

Biological Assessment of

Lynn Haven WWTF

Bay County

NPDES #FL0169978

Sampled February 19-22, 2012

July 2012

Biology Section

Bureau of Laboratories

Division of Environmental Assessment and Restoration

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EPA End Sheet

Facility Overview

The Lynn Haven Wastewater Treatment Facility is a Municipal Domestic Wastewater Treatment Plant. The effluent is discharged into St. Andrew Bay, a Class III Marine Water (see map Appendix A) at Discharge Location (D-001) which extends approximately 1550 feet from shore and discharges at a depth of 32 feet. The Millville WWTF point of discharge is adjacent to the Lynn Haven WWTF point of discharge. In addition to Millville WWTF there are several major NPDES facilities that discharge into St. Andrew Bay, including the Chevron USA Panama City Terminal, St. Andrews WWTF and Military Point WWTF (see Appendix A-2). The design flow of the wastewater system is 2.5 million gallons per day (MGD). The annual average flow to D-001 for February 2011 to January 2012 was 1.43 MGD. The plant discharges using a sequencing batch reactor, and the flow measured during this survey ranged from 900 gallons per minute and 2200 gallons per minute (Lynn Haven WWTF staff).

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

See the Facility Summary (Appendix B) for a description of the facility, summary of permit limits, and discharge monitoring report (DMR) information.

Methods

The purpose of this investigation was to determine the discharger's effects on the biota of the receiving waters. Chemical and biological comparisons were made between the Outfall (Test Site), 2.9 miles southeast of the Outfall (Control Site East) and 1.8 miles southwest of the Outfall (Control Site West). The Control Site West was chosen because it was used in a 2009 inspection for another facility so that temporal comparisons between the macroinvertebrate communities can be made. However differences in the number of ponar samples collected prevent a direct comparison from being made. The facility was discharging to the bay when the Fifth Year sampling was conducted. Sites were sampled on an incoming tide (water flowing north) but the rise in water was less than 1 foot. The effluent pipe's diffuser boil could not be seen at the time of sampling, likely due to the depth of the discharge. Effluent samples for analyses were taken as grab samples from monitoring location EFF-02 after dechlorination. Toxicity samples were composite samples collected from EFF-02.

All field and laboratory biological methods followed Bureau of Laboratories and Biology Section Standard Operating Procedures (see http://www.dep.state.fl.us/labs/library/lab_sops.htm and http://www.dep.state.fl.us/water/sas/sop/sops.htm for details) and met DEP quality assurance/quality control standards (see http://www.dep.state.fl.us/water/sas/qa/index.htm). Explanations of specific methods and measurements can be found in Appendix C.

The following were involved in this investigation: Nathan Mulkey, Corinna Clanton, Rick Abad and Mike King (DEP Northwest District) and DEP Central Laboratory in Tallahassee. The report was reviewed by District representatives and the Point Source Studies Review Committee (Michelle Fish, Ed Smith, and Nancy Ross).

Results

Organic Constituents - Water (See Table 1 and Appendix F)

- Atrazine was detected in the effluent at a level between the method detection limit (MDL) and the practical quantitation limit (PQL).
- No organic constituents were detected in the receiving waters or the field blank.

Metals - Water (See Table 1 and Appendix F)

- All metals in the effluent samples were either undetected or detected at levels that complied with Class III Marine Water Quality Criteria (62-302.530, F.A.C.) and effluent permit limits.

- All metals in Control and Test Site grab samples were either undetected or detected at levels that complied with Class III Marine Water Quality Criteria (62-302.530, F. A. C.).
- Metals were not detected in the field blank.

Toxicity Whole Effluent Test (See Table 1 and Appendices F, G, and H)

- The freshwater chronic definitive bioassays were performed February 21 through February 29, 2012.
- The effluent sample IC25 for the fish, *Pimephales promelas*, and the IC25 for the water flea, *Ceriodaphnia dubia,* were calculated as being greater than 100% effluent because inhibition, if any, of growth or reproduction was less than 25% in 100% effluent; therefore, the effluent was in compliance with effluent permit limits for chronic toxicity.

Physical and Chemical Parameters (See Table 1 and Appendices E and F)

- The Test Site had greater littoral alterations, greater storm water discharge and muddier sediments than the Control Sites. Of the following habitat types: mangrove swamp, marsh, oyster bar, grass bed, reef, saltern, natural beach, and tidal creek, none were observed at the Test Site. Two to three of these habitat types were observed at the Control Sites.
- Dissolved oxygen (mg/L), pH (Standard Units) and specific conductance of the effluent, Control Sites and Test Site complied with Class III Marine Water Quality Criteria (62-302.530, F.A.C.) and effluent permit limits.
- Total residual chlorine (TRC) of the effluent was undetected in the bioassay sample as measured in the FDEP laboratory. The sample was held beyond the normal holding time for this measurement (Q qualifier).
- Chlorophyll *a* (corrected) was detected in the 3 receiving water sites all between the MDL and PQL. Effluent chlorophyll a – corrected was detected at a slightly higher level than the Control and Test Sites.
- Total suspended solids (mg/L) and Carbonaceous Biological Oxygen Demand (CBOD; mg/L) of the effluent complied with permit limits.

Microbiology (See Table 1 and Appendix F)

- Fecal coliforms detected in the effluent complied with Class III Marine Water Quality Criteria (62-302.530, F.A.C.). Enterococci detected in the effluent were over 8 times higher than the next highest sample in this study. Since the samples were not collected at the microbiology compliance point (EFA-02), further sampling at the compliance point for fecal coliforms and enterococci is needed to determine if there is an exceedance of permit limits.
- Enterococci and fecal coliform analyses were performed by The Water Spigot, Panama City, Florida.
- Control Site East and West Fecal Coliforms were detected at levels that complied with Class III Marine Water Quality Criterion (62-302.530(6), F.A.C.). Enterococci were detected at a low level in both sites.
- Test Site fecal coliforms were undetected and therefore complied with Class III Marine Water Quality Criterion (62-302.530(6), F.A.C.). Enterococci were detected at a low level.

Nutrients (See Table 1 and Appendices F)

- Total phosphorus and total nitrogen of the effluent complied with effluent permit limits.
- All effluent nutrient values with the exception of un-ionized ammonia were higher than the Control Sites and Test Site. Test Site nutrient values were similar to the Control Site and do not reflect nutrient enrichment from the effluent.
- Nutrients were undetected in the field blank.

Algal Growth Potential (See Table 2 and Appendix F)

- Raschke and Shultz (1987) determined that AGP values above 10.0 mg dry weight/L represent a "problem" threshold for marine receiving waters, implying nutrient enrichment. The AGP of the salinity adjusted effluent was below the "problem" threshold for the saltwater species *Dunaliella*

tertiolecta. The ratio of total nitrogen to total phosphorus suggests that the effluent is phosphorus limited.

- AGP values for the Control Sites and Test Site were undetected for the saltwater species *Dunaliella tertiolecta*.
- Raschke and Schultz (1987) found that AGP values above 5.0 mg dry weight/L represent a "problem" threshold for fresh receiving waters, implying nutrient enrichment. The AGP value of the effluent using the freshwater species *Pseudokirchneriella subcapitata* was 15 times the "problem" threshold.
- One potential reason for the lack of growth in the salinity-adjusted effluent sample is precipitation of enough orthophosphate by the added salts that the sample became extremely phosphorus-limited (Manahan 1994).

Sediments (See Table 3, Figures 1 and 2, and Appendix F)

- A sediment sample was only collected for the Test Site. Control Site samples were planned but due to an error they could not be collected.
- The Test Site sediments were mostly fine silt. The sample was black, very porous and consisted of 28% dry weight organic content.
- Arsenic (9.02 mg/kg A), chromium III (54.1 mg/kg A), and copper (20.8 mg/kg A) exceeded the TEL for metals.
- Anthracene(66 µg/kg I), benzo(a)anthracene(140 µg/kg), benzo(a)pyrene(140 µg/kg I), chrysene(170 µg/kg), fluoranthene(310 µg/kg), naphthalene(41 µg/kg I), phenanthrene(160 µg/kg) and pyrene(340 µg/kg) exceeded the Threshold Effects Level (TEL) for organic constituents.
- Anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene and naphthalene were detected in the Test Site sediment sample at a level between the MDL and PQL.
- The sediment metal levels may be due to greater binding affinity of metals to smaller sediment particle sizes (Horowitz, 1985).

Bioassessment - Macroinvertebrates (See Table 4a, Table 4b and Appendices I-1 and I-2)

- No study establishing the path of the effluent plume was conducted prior to sampling. The effluent plume was assumed to move South of Outfall D-001.
- Macroinvertebrate samples were collected using a petite ponar. Each sample consisted of 6 ponar drops.
- The Shannon-Weaver Diversity score at the Test Site (3.14) showed a 38% reduction compared to the Control Site West score (5.05). The Control Site East score (3.22) was similar to the Test Site. However, all three sites had less than 300 individuals, and Shannon Weaver diversity scores calculated with less than 300 individuals have the potential for negative bias (Lande 1996).
- The macroinvertebrate communities may be qualitatively compared using Bray Curtis Similarities. Bray Curtis Similarities are commonly used to compare biological communities in ecological studies. The Control Site West and Test Site were more similar than any other paired site comparison at 21.1%. Control Site East was 7.9% similar to Control Site West which indicates high natural variability in the macroinvertebrate community possibly due to natural and spatial influences on community structure or multiple discharge influences within St. Andrew Bay.
- The Test Site had more bivalves but fewer polychaetes than the Control Sites. The dominant taxon at the Test Site was the bivalve *Sphenia fragilis*. This taxon accounts for the larger percentage of suspension feeders at the Test Site. The dominant taxon at the Control Site East was the polychaete, *Minuspio perkinsi* and at the Control Site West, the polychaete, *Scoletoma verrilli*.

Conclusion

The nutrient results and the AGP values do not reflect nutrient enrichment at the Test Site as a result of the effluent. Further sampling of fecal coliforms and enterococci at the compliance point is needed to determine if there is an exceedance of permit limits. Anthracene, benzo(a)anthracene, benzo(a)pyrene, chrysene, fluoranthene, naphthalene, phenanthrene and pyrene detected in Test Site sediments exceeded the Threshold Effects Level (TEL) for organic constituents. Arsenic, chromium III, and copper in the sediments exceeded the TEL for metals. The sediment metal levels may be due to greater binding affinity of metals to smaller sediment particle sizes (Horowitz, 1985), which is consistent with the analytical results. The Test Site sediments consisted of 28% dry weight organic content. The benthic macroinvertebrates at the Test Site may have been adversely affected by the high organic content, the PAHs, and/or the 3 metals exceeding the TEL in the sediment samples. Low numbers of macroinvertebrates were collected from all three study sites. The Test Site had approximately half the number of individuals found at the Control Sites. Sediment results cannot be directly attributed to the Lynn Haven effluent since sediment samples were not collected at the Control Sites for comparison. Also, there are multiple discharges into the bay including the Millville outfall directly adjacent to the Lynn Haven outfall which would complicate the assignment of results to a single effluent.

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Table 1. Effluent limits, Class III Criteria for predominantly marine waters and chemical, microbiological and toxicological data.

Lynn Haven WWTF	Class III Criteria	Effluent Limits	Effluent	Control Site East	Control Site West	Test Site
Organic Constituents (µg/L)						
Atrazine	-	-	0.1 I	-	-	-
Metals (µg/L unless otherwise noted)						
Aluminum	≤ 1500	-	47	60	45 I	44 I
Arsenic	≤ 50	≤ 50 p	0.25 U	0.75 U	0.78 I	1.1 I
Cadmium	≤ 8.8	-	0.05 U	0.15 U	0.15 U	0.15 U
Calcium (mg/L)	-	-	27.1	351	372	364
Chromium-III	-	-	0.3 U	0.9 U	0.9 U	0.9 U
Copper	≤ 3.7	≤ 3.7 p	2.73	1.5 U	1.5 U	1.5 U
Iron	≤ 300	-	33 I	90 U	90 U	90 U
Lead	≤ 8.5	≤ 8.5 p	0.2 U	0.6 U	0.6 U	0.6 U
Magnesium (mg/L)	-	-	13.1	1100	1180	1170
Nickel	≤ 8.3	≤ 8.3 p	0.77 I	0.75 U	0.75 U	0.75 U
Selenium	≤ 71	-	0.2 U	0.6 U	0.6 U	0.6 U
Silver	≤ 2.3	-	0.025 U	0.075 U	0.075 U	0.075 U
Sodium	-	-	57	9320	9900	9550
Zinc	≤ 86	≤ 86.0 p	38	15 U	15 U	15 U
Nutrients (mg/L)						
Total Organic Carbon	-	-	5.6	2.2 I	2.7 I	2.3 I
Ortho-phosphate	-	-	0.017	0.008 U	0.008 U	0.009 I
Total Phosphorus	-	≤ 2.0 p	0.055	0.013 I	0.014 I	0.018 I
Total Ammonia	-	-	0.035	0.01 U	0.01 U	0.01 U
Un-ionized Ammonia	-	-	≤ 0.02 c	≤ 0.02 c	≤ 0.02 c	≤ 0.02 c
Nitrate and Nitrite	-	-	1.2	0.005 U	0.005 U	0.005 U
Total Kjeldahl Nitrogen	-	-	0.7	0.16 U	0.16 U	0.16 U
Organic Nitrogen	-	-	0.665 c	≤ 0.08 U c	≤ 0.08 U c	≤ 0.08 U c
Total Nitrogen	-	≤ 9.0 p	1.9 c	≤ 0.08 U c	≤ 0.08 U c	≤ 0.08 U c
General Physical and Chemical Parameters						
Dissolved Oxygen (mg/L)	≥ 4.0	-	10.1	8.3	8.2	8.1
pH (SU)	6.5 - 8.5	6.5 - 8.5	7.3	7.9	7.9	7.8
Conductivity (µmhos/cm)	-	-	55	45736	47968	47264
Temperature (°C)	-	-	18.4	16.7	16.9	17.0
Salinity	-	-	≤ 0.03 c	36 c	37.8 c	37.1 c
Sample Depth (m)	-	-	-	0.15	0.15	0.15
Total Residual Chlorine (mg/L)	≤ 0.01	-	≤ 0.03 UQ£	-	-	-
Chlorophyll *a* (µg/L) - Corrected	-	-	3.6	1.5 I	1.7 I	1.6 I
Phaeophytin (µg/L)	-	-	0.41 U	0.4 U	0.4 U	0.4 U
Total Suspended Solids (mg/L)	-	≤15.0 s	3 I	11	8 I	10 I
Alkalinity (mg CaCO3)	-	-	86	104 A	110	109
Turbidity (NTU)	< 29 t	-	1.1 A	1.8	0.95	1
Color (PCU)	-	-	23	2.5 U	2.5 U	2.5 U
Chemical Oxygen Demand (mg/L)	-	-	78	620	620	640
CBOD, 5 day (mg/L), N - inhibited	-	≤ 12.6 s	0.72 I	1.0 IJ	1.1 IJ	1.2 IJ
BOD, 5 day (mg/L), N - uninhibited	-	-	1.0 I	1.4 I	1.5 I	1.2 I
Chloride (mg/L)	-	-	76	16000	18000	17000
Fluoride (mg/L)	≤ 5.0	-	0.29	1.1	1.1	1.1
Sulfate (mg/L)	-	-	47	2300	2400	2300
Flow (MGD)	-	≤ 2.5 a	1.43 a	-	-	-
Toxicity (Chronic Definitive, IC25, % effluent)						
Bioassay - Water flea *(Ceriodaphnia dubia) survival and reproduction*	-	≥ 100	> 100†	-	-	-
Bioassay - Fish *(Pimephelas promelas) growth and survival*	-	≥ 100	> 100†	-	-	-
Microbiology (Number of colony forming units/100ml)						
Enterococci ¥	-	-	172	20 B	8 B	8 B
Fecal Coliforms ¥	≤ 400s #	-	89 B	1.1 B	1.1 B	1 U

a - Annual average
c - Value is calculated
p - 16 hour flow proportioned composite
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
J - Estimated value;CBOD-Control Site East and Control Site West-GGA Control Sample result was 223 ppm. The control sample acceptance limits are 165 +/- 26 ppm;CBOD-Test Site-Laboratory duplicate result is 0.99 I mg/L. Precision data is unavailable due to the small amount of analyte in the QC sample. GGA Control Sample result was 223 ppm. The control sample acceptance limits are 165 +/- 26 ppm.
Q - Sample held beyond normal holding time
U - Material analyzed for but not detected; value reported is the method detection limit
IC25 - 25% Inhibition Concentration
¥ - Fecal coliform analysis performed by The Water Spigot, Panama City, FL
- If 10 or fewer samples are taken within a month, the single sample limit is 400 CFU (62-302.530(6), F.A.C.)
£ - measurement taken in the FDEP laboratory
†-Insufficient inhibition of growth or reproduction to calculate the IC25

Table 2a. Measured and predicted algal growth potential (AGP; mg dry weight/L) for orthophosphate (OP) and total phosphorus (TP) limitation of the freshwater species *Pseudokirchneriella subcapitata* and ratios of nitrogen to phosphorus.

Lynn Haven WWTF					
Location	AGP (measured)	Predicted AGP (OP) ± 20%	Predicted AGP (TP) ± 20%	Inorganic N:P ratio	Total N:P ratio
Effluent	76.5	7.3 ± 1.5	23.7 ± 4.7	72.6	34.5

Table 2b. Measured algal growth potential (AGP; mg dry weight/L) of the saltwater species *Dunaliella tertiolecta* and ratios of nitrogen to phosphorus.

Lynn Haven WWTF			
Location	AGP (measured)	Inorganic N:P ratio	Total N:P ratio
Effluent*	6.5	72.6	34.5
Control Site East	3.0 U	1.9	12.7
Control Site West	3.0 U	1.9	11.8
Test Site	3.0 AU	1.7	9.2

* - sample salinity adjusted to 7ppt
A - Value reported is the mean of two or more determinations
U - Material analyzed for but not detected; value reported is the method detection limit

Table 3. Sediment Data for City of Lynn Haven WWTF

Lynn Haven WWTF	Sediment Quality Assessment Guidelines		Test Site	
	TEL	PEL		
Particle Size Distribution (percent volume < 2mm)				
< 0.063 mm	-	-	72.6	A
0.063 - 0.125 mm	-	-	13.6	A
0.125 - 0.25 mm	-	-	8.15	A
0.25 - 0.5 mm	-	-	4.49	A
0.5 - 2.0 mm	-	-	1.19	A
> 2.0 mm (percent dry weight)	-	-	2.2	AJ
Organic Content				
Organic Content (percent dry weight)	-	-	28	A
Organic Constituents (ug/kg)				
Anthracene	46.9	245	66	I*
Benzo(a)anthracene	74.8	693	140	*
Benzo(a)pyrene	88.8	763	140	I*
Benzo(b)fluoranthene	-	-	220	
Benzo(g,h,i)perylene	-	-	80	I
Benzo(k)fluoranthene	-	-	77	I
Chrysene	108	846	170	*
Fluoranthene	113	1494	310	*
Indeno(1,2,3-cd)pyrene	-	-	71	I
Naphthalene	34.6	391	41	I*
Phenanthrene	86.7	544	160	*
Pyrene	153	1398	340	*
Metals (mg/kg)				
Arsenic	7.24	41.6	9.02*	A
Cadmium	0.676	4.21	0.31	A
Chromium III	52.3	160	54.1*	A
Copper	18.7	108	20.8*	A
Lead	30.2	112	28.4	A
Nickel	15.9	42.8	13.7	A
Silver	0.733	1.77	0.171	A
Zinc	124	271	64.2	A

Sediment Quality Assessment Guidlines (MacDonald 1994): TEL = Threshold Effects Level; PEL = Probable Effects Level

* Exceeds the threshold effects level from Sediment Quality Assessment Guidlines (MacDonald 1994)

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

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

J - Estimated value; Result is J-qualified due to a lab duplicate RPD failure. Particles > 2.0 mm are analyzed as a percentage of the total dry weight, not by laser, and therefore not calculated in the sum total of all fractions.

Table 4a. Macroinvertebrate Petite Ponar Samples - Quantitative.
Invertebrates identified by Water and Air Research, Inc. Metrics Calculated By FDEP.

Lynn Haven WWTF	Control Site East	Control Site West	Test Site
Summary Statistics			
Shannon-Weaver Diversity	3.22*	5.05*	3.14*
Number of Taxa	24	51	17
Percent Dominant Taxon	32.0	9.4	32.9
Dominant Taxon Name	*Minuspio perkinsi* (Polychaeta)	*Scoletoma verrilli* (Polychaeta)	*Sphenia fragilis* (Bivalvia)
Number of samples/site	6	6	6
Total Number of Individuals (counted)	184	198	96
Community Composition: Percent of total			
Amphipoda	1.6	14.6	0.0
Bivalvia	3.3	14.2	52.0
Cumacea	0.0	1.0	2.1
Decapoda	2.7	0.5	1.1
Echinodermata	4.9	1.0	0.0
Gastropoda	0.0	13.2	0.0
Isopoda	0.0	1.5	0.0
Nemertea	17.3	5.0	12.4
Polychaeta	70.1	41.4	32.5
Sipuncula	0.0	1.0	0.0
Tanaidacea	0.0	3.5	0.0
Other	0.1	3.1	0.0
Functional Feeding Groups: Percent of total			
Browser-Grazers	1.6	5.8	0.0
Burrowing Deposit Feeders	57.5	17.7	17.8
Predators	25.8	24.2	17.7
Scavengers	2.7	7.3	4.2
Scrapers	0.0	7.1	0.0
Surface Deposit Feeders	1.1	6.6	2.1
Suspension Feeders	5.7	19.6	56.1
Unknown	5.5	11.8	2.1

* - Shannon Weaver Diversity scores calculated on samples with < 300 individuals have the potential for negative bias (lower diversity scores compared to sites with more individuals) (Lande 1996).

