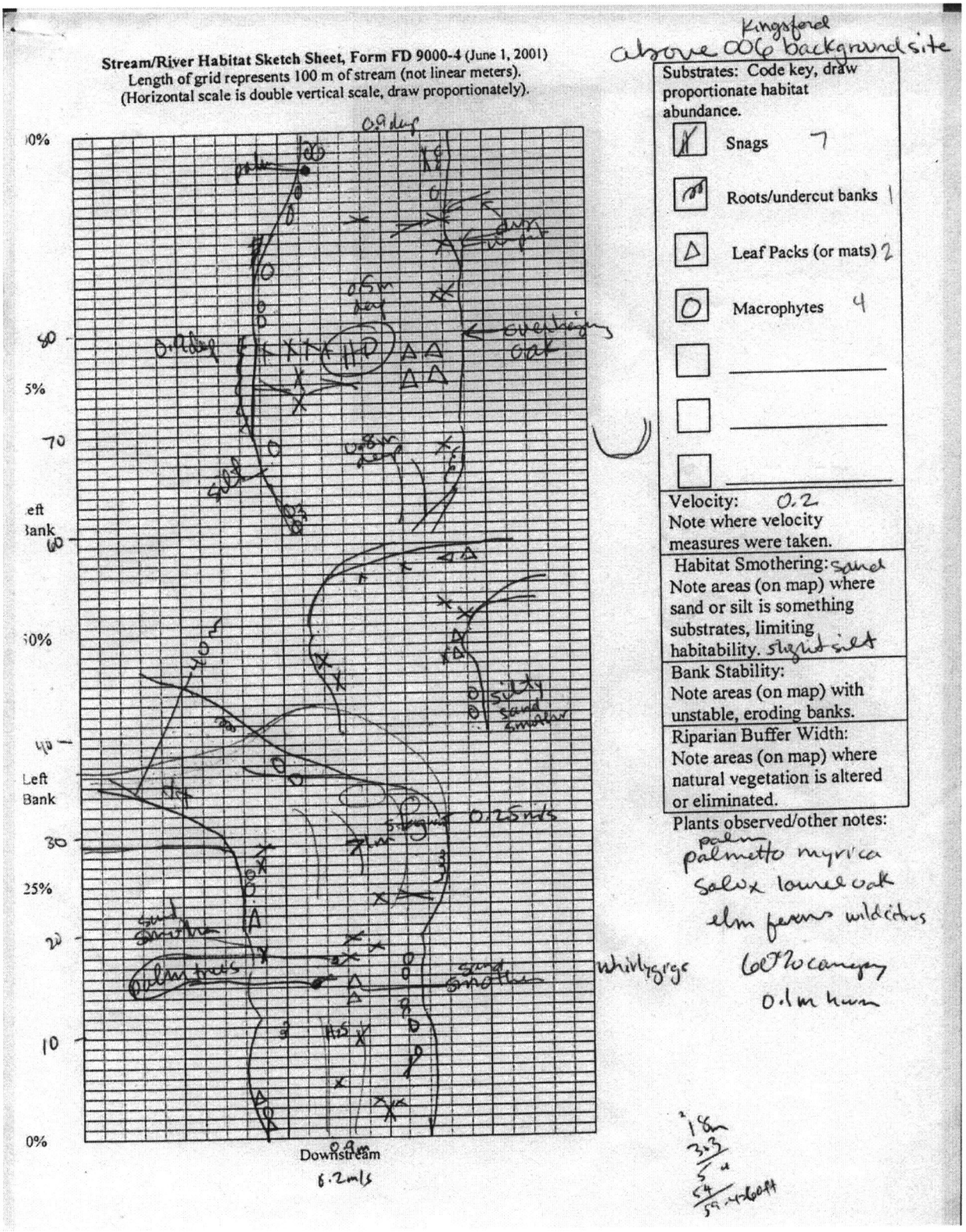
SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		12-11-02	Alafia River

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Polk	S. Prong Alafia above 006	IMC-Kingsford FY1 006 background site

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** 18	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 9	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 14	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec. Or spate occurring: > 1 m/sec 5 4 3 2 1
Habitat Smothering 18 Primary Score (59)	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** 19	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 10 Left Bank 10	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 9 Left Bank 8	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 9 Left Bank 9 Secondary Score (74)	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody machrophytes. Normal, expected plant community for given sunlight & habitat conditions. 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian ozone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (e.g. grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 3 2 1

