Biological Assessment of

Mosaic Fertilizer LLC New Wales Concentrates Plant

Polk County

NPDES # FL00036421

Sampled February 27 and 28, and March 7, 2018

October 2019

Biology Program

DEP Laboratory

Division of Environmental Assessment and Restoration

DEP Laboratory Quality Manual

NELAC Certification No. E31780

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Summary of Results

The scope of this report includes only the instream sampling that was scheduled for the September 2017 facility sampling event but delayed due to flooded river conditions (see Methods for details). The water chemistry results presented in this report are similar among the Control Site and near-field Test Site 1; the facility was not discharging on the day of collection. The far-field Test Site 2 water chemistry was similar to the Control Site and Test Site 1 samples, with only a few slight differences. The algal growth potential (AGP) data indicate that all three site samples were nitrogen limited. Despite Test Site 1 having dense canopy cover, algae were present for most of the 100m stretch sampled and the samplers noted dense algal mats immediately downstream of the outfall. Both downstream test sites had very low habitat diversity and availability compared to the upstream Control Site. The invertebrate communities at both test sites showed a decline in diversity as measured by the Shannon-Weaver Index compared to the Control Site community, and did not meet the Class III Freshwater Quality Criterion 62-302.530(10), F.A.C. The near-field Test Site 1 had both a lower Shannon-Weaver diversity score for the Hester-Dendy samplers and a lower Stream Condition Index (SCI) score compared to the Control Site. For this event, the SCI scores for both the Control Site and Test Site 1 were lower than the 35 single sample threshold for faunal health associated with Chapter 62-302.531, F.A.C. The far-field Test Site 2 had a higher and passing SCI score and the individual SCI metrics were indicative of less human disturbance compared to the scores and metrics of the other 2 sites. The lower specific conductance and greater water velocity measured at Test Site 2 compared to the other two sites likely provide less stressful conditions for the resident macroinvertebrate community, despite the low habitat availability in this portion of the river. The results of both the colonizing (measured using Hester Dendy samplers) and resident (measured using dipnet composite samples) macroinvertebrate samples suggests that the macroinvertebrate community in the South Prong Alafia River may be affected by the synergistic effects of habitat availability and diversity, water velocity, specific conductance, and nutrients expressed in the form of suspended organic material in the water column.

Facility Overview

The Mosaic Fertilizer New Wales Concentrates Facility is a phosphate fertilizer manufacturing facility. A Facility Summary, including a description of the facility, summary of permit limits, and any relevant Administrative Order (AO), Consent Order (CO), and Discharge Monitoring Report (DMR) information is provided in Appendix A. This facility is currently under a consent order executed on October 24, 2016 to repair a sinkhole formation and monitor groundwater onsite and offsite to ensure the contaminants are not affecting drinking water. The effluent is intermittently discharged into South Prong, a tributary of the Alafia River, a Class III Fresh Water.

The South Prong Alafia River falls within the West Central Nutrient Watershed Region for Numeric Nutrient Criteria (NNC). For this region, the NNC thresholds, expressed as annual geometric means, are 0.49 mg/L total phosphorus and 1.65 mg/L total nitrogen. This FYI event only provides single sample results. It should be noted that waterbody impairment assessments are based on longer-term data, and individual exceedances of a criterion do not indicate use impairment.http://ca.dep.state.fl.us/mapdirect/?focus=nutrientcriteria

Methods

Effluent samples were collected in September 2017 from monitoring site location D-006 (see report Effluent Quality Assessment of Mosaic Fertilizer, L.L.C. New Wales Concentrates Plant, 2/1/2018, ftp://ftp.dep.state.fl.us/pub/labs/lds/reports/15132.pdf.). The instream site sampling was also scheduled to be collected during this time however, flood conditions due to Hurricane Irma forced samplers to wait until those conditions subsided. This report contains the instream results from samples collected on February 27, February 28, and March 7, 2018.

Chemical and biological comparisons were made between a Control Site and two test sites. The Control Site was located in the South Prong Alafia River beginning 25 m upstream of the point of discharge (D-006) and ending 125 m upstream of the point of discharge. The current test site (hereafter referred to as Test Site 1) in the South Prong Alafia River begins at 25 m downstream of the point of discharge and ends 125 m downstream of the point of discharge. The historical test site (hereafter referred to as Test Site 2) was located approximately 3 miles downstream in the South Prong Alafia River at Bethlehem Road (see Map of Sampling Locations). Stream Condition Index (SCI) samples were collected at all three sites along with floating Hester-Dendys multiplate samplers.

While Hester-Dendy samplers were being deployed on 1/31/18, a large algal mat was observed at the outfall. Two algal samples were collected on 1/31/18, one at the effluent discharge point and one immediately downstream of the effluent discharge point. Instream field parameter measurements, water chemistry sampling, and Hester Dendy sampler retrieval was conducted at all sites on 2/28/18. The facility was discharging during the 28-day incubation period of the Hester-Dendy

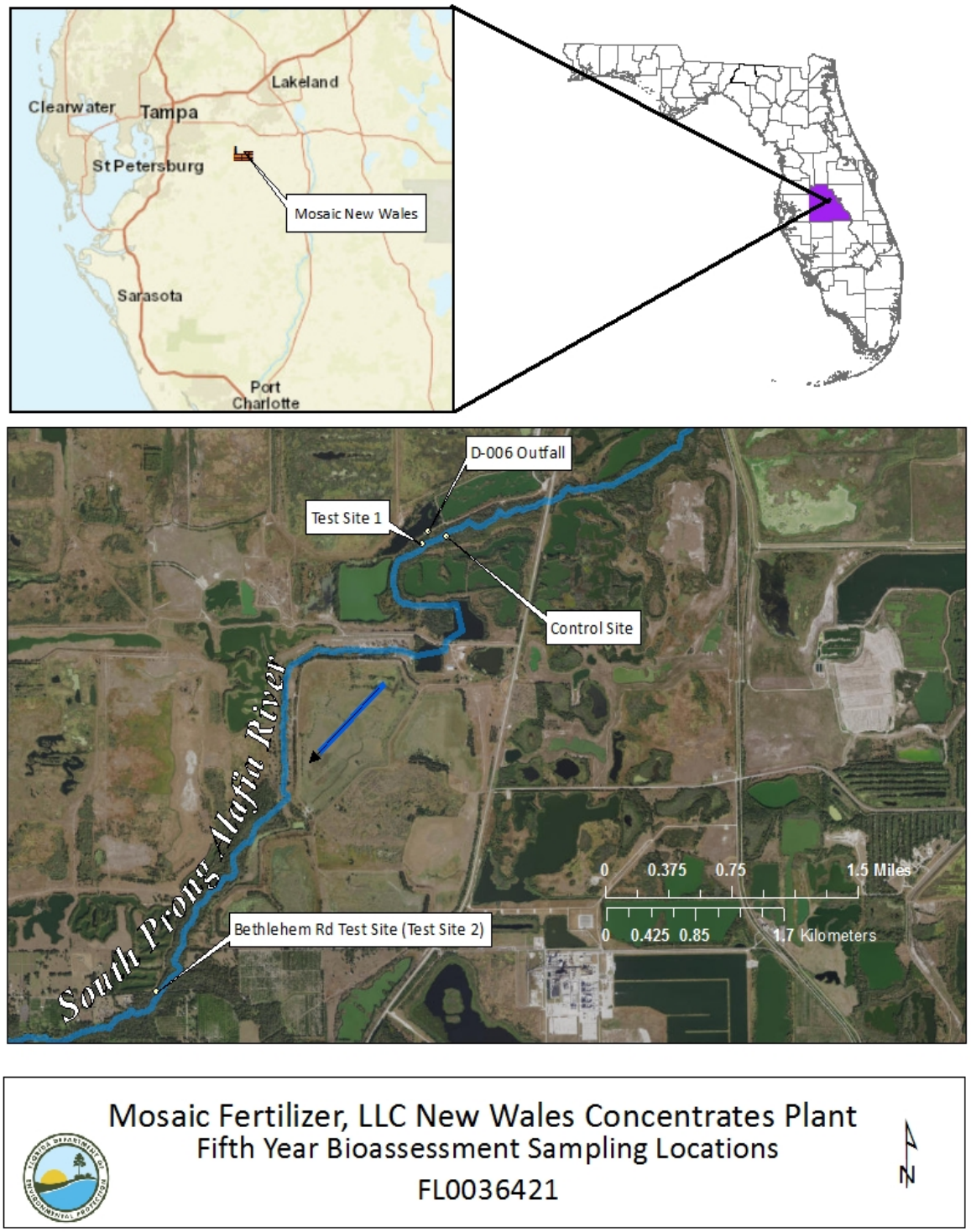
samplers, but not the day the Hester Dendy samplers were retrieved and the water chemistry samples were collected. The near field Test Site 1 dipnet sample was collected on 2/27/18, the Control Site dipnet sample was collected on 2/28/2018, and the far field Test Site 2 dipnet sample was collected on 3/7/18. This was due to time constraints to ensure samples were processed within their holding times.

All field and laboratory methods followed DEP Standard Operating Procedures (see https://floridadep.gov/dear/quality-assurance/content/dep-sops and https://floridadep.gov/dear/florida-dep-laboratory/content/dep-laboratory-quality-assurance-manual-and-sops for details) and met DEP quality assurance/quality control standards (see https://floridadep.gov/dear/quality-assurance). Explanations of specific methods and measurements can be found in Appendix B.

The following were involved in this investigation: Catie Orr (DEAR) and Edgar Guerron Orejuela (DEP Phosphate Management Team, Tampa), and DEP Laboratory in Tallahassee. The report was reviewed by District representatives and the Point Source Studies Review Committee (Mike Tanski, Nancy Ross, and Adrienne Pennington).

All references to 62-302.530, F.A.C. are to the surface water quality criteria table with an effective date of 02/17/2016 and a notice identification number of 17115667.

Bioassessment Sampling Locations - Map



Mosaic Fertilizer, LLC New Wales Concentrates Plant
Fifth Year Bioassessment Sampling Locations
FL0036421

Results

Physical and Chemical Parameters / Site Characterization (See Table 1 and Appendices B, C, D, and E)

- All three sites scored in the suboptimal category for the Habitat Assessment (Appendix B). Test Site 1 scored lower than Test Site 2 (96 and 105, respectively). The highest score, 119, was at the Control Site. Both test sites had very little substrate diversity and availability compared to the Control Site. The Control Site had less habitat smothering. Water velocity at Test Site 2 was greater than at both the Control Site and Test Site 1.

Analytical Water Chemistry (See Table 2 and Appendix E)

- Nutrient values were similar across both Test Site samples and the Control Site sample. Total ammonia and nitrate-nitrite levels in the Test Site 2 sample were almost double the values found in the Test Site 1 and Control Site samples. The two test sites were comparable in all other analytical chemistry data even though Test Site 2 is approximately 3 miles downstream from Test Site 1.
- Chlorophyll *a* (corrected) was slightly higher in the Test Site 2 sample than the other two site samples.

Microbiology (See Table 2 and Appendix B)

- Class III Freshwater criteria are for *Escherichia coli* (62-302.530(6)(a), F.A.C.) however, fecal coliforms were scheduled for analysis.
- Fecal coliforms were detected in the Control Site sample and in both Test Site samples.

Metals (See Table 3 and Appendix E)

- All metals complied with Class III Freshwater Quality Criteria (62-302.530, F.A.C.).
- Aluminum, nickel, and iron values were higher in the Test Site 2 sample than in the Test Site 1 and the Control Site samples.

Algal Growth Potential (See Table 4 and Appendix B)

- The AGP of the Test Site 1 and Control Site samples, using the freshwater species, *Pseudokirchneriella subcapitata*, were similar. The AGP value for the Test Site 2 sample measured twice as high as the other two sites. The measured AGP values for all three sites were very close to the predicted soluble inorganic nitrogen AGP values.
- The analytical chemistry suggests that all three site samples were nitrogen limited. To determine actual nutrient limitation, a limiting-nutrient algal growth potential test should be performed (Miller et al. 1978).

Flora (See Appendix B and D)

- Two temporally independent Linear Vegetation Survey (LVS) samplings showing a Coefficient of Conservatism score ≥ 2.5 and the frequency of occurrence of Florida Exotic Plant Pest Council (FLEPPC) exotic taxa ≤ 25% are needed to achieve NNC floral metrics. Sites with no observed macrophytes are considered to achieve the LVS component of the NNC. Two temporally independent Rapid Periphyton survey (RPS) samplings with ≤ 25% rank 4-6 (algae > 6mm thick) coverage are needed to achieve NNC floral metrics. This FYI event only provides single sample results. It should be noted that waterbody impairment assessments are based on longer-term data, and individual exceedances of a criterion do not indicate use impairment.
- For the LVS, the Control Site had more macrophytes and more diversity than either of the test sites. It also had macrophytes along the entire 100m sampled. Of the two test sites, Test Site 2 had more taxa than Test Site 1, and the plants were more distributed along the 100m stretch than at Test Site 1. Both test sites had less than 2 m^2 of plants and therefore, LVS metrics are not calculated. At the Control Site, the Coefficient of Conservatism was 2.97 and the FLEPPC exotic taxa was 11.76%.
- The RPS was performed at all three sites. The canopy cover was dense at all three sites for most of the length of the segments. There were no algae present along the 100m stretch for either the Control Site or Test Site 2. Despite Test Site 1 having dense canopy cover, algae were present for most of the 100m stretch. At Test Site 1, 28.3% of sampled points were rank 4-6. The samplers noted dense algal mats immediately downstream of the outfall which were sampled for taxonomic identification. The dominant taxon at both locations was *Rhizoclonium hieroglyphicum*, a green alga.

Macroinvertebrates (See Tables 5 and 6 and Appendices B and D)

- Quantitative macroinvertebrate data were collected from floating Hester-Dendy samplers, incubated for 28 days, at the Control Site and both test sites. The Shannon-Weaver diversity score was highest for the Control Site (3.5). The Shannon-Weaver diversity scores for Test Site 1 and Test Site 2 (2.2 and 1.9, respectively) were lower than the Control Site's score by more than 25%, which does not meet Class III Freshwater Quality Criterion 62-302.530(10), F.A.C. The community composition was dominated by dipterans at all three sites (between 62.5% and 70%). However, for the next highest percentage of community composition, amphipods accounted for 20% at the Control Site compared to the 26 to 32% trichopterans at the two test sites. The dominant dipteran taxa can be found in both pristine and nutrient enriched waters. The dominant taxon at the Control Site was the amphipod, *Hyalella azteca.* This species is known to inhabit aquatic plants which were abundant at the Control Site. The total number of individuals and densities of macroinvertebrates on the Hester Dendy samplers was significantly greater at the test sites than at the Control Site. The presence of a great number of suspension feeding trichopterans, *Cheumatopsyche* sp. and *Hydropsyche* sp., at the two test sites indicates that a greater amount of organic particulate material may be routinely available in the water column in this portion of the river to support these individuals, even if the water chemistry nutrient values were similar on the day of sampling for this event.
- Qualitative macroinvertebrate data were collected from dipnet samples at each of the three instream sites. The Stream Condition Index (SCI) score was highest at Test Site 2 (59). Both the Control Site (30) and Test Site 1 (22) scores were lower than the 35 single sample threshold for faunal health associated with Chapter 62-302.531, F.A.C. (see Appendix B, Stream Condition Index, SCI). The Control Site and Test Site 1 were collected on consecutive days and Test Site 2 was collected approximately a week later. In the dipnet samples, all three sites were dominated by the amphipod *Hyalella azteca*. The Test Site 2 sample was the only dipnet sample of the three in which Ephemeroptera taxa and sensitive taxa were present. The Test Site 2 sample had the greatest number of Trichoptera taxa and clinger taxa. It also had the highest percentage of tanytarsini and suspension feeders and filterers, along with the lowest percentage of tolerant individuals and dominant taxa. These SCI metrics for Test Site 2 were indicative of less human disturbance compared to the SCI metrics of the other 2 sites (see Appendix B for an explanation of SCI Categories).
- The results of both the colonizing and resident macroinvertebrate samples suggests that the macroinvertebrate community in the South Prong Alafia River may be affected by the synergistic effects of habitat availability and diversity, water velocity, specific conductance, and the availability of suspended organic material in the water column. Test Site 2 had the highest SCI score of all three sites sampled and the SCI metrics for Test Site 2 were indicative of less human disturbance. Test Site 2 had the greatest number of suspension feeders and the only site at which Ephemeroptera were present in HesterDendy sampler and dipnet samples. Pollman (2013) found that SCI scores were strongly driven by water velocity, substrate diversity, riparian buffer width, and artificial channelization scores. On the day of sampling, Test Site 2 had a greater measured water velocity. In a scientific evaluation of the specific conductance water quality criterion 62-302.530(22) F.A.C., DEP (2005) found that 1) the number and proportion of sensitive taxa in SCI samples has a negative relationship with specific conductance and 2) decreases in Florida sensitive taxa per sample with increases in specific conductance were greatest below 100 µmhos/cm, but declines continued and were significant for the entire range of least disturbed sites (specific conductance range ~20-563 µmhos/cm). In 2009, DEP hired Dr. Curt Pollman to conduct a stressor identification (SI) analysis of all available SCI data (SCI_2004 and SCI_2007). Pollman (2009) found that the SCI is likely to fail if specific conductance was greater than approximately 380 µmhos/cm. The specific conductance measured on the day of sampling at Test Site 2 was 759 µmhos/cm, compared to the specific conductance at the other two sites, which was measured greater than 1100 µmhos/cm. At all 3 sites, specific conductance was greater than both the range identified by DEP for least disturbed sites and Pollman's value for negative effects on the SCI score. Organisms in this area may be somewhat adapted to the greater specific conductance however, the SCI scores at the Control Site (30) and Test Site 1 (22), the sites with the highest specific conductance, were lower than the 35 single sample threshold for faunal health associated with Chapter 62-302.531, F.A.C. (see Appendix B, Stream Condition Index, SCI).) The lower specific conductance and greater water velocity measured at Test Site 2 compared to the other two sites, likely provide less stressful conditions for the resident community, despite the lack of habitat availability in this portion of the river.
- For more information or to obtain a copy of the taxa lists or the 2009 and 2013 Pollman reports, please contact the Biology Laboratory at 850-245-8177.

Literature Cited

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Table 1. Class III Freshwater Criteria parameters.

