

Effluent Quality Assessment

City of Largo AWWTF

Pinellas County

NPDES #FL0026603

Sampled April 23, 2012

June 2012

Biology Section
Bureau of Laboratories
Division of Environmental Assessment and Restoration

Quality Manual No. 870346G
NELAC Certification No. E31780

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City of Largo Advanced Wastewater Treatment Facility (AWWTF), 5100 150th Avenue North, Clearwater, Pinellas County, Florida, 33760. NPDES #FL0026603. Effluent grab samples for biological and chemical analyses for this facility were collected on April 23, 2012.

Introduction

City of Largo AWWTF is a Type 1 advanced wastewater treatment facility which uses the A20 process, a high-rate three-stage biological nutrient removal process, to treat domestic wastewater. (See Appendix F for detailed facility information provided by Peter Wenner of FDEP Southwest District.)

Methods

Samples were collected from the EFD-01 and from the EFB-01 (total suspended solids) NPDES sampling points for Outfall D-001 by Peter Wenner and Andy Farmer (FDEP Southwest District) following DEP-SOP-001/01 FS 2400 Wastewater Sampling. All DEP SOPs are available on the web at: http://www.floridadep.org/labs/bars/sas/sop/index.htm.

See Appendix A for the completed chain of custody form.

The 48-hour acute screening toxicity tests and algal growth potential test were performed following internal DEP SOPs TA07_01, TA07_02, and TA08_01 through TA08_09. All internal DEP SOPs are available on the web at: http://www.floridadep.org/labs/cgi-bin/sop/biosop.asp.

Results and Discussion

- **Toxicity Test Results**
  Tests were performed April 24 - 26, 2012.

Ceriodaphnia dubia 48-hour acute screening bioassay –	LC_{50} > 100%, 10%* mortality in 100% sample at 48 hours
Pimephales promelas 48-hour acute screening bioassay –	LC_{50} > 100%, 0%* mortality in 100% sample at 48 hours

  The bioassay samples were not acutely toxic to the test organisms.

  *NOTE: In a 48-hour acute screening test of 100% effluent, mortality of <20% provides confidence that the effluent meets the acute toxicity criterion of Florida's Surface Water Quality Standards (Rule 62-302.500 (1) (a) 4, F.A.C.). Mortality between 20-50% indicates low to moderate levels of toxicity, and further action may be required. Mortality of >50% indicates that the effluent fails to meet the minimum requirement to discharge to waters of the state (Rule 62-4.244(3) (a), F.A.C.).

  See Appendix B for bioassay bench sheets. See Appendix C for results of the last 20 standard reference toxicant (SRT) tests and the bench sheets and statistical analyses of the SRT tests that correspond to these facility tests. See Appendix D for test organism receipts.

- **Algal Growth Potential**
  The effluent Algal Growth Potential (AGP) was 8.6 mg dry wt/L of the unicellular green alga, *Pseudokirchneriella subcapitata*, formerly known as *Selenastrum capricornutum*. Raschke and Schultz (1987) determined that AGP values above 5.0 mg dry weight/L represent a "problem" threshold for fresh receiving waters, implying nutrient enrichment. The analytical chemistry suggests that the effluent is phosphorus -limited. (Table 1; Miller et al. 1978).

  See Table 1 for AGP results and qualifiers.

- **Chemistry**
  Total residual chlorine and total ammonia were not detected in the bioassay sample in the laboratory. The total ammonia concentration in the grab sample collected and preserved for chemical analysis was 0.037 mg N/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was < 0.02 mg/L.

  Cadmium, copper, dibromochloromethane, fluoride, nickel, and zinc were detected in the effluent at levels that comply with Class III fresh water quality criteria (62-302.530, F.A.C.). Arsenic, atrazine, chromium-III, and iron were detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL).

  Total phosphorus, total kjeldahl nitrogen (TKN), and total nitrogen were detected in the effluent at levels that comply with permit limits.

  Total suspended solids (TSS) were detected between the MDL and PQL and complied with permit limits. Carbonaceous biochemical oxygen demand (CBOD) was scheduled per permit requirements, but due to a lab error (NCR #4130), uninhibited biochemical oxygen demand (BOD) was analyzed. BOD of the effluent was between the MDL and PQL.

  See Table 2 for results of analytes detected in the effluent, corresponding limits, and qualifiers. See Appendix E for a complete list of chemical analyses performed. See Appendix B for bioassay lab equipment.

Conclusion

The effluent sample collected from the EFD-01 NPDES sampling point for this facility on April 23, 2012, was not acutely toxic to either test species during the 48-hour acute screening bioassays. The effluent AGP result was greater than the "problem" threshold for fresh receiving waters, suggesting that nutrient enrichment may be an issue. Effluent water quality samples collected on April 23, 2012, did not exceed any applicable water quality standards or violate any permit conditions.

Literature Cited

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

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

Table 1. 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 for samples collected from the City of Largo AWWTF on April 23, 2012.

City of Largo AWWTF NPDES# FL0026603									
Location	AGP (measured)		Predicted AGP (OP) ± 20%			Predicted AGP (TP) ± 20%			Inorganic N:P ratio	Total N:P ratio
Effluent	8.6	A	17.2	±	3.4	37.8	±	7.6	43.4	30.7

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

Table 2. Effluent limits, Class III Freshwater Criteria, chemical data, and qualifiers for samples collected from the City of Largo AWWTF on April 23, 2012.

City of Largo AWWTF NPDES# FL0026603	Class III Criteria	Effluent Limits	Effluent	
Organic Constituents (µg/L)				
Atrazine	-	-	0.073	I
Dibromochloromethane	-	≤ 22.0 a	10	
Metals (µg/L unless otherwise noted)				
Aluminum	-	-	18	I
Arsenic	≤ 50	-	0.36	I
Cadmium	≤ 0.6 b	-	0.57	
Calcium (mg/L)	-	-	86.1	
Chromium-III	≤ 218.7 b	-	0.37	I
Copper	≤ 24.6 b	-	1.87	
Iron	≤ 1,000	-	45.9	I
Lead	≤ 13.5 b	-	0.2	U
Magnesium (mg/L)	-	-	23.5	
Nickel	≤ 136.5 b	-	5.66	
Selenium	≤ 5.0	-	0.2	U
Silver	≤ 0.07	-	0.025	U
Zinc	≤ 314.0 b	-	45.3	
Nutrients (mg/L)				
Ortho-phosphate	-	-	0.04	
Total Phosphorus	-	≤ 2.0 s	0.088	
Total Ammonia	-	-	0.037	
Un-ionized Ammonia	≤ 0.02 s	-	< 0.02	c
Nitrate and Nitrite	-	-	1.7	
Total Kjeldahl Nitrogen	-	-	1.0	
Organic Nitrogen	-	-	0.963	c
Total Nitrogen	-	≤ 6.0 s	2.7	c
General Physical and Chemical Parameters				
Dissolved Oxygen (mg/L)	≥ 5.0	≥ 5.0 s	7.6	
pH (SU)	6.0 - 8.5	6.0 - 8.5 s	7.3	
Conductivity (µmhos/cm)	≤ 1,275	-	1005	
Temperature (°C)	-	-	26.2	
Salinity	-	-	0.48	c
Sample Depth (m)	-	-	0.2	
Total Residual Chlorine (mg/L)	≤ 0.01	≤ 0.01 s	< 0.03	UQA£
Chlorophyll *a* (µg/L) - Corrected	-	-	0.55	U
Phaeophytin (µg/L)	-	-	0.4	U
Total Suspended Solids (mg/L)	-	≤ 10.0 s	2	I
BOD, 5 day (mg/L), N - uninhibited	-	≤ 10.0 s	1.1	I
Chloride (mg/L)	-	-	150	
Fluoride (mg/L)	≤ 10.0	-	0.28	
Sulfate (mg/L)	-	-	47	
Flow (MGD)	-	15 a	5.66	*
Hardness (mg $CaCO_3$)	-	-	311.76	c
Microbiology (Number of colony forming units/100ml)				
Fecal Coliforms ¥	≤ 400s #	≤ 25 s	2	U

Value exceeds the Class III Water Quality Criteria or permit limits

a - Annual average
b - Value is calculated based on hardness
c - Value is calculated
s - Single sample
A - Value reported is the mean of two or more determinations
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
Q - Sample held beyond normal holding time
U - Material analyzed for but not detected; value reported is the method detection limit
¥ - Fecal coliform analysis performed by Advanced Environmental Laboratories, Inc., Tampa
£ - measurement taken in the FDEP laboratory
* - April 2011- March 2012

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID*

Request Number: RQ-2012-04-09-43
FYI3 City of Largo Sampling Inspection

Requester: Peter Wenner
Field Report Prepared By:

Customer: SW-DIST
Project ID: FYI3
PMAS: 1143

Collected By: PETE WENNER, ANDY FARMER
Sampling Agency: FDEP, SWD
Send Final Report To: Michele Duggan & Peter

Lab ID*	Location / Field ID	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Latitude	Longitude	Comp / Grab	Collection (comp begin or grab) Date	Time	Eastern Central	Composite end Date	Time	Eastern Central	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	Sample Depth	Salinity (PPTh) / Sp Conductance (umho/cm)	NPDES Number	Comments	Bottle Group(s)**
39797	EFD-01	FRESH	26.15	7.26	dd / dms	dd / dms	Grab	4/23/12	1900	Eastern Central					7.55		0.2 m / ft	1005 Sp Conductance		CN samples not collected	A
39798	EFB-01	FRESH			dd / dms	dd / dms	Grab	4/23/12	1045	Eastern Central											B
39799	FIELD BLANK	DI H_2O			dd / dms	dd / dms	Grab	4/23/12	1050	Eastern Central											C
*	TRIP-BLK	T-BLK			dd / dms	dd / dms				Eastern Central											

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
	4/23/12:1700	FEDEX		4/24/12 10-05	2 blocks	10:20 4.24.12	B. Alexander	