(133) **TOTAL SCORE**

ANALYSIS DATE:	ANALYST:	SIGNATURE:
12-11-02	Bonnie Hall	BHall


Stream/River Habitat Sketch Sheet, Form FD 9000-4 (June 1, 2001)
Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).
Kingsford
above COC background site
Substrates: Code key, draw proportionate habitat abundance.
Snags 7
Roots/undercut banks 1
Leaf Packs (or mats) 2
Macrophytes 4
Velocity: 0.2
Note where velocity measures were taken.
Habitat Smothering: sand
Note areas (on map) where sand or silt is something substrates, limiting habitability. slight silt
Bank Stability:
Note areas (on map) with unstable, eroding banks.
Riparian Buffer Width:
Note areas (on map) where natural vegetation is altered or eliminated.
Plants observed/other notes:
palm palmetto myrica
Salix laurel oak
elm ferns wildcitrus
60% canopy
0.1m leaves
overhang oak
0.25m/s
Left Bank
Downstream
0.2m/s
0%
10
20
25%
30
40
50%
60
70
80
5%
90%

Appendix 8a.

Taxa list and density (number/mL) for phytoplankton collected upstream and downstream of IMC – Kingsford/Haynesworth/Big Four Mine Complex facility discharge, 2/3/03 & 2/4/03.

	Outfall 002	Outfall 005	Mizelle Cr. Test 002a	Mizelle Cr. Test 002b	Alafia R. Test 006	Alafia R. Control 006
Bacillariophyta:						
Achnanthes exigua	-	24	8	9	3	3
Achnanthes hungarica	-	-	-	-	3	6
Achnanthes lanceolata	-	49	8	12	22	37
Achnanthes lanceolata apiculata	-	-	16	9	3	-
Achnanthes rupestoides	-	-	8	22	-	-
Achnanthes sp.	-	-	-	3	3	-
Amphipleura sp.	-	24	-	-	3	12
Amphora sp.	-	24	-	-	3	3
Aulacoseira sp.	5	-	24	-	3	3
Bacillaria paxillifer	-	-	8	-	-	3
Bacillariophyceae	16	73	8	47	14	25
Caloneis sp.	-	24	16	-	3	3
Capartogramma crucicula	-	-	-	-	-	3
Cocconeis placentula	-	-	-	-	14	19
Cocconeis sp.	-	-	8	3	5	-
Coscinodiscophyceae	-	171	8	-	-	-
Cyclotella meneghiniana	14	245	32	-	11	22
Cyclotella pseudostelligera	-	807	24	-	-	-
Cyclotella sp.	5	1,785	16	6	33	22
Cymbella tumida	3	-	-	-	-	-
Diadesmis confervacea	-	-	-	-	3	-
Diploneis sp.	-	-	-	-	3	3
Encyonema neomesianum	-	-	-	-	3	3
Eunotia sp.	-	24	8	-	5	9
Fragilaria construens	-	-	-	-	3	-
Fragilaria pinnata	-	-	-	-	-	3
Fragilaria sp.	-	-	-	-	3	3
Fragilariaceae	-	24	-	3	57	50
Gomphonema parvulum	3	24	-	12	16	16
Gomphonema sp.	-	49	-	-	5	3
Gyrosigma sp.	-	24	-	-	-	-
Hippodonta capitata	8	24	24	-	-	-
Hippodonta sp.	-	-	-	16	3	-
Mastogloia smithii	-	24	-	-	-	-
Melosira sp.	-	-	-	-	30	34
Navicula cryptocephala	96	24	248	124	3	3
Navicula cryptotenella	-	-	-	3	-	-
Navicula minima	-	98	16	-	-	-
Navicula porifera	-	-	-	-	-	3
Navicula radiosa	-	-	-	-	-	3
Navicula sp.	132	318	312	257	22	53
Neidium sp.	-	-	8	-	-	-
Nitzschia amphibia	-	-	8	-	-	-
Nitzschia frustulum	-	-	-	-	3	-
Nitzschia palea	14	-	-	-	-	-
Nitzschia sigmoidea	30	-	112	-	-	-
Nitzschia sp.	44	440	136	81	14	28
Pinnularia sp.	8	-	24	9	3	-
Planothidium delicatulum	-	98	-	3	3	3
Pleurosigma sp.	-	24	-	-	3	-
Sellaphora sp.	3	24	8	3	3	-
Seminavis sp.	-	-	-	-	-	3
Stauroneis sp.	-	-	8	3	-	-
Surirella sp.	-	24	-	-	-	3
Synedra fasciculata	-	-	-	-	11	84
Synedra ulna	-	24	8	9	24	40
Terpsinoe sp.	-	-	-	-	3	-
Tryblionella sp.	-	-	-	-	3	-
Undetermined Bacillariophyta	-	-	-	3	-	-