Parameter	Units	Class III Criteria	Test Site 1 2/27/2018	Test Site 1 2/28/2018	Test Site 2 2/28/2018	Control Site 2/28/2018
Habitat Assessment	-	-	96	-	105	119
Sample Depth	m	-	0.2	0.2	0.2	0.2
Temperature	C	-	24.3	22.9	21.5	23.1
pH	SU	6.0 - 8.5	7.6	7.3	8.2	7.6
Specific Conductance	µmhos/cm	≤ 1,275	1,142	1,143	759	1,149
Salinity	-	-	0.6 c	0.6 c	0.4 c	0.6 c
Dissolved Oxygen	% Sat	> 38	75	56	73	64
Dissolved Oxygen	mg/L	-	6.1	4.8	5.8	5.4

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.
c - Value is calculated

Table 2. Class III Freshwater Criteria and analytical water chemistry data

Parameter	Units	Class III Criteria	Test Site 1	Test Site 2	Control Site
Ortho-phosphate	mg P/L	-	0.96	0.93	0.94
Total Phosphorus	mg P/L	< 0.49[2]	1.1	1.1	1.1
Total Ammonia	mg N/L	2.4 sc (Test 1) 1.3 sc (Test 2) 1.1 sc (Control)	0.088	0.14	0.055
Un-ionized Ammonia (calculated salinity)	mg N/L	≤ 0.02 s	< 0.02 c	< 0.02 c	< 0.02 c
Nitrate and Nitrite	mg N/L	-	0.14	0.23	0.14
Total Kjeldahl Nitrogen	mg N/L	-	1.1	1.1	1.1
Organic Nitrogen	mg N/L	-	1 c	1 c	1 c
Total Nitrogen	mg N/L	< 1.69[2]	1.2 c	1.3 c	1.2 c
Total Organic Carbon	mg C/L	-	14	12	14
Chlorophyll *a* - Corrected	µg/L	-	5.3	7.1	4.9
Phaeophytin	µg/L	-	3.8	5.0	2.7
CBOD, 5 day, N - inhibited	mg/L	-	1.3 I	1.4 I	1.4 I
Total Suspended Solids	mg/L	-	3 I	3 AI	3 I
Total Dissolved Solids	mg/L	-	746	636 A	767
Turbidity	NTU	< 29 t	2.0	3.8	2.0
Color (true)	PCU	-	53 A	41	52
Alkalinity	CaCO3	≥ 20	173	167	173
Chloride	mg Cl/L	-	19	18	19
Fluoride	mg F/L	≤ 10.0	1.9	2.8	1.9
Sulfate	mg SO4/L	-	360	300	370
Alpha, Total	pCi/L	≤ 15	4.31	4.28	4.07 U
Alpha-Counting Error	pCi/L	-	2.91	2.67	2.65
Fecal Coliforms[1]	cfu/100 mL	-	60 B	96 B	50 B

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.
c - value is calculated
s - single sample
t - Shall not exceed 29 NTUs above background
A - Value reported is the mean of two or more determinations
B - Results based on colony counts outside the acceptance range
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
U - Material analyzed for but not detected; value reported is the method detection limit
1 - Class III Freshwater criteria are for *Escherichia coli*; however, fecal coliforms were scheduled for analysis.
2 - West Central Nutrient Watershed Region for Numeric Nutrient Criteria (NNC), 62-302.531(2)(c), F.A.C. Value expressed as an annual geometric mean.

Table 3. Class III Freshwater Criteria and analytical metals data

Parameter	Units	Test Site 1 Class III Criteria	Test Site 1	Test Site 2 Class III Criteria	Test Site 2	Control Site Class III Criteria	Control Site
Hardness	mg/L	-	318 c	-	305 c	-	318 c
Aluminum	µg/L	-	110 I	-	134	-	60 U
Arsenic	µg/L	≤ 50	2.03	≤ 50	1.93	≤ 50	2.19
Cadmium	µg/L	≤ 0.637 b	0.020 U	≤ 0.618 b	0.020 U	≤ 0.638 b	0.020 U
Calcium	mg/L	-	79.1	-	71.5	-	79.9
Chromium, Total [3]	µg/L	≤ 222 b	0.40 U	≤ 215 b	0.40 U	≤ 222 b	0.40 U
Copper	µg/L	≤ 25.1 b	0.21 I	≤ 24.2 b	0.20 U	≤ 25.1 b	0.20 U
Iron	µg/L	≤ 1,000	68 I	≤ 1,000	170	≤ 1,000	35 I
Lead	µg/L	≤ 13.9 b	0.094 I	≤ 13.2 b	0.11 I	≤ 13.9 b	0.094 I
Magnesium	mg/L	-	29.2	-	30.7	-	28.8
Nickel	µg/L	≤ 139 b	0.36 I	≤ 134 b	1.25	≤ 139 b	0.29 I
Selenium	µg/L	≤ 5.0	0.20 U	≤ 5.0	0.24 I	≤ 5.0	0.20 I
Silver	µg/L	≤ 0.07	0.010 U	≤ 0.07	0.010 U	≤ 0.07	0.010 U
Sodium	mg/L	-	131	-	81.4	-	136
Zinc	µg/L	≤ 319 b	5.0 U	≤ 308 b	7.4 I	≤ 319 b	5.0 U

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.

b - Value is calculated based on hardness, (62-302.530(3))

c - value is calculated

I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

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

3 - Class III Freshwater Quality Criterion (62-302.530(19)(a), F.A.C.) is for chromium-III

Table 4. Measured and predicted algal growth potential (AGP; mg dry weight/L) for total soluble inorganic nitrogen (TSIN), ortho-phosphate (OP), total nitrogen (TN) and total phosphorus (TP) limitation and ratios of nitrogen to phosphorus

Location	Test Species	AGP (measured)	Predicted AGP (TSIN) ± 20%	Predicted AGP (OP) ± 20%	Predicted AGP (TN) ± 20%	Predicted AGP (TP) ± 20%	Inorganic N:P ratio	Total N:P ratio
Control Site	*Pseudokirchneriella subcapitata*	9.07 A	7.4 ± 1.5	404.2 ± 80.8	47.1 ± 9.4	473 ± 94.6	0.2	1.1
Test Site 1	*Pseudokirchneriella subcapitata*	11.1	8.7 ± 1.7	412.8 ± 82.6	47.1 ± 9.4	473 ± 94.6	0.2	1.1
Test Site 2	*Pseudokirchneriella subcapitata*	22.5	14.1 ± 2.8	399.9 ± 80	50.5 ± 10.1	473 ± 94.6	0.4	1.2

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

Table 5. Macroinvertebrate Dipnet samples - qualitative.

Mosaic New Wales Fertilizer LLC	**Test Site 1**		**Test Site 2**		**Control Site**	
Stream Condition Index 2012	22		59		30	
Replicate	Rep 1	Rep 2	Rep 1	Rep 2	Rep 1	Rep 2
Stream Condition Index Metrics						
Number of Total Taxa	17	14	19	24	13	15
Number of Ephemeroptera Taxa	0	0	3	3	0	0
Number of Trichoptera Taxa	1	2	19	16	2	4
Number of Clinger Taxa	2	3	7	10	3	5
Number of Long-lived Taxa	1	2	2	2	1	1
Number of Sensitive Taxa	0	0	2	1	0	0
Percent of Dominant Taxon	72.5	63.8	26.3	31.3	58.5	49.7
Percent Suspension Feeders and Filterers	5.0	7.2	32.5	29.1	10.9	10.2
Percent of Tanytarsini Individuals	0.0	0.0	13.1	13.1	0.7	6.1
Percent of Very Tolerant Individuals	5.6	4.4	1.9	4.4	8.8	12.2
Total Number of Individuals	160	160	160	160	147	147
Community Composition: Percent of total						
Dominant Taxon Name	*Hyalella azteca* (Amphipoda)	*Hyalella azteca* (Amphipoda)	*Hyalella azteca* (Amphipoda)	*Hyalella azteca* (Amphipoda)	*Hyalella azteca* (Amphipoda)	*Hyalella azteca* (Amphipoda)
Amphipoda	72.5	63.8	26.3	31.3	58.5	31.7
Coleoptera	3.1	4.4	5.0	6.3	0.0	0.0
Decapoda	0.0	0.6	0.6	0.6	1.4	0.7
Diptera	15.0	23.1	45.0	38.8	12.2	16.3
Ephemeroptera	0.0	0.0	0.6	0.6	0.0	0.0
Gastropoda	0.6	0.0	0.0	1.9	8.8	13.6
Hirudinea	1.3	0.6	0.0	0.0	6.9	10.8
Odonata	0.6	0.6	1.9	2.5	0.7	0.7
Oligochaeta	0.0	0.0	0.6	0.6	0.0	0.0
Trichoptera	5.0	5.6	19.4	16.3	10.9	10.9
Other	1.8	1.2	0.6	1.2	0.6	0.1

	Test Site 1		Test Site 2		Control Site	
Functional Feeding Groups: Percent of total						
Browser-Grazers	0.0	0.3	0.3	0.3	0.7	0.3
Burrowing Deposit Feeders	0.0	0.0	0.6	0.6	0.0	0.0
Piercers	0.3	0.0	0.3	0.0	0.7	6.1
Predators	5.3	3.1	4.4	5.0	7.5	11.9
Scavengers	0.0	0.6	0.3	0.3	0.7	0.3
Scrapers	1.9	1.9	2.5	5.0	8.8	13.6
Shredders	41.9	41.3	26.6	25.9	35.0	28.9
Surface Deposit Feeders	45.0	45.6	32.5	33.8	35.0	28.6
Suspension Feeders	5.0	7.2	32.5	29.1	10.9	10.2
Unknown	0.6	0.0	0.0	0.0	0.7	0.0

A - Value reported is the mean of two determinations

Table 6. Macroinvertebrate Hester-Dendy samples - quantitative

Mosaic Fertilizer LLC New Wales	Test Site 1	Test Site 2	Control Site
Summary Statistics			
Shannon-Weaver Diversity	2.2	1.9	3.5
Number of Taxa	18	12	25
Number of EPT Taxa	3	4	3
Percent Dominant Taxon	47.8	56.9	20.6
Dominant Taxon Name	*Polypedilum flavum* (Diptera)	*Rheotanytarsus exiguus* grp. (Diptera)	*Hyalella azteca* (Amphipoda)
Total Number of Individuals (counted)	14,579	11,738	725
Total Number of Individuals (#/m^2)	28,926	23,290	1,440
Community Composition: Percent of total			
Amphipoda	3.6	0	20.6
Coleoptera	1.1	1.2	2.6
Diptera	62.5	69.8	69.7
Ephemeroptera	0	3.0	0
Gastropoda	0.6	0	0.4
Odonata	0	0	0.7
Oligochaeta	0	0	0.6
Plecoptera	0	0	0
Trichoptera	32.2	26.0	4.1
Other	1.1	0	1.7
Functional Feeding Groups: Percent of total			
Burrowing Deposit Feeders	0	0	0.6
Parasite	0	0	0.1
Piercers	0.4	0	1.4
Predators	1.8	0.8	11.5
Scavengers	0.6	0.3	1.3
Scrapers	0.3	1.8	0.4
Shredders	30.0	5.5	26.3
Surface Deposit Feeders	32.9	8.0	49.8
Suspension Feeders	34.1	79.7	8.6
Unknown	0	3.8	0

Appendix A

Facility Summary

State of Florida

Department of Environmental Protection

Facility Introduction & Summary

PART I: Information gathered prior to sampling event	
Prepared By: Edgar Guerron Orejuela	Contact Number: 813-470-5749
Facility Name (as it appears on permit): Mosaic Fertilizer, L.L.C. New Wales Concentrates Plant	Former Names: N/A
NPDES Permit Number: FL0036421	Permit Expiration Date: June 23, 2018
Physical Address: 3095 State Road 640 W. Mulberry, FL 33860 Polk County	
District: DWRM-Phosphate Management (Tampa)	County: Polk
Function of Facility: Mosaic Fertilizer, L.L.C.'s (Mosaic) New Wales Concentrates Plant manufactures ammoniated phosphate fertilizers (MAP and DAP) and animal feed ingredients. The New Wales Plant produces phosphoric acid and sulfuric acid as part of the manufacturing process, but consumes most of the acid internally during the manufacture of the fertilizer and animal feed ingredients products. Phosphogypsum is produced as a by-product of the phosphoric acid production and is disposed of by stacking the phosphogypsum in a lined 704-acre phosphogypsum stack storage area located immediate south of the main cooling pond.	
Facility Type: Phosphate fertilizer manufacturing plant	Permitted Capacity (MGD): N/A
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): D-006 from July 2016 to June 2017 (there was no discharge recorded during April 2017) → 10.42 MGD	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months): N/A	
Description of type of Discharge: ☐ Continuous ☒ Intermittent ☐ Seasonal ☐ Rainfall Dependent ☐ Other, please specify:	
Description of Sampling Location(s) - actual permit designation of permitted sampling point(s): EFF-006	

Description of Permitted Outfall(s):

D-006 discharges treated process wastewater, treated contaminated non-process wastewater, stormwater runoff, directly to the South Prong, a tributary of the Alafia River (Class III Fresh Waters). The D-006 outfall consists of three spillway structures, each with fourteen 27-inch bays with steel rectangular weir plates. The weir invert is 114.90 ft. MSL and the receiving water depth is about 105 feet MSL. The point of discharge is located at latitude 27° 45' 53.2806" N, longitude 82° 00' 11.5581" W. A component of the discharge also includes treated groundwater introduced at locations several miles upstream of Outfall D-006. The treated groundwater is from the site's recovery well system, being pumped to maintain a zone of capture in accordance with the requirements of Consent Order OGC Case No. 16-1356.

Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility):

The wastewater used in the chemical and fertilizer manufacturing process is cooled as it is circulated in the unlined Cooling Pond System with an average ponded surface area on the order of 280 acres. The Phase I and Phase II 60-acre lined perimeter water return ditch system is connected to the cooling pond system via the east and west flume structures, located south of the main cooling pond.

The unlined cooling pond system includes a 247-acre main cooling pond located south east of the chemical plant and a 33-acre cooling channel that encircles the base of the existing unlined North Phosphogypsum Stack located immediately to the east of the chemical plant.

Operation of this system is described as follows: hot process water from the plant operations is discharged into the west channel and flows south into the main cooling pond. Process water contained in the gypsum slurry is transported to the lined South Phosphogypsum Stack (Phases I and II), located south of the cooling pond and returned into the cooling pond via the east and west flumes, located on the south wall of the cooling pond. The combined flow is then directed into the east-cooling channel and is returned to the plant to be reused in the process.

In addition to the 280-acre cooling area, the cooling pond system also includes a 94-acre below-grade unlined Auxiliary Holding Pond (AHP) located at the west end of the main cooling pond. The AHP provides additional storage and is capable of containing a rainfall event exceeding the 100-year, 24-hour storm.

The process water cooling pond recirculation system also receives treated effluent from a 25,000 GPD domestic waste package treatment plant and wastewater generated from a locomotive wash and vehicle wash stations, and wastes from a railroad car wash station. The wash stations are used to clean vehicles prior to routine maintenance. The railroad car wash station is used to wash railcars prior to these cars being loaded with bulk fertilizer materials. All wastewater contained within the process water cooling pond recirculation system shall be considered Industrial Wastewater under this permit. The New Wales process water cooling pond system is designed for zero discharge and in the event of extreme rainfall events may discharge after treatment to the D-006 discharge system. Treatment of process water consists of liming, settling and pH adjustment.

Outfall D-006 receives flows from the New Wales facility by means of using two separate clay settling areas (CSA), A-11 and K-4, which are separated by several miles of ditch systems. The clay settling areas and flow path allow for additional settling of solids and nutrient uptake before reaching the outfall. Specific discharges from the New Wales facility flow into CSA A-11, where the water decants from a spillway located on the southwest embankment of A-11, the water then flows through a series of ditches over an approximate 15,000 feet length, prior to flowing into the northern area of CSA K-4. CSA K-4 eventually discharges through a spillway system located on the east side of K-4 that then flows through a series of ditches over an approximate length of 10,000 feet into a lake that discharges through Outfall D-006.

Outfall D-006 is authorized to use an auxiliary portable pH adjustment system as needed to control pH at the outfall. Operation and reporting requirements for this treatment system are referenced in Condition V.A.5. of this permit.

PART I: Continued

List current Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under
(Leave cell blank if not applicable; note: all condition references, such as I.A.5., are from current NPDES permit)

PARAMETERS (UNITS)	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS		
	Daily Minimum	Monthly Average	Daily Maximum	Monitoring Frequency	Sample Type	Sample Point
Flow (MGD)	N/A	Report	Report	Continuous	Recorder	EFF-006
pH (standard units)	6.0	Report	8.5	1/Week	Grab	EFF-006
	See I.A.2.					
Turbidity (NTUs)	N/A	Report	See I.A.15.	1/Week	Grab	EFF-006
Nitrogen, Total (as N) (mg/L)	N/A	Report	Report	1/Week	Grab	EFF-006
Nitrogen, Total (as N) (lbs/day)	N/A	Report	Report	1/Week	Calculated	EFF-006
		See I.A.5. & 6.				
Phosphate, Ortho (as P) (mg/L)	N/A	Report	Report	1/Week	Grab	EFF-006
Phosphorus, Total (as P) (mg/L)	N/A	3.0**	5.0**	1/Week	Grab	EFF-006
Phosphorus, Total (as P) (lbs/day)	N/A	Report	Report	1/Week	Calculated	EFF-006
		See I.A.5. & 7.				
Ammonia Nitrogen, Total (as N) (mg/L)	N/A	Report	Report	1/Week	Grab	EFF-006
		See I.A.2.				
Ammonia, Unionized (as NH_3) (mg/L)	N/A	Report	0.02 See I.A.2.	1/Week	Calculation	EFF-006
Chlorophyll a (µg/L)	N/A	N/A	Report	1/Month	Grab	EFF-006
Fluoride, Total (as F) (mg/L)	N/A	N/A	10.0	1/Month	Grab	EFF-006
Oxygen, Dissolved (DO) (mg/L)	5.0 See I.A.9.	N/A	N/A	1/Month	Grab	EFF-006
Solids, Total Suspended (TSS) (mg/L)	N/A	30	60	1/Month	Grab	EFF-006

PARAMETERS (UNITS)	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS		
	Daily Minimum	Monthly Average	Daily Maximum	Monitoring Frequency	Sample Type	Sample Point
Solids, Fixed (FS) (mg/L)	N/A	12*	25*	1/Month	Grab	EFF-006
Specific Conductance (µmhos/cm)	N/A	N/A	See I.A.3.	1/Month	Grab	EFF-006
Sulfate, Total (as SO_4) (mg/L)	N/A	N/A	Report	1/Month	Grab	EFF-006
Temperature (ºC)	N/A	Report	Report See I.A.2.	1/Month	Grab	EFF-006
Alpha Particle Activity, Gross (pCi/L)	N/A	N/A	15 See I.A.16.	1/Month	Grab	EFF-006
$Radium^{226}$ + $Radium^{228}$, Combined (pCi/L)	N/A	N/A	5 See I.A.16.	1/Month	Grab	EFF-006
Chronic Whole Effluent Toxicity, IC25 (Ceriodaphnia dubia)	100%	See Condition I.A.4.			24 hour composite	EFF-006
Chronic Whole Effluent Toxicity, IC25 (Pimephales promelas)	100%	See Condition I.A.4.			24 hour composite	EFF-006

* Fixed Solids shall be limited in accordance with the requirements of Rule 62-671.300(1), F.A.C. To correct for losses during the testing and analysis, the analytic results from the above specified tests for non-filterable, non-volatile residue (fixed solids) shall be multiplied by a factor of 1.1 to be reported as total non-volatile, non-filterable residue as defined in Rule 62-671.300(2), F.A.C.

** Total phosphorus shall be for monitoring and reporting only, except: if monitoring data shows total phosphorus levels exceed 3.0 mg/L monthly average 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 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. *[Rule 62-671.300(1), F.A.C.]*

PART I: Continued	
Receiving Waters: South Prong Alafia WBID 1698A	Classification (indicate whether fresh or marine): Class III

Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.):

Semi-annual chronic toxicity tests. The permitee shall conduct a daphnid, Ceriodaphnia dubia, Survival and Reproduction Test and a fathead minnow, Pimephales promelas, Larval Survival and growth Test, concurrently.

Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.):

Consent Order, OGC No. 16-1356 executed on Oct. 24, 2016. The Order requires actions to protect underground sources of drinking water following the unauthorized discharge of process water from fertilizer manufacturing facilities at the New Wales site via a sinkhole formation. The Order requires

Mosaic to complete remedial activities to seal the sinkhole opening, recover process water constituents, and to provide onsite and offsite monitoring, and related follow-up activities to address the unauthorized discharge of process water, thereby protecting underground sources of drinking water. This Order also requires that Mosaic conduct additional hydrogeological and geotechnical site investigations at its New Wales site and its other active phosphogypsum stack systems in Florida.