Table 4b. Bray Curtis Similarities-Macroinvertebrate Community Comparison

Lynn Haven WWTF	Control Site East	Control Site West
Control Site West	7.9%	-
Test Site	12.1%	21.1%

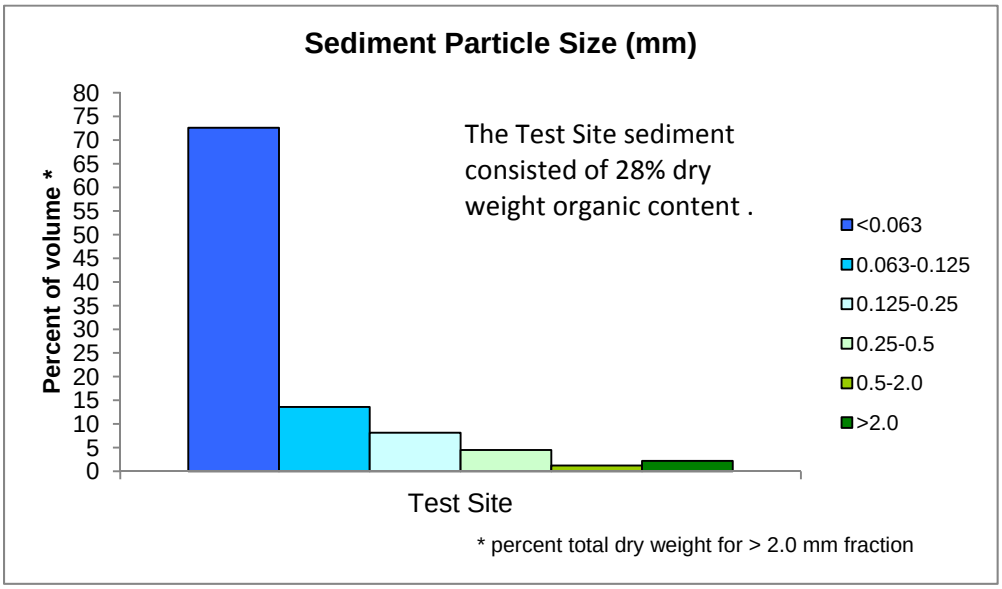
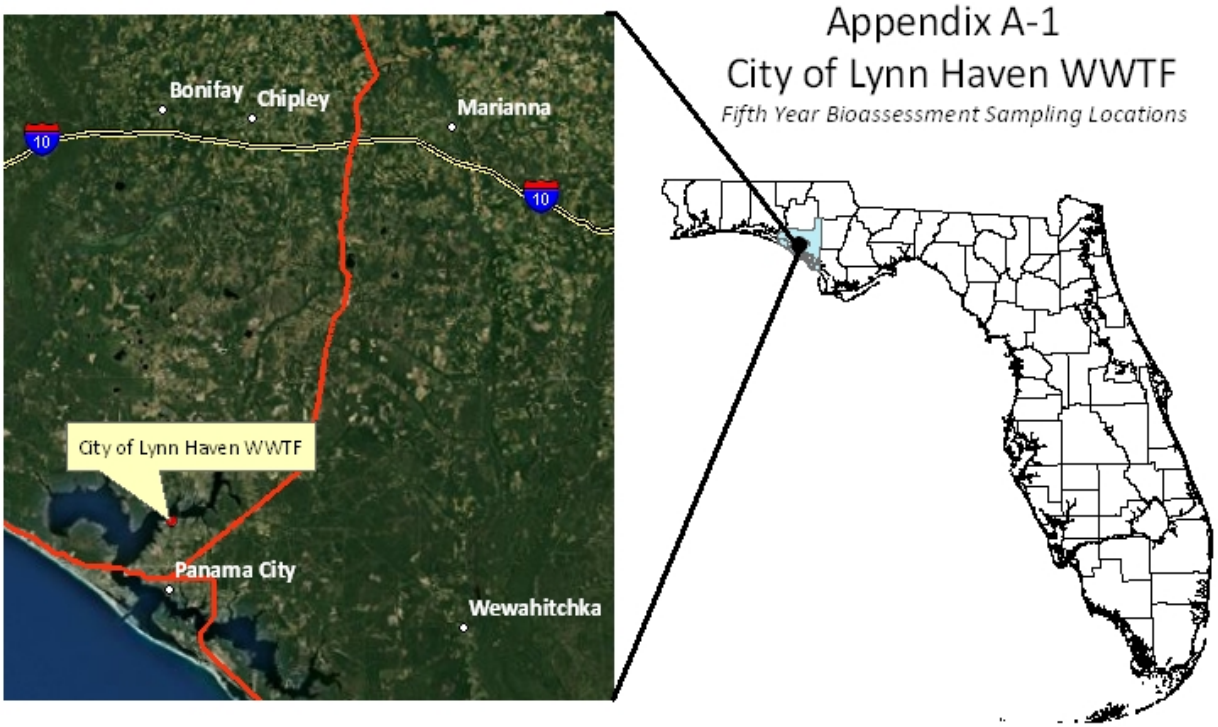


Figure 1. Sediment particle size for Test Site at Lynn Haven WWTF, February 22, 2012

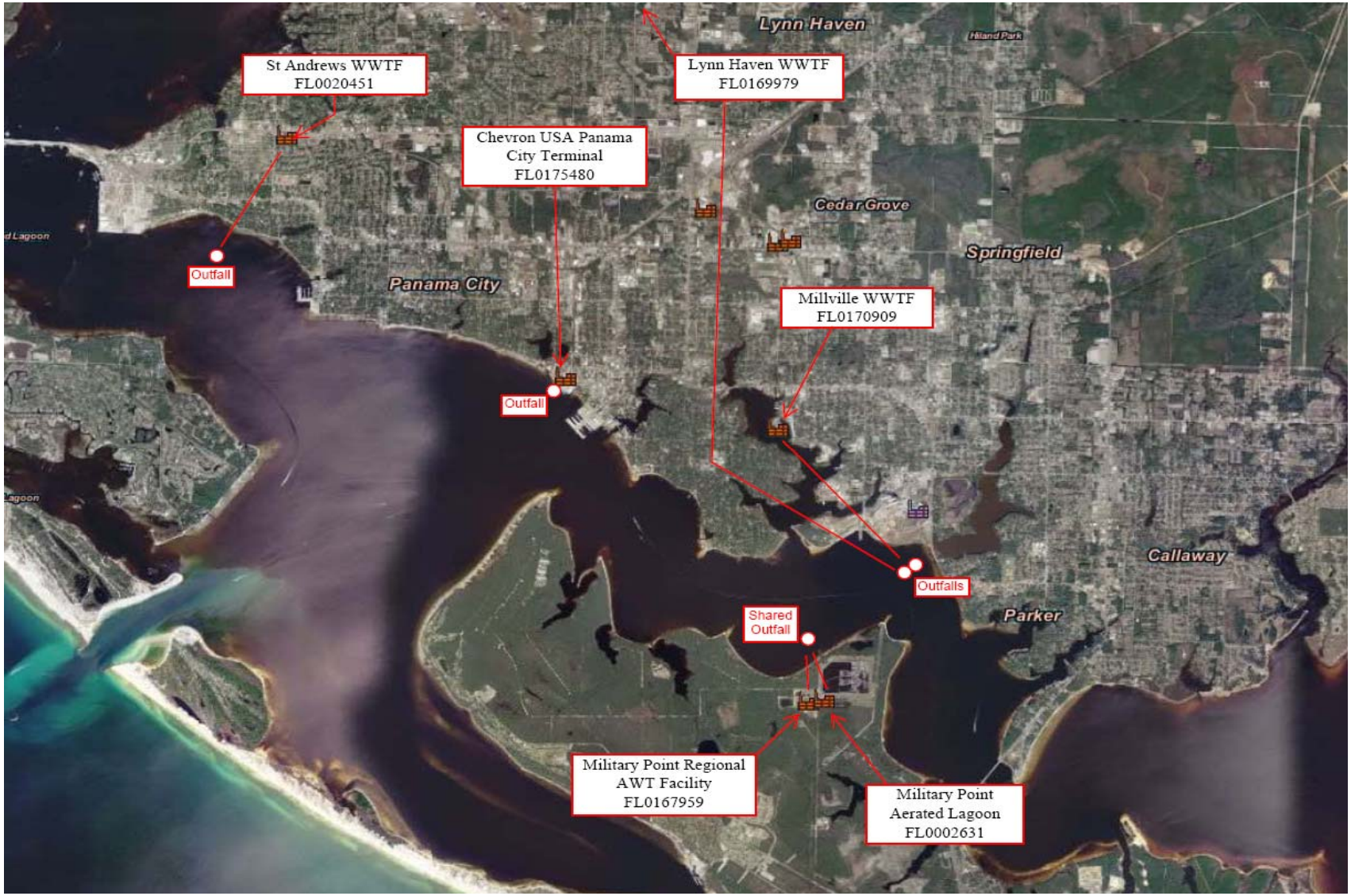
Appendix A-1
City of Lynn Haven WWTF
Fifth Year Bioassessment Sampling Locations





Appendix A-2.

St. Andrew Bay NPDES Discharges



Appendix B

Facility Summary

State of Florida
Department of Environmental Protection
Facility Introduction & Summary

PART I: Information gathered prior to sampling event	
Prepared By: Kim Allen	**Contact Number:** 595-0553
Facility Name (as it appears on permit): Lynn Haven Wastewater Treatment Facility	**Former Names:**
NPDES Permit Number: FL0169978	**Permit Expiration Date:** July 28, 2013
Physical Address: 5th Street and Montana Avenue, Lynn Haven, FL 32444	
District: NWD	**County:** Bay
Function of Facility: Municipal wastewater treatment facility	
Facility Type: Domestic	**Permitted Capacity (MGD):** 2.5
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months):	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months):	
Description of type of Discharge: ☐ Continuous ☒ Intermittent ☐ Seasonal ☐ Rainfall Dependent ☐ Other, please specify Facility is a Sequencing Batch Reactor and therefore discharges in batches. Also, the facility has an alternate discharge to Part III reuse.	

Description of Sampling Location(s) - actual permit designation of permitted sampling point(s):

EFA-02 Fecal Grab Samples (location near intersection of 800 block Illinois Avenue & West 8th Street).

EFF-01 D-001 Surface Water Monitoring Point located near the intersection of Illinois Avenue and 8th Street (at the sanitary lift station #2 approximately 2 miles from the WWTF).

EFF-02 Composite and pH Effluent Sampling point located at the end of the UV channel prior to the V-notch weir to a pit to the effluent pumping station.

FLW-01 Flow Monitoring for Discharge to Surface Waters (to D-001). Located at Sports park Reuse Site #1 at the dechlorination point of f low to St. Andrew Bay.

Description of Permitted Outfall(s):

Discharge Location (D-001) is approximately 1,550 feet in length and discharges at a depth of approximately 32 feet. The point of discharge is located approximately at latitude 30 ° 08' 00" N, longitude 85 ° 37' 13" W.

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

An existing 2.5 MGD annual average daily flow (AADF) permitted capacity activated sludge wastewater treatment facility (WWTP). The treatment facility will operate in the extended aeration mode. The treatment facility is a 2.5 MGD sequential batch reactor (SBR). The batch process provides for biological and chemical removal of nutrients, nitrogen and phosphorus, biochemical oxidation, and solids removal. The existing facility includes pretreatment (mechanical bar screen & vortex degritting unit), influent pumping, two (2) sequential batch reactors, post equalization tank, two (2) aquadisk filter units, a dual channel ultraviolet light & chlorination disinfection systems, four (4) digesters, continuous on-line monitoring instruments for turbidity & residual chlorine, chemical feed system, a 4.19 MG lined rejects holding pond and sludge drying beds. Residuals are transported to R&E Farms and Wetappo Farms for land application.

Surface Water Discharge: An existing 2.5 MGD AADF permitted discharge to St. Andrew Bay (Class III marine waters) at Discharge Location (D-001) which is approximately 1,550 feet in length and discharges at a depth of approximately 32 feet. The point of discharge is located approximately at latitude 30 ° 08' 00" N, longitude 85 ° 37' 13" W.

Land Application: An existing 1.0 MGD AADF permitted capacity Part III slow-rate public access land application system (R-001). The public access quality reclaimed water will be pumped to a covered tank located at the Sports Park and Recreation Center and an unlined pond at Nature Walk Golf Course.

PART I: Continued

I. RECLAIMED WATER AND EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

A. Surface Water Discharges

1. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge effluent from Outfall D-001 to St. Andrew Bay. Such discharge shall be limited and monitored by the permittee as specified below and reported in accordance with condition I.C.11:

			Effluent Limitations				Monitoring Requirements			
Parameter	**Units**	**Max/Min**	**Annual Average**	**Monthly Average**	**Weekly Average**	**Single Sample**	**Monitoring Frequency**	**Sample Type**	**Monitoring Location Site Number**	**Notes**
Flow to D-001	MGD	Maximum	2.5	Report	-	-	Continuous	Recording flow meters and totalizers	FLW-01	See Cond.I.A.4
BOD, Carbonaceous 5 day, 20C	MG/L	Maximum	6.3	6.3	9.45	12.6	Weekly	16-hour flow proportioned composite	EFF-02	
Solids, Total Suspended	MG/L	Maximum	7.5	7.5	11.25	15.0	Weekly	16-hour flow proportioned composite	EFF-02	
pH	SU	Range	-	-	-	6.5 to 8.5	Continuous	Meter	EFF-02	See Cond.I.A.3
Coliform, Fecal	#/100ML	Maximum	See Permit Condition I.A.5.				Weekly	Grab	EFA-02	
Whole Effluent Toxicity (Chronic)	See Permit Condition I.A.6								EFF-02	
Chlorine, Total Residual (For Dechlorination)	MG/L	Maximum	-	-	-	0.01	Daily	Grab	EFF-01	
Phosphorus, Total (as P)	MG/L	Maximum	1.0	1.0	1.5	2.0	Weekly	16-hour flow proportioned composite	EFF-02	
Nitrogen, Total	MG/L	Maximum	4.5	4.5	6.75	9.0	Weekly	16-hour flow proportioned composite	EFF-02	
Ultraviolet Light Dosage	MW-S/CM2	Minimum	-	-	-	43	Continuous	Calculated	PPI-02	See Cond.I.A.9
Ultraviolet Light Transmittance	PERCENT	Maximum	-	-	-	Report	Continuous	Meter	PPI-01	See Cond.I.A.9
Ultraviolet Light Intensity	MW/CM2	Maximum	-	-	-	145	Continuous	Meter	PPI-02	See Cond.I.A.9
Water Level in UV Chamber	FEET	Range	-	-	-	Report	Continuous	Meter	PPI-01	See Cond.I.A.9
Oxygen, Dissolved (DO)	MG/L	Minimum	-	-	-	6.0	Daily	Grab	PPI-02	

			Effluent Limitations				Monitoring Requirements			
Parameter	**Units**	**Max/Min**	**Annual Average**	**Monthly Average**	**Weekly Average**	**Single Sample**	**Monitoring Frequency**	**Sample Type**	**Monitoring Location Site Number**	**Notes**
Nickel, Total Recoverable	UG/L	Maximum	-	-	-	8.3	Semiannually	16-hour flow proportioned composite	EFF-02	
Copper, Total Recoverable	UG/L	Maximum	-	-	-	3.7	Monthly	16-hour flow proportioned composite	EFF-02	
Lead, Total Recoverable	UG/L	Maximum	-	-	-	8.5	Semiannually	16-hour flow proportioned composite	EFF-02	
Arsenic, Total Recoverable	UG/L	Maximum	-	-	-	50	Semiannually	16-hour flow proportioned composite	EFF-02	
Zinc, Total Recoverable	UG/L	Maximum	-	-	-	86.0	Monthly	16-hour flow proportioned composite	EFF-02	
Enterococci	#/100L	Maximum	-	35 (Geo.Mean)	-	-	5 per Month	Grab	EFA-02	See Cond.I.A.8

PART I: Continued

Receiving Waters:	Classification (indicate whether fresh or marine):
St. Andrew Bay	Class III Marine

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

c. Sampling Requirements
(1) For each routine test or additional follow-up test conducted, a total of three flow proportional 24-hour composite samples of final effluent shall be collected and used per the sampling protocol discussed in EPA-821-R-02-013, Section 8.
(2) The first sample shall be used to initiate the test. The remaining two samples shall be collected according to the protocol and used as renewal solutions on Day 3 (48 hours) and Day 5 (96 hours) of the test.

d. Test Requirements
(1) Routine Tests: All routine tests shall be conducted using a control (0% effluent) and a minimum of five test concentrations: **100%**, **50%**, **25%**, **12.5%**, and **6.25%** final effluent.

(2) The permittee shall conduct a daphnid, **Ceriodaphnia dubia**, Survival and Reproduction Test and a fathead minnow, **Pimephales promelas**, Larval Survival and Growth Test, concurrently.

(3) All test species, procedures and quality assurance criteria used shall be in accordance with **Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms**, 4th ed., EPA-821-R-02-013. Any deviation of the bioassay procedures outlined herein shall be submitted in writing to the Department for review and approval prior to use. In the event the above method is revised, the permittee shall conduct chronic toxicity testing in accordance with the revised method.

(4) The control water and dilution water used shall be moderately hard water as described in EPA-821-R-02-013, Section 7.

Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.):
There are no open Administrative or Consent Orders.

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

Monitoring Date	Outfall Indicator	Parameter Code	Parameter Description	Data	Limit	Statistical Base	Units
1/31/2011	**001-1**	**P 01119**	**COPPER, TOTAL RECOVERABLE**	**4.21**	**3.7**	**MAXIMUM**	**ug/L**
6/30/2011	**001-1**	**P 00600**	**NITROGEN, TOTAL**	**5.06**	**4.5**	**MO AVG**	**mg/L**
6/30/2011	**001-1**	**P 00600**	**NITROGEN, TOTAL**	**7.1**	**9**	**MAXIMUM**	**mg/L**
9/30/2011	**001-1**	**P 01094**	**ZINC, TOTAL RECOVERABLE**	**190**	**86**	**MAXIMUM**	**ug/L**
9/30/2011	**001-1**	**P 01119**	**COPPER, TOTAL RECOVERABLE**	**76**	**3.7**	**MAXIMUM**	**ug/L**

Facility Mixing Zone Details (if applicable):

Describe previous FYI and WQBEL study:

An FYI5 has not been performed at this facility in the past. The FYI3 report dated 8/1/01 concluded that the effluent was not acutely toxic. However, the effluent copper was 4.0 ug/L and exceeded the criteria is place at that time (2.9 ug/L). The effluent concentration would also have exceeded the current copper criteria of 3.7 ug/L.

Describe previous or current Enforcement Actions (including WLs):

CO 07-0621-03 was executed 6/20/07 and closed 3/10/09 for violations of Total Phosphorous and Total Recoverable Copper. There are no currently enforcement actions.

Describe any violations or problems noted in previous inspection:

The facility was last inspected on 1/26/11.

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

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

PART II: Sampling Event Information

Date(s) sample collected: **2/20/12**	**Sampler(s):** **Nathan Mulkey**
Temperature (Deg C): **18.36**	**pH (SU):** **7.34**
Dissolved Oxygen (mg/L): **10.12**	**Conductivity (umhos/cm):** **55**
Total Residual Chlorine (mg/L):	**Total Residual Chlorine - after Disinfection (mg/L):**
Method of Chlorination:	**Method of De-chlorination:**

Flow During Sample Collection for each outfall(MGD):

Mean Flow for each outfall for previous 12 months based on sampling date (If samples are taken on more than one day, indicate Mean Flow for each day):
Describe Discharge during Sampling Event: ☐ Continuous ☒ Intermittent ☐ Seasonal ☐ Rainfall Dependent ☐ Other, please specify
Describe any conditions, difficulties or abnormal events that occurred during the sample collection and any other additional comments here:

Appendix C

Explanation of Measurements

(1) Quality Assurance and Quality Control

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

(2) Chemical Analyses

The effluent and water from sampling stations were analyzed for nutrients, metals, organic constituents (base, neutral, and acid extractables) and pesticides. The results from these analyses were compared with Water Quality Criteria (62-302, F.A.C.) and facility permit limits. Exceedances of Water Quality Criteria may constitute violations of specific provisions of Chapter 62-302 (F.A.C.) and/ or facility permit limits.

(3) Toxicity Bioassays

Greater than 50% mortality in an acute toxicity test may constitute an exceedance of 62-302.500(1)a and/or a violation of facility permit limits. An inhibition concentration greater than 25% in a chronic test may constitute exceedences of 62-302.530(20), 62-302.530(61) and/or a violation of facility permit limits. Standard reference toxicant (SRT) tests are conducted monthly to ensure quality in toxicity testing.

(4) Bacteriological Testing

High levels of fecal coliform bacteria may constitute an exceedance of 62-302.530(6) and/or a violation of 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.

(5) Chlorophyll *a* Content

Chlorophyll *a* content is an estimate algal biomass. High algal biomass implies nutrient stress (Stevenson and Bahls 1999) and may constitute exceedences 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.

(6) 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. Raschke and Shultz (1987) found that an AGP above 10.0 mg dry weight/L represents a “problem” threshold for marine receiving waters, implying nutrient enrichment. High AGP values may constitute exceedences 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 in a low salinity sample 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 (EPA-822-B-00-002). 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.. Expected AGP is not calculated for marine samples incubated with *Dunaliella*.

(7) Sediment Sampling

Sediments were collected using a petite ponar dredge at all sampling stations. Sediment samples were analyzed for metals, organic constituents, pesticides, organic content and sediment grain size. The results from these analyses were compared with sediment quality assessment guidelines applicable to Florida coastal waters (Table 4. in MacDonald 1994). The range of sediment contaminant concentrations that fall below the threshold effects level (TEL) are not likely to be associated with adverse biological effects on aquatic

organisms. The range of sediment contaminant concentrations that fall above the probable effects level (PEL) are usually or always associated with adverse biological effects. Within the range of concentrations delineated by the TEL (lower limit) and the PEL (upper limit), adverse biological effects are possible but it is difficult to predict the occurrence, nature, and/or severity of these effects (MacDonald 1994).

(8) Benthic Macroinvertebrate Assemblages

Benthic macroinvertebrates were collected using a petite ponar dredge at all sampling stations. Five replicate ponar samples were collected at each station and sieved through a 500 μm mesh. 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. Decreases in taxa richness related to a facility's effluent may constitute exceedences 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 exceedences 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 (Karr and Chu 1998). Shifts in community composition related to a facility's effluent may constitute exceedences 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.). Changes in the proportions of functional feeding groups related to a facility's effluent may constitute exceedences 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 samples at test and control sites constitutes exceedences of 62-302.530(10), F.A.C.

Appendix D

Chain of Custody

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Request Number: RQ-2012-02-20-16
FY15 Lynn Haven WWTF Sampling Inspection

Event ID *
FY15 Lynn Haven WWTF Samplin
NW-DIST-2012-02-21-02 (FY15)

Customer: NW-DIST
Project ID: FY15
PMAS: 1143

Requester: Michelle Fish
Collected By: Nathan Mulkey / Corinne Clanton
Sampling Agency: FDEP
Field Report Prepared By: N. Mulkey
Send Final Report To: Toni Edwards

Lab ID *	Location	Field ID	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Latitude	Longitude	Comp / Grab	Collection (begin) Date	Time	Eastern Central	Collection (end) Date	Time	Eastern Central	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	Sample Depth m / ft	Salinity (PPTh) / Sp Conductance (umho/cm)	NPDES Number	Bottle Group(s)**	Comments
	Lynn Haven WWTF	Effluent	Matrix (include type e.g. Salt, (Fresh) etc)	18.36	7.34	30.25004 dd / dms	85.66090 dd / dms	☐ Comp ☑ Grab	2/20/12	1030	(Central)					10.12		55	☐ Salinity (PPTh) ☑ Sp Conductance (umho/cm)			D-001
	Lynn Haven WWTF	TOX	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	☑ Comp ☐ Grab	2/19/12	0721	(Central)	2/20/12	1020	(Central)	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	Sample Depth ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number		composite toxicity sample
	Lynn Haven WWTF	Field Blank	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	☐ Comp ☐ Grab	2/20/12	1100	(Central)				Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	Sample Depth ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number		
			Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	☐ Comp ☐ Grab	Date	Time	Eastern Central	Date	Time	Eastern Central	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	Sample Depth ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number		2 biopassy Reid in Tox by JD @ 10:03 2.21.12

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
	2/20/12	Fed Ex	A Smith	02-21-12 0940				

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Page 1 of 5

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2012-02-20-16
FYI5 Lynn Haven WWTF Sampling Inspection

Requester: Michelle Fish
Field Report Prepared By:

Customer: NW-DIST
Project ID: FYI5
PMAS: 1143

Collected By: Corrina Clanton
Send Final Report To: Toni Edwards

Sampling Agency: FDEP

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Lynn Haven WWTF	☑ Comp ☐ Grab	Date 2/22/12 Time 910 Eastern Central	Date 2/22/12 Time 10:00 Eastern Central	
	Field ID: TOX 2	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	
	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments		

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
		☐ Comp ☐ Grab			
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	
	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments		

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
		☐ Comp ☐ Grab			
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	
	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments		

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
		☐ Comp ☐ Grab			
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	
	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments		

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
		☐ Comp ☐ Grab			
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	
	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments 2 Brassy Rec'd in Tox by JID 10:04 2.23.12		

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By	Date/Time
Corrina Clanton	2/22/12	Fed EX						2/23

* Shaded Areas for Lab use only. 10:57 CST

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2012-02-20-16
FY15 Lynn Haven WWTF Sampling Inspection

Requester: Michelle Fish
Collected By: Corinna Clanton
Sampling Agency: FDEP

Field Report Prepared By:
Send Final Report To: Toni Edwards

Customer: NW-DIST
Project ID: FY15
PMAS: 1143

Lab ID *	Location / Field ID / Matrix (include type e.g. Salt, Fresh, etc) / Temp (C) / pH / Latitude / Longitude	Comp / Grab / Collection (begin) Date Time Eastern Central / Tot Res Chlorine (mg/L) / Diss Oxygen (mg/L) / Sample Depth m ft / Salinity (PPTh) / Sp Conductance (umho/cm) / Comments	Collection (end) Date Time Eastern Central / Storet Station Number / NPDES Number / Bottle Group(s)**
	Location: Lynn Haven WWTF Field ID: TOX3 Matrix (include type e.g. Salt, Fresh, etc): (Fresh) Latitude: dd dms Longitude: dd dms	☒ Grab, Collection (begin) Date 2/23/12 Time 10.22 Eastern Central Comments: Composite Jug was emptied by facility. Grab sample taken instead	Collection (end) Date 2/24/12 Time Eastern Central

Relinquished By: Corinna Clanton | Date/Time: 2/24/12 11:00 | Shipping Method: FedEx | Received By: Marshall Faircloth | Date/Time: 0905 2/25/12 | Relinquished By: | Date/Time | Received By: | Date/Time

Printed up at Fed Ex

Cooler 1 1.1°C 2 Jugs
2 0.8°C 1 Jug

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2012-02-~~0023~~ 20-16

~~BEA Samples~~ Lynn Haven FY15

Requester: ~~Cheryl Bunch~~ **Field Report Prepared By:** N. Malloy

Customer: NW-DIST **Collected By:** Nathan Malloy / Rick Mack / Mike King **Send Final Report To:** ~~Cheryl Bunch~~ Toni Edwards

Project ID: ~~DISCRETIONARY~~ FY15 **Sampling Agency:** FDEP

PMAS: ~~1206~~ 1143

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	St. Andrew Bay	☐ Comp ☑ Grab	Date 2/22/12 Time 1115 Central		
	Field ID: Test	Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L): 8.08	Storet Station Number:	
	Matrix (include type e.g. Salt, Fresh, etc): Salt	Temp (C): 16.97	pH: 7.80	Sample Depth: .15 ☑ m ☐ ft	Salinity (PPTh) ☑ Sp Conductance (umho/cm): 47264
	Latitude: 30.13333 ☑ dd ☐ dms	Longitude: 85.62027 ☑ dd ☐ dms		NPDES Number:	
	Comments: Lynn Haven WWTF Outfall				