(continued on next page)

Appendix 8a. continued

	Outfall 002	Outfall 005	Mizelle Cr. Test 002a	Mizelle Cr. Test 002b	Alafia R. Test 006	Alafia R. Control 006
Chlorophycota:						
Actinastrum sp.	-	-	-	-	5	-
Ankistrodesmus falcatus	-	73	-	-	11	12
Chlamydomonas sp.	36	147	144	109	52	72
Chlorella sp.	11	367	80	16	57	28
Chlorococcum sp.	3	98	96	6	11	19
Chlorogonium sp.	-	24	-	6	3	9
Chlorophyceae	11	24	48	-	14	12
Coelastrum microporum	-	-	-	-	5	-
Crucigenia tetrapedia	-	-	-	-	3	3
Oocystis sp.	-	-	-	-	-	19
Pediastrum tetras	-	-	-	-	-	3
Planktosphaeria sp.	-	-	16	-	-	-
Scenedesmus bicaudatus	-	24	-	-	-	-
Scenedesmus bijuga	-	-	-	-	5	-
Scenedesmus quadricauda	-	49	-	-	-	-
Scenedesmus sp.	3	-	-	3	3	3
Schroederia setigera	-	73	-	-	-	-
Selenastrum sp.	3	391	-	-	19	16
Staurastrum sp.	3	-	-	-	3	-
Tetraedron minimum	-	-	-	-	-	6
Chrysophyta:						
Chrysophyceae	145	342	-	-	-	-
Dinobryon sertularia	-	-	-	-	16	25
Dinobryon sp.	3	196	-	-	-	-
Synura sp.	-	24	-	34	3	16
Synura uvella	-	-	432	-	-	-
Cryptophycophyta:						
Chroomonas sp.	3	98	40	-	11	31
Cryptomonas sp.	91	122	192	53	33	31
Cyanophycota:						
Anabaena circinalis	14	-	40	12	11	19
Anabaena sp.	-	-	-	-	30	16
Chroococcaceae	3	-	-	-	-	-
Cyanobium parvum	14	245	16	19	41	40
Cyanobium plancticum	3	318	88	-	41	28
Lyngbya sp.	14	24	32	3	-	-
Microcystis sp.	-	-	-	-	8	6
Oscillatoria sp.	69	171	104	22	22	6
Rhabdogloea sp.	5	73	-	-	71	25
Romeria sp.	-	-	-	-	3	-
Schizothrix sp.	-	-	8	-	-	-
Euglenophycota:						
Euglena sp.	8	-	16	16	3	-
Lepocinclis sp.	5	-	-	3	3	3
Trachelomonas sp.	11	49	-	-	-	-
Prasinophyta:						
Spermatozoopsis sp.	-	-	-	-	-	6
Pyrrophycophyta:						
Glenodinium sp.	-	-	8	-	3	-

Appendix 8b.

Taxa list and number of individuals counted) for phytoplankton collected upstream and downstream of IMC – Kingsford/Haynesworth/Big Four Mine Complex facility discharge, 2/3/03 & 2/4/03.