Facility Mixing Zone Details (if applicable):

N/A

List Permit Violations (DMR data) and plant upsets that occurred at the plant within the last year:

Date	Parameter and Units	Limit	Result
06/30/2017	IC25 STATRE 7DAY CHR CERIODAPHNIA	100	19.4
08/28/2017	Water loss incident caused by sinkhole	N/A	N/A

Describe previous FYI and WQBEL study:

During the previous FYI (sampled in April 2011), the whole effluent toxicity test was performed April 5 through April 7, 2011. Due to a failure of the sampling equipment, the second sample required for the renewal was not collected; therefore, chronic toxicity test was not performed. LC50 was greater than 100% effluent for both C. dubia and P. promelas, during the 48 Hr. Acute Definitive bioassays. Dissolved oxygen for the Control Site (2.1 mg/L) did not comply with the Class III Water Quality Criterion (62-302.530(30) F.A.C.). There was no analysis run for fixed suspended solids (FSS; mg/L), but due to the high level of total dissolved solids (787 mg/L) a follow-up analysis of FSS should be performed to ensure compliance with the permit limits. The AGP values for the effluent, Control Site, and Test Site were all similar and were four times greater than the "problem" threshold. Nutrient values were higher for the Control Site than the effluent and the Test Site, but the chlorophyll *a* value for the effluent was significantly higher than the Control and the Test Sites. The Test Site exhibits lower nutrient values and a higher chlorophyll *a* concentration in comparison to the Control Site. The dominant taxon in the effluent phytoplankton community, the bloom forming and potential toxin producing *Cylindrospermopsis raciborskii*, was absent at the Control Site and was co-dominant at the Test Site. This changing community composition exhibits the influence from the discharge and the contribution of a bloom species could increase the possibility of a bloom in the downstream waters. There were no detectable differences in the macroinvertebrate communities at either site. Overall, the effluent did not appear to be adversely affecting the Test Site.

Describe previous or current Enforcement Actions (including WLs):

N/A

Describe any violations or problems noted in previous inspection:

The facility has presented exceedances in its compliance well MWC-8 for the past three consecutive quarters. The parameters in exceedance are: Gross Alpha, Radium 226+ and Radium 228.

Discuss whether DMR trends within previous five years are improving or declining:

N/A

Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse):

N/A

Appendix B

Explanation of Measurements

Biological assessments are prepared by DEP 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. References to Rule 62-302.530, F.A.C., are to the currently applicable surface water quality criteria table with an effective date of 02/17/2016 and a notice identification number of 17115667. New limits for *Escherichia coli* (*E. coli*), enterococci, and total ammonia nitrogen were approved on 07/24/2017**.**

1) Quality Assurance and Quality Control

All field and laboratory methods followed DEP Standard Operating Procedures (see https://floridadep.gov/dear/quality-assurance/content/dep-sops and https://floridadep.gov/dear/florida-dep-laboratory/content/dep-laboratory-quality-assurance-manual-and-sops for details) and met DEP quality assurance/quality control standards (see https://floridadep.gov/dear/quality-assurance).

2) Chemical Analyses of the Effluent

The effluent was analyzed for nutrients, metals, organic constituents (base, neutral, and acid extractables) and pesticides following DEP SOPs. The results from these analyses were compared with Water Quality Criteria (62-302, F.A.C.) and facility permit limits.

3) Bacteriological Testing

High levels of fecal coliform bacteria may constitute an exceedance of 62-302.530(6) and/or facility permit limits. Fecal coliform and enterococci results often are based on colony counts outside the acceptable range (B-qualifier). The dilutions performed on the sample did not yield results within the method acceptable range of 20- 60 colony forming units per plate. The B-qualifier does not affect data quality.

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 algal growth potential (AGP) value is the peak growth of the alga within that 14-day period, recorded as mg dry weight/L. AGP results within the range 6.10 to 20.0 mg dry wt/L are suggested to be representative of high productivity for freshwaters (Miller et al. 1978). High AGP values may constitute exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a), F.A.C. and/or 62-302.530(47)(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 $\pm$ 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 constitute an exceedance of 62-302.530(61), F.A.C.

6) Algal Phytoplankton and Periphyton Assemblages

Qualitative periphyton are sampled by taking subsamples of algae from natural substrates throughout the sample reach. Phytoplankton were sampled from the water column using a 1 L grab sample. Periphyton were subsampled and identified to the lowest practical level, usually species. Wet taxa and diatoms are identified separately. In the wet taxa analysis, soft algae are identified to the lowest practical level, and diatoms are identified only to order level (diatom). In the diatom analysis, diatoms are identified to the lowest practical level.

Chlorophyll *a* Content: Chlorophyll *a* content is an estimate of algal biomass. High algal biomass implies nutrient stress (Stevenson and Bahls 1999) and may be constitute exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a) F.A.C. and/or 62-302.530(47)(b) F.A.C..

Algal Density: Algal density is estimated as number of natural units/ml for phytoplankton samples. Although algal density of a single site is highly variable and depends on several 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 exceedances of 62-302.530(46) F.A.C., 62-302.530(47)(a) F.A.C., 62-302.530(47)(b) F.A.C. and/or 62-302.530(61) F.A.C.

7) Benthic Macroinvertebrate Assemblages

Benthic macroinvertebrates were collected using two methods. Quantitative samples were collected from Hester-Dendy multi-plate samplers incubated for 28 days. 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.

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 exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a), F.A.C., 62-302.530(47)(b), F.A.C. and/or 62-302.530(61), 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 exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a), F.A.C. and/or 62-302.530(47)(b), 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 (Fore et. al. 2007, Karr and Chu 1998). Shifts in community composition related to a facility's effluent may constitute exceedances of 62-302.530(46) F.A.C., 62-302.530(47)(a), F.A.C., 62-302.530(47)(b), F.A.C. and/or 62-302.530(61), 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 and shredders (Fore et. al. 2007). Changes in the proportions of functional feeding groups related to a facility's effluent may constitute exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a), F.A.C., 62-302.530(47)(b), F.A.C. and/or 62-302.530(61), 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 constitute exceedances of 62-302.530(10), F.A.C.

The Stream Condition Index (SCI): The SCI is a biological assessment tool that measures the degree to which flowing fresh waters support a healthy, well-balanced biological community, as indicated by aquatic, benthic macroinvertebrates. Macroinvertebrate taxonomic and abundance data are used to calculate ten biological metric scores, each of which has been shown to respond predictably to human disturbance (Fore et al. 2007; DEP SOP SCI 1000; DEP-SAS-001/11, incorporated into the Quality Assurance Rule by reference 62-160.210(2)(a), F.A.C.). The points for each of the metric scores (0 to 10) are summed to yield a final SCI score (range 0-100). The ten metrics are percent contribution of Tanytarsini, number of sensitive taxa, percent contribution of very tolerant taxa, number of total taxa, number of Ephemeroptera taxa, number of Trichoptera taxa, percent contribution of the dominant taxon, the percent contribution of suspension and filter feeders, number of long-lived taxa, and number of clinger taxa. As human disturbance increases, it is expected that the number of total taxa, the

number of Ephemeroptera taxa, Trichoptera taxa, sensitive taxa, clinger taxa, long-lived taxa, and the percent contribution of Tanytarsini and suspension and filter feeders will decrease while percent contribution of dominant taxon and percent contribution of very tolerant taxa will increase.

The SCI can be used to determine faunal health associated with Chapter 62-302.531, F.A.C. An average SCI score of 40 or higher from at least two temporally independent SCIs, performed at representative locations and times indicates a balanced faunal community. Neither of the two most recent SCI scores should be less than 35. Failure of the SCI indicates that the stream does not meet the Clean Water Act goal of biological integrity, as measured by community structure and function. A failing SCI could be due to water quality problems or other physical disturbance factors such as habitat disruption or hydrologic alterations. While the stressor may not be known, a failed SCI does indicate that fauna is not well-balanced. A failing SCI score, if it is shown to be related to a facility's effluent, may constitute exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a), F.A.C., 62-302.530(47)(b), F.A.C., or of 62-302.530(61).

8) Rapid Periphyton Survey

Rapid Periphyton Survey (RPS) is a rapid method to quantify the extent and abundance of attached algae (periphyton) in a stream or river. A total of 99 points are assessed within a 100m area of sampling reach, 9 equidistant points along 11 cross-section transects spaced 10 m apart, If greater than 20% of sampled points have algal lengths greater than 6mm, a sample is collected and the autecological information associated with the dominant algae is evaluated (see DEP SOP FS 7230 Rapid Periphyton Survey). This method could be used to determine floral health associated with Chapter 62-302.531, F.A.C.

9) Linear Vegetation Survey

Linear Vegetation Survey (LVS) is a rapid screening tool for ecological condition, by determining how closely a site's flora resembles that of an undisturbed condition. When the total area of macrophytes equals or exceeds two square meters within the wetted area of the 100 m sampling reach, macrophyte taxonomic names are recorded (DEP SOP FS 7320 Stream and River Linear Vegetation Survey (LVS) Method). This method could be used to determine floral health associated with Chapter 62-302.531, F.A.C

10) Definition of Qualifiers

A - Value reported is the mean of two or more determinations
B - Results based on colony counts outside the acceptable range.
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J - Estimated value
K - Actual value is known to be less than value given
L - Actual value is known to be greater than value given
N - Presumptive evidence of presence of material.
O - Sampled, but analysis lost or not performed.
Q - Sample held beyond normal holding time.
T - Value reported is less than the criterion of detection.
U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
V - Analyte was detected in both sample and method blank.
X - Too few individuals to calculate SCI value.
Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
Z - Colonies were too numerous to count (TNTC)

Appendix C

Chain of Custody

Request Number: RQ-2018-02-12-53

FYI5 Mosaic Fertilizer, LLC - New Wales Concentrates
FL0036421 Sampling Inspection

Customer: BMR-TAMPA

Project ID: FYI5

Florida Department of Environmental Protection
Central Laboratory Submittal Form

Page 1 of 3
last revised Jan 25, 2018

Requester: Adrienne E. Pennington
Collected By: C.Orr Edgar G. Oreguela

Field Report Prepared By: C.Orr
Sampling Agency: FDEP - PM

Location: Mosaic - New Whales	☐ Comp ☒ Grab	Collection (comp begin or grab) Date 2/27/18 Time 1300	Eastern / Central	Composite end Date — Time	Bottle Group(s) (See pg 2): A/B Co				
Field ID: MNW - Downstream	Matrix (type, e.g., Salt, Fresh, etc): Fresh	Diss. Oxygen 6.1 / 75 ☐ mg/L ☐ % sat	Total Res. Chlorine (mg/L)						
WIN/STORET #	Temp (C) 24.3	pH 7.6	Sample Depth 0.15 ☐ ft ☒ m	Sp. Conductance (umho/cm) 1142					
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Salinity (ppt)	Comments						
Location: Mosaic - New Whales	☐ Comp ☒ Grab	Collection (comp begin or grab) Date 2/27/18 Time 1215	Eastern / Central	Composite end Date — Time	Bottle Group(s): B				
Field ID: MNW - Downstream	Matrix (type, e.g., Salt, Fresh, etc): Biology - Fresh	Diss. Oxygen — ☐ mg/L ☐ % sat	Total Res. Chlorine (mg/L) —						
WIN/STORET #	Temp (C) —	pH —	Sample Depth — ☐ ft ☐ m	Sp. Conductance (umho/cm) —					
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Salinity (ppt)	Comments						
Location	☐ Comp ☐ Grab	Collection (comp begin or grab) Date Time	Eastern / Central	Composite end Date Time	Bottle Group(s)				
Field ID	Matrix (type, e.g., Salt, Fresh, etc)	Diss. Oxygen ☐ mg/L ☐ % sat	Total Res. Chlorine (mg/L)						
WIN/STORET #	Temp (C)	pH	Sample Depth ☐ ft ☐ m	Sp. Conductance (umho/cm)					
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Salinity (ppt)	Comments						
Location	☐ Comp ☐ Grab	Collection (comp begin or grab) Date Time	Eastern / Central	Composite end Date Time	Bottle Group(s)				
Field ID	Matrix (type, e.g., Salt, Fresh, etc)	Diss. Oxygen ☐ mg/L ☐ % sat	Total Res. Chlorine (mg/L)						
WIN/STORET #	Temp (C)	pH	Sample Depth ☐ ft ☐ m	Sp. Conductance (umho/cm)					
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Salinity (ppt)	Comments						

Relinquished By:	Date/Time	Shipping Method	Number of Coolers Shipped:	Received By:	Date/Time
C.Orr	2/27/18; 1630	Fed Ex	3		

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☐ **Tallahassee:** 2639 North Monroe Street, Suite D • Tallahassee, FL 32303 • 850.219.6274 • Fax 850.219.6275
☑ **Tampa:** 9610 Princess Palm Ave. • Tampa, FL 33619 • 813.630.9616 • Fax 813.630.4327

Client Name: FDEP-PM-SWD	Project Name:	FY15 Mosaic Fertilizer, L.L.C. New Wales	BOTTLE SIZE & TYPE: 120 ml
Address: 13051 N Telecom Pkwy	P.O. Number or Project Number:	AF315E	
	FDEP Facility No:		ANALYSIS REQUIRED: Fecal Coliform
Phone: 813-470-5749	Project Address:		
FAX:	Special Instructions:		
Contact: Edgar Guerron Orejuela			
Sampled By: Edgar Guerron Orejuela	RQ-2018-02-12-53		
Turn Around Time: ☑ STANDARD ☐ RUSH			
Page: ____ of _____	☐ ADaPT ☐ EQuIS ☐ Other		PRESERVATION: 4

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. COUNT	LABORATORY I.D. NUMBER
MNW - Downstream	Surface water		2/27/18	1300	SW	1	

Matrix Code: **WW** = wastewater **SW** = surface water **GW** = ground water **DW** = drinking water **O** = oil **A** = air **SO** = soil **SL** = sludge

Preservation Code: I = ice H=(HCl) S = (H_2SO_4) N = (HNO_3) T = (Sodium Thiosulfate)

Received on Ice ☐ Yes ☐ No ☐ Temp taken from sample ☐ Temp from blank ☐ Where required, pH checked Temperature when received_____(in degrees celcius)

DCN: AD-051 Form last revised 04/30/2015 Device used for measuring Temp by unique identifier (circle IR temp gun used) J: 9A G: LT-1 LT-2 T: 10A A: 3A M: 3A S: 1V

	Relinquished by:	Date	Time	Received by:	Date	Time
1	Edgar Guerron Orejuela	2/27/18	1530		02/27/18	15:31
2						
3						
4						

FOR DRINKING WATER USE:

PWS ID: _____

Contact Person: _____ Phone: _____

Supplier of Water: _____

Site-Address: _____

Request Number: RQ-2018-02-12-53

FYI5 Mosaic Fertilizer, LLC - New Wales Concentrates
FL0036421 Sampling Inspection

Customer: BMR-TAMPA

Project ID: FYI5

Florida Department of Environmental Protection
Central Laboratory Submittal Form

last revised Jan 25, 2018

Requester: Adrienne E. Pennington

Collected By: CEO, EGO, APB

Field Report Prepared By: C. Orr

Sampling Agency: FDEP - PM

Location: Mosaic New Wales - Downstream	☐ Comp ☐ Grab	Collection (comp begin or grab) Date 2/28/18 Time 0950	Eastern Central	Composite end Date	Time	Bottle Group(s) (See pg 2)			
Field ID: MNW - Downstream	Matrix (type, e.g., Salt, Fresh, etc): Biology - Fresh	Diss. Oxygen 4.8 ☐ mg/L 56 ☐ % sat	Total Res. Chlorine (mg/L) —						
WIN/STORET #	Temp (C) 22.9	pH 7.3	Sample Depth 0.15 ☐ ft ☒ m	Sp. Conductance (umho/cm) 1143		B			
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Salinity (ppt)	Comments Hester-Dendeys incubated for 28 days.						
Location: Mosaic New Wales - Upstream	☐ Comp ☒ Grab	Collection (comp begin or grab) Date 2/28/18 Time 1200	Eastern Central	Composite end Date — Time		Bottle Group(s)			
Field ID: MNW - up stream	Matrix (type, e.g., Salt, Fresh, etc): Biology - fresh	Diss. Oxygen 5.1 ☐ mg/L 64 ☐ % sat	Total Res. Chlorine (mg/L) —						
WIN/STORET #	Temp (C) ~~23.4~~ CO	pH ~~7.6~~ CO	Sample Depth ~~0.15~~ 0.2 ☐ ft ☒ m	Sp. Conductance (umho/cm) ~~1149~~ CO		B			
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Salinity (ppt) —	Comments ~~SCE~~ CO						
Location: Mosaic New Wales - upstream	☐ Comp ☒ Grab	Collection (comp begin or grab) Date 2/28/18 Time 1230	Eastern Central	Composite end Date	Time	Bottle Group(s)			
Field ID: MNW - up stream	Matrix (type, e.g., Salt, Fresh, etc): Fresh	Diss. Oxygen 5.4 ☐ mg/L 64 ☐ % sat	Total Res. Chlorine (mg/L) —						
WIN/STORET #	Temp (C) 23.1	pH 7.6	Sample Depth 0.15 ☐ ft ☒ m	Sp. Conductance (umho/cm) 1149		A			
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Salinity (ppt) —	Comments						
Location: Mosaic New Wales - upstream	☐ Comp ☐ Grab	Collection (comp begin or grab) Date 2/28/18 Time 1230	Eastern Central	Composite end Date	Time	Bottle Group(s)			
Field ID: MNW - upstream	Matrix (type, e.g., Salt, Fresh, etc): Biology - Fresh	Diss. Oxygen — ☐ mg/L ☐ % sat	Total Res. Chlorine (mg/L) —						
WIN/STORET #	Temp (C) —	pH —	Sample Depth — ☐ ft ☐ m	Sp. Conductance (umho/cm) —		B			
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Salinity (ppt) —	Comments Hester-Dendeys incubated for 28 days.						