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	St. Andrew Bay	☐ Comp ☑ Grab	Date 2/22/12 Time 1225 Central		
	Field ID: Control East	Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L): 8.25	Storet Station Number:	
	Matrix (include type e.g. Salt, Fresh, etc): Salt	Temp (C): 16.67	pH: 7.86	Sample Depth: .15 ☑ m ☐ ft	Salinity (PPTh) ☑ Sp Conductance (umho/cm): 45736
	Latitude: 30.09643 ☑ dd ☐ dms	Longitude: 85.59743 ☑ dd ☐ dms		NPDES Number:	
	Comments:				

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	St. Andrew Bay	☐ Comp ☑ Grab	Date 2/22/12 Time 1325 Central		
	Field ID: Control West	Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L): 8.24	Storet Station Number:	
	Matrix (include type e.g. Salt, Fresh, etc): Salt	Temp (C): 16.90	pH: 7.91	Sample Depth: .15 ☑ m ☐ ft	Salinity (PPTh) ☑ Sp Conductance (umho/cm): 47968
	Latitude: 30.12710 ☑ dd ☐ dms	Longitude: 85.64933 ☑ dd ☐ dms		NPDES Number:	
	Comments: off Palmetto Point				

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
		☐ Comp ☐ Grab	Date Time Central		
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	
	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth: ☐ m ☐ ft	Salinity (PPTh) ☐ Sp Conductance (umho/cm)
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms		NPDES Number	
	Comments				

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	2/22/12	Fed Ex	[signature]	02/23/12 0950				

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

The Water Spigot
5806 E. Hwy. 22 * Panama City, FL 32404
(850) 871-1900 * Fax (850) 871-9303
Email:trishj-waterspigot@comcast.net

No. 054252

CHAIN OF CUSTODY RECORD

Company Name / Plant: Florida Dept of Environmental Protection
Company Address: 160 Governmental Center
City, State, Zip: Pensacola, FL 32502
Sent Report To: Nathan Mulkey
Copy To DEP / DOH (circle one): Yes ☑ No ☐
Email Address ☑ Yes ☐ No: nathan.mulkey@dep.state.fl.us
Phone #: 850 595 0626
Fax #:
Fax Results ____ Yes ____ No

Project Name: Lynn Haven FX15
Lab Dispose ☐
Return to Client ☐
Other ☐

Sample #
Container #
Check If Rush
Special Instructions: AQ-2012-02-20-16
P.O. #

OF CONTAINERS

Analysis Requested

Preservatives
Containers

Sampling Date	Sampling Time	Type Comp	Type Grab	Matrix Water	Matrix Sludge	Matrix W. Water	Matrix Soil	Sample Site (Be Specific)	Fecal Coliform Method	Enterococcus Method	Field Data Temp.	Field Data C12	Field Data pH
2/22/12	1325		X	X				Control West	X	X			
	1225		X	X				Control East	X	X			
↓	1115		X	X				Test Lynn Haven Outfall	X	X			

Preservative Codes
A - Ammonium Chloride
C - Cool Only
H - Hydrochloric Acid
M - Monochloracetic Acid
N - Nitric Acid
OH - Sodium Hydroxide
S - Sulfuric Acid
T - Sodium Thiosulfate
Z - Zinc Acetate

Container Codes
V - VOA vial
G - glass
P - plastic
M - micro bag/cup
O - Other

		Date	Time
Sampled By & Title	Nathan Mulkey FDEP	2/22/12	
Received By			
Received By			
Received By			
Received in Lab By	Jen Smith	2/22/12	15:23

Relinquished By: Nathan Mulkey — Date / Time: 2/22/12 15:23
Relinquished By — Date / Time
Relinquished By — Date / Time
Shipped VIA: UPS BUS HAND FED EX OTHER
Remarks — Temp. Received in Lab:

Distribution: Original - LAB Yellow - CLIENT

Appendix E

Physical/Chemical and Habitat Assessment field sheets

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FD9000-26 MARINE PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (4/25/00)

LAT/LONGS:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
30.09643 / 85.59743		2/22/12	1225	St. Andrew Bay

REMARKS:	COUNTY:	SITE LOCATION:	FIELD ID/NAME:
	Bay	East Bay	Control East

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
70					15	15	

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

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

Width of riparian vegetation (m) on least buffered side:

Draw aerial view sketch of sampling area including habitats and community types

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

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

Tide Types and Times

Low	6:30 AM (PM)		: AM PM
High	10:00 AM (PM)		: AM PM

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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Seagrass				Sand			
Rock or Shell Rubble		6	P Poncr	Mud/Muck/Silt		6	P Ponar
Aquatic Vegetation				Other:			

Community Types

Mangroves ☐ Oyster bars ☐ Reef ☐ Natural beach ☒ Other: ☐

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):	Sal	DO%	Secchi (m):
Top	.09	16.67	7.86	8.25	45736	29.70	101.4	1.8
Mid-depth	3.21	16.36	7.83	7.54	47583	32.46	93.7	
Bottom	6.60	16.42	7.23	7.20	51177	33.65	90.2	

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

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

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

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

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

Weather Conditions/Notes:
Intermittent Rain 70°F
30.09643
85.59743

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Nathan Milby / Rich Alsmark / Mike King		2/22/12

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

FD 9000-30 MARINE BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME: FDEP	STORET STATION NUMBER:	DATE (M/D/Y): 2/22/12	RECEIVING BODY OF WATER: St. Andrew Bay
REMARKS:	LOCATION: East Bay		FIELD ID/NAME: Control East

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations 10	None—Unaltered shoreline. **9-10 points**	Mostly natural shoreline, but with occasional riprap. **6-8 points**	Shoreline consisting mostly of riprap and vertical seawalls. **3-5 points**	Shoreline consisting almost entirely of vertical seawalls. **0-2 points**
Community Types Observed 30	At least four communities observed from the following list: mangrove swamp, marsh, oyster bar, grass bed, reef, saltern, natural beach, or tidal creek. **38-50 points**	Two or three communities observed from those listed. **26-37 points**	One community observed from those listed. **13-25 points**	No communities observed from those listed. **0-12 points**
Tidal Fluctuation 3	>0.75 m. **4-5 points**	0.5 - 0.75 m. **3 points**	0.25 - 0.5 m. **2 points**	<0.25 m. **0-1 point**
Freshwater Discharges/ Alterations 8	Only natural runoff.. **9-10 points**	Mostly natural runoff, but with a few, small stormwater sources. **6-8 points**	Considerable stormwater discharge from local roads, parking lots, etc. **3-5 points**	Extensive manmade discharges, especially from canals draining large tracts of land. **0-2 points**
Flow and Wave Action 10	Light to moderate wave action present except under the harshest weather conditions. Flow unrestricted by manmade structures. **9-10 points**	—	—	Heavy wave action sometimes present even during average weather conditions, or flow restricted by manmade structures so that velocities are very high. **0-2 points**
Sediment Type 7	Combination of sand, gravel, and shell. **12-15 points**	Primarily sand, with small areas of mud. **8-11 points**	Mixture of sand and mud, or well-aerated mud only. **4-7 points**	Anaerobic mud. **0-3 points**

TOTAL SCORE 68

COMMENTS:

ANALYSIS DATE: 2/22/12	ANALYST: Nathan Milby	SIGNATURE:

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

FD9000-26 MARINE PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (4/25/00)

LAT/LONGS:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
30.12710 / 85.64933		2/22/12	1325	St. Andrew Bay

REMARKS:	COUNTY:	SITE LOCATION:	FIELD ID/NAME:
	Bay	Palmetto Point	Control West

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
☒ 50	☐	☐	☐	☐	☒ 25	☒ 25	☐

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

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

Width of riparian vegetation (m) on least buffered side: ____

Draw aerial view sketch of sampling area including habitats and community types

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

Artificially Impounded ☐ yes

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

Tide Types and Times

Low	6:30 (AM) PM	____ : ____	AM PM
High	10:00 AM (PM)	____ : ____	AM PM

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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Seagrass				Sand		6	P. Ponar
Rock or Shell Rubble		6	P. Ponar	Mud/Muck/Silt			
Aquatic Vegetation				Other:			

Community Types

Mangroves ☐ Oyster bars ☐ Reef ☐ Natural beach ☒ Other: ☐ ____

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):	Sal	DO%	Secchi (m):
Top	.092	16.90	7.91	8.24	47968	31.31	102.7	2.0
Mid-depth	3.215	16.61	7.89	7.85	51015	33.53	98.7	
Bottom	6.318	16.71	7.84	7.62	52921	34.74	96.8	

System Type : Stream: ☐ (1st - 2nd order 3rd - 4th order 5th - 6th order 7th order or greater) Estuary: ☒ Other: ☐ ____

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

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

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

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

Weather Conditions/Notes:

intermittent rain

70°F

30.12710

85.64933

Abundance:

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Nathan Malloy, Rich Abel, Mike King	Nathan Malloy	2/22/12

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

FD 9000-30 MARINE BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME: FDEP	STORET STATION NUMBER:	DATE (M/D/Y): 2/22/12	RECEIVING BODY OF WATER: St. Andrew Bay

REMARKS:	LOCATION: Palmetto Point	FIELD ID/NAME: Control West

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations 10	None—Unaltered shoreline. **9-10 points**	Mostly natural shoreline, but with occasional riprap. **6-8 points**	Shoreline consisting mostly of riprap and vertical seawalls. **3-5 points**	Shoreline consisting almost entirely of vertical seawalls. **0-2 points**
Community Types Observed 30	At least four communities observed from the following list: mangrove swamp, marsh, oyster bar, grass bed, reef, saltern, natural beach, or tidal creek. **38-50 points**	Two or three communities observed from those listed. **26-37 points**	One community observed from those listed. **13-25 points**	No communities observed from those listed. **0-12 points**
Tidal Fluctuation 3	>0.75 m. **4-5 points**	0.5 - 0.75 m. **3 points**	0.25 - 0.5 m. **2 points**	<0.25 m. **0-1 point**
Freshwater Discharges/ Alterations 7	Only natural runoff.. **9-10 points**	Mostly natural runoff, but with a few, small stormwater sources. **6-8 points**	Considerable stormwater discharge from local roads, parking lots, etc. **3-5 points**	Extensive manmade discharges, especially from canals draining large tracts of land. **0-2 points**
Flow and Wave Action 10	Light to moderate wave action present except under the harshest weather conditions. Flow unrestricted by manmade structures. **9-10 points**	—	—	Heavy wave action sometimes present even during average weather conditions, or flow restricted by manmade structures so that velocities are very high. **0-2 points**
Sediment Type 8	Combination of sand, gravel, and shell. **12-15 points**	Primarily sand, with small areas of mud. **8-11 points**	Mixture of sand and mud, or well-aerated mud only. **4-7 points**	Anaerobic mud. **0-3 points**

TOTAL SCORE 68

COMMENTS:

ANALYSIS DATE: 2/22/12	ANALYST: Nathan Mulky	SIGNATURE: Nathan Mulky

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

FD9000-26 MARINE PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (4/25/00)

LAT/LONGS:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME:	RECEIVING BODY OF WATER:
30.13333/85.6227		2/22/12	1115	St. Andrew Bay

REMARKS:	COUNTY:	SITE LOCATION:	FIELD ID/NAME:
27ft Depth	Bay	Lynn Haven WWTP Outfall	Test

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
					50	50	

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

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

Width of riparian vegetation (m) on least buffered side:

Draw aerial view sketch of sampling area including habitats and community types

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

Artificially Impounded ☐ yes

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

Tide Types and Times

Low 6:30 AM / PM

High 10:00 AM / PM

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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Seagrass				Sand			
Rock or Shell Rubble				Mud/Muck/Silt		6	P. Ponar
Aquatic Vegetation				Other:			

Community Types

Mangroves ☐ Oyster bars ☐ Reef ☐ Natural beach ☐ Other: ☒ Rip Rap

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):	Sal	DO%	Secchi (m):
Top	.175	16.97	7.80	8.08	47264	30.79	100.8	1.5
Mid-depth	3.254	16.68	7.75	7.79	50016	32.83	97.3	
Bottom	6.564	16.59	7.58	7.42	52316	34.5	93.9	

System Type : Stream: ☐ (1st - 2nd order 3rd - 4th order 5th - 6th order 7th order or greater) Estuary: ☒ Other: ☐

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

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

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

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

Weather Conditions/Notes:

intermittent rain 70°F

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

SAMPLING TEAM:	SIGNATURE:	DATE:
Nathan Malloy, Rick Black, Mike King	Nathan Malloy	2/22/12

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

FD 9000-30 MARINE BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME: FDEP	STORET STATION NUMBER:	DATE (M/D/Y): 2/22/12	RECEIVING BODY OF WATER: St. Andrew Bay

REMARKS:	LOCATION: Lynn Haven WWTP Outfall	FIELD ID/NAME: Test

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations 3	None—Unaltered shoreline. **9-10 points**	Mostly natural shoreline, but with occasional riprap. **6-8 points**	Shoreline consisting mostly of riprap and vertical seawalls. **3-5 points**	Shoreline consisting almost entirely of vertical seawalls. **0-2 points**
Community Types Observed 12	At least four communities observed from the following list: mangrove swamp, marsh, oyster bar, grass bed, reef, saltern, natural beach, or tidal creek. **38-50 points**	Two or three communities observed from those listed. **26-37 points**	One community observed from those listed. **13-25 points**	No communities observed from those listed. **0-12 points**
Tidal Fluctuation 3	>0.75 m. **4-5 points**	0.5 - 0.75 m. **3 points**	0.25 - 0.5 m. **2 points**	<0.25 m. **0-1 point**
Freshwater Discharges/ Alterations 5	Only natural runoff.. **9-10 points**	Mostly natural runoff, but with a few, small stormwater sources. **6-8 points**	Considerable stormwater discharge from local roads, parking lots, etc. **3-5 points**	Extensive manmade discharges, especially from canals draining large tracts of land. **0-2 points**
Flow and Wave Action 10	Light to moderate wave action present except under the harshest weather conditions. Flow unrestricted by manmade structures. **9-10 points**	—	—	Heavy wave action sometimes present even during average weather conditions, or flow restricted by manmade structures so that velocities are very high. **0-2 points**
Sediment Type 4	Combination of sand, gravel, and shell. **12-15 points**	Primarily sand, with small areas of mud. **8-11 points**	Mixture of sand and mud, or well-aerated mud only. **4-7 points**	Anaerobic mud. **0-3 points**

TOTAL SCORE 37

COMMENTS:

ANALYSIS DATE: 2/22/12	ANALYST: Nathan Milby	SIGNATURE: Nathan Milby

Appendix F

Chemical analysis of effluent and receiving water

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/20/2012 11:30	Eflluent	AGP/LN	Algal Growth Potential-Salinity Adjusted	6.53		mg DryWt/L	3	3
2/20/2012 11:30	Eflluent	AGP/LN	Algal Growth Potential	76.5		mg DryWt/L	0.3	0.9
2/20/2012 11:30	Eflluent	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.41	U	ug/L	0.41	1.2
2/20/2012 11:30	Eflluent	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day	1	I	mg/L	0.2	2
2/20/2012 11:30	Eflluent	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	0.72	I	mg/L	0.2	2
2/20/2012 11:30	Eflluent	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	3.6		ug/L	0.56	1.7
2/20/2012 11:30	Eflluent	Field Parameter	Temperature	18.36		C		
2/20/2012 11:30	Eflluent	Field Parameter	Specific Conductance	55		umhos/cm		
2/20/2012 11:30	Eflluent	Field Parameter	Dissolved Oxygen	10.12		mg/L		
2/20/2012 11:30	Eflluent	Field Parameter	pH	7.34				
2/20/2012 11:30	Eflluent	Metals	Lead	0.2	U	ug/L	0.2	0.8
2/20/2012 11:30	Eflluent	Metals	Chromium	0.3	U	ug/L	0.3	1.2
2/20/2012 11:30	Eflluent	Metals	Aluminum	47		ug/L	5	20
2/20/2012 11:30	Eflluent	Metals	Sodium	57		mg/L	0.5	2
2/20/2012 11:30	Eflluent	Metals	Arsenic	0.25	U	ug/L	0.25	1
2/20/2012 11:30	Eflluent	Metals	Zinc	38		ug/L	5	20
2/20/2012 11:30	Eflluent	Metals	Cadmium	0.05	U	ug/L	0.05	0.2
2/20/2012 11:30	Eflluent	Metals	Silver	0.025	U	ug/L	0.025	0.1
2/20/2012 11:30	Eflluent	Metals	Magnesium	13.1		mg/L	0.04	0.16
2/20/2012 11:30	Eflluent	Metals	Selenium	0.2	U	ug/L	0.2	0.8
2/20/2012 11:30	Eflluent	Metals	Calcium	27.1		mg/L	0.075	0.3
2/20/2012 11:30	Eflluent	Metals	Iron	33	I	ug/L	30	120
2/20/2012 11:30	Eflluent	Metals	Nickel	0.77	I	ug/L	0.25	1
2/20/2012 11:30	Eflluent	Metals	Copper	2.73		ug/L	0.5	1
2/20/2012 11:30	Eflluent	Nutrients	O-Phosphate-P	0.017		mg P/L	0.004	0.01
2/20/2012 11:30	Eflluent	Nutrients	Total-P	0.055		mg P/L	0.005	0.05
2/20/2012 11:30	Eflluent	Nutrients	Sulfate	47		mg SO4/L	0.2	0.5
2/20/2012 11:30	Eflluent	Nutrients	Fluoride	0.29		mg F/L	0.035	0.1
2/20/2012 11:30	Eflluent	Nutrients	Alkalinity	86		mg CaCO3/L	0.65	2.5
2/20/2012 11:30	Eflluent	Nutrients	Color (true)	23		PCU	2.5	6
2/20/2012 11:30	Eflluent	Nutrients	NO2NO3-N	1.2		mg N/L	0.04	0.1

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/20/2012 11:30	Eflluent	Nutrients	Ammonia-N	0.035		mg N/L	0.01	0.02
2/20/2012 11:30	Eflluent	Nutrients	Organic Carbon	5.6		mg C/L	1	5
2/20/2012 11:30	Eflluent	Nutrients	Turbidity	1.1	A	NTU	0.1	0.1
2/20/2012 11:30	Eflluent	Nutrients	TSS	3	I	mg/L	2	10
2/20/2012 11:30	Eflluent	Nutrients	Kjeldahl Nitrogen	0.7		mg N/L	0.08	0.2
2/20/2012 11:30	Eflluent	Overflow	Enterococci-Membrane Filter	172		cfu/100 mL	4	
2/20/2012 11:30	Eflluent	Overflow	Fecal Coliforms-Membrane Filter	89	B	cfu/100 mL	1.3	
2/20/2012 11:30	Eflluent	Overflow	Chemical Oxygen Demand	78		mg/L	6.3	20
2/20/2012 11:30	Eflluent	Pesticides	Malathion	0.15	U	ug/L	0.15	0.6
2/20/2012 11:30	Eflluent	Pesticides	Chlorpyrifos Methyl	0.1	U	ug/L	0.1	0.4
2/20/2012 11:30	Eflluent	Pesticides	Alachlor	0.6	U	ug/L	0.6	2.4
2/20/2012 11:30	Eflluent	Pesticides	Chlorpyrifos Ethyl	0.05	U	ug/L	0.05	0.2
2/20/2012 11:30	Eflluent	Pesticides	Metalaxyl	0.25	U	ug/L	0.25	1
2/20/2012 11:30	Eflluent	Pesticides	Parathion Ethyl	0.15	U	ug/L	0.15	0.6
2/20/2012 11:30	Eflluent	Pesticides	Prometryn	0.15	U	ug/L	0.15	0.6
2/20/2012 11:30	Eflluent	Pesticides	Butylate	0.2	U	ug/L	0.2	0.8
2/20/2012 11:30	Eflluent	Pesticides	Mevinphos	0.2	U	ug/L	0.2	0.8
2/20/2012 11:30	Eflluent	Pesticides	Ethoprop	0.1	U	ug/L	0.1	0.4
2/20/2012 11:30	Eflluent	Pesticides	Norflurazon	0.15	U	ug/L	0.15	0.6
2/20/2012 11:30	Eflluent	Pesticides	Parathion Methyl	0.1	U	ug/L	0.1	0.4
2/20/2012 11:30	Eflluent	Pesticides	Simazine	0.05	U	ug/L	0.05	0.2
2/20/2012 11:30	Eflluent	Pesticides	Ethion	0.05	U	ug/L	0.05	0.2
2/20/2012 11:30	Eflluent	Pesticides	Bromacil	0.2	U	ug/L	0.2	0.8
2/20/2012 11:30	Eflluent	Pesticides	Atrazine	0.1	I	ug/L	0.05	0.2
2/20/2012 11:30	Eflluent	Pesticides	Azinphos Methyl	0.2	U	ug/L	0.2	0.8
2/20/2012 11:30	Eflluent	Pesticides	Fenamiphos	0.2	U	ug/L	0.2	0.8
2/20/2012 11:30	Eflluent	Pesticides	Hexazinone	0.1	U	ug/L	0.1	0.4
2/20/2012 11:30	Eflluent	Pesticides	Naled	0.8	U	ug/L	0.8	3.2
2/20/2012 11:30	Eflluent	Pesticides	Metribuzin	0.1	U	ug/L	0.1	0.4
2/20/2012 11:30	Eflluent	Pesticides	Metolachlor	0.5	U	ug/L	0.5	2
2/20/2012 11:30	Eflluent	Pesticides	Phorate	0.05	U	ug/L	0.05	0.2
2/20/2012 11:30	Eflluent	Pesticides	Fonofos	0.1	U	ug/L	0.1	0.4
2/20/2012 11:30	Eflluent	Pesticides	Diazinon	0.05	U	ug/L	0.05	0.2
2/20/2012 11:30	Eflluent	Pesticides	Ametryn	0.05	U	ug/L	0.05	0.2
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	2,6-Dinitrotoluene	1.1	U	ug/L	1.1	4.4
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1.1	U	ug/L	1.1	4.4
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Chrysene	0.22	U	ug/L	0.22	0.89
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Hexachlorobenzene	1.1	U	ug/L	1.1	4.4

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	2-Nitrophenol	1.1	U	ug/L	1.1	4.4
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Anthracene	0.22	U	ug/L	0.22	0.89
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Benzo(a)anthracene	0.22	U	ug/L	0.22	0.89
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	17	U	ug/L	17	67
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	N-Nitrosodimethylamine	2.2	U	ug/L	2.2	8.9
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Naphthalene	0.22	U	ug/L	0.22	0.89
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	4-Chloro-3-methylphenol	1.1	U	ug/L	1.1	4.4
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Benzo(a)pyrene	0.22	U	ug/L	0.22	0.89
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.22	U	ug/L	0.22	0.89
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Pyrene	0.22	U	ug/L	0.22	0.89
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3.3	U	ug/L	3.3	13
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Di-n-butyl phthalate	5.6	U	ug/L	5.6	22
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Fluoranthene	0.22	U	ug/L	0.22	0.89
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	2,4-Dinitrophenol	17	U	ug/L	17	67
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	3,3'-Dichlorobenzidine	44	U	ug/L	44	180
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1.1	U	ug/L	1.1	4.4
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	4-Nitrophenol	17	U	ug/L	17	67
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Acenaphthene	0.22	U	ug/L	0.22	0.89
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Benzidine	110	U	ug/L	110	440
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Benzo(b)fluoranthene	0.22	U	ug/L	0.22	0.89
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Benzo(k)fluoranthene	0.22	U	ug/L	0.22	0.89
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Di-n-octyl phthalate	1.1	U	ug/L	1.1	4.4
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Fluorene	0.22	U	ug/L	0.22	0.89
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.22	U	ug/L	0.22	0.89
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Phenol	1.1	U	ug/L	1.1	4.4
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	2,4,6-Trichlorophenol	1.1	U	ug/L	1.1	4.4
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	2,4-Dimethylphenol	11	U	ug/L	11	44
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	2,4-Dinitrotoluene	1.1	U	ug/L	1.1	4.4
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	2-Chloronaphthalene	1.1	U	ug/L	1.1	4.4
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	2-Chlorophenol	1.1	U	ug/L	1.1	4.4
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3.3	U	ug/L	3.3	13
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Nitrobenzene	2.2	U	ug/L	2.2	8.9
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Pentachlorophenol	3.3	U	ug/L	3.3	13
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	2,4-Dichlorophenol	1.1	U	ug/L	1.1	4.4
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2.2	U	ug/L	2.2	8.9
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Butyl benzyl phthalate	5.6	U	ug/L	5.6	22
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.22	U	ug/L	0.22	0.89