	Outfall 002	Outfall 005	Mizelle Cr. Test 002a	Mizelle Cr. Test 002b	Alafia R. Test 006	Alafia R. Control 006
Bacillariophyta:						
Achnanthes exigua	-	1	1	3	1	1
Achnanthes hungarica	-	-	-	-	1	2
Achnanthes lanceolata	-	2	1	4	8	12
Achnanthes lanceolata apiculata	-	-	2	3	1	-
Achnanthes rupestoides	-	-	1	7	-	-
Achnanthes sp.	-	-	-	1	1	-
Amphipleura sp.	-	1	-	-	1	4
Amphora sp.	-	1	-	-	1	1
Aulacoseira sp.	2	-	3	-	1	1
Bacillaria paxillifer	-	-	1	-	-	1
Bacillariophyceae	6	3	1	15	5	8
Caloneis sp.	-	1	2	-	1	1
Capartogramma crucicula	-	-	-	-	-	1
Cocconeis placentula	-	-	-	-	5	6
Cocconeis sp.	-	-	1	1	2	-
Coscinodiscophyceae	-	7	1	-	-	-
Cyclotella meneghiniana	5	10	4	-	4	7
Cyclotella pseudostelligera	-	33	3	-	-	-
Cyclotella sp.	2	73	2	2	12	7
Cymbella tumida	1	-	-	-	-	-
Diadesmis confervacea	-	-	-	-	1	-
Diploneis sp.	-	-	-	-	1	1
Encyonema neomesianum	-	-	-	-	1	1
Eunotia sp.	-	1	1	-	2	3
Fragilaria construens	-	-	-	-	1	-
Fragilaria pinnata	-	-	-	-	-	1
Fragilaria sp.	-	-	-	-	1	1
Fragilariaceae	-	1	-	1	21	16
Gomphonema parvulum	1	1	-	4	6	5
Gomphonema sp.	-	2	-	-	2	1
Gyrosigma sp.	-	1	-	-	-	-
Hippodonta capitata	3	1	3	-	-	-
Hippodonta sp.	-	-	-	5	1	-
Mastogloia smithii	-	1	-	-	-	-
Melosira sp.	-	-	-	-	11	11
Navicula cryptocephala	35	1	31	40	1	1
Navicula cryptotenella	-	-	-	1	-	-
Navicula minima	-	4	2	-	-	-
Navicula porifera	-	-	-	-	-	1
Navicula radiosa	-	-	-	-	-	1
Navicula sp.	48	13	39	83	8	17
Neidium sp.	-	-	1	-	-	-
Nitzschia amphibia	-	-	1	-	-	-
Nitzschia frustulum	-	-	-	-	1	-
Nitzschia palea	5	-	-	-	-	-
Nitzschia sigmoidea	11	-	14	-	-	-
Nitzschia sp.	16	18	17	26	5	9
Pinnularia sp.	3	-	3	3	1	-
Planothidium delicatulum	-	4	-	1	1	1
Pleurosigma sp.	-	1	-	-	1	-
Sellaphora sp.	1	1	1	1	1	-
Seminavis sp.	-	-	-	-	-	1
Stauroneis sp.	-	-	1	1	-	-
Surirella sp.	-	1	-	-	-	1
Synedra fasciculata	-	-	-	-	4	27
Synedra ulna	-	1	1	3	9	13
Terpsinoe sp.	-	-	-	-	1	-
Tryblionella sp.	-	-	-	-	1	-
Undetermined Bacillariophyta	-	-	-	1	-	-

(continued on next page)