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

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* Filled by. Amzad's 04/24/12

FDEP Biology Laboratory - Acute Bioassay Bench Sheets

Facility: Largo, City of

Address: 5100 150th Avenue North

City: Clearwater County: Pinellas 33760

Contact/District: Pete Wanner / Southwest

NPDES Permit #: FL 0026603

LIMS Job #: TLH-2012-04-2447 LIMS Sample #: 1424222

Lims Data Entry: 5-1-2012 MF Data Entry Verification: 5-1-2012 JD

Sample Collection: Date: 4-23-12 Time: 1000

Hold Time Start: Date: 4-23-12 Time: 1000

Comments:

Initial sample handling:

Instructions: Check yes or no. If yes is checked, complete blanks

PH adjustment: ☐ yes ☑ no Initial pH: ____ NaOH ____ N HCl ____ N ____ Drops mL Final pH: ____

Aeration: ☑ yes ☐ no Initial DO: 0.2 mg/L Final DO: 8.2 mg/L Duration: 20 minutes Rate: ~100 bubbles/min

Salinity adjusted (Test 1): ☐ yes ☑ no Initial Salinity: ____ Final Salinity: ____ Salts Hypersaline brine

Salinity adjusted (Test 2): ☐ yes ☑ no Initial Salinity: ____ Final Salinity: ____ Salts Hypersaline brine

Dechlorination: ☐ yes ☑ no ____mL of 0.025N Sodium Thiosulfate per liter of sample. Final TRC: ____

Sample Validation:

Instructions: Check yes or no. Fill in temperatures.

Temperature: Shipped ≤ 6°C ☑ Yes ☐ No — IF Hand Delivered: Cooling ☐ Yes ☐ No (received ____°C collected ____°C)

Holding Time: ≤ 36 Hours ☑ Yes ☐ No (Composite-end of collection; grab-when collected; 4 in 24 - time last sample collected)

Investigators' Signatures: Initials:

Anne Alcala BA

Marshall Faircloth MF

James Squire JD

Adrienne Pennington AP

REVIEWER: Kristin Allen KM

Diluent/Control Batch#:	4-16-12		4.23.12						
Water Quality Parameters	5 D MHW ~~20% DMW~~	Well Water	Moderately Hard Water	Salt Water ASW NSW Test 1	Salt Water ASW NSW Test 2	Other:	Original Sample	Measured by	Verified by
Field Total Residual Cl_2 (mg/L):	N/A	N/A	N/A	N/A	N/A	N/A	Not Measured		MF
Lab Total Residual Cl_2 (mg/L):	<0.03		<0.03				<0.03	AP	JS
Alkalinity (mg/L as $CaCO_3$):	78		87				277	AP	JD
Hardness (mg/L as $CaCO_3$):	93		99				246	AP	JD
Total Ammonia (mg/L as N):	<0.017		<0.017				<0.017	ME	AP
Conductivity: ☑ µmhos ☐ mmhos	335		338				1037	MF	AP
Salinity (ppth):	—		—						

V 1.8 1/13/10

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample # 1474222 SOP#: TA 07 02 Test # 1 of 2

Test Species:
Batch #: 4-24-12 Age: 8 days
- ☐ *Ceriodaphnia dubia*
- ☐ *Cyprinella leedsi*
- ☑ *Pimephales promelas*
- ☐ *Menidia beryllina*
- ☐ *Americamysis bahia*
- ☐ Other:_____

Test Validation
Control Survival ≥ 90%: ☑ Yes ☐ No
Temperature Range ≤ 3° C: ☑ Yes ☐ No

Diluent (Batch # 4.23.12)
☐ ASW ☐ 20% DMW
☑ MHW ☐ Well

Test Type: ☑ Acute ☐ Definitive
☑ Static ☐ Static Renewal ☐ Flow-Through

Test Duration:
☒ 48 hr
☐ 96 hr
☐ ___hr

Test Started: Date 4.24.12 Time 1:60 PM

Test Ended: Date 4-26-12 Time 1330

Chamber Size 1000 ml
Test Volume: 500 ml

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
control	A	F1	5	5	5			
	B	F2	5	5	5			
	C	F3	5	5	5			
	D	F4	5	5	5			
100%	A	F5	5	5	5			
	B	F6	5	5	5			
	C	F7	5	5	5			
	D	F8	5	5	5			
Checked or Verified by:			AP	JD	MF			

Loaded/ Verified by: BA / AP
m = missing, d = dead, BR/AR Before/ After Renewal

Test Results:
Screening Tests: Report LC50 as >100%, =100%, or <100%.
% mortality in 100% sample: 0 LC50: >100%
Calculated LC50 (Definitive) 95% CI_____ Method_____

Food
- ☐ YCT Batch#_____
- ☐ P. subcapitata Batch#_____
- ☑ Artemia Lot# 23613

Feeding and Artemia Batch #
- ☒ 0 hr 4-1-12 ☒ Prior to Test
- ☐ 24 hr___
- ☐ 48 hr___ ☐ Prior to Renewal
- ☐ 72 hr___

Temperature Range (°C)
Incubator # 3
min. 24.1 max. 26.2 mean ___
Incubator #___
min.____max.____mean____
Waterbath #___
min.____max.____mean____
Room B246
min. 24.1 max. 24.7 mean ___
Light intensity (ft. candles): 50-100
Photoperiod (hours): 16 light, 8 dark

Comments:

V. 2.5 1-13-10

Substitute highest test concentration used if other than 100% (example: Ocean outfall tested at 30% concentration)

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Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample # 1424222 SOP#: TA 07 01 Test # 2 of 2

Test Species:
Batch #: 4-24-12 Age: <24hr
- [x] *Ceriodaphnia dubia*
- [ ] *Cyprinella leedsi*
- [ ] *Pimephales promelas*
- [ ] *Menidia beryllina*
- [ ] *Americamysis bahia*
- [ ] Other:______

Test Validation
Control Survival ≥ 90%:
- [x] Yes
- [ ] No

Temperature Range ≤ 3° C:
- [x] Yes
- [ ] No

Diluent (Batch # 4-16-12)
- [ ] ASW
- [ ] 20% DMW
- [x] MHW SD
- [ ] Well

Test Type:
- [x] Acute
- [ ] Definitive
- [x] Static
- [ ] Static Renewal
- [ ] Flow-Through

Test Duration:
- [x] 48 hr
- [ ] 96 hr
- [ ] __hr

Test Started: Date 4-24-12 Time 1100 hr

Test Ended: Date 4-26-12 Time 1000

Chamber Size 30 ml
Test Volume: 20 ml

			Test Hour					
Concentration	Replicate	Chamber #	0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
CTL	A	AC	5	5	5			
	B	BC	5	5	5			
	C	CC	5	5	5			
	D	DC	5	5	5			
100%	A	A1	5	5	3 2D			
	B	B1	5	5	5			
	C	C1	5	5	5			
	D	D1	5	5	5			
Checked or Verified by:			AP	MF	MF			

Food
- [x] YCT Batch# 1-20-12
- [x] P. subcapitata Batch# 2-17-12
- [ ] Artemia Lot#______

Feeding and Artemia Batch #
- [x] 0 hr____
- [x] Prior to Test
- [ ] 24 hr____
- [ ] 48 hr____
- [ ] 72 hr____
- [ ] Prior to Renewal

Temperature Range (°C)

Incubator # J5 32
min. 24.7 max. 26.2 mean —

Incubator #___
min.______max.______mean______

Waterbath #___
min.______max.______mean______

Room B246
min. 24.1 max. 24.7 mean —

Light Intensity (ft. candles): 50-100

Photoperiod (hours): 16 light, 8 dark

Loaded/ Verified by: MF / AP

m = missing, d = dead, BR/AR Before/ After Renewal

Test Results:

Screening Tests: Report LC50 as >100%, =100%, or <100%.
% mortality in 100% sample: 10% LC50: >100%
Calculated LC50 (Definitive) 95% CI______ Method______

Comments:

V. 2.5 1-13-10

Substitute highest test concentration used if other than 100% (example: Ocean outfall tested at 30% concentration)

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Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Parameter Sheet

LIMS Sample # 1424222 Test # 2 of 2

Test Species:

☑ *Ceriodaphnia dubia* ☐ *Pimephales promelas* ☐ *Americamysis bahia*
☐ *Cyprinella leedsi* ☐ *Menidia beryllina* ☐ Other:_____

Test aerated: (if DO is < 4.0 mg/L) ☐ Yes ☑ No

Concentration	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☑ µmhos ☐ mmhos	Salinity* (ppth)
CTC	A	0 hr	8.2	24.6	7.9	335	
	~~B~~ MF	24 hr					
	C	48 hr BR	8.3	24.2	8.5	353	
	~~D~~ MF	48 hr AR					
		72 hr					
		96 hr					
100%	A	0 hr	8.3	25.1	8.2	1037	
	~~B~~ MF	24 hr					
	C	48 hr BR	8.7	24.1	8.5	1086	
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
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		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