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Dimethyl phthalate	11	U	ug/L	11	44
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1.1	U	ug/L	1.1	4.4
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Acenaphthylene	0.22	U	ug/L	0.22	0.89
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	1.1	U	ug/L	1.1	4.4
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Hexachlorocyclopentadiene	3.3	U	ug/L	3.3	13
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Hexachloroethane	3.3	U	ug/L	3.3	13
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Isophorone	1.1	U	ug/L	1.1	4.4
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2.2	U	ug/L	2.2	8.9
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3.3	U	ug/L	3.3	13
2/20/2012 11:30	Eflluent	Priority Organic Pollutants	Phenanthrene	0.22	U	ug/L	0.22	0.89
2/20/2012 11:20	Eflluent	Toxicology	Bioassay-Chron-Def-FW-C.dubia, NOEC	100		NOEC		
2/20/2012 11:20	Eflluent	Toxicology	Bioassay-Chron-Def-FW-Fish, IC25	100	L	IC25		
2/20/2012 11:20	Eflluent	Toxicology	Bioassay-Chron-Def-FW-Fish, NOEC	100		NOEC		
2/20/2012 11:20	Eflluent	Toxicology	Bioassay-Chron-Def-FW-C.dubia, IC25	100	L	IC25		
2/22/2012 13:25	Control Site East	AGP/LN	Algal Growth Potential	3	U	mg DryWt/L	3	3
2/22/2012 13:25	Control Site East	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.4	U	ug/L	0.4	1.2
2/22/2012 13:25	Control Site East	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1	IJ	mg/L	0.2	2
2/22/2012 13:25	Control Site East	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	1.5	I	ug/L	0.55	1.7
2/22/2012 13:25	Control Site East	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day	1.4	I	mg/L	0.2	2
2/22/2012 13:25	Control Site East	Field Parameter	pH	7.86				
2/22/2012 13:25	Control Site East	Field Parameter	Dissolved Oxygen	8.25		mg/L		
2/22/2012 13:25	Control Site East	Field Parameter	Temperature	16.67		C		
2/22/2012 13:25	Control Site East	Field Parameter	Specific Conductance	45736		umhos/cm		
2/22/2012 13:25	Control Site East	Field Parameter	Sample Depth	0.15		m		
2/22/2012 13:25	Control Site East	Metals	Calcium	351		mg/L	0.22	0.9
2/22/2012 13:25	Control Site East	Metals	Magnesium	1100		mg/L	2	8
2/22/2012 13:25	Control Site East	Metals	Sodium	9320		mg/L	25	100
2/22/2012 13:25	Control Site East	Metals	Chromium	0.9	U	ug/L	0.9	3.6
2/22/2012 13:25	Control Site East	Metals	Zinc	15	U	ug/L	15	60
2/22/2012 13:25	Control Site East	Metals	Silver	0.075	U	ug/L	0.075	0.3
2/22/2012 13:25	Control Site East	Metals	Iron	90	U	ug/L	90	360
2/22/2012 13:25	Control Site East	Metals	Aluminum	60		ug/L	15	60
2/22/2012 13:25	Control Site East	Metals	Selenium	0.6	U	ug/L	0.6	2.4
2/22/2012 13:25	Control Site East	Metals	Cadmium	0.15	U	ug/L	0.15	0.6
2/22/2012 13:25	Control Site East	Metals	Arsenic	0.75	U	ug/L	0.75	3
2/22/2012 13:25	Control Site East	Metals	Nickel	0.75	U	ug/L	0.75	3
2/22/2012 13:25	Control Site East	Metals	Lead	0.6	U	ug/L	0.6	2.4

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/22/2012 13:25	Control Site East	Nutrients	Sulfate	2300		mg SO4/L	40	100
2/22/2012 13:25	Control Site East	Nutrients	Color (true)	2.5	U	PCU	2.5	6
2/22/2012 13:25	Control Site East	Nutrients	Fluoride	1.1		mg F/L	0.18	0.5
2/22/2012 13:25	Control Site East	Nutrients	Alkalinity	104	A	mg CaCO3/L	0.65	2.5
2/22/2012 13:25	Control Site East	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
2/22/2012 13:25	Control Site East	Nutrients	Turbidity	1.8		NTU	0.1	0.1
2/22/2012 13:25	Control Site East	Nutrients	Kjeldahl Nitrogen	0.16	U	mg N/L	0.16	0.4
2/22/2012 13:25	Control Site East	Nutrients	NO2NO3-N	0.005	U	mg N/L	0.005	0.01
2/22/2012 13:25	Control Site East	Nutrients	O-Phosphate-P	0.008	U	mg P/L	0.008	0.02
2/22/2012 13:25	Control Site East	Nutrients	Total-P	0.013	I	mg P/L	0.008	0.02
2/22/2012 13:25	Control Site East	Nutrients	Chloride	16000		mg Cl/L	40	100
2/22/2012 13:25	Control Site East	Nutrients	Organic Carbon	2.2	I	mg C/L	2	10
2/22/2012 13:25	Control Site East	Nutrients	TSS	11		mg/L	2	10
2/22/2012 13:25	Control Site East	Overflow	Macroinvert-Marine-Quan-NatSubstr-# Taxa	24		# Taxa		
2/22/2012 13:25	Control Site East	Overflow	Fecal Coliforms-Membrane Filter	1.1	B	cfu/100 mL	1	
2/22/2012 13:25	Control Site East	Overflow	Enterococci-Membrane Filter	20	B	cfu/100 mL	4	
2/22/2012 13:25	Control Site East	Overflow	Chemical Oxygen Demand	620		mg/L	63	200
2/22/2012 14:25	Control Site West	AGP/LN	Algal Growth Potential	3	U	mg DryWt/L	3	3
2/22/2012 14:25	Control Site West	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	1.7	I	ug/L	0.55	1.7
2/22/2012 14:25	Control Site West	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.4	U	ug/L	0.4	1.2
2/22/2012 14:25	Control Site West	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day	1.5	I	mg/L	0.2	2
2/22/2012 14:25	Control Site West	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.1	IJ	mg/L	0.2	2
2/22/2012 14:25	Control Site West	Field Parameter	Sample Depth	0.15		m		
2/22/2012 14:25	Control Site West	Field Parameter	Specific Conductance	47968		umhos/cm		
2/22/2012 14:25	Control Site West	Field Parameter	Temperature	16.9		C		
2/22/2012 14:25	Control Site West	Field Parameter	Dissolved Oxygen	8.24		mg/L		
2/22/2012 14:25	Control Site West	Field Parameter	pH	7.91				
2/22/2012 14:25	Control Site West	Metals	Cadmium	0.15	U	ug/L	0.15	0.6
2/22/2012 14:25	Control Site West	Metals	Copper	1.5	U	ug/L	1.5	3
2/22/2012 14:25	Control Site West	Metals	Nickel	0.75	U	ug/L	0.75	3
2/22/2012 14:25	Control Site West	Metals	Iron	90	U	ug/L	90	360
2/22/2012 14:25	Control Site West	Metals	Zinc	15	U	ug/L	15	60
2/22/2012 14:25	Control Site West	Metals	Chromium	0.9	U	ug/L	0.9	3.6
2/22/2012 14:25	Control Site West	Metals	Lead	0.6	U	ug/L	0.6	2.4
2/22/2012 14:25	Control Site West	Metals	Sodium	9900		mg/L	25	100
2/22/2012 14:25	Control Site West	Metals	Aluminum	45	I	ug/L	15	60
2/22/2012 14:25	Control Site West	Metals	Magnesium	1180		mg/L	2	8

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/22/2012 14:25	Control Site West	Metals	Silver	0.075	U	ug/L	0.075	0.3
2/22/2012 14:25	Control Site West	Metals	Selenium	0.6	U	ug/L	0.6	2.4
2/22/2012 14:25	Control Site West	Metals	Arsenic	0.78	I	ug/L	0.75	3
2/22/2012 14:25	Control Site West	Nutrients	O-Phosphate-P	0.008	U	mg P/L	0.008	0.02
2/22/2012 14:25	Control Site West	Nutrients	Color (true)	2.5	U	PCU	2.5	6
2/22/2012 14:25	Control Site West	Nutrients	Kjeldahl Nitrogen	0.16	U	mg N/L	0.16	0.4
2/22/2012 14:25	Control Site West	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
2/22/2012 14:25	Control Site West	Nutrients	Chloride	18000		mg Cl/L	40	100
2/22/2012 14:25	Control Site West	Nutrients	Turbidity	0.95		NTU	0.1	0.1
2/22/2012 14:25	Control Site West	Nutrients	Fluoride	1.1		mg F/L	0.18	0.5
2/22/2012 14:25	Control Site West	Nutrients	NO2NO3-N	0.005	U	mg N/L	0.005	0.01
2/22/2012 14:25	Control Site West	Nutrients	TSS	8	I	mg/L	2	10
2/22/2012 14:25	Control Site West	Nutrients	Alkalinity	110		mg CaCO3/L	0.65	2.5
2/22/2012 14:25	Control Site West	Nutrients	Organic Carbon	2.7	I	mg C/L	2	10
2/22/2012 14:25	Control Site West	Nutrients	Total-P	0.014	I	mg P/L	0.008	0.02
2/22/2012 14:25	Control Site West	Nutrients	Sulfate	2400		mg SO4/L	40	100
2/22/2012 14:25	Control Site West	Overflow	Macroinvert-Marine-Quan-NatSubstr-# Taxa	51		# Taxa		
2/22/2012 14:25	Control Site West	Overflow	Fecal Coliforms-Membrane Filter	1.1	B	cfu/100 mL	1	
2/22/2012 14:25	Control Site West	Overflow	Enterococci-Membrane Filter	8	B	cfu/100 mL	4	
2/22/2012 14:25	Control Site West	Overflow	Chemical Oxygen Demand	620		mg/L	63	200
2/22/2012 12:15	Test Site	AGP/LN	Algal Growth Potential	3	AU	mg DryWt/L	3	3
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Sediment Particle Size, %, 0.25-0.5 mm	4.49	A	% vol <2mm	0	0.01
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Sediment Particle Size, %, 0.125-0.25 mm	8.15	A	% vol <2mm	0	0.01
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	1.6	I	ug/L	0.55	1.7
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day	1.2	I	mg/L	0.2	2
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Sediment Particle Size, %, 0.063-0.125mm	13.6	A	% vol <2mm	0	0.01
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Sediment Particle Size, %, 0.5-2.0 mm	1.19	A	% vol <2mm	0	0.01
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Sediment % Organic	28	A	% dry wt		
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Sediment Particle Size, %, <0.063 mm	72.6	A	% vol <2mm	0	0.01
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.2	IJ	mg/L	0.2	2
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Sediment Particle Size, %, >2.0 mm	2.2	AJ	%totdrywt	0	1
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.4	U	ug/L	0.4	1.2
2/22/2012 12:15	Test Site	Field Parameter	pH	7.8				
2/22/2012 12:15	Test Site	Field Parameter	Specific Conductance	47264		umhos/cm		
2/22/2012 12:15	Test Site	Field Parameter	Sample Depth	0.15		m		
2/22/2012 12:15	Test Site	Field Parameter	Dissolved Oxygen	8.08		mg/L		
2/22/2012 12:15	Test Site	Field Parameter	Temperature	16.97		C		

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/22/2012 12:15	Test Site	Metals	Copper	1.5	U	ug/L	1.5	3
2/22/2012 12:15	Test Site	Metals	Cadmium	0.31	A	mg/Kg	0.05	0.2
2/22/2012 12:15	Test Site	Metals	Cadmium	0.15	U	ug/L	0.15	0.6
2/22/2012 12:15	Test Site	Metals	Lead	28.4	A	mg/Kg	0.37	1.5
2/22/2012 12:15	Test Site	Metals	Sodium	9550		mg/L	25	100
2/22/2012 12:15	Test Site	Metals	Nickel	0.75	U	ug/L	0.75	3
2/22/2012 12:15	Test Site	Metals	Zinc	15	U	ug/L	15	60
2/22/2012 12:15	Test Site	Metals	Magnesium	1170		mg/L	2	8
2/22/2012 12:15	Test Site	Metals	Lead	0.6	U	ug/L	0.6	2.4
2/22/2012 12:15	Test Site	Metals	Arsenic	1.1	I	ug/L	0.75	3
2/22/2012 12:15	Test Site	Metals	Iron	90	U	ug/L	90	360
2/22/2012 12:15	Test Site	Metals	Calcium	364		mg/L	0.22	0.9
2/22/2012 12:15	Test Site	Metals	Silver	0.171	A	mg/Kg	0.012	0.05
2/22/2012 12:15	Test Site	Metals	Arsenic	9.02	A	mg/Kg	0.099	0.4
2/22/2012 12:15	Test Site	Metals	Selenium	0.6	U	ug/L	0.6	2.4
2/22/2012 12:15	Test Site	Metals	Chromium	0.9	U	ug/L	0.9	3.6
2/22/2012 12:15	Test Site	Metals	Aluminum	44	I	ug/L	15	60
2/22/2012 12:15	Test Site	Metals	Copper	20.8	A	mg/Kg	0.25	0.99
2/22/2012 12:15	Test Site	Metals	Chromium	54.1	A	mg/Kg	0.25	0.99
2/22/2012 12:15	Test Site	Metals	Silver	0.075	U	ug/L	0.075	0.3
2/22/2012 12:15	Test Site	Metals	Zinc	64.2	A	mg/Kg	2	8
2/22/2012 12:15	Test Site	Nutrients	NO2NO3-N	0.005	U	mg N/L	0.005	0.01
2/22/2012 12:15	Test Site	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
2/22/2012 12:15	Test Site	Nutrients	Color (true)	2.5	U	PCU	2.5	6
2/22/2012 12:15	Test Site	Nutrients	Chloride	17000		mg Cl/L	40	100
2/22/2012 12:15	Test Site	Nutrients	Sulfate	2300		mg SO4/L	40	100
2/22/2012 12:15	Test Site	Nutrients	O-Phosphate-P	0.009	I	mg P/L	0.008	0.02
2/22/2012 12:15	Test Site	Nutrients	Organic Carbon	2.3	I	mg C/L	2	10
2/22/2012 12:15	Test Site	Nutrients	Kjeldahl Nitrogen	0.16	U	mg N/L	0.16	0.4
2/22/2012 12:15	Test Site	Nutrients	Turbidity	1		NTU	0.1	0.1
2/22/2012 12:15	Test Site	Nutrients	Total-P	0.018	I	mg P/L	0.008	0.02
2/22/2012 12:15	Test Site	Nutrients	Alkalinity	109		mg CaCO3/L	0.65	2.5
2/22/2012 12:15	Test Site	Nutrients	Fluoride	1.1		mg F/L	0.18	0.5
2/22/2012 12:15	Test Site	Nutrients	TSS	10	I	mg/L	2	10
2/22/2012 12:15	Test Site	Nutrients	% Solid	18.5	A	%	1	1
2/22/2012 12:15	Test Site	Overflow	Macroinvert-Marine-Quan-NatSubstr-# Taxa	17		# Taxa		
2/22/2012 12:15	Test Site	Overflow	Fecal Coliforms-Membrane Filter	1	U	cfu/100 mL	1	

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/22/2012 12:15	Test Site	Overflow	Chemical Oxygen Demand	640		mg/L	63	200
2/22/2012 12:15	Test Site	Priority Organic Pollutants	1,2,4-Trichlorobenzene	960	U	ug/kg	960	3900
2/22/2012 12:15	Test Site	Priority Organic Pollutants	2,4-Dinitrophenol	1900	UJ	ug/kg	1900	7700
2/22/2012 12:15	Test Site	Priority Organic Pollutants	2,6-Dinitrotoluene	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	320	UJ	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Anthracene	66	I	ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Chrysene	170		ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Diethyl phthalate	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Fluorene	36	U	ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Hexachloroethane	960	UJ	ug/kg	960	3900
2/22/2012 12:15	Test Site	Priority Organic Pollutants	N-Nitrosodimethylamine	1900	U	ug/kg	1900	7700
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Naphthalene	41	I	ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Pyrene	340		ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	2-Chloronaphthalene	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Azobenzene/1,2-Diphenylhydrazine	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Benzidine	7000	UJ	ug/kg	7000	28000
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Benzo(a)anthracene	140		ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Benzo(a)pyrene	140	I	ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Butyl benzyl phthalate	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Dibenzo(a,h)anthracene	36	U	ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Isophorone	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Phenol	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	2-Chlorophenol	960	U	ug/kg	960	3900
2/22/2012 12:15	Test Site	Priority Organic Pollutants	2-Nitrophenol	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	3,3'-Dichlorobenzidine	19000	UJ	ug/kg	19000	77000
2/22/2012 12:15	Test Site	Priority Organic Pollutants	4-Chloro-3-methylphenol	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Acenaphthene	36	U	ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Di-n-butyl phthalate	1900	U	ug/kg	1900	7700
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Hexachlorobenzene	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Nitrobenzene	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	4-Bromophenyl phenyl ether	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	4-Nitrophenol	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Bis(2-chloroethyl)ether	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Di-n-octyl phthalate	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	2,4-Dichlorophenol	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	2,4-Dimethylphenol	1900	U	ug/kg	1900	7700

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	71	I	ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Phenanthrene	160		ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	2,4,6-Trichlorophenol	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Benzo(g,h,i)perylene	80	I	ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	1900	U	ug/kg	1900	7700
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Hexachlorocyclopentadiene	320	UJ	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Acenaphthylene	36	U	ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Benzo(b)fluoranthene	220		ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Fluoranthene	310		ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	320	UJ	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Pentachlorophenol	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	2,4-Dinitrotoluene	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Benzo(k)fluoranthene	77	I	ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Dimethyl phthalate	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Hexachlorobutadiene	960	U	ug/kg	960	3900
2/20/2012 12:00	Field Blank	Metals	Zinc	5	U	ug/L	5	20
2/20/2012 12:00	Field Blank	Metals	Cadmium	0.05	U	ug/L	0.05	0.2
2/20/2012 12:00	Field Blank	Metals	Arsenic	0.25	U	ug/L	0.25	1
2/20/2012 12:00	Field Blank	Metals	Sodium	0.5	U	mg/L	0.5	2
2/20/2012 12:00	Field Blank	Metals	Copper	0.5	U	ug/L	0.5	1
2/20/2012 12:00	Field Blank	Metals	Chromium	0.3	U	ug/L	0.3	1.2
2/20/2012 12:00	Field Blank	Metals	Selenium	0.2	U	ug/L	0.2	0.8
2/20/2012 12:00	Field Blank	Metals	Magnesium	0.04	U	mg/L	0.04	0.16
2/20/2012 12:00	Field Blank	Metals	Silver	0.025	U	ug/L	0.025	0.1
2/20/2012 12:00	Field Blank	Metals	Calcium	0.075	U	mg/L	0.075	0.3
2/20/2012 12:00	Field Blank	Metals	Lead	0.2	U	ug/L	0.2	0.8
2/20/2012 12:00	Field Blank	Metals	Aluminum	5	U	ug/L	5	20
2/20/2012 12:00	Field Blank	Metals	Nickel	0.25	U	ug/L	0.25	1
2/20/2012 12:00	Field Blank	Metals	Iron	30	U	ug/L	30	120
2/20/2012 12:00	Field Blank	Nutrients	Organic Carbon	1	U	mg C/L	1	5
2/20/2012 12:00	Field Blank	Nutrients	Sulfate	0.2	U	mg SO4/L	0.2	0.5
2/20/2012 12:00	Field Blank	Nutrients	O-Phosphate-P	0.004	U	mg P/L	0.004	0.01
2/20/2012 12:00	Field Blank	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
2/20/2012 12:00	Field Blank	Nutrients	Turbidity	0.1	U	NTU	0.1	0.1
2/20/2012 12:00	Field Blank	Nutrients	Chloride	0.2	U	mg Cl/L	0.2	0.5

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/20/2012 12:00	Field Blank	Nutrients	Total-P	0.004	U	mg P/L	0.004	0.01
2/20/2012 12:00	Field Blank	Nutrients	Fluoride	0.035	U	mg F/L	0.035	0.1
2/20/2012 12:00	Field Blank	Nutrients	Color (true)	2.5	U	PCU	2.5	6
2/20/2012 12:00	Field Blank	Nutrients	Alkalinity	0.65	U	mg CaCO3/L	0.65	2.5
2/20/2012 12:00	Field Blank	Nutrients	NO2NO3-N	0.004	U	mg N/L	0.004	0.01
2/20/2012 12:00	Field Blank	Overflow	Chemical Oxygen Demand	6.3	U	mg/L	6.3	20
2/20/2012 12:00	Field Blank	Pesticides	Metalaxyl	0.27	U	ug/L	0.27	1.1
2/20/2012 12:00	Field Blank	Pesticides	Naled	0.86	U	ug/L	0.86	3.4
2/20/2012 12:00	Field Blank	Pesticides	Norflurazon	0.16	U	ug/L	0.16	0.64
2/20/2012 12:00	Field Blank	Pesticides	Phorate	0.054	U	ug/L	0.054	0.21
2/20/2012 12:00	Field Blank	Pesticides	Bromacil	0.21	U	ug/L	0.21	0.86
2/20/2012 12:00	Field Blank	Pesticides	Butylate	0.21	U	ug/L	0.21	0.86
2/20/2012 12:00	Field Blank	Pesticides	Chlorpyrifos Ethyl	0.054	U	ug/L	0.054	0.21
2/20/2012 12:00	Field Blank	Pesticides	Metribuzin	0.11	U	ug/L	0.11	0.43
2/20/2012 12:00	Field Blank	Pesticides	Atrazine	0.054	U	ug/L	0.054	0.21
2/20/2012 12:00	Field Blank	Pesticides	Chlorpyrifos Methyl	0.11	U	ug/L	0.11	0.43
2/20/2012 12:00	Field Blank	Pesticides	Mevinphos	0.21	U	ug/L	0.21	0.86
2/20/2012 12:00	Field Blank	Pesticides	Parathion Methyl	0.11	U	ug/L	0.11	0.43
2/20/2012 12:00	Field Blank	Pesticides	Alachlor	0.64	U	ug/L	0.64	2.6
2/20/2012 12:00	Field Blank	Pesticides	Diazinon	0.054	U	ug/L	0.054	0.21
2/20/2012 12:00	Field Blank	Pesticides	Fenamiphos	0.21	U	ug/L	0.21	0.86
2/20/2012 12:00	Field Blank	Pesticides	Ethion	0.054	U	ug/L	0.054	0.21
2/20/2012 12:00	Field Blank	Pesticides	Parathion Ethyl	0.16	U	ug/L	0.16	0.64
2/20/2012 12:00	Field Blank	Pesticides	Prometryn	0.16	U	ug/L	0.16	0.64
2/20/2012 12:00	Field Blank	Pesticides	Ametryn	0.054	U	ug/L	0.054	0.21
2/20/2012 12:00	Field Blank	Pesticides	Azinphos Methyl	0.21	U	ug/L	0.21	0.86
2/20/2012 12:00	Field Blank	Pesticides	Hexazinone	0.11	U	ug/L	0.11	0.43
2/20/2012 12:00	Field Blank	Pesticides	Metolachlor	0.54	U	ug/L	0.54	2.1
2/20/2012 12:00	Field Blank	Pesticides	Simazine	0.054	U	ug/L	0.054	0.21
2/20/2012 12:00	Field Blank	Pesticides	Ethoprop	0.11	U	ug/L	0.11	0.43
2/20/2012 12:00	Field Blank	Pesticides	Fonofos	0.11	U	ug/L	0.11	0.43
2/20/2012 12:00	Field Blank	Pesticides	Malathion	0.16	U	ug/L	0.16	0.64
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1.1	U	ug/L	1.1	4.4
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3.3	U	ug/L	3.3	13
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Benzo(a)anthracene	0.22	U	ug/L	0.22	0.88
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Benzo(k)fluoranthene	0.22	U	ug/L	0.22	0.88
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Hexachlorobutadiene	3.3	U	ug/L	3.3	13

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.22	U	ug/L	0.22	0.88
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	N-Nitrosodimethylamine	2.2	U	ug/L	2.2	8.8
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Phenanthrene	0.22	U	ug/L	0.22	0.88
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Phenol	1.1	U	ug/L	1.1	4.4
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Pyrene	0.22	U	ug/L	0.22	0.88
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	2,4-Dimethylphenol	11	U	ug/L	11	44
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	2,4-Dinitrotoluene	1.1	U	ug/L	1.1	4.4
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Acenaphthene	0.22	U	ug/L	0.22	0.88
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Benzidine	110	U	ug/L	110	440
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Butyl benzyl phthalate	5.5	U	ug/L	5.5	22
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Di-n-octyl phthalate	1.1	U	ug/L	1.1	4.4
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Pentachlorophenol	3.3	U	ug/L	3.3	13
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	2,4-Dinitrophenol	16	U	ug/L	16	66
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2.2	U	ug/L	2.2	8.8
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Benzo(a)pyrene	0.22	U	ug/L	0.22	0.88
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	1.1	U	ug/L	1.1	4.4
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Hexachlorobenzene	1.1	U	ug/L	1.1	4.4
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	2,4,6-Trichlorophenol	1.1	U	ug/L	1.1	4.4
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	2,4-Dichlorophenol	1.1	U	ug/L	1.1	4.4
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	3,3'-Dichlorobenzidine	44	U	ug/L	44	180
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	4-Chloro-3-methylphenol	1.1	U	ug/L	1.1	4.4
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Chrysene	0.22	U	ug/L	0.22	0.88
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Fluoranthene	0.22	U	ug/L	0.22	0.88
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Isophorone	1.1	U	ug/L	1.1	4.4
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2.2	U	ug/L	2.2	8.8
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Nitrobenzene	2.2	U	ug/L	2.2	8.8
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	2-Chloronaphthalene	1.1	U	ug/L	1.1	4.4
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1.1	U	ug/L	1.1	4.4
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Anthracene	0.22	U	ug/L	0.22	0.88
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Fluorene	0.22	U	ug/L	0.22	0.88
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Naphthalene	0.22	U	ug/L	0.22	0.88
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	2-Chlorophenol	1.1	U	ug/L	1.1	4.4
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Benzo(b)fluoranthene	0.22	U	ug/L	0.22	0.88
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1.1	U	ug/L	1.1	4.4
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3.3	U	ug/L	3.3	13
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Di-n-butyl phthalate	5.5	U	ug/L	5.5	22
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Dimethyl phthalate	11	U	ug/L	11	44