Relinquished By:	Date/Time	Shipping Method	Number of Coolers Shipped:	Received By:	Date/Time
C. Orr	2/28/18; 1700	FedEx	6		

Request Number: RQ-2018-02-12-53

FYI5 Mosaic Fertilizer, LLC - New Wales Concentrates
FL0036421 Sampling Inspection

Customer: BMR-TAMPA

Project ID: FYI5

Florida Department of Environmental Protection
Central Laboratory Submittal Form

last revised Jan 25, 2018

Requester: Adrienne E. Pennington

Collected By: CEO, EGO, APB

Field Report Prepared By: C. Orr

Sampling Agency: FDEP - PM

Location: Mosaic NewWales - Bethlehem Rd.	☐ Comp ☐ Grab	Collection (comp begin or grab) Date 2/28/18 Time 1400	Eastern Central	Composite end Date —— Time ——	Bottle Group(s) (See pg 2): B				
Field ID: MNW - Bethlehem Rd.	Matrix (type, e.g., Salt, Fresh, etc): Biology - Fresh	Diss. Oxygen: 5.8 mg/L, 69 % sat	Total Res. Chlorine (mg/L): —						
WIN/STORET #	Temp (C): 24.5	pH: 7.5	Sample Depth: 0.3 ☐ ft ☒ m	Sp. Conductance (umho/cm): 952					
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Salinity (ppt): —	Comments: Hester-Dendys incubated for 28 days						
Location	☐ Comp ☐ Grab	Collection (comp begin or grab) Date Time	Eastern Central	Composite end Date Time	Bottle Group(s)				
Field ID	Matrix (type, e.g., Salt, Fresh, etc)	Diss. Oxygen ☐ mg/L ☐ % sat	Total Res. Chlorine (mg/L)						
WIN/STORET #	Temp (C)	pH	Sample Depth ☐ ft ☐ m	Sp. Conductance (umho/cm)					
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Salinity (ppt)	Comments						
Location	☐ Comp ☐ Grab	Collection (comp begin or grab) Date Time	Eastern Central	Composite end Date Time	Bottle Group(s)				
Field ID	Matrix (type, e.g., Salt, Fresh, etc)	Diss. Oxygen ☐ mg/L ☐ % sat	Total Res. Chlorine (mg/L)						
WIN/STORET #	Temp (C)	pH	Sample Depth ☐ ft ☐ m	Sp. Conductance (umho/cm)					
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Salinity (ppt)	Comments						
Location	☐ Comp ☐ Grab	Collection (comp begin or grab) Date Time	Eastern Central	Composite end Date Time	Bottle Group(s)				
Field ID	Matrix (type, e.g., Salt, Fresh, etc)	Diss. Oxygen ☐ mg/L ☐ % sat	Total Res. Chlorine (mg/L)						
WIN/STORET #	Temp (C)	pH	Sample Depth ☐ ft ☐ m	Sp. Conductance (umho/cm)					
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Salinity (ppt)	Comments						

Relinquished By:	Date/Time	Shipping Method	Number of Coolers Shipped:	Received By:	Date/Time
C.Orr	2/28/18 ; 1700	Fed Ex	6		

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☐ **Miramar:** 10200 USA Today Way • Miramar, FL 33025 • 954.889.2288 • Fax 954.889.2281
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☑ **Tampa:** 9610 Princess Palm Ave. • Tampa, FL 33619 • 813.630.9616 • Fax 813.630.4327

Client Name: FDEP-PM-SWD	Project Name:	FY15 Mosaic Fertilizer L.L.C. New Wales	
Address: 13051 N Telecom Pkwy	P.O. Number or Project Number:	AF315E	
	FDEP Facility No:		
Phone: 813-470-5749	Project Address:		
FAX:	Special Instructions:		
Contact: Edgar Guerron Orejuela			
Sampled By: Edgar Guerron Orejuela	RQ-2018-02-12-53		
Turn Around Time: ☑ STANDARD ☐ RUSH			
Page: 1 of 1	☐ ADaPT ☐ EQuIS ☐ Other		

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. COUNT	PRESERVATION	ANALYSIS REQUIRED: Fecal Coliform	BOTTLE SIZE & TYPE: 125 mL	LABORATORY I.D. NUMBER
MNW-upstream	Mosaic New Wales - upstream of outfall	Grab	2/28/18	1230	SW	1	H	✓		

Matrix Code: **WW** = wastewater **SW** = surface water **GW** = ground water **DW** = drinking water **O** = oil **A** = air **SO** = soil **SL** = sludge

Preservation Code: I = ice H=(HCl) S = (H_2SO_4) N = (HNO_3) T = (Sodium Thiosulfate)

Received on Ice ☐ Yes ☐ No ☐ Temp taken from sample ☐ Temp from blank ☐ Where required, pH checked Temperature when received_____(in degrees celcius)

DCN: AD-051 Form last revised 04/30/2015 Device used for measuring Temp by unique identifier (circle IR temp gun used) J: 9A G: LT-1 LT-2 T: 10A A: 3A M: 3A S: 1V

	Relinquished by:	Date	Time	Received by:	Date	Time
1	Edgar Guerron Orejuela	2/28/18	1526		2/28/18	15:26
2						
3						
4						

FOR DRINKING WATER USE:

PWS ID: _____

Contact Person: _____ Phone: _____

Supplier of Water: _____

Site-Address: _____

Request Number: RQ-2018-02-12-53

FYI5 Mosaic Fertilizer, LLC - New Wales Concentrates
FL0036421 Sampling Inspection

Customer: BMR-TAMPA

Project ID: FYI5

Florida Department of Environmental Protection
Central Laboratory Submittal Form

last revised Jan 25, 2018

Requester: Adrienne E. Pennington

Field Report Prepared By: Catie Orr

Collected By: Edgar Guerron Onegüela

Sampling Agency: FDEP PM

Location: MNW @ Bethlehem Rd	☐ Comp ☒ Grab	Collection (comp begin or grab) Date 3/7/18 Time 1320	Eastern / Central	Composite end Date — Time —	Bottle Group(s) (See pg 2): B						
Field ID: ~~MW~~	Matrix (type, e.g., Salt, Fresh, etc): Biology - Fresh		Diss. Oxygen ☐ mg/L ☐ % sat	Total Res. Chlorine (mg/L)							
WIN/STORET #	Temp (C) —	pH —	Sample Depth — ☐ ft ☐ m	Sp. Conductance (umho/cm) —							
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Salinity (ppt) —	Comments: SCI								
Location: MNW @ Bethlehem Rd	☐ Comp ☒ Grab	Collection (comp begin or grab) Date 3/7/18 Time 1330	Eastern / Central	Composite end Date — Time —	Bottle Group(s): A						
Field ID	Matrix (type, e.g., Salt, Fresh, etc): Fresh		Diss. Oxygen 6.5 / 73 ☐ mg/L ☐ % sat	Total Res. Chlorine (mg/L) —							
WIN/STORET #	Temp (C) 18.21.5	pH 8.2	Sample Depth 0.2 ☐ ft ☒ m	Sp. Conductance (umho/cm) 759							
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Salinity (ppt) —	Comments								
Location	☐ Comp ☐ Grab	Collection (comp begin or grab) Date Time	Eastern / Central	Composite end Date Time	Bottle Group(s)						
Field ID	Matrix (type, e.g., Salt, Fresh, etc)		Diss. Oxygen ☐ mg/L ☐ % sat	Total Res. Chlorine (mg/L)							
WIN/STORET #	Temp (C)	pH	Sample Depth ☐ ft ☐ m	Sp. Conductance (umho/cm)							
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Salinity (ppt)	Comments								
Location	☐ Comp ☐ Grab	Collection (comp begin or grab) Date Time	Eastern / Central	Composite end Date Time	Bottle Group(s)						
Field ID	Matrix (type, e.g., Salt, Fresh, etc)		Diss. Oxygen ☐ mg/L ☐ % sat	Total Res. Chlorine (mg/L)							
WIN/STORET #	Temp (C)	pH	Sample Depth ☐ ft ☐ m	Sp. Conductance (umho/cm)							
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Salinity (ppt)	Comments								

Relinquished By:	Date/Time	Shipping Method	Number of Coolers Shipped:	Received By:	Date/Time
C. Orr	3/7/18 ; 1700	FedEx	2		

Appendix D

Physical/Chemical and Habitat Assessment field sheets

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
SURFACE WATER FIELD SHEET
Watershed Monitoring Section
October 2017

STATION INFORMATION

Station Name (Random ID for Status): MNW - upstream Date: 2/28/18 (MM/DD/YYYY)

Waterbody Name: S. prong Alafia (if known) All Times Are: (circle one) ETZ or CTZ or EST (daylight savings time never observed)

Waterbody Type: (Circle One)
Small Lake (≥ 4 and < 10 hectares) (collect samples in middle of open water) / Large Lake (≥ 10 hectares) (collect samples at selected location point)
Stream (collect samples in representative area) / Canal (collect samples in representative area) / River (collect samples in representative area)

Field Sheet Completed by: CO WQ Sample Collected by: EGO

WATER CHARACTERISTICS

Total Water Depth: 0.3 (meters) (Average of 2 measurements) Secchi Depth: 0.3 (meters) (from SHADED side) ☑ Check if Secchi Visible on Bottom ("S" qualifier needed)

Stream/River/Canal Flow: (Circle One) N/A (waterbody not stream / river / canal) / No Flow, Water within Banks / Flowing within Banks (comment if avg. velocity < 0.05 m/s) / Flow Above Banks (For Status sites, DO NOT sample if flooded above banks.)

Water Level: (Circle One) Low / Normal / High

Water Sample Collection Device: (Circle One) Direct Grab with Sample Bottle / Van Dorn: ____ # of grabs & Equipment ID ____

FIELD MEASUREMENTS Meter ID# PM - YSI Read by: CO

Time (24 hr.)	Surface Depth Collected (meters)	Temperature (°C)	Specific Conductance (µmhos/cm)	D.O. (%)	D.O. (mg/L)	pH (SU)
1230	0.15	23.1	1149	64	5.4	7.6
Time (24 hr.)	Bottom Depth Collected (meters)	Temperature (°C)	Specific Conductance (µmhos/cm)	D.O. (%)	D.O. (mg/L)	pH (SU)

☒ Check here if bottom measurements not collected because total depth < 1.5 m.

DATA COLLECTION DEPTHS: Total depth < 0.1 m → no data collection. Total depth ≥ 0.1m and < 0.6m → surf. meas. & sample at mid-depth. Total depth ≥ 0.6 m & < 1.5 m → surface meas. & sample at 0.3m. Total depth ≥ 1.5 m → surface meas. & sample at 0.3m, bottom meas. 0.5 m above bottom.

PRESERVATION INFORMATION ☐ N/A (No samples collected; please state why in comments.)

Were all samples (including QA/QC blanks) properly preserved within 15 minutes of collection? **Yes / No**
1 vial sulfuric acid added to nutrients sample(s)? **Yes / No** Sulfuric acid info: (circle one) Chem ID / Lot # 7093010
1 vial nitric acid added to metals sample(s)? **Yes / No** Nitric acid info: (circle one) Chem ID / Lot # 7341010
pH of all acidified samples verified to be < 2? **Yes / No**
All water & sediment samples submerged in wet ice (≤ 6°C)? **Yes / No**
SCI samples preserved with buffered formalin? **Yes / No / NA** Preserved By: EGO
(Please describe any variations to this preservation protocol in the comments section below.)

QA/QC SAMPLE INFORMATION

QA/QC Sample: (Circle One) N/A / Field Blank / Equipment Blank (Field-cleaned) or (Lab-cleaned) Time: ____ (24 hr.)
Van Dorn Equipment ID: ____ Collected by: ____

Photos Taken? Yes / No / Not Due (Required for all Status sites. Required annually for Trend sites.)
Fuel Powered Equipment Used? (e.g. boat motor) Yes / No
Access Method for Sample Collection (circle one):
Wading / Bank or Structure (e.g. bridge, dock) / Motorized Boat /
Non-Motorized Boat (e.g. canoe, kayak) / Air Boat / Other ____
Weather Conditions: P. Cloudy; 80's (comment on back if weather may affect water quality parameter values)
Personnel/Visitors On Site: Alex Pearson - Streamline Pearson (AP)

PLACE SITE LABEL HERE (if water quality samples collected)

PLACE QA/QC LABEL HERE (if blank collected at this site)

Station Name (Random ID for Status): MNW- Ogdveem Date: 7/28/18

SEDIMENT INFORMATION (for Lakes only) ☒ N/A (Site not a lake or no samples collected. If no samples collected, please state why in comments.)

Collection Depth: _____ (meters) (Total Water Depth) Collection Time: _____ (24 hr.) (Different than surface and bottom time in Field Measurements section)

Collection Interval: (Circle) Top 3-5 cm Other: _____ (cm) (If top 3-5 is too flocculent)

General Sample Collection Area: _____ (Describe-- near shore, central, north side near dock, etc.)

Sample Collection Device: (Circle One) Corer Ekman Petite Ponar Equipment ID: _____

Sediment Type: (Circle All That Apply) Clay/Silt Sand Gravel/Shell Rubble *Organic Muck *(very fine-grained flocculent organic material)

Sediment Odors: (Circle One) Normal Sewage Petroleum Hydrogen Sulfide Other: _____

Sediment Color: _____

Number of Grabs Collected (3 minimum): _____ Collected by: _____

BIOASSESSMENT INFORMATION

Stream Condition Index Information (Appropriate Trend sites)

Was the SCI sample collected? (Circle One) (Yes) / No / Not Due / NA (not an appropriate Trend site) Collection Time: 1200 (24 hr.) (Different than surface and bottom time in Field Measurements section)

If site was an appropriate Trend stream or river but "NO" was selected, why was the SCI not collected (flooded, < 0.05 m/s velocity, etc.)?

_____ Collected by: CO, EGO

Habitat Assessment Information (All Status Streams, Rivers, & Canals; Trend sites appropriate for SCI)

Was the HA performed? (Circle One) (Yes) / No / Not Due / NA (site not a Status Stream/River/Canal or appropriate Trend site)

If site was a stream, river or canal but "NO" was selected, why was the HA not performed (dangerous site conditions, etc)?

_____ Performed by: CO, EGO

Rapid Periphyton Survey Information (Trend sites appropriate for SCI)

Was the RPS performed? (Circle One) (Yes) / No / Not Due / NA (not an appropriate Trend site) ALGAL-ID sample collected? (circle one) Yes (No)

If site was an appropriate Trend stream or river but "NO" was selected, why was the RPS not performed (dangerous site conditions, etc.)?

_____ Performed by: CO, EGO

Linear Vegetation Survey Information (Trend sites appropriate for SCI) / **Lake Vegetation Index Information** (Status Lakes)

Was the LVS performed? (Circle One) (Yes) / No / Not Due / NA (not an appropriate Trend site) Number of Plant ID specimens collected: 0

Was the LVI performed? (Circle One) Yes / No / Not Due (LVI performed previous year) / (NA) (not a Status Lake)

If site was an appropriate Trend stream or river but "NO" was selected, why was LVS not performed (< 2 m^2 aquatic vegetation, dangerous site conditions, etc.)?
If site was a Status Lake but "NO" was selected, why was LVI not performed (LVI will be performed at later date, dangerous site conditions, etc.)?

_____ Performed by: CO, EGO

Comments: Include information such as: estimated level of impact to the system (ex. obvious pollution, etc.), any variations from normal preservation protocols (ex. adding more than 1 vial acid, etc.), any problems experienced with collecting samples (ex. sediment grab 1 lost due to fall-out, etc.), any site specifics (ex. dense submerged vegetation, etc.), any site conditions (ex. recent heavy rains, etc.), description of any photos taken, etc., any qualifiers needed (ex. "J" for failed calibration verification, etc.), etc.

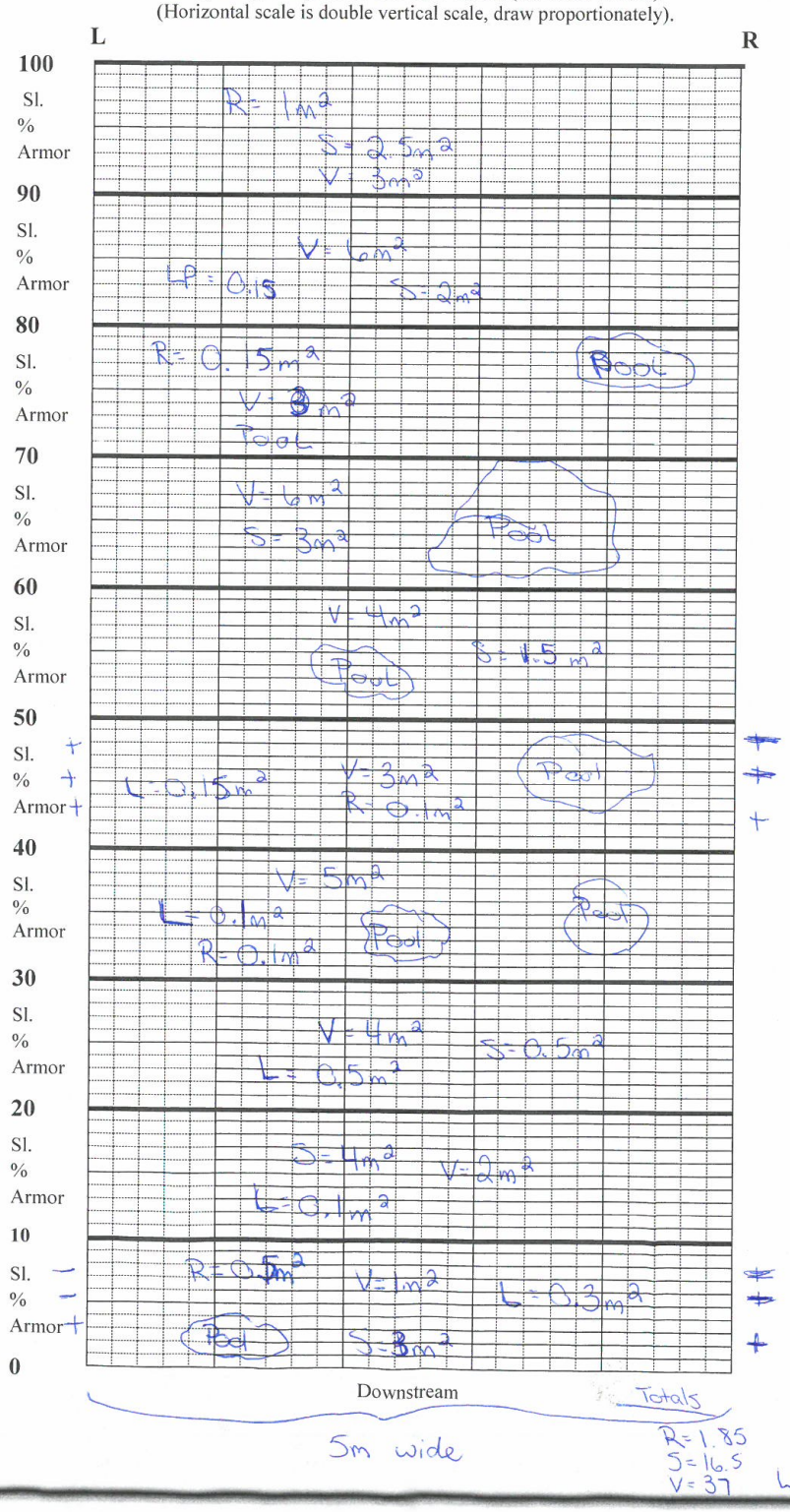
Sampler Names: Catie Orr (Please PRINT) Edgar Gomez Orozco (Please PRINT) Amanda P. Betancourt (Please PRINT)

Sampler Signatures: _____ _____ _____

OFFICE USE ONLY

Reviewed for completion by: **Date:**

Stream/River Habitat Sketch Sheet, Form FD 9000-4 (March07, 2013)
Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).



Location: MNW - Upstream

Date: 2/28/18

Samplers: Katie Orr
Edgar Guzman Orejuela

Substrates: Code key, draw proportionate habitat abundance. %

S	Snags	3.3
R	Roots/undercut banks	0.37
L	Leaf Packs (or mats)	0.26
V	Macrophytes	7.4

Total observed 11.33

Pool Pools Range expected___

Velocity measured at 50 **meter mark.**

WQ & chemistry taken at 50 **meter mark.**

Habitat Smothering:
Note areas (on map) where sand or silt is smothering 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.