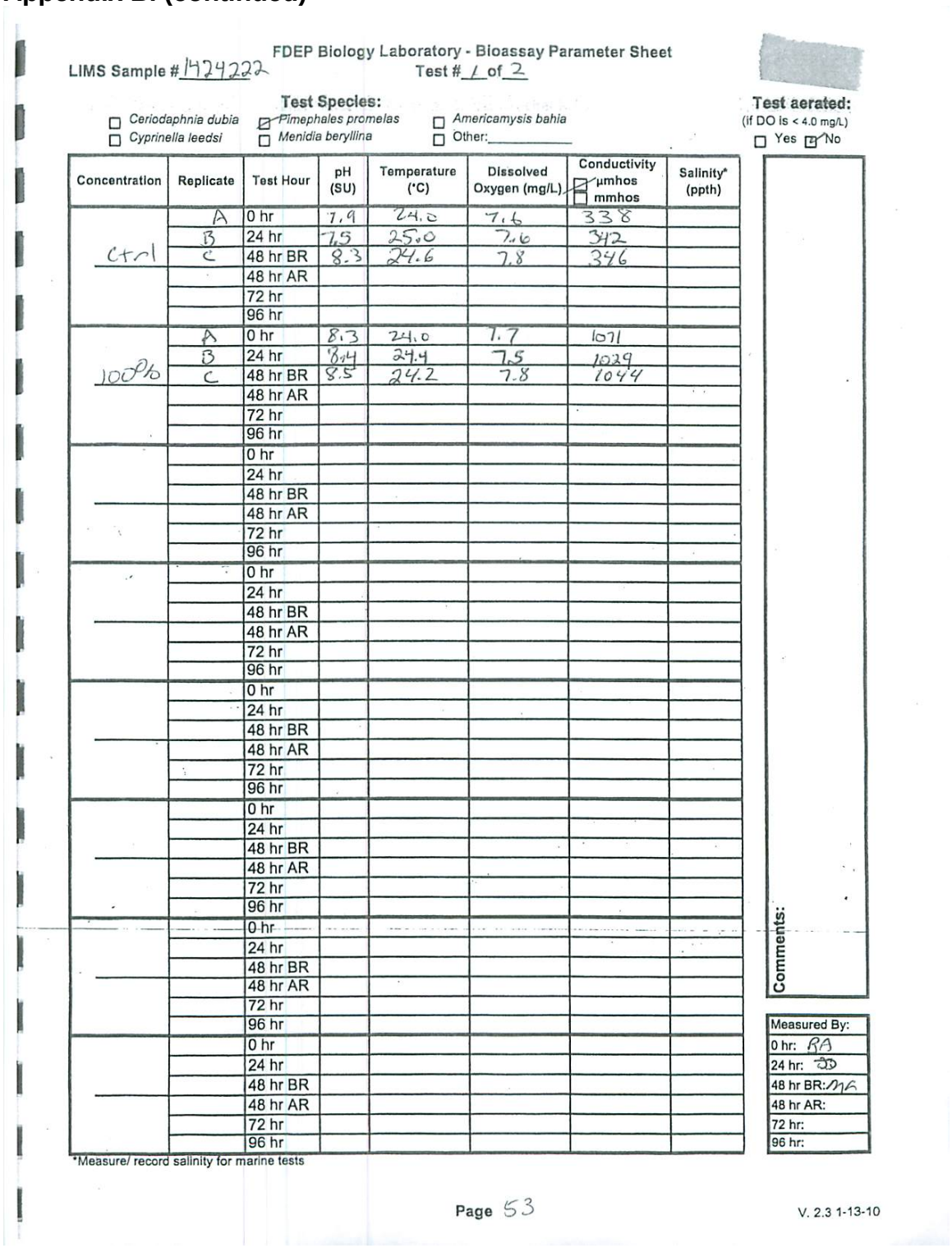
*Measure/ record salinity for marine tests

Comments:

Measured By:
0 hr: MF
24 hr: —
48 hr BR: MF
48 hr AR:
72 hr:
96 hr:

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Appendix B. (continued)



FDEP Biology Laboratory - Bioassay Parameter Sheet

LIMS Sample # 1424222 Test # 1 of 2

Test Species:

☐ *Ceriodaphnia dubia* ☑ *Pimephales promelas* ☐ *Americamysis bahia*
☐ *Cyprinella leedsi* ☐ *Menidia beryllina* ☐ Other:_____

Test aerated: (if DO is < 4.0 mg/L) ☐ Yes ☑ No

Concentration	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☑ µmhos ☐ mmhos	Salinity* (ppth)
	A	0 hr	7.9	24.0	7.6	338	
	B	24 hr	7.5	25.0	7.6	342	
Ctrl	C	48 hr BR	8.3	24.6	7.8	346	
		48 hr AR					
		72 hr					
		96 hr					
	A	0 hr	8.3	24.0	7.7	1071	
	B	24 hr	8.4	24.4	7.5	1029	
100%	C	48 hr BR	8.5	24.2	7.8	1044	
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
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		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

*Measure/ record salinity for marine tests

Comments:

Measured By:
0 hr: RA
24 hr: DD
48 hr BR: MG
48 hr AR:
72 hr:
96 hr:

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Appendix B. (continued)

City of Largo

Test ID: 14241228 Dates: 4.24.12 – 4.26.12

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 5.4.12

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V 1.1 9/21/10 MF/jd

Appendix C. SRT Bench Sheets and Statistical Analysis

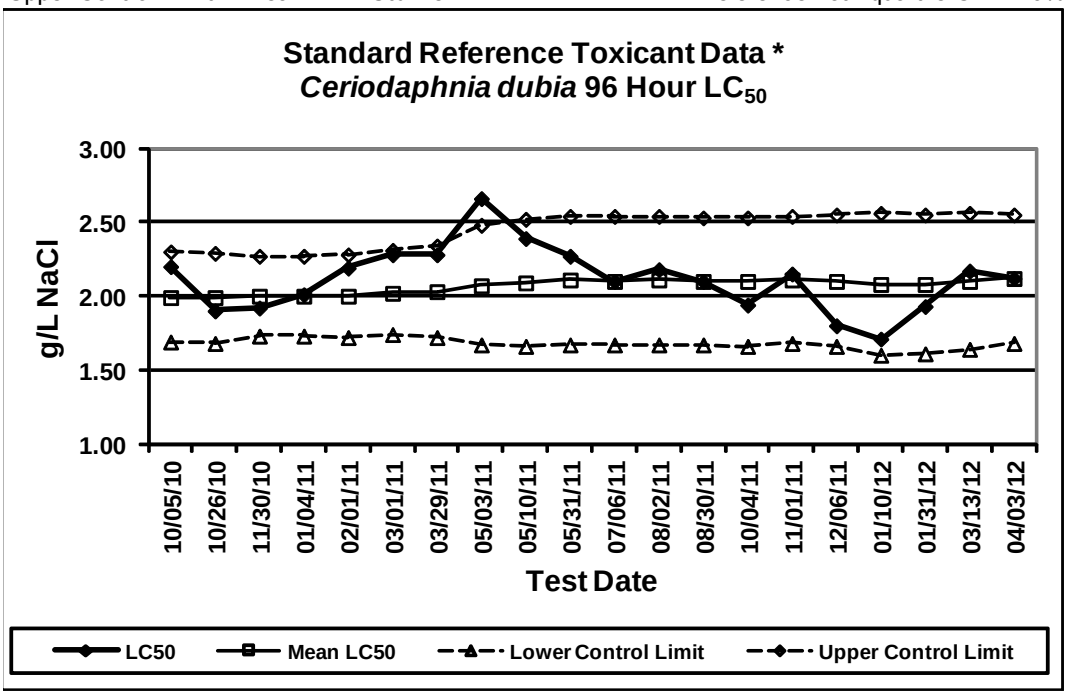
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 96-hour Acute Toxicity
Ceriodaphnia dubia (water flea) - Sodium Chloride (NaCl)

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
10/05/10	2.20	1.99	0.15	1.69	2.30
10/26/10	1.90	1.99	0.15	1.68	2.29
11/30/10	1.92	2.00	0.14	1.73	2.27
01/04/11	2.01	2.00	0.14	1.73	2.27
02/01/11	2.19	2.00	0.14	1.72	2.28
03/01/11	2.28	2.02	0.14	1.74	2.31
03/29/11	2.28	2.03	0.15	1.72	2.34
05/03/11	2.66	2.07	0.20	1.67	2.48
05/10/11	2.39	2.09	0.21	1.66	2.52
05/31/11	2.27	2.11	0.22	1.67	2.54
07/06/11	2.10	2.10	0.22	1.67	2.54
08/02/11	2.18	2.11	0.22	1.67	2.54
08/30/11	2.10	2.10	0.22	1.67	2.53
10/04/11	1.94	2.10	0.22	1.66	2.53
11/01/11	2.15	2.11	0.22	1.68	2.54
12/06/11	1.80	2.10	0.22	1.66	2.55
01/10/12	1.71	2.08	0.24	1.60	2.56
01/31/12	1.93	2.08	0.24	1.61	2.55
03/13/12	2.17	2.10	0.23	1.64	2.56
04/03/12	2.12	2.12	0.22	1.68	2.55

Lower Control Limit = mean - 2 * Std Dev
Upper Control Limit = mean + 2 * Std Dev

CV = 10.27
EPA reference 75th quartile CV = 29%



Appendix C. (continued)

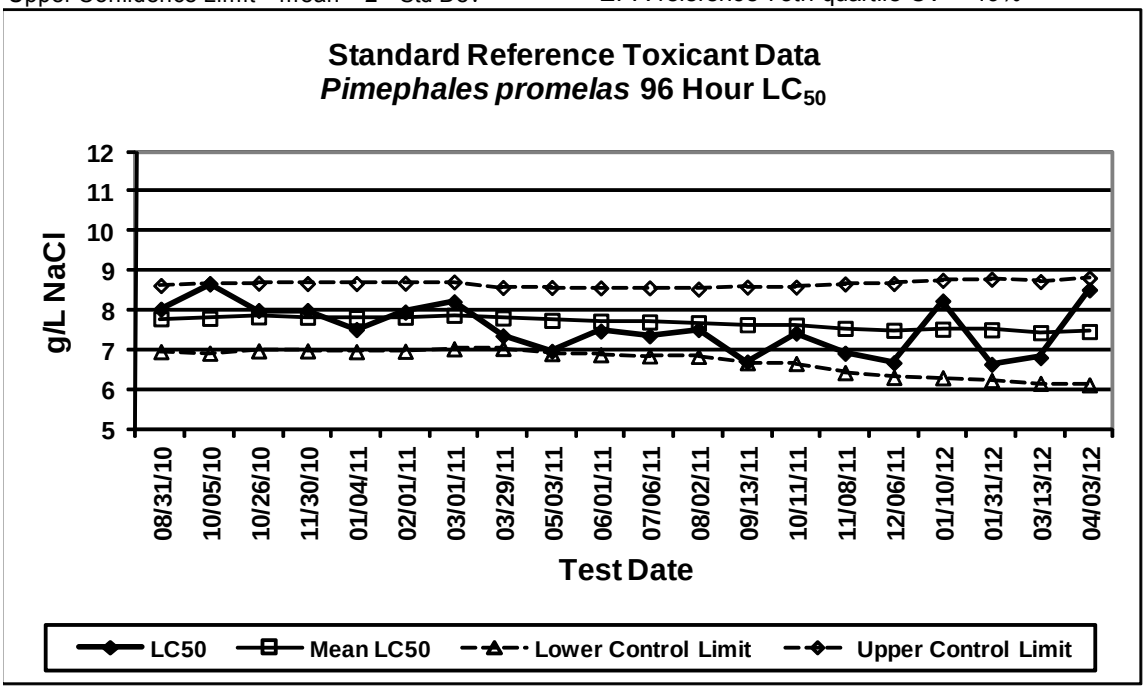
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 96-hour Acute Toxicity
Pimephales promelas (fathead minnow) - Sodium Chloride (NaCl)