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	2-Nitrophenol	1.1	U	ug/L	1.1	4.4
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Acenaphthylene	0.22	U	ug/L	0.22	0.88
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Diethyl phthalate	1.1	U	ug/L	1.1	4.4
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3.3	U	ug/L	3.3	13
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.22	U	ug/L	0.22	0.88
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	16	U	ug/L	16	66
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.22	U	ug/L	0.22	0.88
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	Hexachlorocyclopentadiene	3.3	U	ug/L	3.3	13
2/20/2012 12:00	Field Blank	Priority Organic Pollutants	4-Nitrophenol	16	U	ug/L	16	66
2/22/2012 12:15	Test Site	AGP/LN	Algal Growth Potential	3	AU	mg DryWt/L	3	3
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Sediment Particle Size, %, 0.25-0.5 mm	4.49	A	% vol <2mm	0	0.01
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Sediment Particle Size, %, 0.125-0.25 mm	8.15	A	% vol <2mm	0	0.01
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	1.6	I	ug/L	0.55	1.7
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day	1.2	I	mg/L	0.2	2
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Sediment Particle Size, %, 0.063-0.125mm	13.6	A	% vol <2mm	0	0.01
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Sediment Particle Size, %, 0.5-2.0 mm	1.19	A	% vol <2mm	0	0.01
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Sediment % Organic	28	A	% dry wt		
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Sediment Particle Size, %, <0.063 mm	72.6	A	% vol <2mm	0	0.01
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.2	IJ	mg/L	0.2	2
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Sediment Particle Size, %, >2.0 mm	2.2	AJ	%totdrywt	0	1
2/22/2012 12:15	Test Site	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.4	U	ug/L	0.4	1.2
2/22/2012 12:15	Test Site	Field Parameter	pH	7.8				
2/22/2012 12:15	Test Site	Field Parameter	Specific Conductance	47264		umhos/cm		
2/22/2012 12:15	Test Site	Field Parameter	Sample Depth	0.15		m		
2/22/2012 12:15	Test Site	Field Parameter	Dissolved Oxygen	8.08		mg/L		
2/22/2012 12:15	Test Site	Field Parameter	Temperature	16.97		C		
2/22/2012 12:15	Test Site	Metals	Nickel	13.7	A	mg/Kg	0.25	0.99
2/22/2012 12:15	Test Site	Metals	Copper	1.5	U	ug/L	1.5	3
2/22/2012 12:15	Test Site	Metals	Cadmium	0.31	A	mg/Kg	0.05	0.2
2/22/2012 12:15	Test Site	Metals	Cadmium	0.15	U	ug/L	0.15	0.6
2/22/2012 12:15	Test Site	Metals	Lead	28.4	A	mg/Kg	0.37	1.5
2/22/2012 12:15	Test Site	Metals	Sodium	9550		mg/L	25	100
2/22/2012 12:15	Test Site	Metals	Nickel	0.75	U	ug/L	0.75	3
2/22/2012 12:15	Test Site	Metals	Zinc	15	U	ug/L	15	60
2/22/2012 12:15	Test Site	Metals	Magnesium	1170		mg/L	2	8
2/22/2012 12:15	Test Site	Metals	Lead	0.6	U	ug/L	0.6	2.4
2/22/2012 12:15	Test Site	Metals	Arsenic	1.1	I	ug/L	0.75	3

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/22/2012 12:15	Test Site	Metals	Calcium	364		mg/L	0.22	0.9
2/22/2012 12:15	Test Site	Metals	Silver	0.171	A	mg/Kg	0.012	0.05
2/22/2012 12:15	Test Site	Metals	Arsenic	9.02	A	mg/Kg	0.099	0.4
2/22/2012 12:15	Test Site	Metals	Selenium	0.6	U	ug/L	0.6	2.4
2/22/2012 12:15	Test Site	Metals	Chromium	0.9	U	ug/L	0.9	3.6
2/22/2012 12:15	Test Site	Metals	Aluminum	44	I	ug/L	15	60
2/22/2012 12:15	Test Site	Metals	Copper	20.8	A	mg/Kg	0.25	0.99
2/22/2012 12:15	Test Site	Metals	Chromium	54.1	A	mg/Kg	0.25	0.99
2/22/2012 12:15	Test Site	Metals	Silver	0.075	U	ug/L	0.075	0.3
2/22/2012 12:15	Test Site	Metals	Zinc	64.2	A	mg/Kg	2	8
2/22/2012 12:15	Test Site	Nutrients	NO2NO3-N	0.005	U	mg N/L	0.005	0.01
2/22/2012 12:15	Test Site	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
2/22/2012 12:15	Test Site	Nutrients	Color (true)	2.5	U	PCU	2.5	6
2/22/2012 12:15	Test Site	Nutrients	Chloride	17000		mg Cl/L	40	100
2/22/2012 12:15	Test Site	Nutrients	Sulfate	2300		mg SO4/L	40	100
2/22/2012 12:15	Test Site	Nutrients	O-Phosphate-P	0.009	I	mg P/L	0.008	0.02
2/22/2012 12:15	Test Site	Nutrients	Organic Carbon	2.3	I	mg C/L	2	10
2/22/2012 12:15	Test Site	Nutrients	Kjeldahl Nitrogen	0.16	U	mg N/L	0.16	0.4
2/22/2012 12:15	Test Site	Nutrients	Turbidity	1		NTU	0.1	0.1
2/22/2012 12:15	Test Site	Nutrients	Total-P	0.018	I	mg P/L	0.008	0.02
2/22/2012 12:15	Test Site	Nutrients	Alkalinity	109		mg CaCO3/L	0.65	2.5
2/22/2012 12:15	Test Site	Nutrients	Fluoride	1.1		mg F/L	0.18	0.5
2/22/2012 12:15	Test Site	Nutrients	TSS	10	I	mg/L	2	10
2/22/2012 12:15	Test Site	Nutrients	% Solid	18.5	A	%	1	1
2/22/2012 12:15	Test Site	Overflow	Macroinvert-Marine-Quan-NatSubstr-# Taxa	17		# Taxa		
2/22/2012 12:15	Test Site	Overflow	Fecal Coliforms-Membrane Filter	1	U	cfu/100 mL	1	
2/22/2012 12:15	Test Site	Overflow	Enterococci-Membrane Filter	8	B	cfu/100 mL	4	
2/22/2012 12:15	Test Site	Overflow	Chemical Oxygen Demand	640		mg/L	63	200
2/22/2012 12:15	Test Site	Priority Organic Pollutants	1,2,4-Trichlorobenzene	960	U	ug/kg	960	3900
2/22/2012 12:15	Test Site	Priority Organic Pollutants	2,4-Dinitrophenol	1900	UJ	ug/kg	1900	7700
2/22/2012 12:15	Test Site	Priority Organic Pollutants	2,6-Dinitrotoluene	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	320	UJ	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Anthracene	66	I	ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Chrysene	170		ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Diethyl phthalate	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Fluorene	36	U	ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Hexachloroethane	960	UJ	ug/kg	960	3900

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Naphthalene	41	I	ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Pyrene	340		ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	2-Chloronaphthalene	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Azobenzene/1,2-Diphenylhydrazine	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Benzidine	7000	UJ	ug/kg	7000	28000
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Benzo(a)anthracene	140		ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Benzo(a)pyrene	140	I	ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Butyl benzyl phthalate	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Dibenzo(a,h)anthracene	36	U	ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Isophorone	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Phenol	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	2-Chlorophenol	960	U	ug/kg	960	3900
2/22/2012 12:15	Test Site	Priority Organic Pollutants	2-Nitrophenol	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	3,3'-Dichlorobenzidine	19000	UJ	ug/kg	19000	77000
2/22/2012 12:15	Test Site	Priority Organic Pollutants	4-Chloro-3-methylphenol	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Acenaphthene	36	U	ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Di-n-butyl phthalate	1900	U	ug/kg	1900	7700
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Hexachlorobenzene	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Nitrobenzene	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	4-Bromophenyl phenyl ether	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	4-Nitrophenol	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Bis(2-chloroethyl)ether	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Di-n-octyl phthalate	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	2,4-Dichlorophenol	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	2,4-Dimethylphenol	1900	U	ug/kg	1900	7700
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	71	I	ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Phenanthrene	160		ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	2,4,6-Trichlorophenol	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Benzo(g,h,i)perylene	80	I	ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	1900	U	ug/kg	1900	7700
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Hexachlorocyclopentadiene	320	UJ	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Acenaphthylene	36	U	ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Benzo(b)fluoranthene	220		ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Fluoranthene	310		ug/kg	36	140

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/22/2012 12:15	Test Site	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	320	UJ	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Pentachlorophenol	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	2,4-Dinitrotoluene	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Benzo(k)fluoranthene	77	I	ug/kg	36	140
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Dimethyl phthalate	320	U	ug/kg	320	1300
2/22/2012 12:15	Test Site	Priority Organic Pollutants	Hexachlorobutadiene	960	U	ug/kg	960	3900

Appendix G

Toxicological results

FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia

Facility: Lynn Haven WWTF
Address: 825 Ohio AVE., Lynn Haven
County: Bay ZIP 32444
NPDES Permit #: FL 0169978
Contact/District: Nathan Markley / Northwest

LIMS entry: MF 3-1-12 verified: BA 3.1.12

Diluent/ Batch: 20% DMW / 2-7-12 Test Days Used: BA 0-4-7
20% DMW / 1-30-12 MF Test Days Used: 0-1-2-3

SOP#: TA07_05 EPA 821-R-02-013 Method 1002.0

Organism: *Ceriodaphnia dubia*
Organism Batch #: 2-21-12
Organism age : <24 hours
Feeding: Prior to Test and Daily
Food: ☒ YCT ☒ *P. subcapitata*
Food Batch: 1-20-12 10-31-11
Chamber size : 30 ml
Sample volume : 20 ml

Sample Received	LAB Sample #	LIMS JOB #	LIMS SAMPLE #	Collection Date/Time	Received Date/Time
Test Day 0	1	TLH-2012-02-21-36	1409784	2/20/12 1120	2/21/12 1003
Test Day 2	2	TLH-2012-02-23-75	1410462	2/22/12 1100	2/23/12 1009
Test Day 4	3	TLH-2012-03-01-40	1411568	2/24/12 1122	2/25/12 0905

Batch #	2-7-12	1-30-12	NA	NA	NA			
Water Quality Parameters	20% DMW	20% DMW	Sample 1	Sample 2	Sample 3	Other:	Measured By:	Verified by:
Field Total Residual Cl_2 (mg/L):	NA	NA	Not measured	Not measured	Not measured		—	MF
Lab Total Residual Cl_2 (mg/L):	<0.03	<0.03	<0.03	<0.03	<0.03		AP JD	BA MF
Alkalinity (mg/L as $CaCO_3$):	76	85	97	89	147		AP/JD	BA MF
Hardness (mg/L as $CaCO_3$):	101	87	124	126	135		AP/JD	BA MF
Total Ammonia (mg/L as N):	<0.017	<0.017	<0.017	<0.017	<0.017		MF	BA
Conductivity (µmhos) mmhos:	298	314	576	542	521		BA	MF
Salinity (ppth):	—	—	—	—	—	—	—	—

Test Incubated in: Incubator #: 2

Temperature Shipped ≤ 6° C (all samples) (yes) no
Holding Time ≤ 36 hours (yes) no
Light Intensity : 50 - 100 ft. candles
Photoperiod : 16 light 8 dark
Temperature Range °C:
Incubator # 2 min. 24.5 max. 26.3 mean —
Room B246 min. 23.4 max. 25.3 mean —
Test min. ____ max. ____ mean ____

Loaded by: MF

Test Replicates	Loaded from culture vial
1	A4
2	A9
3	A10
4	A27
5	A18
6	A29
7	B1
8	B6
9	B26
10	B19

Results	
Control % CV:	22.03%
Dunnetts PMSD:	19.3%
Reproduction NOEC:	100%
Reproduction LOEC:	>100%
Survival NOEC:	100%
Survival LOEC:	>100%
ICP_{20}:	>100%
ICP_{25}:	>100%

Investigators' signatures
Brian Adkins
Marshall Faircloth
Andrew Pennington
James Smith
Liz Gillen
REVIEWER

Comments:

FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia Survival and Reproduction

SOP TA07_05

Facility: LYNN HAVEN WWTF

LIMS Sample #: 1409784 for lab sample #1

Start Date: 2-21-12 Time: 1300

End Date: 2-29-12 Time: 0800

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving adults	Neonates per adult
Control	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	0	10	0
	4	0	0	0	4	4	6	4	5	0	0	18	10	1.8
	5	5	7	0	0	1(5)	0	0	0	0	6	18	10	1.8
	6	0	0	2	0	0	8	7	4	7	0	28	10	2.8
	7	8	9	16	2	9	12	6	9	7	5	83	10	8.3
	8	10	6	12	8	12	0	0	0	10	8	66	10	6.6
	Total	23	22	30	14	26	20	17	18	24	19	213	10	21.3

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving adults	Neonates per adult
6.25%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	0	10	0
	4	6	4	4	1	4	4	0	4	4	4	35	10	3.5
	5	13	9	11	8	9	10	0	12	2	9	83	10	8.3
	6	0	14	13	13	9	0	0	0	0	9	58	10	5.8
	7	10	0	0	0	0	10 MF 3	12 MF 12	7	13	0	43	10	4.3
	X 8	-	-	-	-	-	-	12	-	-	-	12	10	1.2
	Total	29	27	28	22	22	17	22	23	19	22	231	10	23.1

Organisms loaded by: MF

Day	Counted/ verified by:	Concentrations prepared by:
0	BA	BA
1	BA	BA
2	MF	MF
3	MF	MF
4	MF	MF
5	MF	MF
6	MF	MF
7	MF	MF
8	MF	—

Concentration	Mean neonates /adult	% survival
Control	21.3	100 %
6.25%	23.1	100 %
12.50%	22.2	100 %
25%	23.7	100 %
50%	25.0	100 %
100%	24.7	100 %

Test acceptability		
Mean control reproduction 15/female	(yes)	no
3rd brood in 60% of surviving females	(yes)	no
Control survival ≥ 80%:	(yes)	no

Comments: (5) = split MF 2-26-12 MF

X Day 8 counts not made for 4th broods - MF 2-29-12

*Day 0 is test initiation day

X = Dead (original organism)

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FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia Survival and Reproduction

SOP TA07_05

Facility: Lynn Haven WWTF

LIMS Sample # : 1409784 for lab sample #1

Start Date: 2-21-12 Time: 1300

End Date: 2-29-12 Time: 0800

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving Adults	Neonates per adult
12.50%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	0	10	0
	4	5	5	3	4	3	5	0	4	4	5	38	10	3.8
	5	10	8	9	10	8	8	0	10	6	10	79	10	7.9
	6	9	9	0	11	12	0	0	10	0	13	64	10	6.4
	7	0	0	9	0	0	11	1	0	10	0	31	10	3.1
	*8	-	-	-	-	-	-	10	-	-	-	10	10	1.0
	Total	24	22	21	25	23	24	11	24	20	28	222	10	22.2

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving Adults	Neonates per adult
25%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	0	10	0
	4	5	2	3	0	4	4	5	4	4	4	35	10	3.5
	5	11	10	9	0	9	10	9	12	7	6	83	10	8.3
	6	11	11	11	9	0	11	12	10	0	11	86	10	8.6
	7	0	0	0	10	0	0	0	0	10	0	20	10	~~0.2~~ 2.0 M
	*8	-	-	-	0	13	-	-	-	-	-	13	10	1.3
	Total	27	23	23	19	26	25	26	26	~~25~~ 21 M	21	237	10	23.7

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving Adults	Neonates per adult
50%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	0	10	0
	4	2	3	6	2	3	5	1	5	5	6	38	10	3.8
	5	11	8	9	8	6	10	10	10	10	10	92	10	9.2
	6	15	9	13	12	13	0	0	14	0	15	91	10	9.1
	7	0	0	0	0	0	8	11	0	10	0	29	10	2.9
	X 8	-	-	-	-	-	-	-	-	-	-	0	10	0
	Total	28	20	28	22	22	23	22	29	25	31	250	10	25.0

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving Adults	Neonates per adult
100%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	0	10	0
	4	5	5	5	1	4	4	4	4	5	6	43	10	4.3
	5	11	10	12	6	8	11	0	8	9	11	86	10	8.6
	6	12	12	15	13	8	8	0	9	0	13	90	10	9.0
	7	0	0	0	0	0	0	5	0	11	0	16	10	1.6
	*8	-	-	-	-	-	-	12	-	-	-	12	10	1.2
	Total	28	27	32	20	20	23	21	21	25	30	247	10	24.7

Comments:

* 4th brood is Not Counted on Day 8 MF 2-29-12

*Day 0 is test initiation day
X = Dead (original organism)

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revised 07/15/08 MF

Page 15

FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia Parameters

Facility: Lynn Haven MF WWTP SOP TA07_05

LIMS Sample #: 1409784 for lab sample 1

Circle µmhos-cm or mmhos-cm

Test Day ↓		Concentration	New Sample: Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)	Old Sample: Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)
Day 0	sample	Control	M	7.6	24.6	6.9	314					
	1	6.25%	M	7.7	24.7	7.6	334					
	1	12.5%	M	7.8	24.7	7.8	350					
	1	25%	M	7.8	24.8	7.2	382					
	1	50%	M	7.8	24.8	7.6	446					
	1	100%	M	7.9	24.7	7.4	576					
	Measured by:			BA	BA	BA	BA					
	Recorded by:			BA	BA	BA	BA					
Day 1	sample:	Control	M	7.6	24.7	6.3	309	M	7.5	24.6	6.5	337
	1	6.25%	M	7.7	24.4	6.8	333	M	7.5	24.4	6.8	365
	1	12.5%	M	7.7	24.0	6.7	351	M	7.6	24.1	6.8	377
	1	25%	M	7.8	24.0	7.2	384	M	7.6	24.0	7.0	397
	1	50%	M	7.8	24.1	7.2	448	M	7.7	24.0	7.0	451
	1	100%	M	7.9	24.3	7.2	580	M	7.7	24.0	7.0	580
	Measured by:			BA	BA	BA	BA		BA	BA	BA	BA
	Recorded by:			BA	BA	BA	BA		BA	BA	BA	BA
Day 2	sample:	Control	M	7.7	25.4	7.5	310	M	7.7	24.1	7.6	342
	2	6.25%	M	7.8	25.6	7.4	325	M	8.0	24.4	7.7	348
	2	12.5%	M	7.9	25.6	7.4	338	M	8.1	24.8	7.9	354
	2	25%	M	7.9	25.7	7.5	367	M	8.1	25.0	8.0	385
	2	50%	M	7.9	25.7	7.6	424	M	8.0	25.0	8.0	452
	2	100%	M	7.9	25.7	7.8	546	M	8.1	24.8	8.1	591
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF
Day 3	sample:	Control	M	7.7	25.3	7.1	307	*M	7.9	—	24.2	7.6 / 320
	2	6.25%	M	7.7	25.3	7.3	319	M	7.9	—	24.4	7.6 / 342
	2	12.5%	M	7.7	25.3	7.3	333	M	7.9	—	24.6	7.6 / 350
	2	25%	M	7.8	25.4	7.3	360	M	7.9	—	24.5	7.4 / 378
	2	50%	M	7.8	25.3	7.3	415	M	7.9	—	24.5	7.5 / 428
	2	100%	M	7.7	25.2	7.5	533	M	7.9	—	24.3	7.4 / 554
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF

Comments: * Temp in DO column MF 2-24-12 D.O. To right of temp. D. Lm

D.O.

Replicate M= "Metered" vial, a surrogate vial for parameters

FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia Parameters

Facility: Lynn Haven WWTP SOP TA07_05

LIMS Sample #: 149784 for lab sample 1
140784 fm

Circle µmhos-cm or mmhos-cm

Test Day ←		Concentration	New Sample					Old Sample				
			Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)	Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)
Day 4	sample:	Control	M	7.6	24.7	7.9	298	M	7.9	24.2	8.7	333
	3	6.25%	M	7.7	25.2	8.1	317	M	7.9	24.3	8.8	338
	3	12.5%	M	7.6	25.2	8.2	331	M	7.9	24.5	9.0	351
	3	25%	M	7.7	25.1	8.2	357	M	7.9	24.5	9.0	382
	3	50%	M	7.7	25.1	8.3	411	M	7.9	24.3	9.1	443
	3	100%	M	7.8	24.8	8.3	517	M	7.9	24.0	9.1	583
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF
Day 5	sample:	Control	M	7.6	24.2	7.9	300	M	7.9	24.1	8.8	338
	3	6.25%	M	7.6	24.7	8.0	305	M	7.9	24.0	8.8	351
	3	12.5%	M	7.6	24.8	8.0	321	M	7.9	24.2	8.9	354
	3	25%	M	7.6	24.7	8.1	347	M	7.9	24.4	8.9	382
	3	50%	M	7.7	24.7	8.1	403	M	7.9	24.7	9.0	430
	3	100%	M	7.7	25.0	8.3	517	M	7.9	24.7	9.0	548
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF
Day 6	sample:	Control	M	7.6	24.5	8.0	317	M	8.1	24.1	8.4	336
	3	6.25%	M	7.6	24.6	7.8	332	M	8.1	24.2	8.5	326
	3	12.5%	M	7.7	24.7	7.6	344	M	8.1	24.4	8.5	338
	3	25%	M	7.7	24.7	7.7	369	M	8.1	24.4	8.4	364
	3	50%	M	7.7	24.9	7.7	419	M	8.1	24.3	8.5	432
	3	100%	M	7.8	25.1	7.8	525	M	8.1	24.2	8.5	595
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF
Day 7	sample:	Control	M	7.6	24.9	7.6	329	M	7.9	24.2	8.2	340
	3	6.25%	M	7.6	24.8	7.6	333	M	8.0	24.1	8.3	347
	3	12.5%	M	7.6	24.7	7.6	350	M	8.0	24.1	8.3	352
	3	25%	M	7.7	24.5	7.6	370	M	8.0	24.2	8.3	375
	3	50%	M	7.7	24.4	7.7	420	M	8.0	24.3	8.2	450
	3	100%	M	8.0	24.2	7.7	532	M	8.0	24.3	8.3	549
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF

Comments:

DAY 8 only

Conc.	pH	Temp	DO	Cond. umhos
C+C	7.7	24.4	7.9	340
6.25%	7.8	24.4	8.0	342
12.5%	7.8	24.3	8.0	345
25%	7.9	24.2	7.9	379
50%	7.9	24.2	8.0	428
100%	7.8	24.0	8.1	533

Replicate M= "Metered" vial, a surrogate vial for parameters

Test Page 5 of 6

PAGE 17

revised 07/15/08 MF

FW Bioassays MF 2-29-12

Test ID: Lynn Haven WWTF Chronic ~~SRTs~~ Dates: 2-21-12 – 2-29-12

METER / DEVICE	ID	SOP	Parameter	Method	v used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
YSI DO Probe	5905	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
Accumet AR-10 pH Meter	93312105	TA06_23	pH	SM 4500 H+	✓
Mettler-Toledo SevenMulti Conductivity Meter	SN 1225117049 Probe H04257	TA06_25	Conductivity Salinity	SM 2510 B SM 2520 B	✓
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	✓
Traceable Thermometer	#1-SN101686412 #2-SN221295527 #3-SN240116020 #4-SN80361795 (#5 SN61990624)	TA06_05	Temperature	SM-2530B modified DEP SOP-001/01 FT1400	✓
Hach Pocket Colorimeter II	05050C026378	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	✓
Alkalinity (Hach Kit)	No SN	TA06_08	Alkalinity	SM 2320 B	✓
Hardness (Hach Kit)	No SN	TA06_09	Hardness	SM 2340 C	✓
OHAUS Balance 250D	1125481084	TA06_21 TA06_27	Weight	-	
S-Weights	BIO-S-WEIGHTS-01	NA	Balance check	-	

SM-2530B modified to allow use of electronic and non-mercury filled thermometers.