1 sec per 1 m	1m/s	sec	m/s
2	0.5	12	0.08
3	0.33	13	0.076
4	0.25	14	0.071
5	0.2	15	0.066
6	0.16	16	0.062
7	0.14	17	0.058
8	0.12	18	0.055
9	0.11	19	0.052
10	0.1	20	0.052
11	0.09	21	0.047
22	0.045	NO	FLOW

Prod. hab	1	2	3	4	5
Sweeps (Maj)	10	7	5	4	3
Sweeps (Min)	10	6	5	4	5

DEP Form FD 9000-5 Stream/River Habitat Assessment Field Sheet

SAMPLING AGENCY:		STORET STATION NUMBER:	DATE (MM/DD/YY):	RECEIVING BODY OF WATER:
FDEP - SWROC / PM			2/28/18	Alafia River.
REMARKS:	COUNTY: Polk	LOCATION: South Prong Alafia		FIELD ID/NAME: MNW - Upstream

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** 14	Four or more major productive habitats present [snags, tree roots, aquatic vegetation, leaf packs (partially decayed), rock] 20 19 18 17 16	Three major productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags) 15 (14) 13 12 11	Two major productive habitats present. Less than desirable habitat, frequently disturbed or removed 10 9 8 7 6	One or less major productive habitat. Lack of habitat is obvious, substrates unstable or smothered 5 4 3 2 1
Substrate Availability 9	Greater than 30% major productive habitat present at site 20 19 18 17 16	16% to 30% major productive habitat, by aerial extent 15 14 13 12 11	6% to 15% major productive habitat 10 (9) 8 7 6	Less than 5% major productive habitat 5 4 3 2 1
Water Velocity 14	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec ≥0.33 0.31 0.29 0.27 >0.25 20 19 18 17 16	Max. observed at typical transect: >0.1 to 0.25 m/sec 0.25 0.21 0.17 0.13 >0.1 15 (14) 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 0.1 0.09 0.07 0.06 0.05 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec; or spate occurring: > 1 m/sec <0.05 0.04 0.03 0.01 <0.01 5 4 3 2 1
Habitat Smothering 17 Primary Score 54	Adequate number of stable pools (1-2 per 12 times width) and <25% of habitats affected by sand, silt, or algae. 20 19 18 (17) 16	Adequate number of stable pools (1-2 per 12 times width) and >25% of habitats affected by sand, silt, or algae. 15 14 13 12 11	Does not have required number of stable pools (1-2 per 12 x width) and/or has shallow pools (<2 x prevailing depth). 10 9 8 7 6	Stable pools are absent. Most habitats affected by sand, silt, or algae accumulation. 5 4 3 2 1
Secondary Habitat Components **Artificial Channelization** 16	Expected sinuosity given the stream width. No evidence of dredging or artificial straightening. No spoil banks. 20 19 18 17 (16)	Good sinuosity within old channelized area. Evidence of dredging in the past (>25 yrs) but mostly recovered. 15 14 13 12 11	Straightened with trapezoidal cross section, but has a small degree of sinuosity developed within channelized area. 10 9 8 7 6	Straightened or engineered by dredging, has trapezoidal or box cut cross section, lacks required pools. May have spoil banks. 5 4 3 2 1
Bank Stability Right Bank 8 Left Bank 7	Bankfull > 60% of bank height. Slope of bank ≤ 60° from bankful to top of bank. Bankfull is within or above the root zone with few raw, eroded areas. 10 9	Only meets 2 of the 3 requirements for optimal bank stability. (8) (7) 6	Only meets 1 of the 3 requirements for optimal bank stability. 5 4	Bankfull < 60% of bank height. Slope of bank > 60°. Bankfull is below the root zone with raw, eroded areas. 3 2 1
Riparian Buffer Zone Width Right Bank 10 Left Bank 9	Width of vegetation greater than 18 m (10) (9)	Width of vegetation >12 to 18m 8 7 6	Width of vegetation 6 to 12 m. human activities close to system 5 4	Less than 6 m of buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 8 Left Bank 7 Secondary Score 65	Over 80% of riparian surfaces consist of normal, expected plant community for given sunlight & habitat conditions (e.g., native plants; tree, shrub, and forbs represented, if appropriate). Minimal disturbance. 10 9	>50% to 80% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Some disruption in community observed. (8) (7) 6	25% to 50% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Disruption obvious. 5 4	Less than 25% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). 3 2 1

119 **TOTAL SCORE**

Date:	Analyst:	Signature:
2/28/18	Carie Orr, Edgar Guevara Orjuela	

62-160.800, F.A.C.

Revision Date: March 1, 2014

DEP FORM FD 9000-25 Rapid Periphyton Survey Field Sheet

Site: MNW - upstream | County: Polk | Date: 2/28/18 | Investigators: Catie Orr, Edgar Guevara Ogando

STORET Station Number:

Transect (m)	Point 1=right 9=left	Algal Thickness Rank (N-6, X)	Estimated	Canopy Cover
0	1	N		
	2	N		
	3	N		
	4	N		
	5	N		95
	6	N		
	7	N		
	8	N		
	9	N		
10	1	N		
	2	N		
	3	N		
	4	N		
	5	N		96
	6	N		
	7	N		
	8	N		
	9	N		
20	1	N		
	2	N		
	3	N		
	4	N		
	5	N		96
	6	3		
	7	N		
	8	N		
	9	N		
30	1	N		
	2	N		
	3	N		
	4	N		
	5	N		74
	6	N		
	7	N		
	8	N		
	9	N		
40	1	N		
	2	N		
	3	N		
	4	N		
	5	N		96
	6	N		
	7	N		
	8	N		
	9	N		
50	1	N		
	2	N		
	3	N		
	4	N		
	5	N		83
	6	N		
	7	N		
	8	N		
	9	N		

Transect (m)	Point 1=right 9=left	Algal Thickness Rank (N-6, X)	Estimated	Canopy Cover
60	1	N		
	2	N		
	3	N		
	4	N		
	5	N		94
	6	N		
	7	N		
	8	N		
	9	N		
70	1	N		
	2	N		
	3	N		
	4	N		
	5	N		96
	6	N		
	7	N		
	8	N		
	9	N		
80	1	N		
	2	N		
	3	N		
	4	N		
	5	N		96
	6	N		
	7	N		
	8	N		
	9	N		
90	1	N		
	2	N		
	3	N		
	4	N		
	5	N		90
	6	N		
	7	N		
	8	N		
	9	N		
100	1	N		
	2	N		
	3	N		
	4	N		
	5	N		96
	6	N		
	7	N		
	8	N		
	9	N		

Secchi depth	03
Estimated?	

# points ranked 4-6	0
total points assessed	90
% points ranked 4-6	0

Check accompanying data collected at same site/date.	
Algal mat sample	
Linear Veg Survey	✓
Habitat Assessment	✓
SCI/Biorecon	✓
Water sample	✓

RQ- 2018-02-12-53

Algal Thickness Rank	
N	rough, no algae, slimy, algae up to 1mm
3	>1mm - 6mm
4	>6mm - 20mm
5	>20mm - 10 cm
6	>10 cm

Record "N" and check "Estimated" for points deeper than the Secchi depth; algae are presumed absent. Check "Estimated" if thickness estimated for deep points which can be seen but not reached.

Record "X" for points shallower than Secchi depth for which substrate cannot be seen or reached with the hand. No estimated rank.

Record canopy cover as the number of small densiometer quadrants (out of 96) that HAVE canopy cover. Measure facing upstream at point 4, 5, or 6.

Collect algal mat sample following DEP SOP FS 7240 if the percentage of total sampled points with a thickness rank of 4, 5, or 6 is >20%.

62-160.800, F.A.C.

Revision Date: March 1, 2014

DEP FORM FD 9000-32: LINEAR VEGETATION SURVEY FIELD SHEET

Waterbody: S. Prong Alafia-MNW-upstream | Date: 2/27/18 | County: Polk | Storet Number:

Analyst: Cole Orr | Signature: Cole Orr

Comments:

Instructions: Note taxa growing in the water with a checkmark if present, "D" if dominant, and "C" if codominant (dominance only if 1 m^2 of taxa present). Note in the boxes below if no dominant are selected, and note total macrophyte abundance rank for each section. Only the most common taxa are listed, so use blank spaces for additional taxa names.

HERBACEOUS SPECIES	Meter Mark 0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	Specimen collected (check)
Alternanthera philoxeroides		✓	✓		✓		✓	✓	✓		
Bacopa caroliniana											
Bacopa monneri											
Bidens mitis											
Boehmeria cylindrica											
Centella asiatica											
Ceratophyllum demersum	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Chara											
Cicuta maculata											
Cladium jamaicense											
Colocasia esculenta											
Commelina diffusa											
Commelina virginica											
Crinum americanum											
Diodia virginiana											
Eichhornia crassipes											
Eleocharis (wispy viviparous)	✓	✓	✓	✓					✓		
Hydrilla verticillata											
Hydrocotle							✓	✓	✓		
Hygrophila polysperma											
Hymenocallis											
Lachnanthes caroliniana											
Landoltia punctata											
Lemna		✓	✓	✓	✓	✓	✓	✓	✓	✓	
Limnophila sessiflora											
Ludwigia leptocarpa											
Ludwigia palustris											
Ludwigia peruviana											
Ludwigia repens											
Luziola fluitans											
If no Dominant or Co-Dominant were selected, indicate with "X"											
Indicate % cover macrophytes per section											
0-5% Macrophyte Coverage											
>5 and ≤10% Macrophyte Coverage											
>10 and ≤25% Macrophyte Coverage											
>25 and ≤50% Macrophyte Coverage											
> 50% Macrophyte Coverage											

HERBACEOUS SPECIES	Meter Mark 0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	Specimen collected (check)
Micranthemum glomeratum											
Micranthemum umbrosum											
Myriophyllum aquaticum	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Najas guadelupensis	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Nuphar luteum											
Orontium aquaticum											
Panicum hemitomon											
Panicum repens											
Panicum rigidulum											
Pistia stratioides											
Polygonum glabra											
Polygonum hydropiperoides											
Polygonum punctatum											
Pontedaria cordata											
Potamogeton illinoensis											
Ruellia simplex											
Sacciolepis striata											
Sagittaria kurziana											
Sagittaria lancifolia											
Sagittaria latifolia											
Salvinia minima											
Samolus parviflora											
Saururus cernuus											
Sparganium americanum											
Typha											
Vallisneria americana											
Zizania aquatica											
~~Unknown~~ Plant #1		✓					✓	C			
~~Unknown~~ Plant #2		✓	✓	✓	✓	✓	✓	✓	✓	C	
~~Unknown Grassy~~ Ceratopteris thalictroides			✓		✓			✓	✓	✓	
~~Fern #1~~ Thelypteris interrupta								✓	✓		

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
SURFACE WATER FIELD SHEET
Watershed Monitoring Section
October 2017

STATION INFORMATION

Station Name (Random ID for Status): MNW - Downstream Date: 2/27/18 (MM/DD/YYYY)

Waterbody Name: South Prong Alafia (if known) All Times Are: (circle one) (EDT) or CDT or EST (daylight savings time never observed)

Waterbody Type: (Circle One)
- Small Lake (≥ 4 and < 10 hectares) (collect samples in middle of open water)
- Large Lake (≥ 10 hectares) (collect samples at selected location point)
- (Stream) (collect samples in representative area)
- Canal (collect samples in representative area)
- River (collect samples in representative area)

Field Sheet Completed by: CO WQ Sample Collected by: EGO

WATER CHARACTERISTICS

Total Water Depth: 0.3 (meters) (Average of 2 measurements) Secchi Depth: 0.3 (meters) (from SHADED side) ☒ Check if Secchi Visible on Bottom ("S" qualifier needed)

Stream/River/Canal Flow: (Circle One) N/A (waterbody not stream / river / canal) / No Flow, Water within Banks / (Flowing within Banks) (comment if avg. velocity < 0.05 m/s) / Flow Above Banks (For Status sites, DO NOT sample if flooded above banks.)

Water Level: (Circle One) (Low) / Normal / High

Water Sample Collection Device: (Circle One) (Direct Grab with Sample Bottle) / Van Dorn: ____ # of grabs & Equipment ID ____

FIELD MEASUREMENTS Meter ID# Weeze Read by: CO

Time (24 hr.)	Surface Depth Collected (meters)	Temperature (°C)	Specific Conductance (µmhos/cm)	D.O. (%)	D.O. (mg/L)	pH (SU)
1300	0.15	24.3	1142	75	6.1	7.6
Time (24 hr.)	Bottom Depth Collected (meters)	Temperature (°C)	Specific Conductance (µmhos/cm)	D.O. (%)	D.O. (mg/L)	pH (SU)

☒ Check here if bottom measurements not collected because total depth < 1.5 m.

DATA COLLECTION DEPTHS: Total depth < 0.1 m → no data collection. Total depth ≥ 0.1m and < 0.6m → surf. meas. & sample at mid-depth. Total depth ≥ 0.6 m & < 1.5 m → surface meas. & sample at 0.3m. Total depth ≥ 1.5 m → surface meas. & sample at 0.3m, bottom meas. 0.5 m above bottom.

PRESERVATION INFORMATION ☐ N/A (No samples collected, please state why in comments.)

Were all samples (including QA/QC blanks) properly preserved within 15 minutes of collection? (Yes) / No

1 vial sulfuric acid added to nutrients sample(s)? (Yes) / No Sulfuric acid info: (circle one) Chem ID / Lot # J043D10

1 vial nitric acid added to metals sample(s)? (Yes) / No Nitric acid info: (circle one) Chem ID / Lot # 7341010

pH of all acidified samples verified to be < 2? (Yes) / No

All water & sediment samples submerged in wet ice (≤ 6°C)? (Yes) / No

SCI samples preserved with buffered formalin? (Yes) / No / NA Preserved By: EGO, CO

(Please describe any variations to this preservation protocol in the comments section below.)

QA/QC SAMPLE INFORMATION

QA/QC Sample: (Circle One) (N/A) / Field Blank / Equipment Blank (Field-cleaned) or (Lab-cleaned) Time: ____ (24 hr.)

Van Dorn Equipment ID: ____ Collected by: ____

Photos Taken? (Yes) / No / Not Due (Required for all Status sites. Required annually for Trend sites.)

Fuel Powered Equipment Used? (e.g. boat motor) Yes / (No)

Access Method for Sample Collection (circle one):

(Wading) / Bank or Structure (e.g. bridge, dock) / Motorized Boat /

Non-Motorized Boat (e.g. canoe, kayak) / Air Boat / Other ____

Weather Conditions: Clear ; 80's (comment on back if weather may affect water quality parameter values)

Personnel/Visitors On Site: Alex Pearson - Streamline

PLACE SITE LABEL HERE (if water quality samples collected)

PLACE QA/QC LABEL HERE (if blank collected at this site)

Station Name (Random ID for Status): MW-Downstream Date: 2/27/18

SEDIMENT INFORMATION (for Lakes only) [X] N/A (Site not a lake or no samples collected. If no samples collected, please state why in comments.)

Collection Depth: _____ (meters) (Total Water Depth) Collection Time: _____ (24 hr.) (Different than surface and bottom time in Field Measurements section)

Collection Interval: (Circle) Top 3-5 cm Other: _____ (cm) (If top 3-5 is too flocculent)

General Sample Collection Area: _____ (Describe-- near shore, central, north side near dock, etc.)

Sample Collection Device: (Circle One) Corer Ekman Petite Ponar Equipment ID: _____

Sediment Type: (Circle All That Apply) Clay/Silt Sand Gravel/Shell Rubble *Organic Muck (*very fine-grained flocculent organic material)

Sediment Odors: (Circle One) Normal Sewage Petroleum Hydrogen Sulfide Other: _____

Sediment Color: _____

Number of Grabs Collected (3 minimum): _____ Collected by: _____

BIOASSESSMENT INFORMATION

Stream Condition Index Information (Appropriate Trend sites)

Was the SCI sample collected? (Circle One) (Yes) / No / Not Due / NA (not an appropriate Trend site) Collection Time: 1215 (24 hr.) (Different than surface and bottom time in Field Measurements section)

If site was an appropriate Trend stream or river but "NO" was selected, why was the SCI not collected (flooded, < 0.05 m/s velocity, etc.)?

_____ Collected by: CO/EGO

Habitat Assessment Information (All Status Streams, Rivers, & Canals; Trend sites appropriate for SCI)

Was the HA performed? (Circle One) (Yes) / No / Not Due / NA (site not a Status Stream/River/Canal or appropriate Trend site)

If site was a stream, river or canal but "NO" was selected, why was the HA not performed (dangerous site conditions, etc)?

_____ Performed by: CO/EGO

Rapid Periphyton Survey Information (Trend sites appropriate for SCI)

Was the RPS performed? (Circle One) (Yes) / No / Not Due / NA (not an appropriate Trend site) ALGAL-ID sample collected? (circle one) (Yes) No

If site was an appropriate Trend stream or river but "NO" was selected, why was the RPS not performed (dangerous site conditions, etc.)?

_____ Performed by: EGO/CO

Linear Vegetation Survey Information (Trend sites appropriate for SCI) / **Lake Vegetation Index Information** (Status Lakes)

Was the LVS performed? (Circle One) (Yes) / No / Not Due / NA (not an appropriate Trend site) Number of Plant ID specimens collected: _____

Was the LVI performed? (Circle One) Yes / No / Not Due (LVI performed previous year) / (NA) (not a Status Lake)

If site was an appropriate Trend stream or river but "NO" was selected, why was LVS not performed (< 2 m^2 aquatic vegetation, dangerous site conditions, etc.)?
If site was a Status Lake but "NO" was selected, why was LVI not performed (LVI will be performed at later date, dangerous site conditions, etc.)?

_____ Performed by: CO, EGO

Comments: Include information such as: estimated level of impact to the system (ex. obvious pollution, etc.), any variations from normal preservation protocols (ex. adding more than 1 vial acid, etc.), any problems experienced with collecting samples (ex. sediment grab 1 lost due to fall-out, etc.), any site specifics (ex. dense submerged vegetation, etc.), any site conditions (ex. recent heavy rains, etc.), description of any photos taken, etc., any qualifiers needed (ex. "J" for failed calibration verification, etc.), etc.

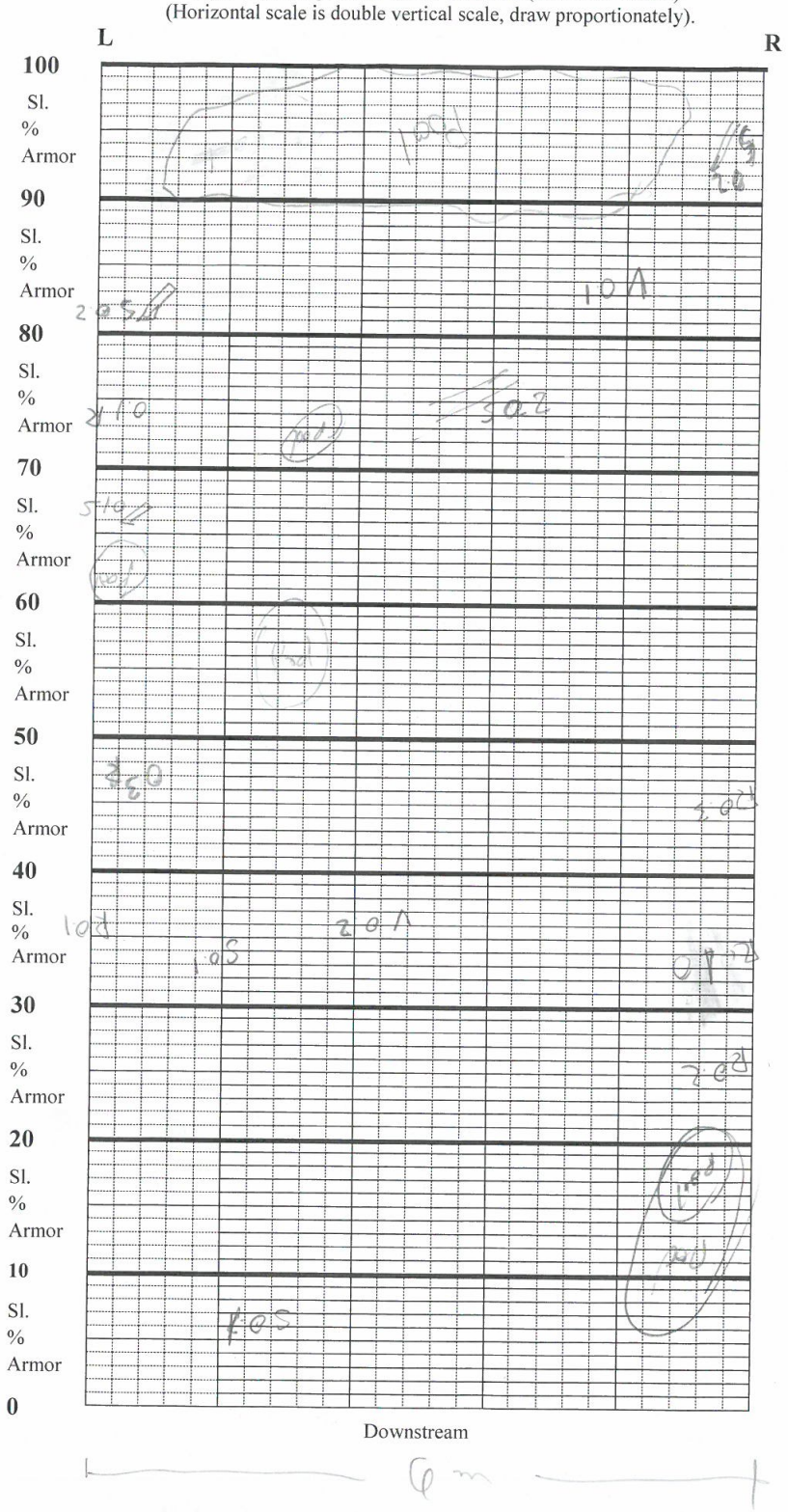
Sampler Names: Catie Cox (Please PRINT) Edgar Ramos-Orejuela (Please PRINT) _____ (Please PRINT)

Sampler Signatures: _____ _____ _____

OFFICE USE ONLY

Reviewed for completion by: **Date:**

Stream/River Habitat Sketch Sheet, Form FD 9000-4 (March07, 2013)
Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).