Appendix 8b. continued

	Outfall 002	Outfall 005	Mizelle Cr. Test 002a	Mizelle Cr. Test 002b	Alafia R. Test 006	Alafia R. Control 006
Chlorophycota:						
Actinastrum sp.	-	-	-	-	2	-
Ankistrodesmus falcatus	-	3	-	-	4	4
Chlamydomonas sp.	13	6	18	35	19	23
Chlorella sp.	4	15	10	5	21	9
Chlorococcum sp.	1	4	12	2	4	6
Chlorogonium sp.	-	1	-	2	1	3
Chlorophyceae	4	1	6	-	5	4
Coelastrum microporum	-	-	-	-	2	-
Crucigenia tetrapedia	-	-	-	-	1	1
Oocystis sp.	-	-	-	-	-	6
Pediastrum tetras	-	-	-	-	-	1
Planktosphaeria sp.	-	-	2	-	-	-
Scenedesmus bicaudatus	-	1	-	-	-	-
Scenedesmus bijuga	-	-	-	-	2	-
Scenedesmus quadricauda	-	2	-	-	-	-
Scenedesmus sp.	1	-	-	1	1	1
Schroederia setigera	-	3	-	-	-	-
Selenastrum sp.	1	16	-	-	7	5
Staurastrum sp.	1	-	-	-	1	-
Tetraedron minimum	-	-	-	-	-	2
Chrysophyta:						
Chrysophyceae	53	14	-	-	-	-
Dinobryon sertularia	-	-	-	-	6	8
Dinobryon sp.	1	8	-	-	-	-
Synura sp.	-	1	-	11	1	5
Synura uvella	-	-	54	-	-	-
Cryptophycophyta:						
Chroomonas sp.	1	4	5	-	4	10
Cryptomonas sp.	33	5	24	17	12	10
Cyanophycota:						
Anabaena circinalis	5	-	5	4	4	6
Anabaena sp.	-	-	-	-	11	5
Chroococcaceae	1	-	-	-	-	-
Cyanobium parvum	5	10	2	6	15	13
Cyanobium plancticum	1	13	11	-	15	9
Lyngbya sp.	5	1	4	1	-	-
Microcystis sp.	-	-	-	-	3	2
Oscillatoria sp.	25	7	13	7	8	2
Rhabdogloea sp.	2	3	-	-	26	8
Romeria sp.	-	-	-	-	1	-
Schizothrix sp.	-	-	1	-	-	-
Euglenophycota:						
Euglena sp.	3	-	2	5	1	-
Lepocinclis sp.	2	-	-	1	1	1
Trachelomonas sp.	4	2	-	-	-	-
Prasinophyta:						
Spermatozoopsis sp.	-	-	-	-	-	2
Pyrrophycophyta:						
Glenodinium sp.	-	-	1	-	1	-

Appendix 9a.

Benthic macroinvertebrates collected from Hester-Dendy artificial substrates incubated upstream and downstream of the IMC – Kingsford/Haynesworth/Big Four Mine Complex facility for 28 days (2/3/03). Taxa collected and density (average individuals/m^2) rounded to the nearest individual (n = 3 samples). See SOP LT 7100 sect. 4.2.1 for method on collapsing taxa.

	Alafia R. Control 006	Alafia R. Test 006
Annelida:		
Hirudinea		
Helobdella stagnalis	-	3
Oligochaeta		
Nais communis complex	-	16
Pristinella sima	-	3
Arthropoda:		
Arachnida		
Atractides sp.	3	3
Hygrobates sp.	5	13
Crustacea		
Hyalella azteca	-	77
Insecta		
Coleoptera		
Dineutus sp.	-	13
Dubiraphia vittata	3	-
Microcylloepus pusillus	3	-
Stenelmis sp.	26	3
Diptera		
Cladotanytarsus sp.	22	-
Corynoneura lobata	5	32
Cricotopus bicinctus	5	11
Glyptotendipes sp.	-	281
Nanocladius sp.	-	8
Parachironomus sp.	-	3
Pentaneura inconspicua	110	162
Polypedilum flavum	1,090	366
Polypedilum scalaenum grp.	8	-
Rheotanytarsus exiguus	138	-
Rheotanytarsus exiguus grp.	26	19
Rheotanytarsus pellucidus	21	52
Tanytarsus sp. T Epler	-	3
Thienemanniella similis	3	-
Thienemanniella xena	82	3
Ephemeroptera		
Acerpenna pygmaea	14	17
Baetis intercalaris	3	-
Pseudocloeon sp.	43	54
Stenacron sp.	16	11
Trichoptera		
Cheumatopsyche sp.	2,809	3,598
Hydroptila sp.	43	138
Neotrichia sp.	3	13
Odonata		
Enallagma sp.	-	3

(continued on next page)

Appendix 9a. continued

	Alafia R. Control 006	Alafia R. Test 006
Cnidaria:		
Hydrozoa		
Hydra sp.	-	3
Mollusca:		
Bivalvia		
Corbicula fluminea	5	-
Undetermined Bivalvia	-	3
Gastropoda		
Amnicola sp.	5	3
Physella sp.	-	3
Pyrgophorus platyrachis	5	-

Appendix 9b.

Benthic macroinvertebrates collected from Hester-Dendy artificial substrates incubated upstream and downstream of the IMC – Kingsford/Haynesworth/Big Four Mine Complex facility for 28 days (2/3/03). Taxa collected and total number of individuals counted (n = 3 samples).