Insert other device information in blank spaces(if used). Test ID = Facility or SRTs (acute SRT–Chronic SRT)

BA ~~2-17-12~~ 2.21.12

V 1.1 9/21/10 MF/jd

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	2/21/2012 13:00	Test ID:	lynn22012	Sample ID:	Lynn Haven wwtf c. dubia chronic
End Date:	2/29/2012 08:00	Lab ID:	DEP TOXLAB-FDEP Biology T	Sample Type:	EFF1-POTW
Sample Date:		Protocol:	EPAF 94-EPA/600/4-91/002	Test Species:	CD-Ceriodaphnia dubia
Comments:					

Conc-%	1	2	3	4	5	6	7	8	9	10
D-Control	23.000	22.000	30.000	14.000	26.000	20.000	17.000	18.000	24.000	19.000
6.25	29.000	27.000	28.000	22.000	22.000	17.000	22.000	23.000	19.000	22.000
12.5	24.000	22.000	21.000	25.000	23.000	24.000	11.000	24.000	20.000	28.000
25	27.000	23.000	23.000	19.000	26.000	25.000	26.000	26.000	21.000	21.000
50	28.000	20.000	28.000	22.000	22.000	23.000	22.000	29.000	25.000	31.000
100	28.000	27.000	32.000	20.000	20.000	23.000	21.000	21.000	25.000	30.000

			Transform: Untransformed					Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	21.300	1.0000	21.300	14.000	30.000	22.026	10	23.333	1.0000
6.25	23.100	1.0845	23.100	17.000	29.000	16.635	10	23.333	1.0000
12.5	22.200	1.0423	22.200	11.000	28.000	20.345	10	23.333	1.0000
25	23.700	1.1127	23.700	19.000	27.000	11.435	10	23.333	1.0000
50	25.000	1.1737	25.000	20.000	31.000	14.967	10	23.333	1.0000
100	24.700	1.1596	24.700	20.000	32.000	17.704	10	23.333	1.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.55082	1.035	-0.1555	0.12453
Bartlett's Test indicates equal variances (p = 0.69)	3.05518	15.0863		

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

FDEP Biology Laboratory - Chronic Bioassay Bench Sheet

Pimphales promelas or Menidia beryllina

Facility: Lynn Haven IWTF
Address: 825 Ohio Ave, Lynn Haven
County: Bay Zip 32444
NPDES Permit #: FL 0169978
Contact/District: Nathan Mulkey / Northwest

Test Species (circle one)
(P. promelas) SOP#: TA07_09 EPA-821-R-02-013 Method 1000.0
M. beryllina SOP#: TA07_14 EPA-821-R-02-014 Method 1006.0

Start Date: 2.21.12 Time: 1300
End Date: 2.28.12 Time: 1000

Diluent/ Batch:
MHW / 2.17.12 Test Days Used: 0-7
MHW / Test Days Used:
ASW / Test Days Used:
ASW / Test Days Used:

Organism age : <24hrs ~~days~~ JD
Feeding Prior to Test and Daily
Artemia Lot # : 23613
Chamber size : 1000 ml
Test volume : 500 ml

Artemia Batch #		Day 3	21-12
Day 0	18-12	Day 4	22-12
Day 1	19-12	Day 5	23-12
Day 2	20-12	Day 6	24-12

Sample Received	Lab Sample #	LIMS Job #	LIMS Sample #	Collection Date/Time	Received Date/Time
Test Day 0	1	TLH-2012-02-21-36	1409784	2/20/12 1120	2/21/12 1003
Test Day 2	2	TLH-2012-02-23-75	1410462	2/22/12 1100	2/23/12 1009
Test Day 4	3	TLH-2012-02-01-40	1411568	2/24/12 1122	2/25/12 0905

Water Quality Parameters	Field Chlorine (mg/L)			Lab Chlorine (mg/L)			Alkalinity (mg/L as $CaCO_3$)			Hardness (mg/L as $CaCO_3$)		
Lab Sample #:	1	2	3	1	2	3	1	2	3	1	2	3
Sample:	Not measured	Not measured	Not measured	<0.03	<0.03	<0.03	97	89	147	124	126	135
Diluent/Control:				<0.03	<0.03	<0.03	77	77	77	94	94	94
Method:	—	—	—	Hach	Hach	Hach	Hach	Hach	Hach	Hach	Hach	Hach
Measured by:	—	—	—	AP	JD	JD	AP	JD	JD	AP	JD	JD
Verified by:	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF

	Conductivity (circle one) (µmhos-cm mmhos-cm)			Ammonia (mg/L)			Salinity (ppth)		
Lab Sample#:	1	2	3	1	2	3	1	2	3
Sample:	588	542	521 ~~574~~	<0.017	<0.017	<0.017	—	—	
Diluent/Control:	337	337	337	<0.017	<0.017	<0.017	—	—	
Method:	Mettler	Mettler	Mettler	Denver	Denver	Denver	Mettler	Mettler	Mettler
Measured by:	AP	JD	JD	MF	MF	MF			
Verified by:	MF	MF	MF	BA	BA	BA			

Statistics	
Growth NOEC:	100%
Growth LOEC:	>100%
Growth IC_{20}:	>100%
Growth IC_{25}:	>100%
Ctrl % CV:	13.7%
Dunnetts PMSD:	26.4%
Survival NOEC:	100%
Survival LOEC:	>100%

Light Intensity : 50 - 100 ft. candles
Photoperiod : 16 light 8 dark
Temperature Range °C:
Incubator # 3 min. 24.6 max. 26.4 mean —
Water bath # ___ min. ___ max. ___ mean ___
Room B246 min. 23.4 max. 25.3 mean —

Investigators' signatures
James Daniels
Melissa Pennington for Marshall Faircloth
Bruce Parker
Liz Miller
REVIEWER

Comments:
Uploaded MF 3-1-12
verified BA 3.1.12

revised 08/24/06 MF/SP

Chronic Bioassay Parameters Benchsheet

P. promelas and M. beryllina SOP TA07_09 and TA-07_15 parameter pg 1

Sample Source: Lyn Haven
LIMS Sample #: 1409784 (for Lab sample #1)

Start Date: 2.21.12 End Date: 2.28.12
Start Time: 1300 End Time: 1000

conc = concentration rep = replicate circle umhos or mmhos

Test Day ↓		Conc.	Before Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth	After Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth
Day 0	sample:	Control	A	7.9	25.9	7.5	337							
	1	6.25%	A	8.0	25.9	7.3	348							
	1	12.5%	A	7.9	25.9	7.4	363							
	1	25%	A	7.9	25.9	7.0	379							
	1	50%	A	8.0	25.9	7.4	459							
	1	100%	A	8.0	25.9	7.4	588							
	1		A											
	Measured by:			AP	JD	AP	AP							
	Recorded by:			AP	JD	AP	AP							
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 1	sample:	Control	B	7.8	24.9	7.1	336		B	7.7	25.2	7.0	331	
	1	6.25%	B	7.8	25.4	7.4	347		B	7.8	25.5	7.1	344	
	1	12.5%	B	7.8	24.7	7.2	355		B	7.8	25.4	7.2	364	
	1	25%	B	7.8	24.9	7.0	392		B	7.8	25.5	7.2	392	
	1	50%	B	7.8	25.1	7.1	455		B	7.9	25.5	7.1	451	
	1	100%	B	8.0	25.0	7.2	581		B	7.9	25.4	7.2	576 AP	
	1		B						B					
	Measured by:			AP	JD	AP	AP			AP	JD	AP	AP	
	Recorded by:			AP	AP	AP	AP			AP	AP	AP	AP	
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 2	sample:	Control	C	7.2	25.8	6.2	335		C	7.7	25.7	7.0	334	
	2	6.25%	C	7.3	25.8	5.9	345		C	7.8	25.7	6.4	346	
	2	12.5%	C	7.4	25.7	6.0	356		C	7.7	25.8	6.9	358	
	2	25%	C	7.4	25.9	6.1	392		C	7.7	25.6	6.9	388	
	2	50%	C	7.4	25.8	6.2	451		C	7.7	25.5	6.8	443	
	2	100%	C	7.6	25.8	6.3	579		C	7.7	25.7	6.8	564	
	2		C						C					
	Measured by:			JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by:			JD	JD	JD	JD			JD	JD	JD	JD	
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 3	sample:	Control	D	7.4	25.3	6.0	335		D	7.5	25.5	7.2	324	
	2	6.25%	D	7.4	25.5	5.4	350		D	7.6	25.6	6.9	339	
	2	12.5%	D	7.5	25.3	5.6	361		D	7.7	25.4	7.0	349	
	2	25%	D	7.5	24.9	5.8	386		D	7.8	25.3	7.1	380	
	2	50%	D	7.5	25.1	5.6	446		D	7.7	25.0	7.1	434	
	2	100%	D	7.5	25.0	5.3	560		D	7.6	24.9	7.2	548	
	2		D						D					
	Measured by:			JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by:			JD	JD	JD	JD			JD	JD	JD	JD	

Comments:

For salinity <1 ppth insert <1. For salinity > 1 ppth, conductivity measurement is not required if salinity probe is functional.

Chronic Bioassay Survival Benchsheet

Facility: LYNN HAVEN

LIMS Sample Number: 1409784
(for Lab Sample # 1)

Department of Environmental Protection
Biology Laboratory Chronic Screening Bioassay
***P. promelas* SOP TA07_09 *M. beryllina* SOP TA07_14**

Organism: *P. promelas* *M.beryllina* (circle one)

		TEST DAY							
Concentration	Replicate	0	1	2	3	4	5	6	7
Control	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	8 2D	8	8	8
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
Sample 6.25 %	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	9 1D	9
	C	10	10	10	10	10	10	10	8 2D
	D	10	10	10	10	10	10	10	10
Sample 12.5 %	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
Sample 25 %	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	9 1D	9
	C	10	10	10	10	10	10	10	9 1D
	D	10	10	10	10	10	10	10	10
Sample 50 %	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	9 1D	9	9
	D	10	10	10	10	10	10	10	10
Sample 100 %	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	9 1D
	C	10	10	10	9 1D	9	9	9	9
	D	10	10	10	10	10	10	10	10
Sample %	A	10							
	B	10							
	C	10							
	D	10							
Loaded by: JD	Checked by:		JD	JD	JD	JD	JD	JD	JD
Verified by: AP	AP								

Comments:

Chronic Bioassay Parameters Benchsheet

P. promelas and M. beryllina SOP TA07_09 and TA-07_15 parameter pg. 1

Sample Source: Lynn Haven Start Date: 2.21.12 End Date: 2.28.12

LIMS Sample #: 1409784 (for Lab sample #1) Start Time: 1300 End Time: 1000

conc = concentration rep = replicate circle umhos or mmhos

Test Day ↓		Conc.	Before Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth	After Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth
Day 0	sample:	Control	A	7.9	25.9	7.5	337							
	1	6.25%	A	8.0	25.9	7.3	348							
	1	12.5%	A	7.9	25.9	7.4	363							
	1	25%	A	7.9	25.9	7.0	379							
	1	50%	A	8.0	25.9	7.4	459							
	1	100%	A	8.0	25.9	7.4	588							
	1		A											
	Measured by:			AP	JD	AP	AP							
	Recorded by:			AP	JD	AP	AP							
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 1	sample:	Control	B	7.8	24.9	7.1	336		B	7.7	25.2	7.0	331	
	1	6.25%	B	7.8	25.4	7.4	347		B	7.8	25.5	7.1	344	
	1	12.5%	B	7.8	24.7	7.2	355		B	7.8	25.4	7.2	364	
	1	25%	B	7.8	24.9	7.0	392		B	7.8	25.5	7.2	392	
	1	50%	B	7.8	25.1	7.1	455		B	7.9	25.5	7.1	451	
	1	100%	B	8.0	25.0	7.2	581		B	7.9	25.4	7.2	576	
	1		B						B					
	Measured by:			AP	JD	AP	AP			AP	JD	AP	AP	
	Recorded by:			AP	AP	AP	AP			AP	AP	AP	AP	
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 2	sample:	Control	C	7.2	25.8	6.2	335		C	7.7	25.7	7.0	334	
	2	6.25%	C	7.3	25.8	5.9	345		C	7.8	25.7	6.4	346	
	2	12.5%	C	7.4	25.7	6.0	356		C	7.7	25.8	6.9	358	
	2	25%	C	7.4	25.9	6.1	392		C	7.7	25.6	6.9	388	
	2	50%	C	7.4	25.8	6.2	451		C	7.7	25.5	6.8	443	
	2	100%	C	7.6	25.8	6.3	579		C	7.7	25.7	6.8	564	
	2		C						C					
	Measured by:			JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by:			JD	JD	JD	JD			JD	JD	JD	JD	
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 3	sample:	Control	D	7.4	25.3	6.0	335		D	7.5	25.5	7.2	324	
	2	6.25%	D	7.4	25.5	5.4	350		D	7.6	25.6	6.9	339	
	2	12.5%	D	7.5	25.3	5.6	361		D	7.7	25.4	7.0	349	
	2	25%	D	7.5	24.9	5.8	386		D	7.8	25.3	7.1	380	
	2	50%	D	7.5	25.1	5.6	446		D	7.7	25.0	7.1	434	
	2	100%	D	7.5	25.0	5.3	560		D	7.6	24.9	7.2	548	
	2		D						D					
	Measured by:			JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by:			JD	JD	JD	JD			JD	JD	JD	JD	

Comments:

For salinity <1 ppth insert <1. For salinity > 1 ppth, conductivity measurement is not required if salinity probe is functional.

Chronic Bioassay Parameters Benchsheet

P. promelas and M. beryllina SOP TA07_09 and TA-07_15

parameter pg 2

Sample Source: Lynn Haven

LIMS Sample #: 149784 (for Lab sample #1)

Start Date: 2.21.12 End Date: 2.28.12

Start Time: 1300 End Time: 1000

conc = concentration rep = replicate

Test Day			Before Renewal						After Renewal					
		Conc.	Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth	Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth
Day 4	sample:	Control	A	7.3	24.9	5.8	331		A	7.3	25.0	7.3	322	
	3	6.25%	A	7.3	24.6	6.1	346		A	7.5	24.9	7.3	344	
	3	12.5%	A	7.4	24.8	6.7	360		A	7.5	25.0	7.6	356	
	3	25%	A	7.5	24.5	6.7	392		A	7.5	25.0	7.8	383	
	3	50%	A	7.4	24.4	6.4	444		A	7.5	24.9	7.6	436	
	3	100%	A	7.4	24.4	6.6	561		A	7.7	25.0	7.8	543	
	3		A						A					
	Measured by:			JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by:			JD	JD	JD	JD			JD	JD	JD	JD	
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 5	sample:	Control	B	7.4	24.9	6.8	337		B	7.7	24.9	7.9	336	
	3	6.25%	B	7.4	25.3	6.5	346		B	7.8	25.0	8.0	343	
	3	12.5%	B	7.4	25.1	6.5	359		B	7.7	25.0	7.9	356	
	3	25%	B	7.4	25.3	6.8	393		B	7.7	25.1	8.3	387	
	3	50%	B	7.4	25.0	7.2	439		B	7.7	24.9	8.2	435	
	3	100%	B	7.4	25.7	6.5	550		B	7.7	25.4	8.5	545	
	3		B						B					
	Measured by:			JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by:			JD	JD	JD	JD			JD	JD	JD	JD	
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 6	sample:	Control	C	7.3	25.3	5.1	342		C	7.4	25.3	6.6	320	
	3	6.25%	C	7.4	25.3	5.3	355		C	7.5	24.8	6.7	327	
	3	12.5%	C	7.4	25.0	5.8	367		C	7.5	25.0	7.0	345	
	3	25%	C	7.4	24.9	5.8	396		C	7.5	25.1	7.0	378	
	3	50%	C	7.5	25.0	5.8	450		C	7.5	25.0	6.9	420	
	3	100%	C	7.5	25.1	5.9	554		C	7.6	25.0	6.9	523	
	3		C						C					
	Measured by:			JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by:			JD	JD	JD	JD			JD	JD	JD	JD	
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 7	sample:	Control	JD D	7.2	25.4	5.4	327		D					
	3	6.25%	JD D	7.3	25.7	6.4	340		D					
	3	12.5%	JD D	7.3	25.7	6.1	352		D					
	3	25%	D	7.3	25.5	6.1	374		D					
	3	50%	D	7.3	25.7	6.0	424		D					
	3	100%	D	7.5	25.6	5.6	526		D					
	3								D					
	Measured by:			JD	JD	JD	JD							
	Recorded by:			JD	JD	JD	JD							

Comments:

For salinity <1 ppth insert <1. For salinity > 1 ppth, conductivity measurement is not required if salinity probe is functional.

Chronic Bioassay Weighing Benchsheet

Facility: LYNN Haven

LIMS Sample Number: 1409784
(for Lab Sample # 1)

***P. promelas* and *M. beryllina* Bench Sheet**
SOP TA06_21

			mean wt = fish wt divided by 10 convert g to mg: move decimal 3 places to right					
Concentration	Replicate	Pan #	Pan wt. g	Pan + Fish g	Fish wt. g	Original # Fish	Mean wt. mg	
Control	A	1	0.02194	0.03074	0.00880	10	.880	
	B	2	0.02287	0.02848	0.00561	10	.561	
	C	3	0.02334	0.03171	0.00837	10	.837	.775
	D	4	0.02431	0.03252	0.00821	10	.821	
sample 6.25 %	A	5	0.02278	0.03135	0.00857	10	.857	
	B	6	0.02231	0.02898	0.00667	10	.667	
	C	7	0.02284	0.02765	0.00481	10	.481	.707
	D	8	0.02320	0.03144	0.00824	10	.824	
sample 12.5 %	A	9	0.02221	0.02872	0.00651	10	.651	
	B	10	0.02209	0.02878	0.00669	10	.669	
	C	11	0.02310	0.02977	0.00667	10	.667	.640
	D	12	0.02211	0.02787	0.00576	10	.576	
sample 25 %	A	13	0.02215	0.03004	0.00789	10	.789	
	B	14	0.02238	0.02966	0.00728	10	.728	
	C	15	0.02197	0.02735	0.00538	10	.538	.681
	D	16	0.02340	0.03008	0.00668	10	.668	
sample 50 %	A	17	0.02268	0.02946	0.00678	10	.678	
	B	18	0.02192	0.03016	0.00824	10	.824	
	C	19	0.02335	0.02915	0.00580	10	.580	.708
	D	20	0.02276	0.03025	0.00749	10	.749	
sample 100 %	A	21	0.02195	0.03008	0.00813	10	.813	
	B	22	0.02152	0.02730	0.00578	10	.578	
	C	23	0.02089	0.02874	0.00785	10	.785	.738
	D	24	0.02152	0.02926	0.00774	10	.774	
sample %	A					10		
	B					10		
	C					10		
	D					10		
	Weighed by initials:		JD	JD	revised 7/16/08 mf			

Comments:

Balance: Ohaus 250D Ser# 1125481084
S-Weights: BIO-S-Weights-01

Note: Pan number (#) refers to actual Pan number.

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Chronic Bioassay Weighing Benchsheet

Quality Control

Facility: Lynn Haven

LIMS Sample Number: 1409784
(for Lab Sample # 1)

***P. promelas and M. beryllina* Bench sheet**
SOPs TA07_09, TA07_14 and TA06_21

Drying Oven ID:	ER034000	Tare weighed by:	JD
Temperature °C:	100	Final weighed by:	JD
Hours:	8		

Tare Weighing Date: 2.27.12 Final Weighing Date: 3.1.12

			Measured Value (g)		S-weight Value (g)
Tare Pan 1 after Pan 5 (g)	0.02197	@ 0.02194	S-weights	@	
Tare Pan 1 after Pan 10 (g)	0.02198	@ 0.02194	at tare	@	
Tare Pan 1 after Pan 15 (g)	0.02198	@ 0.02194	S-weights	@	
Tare Pan 1 after Pan 20 (g)	0.02199	@ 0.02194	at final	@	
Tare Pan 1 after Pan 25 (g)	0.02196	@ 0.02194			
Tare Pan 1 after Pan 30 (g)		@			
Tare Pan 1 after Pan 35 (g)		@			
Tare Pan 1 after Pan 40 (g)		@			
Tare Pan 1 after Pan 45 (g)		@			
Tare Pan 1 after Pan 48 (g)		@			
Final Pan 1 after Pan 5 (g)	0.03072	@ 0.03074			
Final Pan 1 after Pan 10 (g)	0.03072	@ 0.03074			
Final Pan 1 after Pan 15 (g)	0.03071	@ 0.03074			
Final Pan 1 after Pan 20 (g)	0.03070	@ 0.0374			
Final Pan 1 after Pan 25 (g)	0.03070	@ 0.0374			
Final Pan 1 after Pan 30 (g)		@			
Final Pan 1 after Pan 35 (g)		@			
Final Pan 1 after Pan 40 (g)		@			
Final Pan 1 after Pan 45 (g)		@			
Final Pan 1 after Pan 48 (g)		@			

S-weights at tare: 0.01002g @ 0.01g
S-weights at final: 0.03006g @ 0.03g
0.01001g @ 0.01g
0.05004g @ 0.05g

Balance: Ohaus 250D Ser# 1125481084
S-Weights: BIO-S-Weights-01

Note: Pan numbers (5, 10, etc.) for Tare and Final refers to sequence of weighing as actual Pan #s may differ.

Comments:

revised 7/16/08 MF

Test ID: Lynn Haven WWTP Dates: 2-21-12 — 2-28-12

METER / DEVICE	ID	SOP	Parameter	Method	v used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
YSI DO Probe	5905	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
Accumet AR-10 pH Meter	93312105	TA06_23	pH	SM 4500 H+	✓
Mettler-Toledo SevenMulti Conductivity Meter	SN 1225117049 Probe H04257	TA06_25	Conductivity Salinity	SM 2510 B SM 2520 B	✓
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	✓
Traceable Thermometer	#1-SN101686412 #2-SN221295527 #3-SN240116020 #4-SN80361795 (#5) SN61990624	TA06_05	Temperature	SM-2530B modified DEP SOP-001/01 FT1400	✓ #5
Hach Pocket Colorimeter II	05050C026378	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	✓
Alkalinity (Hach Kit)	No SN	TA06_08	Alkalinity	SM 2320 B	✓
Hardness (Hach Kit)	No SN	TA06_09	Hardness	SM 2340 C	✓
OHAUS Balance 250D	1125481084	TA06_21 TA06_27	Weight	-	✓
S-Weights	BIO-S-WEIGHTS-01	NA	Balance check	-	✓

SM-2530B modified to allow use of electronic and non-mercury filled thermometers.