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
08/31/10	8.02	7.78	0.42	6.95	8.62
10/05/10	8.66	7.79	0.44	6.91	8.67
10/26/10	7.99	7.83	0.43	6.97	8.68
11/30/10	7.99	7.82	0.42	6.97	8.67
01/04/11	7.51	7.81	0.43	6.95	8.67
02/01/11	7.95	7.82	0.43	6.96	8.68
03/01/11	8.21	7.87	0.42	7.02	8.71
03/29/11	7.35	7.8	0.39	7.03	8.57
05/03/11	6.96	7.74	0.42	6.9	8.57
06/01/11	7.47	7.72	0.42	6.87	8.56
07/06/11	7.35	7.7	0.43	6.84	8.56
08/02/11	7.51	7.68	0.43	6.83	8.53
09/13/11	6.69	7.63	0.48	6.67	8.58
10/11/11	7.42	7.62	0.48	6.65	8.58
11/08/11	6.91	7.54	0.56	6.42	8.66
12/06/11	6.67	7.49	0.59	6.3	8.67
01/10/12	8.23	7.52	0.61	6.29	8.75
01/31/12	6.63	7.5	0.64	6.22	8.78
03/13/12	6.80	7.43	0.64	6.15	8.72
04/03/12	8.51	7.46	0.68	6.11	8.81

Lower Confidence Limit = mean - 2 * Std Dev
Upper Confidence Limit = mean + 2 * Std Dev

CV = 9.06
EPA reference 75th quartile CV = 19%



Appendix C. (continued)

FDEP Biology Laboratory - Acute SRT Bench Sheet

Method from EPA-821-R-02-012 except *H. azteca*

Test Organism: (check one)
☐ *Americamysis bahia* Method 2007.0 TA07.03 ☐ *Menidia Beryllina* Method 2006.0 TA07.04 ☐ *Hyalella azteca* Method 100.1 EPA-600-R-99-064
☑ *Ceriodaphnia dubia* Method 2002.0 TA07.01 ☐ *Cyprinella leedsi* Method 2000.0 TA07.02 ☐ *Pimephales promelas* Method 2000.0 TA07.02

Test Type: ☐ non-renewal ☑ renewal
Test Page 1 of 2

Diluent/ Batch #: SDMW 13.18.12
Toxicant/ Batch#: NaCl 13.19.12
Organism Batch: 4.3.12 Age: < 24 hr
Test Beginning: Date: 4.3.12 Time: 10:30
Test Ending: Date: 4.7.12 Time: 7:30 BA

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	JD
Alkalinity (mg/L as $CaCO_3$):	65	TA06_08	AP
Hardness (mg.L as $CaCO_3$):	80	TA06_09	AP
Total Ammonia (mg/L as N):	<0.017	TA06_17	MF
Conductivity: ~~µmhos~~ mmhos	308	TA06_25	BA
Salinity (ppth):	—	TA06_25	

Food:	Batch
☑ YCT	1.20.12
☑ *P. subcapitata*	2.17.12
☐ Artemia Lot #	

Artemia Batch:
0 hr:
24 hr:
48 hr:
72 hr:

Feeding: √ as needed
☐ Before test
☐ 24 hr
☑ 48 hr
☐ 72 hr

all species 2 hrs prior to test
mysids daily
all species except *H. azteca* 2 hr prior to renewal
H. azteca 0 hr and 48 hr

Concentrations prepared by: BA
Test Incubated in: Incubator # 2 Waterbath # ____
Light Intensity: 50-100 Ft. candles
Photoperiod: 16 hours Light / 8 hours dark

Temperature Range °C:(if used)
Incubator # 2 min 25.2 max 26.7 mean —
Waterbath # ___ min. ___ max. ___ mean ___
Room B246 min 24.5 max 25.2 mean —

Chamber size: 30 mL
Test volume: 20 mL per replicate

Concentration µg/L mg/L (circle)	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	A	—	5	5	5	5	5	5
	B	-	5	5	5	5	5	5
	C	-	5	5	5	5	5	5
	D	-	5	5	5	5	5	5
1.5	A	-	5	5	5	5	5	5
	B	-	5	5	5	5	5	5
	C	-	5	5	5	5	5	5
	D	-	5	5	5	5	5	5
2.0	A	-	5	5	4^{1D}	4	4	4
	B	-	5	5	4^{1D}	4	3^{1D}	3
	C	-	5	4^{1D}	4	4	4	4
	D	-	5	4^{1D}	4	4	4	4
2.5	A	-	5	5	0^{5D}	—	—	—
	B	-	5	5	1^{4D}	1	1	1
	C	-	5	5	0^{5D}	—	—	—
	D	-	5	5	0^{5D}	-	-	-
3.0	A	-	5	0^{5D}	-	-	—	
	B	-	5	1^{4D}	0^{1D}	-	—	
	C	-	5	2^{3D}	0^{2D}	-	—	
	D	-	5	3^{2D}	0^{3D}	-	—	
4.0	A	-	5	0^{5D}	-	-	—	
	B	-	5	0^{5D}	-	-	—	
	C	-	5	0^{5D}	-	-	—	
	D	-	5	0^{5D}	-	-	—	
Organisms loaded by: BA		Checked by:	AP	BA	BA	BA	BA	BA
Loading Verified by: JD								

AR = after renewal
m = missing d = dead BR = before renewal hr = hour

H. azteca		
0 hr	Alk	Hrd
Well		
100%		
96 hr	Alk	Hrd
Well		
100%		

Comments:

Investigators' Signatures
Brian Fleeter
Patricia Pennington
Maybell Faircloth
James Daniel

Reviewer: Liz Miller

Method: TSK

Statistics: LC50	95% confidence intervals Lower	Upper
48 hour: —	—	—
96 hour: 2.12	2.01	2.24

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Revised 7/15/2008 mf

Appendix C. (continued)

FDEP Biology Laboratory - Acute SRT Bench Sheet
0-96 hour parameters

Methods from EPA-821-R-02-012 except *H. azteca*

Test Page 2 of 2

Test Organism: (check one)
- ☐ *Americamysis bahia* Method 2007.0 TA07.03
- ☐ *Menidia Beryllina* Method 2006.0 TA07.04
- ☐ *Hyalella azteca* Method 100.1 EPA-600-R-99-064
- ☑ *Ceriodaphnia dubia* Method 2002.0 TA07.01
- ☐ *Cyprinella leedsi* Method 2000.0 TA07.02
- ☐ *Pimephales promelas* Method 2000.0 TA07.02

Test Beginning: Date: 4.3.12 Time: 10:30
Test Ending: Date: 4.7.12 Time: 11:30

Test Type: ☐ non-renewal ☑ renewal

hr = hour

AR = after renewal BR = before renewal

Concentration µg/L mg/L g/L	Replicate	Test Hour	pH (SU)	Temperature (° C)	Dissolved Oxygen (mg/L)	Conductivity ☑ µmhos ☐ mmhos	Salinity (ppth)
Control	M	0 hr	7.7	24.0	6.5	308	
	—	24 hr	—	—	—	—	
	A	48 hr BR	7.4	~~25~~ 25.4 BR	7.8	~~302~~ 348	BA
	M	48 hr AR	7.6	25.0	7.5	302	
	—	72 hr	—	—	—	—	
	A	96 hr	7.4	24.9	7.3	329	
1.5	M	0 hr	7.7	24.7	6.7	3140	
	—	24 hr	—	—	—	—	
	A	48 hr BR	7.5	24.6	7.5	3330	
	M	48 hr AR	7.7	24.9	6.7	3250	
	—	72 hr	—	—	—	—	
	A	96 hr	7.4	24.4	7.5	3260	
2.0	M	0 hr	7.7	25.1	6.6	4160	
	—	24 hr	—	—	—	—	
	A	48 hr BR	7.5	24.4	7.4	4390	
	M	48 hr AR	7.7	24.8	7.1	4250	
	—	72 hr	—	—	—	—	
	A	96 hr	7.4	24.2	7.7	4300	
2.5	M	0 hr	7.7	25.1	6.6	5060	
	—	24 hr	—	—	—	—	
	A	48 hr BR	7.6	24.3	7.4	5350	
	AM	48 hr AR	7.8	24.8	7.2	5080	
	—	72 hr	—	—	—	—	
	B	96 hr	7.5	24.1	7.7	5020	
3.0	M	0 hr	7.8	25.1	6.7	5930	
	—	24 hr	—	—	—	—	
	A	48 hr BR	7.6	24.3	7.5	6160	
		48 hr AR					
		72 hr					
		96 hr					
4.0	M	0 hr	7.8	25.3	6.8	7770	
	A	24 hr	7.5	25.1	7.0	7810	
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

Investigators Signatures
Bruce Alexander
Adrienne Pennington
Marshall Faulk
James Daniel