	Alafia R. Control 006	Alafia R. Test 006
Annelida:		
Hirudinea		
Helobdella stagnalis	-	1
Oligochaeta		
Nais communis complex	-	6
Pristinella sima	-	1
Arthropoda:		
Arachnida		
Atractides sp.	1	1
Hygrobates sp.	2	5
Crustacea		
Hyalella azteca	-	29
Insecta		
Coleoptera		
Dineutus sp.	-	5
Dubiraphia vittata	1	-
Microcylloepus pusillus	1	-
Stenelmis sp.	10	1
Diptera		
Chironomidae	38	50
Cladotanytarsus sp.	2	-
Corynoneura lobata	2	12
Cricotopus bicinctus	1	4
Cricotopus sp.	1	-
Glyptotendipes sp.	-	106
Nanocladius sp.	-	3
Parachironomus sp.	-	1
Pentaneura inconspicua	10	11
Polypedilum flavum	412	138
Polypedilum scalaenum grp.	3	-
Rheotanytarsus exiguus	52	-
Rheotanytarsus exiguus grp.	10	7
Rheotanytarsus pellucidus	8	19
Rheotanytarsus sp.	-	1
Tanytarsus sp. T Epler	-	1
Thienemanniella similis	1	-
Thienemanniella xena	31	1
Undetermined Diptera	-	1
Ephemeroptera		
Acerpenna pygmaea	5	6
Baetidae	2	2
Baetis intercalaris	1	-
Heptageniidae	1	1
Pseudocloeon sp.	15	19
Stenacron sp.	5	3
Trichoptera		
Cheumatopsyche sp.	925	1297
Hydropsychidae	129	60
Hydroptila sp.	16	52
Neotrichia sp.	1	5
Undetermined Trichoptera	8	3
Odonata		
Enallagma sp.	-	1

(continued on next page)

Appendix 9b. continued

	Alafia R. Control 006	Alafia R. Test 006
Cnidaria:		
Hydrozoa		
Hydra sp.	-	1
Mollusca:		
Bivalvia		
Corbicula fluminea	2	-
Undetermined Bivalvia	-	1
Gastropoda		
Amnicola sp.	2	1
Physella sp.	-	1
Pyrgophorus platyrachis	2	-

Appendix 10a.

Qualitative benthic macroinvertebrate collections (n = 20 discrete dipnet sweeps) upstream and downstream of IMC – Kingsford/Haynesworth/Big Four Mine Complex facility (2/3/03 & 2/4/03). Taxa list and number of individuals counted (collapsed). See SOP LT 7100 sect. 4.2.1 for method on collapsing taxa.

	Mizelle Cr. Test 002a	Mizelle Cr. Test 002b	Alafia R. Test 006	Alafia R. Control 006
Annelida:				
Hirudinea				
Gloiobdella elongata	-	-	5	-
Oligochaeta				
Limnodrilus sp.	-	-	1	1
Nais communis complex	1	-	8	-
Arthropoda:				
Arachnida				
Acariformes sp.	-	1	-	-
Crustacea				
Hyalella azteca	4	1	6	2
Insecta				
Coleoptera				
Dubiraphia vittata	-	1	-	8
Microcylloepus pusillus	13	54	-	1
Stenelmis sp.	-	1	-	-
Diptera				
Ablabesmyia rhamphe grp.	-	-	-	2
Cladotanytarsus sp.	-	-	3	3
Corynoneura sp.	1	-	1	-
Corynoneura lobata	-	-	-	1
Cricotopus bicinctus	-	-	-	3
Cryptochironomus sp.	-	-	1	-
Glyptotendipes sp.	-	-	8	-
Hemerodromia sp.	-	3	-	-
Labrundinia pilosella	4	-	-	-
Mesosmittia sp.	1	-	-	-
Paratanytarsus sp.	1	3	-	-
Pentaneura inconspicua	6	-	-	2
Polypedilum flavum	16	7	18	14
Polypedilum halterale grp.	-	-	-	1
Polypedilum illinoense grp.	5	-	-	1
Rheocricotopus robacki	5	1	-	-
Rheotanytarsus exiguus grp.	16	7	-	5
Rheotanytarsus pellucidus	9	1	-	4
Tanytarsus sp. A Epler	4	-	-	-
Tanytarsus sp. T Epler	-	-	-	1
Thienemanniella xena	8	-	-	-
Ephemeroptera				
Procloeon sp.	-	-	-	1
Pseudocloeon sp.	3	4	2	9
Stenonema exiguum	-	5	-	-
Heteroptera				
Rhagovelia sp.	-	1	-	-
Trichoptera				
Cheumatopsyche sp.	1	7	56	31
Hydroptila sp.	-	-	-	9
Neotrichia sp.	-	-	-	4
Odonata				
Argia sp.	-	1	-	-