Insert other device information in blank spaces(if used). Test ID = Facility or SRTs (acute SRT--Chronic SRT)

3.1.12 J.D.

V 1.1 9/21/10 MF/jd

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Larval Fish Growth and Survival Test-7 Day Growth				
Start Date:	2/21/2012 13:00	Test ID:	lynn22012	Sample ID:	lynn haven wwtf pp chron 2 20 12
End Date:	2/28/2012 22:00	Lab ID:	DEP TOXLAB-FDEP Biology T	Sample Type:	EFF1-POTW
Sample Date:		Protocol:	EPAF 94-EPA/600/4-91/002	Test Species:	PP-Pimephales promelas
Comments:	Chronic P. promelas test for Lynn Haven WWTF week of 2 20 12				

Conc-%	1	2	3	4
D-Control	0.8800	0.5610	0.8370	0.8210
6.25	0.8570	0.6670	0.4810	0.8240
12.5	0.6510	0.6690	0.6670	0.5760
25	0.7890	0.7280	0.5380	0.6680
50	0.6780	0.8240	0.5800	0.7490
100	0.8130	0.5780	0.7850	0.7740

			Transform: Untransformed					Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	0.7748	1.0000	0.7748	0.5610	0.8800	18.672	4	0.7748	1.0000
6.25	0.7073	0.9129	0.7073	0.4810	0.8570	24.335	4	0.7073	0.9129
12.5	0.6408	0.8270	0.6408	0.5760	0.6690	6.853	4	0.6917	0.8928
25	0.6808	0.8787	0.6808	0.5380	0.7890	15.751	4	0.6917	0.8928
50	0.7078	0.9135	0.7078	0.5800	0.8240	14.688	4	0.6917	0.8928
100	0.7375	0.9519	0.7375	0.5780	0.8130	14.589	4	0.6917	0.8928

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.91342	0.884	-0.8199	-0.2054
Bartlett's Test indicates equal variances (p = 0.50)	4.36337	15.0863		

Linear Interpolation (200 Resamples)				
Point	%	SD	95% CL(Exp)	Skew
IC05*	3.587			
IC10	10.256			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

* indicates IC estimate less than the lowest concentration

Appendix H

Standard Reference Toxicant Data

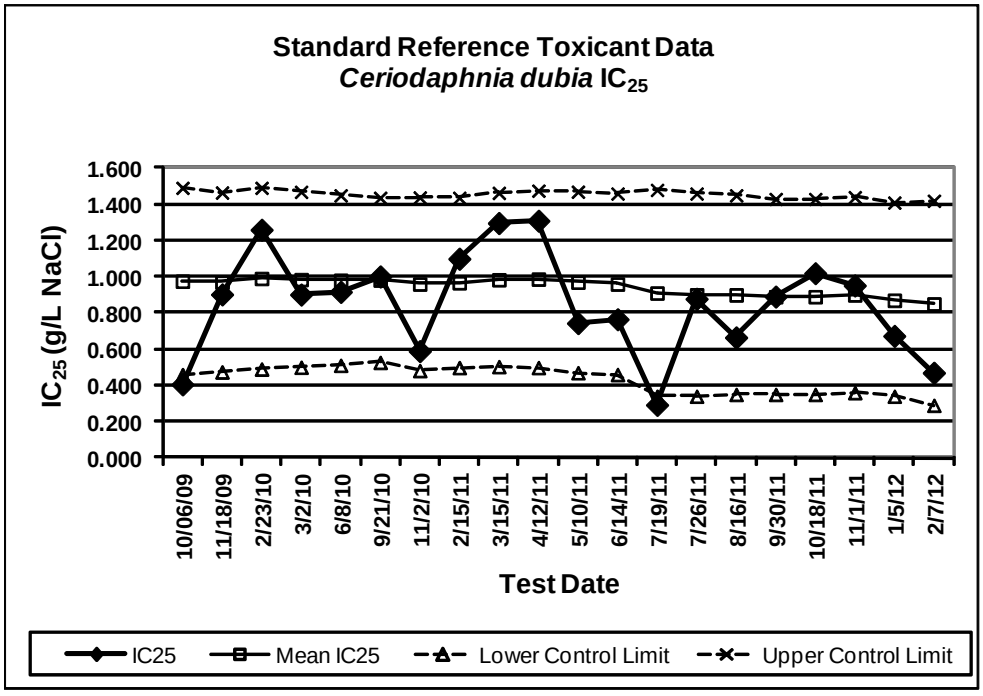
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 7-Day Chronic Toxicity
Ceriodaphnia dubia (water flea) - Sodium Chloride (NaCl)

Date	IC25	Mean IC25	Std Dev	Lower Control Limit	Upper Control Limit
10/06/09	0.406	0.98	0.26	0.46	1.49
11/18/09	0.903	0.97	0.25	0.47	1.47
2/23/10	1.260	0.99	0.25	0.49	1.49
3/2/10	0.902	0.98	0.24	0.50	1.47
6/8/10	0.917	0.98	0.23	0.51	1.45
9/21/10	1.002	0.98	0.23	0.53	1.44
11/2/10	0.590	0.96	0.24	0.48	1.44
2/15/11	1.100	0.97	0.23	0.50	1.44
3/15/11	1.297	0.98	0.24	0.50	1.46
4/12/11	1.310	0.99	0.24	0.50	1.48
5/10/11	0.744	0.97	0.25	0.47	1.47
6/14/11	0.765	0.96	0.25	0.46	1.46
7/19/11	0.293	0.91	0.28	0.34	1.48
7/26/11	0.879	0.90	0.28	0.34	1.46
8/16/11	0.665	0.90	0.27	0.35	1.45
9/30/11	0.891	0.89	0.27	0.35	1.43
10/18/11	1.020	0.89	0.27	0.35	1.43
11/1/11	0.953	0.90	0.27	0.36	1.44
1/5/12	0.674	0.87	0.27	0.34	1.41
2/7/12	0.470	0.85	0.28	0.29	1.42

Means are of the last 20 SRT tests.
Lower Confidence Limit = mean - 2 * Std Dev
Upper Confidence Limit = mean + 2 * Std Dev

EPA 75th Percentile %CV for Reproduction **45%**
Last 20 - Lab %CV Reproduction 30.7%



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	2/7/2012 08:40	Test ID:	cdsrtfeb12	Sample ID:	C. dubia chronic srt Feb. 7 2012
End Date:	2/13/2012 13:00	Lab ID:	DEP TOXLAB-FDEP Biology T	Sample Type:	NACL-Sodium chloride
Sample Date:		Protocol:	EPAF 94-EPA/600/4-91/002	Test Species:	CD-Ceriodaphnia dubia

Comments: Ceriodaphnia dubia chronic srt for February 2012

Conc-gm/L	1	2	3	4	5	6	7	8	9	10
D-Control	28.000	22.000	13.000	21.000	17.000	24.000	27.000	24.000	17.000	30.000
0.59	23.000	17.000	23.000	20.000	20.000	11.000	4.000	6.000	6.000	23.000
0.89	5.000	15.000	3.000	0.000	13.000	11.000	3.000	15.000	16.000	18.000
1.3	14.000	2.000	1.000	5.000	12.000	13.000	1.000	0.000	11.000	1.000
2	0.000	0.000	1.000	0.000	3.000	0.000	0.000	1.000	3.000	4.000
3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

			Transform: Untransformed					Isotonic	
Conc-gm/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	22.300	1.0000	22.300	13.000	30.000	24.292	10	22.300	1.0000
0.59	15.300	0.6861	15.300	4.000	23.000	50.819	10	15.300	0.6861
0.89	9.900	0.4439	9.900	0.000	18.000	65.885	10	9.900	0.4439
1.3	6.000	0.2691	6.000	0.000	14.000	96.545	10	6.000	0.2691
2	1.200	0.0538	1.200	0.000	4.000	129.099	10	1.200	0.0538
3	0.000	0.0000	0.000	0.000	0.000	0.000	10	0.000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.93537	0.93	-0.2502	-0.9945
Bartlett's Test indicates unequal variances (p = 2.02E-03)	16.9007	13.2767		

	Linear Interpolation (200 Resamples)				
Point	gm/L	SD	95% CL		Skew
IC05*	0.0940	0.0797	0.0644	0.3692	3.6406
IC10*	0.1880	0.1124	0.1288	0.6037	2.0945
IC15*	0.2819	0.1202	0.1932	0.6324	1.2058
IC20*	0.3759	0.1214	0.2576	0.6724	0.5724
IC25*	0.4699	0.1134	0.3220	0.7102	0.1247
IC40	0.6967	0.0951	0.5152	0.8997	0.1170
IC50	0.8206	0.0960	0.6859	1.0449	0.4414

* indicates IC estimate less than the lowest concentration

FDEP Biology Laboratory - Chronic SRT Bench Sheet

Ceriodaphnia dubia

Diluent/ Batch: 20% DMW / 1-30-12 Test Days Used: 0-4
20% DMW / 2-7-12 Test Days Used: 5-7
Toxicant/ Batch: NaCl / 2-6-12 35/L

SOP # : TA 07_05
EPA-821-R-02-013 Method 1002.0

Organism: *Ceriodaphnia dubia*
Organism Batch #/ Age: 2-7-12 / <24 hr.
Feeding: Prior to Test and Daily
Food: ☐ YCT ☑ *P. subcapitata*
Food Batch: 8-26-11 10-31-11
Chamber size: 30 mL
Test Volume: 20 mL

Start Date: 2-7-12 MF Time: 0840
End Date: 2-13-12 Time: 1300

Batch:	1-30-12	2-7-12			
Water Quality Parameters	20% DMW MF	20% DMW	Other	Measured by:	Verified by:
Lab Total Residual Cl_2 (mg/L):	~~<0.043~~	<0.03		AD	JD/MF
Alkalinity (mg/L as $CaCO_3$):	85	76		AD	JD/MF
Hardness (mg/L as $CaCO_3$):	MF 87	101		AD	JD/MF
Total Ammonia (mg/L as N):	~~<0.017~~	<0.017		MF	AD
Conductivity ~~umhos-cm~~ mmhos-cm :	313	344		BA	AD

Loaded by: MF

Day	Concentrations prepared by	Counted by
0	BA	AD
1	BA	BA
2	MF	MF
3	BA	BA
4	BA	BA
5	BA	MF
6	—	MF
7		
8		

Test Replicate	Loaded from culture vial
1	A7
2	A16
3	A25
4	B5
5	B14
6	B18
7	B20
8	B23
9	B24
10	B27

Results	
Control % CV:	24.3%
Dunnetts PMSD:	25.7%
Reproduction NOEC:	0.59 g/L
Reproduction LOEC:	0.89 g/L
Survival NOEC:	MF ~~2.5~~ 2 g/L
Survival LOEC:	MF ~~0.89~~ 3 g/L
ICP_{20}:	0.3759 g/L
ICP_{25}:	0.4699 g/L

Comments:

Investigators' signatures

Marshall Faircloth
Adrienne Day
Bruce Absher
James Daniels

REVIEWER

Test Incubated in: Incubator: # 2
Light Intensity : 50 - 100 ft. candles
Photoperiod : 16 light 8 dark
Temperature Range °C:
Incubator # 2 min. 24.1 max. 26.2 mean —
Room B246 ~~21.8~~ MF min. ~~21.3~~ 24.3 max. 24.8 mean —
Test min.____ max.____ mean____

Ceriodaphnia dubia Survival and Reproduction

Start Date: 2-7-12 MF Time: 0840 Loaded by: MF
End Date: 2-13-12 Time: 1300 Verified by: AD

Concentration	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Live adults	Neonates per adult
Control	0												10	
	1			MF									10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	6	4	5	3	0	4	4	5	0	6	37	10	3.7
	4	0	6	0	0	7	0	0	0	6	0	19	10	1.9
	5	9	0	4	9	10	9	9	7	11	9	77	10	7.7
	6	13	12	4	9	0	11	14	12	0	15	90	10	9.0
	7													
	8													
	Total	28	22	13	21	17	24	27	24	17	30	223	10	22.3
0.59 ppth	0												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	4	4	5	2	2	3	4	6	0	5	35	10	3.5
	4	0	7	0	0	0	3	0	0	4	0	14	10	1.4
	5	8	0	6	6	7	5	0	0	2	5	39	10	3.9
	6	11	6	12	12	11	0	0	0	0	13	65	10	6.5
	7													
	8													
	Total	23	17	23	20	20	11	4	6	6	23	153	10	15.3
0.89 ppth	0												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	3	1	3	0	0	2	3	2	3	6	23	10	2.3
	4	0	8	0	0	4	0	0	7	6	0	25	10	2.5
	5	1	0	0	0	9	2	0	0	0	3	15	10	1.5
	6	1	6	0	0	0	7	0	6	7	9	36	10	3.6
	7													
	8													
	Total	5	15	3	0	13	11	3	15	16	18	99	10	9.9

Comments:

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FDEP Biology Laboratory - Chronic SRT Bench Sheet

Ceriodaphnia dubia Survival and Reproduction

Concentration	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Live adults	Neonates per adult
1.3 ppth	0												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	1	2	0	1	3	2	0	X	0	1	10	9	1.1
	4	0	0	0	1	0	0	1	|	1	X	3	8	0.38
	5	5	0	1	3	2	4	0	|	3	|	18	8	2.25
	6	8	0	0	0	7	7	0	|	7	|	29	8	3.63
	7								|		|			
	8								|		↓			
	Total	14	2	1	5	12	13	1	0	11	1	60	8 (10)	6.0
2.0 ppth	0												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	X	0	0	0	0	0	1	0	0	1	9	0.11
	4	0	|	0	0	0	0	0	0	0	0	0	9	0
	5	0	|	1	0	1	0	0	0	1	2	5	9	0.56
	6	0	|	0	0	2	0	0	0	2	2	6	9	0.67
	7		|											
	8		|											
	Total	0	0	1	0	3	0	0	1	3	4	12	9 (10)	1.2
3.0 ppth	0												10	
	1	X	X	X	0	X	X	0	0	X	0	0	4	
	2	|	|	|	X0	|	|	X0	X0	|	X0	0	0	
	3	|	|	|	|	|	|	|	|	|	|	|	|	
	4	|	|	|	|	|	|	|	|	|	|	|	|	
	5	|	|	|	|	|	|	|	|	|	|	|	|	
	6	|	|	|	|	|	|	|	|	|	|	|	|	
	7	|	|	|	|	|	|	|	|	|	|	|	|	
	8	|	|	|	|	|	|	|	|	|	|	|	|	
	Total	0	0	0	0	0	0	0	0	0	0	0	0	

Comments:

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FDEP Biology Laboratory - Chronic SRT Bench Sheet

Ceriodaphnia dubia Parameters

Test Day ↓	Conc.	New Sample Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)	Old Sample Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)
Day 0	Control	M	7.2	24.9	7.3	313					
	0.59 ppth	M	7.3	25.2	7.3	1427					
	0.89 ppth	M	7.3	25.8	7.4	2020					
	1.3ppth	M	7.4	25.9	7.4	2830					
	2.0 ppth	M	7.4	25.9	7.7	3990					
	3.0 ppth	M	7.5	25.9	7.7	5700					
	Measured by:		BA	BA	BA	BA					
	Recorded by:		BA	BA	BA	BA					
Day 1	Control	M	7.4	24.3	6.7	307	A	7.6	24.3	7.0	317
	0.59 ppth	M	7.5	24.1	6.8	1468	A	7.6	24.0	7.0	1444
	0.89 ppth	M	7.5	24.3	6.8	1981	A	7.6	24.0	7.1	2010
	1.3ppth	M	7.5	24.4	7.0	2780	A	7.6	24.0	7.3	2870
	2.0 ppth	M	7.6	24.4	7.0	3940	A	7.7	24.0	7.6	4000
	3.0 ppth	M	7.6	24.3	7.0	5740	A	7.7	24.0	7.4	5710
	Measured by:		BA	BA	BA	BA		BA	BA	BA	BA
	Recorded by:		BA	BA	BA	BA		BA	BA	BA	BA
Day 2	Control	M	7.7	24.9	7.9	310	A	7.8	24.4	7.7	321
	0.59 ppth	M	7.7	24.9	8.0	1436	A	7.8	24.7	7.6	1477
	0.89 ppth	M	7.7	25.0	8.1	1973	A	7.8	24.5	7.7	2004
	1.3ppth	M	7.8	25.1	8.0	2740	A	7.9	24.4	7.6	2880
	2.0 ppth	M	7.7	25.2	8.0	3840	A	7.9	24.4	7.6	4190
	3.0 ppth	M	—	—	—	—	D	7.9	24.2	7.6	6100
	Measured by:		MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:		MF	MF	MF	MF		MF	MF	MF	MF
Day 3	Control	M	7.4	25.0	7.0	311	A	7.3	24.0	7.4	325
	0.59 ppth	M	7.4	24.8	7.1	1446	A	7.3	24.0	7.3	1547
	0.89 ppth	M	7.4	24.8	7.4	2020	A	7.4	24.0	7.3	2060
	1.3ppth	M	7.5	24.7	7.0	2810	A	7.4	24.0	7.2	2760
	2.0 ppth	M	7.5	24.6	7.6	4020	A	7.5	24.0	7.3	3960
	3.0 ppth	M									
	Measured by:		BA	BA	BA	BA		BA	BA	BA	BA
	Recorded by:		BA	BA	BA	BA		BA	BA	BA	BA

Comments:

M= "Metered" vial, a surrogate vial for parameters

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FDEP Biology Laboratory - Chronic SRT Bench Sheet

Ceriodaphnia dubia Parameters

Test Day		New Sample				Conductivity	Old Sample				Conductivity
←	Conc.	Replicate	pH (su)	Temp (°C)	DO (mg/L)	(µmhos/cm) (mmhos/cm)	Replicate	pH (su)	Temp (°C)	DO (mg/L)	(µmhos/cm) (mmhos/cm)
Day 4	Control	M	7.3	24.0	7.3	295	A	7.7	24.0	8.0	334
	0.59 ppth	M	7.4	24.0	7.3	1381	A	7.7	24.0	8.1	1477
	0.89 ppth	M	7.4	24.0	7.4	1893	A	7.7	24.0	8.1	2060
	1.3ppth	M	7.5	24.0	7.4	2660	A	7.7	24.0	8.2	3060
	2.0 ppth	M	7.5	24.0	7.4	3790	A	7.8	24.0	7.9	4400
	3.0 ppth	M									
	Measured by:		BA	BA	BA	BA		BA	BA	BA	BA
	Recorded by:		BA	BA	BA	BA		BA	BA	BA	BA
Day 5	Control	M	7.8	25.2	7.9	344	A	7.9	24.5	8.2	343
	0.59 ppth	M	7.7	25.0	8.0	1542	A	7.8	24.5	8.2	1589
	0.89 ppth	M	7.8	24.8	8.0	2110	A	7.9	24.3	8.1	2200
	1.3ppth	M	7.8	25.0	8.1	2960	A	7.9	24.3	8.2	3140
	2.0 ppth	M	7.8	25.3	8.0	4210	A	7.9	24.4	8.1	4200
	3.0 ppth	M					mf				
	Measured by:		MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:		MF	MF	MF	MF		MF	MF	MF	MF
Day 6	Control	M					A	7.9	24.3	8.2	317
	0.59 ppth	M					A	7.9	24.3	8.3	1496
	0.89 ppth	M					A	7.9	24.2	8.3	2010
	1.3ppth	M					A	7.9	24.4	8.3	2880
	2.0 ppth	M	Not Applicable				A	7.9	24.5	8.3	4020
	3.0 ppth	M									
	Measured by:		MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:		MF	MF	MF	MF		MF	MF	MF	MF
Day 7	Control	M									
	0.59 ppth	M									
	0.89 ppth	M									
	1.3ppth	M									
	2.0 ppth	M									
	3.0 ppth	M									
	Measured by:										
	Recorded by:										
Day 8	Control	M									
	0.59 ppth	M									
	0.89 ppth	M									
	1.3ppth	M									
	2.0 ppth	M									
	3.0 ppth	M									
	Measured by:										
	Recorded by:										

Replicate M= "Metered" vial, a surrogate vial for parameters

FDEP Biology Laboratory - Bioassay Instrument Identification

Test ID: February 2012 SRT (C. dubia) Dates: 2-7-12 — 2-13-12

METER / DEVICE	ID	SOP	Parameter	Method	v used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
Accumet AR-10 pH Meter	93312105	TA06_23	pH	SM 4500 H^+	✓
Mettler-Toledo SevenMulti Conductivity Meter	SN 1225117049 Probe H04257	TA06_25	Conductivity Salinity	SM 2510 B SM 2520 B	✓
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	✓
Thermometer (~~DO probe~~)	electronic EC #5 ~~YSI 5750~~ ~~SN~~ 05J1720	TA06_05	Temperature	SM-2530B modified DEP SOP-001/01 FT1400	✓
Hach Pocket Colorimeter II	05050C026378	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	✓
Alkalinity (Hach Kit)	No SN	TA06_08	Alkalinity	SM 2320 B	✓
Hardness (Hach Kit)	No SN	TA06_09	Hardness	SM 2340 C	✓
OHAUS Balance 250D	1125481084	TA06_21 TA06_27	Weight	-	
S-Weights	BIO-S-WEIGHTS-01	NA	Balance check	-	

SM-2530B modified to allow use electronic and non-mercury filled thermometers.
Insert other device information in blank spaces(if used). Test ID = Facility or SRTs (acute SRT--Chronic SRT)

Comments: Entered by: M. Faircloth 2/14/12

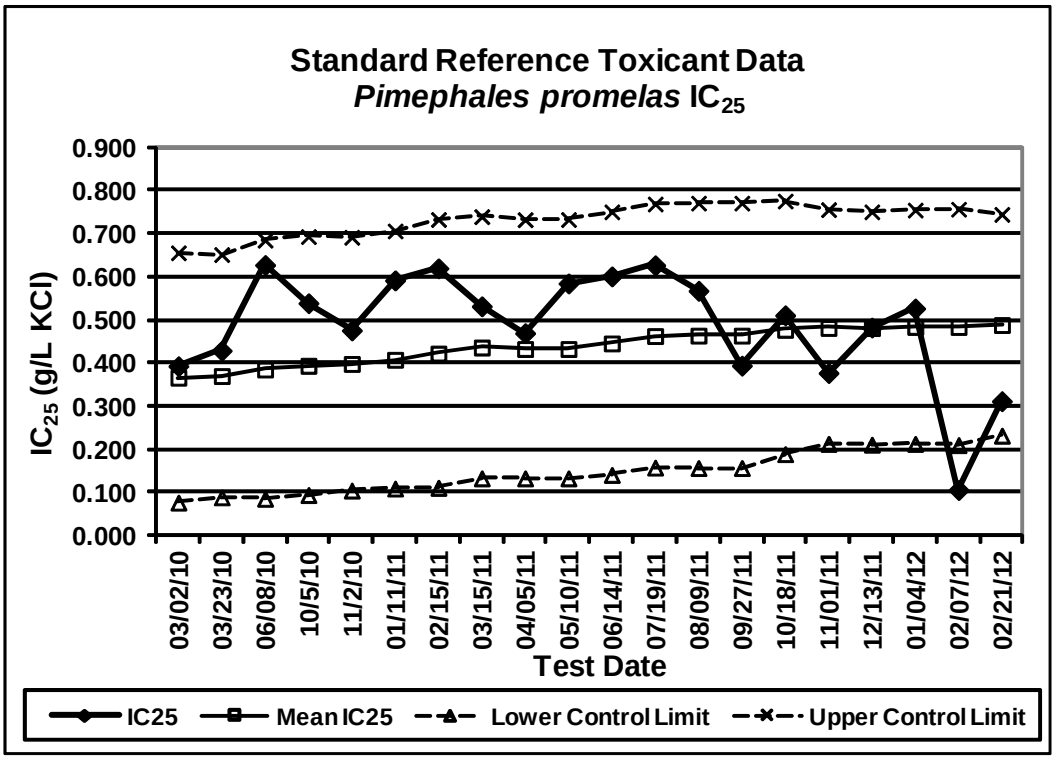
V 1.4 8/21/08 BA pg 6 of 6

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Florida Department of Environmental Protection
Bureau of Laboratories
Standard Reference Toxicant (SRT) Test Data - 7-Day Chronic Toxicity
Pimephales promelas (fathead minnow) - Potassium Chloride (KCl)

Date	IC25	Mean IC25	Std Dev	Lower Control Limit	Upper Control Limit
03/02/10	0.393	0.366	0.14	0.077	0.656
03/23/10	0.429	0.370	0.14	0.089	0.652
06/08/10	0.628	0.385	0.15	0.086	0.685
10/05/10	0.539	0.394	0.15	0.094	0.694
11/02/10	0.476	0.398	0.15	0.105	0.692
01/11/11	0.592	0.408	0.15	0.109	0.707
02/15/11	0.620	0.422	0.16	0.111	0.733
03/15/11	0.532	0.436	0.15	0.133	0.740
04/05/11	0.470	0.433	0.15	0.133	0.733
05/10/11	0.585	0.433	0.15	0.133	0.733
06/14/11	0.601	0.446	0.15	0.141	0.751
07/19/11	0.627	0.463	0.15	0.158	0.769
08/09/11	0.568	0.464	0.15	0.157	0.771
09/27/11	0.394	0.464	0.15	0.157	0.771
10/18/11	0.511	0.478	0.14	0.189	0.776
11/01/11	0.377	0.482	0.14	0.213	0.756
12/13/11	0.483	0.481	0.14	0.211	0.751
01/04/12	0.527	0.484	0.14	0.213	0.755
02/07/12	0.106	0.484	0.14	0.210	0.757
02/21/12	0.312	0.489	0.13	0.232	0.745

Means are from the last 20 SRTs.
Lower Confidence Limit = mean - 2 * Std Dev EPA 75th %CV: 38%
Upper Confidence Limit = mean + 2 * Std Dev 25.6



Larval Fish Growth and Survival Test-7 Day Growth

Start Date:	2/21/2012 12:15	Test ID:	ppsrt22112	Sample ID:	p prom chronic srt 2 21 12
End Date:	2/28/2012 10:15	Lab ID:	DEP TOXLAB-FDEP Biology T	Sample Type:	KCL-Potassium chloride
Sample Date:		Protocol:	EPAF 94-EPA/600/4-91/002	Test Species:	PP-Pimephales promelas
Comments:	P. promelas chronic srt 2 21 12				

Conc-gm/L	1	2	3	4
D-Control	0.8600	0.7440	0.9830	0.7810
0.125	0.6230	0.8220	0.7860	0.7590
0.25	0.6980	0.5830	0.6780	0.6490
0.5	0.5680	0.6010	0.5320	0.5760
1	0.0000	0.0000	0.1180	0.0000
2	0.0000	0.0000	0.0000	0.0000

			Transform: Untransformed					Isotonic	
Conc-gm/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	0.8420	1.0000	0.8420	0.7440	0.9830	12.556	4	0.8420	1.0000
0.125	0.7475	0.8878	0.7475	0.6230	0.8220	11.628	4	0.7475	0.8878
0.25	0.6520	0.7743	0.6520	0.5830	0.6980	7.700	4	0.6520	0.7743
0.5	0.5693	0.6761	0.5693	0.5320	0.6010	5.013	4	0.5693	0.6761
1	0.0295	0.0350	0.0295	0.0000	0.1180	200.000	4	0.0295	0.0350
2	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	4	0.0000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.98927	0.868	0.12927	0.31823
Bartlett's Test indicates equal variances (p = 0.33)	4.64064	13.2767		

Linear Interpolation (200 Resamples)					
Point	gm/L	SD	95% CL(Exp)		Skew
IC05*	0.0557	0.0421	0.0142	0.2317	0.8666
IC10*	0.1114	0.0483	0.0285	0.2830	0.4952
IC15	0.1666	0.0566	0.0430	0.3769	0.4392
IC20	0.2217	0.0735	0.0576	0.4943	0.5155
IC25	0.3119	0.0937	0.1080	0.6136	0.1930
IC40	0.5593	0.0300	0.4841	0.6407	-1.2821
IC50	0.6373	0.0237	0.5746	0.7118	0.0434

* indicates IC estimate less than the lowest concentration

FDEP Biology Laboratory - Chronic SRT Benchsheet

Pimephales promelas or *Menidia beryllina*

Test Species (circle one)