Reviewed By: Steve Ferry

Measured by:
0 hr: BA
24 hr: BA
48 hr BR: BA
48 hr AR: BA
72 hr: —
96 hr: BA

Measure/record salinity for marine tests

Comments:

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Revised 07/15/2008 MF

Appendix C. (continued)

FDEP Biology Laboratory - Acute SRT Bench Sheet

Method from EPA-821-R-02-012 except *H. azteca*

Test Organism: (check one)
☐ *Americamysis bahia* Method 2007.0 TA07.03
☐ *Menidia Beryllina* Method 2006.0 TA07.04
☐ *Hyalella azteca* Method 100.1 EPA-600-R-99-064
☐ *Ceriodaphnia dubia* Method 2002.0 TA07.01
☐ *Cyprinella leedsi* Method 2000.0 TA07.02
☒ *Pimephales promelas* Method 2000.0 TA07.02

Test Type: ☐ non-renewal ☒ renewal

Test Page 1 of 2

Diluent/ Batch #: MHW 1 3.19.12
Toxicant/ Batch#: NaCl 1 4.2.12
Organism Batch: 4.3.12
Age: 8 days
Test Beginning: Date: 4.3.12 Time: 14:00
Test Ending: Date: 4.7.12 Time: 12:00

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	JD
Alkalinity (mg/L as $CaCO_3$):	73	TA06_08	AP
Hardness (mg L as $CaCO_3$):	95	TA06_09	AP
Total Ammonia (mg/L as N):	<0.017	TA06_17	MF
Conductivity: µmhos (mmhos)	0.340	TA06_25	BA
Salinity (ppth):	—	TA06_25	—

Food:	Batch
☐ YCT	
☐ *P. subcapitata*	
☒ Artemia Lot # 23613	

Artemia Batch:
0 hr: 4.5-12
24 hr:
48 hr: 4.6-12
72 hr:

Chamber size: 1000 mL
Test volume: 400 mL per replicate

Concentrations prepared by: BA
Temperature Range °C: (if used)
Test Incubated in: Incubator # 3 Waterbath # ___
Incubator # 3 min 24.5 max 26.1 mean —
Light Intensity: 50-100 Ft. candles
Waterbath # ___ min. ___ max. ___ mean ___
Photoperiod: 16 hours Light / 8 hours dark
Room B246 min. 24.5 max 25.2 mean —

Feeding: √ as needed

☒	Before test
☐	24 hr
☒	48 hr
☐	72 hr

all species 2 hrs prior to test
mysids daily
all species except *H. azteca* 2 hr prior to renewal
H. azteca 0 hr and 48 hr

Concentration µg/L mg/L (ppt)	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	A	E1	10	10	10	10	10	10
	B	E2	10	10	10	10	10	10
5	A	E3	10	10	10	10	10	10
	B	E4	10	10	10	10	10	10
6	A	E5	10	10	9 1D	9	9	9
	B	E6	10	10	10	10	10	10
		~~E7~~						
7	A	E7	10	10	10	10	9 1D	9
	B	E8	10	10	9 1D	9	9	9
8	A	E9	10	10	10	10	9 1D	9
	B	E10	10	10	~~1D~~ 8 2D	8	8	8
10	A	E11	10	2 8D	~~2D~~ 0 2D			
	B	E12	10	0 10D	~~0 10D~~ AP			
				~~AP~~				
Organisms loaded by: BA		Checked by: JS		AP	JS	JD	AP	BA
Loading Verified by: JS		AR = after renewal						

m = missing d = dead BR = before renewal hr = hour

H. azteca		
0 hr	Alk	Hrd
Well		
100%		
96 hr	Alk	Hrd
Well		
100%		

Investigators' Signatures
Reviewer:

Comments:

Method: TSK

Statistics: LC50	95% confidence intervals Lower	Upper
48 hour: —	—	—
96 hour: 8.51	8.19	8.84

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Revised 7/15/2008 mf

Appendix C.
(continued)

FDEP Biology Laboratory - Acute SRT Bench Sheet
0-96 hour parameters
Methods from EPA-821-R-02-012 except *H. azteca*
Test Page 2 of 2

Test Organism: (check one)
- ☐ *Americamysis bahia* Method 2007.0 TA07.03
- ☐ *Menidia Beryllina* Method 2006.0 TA07.04
- ☐ *Hyalella azteca* Method 100.1 EPA-600-R-99-064
- ☐ *Ceriodaphnia dubia* Method 2002.0 TA07.01
- ☐ *Cyprinella leedsi* Method 2000.0 TA07.02
- ☑ *Pimephales promelas* Method 2000.0 TA07.02

Test Beginning: Date: 4.3.12 Time: 14:00
Test Ending: Date: 4.7.12 Time: 12:00
Test Type: ☐ non-renewal ☒ renewal

hr = hour AR = after renewal BR = before renewal

Concentration µg/L mg/L (g/L)	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☑ mmhos	Salinity (ppth)
Control	A	0 hr	7.6	24.7	6.9	0.340	
	B	24 hr	7.6	25.5	7.8	0.353	
	A	48 hr BR	7.8	25.5	8.0	0.350	
	A	48 hr AR	7.8	24.1	7.4	0.352	
	B	72 hr	7.6	25.3	7.0	0.364	
	A	96 hr	7.9	25.4	6.6	0.362	
5	A	0 hr	7.7	24.9	7.1	9.9	
	B	24 hr	7.7	25.6	7.7	10.1	
	A	48 hr BR	7.9	25.6	7.2	9.8	
	A	48 hr AR	7.8	24.3	7.2	9.8	
	B	72 hr	7.7	25.6	6.5	10.1	
	A	96 hr	8.0	25.5	6.8	10.2	
6	A	0 hr	7.7	24.8	7.1	11.9	
	B	24 hr	7.7	25.5	7.5	11.8	
	A	48 hr BR	7.9	25.7	7.6	11.8	
	A	48 hr AR	7.9	24.4	7.3	11.6	
	B	72 hr	7.7	25.6	6.5	12.0	
	A	96 hr	8.0	25.3	6.8	12.0	
7	A	0 hr	7.7	24.7	7.0	13.6	
	B	24 hr	7.8	25.5	7.4	13.3	
	A	48 hr BR	8.0	25.6	7.9	13.4	
	A	48 hr AR	7.9	24.4	7.4	13.2	
	B	72 hr	7.7	24.8	6.6	13.5	
	A	96 hr	8.0	25.1	6.7	13.6	
8	A	0 hr	7.7	24.8	7.0	14.7	
	B	24 hr	7.7	25.2	7.4	14.9	
	A	48 hr BR	8.0	25.6	8.1	14.9	
	A	48 hr AR	7.9	24.5	7.5	14.7	
	B	72 hr	7.8	24.9	6.8	14.9	
	A	96 hr	7.9	26.0	6.5	15.3 BA	
10	A	0 hr	7.8	24.8	6.9	18.1	
	B	24 hr	7.7	25.1	7.2	18.3	
	A	48 hr BR	8.0	25.6	8.2	18.3	
		48 hr AR					
		72 hr					
		96 hr					

Investigators Signatures
Brian Fluth
Hans Wells
Patricia Pennington
James Daniels
Marshall Faircloth
Reviewed By: Lizy Mellen

Measured by:
0 hr: BA/AP
24 hr: HW/AP
48 hr BR: JD
48 hr AR: JD
72 hr: AP
96 hr: BA

Measure/record salinity for marine tests

Comments:

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Revised 07/15/2008 MF

Appendix C. (continued)

***Cyprinella leedsi* Acute Standard Reference Toxicant Test**

DATE: 4-3-12 DURATION: 96 h TOXICANT : NaCl
SPECIES: *Ceriodaphnia dubia*

RAW DATA: Concentration (g/L)	Number Exposed	Mortalities
.00	20	0
1.50	20	0
2.00	20	5
2.50	20	19
3.00	20	20
4.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: LC50: 2.12
95% LOWER CONFIDENCE: 2.01
95% UPPER CONFIDENCE: 2.24

***Pimephales promelas* Acute Standard Reference Toxicant Test**

DATE: 4-3-12 DURATION: 96 h TOXICANT : NaCl
SPECIES: *Pimephales promelas*

RAW DATA: Concentration (g/L)	Number Exposed	Mortalities
.00	20	0
5.00	20	0
6.00	20	1
7.00	20	2
8.00	20	3
10.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: LC50: 8.51
95% LOWER CONFIDENCE: 8.19
95% UPPER CONFIDENCE: 8.84

Appendix D. Test Organism Receipts

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Shipping Date: ~~3~~ 4/2/12

Ship to: FDEP

P.O. No: _____

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia	~~150 ac~~	~~4DAYS~~	~~MS120329~~	25	~~7.9~~	~~20~~
Menidia beryllina	~~150 ac~~	~~12DAYS~~	~~SS120321~~	~~25~~	~~7.9~~	~~20~~
						Hardness mg/L
Cyprinella leedsi	150 ac	7DAYS	CL120326	25	7.8	60
Pimephales promelas	150 ac	7DAYS	FM120326	25	7.8	90
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

Packed by: PM

Shipped Via: Fed Ex

Notes: _____

Thank you for your order.

4569 Samuel Street · Sarasota, FL 34233 · Tel: 941-925-3594 · Fax: 941-922-3874 · Web: www.biologylab.com

Appendix D. (continued)

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Shipping Date: 4/23/12

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	250	<24HRS	FM120422-1640	25	7.8	80
	50 ac	7DAYS	FM120416	25	7.8	80
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

Packed by: PM

Shipped Via: Fed Ex

Notes: _____

Thank you for your order.

4569 Samuel Street · Sarasota, FL 34233 · Tel: 941-925-3594 · Fax: 941-922-3874 · Web: www.biologylab.com

Appendix E. Chemical Analyses performed on the effluent from the City of Largo AWWTF Outfall D-001, sampled on April 23, 2012.