Location: MNW - Downstream

Date: 2/27/18

Samplers: Cahe OW
Edgar Guevara Argueles

Substrates: Code key, draw proportionate habitat abundance. %

S	Snags 0.9	0.15
R	2 Roots/undercut banks	0.33
	Leaf Packs (or mats)	
✓	0.3 Macrophytes	0.05

Total observed 0.53 %

Pools Range expected

Velocity measured at 50 meter mark.

WQ & chemistry taken at ____ meter mark.

Habitat Smothering:
Note areas (on map) where sand or silt is smothering 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.

1 sec per 1 m	1m/s	sec	m/s
2	0.5	12	0.08
3	0.33	13	0.076
4	0.25	14	0.071
5	0.2	15	0.066
6	0.16	16	0.062
7	0.14	17	0.058
8	0.12	18	0.055
9	0.11	19	0.052
10	0.1	20	0.052
11	0.09	21	0.047
22	0.045	NO	FLOW

Prod. hab	1	2	3	4	5
Sweeps (Maj)	10	7	5	4	3
Sweeps (Min)	10	6	5	4	5

DEP Form FD 9000-5 Stream/River Habitat Assessment Field Sheet

SAMPLING AGENCY:		STORET STATION NUMBER:	DATE (MM/DD/YY):	RECEIVING BODY OF WATER:
FDEP - PM			2/27/18	~~Joe~~ Alafia River
REMARKS:	COUNTY:	LOCATION:		FIELD ID/NAME:
	POLK	South Prong Alafia		MNW - Downstream

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** 4	Four or more major productive habitats present [snags, tree roots, aquatic vegetation, leaf packs (partially decayed), rock] 20 19 18 17 16	Three major productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags) 15 14 13 12 11	Two major productive habitats present. Less than desirable habitat, frequently disturbed or removed 10 9 8 7 6	One or less major productive habitat. Lack of habitat is obvious, substrates unstable or smothered 5 (4) 3 2 1
Substrate Availability 1	Greater than 30% major productive habitat present at site 20 19 18 17 16	16% to 30% major productive habitat, by aerial extent 15 14 13 12 11	6% to 15% major productive habitat 10 9 8 7 6	Less than 5% major productive habitat 5 4 3 2 (1)
Water Velocity 15	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec ≥0.33 0.31 0.29 0.27 >0.25 20 19 18 17 16	Max. observed at typical transect: >0.1 to 0.25 m/sec 0.25 0.21 0.17 0.13 >0.1 (15) 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 0.1 0.09 0.07 0.06 0.05 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec; or spate occurring: > 1 m/sec <0.05 0.04 0.03 0.01 <0.01 5 4 3 2 1
Habitat Smothering 11 Primary Score 31	Adequate number of stable pools (1-2 per 12 times width) and <25% of habitats affected by sand, silt, or algae. 20 19 18 17 16	Adequate number of stable pools (1-2 per 12 times width) and >25% of habitats affected by sand, silt, or algae. 15 14 13 12 (11)	Does not have required number of stable pools (1-2 per 12 x width) and/or has shallow pools (<2 x prevailing depth). 10 9 8 7 6	Stable pools are absent. Most habitats affected by sand, silt, or algae accumulation. 5 4 3 2 1
Secondary Habitat Components **Artificial Channelization** 16	Expected sinuosity given the stream width. No evidence of dredging or artificial straight-ening. No spoil banks. 20 19 18 17 (16)	Good sinuosity within old chan-nelized area. Evidence of dredging in the past (>25 yrs) but mostly recovered. 15 14 13 12 11	Straightened with trapezoidal cross section, but has a small degree of sinuosity developed within channelized area. 10 9 8 7 6	Straightened or engineered by dredging, has trapezoidal or box cut cross section, lacks required pools. May have spoil banks. 5 4 3 2 1
Bank Stability Right Bank 8 Left Bank 7	Bankfull > 60% of bank height. Slope of bank ≤ 60° from bankful to top of bank. Bankfull is within or above the root zone with few raw, eroded areas. 10 9	Only meets 2 of the 3 requirements for optimal bank stability. (8) (7) 6	Only meets 1 of the 3 requirements for optimal bank stability. 5 4	Bankfull < 60% of bank height. Slope of bank > 60°. Bankfull is below the root zone with raw, eroded areas. 3 2 1
Riparian Buffer Zone Width Right Bank 10 Left Bank 9	Width of vegetation greater than 18 m (10) (9)	Width of vegetation >12 to 18m 8 7 6	Width of vegetation 6 to 12 m. human activities close to system 5 4	Less than 6 m of buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 8 Left Bank 7 Secondary Score 65	Over 80% of riparian surfaces consist of normal, expected plant community for given sunlight & habitat conditions (e.g., native plants; tree, shrub, and forbs represented, if appropriate). Minimal disturbance. 10 9	>50% to 80% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Some disruption in community observed. (8) (7) 6	25% to 50% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Disruption obvious. 5 4	Less than 25% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). 3 2 1

96 **TOTAL SCORE**

Date:	Analyst:	Signature:
2/27/18	Catie Orr, Edgar Guzman Ortiz	

62-160.800, F.A.C.

Revision Date: March 1, 2014

DEP FORM FD 9000-25 Rapid Periphyton Survey Field Sheet

Site:	County:	Date:	Investigators:
MPNW - Downstream	Polk	2/27/18	Catie Orr, Edgar Guzman Ochoa

STORET Station Number:

Transect (m)	Point 1=right 9=left	Algal Thickness Rank (N-6, X)	Estimated	Canopy Cover
0	1	N		
	2	N		
	3	N		
	4			
	5			96
	6			
	7			
	8			
	9			
10	1	N	/	
	2		/	
	3		/	
	4		/	
	5		/	96
	6	N		
	7	N		
	8	N		
	9	N		
20	1	N	/	
	2		/	
	3		/	
	4		/	
	5		/	90
	6		/	
	7	N		
	8	N		
	9	N		
30	1	6		
	2	6		
	3	6		
	4	4		
	5	N		84
	6	N		
	7	N		
	8	N		
	9	N		
40	1	6		
	2	N		
	3	N		
	4	6		
	5	N		96
	6	N		
	7	6		
	8	N		
	9	N		
50	1	3		
	2	N		
	3	4		
	4	3		
	5	4		96
	6	5		
	7	4		
	8	N		
	9	N		
60	1	N		
	2	N		
	3	N		
	4	5		
	5	N		96
	6	N	/	
	7	N	/	
	8	N	/	
	9	N	/	
70	1	N		
	2	N		
	3	5		
	4	6		
	5	6		96
	6	4		
	7	3		
	8	4		
	9	N		
80	1	N		
	2	N		
	3	N		
	4	N		
	5	N		93
	6	6		
	7	6		
	8	6		
	9	6		
90	1	N		
	2	N		
	3	N		
	4	N		
	5	6		76
	6	6		
	7	6		
	8	6		
	9	6		
100	1	N	/	
	2		/	
	3		/	
	4		/	
	5		/	30
	6		/	
	7		/	
	8		/	
	9		/	

Secchi depth	03
Estimated?	

# points ranked 4-6	25
total points assessed	90
% points ranked 4-6	27.7

Check accompanying data collected at same site/date.	
Algal mat sample	✓
Linear Veg Survey	✓
Habitat Assessment	✓
SCI/Biorecon	✓
Water sample	✓

RQ- 2018-02-12-53

Algal Thickness Rank	
N	rough, no algae, slimy, algae up to 1mm
3	>1mm - 6mm
4	>6mm - 20mm
5	>20mm - 10 cm
6	>10 cm

Record "N" and check "Estimated" for points deeper than the Secchi depth; algae are presumed absent. Check "Estimated" if thickness estimated for deep points which can be seen but not reached.

Record "X" for points shallower than Secchi depth for which substrate cannot be seen or reached with the hand. No estimated rank.

Record canopy cover as the number of small densiometer quadrants (out of 96) that HAVE canopy cover. Measure facing upstream at point 4, 5, or 6.

Collect algal mat sample following DEP SOP FS 7240 if the percentage of total sampled points with a thickness rank of 4, 5, or 6 is >20%.

62-160.800, F.A.C.

Revision Date: March 1, 2014

DEP FORM FD 9000-32: LINEAR VEGETATION SURVEY FIELD SHEET

Waterbody: South Prong Alafia | Date: 2/27/18 | County: Polk | Storet Number:

Analyst: Catie Orr, Edgar Guzman Arguelles | Signature: Orr

Comments:

Instructions: Note taxa growing in the water with a checkmark if present, "D" if dominant, and "C" if codominant (dominance only if 1 m^2 of taxa present). Note in the boxes below if no dominant are selected, and note total macrophyte abundance rank for each section. Only the most common taxa are listed, so use blank spaces for additional taxa names.

HERBACEOUS SPECIES	Meter Mark 0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	Specimen collected (check)
Alternanthera philoxeroides				✓							
Bacopa caroliniana											
Bacopa monneri											
Bidens mitis											
Boehmeria cylindrica											
Centella asiatica											
Ceratophyllum demersum											
Chara											
Cicuta maculata											
Cladium jamaicense											
Colocasia esculenta											
Commelina diffusa											
Commelina virginica											
Crinum americanum											
Diodia virginiana											
Eichhornia crassipes											
Eleocharis (wispy viviparous)											
Hydrilla verticillata								X			
Hydrocotle			X	X		✓			✓		
Hygrophila polysperma											
Hymenocallis											
Lachnanthes caroliniana											
Landoltia punctata											
Lemna											
Limnophila sessiflora											
Ludwigia leptocarpa											
Ludwigia palustris											
Ludwigia peruviana											
Ludwigia repens											
Luziola fluitans											
If no Dominant or Co-Dominant were selected, indicate with "X"											
Indicate % cover macrophytes per section											
0-5% Macrophyte Coverage											
>5 and ≤10% Macrophyte Coverage											
>10 and ≤25% Macrophyte Coverage											
>25 and ≤50% Macrophyte Coverage											
> 50% Macrophyte Coverage											

HERBACEOUS SPECIES	Meter Mark 0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	Specimen collected (check)
Micranthemum glomeratum											
Micranthemum umbrosum											
Myriophyllum aquaticum											
Najas guadelupensis											
Nuphar luteum											
Orontium aquaticum											
Panicum hemitomon											
Panicum repens											
Panicum rigidulum											
Pistia stratioides											
Polygonum glabra											
Polygonum hydropiperoides											
Polygonum punctatum											
Pontedaria cordata											
Potamogeton illinoensis											
Ruellia simplex											
Sacciolepis striata											
Sagittaria kurziana											
Sagittaria lancifolia											
Sagittaria latifolia											
Salvinia minima											
Samolus parviflora											
Saururus cernuus											
Sparganium americanum											
Typha											
Vallisneria americana											
Zizania aquatica											
Myriophyllum sp			X	X	X			X	✓		

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
SURFACE WATER FIELD SHEET
Watershed Monitoring Section
October 2017

STATION INFORMATION

Station Name (Random ID for Status): MNWR Bethlehem Rd Date: 3/7/18 (MM/DD/YYYY)

Waterbody Name: S. Prong Alafia (if known) All Times Are: (circle one) ETZ or CTZ or EST (daylight savings time never observed)

Waterbody Type: (Circle One)
Small Lake (≥ 4 and < 10 hectares) (collect samples in middle of open water) / Large Lake (≥ 10 hectares) (collect samples at selected location point)
Stream (collect samples in representative area) / Canal (collect samples in representative area) / River (collect samples in representative area)

Field Sheet Completed by: CO WQ Sample Collected by: EGO

WATER CHARACTERISTICS

Total Water Depth: 0.41 (meters) (Average of 2 measurements) Secchi Depth: 0.4 (meters) (from SHADED side) ☒ Check if Secchi Visible on Bottom ("S" qualifier needed)

Stream/River/Canal Flow: (Circle One) N/A (waterbody not stream / river / canal) / No Flow, Water within Banks / Flowing within Banks (comment if avg. velocity < 0.05 m/s) / Flow Above Banks (For Status sites, DO NOT sample if flooded above banks.)

Water Level: (Circle One) Low / Normal / High

Water Sample Collection Device: (Circle One) Direct Grab with Sample Bottle / Van Dorn: _____ # of grabs & Equipment ID _____

FIELD MEASUREMENTS Meter ID# PM #1 Read by: CO

Time (24 hr.)	Surface Depth Collected (meters)	Temperature (°C)	Specific Conductance (µmhos/cm)	D.O. (%)	D.O. (mg/L)	pH (SU)
1330	0.2	21.5	759	73	6.5	8.2
Time (24 hr.)	Bottom Depth Collected (meters)	Temperature (°C)	Specific Conductance (µmhos/cm)	D.O. (%)	D.O. (mg/L)	pH (SU)

☒ Check here if bottom measurements not collected because total depth < 1.5 m.

DATA COLLECTION DEPTHS: Total depth < 0.1 m → no data collection. Total depth ≥ 0.1m and < 0.6m → surf. meas. & sample at mid-depth. Total depth ≥ 0.6 m & < 1.5 m → surface meas. & sample at 0.3m. Total depth ≥ 1.5 m → surface meas. & sample at 0.3m, bottom meas. 0.5 m above bottom.

PRESERVATION INFORMATION ☐ N/A (No samples collected; please state why in comments.)

Were all samples (including QA/QC blanks) properly preserved within 15 minutes of collection? **Yes** / **No**
1 vial sulfuric acid added to nutrients sample(s)? **Yes** / **No** Sulfuric acid info: (circle one) Chem ID / Lot # 7093010
1 vial nitric acid added to metals sample(s)? **Yes** / **No** Nitric acid info: (circle one) Chem ID / Lot # 7341010
pH of all acidified samples verified to be < 2? **Yes** / **No**
All water & sediment samples submerged in wet ice (≤ 6°C)? **Yes** / **No**
SCI samples preserved with buffered formalin? **Yes** / **No** / **NA** Preserved By: CO, EGO
(Please describe any variations to this preservation protocol in the comments section below.)

QA/QC SAMPLE INFORMATION

QA/QC Sample: (Circle One) N/A / Field Blank / Equipment Blank (Field-cleaned) or (Lab-cleaned) Time: _____ (24 hr.)
Van Dorn Equipment ID: _____ Collected by: _____

Photos Taken? Yes / No / Not Due (Required for all Status sites. Required annually for Trend sites.)
Fuel Powered Equipment Used? (e.g. boat motor) Yes / No
Access Method for Sample Collection (circle one):
Wading / Bank or Structure (e.g. bridge, dock) / Motorized Boat /
Non-Motorized Boat (e.g. canoe, kayak) / Air Boat / Other _____
Weather Conditions: P. Cloudy; 70's (comment on back if weather may affect water quality parameter values)
Personnel/Visitors On Site: N/A

PLACE SITE LABEL HERE (if water quality samples collected)

PLACE QA/QC LABEL HERE (if blank collected at this site)

Station Name (Random ID for Status): MNW Bethlehem Rd Date: 3/7/2018

SEDIMENT INFORMATION (for Lakes only) ☒ N/A (Site not a lake or no samples collected. If no samples collected, please state why in comments.)

Collection Depth: _____ (meters) (Total Water Depth) Collection Time: _____ (24 hr.) (Different than surface and bottom time in Field Measurements section)

Collection Interval: (Circle) Top 3-5 cm Other: _____ (cm) (If top 3-5 is too flocculent)

General Sample Collection Area: _____ (Describe-- near shore, central, north side near dock, etc.)

Sample Collection Device: (Circle One) Corer Ekman Petite Ponar Equipment ID: _____

Sediment Type: (Circle All That Apply) Clay/Silt Sand Gravel/Shell Rubble *Organic Muck (*(very fine-grained flocculent organic material))

Sediment Odors: (Circle One) Normal Sewage Petroleum Hydrogen Sulfide Other: _____

Sediment Color: _____

Number of Grabs Collected (3 minimum): _____ Collected by: _____

BIOASSESSMENT INFORMATION

Stream Condition Index Information (Appropriate Trend sites)

Was the SCI sample collected? (Circle One) (Yes) / No / Not Due / NA (not an appropriate Trend site) Collection Time: 1220 (24 hr.) (Different than surface and bottom time in Field Measurements section)

If site was an appropriate Trend stream or river but "NO" was selected, why was the SCI not collected (flooded, < 0.05 m/s velocity, etc.)?

_____

Collected by: ~~1220~~ CO, EGO

Habitat Assessment Information (All Status Streams, Rivers, & Canals; Trend sites appropriate for SCI)

Was the HA performed? (Circle One) (Yes) / No / Not Due / NA (site not a Status Stream/River/Canal or appropriate Trend site)

If site was a stream, river or canal but "NO" was selected, why was the HA not performed (dangerous site conditions, etc)?

_____

Performed by: EGO, CO

Rapid Periphyton Survey Information (Trend sites appropriate for SCI)

Was the RPS performed? (Circle One) (Yes) / No / Not Due / NA (not an appropriate Trend site) ALGAL-ID sample collected? (circle one) Yes (No)

If site was an appropriate Trend stream or river but "NO" was selected, why was the RPS not performed (dangerous site conditions, etc.)?

_____

Performed by: CO, EGO

Linear Vegetation Survey Information (Trend sites appropriate for SCI) / **Lake Vegetation Index Information** (Status Lakes)

Was the LVS performed? (Circle One) (Yes) / No / Not Due / NA (not an appropriate Trend site) Number of Plant ID specimens collected: 0

Was the LVI performed? (Circle One) Yes / No / Not Due (LVI performed previous year) / (NA) (not a Status Lake)

If site was an appropriate Trend stream or river but "NO" was selected, why was LVS not performed (< 2 m^2 aquatic vegetation, dangerous site conditions, etc.)?
If site was a Status Lake but "NO" was selected, why was LVI not performed (LVI will be performed at later date, dangerous site conditions, etc.)?