(continued on next page)

Appendix 10a. continued

	Mizelle Cr. Test 002a	Mizelle Cr. Test 002b	Alafia R. Test 006	Alafia R. Control 006
Cnidaria:				
Hydrozoa				
Clavidae	-	-	1	-
Hydra sp.	-	-	4	-
Mollusca:				
Bivalvia				
Corbicula fluminea	-	-	3	-
Undetermined Bivalvia	1	1	-	1
Gastropoda				
Amnicola sp.	-	-	-	5
Pyrgophorus platyrachis	-	-	2	1
Platyhelminthes:				
Undetermined Platyhelminthes	-	-	2	-

Appendix 10b.

Qualitative benthic macroinvertebrate collections (n = 20 discrete dipnet sweeps) upstream and downstream of IMC – Kingsford/Haynesworth/Big Four Mine Complex facility (2/3/03 & 2/4/03). Taxa list and number of individuals counted.

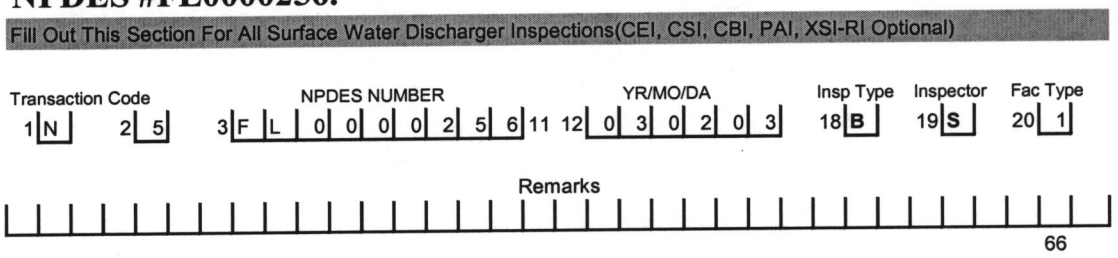
	Mizelle Cr. Test 002a	Mizelle Cr. Test 002b	Alafia R. Test 006	Alafia R. Control 006
Annelida:				
Hirudinea				
Gloiobdella elongata	-	-	1	-
Glossiphoniidae	-	-	4	-
Oligochaeta				
Limnodrilus sp.	-	-	1	1
Nais communis complex	1	-	8	-
Arthropoda:				
Arachnida				
Acariformes sp.	-	1	-	-
Crustacea				
Hyalella azteca	3	1	6	2
Undetermined Amphipoda	1	-	-	-
Insecta				
Coleoptera				
Dubiraphia vittata	-	1	-	8
Elmidae	1	-	-	-
Microcylloepus pusillus	12	54	-	1
Stenelmis sp.	-	1	-	-
Diptera				
Ablabesmyia rhamphe grp.	-	-	-	1
Chironomidae	5	5	2	4
Cladotanytarsus sp.	-	-	1	1
Corynoneura sp.	1	-	1	-
Corynoneura lobata	-	-	-	1
Cricotopus bicinctus	-	-	-	3
Cryptochironomus sp.	-	-	1	-
Glyptotendipes sp.	-	-	8	-
Hemerodromia sp.	-	3	-	-
Labrundinia pilosella	2	-	-	-
Mesosmittia sp.	1	-	-	-
Paratanytarsus sp.	1	2	-	-
Pentaneura inconspicua	3	-	-	1
Polypedilum flavum	16	5	18	14
Polypedilum halterale grp.	-	-	-	1
Polypedilum illinoense grp.	5	-	-	1
Rheocricotopus robacki	5	1	-	-
Rheotanytarsus exiguus grp.	16	5	-	5
Rheotanytarsus pellucidus	9	1	-	4
Tanytarsus sp. A Epler	4	-	-	-
Tanytarsus sp. T Epler	-	-	-	1
Thienemanniella xena	8	-	-	-
Ephemeroptera				
Baetidae	1	1	1	-
Procloeon sp.	-	-	-	1
Pseudocloeon sp.	2	3	1	9
Stenonema exiguum	-	5	-	-
Heteroptera				
Rhagovelia sp.	-	1	-	-