Date Sampled	Field ID	Analysis Group	Component	Result	Remark	Units	MDL	PQL
4/23/2012 10:00	EFD-01 (39797)	AGP/LN	Algal Growth Potential	8.61	A	mg DryWt/L	0.3	0.9
4/23/2012 10:00	EFD-01 (39797)	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.4	U	ug/L	0.4	1.2
4/23/2012 10:00	EFD-01 (39797)	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day	1.1	I	mg/L	0.2	2
4/23/2012 10:00	EFD-01 (39797)	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	0.55	U	ug/L	0.55	1.7
4/23/2012 10:00	EFD-01 (39797)	Overflow	Fecal Coliforms-Membrane Filter	2	U	cfu/100 mL	2	2
4/23/2012 10:00	EFD-01 (39797)	Toxicology	Bioassay-Acute-Screen-FW-Fish, LC50	100	L	LC50		
4/23/2012 10:00	EFD-01 (39797)	Toxicology	Bioassay-Acute-Screen-FW-C.dubia, LC50	100	L	LC50		
4/23/2012 10:00	EFD-01 (39797)	Metals	Sodium	95.9		mg/L	0.5	2
4/23/2012 10:00	EFD-01 (39797)	Metals	Zinc	45.3		ug/L	5	20
4/23/2012 10:00	EFD-01 (39797)	Metals	Aluminum	18	I	ug/L	5	20
4/23/2012 10:00	EFD-01 (39797)	Metals	Magnesium	23.5		mg/L	0.04	0.16
4/23/2012 10:00	EFD-01 (39797)	Metals	Cadmium	0.57		ug/L	0.05	0.2
4/23/2012 10:00	EFD-01 (39797)	Metals	Iron	45.9	I	ug/L	30	120
4/23/2012 10:00	EFD-01 (39797)	Metals	Copper	1.87		ug/L	0.5	1
4/23/2012 10:00	EFD-01 (39797)	Metals	Chromium	0.37	I	ug/L	0.3	1.2
4/23/2012 10:00	EFD-01 (39797)	Metals	Arsenic	0.36	I	ug/L	0.25	1
4/23/2012 10:00	EFD-01 (39797)	Metals	Lead	0.2	U	ug/L	0.2	0.8
4/23/2012 10:00	EFD-01 (39797)	Metals	Nickel	5.66		ug/L	0.25	1
4/23/2012 10:00	EFD-01 (39797)	Metals	Selenium	0.2	U	ug/L	0.2	0.8
4/23/2012 10:00	EFD-01 (39797)	Metals	Silver	0.025	U	ug/L	0.025	0.1
4/23/2012 10:00	EFD-01 (39797)	Metals	Calcium	86.1		mg/L	0.075	0.3
4/23/2012 10:00	EFD-01 (39797)	Nutrients	TSS	2	I	mg/L	2	10
4/23/2012 10:00	EFD-01 (39797)	Nutrients	Organic Carbon	9.4		mg C/L	1	5
4/23/2012 10:00	EFD-01 (39797)	Nutrients	Ammonia-N	0.037		mg N/L	0.01	0.02
4/23/2012 10:00	EFD-01 (39797)	Nutrients	Chloride	150		mg Cl/L	2	5
4/23/2012 10:00	EFD-01 (39797)	Nutrients	Sulfate	47		mg SO4/L	2	5
4/23/2012 10:00	EFD-01 (39797)	Nutrients	Fluoride	0.28		mg F/L	0.035	0.1
4/23/2012 10:00	EFD-01 (39797)	Nutrients	NO2NO3-N	1.7		mg N/L	0.02	0.05
4/23/2012 10:00	EFD-01 (39797)	Nutrients	Total-P	0.088		mg P/L	0.004	0.01
4/23/2012 10:00	EFD-01 (39797)	Nutrients	O-Phosphate-P	0.04		mg P/L	0.004	0.01
4/23/2012 10:00	EFD-01 (39797)	Nutrients	Alkalinity	262		mg CaCO3/L	0.65	2.5

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Component	Result	Remark	Units	MDL	PQL
4/23/2012 10:00	EFD-01 (39797)	Nutrients	Color (true)	11		PCU	2.5	6
4/23/2012 10:00	EFD-01 (39797)	Nutrients	Kjeldahl Nitrogen	1		mg N/L	0.08	0.2
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Ethoprop	0.1	U	ug/L	0.1	0.4
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Simazine	0.05	U	ug/L	0.05	0.2
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Parathion Ethyl	0.15	U	ug/L	0.15	0.6
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Malathion	0.15	U	ug/L	0.15	0.6
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Metalaxyl	0.25	U	ug/L	0.25	1
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Butylate	0.2	U	ug/L	0.2	0.8
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Prometryn	0.15	U	ug/L	0.15	0.6
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Parathion Methyl	0.1	U	ug/L	0.1	0.4
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Naled	0.8	U	ug/L	0.8	3.2
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Mevinphos	0.2	U	ug/L	0.2	0.8
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Fonofos	0.1	U	ug/L	0.1	0.4
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Norflurazon	0.15	U	ug/L	0.15	0.6
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Metolachlor	0.5	U	ug/L	0.5	2
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Hexazinone	0.1	U	ug/L	0.1	0.4
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Fenamiphos	0.2	U	ug/L	0.2	0.8
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Ethion	0.05	U	ug/L	0.05	0.2
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Diazinon	0.05	U	ug/L	0.05	0.2
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Chlorpyrifos Ethyl	0.05	U	ug/L	0.05	0.2
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Atrazine	0.073	I	ug/L	0.05	0.2
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Phorate	0.05	U	ug/L	0.05	0.2
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Metribuzin	0.1	U	ug/L	0.1	0.4
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Chlorpyrifos Methyl	0.1	U	ug/L	0.1	0.4
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Bromacil	0.2	U	ug/L	0.2	0.8
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Ametryn	0.05	U	ug/L	0.05	0.2
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Alachlor	0.6	U	ug/L	0.6	2.4
4/23/2012 10:00	EFD-01 (39797)	Pesticides	Azinphos Methyl	0.2	U	ug/L	0.2	0.8
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.99	U	ug/L	0.99	4
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	2,4-Dichlorophenol	0.99	U	ug/L	0.99	4
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Benzo(a)anthracene	0.2	U	ug/L	0.2	0.79
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.2	U	ug/L	0.2	0.79
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Di-n-octyl phthalate	0.99	U	ug/L	0.99	4
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.2	U	ug/L	0.2	0.79

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Component	Result	Remark	Units	MDL	PQL
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	2,4-Dimethylphenol	9.9	U	ug/L	9.9	40
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	2,4-Dinitrotoluene	0.99	U	ug/L	0.99	4
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Benzidine	99	U	ug/L	99	400
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Benzo(k)fluoranthene	0.2	U	ug/L	0.2	0.79
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.99	U	ug/L	0.99	4
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Chrysene	0.2	U	ug/L	0.2	0.79
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Dimethyl phthalate	9.9	U	ug/L	9.9	40
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Isophorone	0.99	U	ug/L	0.99	4
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3	U	ug/L	3	12
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3	U	ug/L	3	12
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Benzo(a)pyrene	0.2	U	ug/L	0.2	0.79
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Butyl benzyl phthalate	5	U	ug/L	5	20
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.2	U	ug/L	0.2	0.79
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Hexachlorobenzene	0.99	U	ug/L	0.99	4
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	N-Nitrosodimethylamine	2	U	ug/L	2	7.9
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	2-Chloronaphthalene	0.99	U	ug/L	0.99	4
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.99	U	ug/L	0.99	4
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.99	U	ug/L	0.99	4
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3	U	ug/L	3	12
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Di-n-butyl phthalate	5	U	ug/L	5	20
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Fluoranthene	0.2	U	ug/L	0.2	0.79
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Hexachlorocyclopentadiene	3	U	ug/L	3	12
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Phenol	0.99	U	ug/L	0.99	4
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	2,6-Dinitrotoluene	0.99	U	ug/L	0.99	4
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Hexachlorobutadiene	3	U	ug/L	3	12
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	2,4-Dinitrophenol	15	U	ug/L	15	59
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	2-Nitrophenol	0.99	U	ug/L	0.99	4
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	3,3'-Dichlorobenzidine	40	U	ug/L	40	160
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.99	U	ug/L	0.99	4
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2	U	ug/L	2	7.9
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L	15	59
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Anthracene	0.2	U	ug/L	0.2	0.79
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2	U	ug/L	2	7.9
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Nitrobenzene	2	U	ug/L	2	7.9

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Component	Result	Remark	Units	MDL	PQL
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Acenaphthene	0.2	U	ug/L	0.2	0.79
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Benzo(b)fluoranthene	0.2	U	ug/L	0.2	0.79
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	15	U	ug/L	15	59
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Fluorene	0.2	U	ug/L	0.2	0.79
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Naphthalene	0.2	U	ug/L	0.2	0.79
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Pentachlorophenol	3	U	ug/L	3	12
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Dibromochloromethane	10		ug/L	0.2	1
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.99	U	ug/L	0.99	4
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	2-Chlorophenol	0.99	U	ug/L	0.99	4
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Acenaphthylene	0.2	U	ug/L	0.2	0.79
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Diethyl phthalate	0.99	U	ug/L	0.99	4
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Hexachloroethane	3	U	ug/L	3	12
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Phenanthrene	0.2	U	ug/L	0.2	0.79
4/23/2012 10:00	EFD-01 (39797)	Priority Organic Pollutants	Pyrene	0.2	U	ug/L	0.2	0.79
4/23/2012 10:00	EFD-01 (39797)	Field Parameter	Temperature	26.15		C		
4/23/2012 10:00	EFD-01 (39797)	Field Parameter	pH	7.26				
4/23/2012 10:00	EFD-01 (39797)	Field Parameter	Dissolved Oxygen	7.55		mg/L		
4/23/2012 10:00	EFD-01 (39797)	Field Parameter	Sample Depth	0.2		m		
4/23/2012 10:00	EFD-01 (39797)	Field Parameter	Specific Conductance	1005		umhos/cm		
4/23/2012 10:45	EFB-01 (39798)	Nutrients	TSS	2	U	mg/L	2	10
4/23/2012 10:50	39799	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day	0.2	U	mg/L	0.2	2
4/23/2012 10:50	39799	Metals	Chromium	0.3	U	ug/L	0.3	1.2
4/23/2012 10:50	39799	Metals	Copper	0.5	U	ug/L	0.5	1
4/23/2012 10:50	39799	Metals	Lead	0.2	U	ug/L	0.2	0.8
4/23/2012 10:50	39799	Metals	Nickel	0.25	U	ug/L	0.25	1
4/23/2012 10:50	39799	Metals	Zinc	5	U	ug/L	5	20
4/23/2012 10:50	39799	Metals	Cadmium	0.05	U	ug/L	0.05	0.2
4/23/2012 10:50	39799	Metals	Magnesium	0.04	U	mg/L	0.04	0.16
4/23/2012 10:50	39799	Metals	Arsenic	0.25	U	ug/L	0.25	1
4/23/2012 10:50	39799	Metals	Aluminum	5	U	ug/L	5	20
4/23/2012 10:50	39799	Metals	Sodium	0.5	U	mg/L	0.5	2
4/23/2012 10:50	39799	Metals	Iron	30	U	ug/L	30	120