_____

Performed by: CO, EGO

Comments: Include information such as: estimated level of impact to the system (ex. obvious pollution, etc.), any variations from normal preservation protocols (ex. adding more than 1 vial acid, etc.), any problems experienced with collecting samples (ex. sediment grab 1 lost due to fall-out, etc.), any site specifics (ex. dense submerged vegetation, etc.), any site conditions (ex. recent heavy rains, etc.), description of any photos taken, etc., any qualifiers needed (ex. "J" for failed calibration verification, etc.), etc.

_____

_____

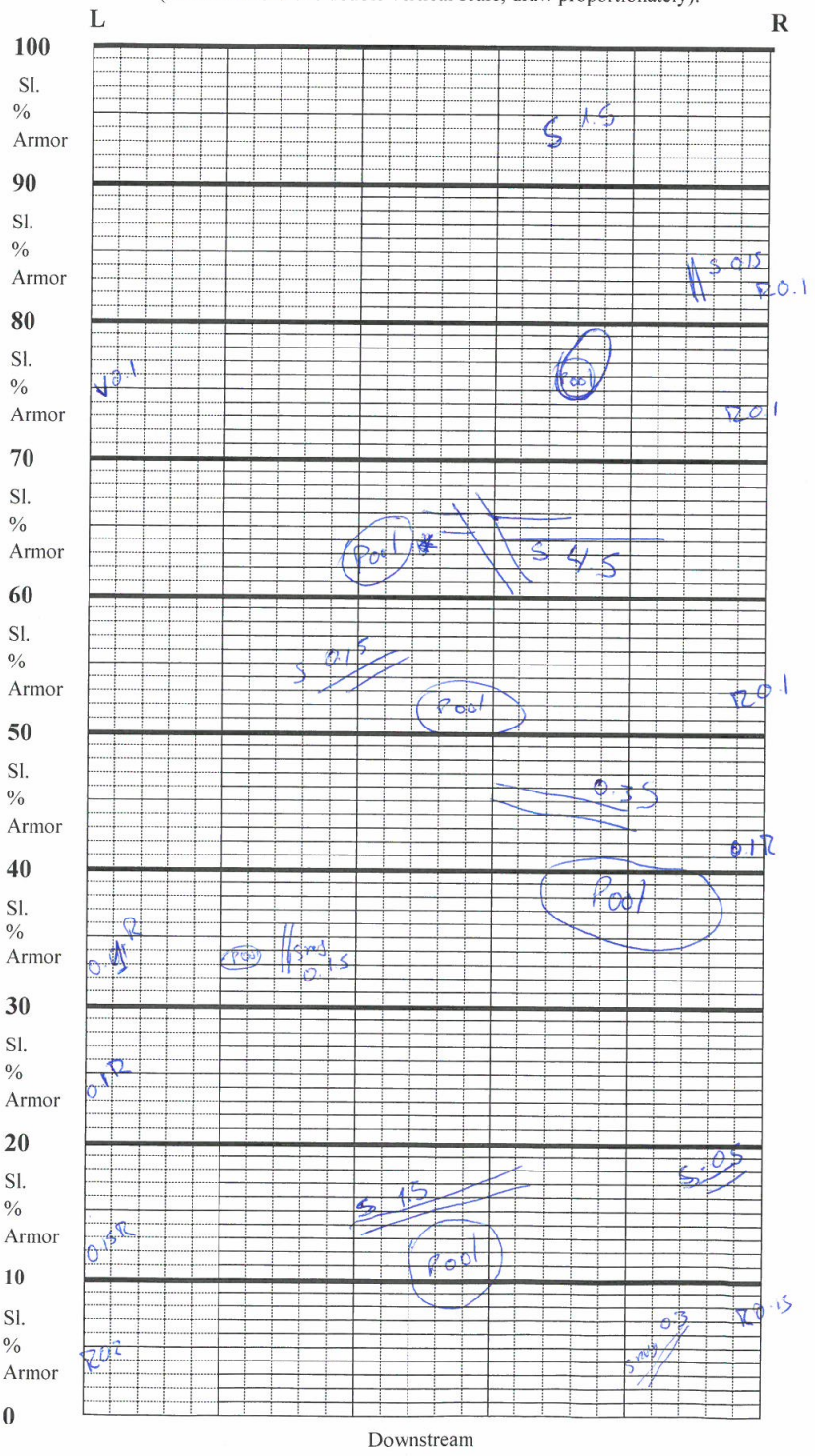
Sampler Names: Catie Orr (Please PRINT) Edgar Guzman Orozco (Please PRINT) _____ (Please PRINT)

Sampler Signatures: _____ _____ _____

OFFICE USE ONLY

Reviewed for completion by: **Date:**

Stream/River Habitat Sketch Sheet, Form FD 9000-4 (March07, 2013)
Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).



Location: MNW Bethlehem Rd.

Date: ~~2/7/2018~~ 3/7/18

Samplers: Catie Orr
Edgar Guerrero Orgil

Substrates: Code key, draw proportionate habitat abundance. %

S	Snags	1.2
R	Roots/undercut banks	0.1
	Leaf Packs (or mats)	
	Macrophytes	

Total observed 1.3

Pool Pools Range expected

Velocity measured at 40 **meter mark.**

WQ & chemistry taken at ____ **meter mark.**

Habitat Smothering:
Note areas (on map) where sand or silt is smothering 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.

1 sec per 1 m	1m/s	sec	m/s
2	0.5	12	0.08
3	0.33	13	0.076
4	0.25	14	0.071
5	0.2	15	0.066
6	0.16	16	0.062
7	0.14	17	0.058
8	0.12	18	0.055
9	0.11	19	0.052
10	0.1	20	0.052
11	0.09	21	0.047
22	0.045	NO	FLOW

Prod. hab	1	2	3	4	5
Sweeps (Maj)	10	7	5	4	3
Sweeps (Min)	10	6	5	4	5

6 m.

Lots of dry root out of water

DEP Form FD 9000-5 Stream/River Habitat Assessment Field Sheet

SAMPLING AGENCY:		STORET STATION NUMBER:	DATE (MM/DD/YY):	RECEIVING BODY OF WATER:
FDEP-SWROC / PM.			03/07/18	Alafia River.
REMARKS:	COUNTY: Polk	LOCATION: South Prong Alafia		FIELD ID/NAME: NW Bethlehem Rd

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** 5	Four or more major productive habitats present [snags, tree roots, aquatic vegetation, leaf packs (partially decayed), rock] 20 19 18 17 16	Three major productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags) 15 14 13 12 11	Two major productive habitats present. Less than desirable habitat, frequently disturbed or removed 10 9 8 7 6	One or less major productive habitat. Lack of habitat is obvious, substrates unstable or smothered (5) 4 3 2 1
Substrate Availability 2	Greater than 30% major productive habitat present at site 20 19 18 17 16	16% to 30% major productive habitat, by aerial extent 15 14 13 12 11	6% to 15% major productive habitat 10 9 8 7 6	Less than 5% major productive habitat 5 4 3 (2) 1
Water Velocity 20	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec ≥0.33 0.31 0.29 0.27 >0.25 (20) 19 18 17 16	Max. observed at typical transect: >0.1 to 0.25 m/sec 0.25 0.21 0.17 0.13 >0.1 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 0.1 0.09 0.07 0.06 0.05 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec; or spate occurring: > 1 m/sec <0.05 0.04 0.03 0.01 <0.01 5 4 3 2 1
Habitat Smothering 15 Primary Score 42	Adequate number of stable pools (1-2 per 12 times width) and <25% of habitats affected by sand, silt, or algae. 20 19 18 17 16	Adequate number of stable pools (1-2 per 12 times width) and >25% of habitats affected by sand, silt, or algae. (15) 14 13 12 11	Does not have required number of stable pools (1-2 per 12 x width) and/or has shallow pools (<2 x prevailing depth). 10 9 8 7 6	Stable pools are absent. Most habitats affected by sand, silt, or algae accumulation. 5 4 3 2 1
Secondary Habitat Components **Artificial Channelization** 17	Expected sinuosity given the stream width. No evidence of dredging or artificial straight-ening. No spoil banks. 20 19 18 (17) 16	Good sinuosity within old chan-nelized area. Evidence of dredging in the past (>25 yrs) but mostly recovered. 15 14 13 12 11	Straightened with trapezoidal cross section, but has a small degree of sinuosity developed within channelized area. 10 9 8 7 6	Straightened or engineered by dredging, has trapezoidal or box cut cross section, lacks required pools. May have spoil banks. 5 4 3 2 1
Bank Stability Right Bank 6 Left Bank 4	Bankfull > 60% of bank height. Slope of bank ≤ 60° from bankful to top of bank. Bankfull is within or above the root zone with few raw, eroded areas. 10 9	Only meets 2 of the 3 requirements for optimal bank stability. 8 7 (6)	Only meets 1 of the 3 requirements for optimal bank stability. 5 (4)	Bankfull < 60% of bank height. Slope of bank > 60°. Bankfull is below the root zone with raw, eroded areas. 3 2 1
Riparian Buffer Zone Width Right Bank 10 Left Bank 8	Width of vegetation greater than 18 m (10) 9	Width of vegetation >12 to 18m (8) 7 6	Width of vegetation 6 to 12 m. human activities close to system 5 4	Less than 6 m of buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 10 Left Bank 8 Secondary Score 63	Over 80% of riparian surfaces consist of normal, expected plant community for given sunlight & habitat conditions (e.g., native plants; tree, shrub, and forbs represented, if appropriate). Minimal disturbance. (10) 9	>50% to 80% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Some disruption in community observed. (8) 7 6	25% to 50% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Disruption obvious. 5 4	Less than 25% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). 3 2 1

105 **TOTAL SCORE**

Date:	Analyst:	Signature:
3/7/18	Catie Orr, Edgar Guevara Orpeda	

62-160.800, F.A.C.

Revision Date: March 1, 2014

DEP FORM FD 9000-25 Rapid Periphyton Survey Field Sheet

Site: MNW Bethlehem Rd | County: Polk | Date: 03/07/18 | Investigators: Colin Orr, Edgar Guzman Orjuela.

STORET Station Number:

Transect (m)	Point 1=right 9=left	Algal Thickness Rank (N-6, X)	Estimated	Canopy Cover
0	1	N		
	2	N		
	3	N		
	4	N		
	5	N		80
	6	N		
	7	N		
	8	N		
	9	N		
10	1	N		
	2	N		
	3	N		
	4	N		
	5	N	✓	96
	6	|	|	
	7	|	|	
	8	|	|	
	9	|	|	
20	1	N		
	2	N		
	3	N		
	4	N		
	5	N		86
	6	N		
	7	N		
	8	N		
	9	N		
30	1	N		
	2	N		
	3	N		
	4	N		
	5	N		91
	6	N		
	7	N		
	8	N		
	9	N		
40	1	~~X~~	~~✓~~	
	2	X		
	3	X		
	4	X		
	5	X		96
	6	N	✓	
	7	|	|	
	8	|	|	
	9	|	|	
50	1	N		
	2	|	|	
	3	|	|	
	4	|	|	
	5	|	|	78
	6	|	|	
	7	|	|	
	8	|	|	
	9	|	|	

Transect (m)	Point 1=right 9=left	Algal Thickness Rank (N-6, X)	Estimated	Canopy Cover
60	1	N		
	2	|	|	
	3	|	|	
	4	|	|	
	5	|	|	82
	6	|	|	
	7	|	|	
	8	|	|	
	9	|	|	
70	1	N		
	2	|	|	
	3	|	|	
	4	|	|	
	5	|	|	75
	6	|	|	
	7	|	|	
	8	|	|	
	9	|	|	
80	1	N		
	2	|	|	
	3	|	|	
	4	|	|	
	5	|	|	91
	6	|	|	
	7	|	|	
	8	|	|	
	9	|	|	
90	1	N		
	2	|	|	
	3	|	|	
	4	|	|	
	5	|	|	93
	6	|	|	
	7	|	|	
	8	|	|	
	9	|	|	
100	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			

Secchi depth	0.4
Estimated?	

# points ranked 4-6	0
total points assessed	90
% points ranked 4-6	

Check accompanying data collected at same site/date.	
Algal mat sample	
Linear Veg Survey	✓
Habitat Assessment	✓
SCI/Biorecon	✓
Water sample	✓

RQ- 2018-02-12-53

Algal Thickness Rank	
N	rough, no algae, slimy, algae up to 1mm
3	>1mm - 6mm
4	>6mm - 20mm
5	>20mm - 10 cm
6	>10 cm

Record "N" and check "Estimated" for points deeper than the Secchi depth; algae are presumed absent. Check "Estimated" if thickness estimated for deep points which can be seen but not reached.

Record "X" for points shallower than Secchi depth for which substrate cannot be seen or reached with the hand. No estimated rank.

Record canopy cover as the number of small densiometer quadrants (out of 96) that HAVE canopy cover. Measure facing upstream at point 4, 5, or 6.

Collect algal mat sample following DEP SOP FS 7240 if the percentage of total sampled points with a thickness rank of 4, 5, or 6 is >20%.

DEP FORM FD 9000-32: LINEAR VEGETATION SURVEY FIELD SHEET

Waterbody: South Prong Alafia @ Bethlehem Rd | Date: 3/7/18 | County: POLK | Storet Number:

Analyst: Carlie Orr, Edgar Guerrero Orgiels | Signature: Carlie Orr

Comments:

Instructions: Note taxa growing in the water with a checkmark if present, "D" if dominant, and "C" if codominant (dominance only if 1 m^2 of taxa present). Note in the boxes below if no dominant are selected, and note total macrophyte abundance rank for each section. Only the most common taxa are listed, so use blank spaces for additional taxa names.

HERBACEOUS SPECIES	Meter Mark 0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	Specimen collected (check)
Alternanthera philoxeroides								X	X	X	
Bacopa caroliniana											
Bacopa monneri											
Bidens mitis											
Boehmeria cylindrica									X		
Centella asiatica											
Ceratophyllum demersum											
Chara											
Cicuta maculata											
Cladium jamaicense											
Colocasia esculenta											
Commelina diffusa											
Commelina virginica											
Crinum americanum											
Diodia virginiana											
Eichhornia crassipes											
Eleocharis (wispy viviparous)											
Hydrilla verticillata											
Hydrocotle									X		
Hygrophila polysperma											
Hymenocallis											
Lachnanthes caroliniana											
Landoltia punctata											
Lemna										X	
Limnophila sessiflora											
Ludwigia leptocarpa											
Ludwigia palustris											
Ludwigia peruviana											
Ludwigia repens											
Luziola fluitans											
If no Dominant or Co-Dominant were selected, indicate with "X"											
Indicate % cover macrophytes per section											
0-5% Macrophyte Coverage											
>5 and ≤10% Macrophyte Coverage											
>10 and ≤25% Macrophyte Coverage											
>25 and ≤50% Macrophyte Coverage											
> 50% Macrophyte Coverage											

HERBACEOUS SPECIES	Meter Mark 0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	Specimen collected (check)
Micranthemum glomeratum											
Micranthemum umbrosum											
Myriophyllum aquaticum											
Najas guadelupensis											
Nuphar luteum								X			
Orontium aquaticum											
Panicum hemitomon											
Panicum repens											
Panicum rigidulum											
Pistia stratioides											
Polygonum glabra											
Polygonum hydropiperoides								X		X	
Polygonum punctatum											
Pontedaria cordata											
Potamogeton illinoensis											
Ruellia simplex											
Sacciolepis striata											
Sagittaria kurziana											
Sagittaria lancifolia											
Sagittaria latifolia											
Salvinia minima											
Samolus parviflora											
Saururus cernuus											
Sparganium americanum											
Typha											
Vallisneria americana											
Zizania aquatica											
Sabal Palmetto					X						
~~water fern~~										X	
Ceratopteris thalictroides										X	

Appendix E

Chemical analysis of effluent and receiving water

Date Sampled	UDL	SCH_Group	Component	Result	Units	MDL	PQL
1/31/2018 10:00	Effluent	Nutrients	Sample Depth	0.3	m		
2/28/2018 12:30	Control Site	AGP/LN	Algal Growth Potential	9.07 A	mg DryWt/L	0.3	0.9
2/28/2018 12:30	Control Site	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.4 I	mg/L	0.2	2
2/28/2018 12:30	Control Site	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	4.9	ug/L	0.55	1.7
2/28/2018 12:30	Control Site	Chlorophyll/Grain Size/BOD	Phaeophytin-a	2.7	ug/L	0.4	1.2
2/28/2018 12:30	Control Site	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Uncorrected	6.7	ug/L	0.4	1.2
2/28/2018 12:30	Control Site	Overflow	Fecal Coliforms-Membrane Filter	50 B	cfu/100 mL	10	10
2/28/2018 12:30	Control Site	Metals	Silver	0.010 U	ug/L	0.01	0.04
2/28/2018 12:30	Control Site	Metals	Chromium	0.40 U	ug/L	0.4	1.6
2/28/2018 12:30	Control Site	Metals	Arsenic	2.19	ug/L	0.05	0.2
2/28/2018 12:30	Control Site	Metals	Sodium	136	mg/L	0.5	2
2/28/2018 12:30	Control Site	Metals	Magnesium	28.8	mg/L	0.04	0.16
2/28/2018 12:30	Control Site	Metals	Zinc	5.0 U	ug/L	5	20
2/28/2018 12:30	Control Site	Metals	Copper	0.20 U	ug/L	0.2	0.8
2/28/2018 12:30	Control Site	Metals	Nickel	0.29 I	ug/L	0.2	0.8
2/28/2018 12:30	Control Site	Metals	Iron	35 I	ug/L	30	120
2/28/2018 12:30	Control Site	Metals	Aluminum	60 U	ug/L	60	240
2/28/2018 12:30	Control Site	Metals	Selenium	0.20 I	ug/L	0.2	0.8
2/28/2018 12:30	Control Site	Metals	Calcium	79.9	mg/L	0.075	0.3
2/28/2018 12:30	Control Site	Metals	Lead	0.094 I	ug/L	0.05	0.2
2/28/2018 12:30	Control Site	Metals	Cadmium	0.020 U	ug/L	0.02	0.08
2/28/2018 12:30	Control Site	Nutrients	Organic Carbon	14	mg C/L	0.5	1
2/28/2018 12:30	Control Site	Nutrients	Total-P	1.1	mg P/L	0.025	0.25
2/28/2018 12:30	Control Site	Nutrients	Fluoride	1.9	mg F/L	0.035	0.1
2/28/2018 12:30	Control Site	Nutrients	NO2NO3-N	0.14	mg N/L	0.004	0.01
2/28/2018 12:30	Control Site	Nutrients	O-Phosphate-P	0.94	mg P/L	0.016	0.04
2/28/2018 12:30	Control Site	Nutrients	Kjeldahl Nitrogen	1.1	mg N/L	0.08	0.2
2/28/2018 12:30	Control Site	Nutrients	Sulfate	370	mg SO4/L	2	5
2/28/2018 12:30	Control Site	Nutrients	Turbidity	2.0	NTU	0.1	0.13
2/28/2018 12:30	Control Site	Nutrients	Ammonia-N	0.055	mg N/L	0.002	0.005
2/28/2018 12:30	Control Site	Nutrients	TSS	3 I	mg/L	2	10
2/28/2018 12:30	Control Site	Nutrients	Chloride	19	mg Cl/L	2	5