(continued on next page)

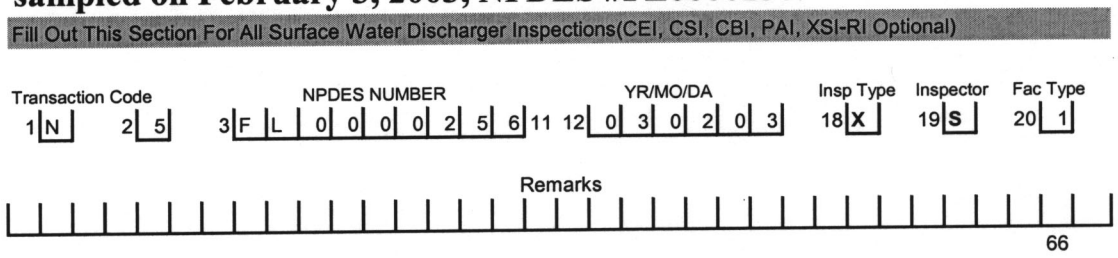
Appendix 10b. continued

	Mizelle Cr. Test 002a	Mizelle Cr. Test 002b	Alafia R. Test 006	Alafia R. Control 006
Trichoptera				
Cheumatopsyche sp.	1	6	56	31
Hydroptila sp.	-	-	-	9
Neotrichia sp.	-	-	-	4
Undetemrined Trichoptera	-	1	-	-
Odonata				
Argia sp.	-	1	-	-
Cnidaria:				
Hydrozoa				
Clavidae	-	-	1	-
Hydra sp.	-	-	4	-
Mollusca:				
Bivalvia				
Corbicula fluminea	-	-	1	-
Undetermined Bivalvia	1	1	2	1
Gastropoda				
Amnicola sp.	-	-	-	5
Pyrgophorus platyrachis	-	-	2	1
Platyhelminthes:				
Undetermined Platyhelminthes	-	-	2	-

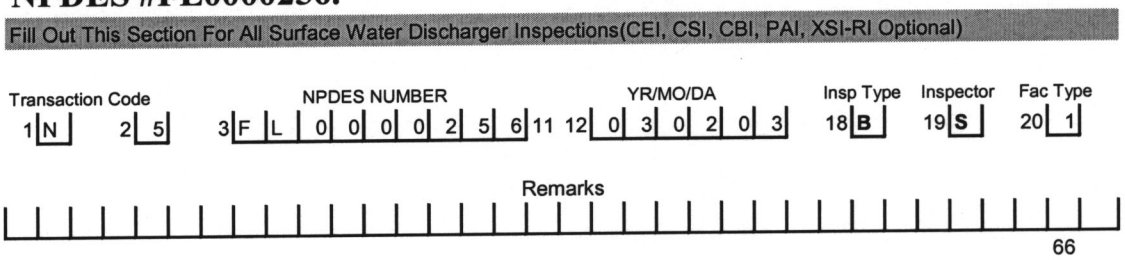
The Bioassay of IMC Phosphate- Kingsford/Haynesworth/Big Four Mine Complex, Outfall 002 effluent sampled on February 3, 2003, NPDES #FL0000256.



The Priority Pollutants Analysis for Bioassay of IMC Phosphate-Kingsford/Haynesworth/Big Four Mine Complex, Outfall 002 effluent sampled on February 3, 2003, NPDES #FL0000256.



The Bioassay of IMC Phosphate- Kingsford/Haynesworth/Big Four Mine Complex, Outfall 005 effluent sampled on February 3, 2003, NPDES #FL0000256.



The Priority Pollutants Analysis for Bioassay of IMC Phosphate-Kingsford/Haynesworth/Big Four Mine Complex, Outfall 005 effluent sampled on February 3, 2003, NPDES #FL0000256.