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Component	Result	Remark	Units	MDL	PQL
4/23/2012 10:50	39799	Metals	Calcium	0.075	U	mg/L	0.075	0.3
4/23/2012 10:50	39799	Metals	Silver	0.025	U	ug/L	0.025	0.1
4/23/2012 10:50	39799	Metals	Selenium	0.2	U	ug/L	0.2	0.8
4/23/2012 10:50	39799	Nutrients	Chloride	0.2	U	mg Cl/L	0.2	0.5
4/23/2012 10:50	39799	Nutrients	Color (true)	2.5	U	PCU	2.5	6
4/23/2012 10:50	39799	Nutrients	Organic Carbon	1	U	mg C/L	1	5
4/23/2012 10:50	39799	Nutrients	Total-P	0.004	U	mg P/L	0.004	0.01
4/23/2012 10:50	39799	Nutrients	Alkalinity	0.65	U	mg CaCO3/L	0.65	2.5
4/23/2012 10:50	39799	Nutrients	Kjeldahl Nitrogen	0.08	U	mg N/L	0.08	0.2
4/23/2012 10:50	39799	Nutrients	Fluoride	0.035	U	mg F/L	0.035	0.1
4/23/2012 10:50	39799	Nutrients	Sulfate	0.2	U	mg SO4/L	0.2	0.5
4/23/2012 10:50	39799	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
4/23/2012 10:50	39799	Nutrients	O-Phosphate-P	0.004	U	mg P/L	0.004	0.01
4/23/2012 10:50	39799	Nutrients	NO2NO3-N	0.004	U	mg N/L	0.004	0.01
4/23/2012 10:50	39799	Pesticides	Ethion	0.048	U	ug/L	0.048	0.19
4/23/2012 10:50	39799	Pesticides	Chlorpyrifos Ethyl	0.048	U	ug/L	0.048	0.19
4/23/2012 10:50	39799	Pesticides	Ametryn	0.048	U	ug/L	0.048	0.19
4/23/2012 10:50	39799	Pesticides	Norflurazon	0.14	U	ug/L	0.14	0.58
4/23/2012 10:50	39799	Pesticides	Metribuzin	0.096	U	ug/L	0.096	0.39
4/23/2012 10:50	39799	Pesticides	Fenamiphos	0.19	U	ug/L	0.19	0.77
4/23/2012 10:50	39799	Pesticides	Chlorpyrifos Methyl	0.096	U	ug/L	0.096	0.39
4/23/2012 10:50	39799	Pesticides	Parathion Ethyl	0.14	U	ug/L	0.14	0.58
4/23/2012 10:50	39799	Pesticides	Ethoprop	0.096	U	ug/L	0.096	0.39
4/23/2012 10:50	39799	Pesticides	Simazine	0.048	U	ug/L	0.048	0.19
4/23/2012 10:50	39799	Pesticides	Azinphos Methyl	0.19	U	ug/L	0.19	0.77
4/23/2012 10:50	39799	Pesticides	Naled	0.77	U	ug/L	0.77	3.1
4/23/2012 10:50	39799	Pesticides	Bromacil	0.19	U	ug/L	0.19	0.77
4/23/2012 10:50	39799	Pesticides	Atrazine	0.048	U	ug/L	0.048	0.19
4/23/2012 10:50	39799	Pesticides	Prometryn	0.14	U	ug/L	0.14	0.58
4/23/2012 10:50	39799	Pesticides	Parathion Methyl	0.096	U	ug/L	0.096	0.39
4/23/2012 10:50	39799	Pesticides	Mevinphos	0.19	U	ug/L	0.19	0.77
4/23/2012 10:50	39799	Pesticides	Metalaxyl	0.24	U	ug/L	0.24	0.96
4/23/2012 10:50	39799	Pesticides	Malathion	0.14	U	ug/L	0.14	0.58
4/23/2012 10:50	39799	Pesticides	Fonofos	0.096	U	ug/L	0.096	0.39

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Component	Result	Remark	Units	MDL	PQL
4/23/2012 10:50	39799	Pesticides	Alachlor	0.58	U	ug/L	0.58	2.3
4/23/2012 10:50	39799	Pesticides	Phorate	0.048	U	ug/L	0.048	0.19
4/23/2012 10:50	39799	Pesticides	Metolachlor	0.48	U	ug/L	0.48	1.9
4/23/2012 10:50	39799	Pesticides	Diazinon	0.048	U	ug/L	0.048	0.19
4/23/2012 10:50	39799	Pesticides	Butylate	0.19	U	ug/L	0.19	0.77
4/23/2012 10:50	39799	Pesticides	Hexazinone	0.096	U	ug/L	0.096	0.39
4/23/2012 10:50	39799	Priority Organic Pollutants	2,4-Dinitrotoluene	0.98	U	ug/L	0.98	3.9
4/23/2012 10:50	39799	Priority Organic Pollutants	Benzidine	98	U	ug/L	98	390
4/23/2012 10:50	39799	Priority Organic Pollutants	Benzo(a)anthracene	0.2	U	ug/L	0.2	0.78
4/23/2012 10:50	39799	Priority Organic Pollutants	Benzo(a)pyrene	0.2	U	ug/L	0.2	0.78
4/23/2012 10:50	39799	Priority Organic Pollutants	Hexachlorobenzene	0.98	U	ug/L	0.98	3.9
4/23/2012 10:50	39799	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.2	U	ug/L	0.2	0.78
4/23/2012 10:50	39799	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.98	U	ug/L	0.98	3.9
4/23/2012 10:50	39799	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L	15	59
4/23/2012 10:50	39799	Priority Organic Pollutants	Acenaphthylene	0.2	U	ug/L	0.2	0.78
4/23/2012 10:50	39799	Priority Organic Pollutants	Fluorene	0.2	U	ug/L	0.2	0.78
4/23/2012 10:50	39799	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	U	ug/L	2.9	12
4/23/2012 10:50	39799	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L	2.9	12
4/23/2012 10:50	39799	Priority Organic Pollutants	Pyrene	0.2	U	ug/L	0.2	0.78
4/23/2012 10:50	39799	Priority Organic Pollutants	2-Chlorophenol	0.98	U	ug/L	0.98	3.9
4/23/2012 10:50	39799	Priority Organic Pollutants	Anthracene	0.2	U	ug/L	0.2	0.78
4/23/2012 10:50	39799	Priority Organic Pollutants	Diethyl phthalate	0.98	U	ug/L	0.98	3.9
4/23/2012 10:50	39799	Priority Organic Pollutants	Dibromochloromethane	0.2	U	ug/L	0.2	1
4/23/2012 10:50	39799	Priority Organic Pollutants	2,4-Dinitrophenol	15	U	ug/L	15	59
4/23/2012 10:50	39799	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.98	U	ug/L	0.98	3.9
4/23/2012 10:50	39799	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.98	U	ug/L	0.98	3.9
4/23/2012 10:50	39799	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2	U	ug/L	2	7.8
4/23/2012 10:50	39799	Priority Organic Pollutants	Acenaphthene	0.2	U	ug/L	0.2	0.78
4/23/2012 10:50	39799	Priority Organic Pollutants	Benzo(b)fluoranthene	0.2	U	ug/L	0.2	0.78
4/23/2012 10:50	39799	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.2	U	ug/L	0.2	0.78
4/23/2012 10:50	39799	Priority Organic Pollutants	Nitrobenzene	2	U	ug/L	2	7.8
4/23/2012 10:50	39799	Priority Organic Pollutants	2-Chloronaphthalene	0.98	U	ug/L	0.98	3.9
4/23/2012 10:50	39799	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L	2.9	12
4/23/2012 10:50	39799	Priority Organic Pollutants	3,3'-Dichlorobenzidine	39	U	ug/L	39	160