Date Sampled	UDL	SCH_Group	Component	Result	Units	MDL	PQL
2/28/2018 12:30	Control Site	Nutrients	TDS	767	mg/L	15	25
2/28/2018 12:30	Control Site	Nutrients	Total Alkalinity	173	mg CaCO3/L	0.65	2.5
2/28/2018 12:30	Control Site	Nutrients	Color (true)	52	PCU	2.5	6
2/28/2018 12:30	Control Site	Priority Organic Pollutants	2,4-Dimethylphenol	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	3,3'-Dichlorobenzidine	9.5 U	ug/L	9.5	38
2/28/2018 12:30	Control Site	Priority Organic Pollutants	4-Nitrophenol	9.5 U	ug/L	9.5	38
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Anthracene	0.024 U	ug/L	0.024	0.095
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Benzidine	9.5 U	ug/L	9.5	38
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Benzo(b)fluoranthene	0.024 U	ug/L	0.024	0.095
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Benzo(k)fluoranthene	0.024 U	ug/L	0.024	0.095
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.024 U	ug/L	0.024	0.095
2/28/2018 12:30	Control Site	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Pentachlorophenol	0.48 U	ug/L	0.48	1.9
2/28/2018 12:30	Control Site	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	2-Chloronaphthalene	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.024 U	ug/L	0.024	0.095
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Dimethyl phthalate	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	0.095 U	ug/L	0.095	0.38
2/28/2018 12:30	Control Site	Priority Organic Pollutants	2,4-Dinitrotoluene	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	2,6-Dinitrotoluene	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	2-Chlorophenol	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Acenaphthene	0.024 U	ug/L	0.024	0.095
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Fluorene	0.024 U	ug/L	0.024	0.095
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Hexachlorobenzene	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Phenanthrene	0.024 U	ug/L	0.024	0.095
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Phenol	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	2,4-Dinitrophenol	9.5 U	ug/L	9.5	38
2/28/2018 12:30	Control Site	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9 U	ug/L	2.9	11
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	1.9 U	ug/L	1.9	7.6
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Hexachlorocyclopentadiene	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Pyrene	0.024 U	ug/L	0.024	0.095
2/28/2018 12:30	Control Site	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Acenaphthylene	0.024 U	ug/L	0.024	0.095

Date Sampled	UDL	SCH_Group	Component	Result	Units	MDL	PQL
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Benzo(a)anthracene	0.024 U	ug/L	0.024	0.095
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Diethyl phthalate	1.9 U	ug/L	1.9	7.6
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Fluoranthene	0.024 U	ug/L	0.024	0.095
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Hexachlorobutadiene	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	2-Nitrophenol	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Butyl benzyl phthalate	0.95 U	ug/L	0.95	3.8
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Chrysene	0.024 U	ug/L	0.024	0.095
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Di-n-butyl phthalate	1.9 U	ug/L	1.9	7.6
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Isophorone	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	2,4-Dichlorophenol	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Benzo(a)pyrene	0.024 U	ug/L	0.024	0.095
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.024 U	ug/L	0.024	0.095
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Hexachloroethane	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Nitrobenzene	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Di-n-octyl phthalate	0.048 U	ug/L	0.048	0.19
2/28/2018 12:30	Control Site	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9 U	ug/L	1.9	7.6
2/28/2018 12:30	Control Site	Priority Organic Pollutants	Naphthalene	0.024 U	ug/L	0.024	0.095
2/28/2018 12:30	Control Site	Nutrients	Sample Depth	0.15	m		
2/28/2018 12:30	Control Site	Nutrients	Dissolved Oxygen	64	%Sat		
2/28/2018 12:30	Control Site	Nutrients	pH	7.6			
2/28/2018 12:30	Control Site	Nutrients	Temperature	23.1	C		
2/28/2018 12:30	Control Site	Nutrients	Specific Conductance	1149	umhos/cm		
2/28/2018 12:30	Control Site	Overflow	Alpha-Counting Error	2.65	pCi/L	4.07	
2/28/2018 12:30	Control Site	Overflow	Alpha, Total	4.07 U	pCi/L	4.07	
2/28/2018 12:30	Control Site	Nutrients	Sample Depth	0.15	m		
2/28/2018 12:30	Control Site	Nutrients	Dissolved Oxygen	64	%Sat		
2/28/2018 12:30	Control Site	Nutrients	Temperature	23.1	C		
2/28/2018 12:30	Control Site	Nutrients	pH	7.6			
2/28/2018 12:30	Control Site	Nutrients	Specific Conductance	1149	umhos/cm		
2/27/2018 13:00	Test Site 1	AGP/LN	Algal Growth Potential	11.1	mg DryWt/L	0.3	0.9
2/27/2018 13:00	Test Site 1	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.3 I	mg/L	0.2	2

Date Sampled	UDL	SCH_Group	Component	Result	Units	MDL	PQL
2/27/2018 13:00	Test Site 1	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	5.3	ug/L	0.55	1.7
2/27/2018 13:00	Test Site 1	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Uncorrected	7.9	ug/L	0.4	1.2
2/27/2018 13:00	Test Site 1	Chlorophyll/Grain Size/BOD	Phaeophytin-a	3.8	ug/L	0.4	1.2
2/27/2018 13:00	Test Site 1	Overflow	Fecal Coliforms-Membrane Filter	60 B	cfu/100 mL	10	10
2/27/2018 13:00	Test Site 1	Metals	Magnesium	29.2	mg/L	0.04	0.16
2/27/2018 13:00	Test Site 1	Metals	Lead	0.094 I	ug/L	0.05	0.2
2/27/2018 13:00	Test Site 1	Metals	Selenium	0.20 U	ug/L	0.2	0.8
2/27/2018 13:00	Test Site 1	Metals	Aluminum	110 I	ug/L	60	240
2/27/2018 13:00	Test Site 1	Metals	Silver	0.010 U	ug/L	0.01	0.04
2/27/2018 13:00	Test Site 1	Metals	Calcium	79.1	mg/L	0.075	0.3
2/27/2018 13:00	Test Site 1	Metals	Zinc	5.0 U	ug/L	5	20
2/27/2018 13:00	Test Site 1	Metals	Chromium	0.40 U	ug/L	0.4	1.6
2/27/2018 13:00	Test Site 1	Metals	Arsenic	2.03	ug/L	0.05	0.2
2/27/2018 13:00	Test Site 1	Metals	Sodium	131	mg/L	0.5	2
2/27/2018 13:00	Test Site 1	Metals	Copper	0.21 I	ug/L	0.2	0.8
2/27/2018 13:00	Test Site 1	Metals	Nickel	0.36 I	ug/L	0.2	0.8
2/27/2018 13:00	Test Site 1	Metals	Iron	68 I	ug/L	30	120
2/27/2018 13:00	Test Site 1	Metals	Cadmium	0.020 U	ug/L	0.02	0.08
2/27/2018 13:00	Test Site 1	Nutrients	Chloride	19	mg Cl/L	2	5
2/27/2018 13:00	Test Site 1	Nutrients	Turbidity	2.0	NTU	0.1	0.13
2/27/2018 13:00	Test Site 1	Nutrients	Total Alkalinity	173	mg CaCO3/L	0.65	2.5
2/27/2018 13:00	Test Site 1	Nutrients	Fluoride	1.9	mg F/L	0.035	0.1
2/27/2018 13:00	Test Site 1	Nutrients	NO2NO3-N	0.14	mg N/L	0.004	0.01
2/27/2018 13:00	Test Site 1	Nutrients	Color (true)	53 A	PCU	2.5	6
2/27/2018 13:00	Test Site 1	Nutrients	Ammonia-N	0.088	mg N/L	0.002	0.005
2/27/2018 13:00	Test Site 1	Nutrients	Kjeldahl Nitrogen	1.1	mg N/L	0.08	0.2
2/27/2018 13:00	Test Site 1	Nutrients	Total-P	1.1	mg P/L	0.025	0.25
2/27/2018 13:00	Test Site 1	Nutrients	TDS	746	mg/L	15	25
2/27/2018 13:00	Test Site 1	Nutrients	O-Phosphate-P	0.96	mg P/L	0.016	0.04
2/27/2018 13:00	Test Site 1	Nutrients	Sulfate	360	mg SO4/L	2	5
2/27/2018 13:00	Test Site 1	Nutrients	Organic Carbon	14	mg C/L	0.5	1
2/27/2018 13:00	Test Site 1	Nutrients	TSS	3 I	mg/L	2	10
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	2-Chlorophenol	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Naphthalene	0.024 U	ug/L	0.024	0.095
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.048 U	ug/L	0.048	0.19

Date Sampled	UDL	SCH_Group	Component	Result	Units	MDL	PQL
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Hexachloroethane	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Pyrene	0.024 U	ug/L	0.024	0.095
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	2,4-Dichlorophenol	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	2,4-Dinitrotoluene	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	2,6-Dinitrotoluene	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9 U	ug/L	2.9	11
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	3,3'-Dichlorobenzidine	9.5 U	ug/L	9.5	38
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Anthracene	0.024 U	ug/L	0.024	0.095
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.024 U	ug/L	0.024	0.095
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9 U	ug/L	1.9	7.6
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Diethyl phthalate	1.9 U	ug/L	1.9	7.6
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Dimethyl phthalate	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Hexachlorocyclopentadiene	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	0.095 U	ug/L	0.095	0.38
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	2-Nitrophenol	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Acenaphthylene	0.024 U	ug/L	0.024	0.095
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Benzidine	9.5 UJ	ug/L	9.5	38
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Pentachlorophenol	0.48 U	ug/L	0.48	1.9
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	2,4-Dimethylphenol	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	4-Nitrophenol	9.5 U	ug/L	9.5	38
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Benzo(a)anthracene	0.024 U	ug/L	0.024	0.095
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Benzo(a)pyrene	0.024 U	ug/L	0.024	0.095
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.024 U	ug/L	0.024	0.095
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Phenanthrene	0.024 U	ug/L	0.024	0.095
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Phenol	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	2,4-Dinitrophenol	9.5 UJ	ug/L	9.5	38
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Benzo(b)fluoranthene	0.024 U	ug/L	0.024	0.095
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Butyl benzyl phthalate	0.95 U	ug/L	0.95	3.8
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Fluorene	0.024 U	ug/L	0.024	0.095
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Isophorone	0.048 U	ug/L	0.048	0.19

Date Sampled	UDL	SCH_Group	Component	Result	Units	MDL	PQL
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Nitrobenzene	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	2-Chloronaphthalene	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Acenaphthene	0.024 U	ug/L	0.024	0.095
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	1.9 U	ug/L	1.9	7.6
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Di-n-butyl phthalate	1.9 U	ug/L	1.9	7.6
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.024 U	ug/L	0.024	0.095
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Fluoranthene	0.024 U	ug/L	0.024	0.095
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Hexachlorobenzene	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Hexachlorobutadiene	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Chrysene	0.024 U	ug/L	0.024	0.095
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Di-n-octyl phthalate	0.048 U	ug/L	0.048	0.19
2/27/2018 13:00	Test Site 1	Priority Organic Pollutants	Benzo(k)fluoranthene	0.024 U	ug/L	0.024	0.095
2/27/2018 13:00	Test Site 1	Nutrients	Dissolved Oxygen	75	%Sat		
2/27/2018 13:00	Test Site 1	Nutrients	Specific Conductance	1142	umhos/cm		
2/27/2018 13:00	Test Site 1	Nutrients	Temperature	24.3	C		
2/27/2018 13:00	Test Site 1	Nutrients	Sample Depth	0.15	m		
2/27/2018 13:00	Test Site 1	Nutrients	pH	7.6			
2/27/2018 13:00	Test Site 1	Overflow	Alpha, Total	4.31	pCi/L	4.11	
2/27/2018 13:00	Test Site 1	Overflow	Alpha-Counting Error	2.91	pCi/L	4.11	
2/27/2018 13:00	Test Site 1	Nutrients	Sample Depth	0.15	m		
2/27/2018 13:00	Test Site 1	Nutrients	Dissolved Oxygen	75	%Sat		
2/27/2018 13:00	Test Site 1	Nutrients	pH	7.6			
2/27/2018 13:00	Test Site 1	Nutrients	Temperature	24.3	C		
2/27/2018 13:00	Test Site 1	Nutrients	Specific Conductance	1142	umhos/cm		
2/28/2018 9:50	Test Site 1	Nutrients	Sample Depth	0.15	m		
2/28/2018 9:50	Test Site 1	Nutrients	Specific Conductance	1143	umhos/cm		
2/28/2018 9:50	Test Site 1	Nutrients	pH	7.3			
2/28/2018 9:50	Test Site 1	Nutrients	Temperature	22.9	C		
2/28/2018 9:50	Test Site 1	Nutrients	Dissolved Oxygen	56	%Sat		
3/7/2018 13:30	Test Site 2	AGP/LN	Algal Growth Potential	22.5	mg DryWt/L	0.3	0.9
3/7/2018 13:30	Test Site 2	Chlorophyll/Grain Size/BOD	Phaeophytin-a	5.0	ug/L	0.45	1.4
3/7/2018 13:30	Test Site 2	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.4 I	mg/L	0.2	2

Date Sampled	UDL	SCH_Group	Component	Result	Units	MDL	PQL
3/7/2018 13:30	Test Site 2	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Uncorrected	10	ug/L	0.45	1.4
3/7/2018 13:30	Test Site 2	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	7.1	ug/L	0.62	1.9
3/7/2018 13:30	Test Site 2	Overflow	Fecal Coliforms-Membrane Filter	96 B	cfu/100 mL	1	1
3/7/2018 13:30	Test Site 2	Metals	Calcium	71.5	mg/L	0.075	0.3
3/7/2018 13:30	Test Site 2	Metals	Arsenic	1.93	ug/L	0.05	0.2
3/7/2018 13:30	Test Site 2	Metals	Selenium	0.24 I	ug/L	0.2	0.8
3/7/2018 13:30	Test Site 2	Metals	Lead	0.11 I	ug/L	0.05	0.2
3/7/2018 13:30	Test Site 2	Metals	Sodium	81.4	mg/L	0.5	2
3/7/2018 13:30	Test Site 2	Metals	Aluminum	134	ug/L	3	12
3/7/2018 13:30	Test Site 2	Metals	Nickel	1.25	ug/L	0.2	0.8
3/7/2018 13:30	Test Site 2	Metals	Cadmium	0.020 U	ug/L	0.02	0.08
3/7/2018 13:30	Test Site 2	Metals	Magnesium	30.7	mg/L	0.04	0.16
3/7/2018 13:30	Test Site 2	Metals	Iron	170	ug/L	30	120
3/7/2018 13:30	Test Site 2	Metals	Silver	0.010 U	ug/L	0.01	0.04
3/7/2018 13:30	Test Site 2	Metals	Zinc	7.4 I	ug/L	5	20
3/7/2018 13:30	Test Site 2	Metals	Chromium	0.40 U	ug/L	0.4	1.6
3/7/2018 13:30	Test Site 2	Metals	Copper	0.20 U	ug/L	0.2	0.8
3/7/2018 13:30	Test Site 2	Nutrients	Chloride	18	mg Cl/L	0.4	1
3/7/2018 13:30	Test Site 2	Nutrients	Total-P	1.1	mg P/L	0.025	0.25
3/7/2018 13:30	Test Site 2	Nutrients	Fluoride	2.8	mg F/L	0.035	0.1
3/7/2018 13:30	Test Site 2	Nutrients	Kjeldahl Nitrogen	1.1	mg N/L	0.08	0.2
3/7/2018 13:30	Test Site 2	Nutrients	Sulfate	300	mg SO4/L	2	5
3/7/2018 13:30	Test Site 2	Nutrients	TDS	636 A	mg/L	15	25
3/7/2018 13:30	Test Site 2	Nutrients	O-Phosphate-P	0.93	mg P/L	0.016	0.04
3/7/2018 13:30	Test Site 2	Nutrients	Total Alkalinity	167	mg CaCO3/L	0.65	2.5
3/7/2018 13:30	Test Site 2	Nutrients	NO2NO3-N	0.23	mg N/L	0.004	0.01
3/7/2018 13:30	Test Site 2	Nutrients	TSS	3 IA	mg/L	2	10
3/7/2018 13:30	Test Site 2	Nutrients	Ammonia-N	0.14	mg N/L	0.002	0.005
3/7/2018 13:30	Test Site 2	Nutrients	Color (true)	41	PCU	2.5	6
3/7/2018 13:30	Test Site 2	Nutrients	Organic Carbon	12	mg C/L	0.5	1
3/7/2018 13:30	Test Site 2	Nutrients	Turbidity	3.8	NTU	0.1	0.13
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Naphthalene	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Benzo(a)pyrene	0.024 U	ug/L	0.024	0.094
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	0.047 U	ug/L	0.047	0.19

Date Sampled	UDL	SCH_Group	Component	Result	Units	MDL	PQL
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Di-n-octyl phthalate	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Hexachlorobutadiene	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Pentachlorophenol	0.47 U	ug/L	0.47	1.9
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Phenanthrene	0.024 U	ug/L	0.024	0.094
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Benzo(a)anthracene	0.024 U	ug/L	0.024	0.094
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.024 U	ug/L	0.024	0.094
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Di-n-butyl phthalate	1.9 U	ug/L	1.9	7.5
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Phenol	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	2-Nitrophenol	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Anthracene	0.024 U	ug/L	0.024	0.094
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Benzo(k)fluoranthene	0.024 U	ug/L	0.024	0.094
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Butyl benzyl phthalate	0.94 U	ug/L	0.94	3.8
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Hexachloroethane	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.8 U	ug/L	2.8	11
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	3,3'-Dichlorobenzidine	9.4 U	ug/L	9.4	38
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Acenaphthene	0.024 U	ug/L	0.024	0.094
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Chrysene	0.024 U	ug/L	0.024	0.094
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Isophorone	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9 U	ug/L	1.9	7.5
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	0.094 U	ug/L	0.094	0.38
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	2,4-Dinitrophenol	9.4 U	ug/L	9.4	38
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	2-Chloronaphthalene	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	4-Nitrophenol	9.4 U	ug/L	9.4	38
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	1.9 U	ug/L	1.9	7.5
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.024 U	ug/L	0.024	0.094
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Fluorene	0.024 U	ug/L	0.024	0.094
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	2,6-Dinitrotoluene	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	2-Chlorophenol	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Benzo(b)fluoranthene	0.024 U	ug/L	0.024	0.094

Date Sampled	UDL	SCH_Group	Component	Result	Units	MDL	PQL
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Hexachlorocyclopentadiene	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Nitrobenzene	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	2,4-Dinitrotoluene	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Dimethyl phthalate	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Fluoranthene	0.024 U	ug/L	0.024	0.094
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Hexachlorobenzene	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Pyrene	0.024 U	ug/L	0.024	0.094
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	2,4-Dichlorophenol	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	2,4-Dimethylphenol	0.047 U	ug/L	0.047	0.19
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Acenaphthylene	0.024 U	ug/L	0.024	0.094
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Diethyl phthalate	1.9 U	ug/L	1.9	7.5
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.024 U	ug/L	0.024	0.094
3/7/2018 13:30	Test Site 2	Priority Organic Pollutants	Benzidine	9.4 U	ug/L	9.4	38
3/7/2018 13:30	Test Site 2	Nutrients	Sample Depth	0.2	m		
3/7/2018 13:30	Test Site 2	Nutrients	pH	8.2			
3/7/2018 13:30	Test Site 2	Nutrients	Temperature	21.5	C		
3/7/2018 13:30	Test Site 2	Nutrients	Specific Conductance	759	umhos/cm		
3/7/2018 13:30	Test Site 2	Nutrients	Dissolved Oxygen	73	%Sat		
3/7/2018 13:30	Test Site 2	Overflow	Alpha-Counting Error	2.67	pCi/L	3.66	
3/7/2018 13:30	Test Site 2	Overflow	Alpha, Total	4.28	pCi/L	3.66	