(*P. promelas*)	SOP#: TA07_09	EPA-821-R-02-013	Method 1000.0
M. beryllina	SOP#: TA07_14	EPA-821-R-02-014	Method 1006.0

Diluent/ Batch: MHW/2.17.12 Test Days Used: 0 – 7

Diluent/ Batch: _____ Test Days Used: _____

Toxicant/ Batch # : KCl/2.20.12

Artemia Lot # : 23613

Start Date: 2.21.12 Time: 1215

End Date: 2.28.12 Time: 1015

Organism Batch #/ Age: 2.21.12 <24hrs

Artemia Batch #	Day 2 20-12	Day 5 23-12	Chamber size : 1000 ml
Day 0 18-12	Day 3 21-12	Day 6 24-12	Test volume : 500 ml
Day1 19-12	Day 4 22-12		

Feeding: *P. promelas* 0.15 g wet wt. 2X day 6 hour interval

M. beryllina 0.10 g wet wt days 0-2 0.15g wet wt. days 3-7

Water Quality Parameters	Diluent 2-17-12	Diluent (or other)	Method	Measured by	Verified by
Total Residual Cl_2 (mg/L):	<0.03		HACH	AP	MF
Alkalinity (mg/L as $CaCO_3$):	77		HACH	AP	MF
Hardness (mg/L as $CaCO_3$):	94		HACH	AP	MF
Total Ammonia (mg/L as N):	<0.017		DENVER	MF	JD
Conductivity (umhos-cm) mmhos-cm:	332		METTLER	JD	MF

Statistics	
Growth NOEC:	0.125 g/L
Growth LOEC:	0.250 g/L
Growth IC_{20}:	0.222 g/L
Growth IC_{25}:	0.312 g/L
Ctrl % CV:	12.6 %
Dunnetts PMSD:	14.2 %
Survival NOEC:	0.5 g/L
Survival LOEC:	1.0 g/L

Test incubated in : [X] Incubator # 3

[ ] Waterbath #_____

Light Intensity : 50 - 100 ft. candles

Photoperiod : 16 light 8 dark

Temperature Range °C:

Incubator # 3 min. 24.6 max. 26.4 mean –

Water bath # ____ min._____ max._____ mean_____

Room B246 min. 23.4 max. 25.3 mean –

P. promelas PMSD Bounds for Growth: Lower 12 Upper 30

M. beryllina PMSD Bounds for Growth: Lower 11 Upper 28

Investigators' signatures

James Davis

Natalie Pennington

Marshall Faircloth

Bruce Archer

_____

_____

Stig Miller

REVIEWER

Comments:

revised 7/16/08 MF

FDEP Biology Laboratory - Chronic SRT Benchsheet

Pimephales promelas or Menidia beryllina Survival

Organism: (*P. promelas*) *M.beryllina* (circle one) D = dead M = missing

Concentration: µg/L g/L (circle one)

			TEST DAY							
Concentration	Replicate	Chamber	0	1	2	3	4	5	6	7
Control	A	A1	10	10	10	10	10	10	10	10
	B	A2	10	10	10	10	10	10	10	10
	C	A3	10	10	10	10	10	10	10	10
	D	A4	10	10	10	10	9 10	9	9	9
.125	A	A5	10	10	10	10	9 10	9	9	9
	B	A6	10	10	10	10	10	10	10	10
	C	A7	10	10	10	10	10	10	10	10
	D	A8	10	10	10	10	10	10	10	10
.25	A	A9	10	10	10	10	10	10	10	10
	B	A10	10	10	10	10	10	10	10	10
	C	A11	10	10	10	10	10	10	10	10
	D	A12	10	10	10	10	10	10	10	10
.5	A	A13	10	9 10	9	9	9	9	9	9
	B	A14	10	10	10	10	10	10	10	10
	C	A15	10	10	10	10	10	10	10	10
	D	A16	10	10	10	10	10	9 10	9	9
1.0	A	A17	10	2 8D	~~10 8D~~	—	—	—	—	—
	B	A18	10	2 8D	2	2	0 2D	—	—	—
	C	A19	10	2 8D	2	2	2	2	2	2
	D	A20	10	0 10D	—	—	—	—	—	—
2.0	A	A21	10	0 10D	—	~~10 JD~~				
	B	A22	10	~~8 10D~~ 9 9D	0 10					
	C	A23	10	0 10D	—					
	D	A24	10	0 10D	—					
	A		10							
	B		10							
	C		10							
	D		10							
Loaded by (0 hr): JD		Checked by:		JD	JD	JD	JD	JD	JD	JD
Verified by (0 hr): AP										
Concentrations prepared by:				JD	JD	JD	JD	JD	JD	

Comments:

revised 7/16/08 MF

Chronic SRT Parameters Benchsheet

P. promelas and M. beryllina SOP TA07_09 and TA-07_15 parameter pg. 1

Start Date: 2.21.12 End Date: 2.28.12

Start Time: 1215 End Time: 10:15

conc = concentration rep = replicate circle umhos or mmhos

Test Day	Conc.	Before Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth	After Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth
Day 0	Control	A	7.5	25.9	6.7	332							
	.125	A	7.8	25.9	8.0	512							
	.25	A	7.8	25.9	7.8	789							
	.5	A	7.8	25.9	7.5	1265							
	1	A	7.9	25.9	7.6	2250							
	2	A	7.9	25.9	7.7	4060							
		A											
	Measured by		JD	JD	JD	JD							
	Recorded by		JD	JD	JD	JD							
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 1	Control	B	7.9	25.3	7.2	332		B	7.9	25.1	7.4	327	
	.125	B	7.9	24.7	7.5	506		B	7.9	24.5	7.3	532	
	.25	B	7.9	25.0	7.3	793		B	7.9	24.5	7.4	789	
	.5	B	7.9	24.6	7.4	1260		B	7.9	24.6	7.4	1276	
	1	B	8.0	24.7	7.4	2260		B	8.0	24.9	7.6	2210	
	2	B	7.9	~~24.7~~ AP	7.5	4030		B	8.0	25.4	7.4	4070	
		B						B					
	Measured by		AP	JD	AP	AP			AP	JD	AP	AP	
	Recorded by		AP	AP	AP	AP			AP	AP	AP	AP	
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 2	Control	C	7.6	25.0	6.7	333		C	7.8	25.9	6.9	328	
	.125	C	7.7	24.8	6.8	550		C	7.8	25.6	6.9	558	
	.25	C	7.6	24.5	6.5	780		C	7.8	25.5	6.9	802	
	.5	C	7.7	24.5	6.5	1283		C	~~7.9~~ JD 7.9	25.2	6.8	1270	
	1	C	7.7	25.3	6.8	JD ~~1292~~ 2210		C	7.9	25.5	7.1	2200	
	2	CB	7.8	25.6	7.3	4030		C					
		C						C					
	Measured by		JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by		JD	JD	JD	JD			JD	JD	JD	JD	
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 3	Control	D	7.6	24.2	6.1	330		D	7.6	25.5	7.1	318	
	.125	D	7.6	24.1	6.3	564		D	7.6	25.6	7.2	555	
	.25	D	7.6	24.0	6.4	800		D	7.7	24.9	7.2	792	
	.5	D	7.6	24.1	5.9	1290		D	7.8	25.1	7.1	1275	
	1	JD DB	7.7	24.3	7.2	2230		JD DB	7.9	24.9	7.3	2170	
		D						D					
		D						D					
	Measured by		JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by		JD	JD	JD	JD			JD	JD	JD	JD	

@ Day 2 P.H .5C=; JD

Comments:
AP: Day 1, 2B: temp = 24.7

For salinity <1 ppth insert <1. For salinity > 1 ppth, conductivity measurement is not required if salinity probe is functional.

Chronic SRT Parameters Benchsheet

P. promelas and M. beryllina SOP TA07_09 and TA-07_15 parameter pg. 2

Start Date: 2.21.12 End Date: 2.28.12

Start Time: 1215 End Time: 1015

conc = concentration rep = replicate

Test Day	Conc.	Before Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (umhos) mmhos	Salinity ppth	After Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (umhos) mmhos	Salinity ppth
Day 4	Control	A	7.3	25.3	6.7	344		A	7.3	25.5	7.1	333	
	.125	A	7.3	25.0	6.8	589		A	7.4	25.9	7.0	591	
	.25	A	7.4	25.3	7.4	845		A	7.5	25.9	7.3	841	
	.5	A	7.4	25.6	7.5	1374		A	7.6	25.6	7.6	1344	
	1	CA JD	7.6	25.4	7.8	2310		CA JD	7.7	25.2	7.5	2260	
		A						A					
		A						A					
	Measured by		JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by		JD	JD	JD	JD			JD	JD	JD	JD	
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 5	Control	B	7.4	24.1	7.3	329		B	7.8	24.8	7.7	335	
	.125	B	7.4	24.1	7.4	580		B	7.9	25.0	7.9	588	
	.25	B	7.5	24.0	7.5	817		B	7.9	25.1	8.2	840	
	.5	B	7.5	24.4	7.7	1326		B	7.9	25.1	8.3	1349	
	1	JD BC	7.6	24.4	8.1	2260		B	7.9	24.8	8.3	2270	
		B						B					
		B						B					
	Measured by		JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by		JD	JD	JD	JD			JD	JD	JD	JD	
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 6	Control	C	7.3	25.0	5.3	341		C	7.2	25.8	7.2	321	
	.125	C	7.4	25.3	6.2	596		C	7.3	25.1	7.3	574	
	.25	C	7.4	24.8	6.1	842		C	7.3	25.3	7.3	811	
	.5	C	7.5	24.8	6.5	1361		C	7.5	25.7	7.4	1317	
	1	C	7.6	24.7	6.7	2280		C	7.6	25.4	7.5	2200	
		C						C					
		C						C					
	Measured by		JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by		JD	JD	JD	JD			JD	JD	JD	JD	
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 7	Control	D	7.2	24.7	5.4	326		D					
	.125	D	7.3	24.6	5.7	576		D					
	.25	D	7.3	24.5	6.2	817		D					
	.5	D	7.3	24.6	7.1	1318		D					
	1	JD BC	7.3	24.7	6.7	2220		D					
		D						D					
		D						D					
	Measured by		JD	JD	JD	JD							
	Recorded by		JD	JD	JD	JD							

For salinity <1 ppth insert <1. For salinity > 1 ppth, conductivity measurement is not required if salinity probe is functional.

FDEP Biology Laboratory - Chronic SRT Benchsheet

Pimephales promelas or *Menidia beryllina* Weights

SOP TA06_21

Organism: (*P. promelas*) *M.beryllina* (circle one)

Concentration: µg/L (g/L) (circle one)

mean wt = fish wt divided by 10

convert g to mg: move decimal 3 places to right

Concentration	Replicate	Pan #	Pan wt. (g)	Pan + Fish (g)	Fish wt. (g)	Original # of fish	Mean wt. (mg)	
Control	A	25	0.0[illegible]2172	0.0[illegible]3032	0.00 860	10	.860	
	B	26	0.0[illegible]2133	0.0[illegible]2877	0.00 744	10	.744	
	C	27	0.0[illegible]2198	0.0[illegible]3181	0.00 983	10	.983	.842
	D	28	0.0[illegible]2128	0.0[illegible]2909	0.00 781	10	.781	
.125	A	29	0.0[illegible]2036	0.0[illegible]2659	0.00 623	10	.623	
	B	30	0.0[illegible]2092	0.0[illegible]2914	0.00 822	10	.822	.748
	C	31	0.0[illegible]2289	0.0[illegible]3075	0.00 786	10	.786	
	D	32	0.0[illegible]2166	0.0[illegible]2925	0.00 759	10	.759	
.25	A	33	0.0[illegible]2190	0.0[illegible]2888	0.00 698	10	.698	
	B	34	0.0[illegible]2311	0.0[illegible]2894	0.00 583	10	.583	
	C	35	0.0[illegible]2262	0.0[illegible]2940	0.00 678	10	.678	.652
	D	36	0.0[illegible]2338	0.0[illegible]2987	0.00 649	10	.649	
.5	A	37	0.0[illegible]2368	0.0[illegible]2936	0.00 568	10	.568	
	B	38	0.0[illegible]2156	0.0[illegible]2757	0.00 601	10	.601	
	C	39	0.0[illegible]2274	0.0[illegible]2806	0.00 532	10	.532	.569
	D	40	0.0[illegible]2226	0.0[illegible]2802	0.00 576	10	.576	
1	A	—	—	—	—	10	—	
	B	—	—	—	—	10	—	
	C	41	0.0[illegible]2329	0.0[illegible]2447	0.00 118	10	.118	.118
	D	—	—	—	—	10	—	
	A					10		
	B					10		
	C					10		
	D					10		
	A					10		
	B					10		
	C					10		
	D					10		
		Weighed by:	JD	JD				

Comments:

Note: Pan number (#) refers to actual Pan number.

revised 8/24/06 MF/SP

FDEP Biology Laboratory - Chronic SRT Benchsheet

Pimephales promelas or *Menidia beryllina* QC

SOPs TA07_09, TA07_14 and TA06_21

all weights in grams

Empty Pan Weights Date: 2/27/12 Weighed by: JD

	Pan 1 wt.	Pan 1 initial wt.
after Pan 5	0.02171	@ 0.02172
after Pan 10	0.02171	@ 0.02172
after Pan 15	0.02169	@ 0.02172
after Pan 20	0.02173	@ 0.02172
after Pan 25		@
after Pan 30		@
after Pan 35		@
after Pan 40		@
after Pan 45		@
after Pan 48		@

	Measured Value	S-weight Value
S-weights	0.00102g	@ 0.01g
	0.03006g	@ 0.03g

Balance: Ohaus 250D Ser# 1125481084

S-Weights: BIO-S-Weights-01

Fish + Pan Weights Date: 3/1/12 Weighed by: JJ

	Pan 1 wt.	Pan 1 initial wt.
after Pan 5	0.03031	@ 0.03032
after Pan 10	0.03033	@ 0.03032
after Pan 15	0.03034	@ 0.03032
after Pan 20	0.03032	@ 0.03032
after Pan 25		@
after Pan 30		@
after Pan 35		@
after Pan 40		@
after Pan 45		@
after Pan 48		@

	Measured Value	S-weight Value
S-weights	0.00100g	@ 0.01g
	0.05004g	@ 0.05g

Drying Oven ID: ER034000

Temperature °C: 100

Drying Hours: 8

Note: Pan number (5, 10, etc.) refers to sequence of weighing as actual Pan #s may differ.

Comments:

revised 7/16/08 MF

Test ID: P. promelas chronic SRT Dates: 2/21/12 - 2/28/12

METER / DEVICE	ID	SOP	Parameter	Method	v used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
YSI DO Probe	5905	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
Accumet AR-10 pH Meter	93312105	TA06_23	pH	SM 4500 H+	✓
Mettler-Toledo SevenMulti Conductivity Meter	SN 1225117049 Probe H04257	TA06_25	Conductivity Salinity	SM 2510 B SM 2520 B	✓
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	✓
Traceable Thermometer	#1-SN101686412 #2-SN221295527 #3-SN240116020 #4-SN80361795 #5 SN61990624	TA06_05	Temperature	SM-2530B modified DEP SOP-001/01 FT1400	✓ #5
Hach Pocket Colorimeter II	05050C026378	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	✓
Alkalinity (Hach Kit)	No SN	TA06_08	Alkalinity	SM 2320 B	✓
Hardness (Hach Kit)	No SN	TA06_09	Hardness	SM 2340 C	✓
OHAUS Balance 250D	1125481084	TA06_21 TA06_27	Weight	-	✓
S-Weights	BIO-S-WEIGHTS-01	NA	Balance check	-	✓

SM-2530B modified to allow use of electronic and non-mercury filled thermometers.

Insert other device information in blank spaces(if used). Test ID = Facility or SRTs (acute SRT--Chronic SRT)

JD 3.1.12

V 1.1 9/21/10 MF/jd

Pg 42

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Shipping Date: 2/20/12

Ship to: FDEP

P.O. No: _____

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia						
Menidia beryllina						
						Hardness mg/L
Cyprinella leedsi						
Pimephales promelas	500	<24 HRS	FA112 0219-1630	25	7.8	80
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

Packed by: PM

Shipped Via: Fed Ex

Notes: _____

Thank you for your order.

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Appendix I-1

Benthic macroinvertebrates collected from ponar samples at 2 Sites bracketing the City of Lynn Haven Wastewater Treatment Facility's effluent discharge pipe (D-001). Taxa collected and density (average number of individuals/m^2) rounded to the nearest individual (n = 5 samples/site). See SOP LT 7100 sect. 4.2.1 for method on collapsing taxa.

	Control Site East	Control Site West	Test Site
Annelida			
Polychaeta			
Aricidea sp.	-	14	-
Armandia maculata	160	28	56
Chaetopterus variopedatus	7	-	-
Cirratulidae	-	-	7
Cirrophorus sp.	-	7	7
Diopatra cuprea	-	21	28
Eupolymnia sp.	-	14	-
Exogone sp.	-	14	-
Fabricinuda trilobata	-	9	-
Galathowenia oculata	-	14	-
Glycinde solitaria	21	-	-
Harmothoe lancerocirrata	14	-	-
Harmothoe sp.	-	-	7
Magelona pettiboneae	7	-	-
Maldanidae	-	21	-
Malmgreniella maccrayae	-	7	-
Mediomastus ambiseta	167	-	-
Mediomastus sp.	-	97	56
Melinna cristata	-	7	-
Minuspio perkinsi	409	-	-
Minuspio sp.	-	7	-
Monticellina sp.	21	7	-
Neanthes sp.	-	28	-
Nephtys squamosa	-	14	-
Nereididae	7	-	-
Notomastus sp.	-	7	-
Onuphidae	7	-	-
Ophiodromus sp.	-	14	-
Paradialychone sp.	-	19	7
Paraprionospio sp.	7	-	7
Phyllodoce sp.	-	7	-
Phyllodocida sp.	-	-	7
Prionospio sp.	-	-	7
Sabellidae	7	-	-

Appendix I-1 (continued)

	Control Site East	Control Site West	Test Site
Scoletoma ernesti	-	51	-
Scoletoma verrilli	49	130	28
Sigambra tentaculata	7	7	-
Sthenelais sp.	7	-	-
Terebellides stroemi	-	28	-
Arthropoda			
Crustacea			
Amphipoda			
Ampelisca sp. D	-	55	-
Ampelisca vadorum	-	110	-
Ericthonius brasiliensis	-	15	-
Listriella barnardi	21	15	-
Monocorophium sp.	-	8	-
Cumacea			
Leucon sp.	-	14	-
Leuconidae	-	-	14
Decapoda			
Alpheus nuttingi	14	-	-
Callianassidae	-	-	7
Ogyrides alphaerostris	7	-	-
Pinnixa sp.	-	7	-
Polyonyx gibbesi	14	-	-
Isopoda			
Xenanthura brevitelson	-	21	-
Tanaidacea			
Alokalliapseudes macsweenyi	-	7	-
Apseudidae	-	28	-
Apseudomorpha sp.	-	14	-
Bryozoa			
Gymnolaemata			
Cupuladria sp.	-	35	-
Chordata			
Cephalochordata			
Branchiostoma sp.	-	7	-
Echinodermata			
Holothuroidea			
Protankyra raminura	49	-	-
Stelleroidea			
Amphiuridae	14	-	-
Ophiuroidea sp.	-	14	-

Appendix I-1 (continued)

	Control Site East	Control Site West	Test Site
Mollusca			
Bivalvia			
Lucinidae	25	-	100
Nuculana concentrica	-	24	-
Nuculana sp.	-	-	28
Parvilucina crenella	-	94	-
Sphenia fragilis	-	-	220
Tellina versicolor	-	71	-
Tellinidae	17	-	-
Veneridae	-	8	-
Gastropoda			
Caecum cooperi	-	18	-
Caecum pulchellum	-	53	-
Costoanachis sp.	-	21	-
Olivella sp.	-	56	-
Solariorbis infracarinatus	-	14	-
Tectonatica pusilla	-	14	-
Turbonilla sp.	-	7	-
Nemertea			
Anopla			
Cerebratulus lacteus	222	-	-
Nemertea			
Undetermined Nemertea	-	69	83
Sipuncula			
Phascolion sp.	-	14	-

Appendix I-2

Benthic macroinvertebrates collected in ponar samples at 2 Sites bracketing the City of Lynn Haven Wastewater Treatment Facility's effluent discharge pipe (D-001). Taxa collected and total number of individuals counted (n = 5 samples/site).

	Control Site East	Control Site West	Test Site
Annelida			
Polychaeta			
Armandia maculata	23	4	8
Chaetopterus variopedatus	1	-	-
Cirratulidae	1	-	1
Cirrophorus sp.	-	1	1
Diopatra cuprea	-	2	4
Eupolymnia sp.	-	1	-
Exogone sp.	-	2	-
Fabricinuda trilobata	-	1	-
Galathowenia oculata	-	2	-
Glycinde solitaria	3	-	-
Harmothoe lancerocirrata	1	-	-
Harmothoe sp.	1	-	1
Lumbrineridae	-	1	-
Magelona pettiboneae	1	-	-
Maldanidae	-	3	-
Malmgreniella maccrayae	-	1	-
Mediomastus ambiseta	3	-	-
Mediomastus sp.	21	14	8
Melinna cristata	-	1	-
Minuspio perkinsi	29	-	-
Minuspio sp.	30	1	-
Monticellina	2	1	-
Neanthes sp.	-	1	-
Nephtys squamosa	-	2	-
Nereididae	1	3	-
Notomastus sp.	-	1	-
Onuphidae	1	1	-
Ophiodromus sp.	-	2	-
Paradialychone sp.	-	2	1
Paraprionospio sp.	1	-	1
Phyllodoce sp.	-	1	-
Phyllodocida	-	-	1
Prionospio sp.	-	-	1
Sabellidae	1	1	-
Scoletoma ernesti	-	7	-

Appendix I-1 (continued)

	Control Site East	Control Site West	Test Site
Scoletoma verrilli	7	18	4
Sigambra tentaculata	1	1	-
Sthenelais sp.	1	-	-
Terebellidae	-	1	-
Terebellides stroemi	-	4	-
Undetermined Aricidea	-	2	-
Arthropoda			
Crustacea			
Amphipoda			
Ampelisca sp.	-	19	-
Ampelisca sp. D	-	1	-
Ampelisca vadorum	-	2	-
Ericthonius brasiliensis	-	2	-
Listriella barnardi	1	2	-
Monocorophium sp.	-	1	-
Undetermined Amphipoda	2	2	-
Cumacea			
Leucon sp.	-	2	-
Leuconidae	-	-	1
Undetermined Cumacea	-	-	1
Decapoda			
Alpheus nuttingi	2	-	-
Callianassidae	-	-	1
Ogyrides alphaerostris	1	-	-
Pinnixa sp.	-	1	-
Polyonyx gibbesi	2	-	-
Isopoda			
Xenanthura brevitelson	-	3	-
Tanaidacea			
Alokalliapseudes macsweenyi	-	1	-
Apseudidae	-	4	-
Apseudomorpha sp.	-	2	-
Bryozoa			
Gymnolaemata			
Cupuladria sp.	-	5	-
Chordata			
Cephalochordata			
Branchiostoma sp.	-	1	-
Echinodermata			
Holothuroidea			

| | Control | Control | Test |

Appendix I-1 (continued)

	Site East	Site West	Site
Protankyra raminura	7	-	-
Stelleroidea			
Amphiuridae	2	-	-
Ophiuroidea sp.	-	2	-
Mollusca			
Bivalvia			
Lucinidae	3	6	11
Nuculana concentrica	-	2	-
Nuculana sp.	-	-	3
Nuculanidae	-	1	-
Parvilucina crenella	-	6	-
Sphenia fragilis	-	-	24
Tellina sp.	-	8	-
Tellina versicolor	-	1	-
Tellinidae	2	-	-
Undetermined Bivalvia	1	3	12
Veneridae	-	1	-
Gastropoda			
Caecum cooperi	-	2	-
Caecum pulchellum	-	6	-
Caecum sp.	-	2	-
Costoanachis sp.	-	3	-
Olivella sp.	-	8	-
Solariorbis infracarinatus	-	2	-
Tectonatica pusilla	-	2	-
Turbonilla sp.	-	1	-
Nemertea			
Anopla			
Cerebratulus lacteus	20	-	-
Undetermined Nemertea	12	10	12
Sipuncula			
Phascolion sp.	-	2	-

The Bioassay of the City of Lynn Haven WWTF effluent sampled on February 19, 2012 NPDES #FL0169978

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 1 6 9 9 7 8 11	12 1 2 0 2 1 9	# B	# S	# 1

Remarks

#

The Priority Pollutants Analysis for Bioassay of the City of Lynn Haven WWTF effluent sampled on February 20, 2012 NPDES #FL0169978

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 1 6 9 9 7 8 11	12 1 2 0 2 2 0	# X	# S	# 1

Remarks

#

Biological Analyses of the City of Lynn Haven WWTF effluent sampled on February 22, 2012 NPDES #FL0169978

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 1 6 9 9 7 8 11	12 1 2 0 2 2 2	# S	# S	# 1

Remarks