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Component	Result	Remark	Units	MDL	PQL
4/23/2012 10:50	39799	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.98	U	ug/L	0.98	3.9
4/23/2012 10:50	39799	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	15	U	ug/L	15	59
4/23/2012 10:50	39799	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L	2.9	12
4/23/2012 10:50	39799	Priority Organic Pollutants	Phenanthrene	0.2	U	ug/L	0.2	0.78
4/23/2012 10:50	39799	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.2	U	ug/L	0.2	0.78
4/23/2012 10:50	39799	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L	2.9	12
4/23/2012 10:50	39799	Priority Organic Pollutants	Butyl benzyl phthalate	4.9	U	ug/L	4.9	20
4/23/2012 10:50	39799	Priority Organic Pollutants	Di-n-butyl phthalate	4.9	U	ug/L	4.9	20
4/23/2012 10:50	39799	Priority Organic Pollutants	Di-n-octyl phthalate	0.98	U	ug/L	0.98	3.9
4/23/2012 10:50	39799	Priority Organic Pollutants	Isophorone	0.98	U	ug/L	0.98	3.9
4/23/2012 10:50	39799	Priority Organic Pollutants	Chrysene	0.2	U	ug/L	0.2	0.78
4/23/2012 10:50	39799	Priority Organic Pollutants	Dimethyl phthalate	9.8	U	ug/L	9.8	39
4/23/2012 10:50	39799	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L	2.9	12
4/23/2012 10:50	39799	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2	U	ug/L	2	7.8
4/23/2012 10:50	39799	Priority Organic Pollutants	N-Nitrosodimethylamine	2	U	ug/L	2	7.8
4/23/2012 10:50	39799	Priority Organic Pollutants	Naphthalene	0.2	U	ug/L	0.2	0.78
4/23/2012 10:50	39799	Priority Organic Pollutants	Phenol	0.98	U	ug/L	0.98	3.9
4/23/2012 10:50	39799	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.98	U	ug/L	0.98	3.9
4/23/2012 10:50	39799	Priority Organic Pollutants	2,4-Dichlorophenol	0.98	U	ug/L	0.98	3.9
4/23/2012 10:50	39799	Priority Organic Pollutants	2,4-Dimethylphenol	9.8	U	ug/L	9.8	39
4/23/2012 10:50	39799	Priority Organic Pollutants	2,6-Dinitrotoluene	0.98	U	ug/L	0.98	3.9
4/23/2012 10:50	39799	Priority Organic Pollutants	2-Nitrophenol	0.98	U	ug/L	0.98	3.9
4/23/2012 10:50	39799	Priority Organic Pollutants	Benzo(k)fluoranthene	0.2	U	ug/L	0.2	0.78
4/23/2012 10:50	39799	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.98	U	ug/L	0.98	3.9
4/23/2012 10:50	39799	Priority Organic Pollutants	Fluoranthene	0.2	U	ug/L	0.2	0.78
4/23/2012 10:50	39799	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9	U	ug/L	2.9	12
4/23/2012 10:00	TRIP BLANK	Priority Organic Pollutants	Dibromochloromethane	0.2	U	ug/L	0.2	1

Appendix F. Facility Summary, Effluent Limits, and Permit Violations Recorded on Discharge Monitoring Report

State of Florida
Department of Environmental Protection
Facility Introduction & Summary

PART I: Information gathered prior to sampling event	
Prepared By: Peter Wenner	**Contact Number:** 813-632-7600 x442
Facility Name (as it appears on permit): City of Largo AWWTF	**Former Names:** N/A
NPDES Permit Number: FL0026603-004-DW1P/NR	**Permit Expiration Date:** July 26, 2012
Physical Address: 5100 150th Avenue North, Clearwater, FL 33760	
District: Southwest	**County:** Pinellas
Function of Facility: Treatment of Domestic Waste	
Facility Type: Domestic Waste	**Permitted Capacity (MGD):** 15.0 MGD Surface Water, 12.0 Public Access Reuse
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): March 2011-February 2012: 6.1 MGD	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months): March 2011-February 2012: 5.52 MGD	
Description of type of Discharge: ☒ Continuous ☐ Intermittent ☐ Seasonal ☐ Rainfall Dependent ☐ Other, please specify	

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Appendix F. (continued)

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

Monitoring Location Site Number	Description of Monitoring Location
EFA-01	After disinfection
EFB-01	After filtration and prior to disinfection
EFD-01	Prior to discharge to Feather Sound Outfall
FLW-03	Flow to D-001 (FLW-01) - (FLW-02)

Description of Permitted Outfall(s):

DISPOSAL:

Surface Water Discharge: An existing 15.0 MGD annual average daily flow (AADF) permitted discharge to a ditch part of the stormwater system within Feather Sound (Class III fresh waters) which discharges to Old Tamp Discharge Location (D-001) which is approximately at a depth of approximately 2 feet. The point of discharge i approximately at latitude 27 ° 53' 52" N, longitude 82 ° 40' 13" W.

REUSE:

Land Application: An existing 12.0 mgd AADF permitted capacity slow-rate public access (R001) Master Re consisting of the limits of the City of Largo and including the Carillon area within the City of St. Petersburg and three reclaimed water storage tanks (5 mg at Starkey Road, 3 mg at Southwest and 10 mg at the WWTF).

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

TREATMENT FACILITIES:

An existing 18.0 mgd Annual Average Daily Flow (AADF), Type I, advanced wastewater treatment plant utilizing a high-rate three-stage biological nutrient removal process, commonly referred to as the A2O process. The overall plant consists of three automatic bar screens, three grit removal basins, three primary clarifiers of 701,250 gallons total volume, three anaerobic basins of 549,780 gallons total volume, three anoxic basins of 392,700 gallons total volume, three aeration basins of 2,153,300 gallons total volume, six final clarifiers of 2,933,000 gallons total volume and a total surface area of 30,160 square feet, three traveling bridge type, shallow bed sand filters of 5,325 square feet total surface area, nine deep bed denitrification filters of 5,400 square feet total surface area, one post aeration basin of 440,000 gallons total volume, and two chlorine contact chambers of 690,000 gallons total volume. This facility is operated to provide advanced wastewater treatment (AWT) and high-level disinfected reclaimed water to a master reuse system within the City of Largo, the Carillon area and within the City of St. Petersburg, or to discharge effluent through an outfall to the stormwater system within Feather Sound and thence to Tampa Bay.

PART I: Continued

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 an unnamed ditch, part of the stormwater system within Feather Sound (Class III fresh waters) which discharges to Old Tampa 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 (D-001)	MGD	Maximum	15.0	Report	-	-	Continuous	Recording flow meters and totalizers	FLW-03	See Cond.I.A.4
BOD, Carbonaceous 5 day, 20C	MG/L	Maximum	5.0	6.25	7.5	10.0	7 Days/Week	24-hour flow proportioned composite	EFA-01	
Solids, Total Suspended	MG/L	Maximum	5.0	6.25	7.5	10.0	7 Days/Week	24-hour flow proportioned composite	EFA-01	
Nitrogen, Total (as N)	MG/L	Maximum	3.0	3.75	4.5	6.0	7 Days/Week	24-hour flow proportioned composite	EFA-01	
Phosphorus, Total (as P)	MG/L	Maximum	1.0	1.25	1.5	2.0	7 Days/Week	24-hour flow proportioned composite	EFA-01	
Solids, Total Suspended	MG/L	Maximum	-	-	-	5.0	7 Days/Week	Grab	EFB-01	
pH	SU	Range	-	-	-	6.0 to 8.5	Continuous	Meter	EFA-01	See Cond.I.A.3
Coliform, Fecal, % less than detection	PERCENT	Minimum		75			Monthly	Calculation	EFA-01	See Cond.I.A.5
Coliform, Fecal	#/100ML	Maximum				25	7 Days/Week	Grab	EFA-01	See Cond.I.A.5
Oxygen, Dissolved (DO)	MG/L	Minimum	-	-	-	5.0	7 Days/Week	Grab	EFD-01	
Total Residual Chlorine (For Disinfection)	MG/L	Minimum	-	-	-	1.0	Continuous	Meter	EFA-01	See Cond.I.A.3, & 6
Total Residual Chlorine (For Dechlorination)	MG/L	Maximum	-	-	-	0.01	7 Days/Week	Grab	EFD-01	
Cyanide, Total (as CN)	UG/L	Maximum	-	-	-	5.2	Quarterly	Grab	EFD-01	
Dichlorobromomethane	UG/L	Maximum	22.0	-	-	-	Monthly	Grab	EFD-01	
Chronic Whole Effluent Toxicity	PERCENT	Minimum	-	-	-	100	Quarterly	24-hour flow proportioned composite	EFD-01	See Cond. I.A.8

Appendix F. (continued)

PART I: Continued			
Receiving Waters: Feather Sound ditch system	**Classification (indicate whether fresh or marine):** Class III Fresh		
Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.): **Please see attached Word document entitled: *City of Largo AWWTF Toxicity Language***			
Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.): Consent Order OGC File No. 03-0666, effective 04/10/06, addressing sanitary sewer overflows and effluent exceedances of dibromochloromethane. Consent Order remains open.			
Facility Mixing Zone Details (if applicable): NA			
List Permit Violations (DMR data) and plant upsets that occurred at the plant within the last year:			
Date	Parameter and Units	Limit	Result
Please see attached Excel Spreadsheet entitled *Largo DMR Exceedances*			
Describe previous FYI and WQBEL study: Previous FYI Report Attached			
Describe previous or current Enforcement Actions (including WLs): See consent order information, above.			
Describe any violations or problems noted in previous inspection: October 13, 2010: Sampler cabinet not ≤4° C as required; not calibrating portable pH meter; TP maximum, weekly, monthly limits exceeded in Sept. – Dec. 2009; fecal coliform %non-detectable criterion not met in Oct. and Dec. 2009 or March 2010; toxicity test failures in Feb. 2010.			
Discuss whether DMR trends within previous five years are improving or declining: With the exception of TP, effluent parameters are fairly stable. TP is trending downward.			

Appendix F. (continued)

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:	Sampler(s):
Temperature (Deg C):	pH (SU):
Dissolved Oxygen (mg/L):	Conductivity (umhos/cm):
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	

Appendix F. (continued)

Describe any conditions, difficulties or abnormal events that occurred during the sample collection and any other additional comments here:

Appendix G. EPA End Sheet

The Bioassay of City of Largo AWWTF effluent sampled on April 23, 2012. NPDES #FL0026603.

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 FL0026603 11	12 120423	18 B	19 S	20 1

Remarks

66

The Priority Pollutants Analysis of City of Largo AWWTF effluent sampled on April 23, 2012. NPDES #FL0026603.

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 FL0026603 11	12 120423	18 X	19 S	20 1

Remarks

66

Biological Analyses of City of Largo AWWTF effluent sampled on April 23, 2012. NPDES #FL0026603

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 FL0026603 11	12 120423	18 S	19 S	20 1

Remarks

66