

Effluent Quality Assessment

Florida Power and Light Company
Fort Myers Plant

Lee County

NPDES #FL0001490

Sampled July 21, 2008

November 2008

Biology Section
Bureau of Laboratories
Division of Environmental Assessment and Restoration

Quality Manual No. 870346G
NELAC Certification No. E31780

Florida Power and Light Company – Fort Myers Plant, 10650 State Road 80, Fort Myers, Lee County, Florida, 33905. NPDES #FL0001490. Effluent samples for this facility were collected on July 21, 2008.

Introduction

Florida Power and Light Company – Fort Myers Plant is an electric power generating plant. The plant consists of:

- six natural gas combined-cycle combustion turbines with a total generating capacity of 1,550 megawatts (MW);
- associated Heat-Recover Steam Generators and steam turbines;
- twelve gas turbine peaking units with a combined generating capacity of 600 (MW);
- two peaker combustion turbines with a combined generating capacity of 326 (MW);
- a once-through condenser cooling water system;
- a once-through helper cooling tower;
- a stormwater basin;
- an evaporation/percolation pond;
- ground water monitoring wells; and,
- a reverse osmosis plant.

The facility does not have a design flow. The combined discharge (once through cooling water, RO plant discharge, auxiliary equipment cooling water, etc.) from the plant from July 2007 through June 2008 was approximately 670.3 million gallons per day (MGD). Surface water discharge occurs at the end of the 762 M (2,500 feet) long on-site discharge canal at Outfall D-010. The receiving water is the Class III Marine waters of the Orange River (Note: the Orange River is designated as Class III freshwater in the facility's permit; however, watershed biologists classify this portion of the river as tidal marine). The point of discharge is located approximately at latitude 26º 41' 31" N, longitude 81º 46' 41" W. Wastewater treatment at the facility consists of routing equipment-area stormwater and washdown water that have the potential to contain oil and grease through an oil/water separator prior to discharge to the stormwater basin. The contents of the stormwater basin are pumped to the evaporation/percolation basin. Fuel oil storage runoff is administratively controlled by visual inspections prior to discharge to the evaporation/percolation basin. Metal cleaning wastewater is disposed of offsite.

The facility's once-through condenser cooling water system uses water from the Caloosahatchee River as intake water. Cooling water is routed through the plant condensers and is then discharged to the discharge canal. A once-through cooling tower, located adjacent to the discharge canal, is used to reduce the discharge temperature of the cooling water. Boiler blowdown is captured and reused. Reverse osmosis reject is discharged indirectly to the discharge canal via an internal discharge to the cooling tower basin.

The facility has no permitted toxicity test requirements; however, a 48-hour acute screening test can provide 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.) if the mortality in 100% effluent is less than 20%.

The facility has no Administrative Orders, Consent Orders or mixing zones. A review of Discharge Monitoring Report data showed no permit violations for the past year. (Facility information from NPDES permit #FL0001490 and Alyssa Mork FDEP South District.)

Methods

Samples were collected from the EFF-1 NPDES sampling point for Outfall D-010 by Alyssa Mork (FDEP South District) following DEP-SOP-001/01 FS 2400 Wastewater Sampling. All DEP SOPs are available on the web at: http://www.floridadep.org/labs/qa/sops.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.

An aliquot of the AGP sample was salinity adjusted to meet the minimum salinity requirements of the marine test species. Both a freshwater AGP analysis and a marine AGP analysis were performed.

Toxicity Test Results

Tests were performed July 22 - 24, 2008.

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

Cyprinella leedsi 48-hour acute screening bioassay – LC_{50} > 100%, 5% mortality* in 100% sample at 48 hours

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

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.

*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.).

Algal Growth Potential

The effluent Algal Growth Potential (AGP) was 24.9 mg dry wt/L of the unicellular green alga, *Pseudokirchneriella subcapitata*, formerly known as *Selenastrum capricornutum*. Raschke and Shultz (1987) found that AGP values above 5.0 mg dry weight/L represent a "problem" threshold for fresh receiving waters, implying nutrient enrichment. The analytical chemistry suggests that the effluent is nitrogen-limited. The predicted AGP based on the effluent's inorganic nitrogen concentration was 10.3 (±20%) mg dry wt/L (Table 1; Miller et al. 1978).

The salinity-adjusted effluent AGP was 3.0 U (U - Material was analyzed for but not detected; the reported value is the minimum detection limit) mg dry wt/L of the saltwater species, *Dunaliella tertiolecta.* Raschke and Shultz found that AGP values above 10.0 mg dry weight/L represent a "problem" threshold for marine receiving waters, implying nutrient enrichment (personal communication, Marshall Faircloth, et. al. FDEP, with Ron Raschke USEPA Region 4 1987). One potential reason for the lack of growth in the salinity-adjusted sample is precipitation of enough orthophosphate by the added salts that the sample became extremely phosphorus-limited (Manahan 1994).

See Table 1 for AGP results

Chemistry Results

Total residual chlorine (TRC) and total ammonia were not detected in the bioassay sample in the laboratory. TRC was not detected in the effluent in the field. The total ammonia concentration in the sample collected and preserved for chemical analysis was 0.1 mg/L Y (Y – the laboratory analysis was from an unpreserved or improperly preserved sample; the data may not be accurate) mg/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was ≤ 0.02 mg/L.

Aluminum, arsenic, copper, nickel and norflurazon were detected in the effluent at levels that comply with Class III marine water quality criteria (62-302.530, F.A.C.). Bromacil, chromium III and lead were detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL).

The effluent iron (430 µg/L) violated the Class III marine water criterion for iron (≤ 300 µg/L; 62-302.530(39), F.A.C.).

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

Conclusion

The effluent sample collected from the EFF-1 NPDES sampling point for Outfall D-010 for this facility on July 21, 2008, was not acutely toxic to either test species during the 48-hour acute screening bioassays. The effluent AGP result exceeded the "problem" threshold for fresh receiving waters. The AGP in the salinity-adjusted effluent was less than the method detection limit. Effluent iron violated the Class III marine water criterion for iron. The measured constituents of other effluent water quality samples 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.

Manahan, S. E. 1994. Environmental Chemistry, 6th edition. Lewis Publishers, USA. 811 pp

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 1a. Measured and predicted algal growth potential (AGP; mg dry weight/L) for total soluble inorganic nitrogen (TSIN) and total nitrogen (TN) limitation of the freshwater species *Pseudokirchneriella subcapitata,* and ratios of nitrogen to phosphorus for samples collected from the Florida Power and Light Company - Fort Myers Plant on July 21, 2008.

Florida Power and Light Company - Fort Myers Plant					
Sample	AGP (measured)	Predicted AGP (TSIN) ± 20%	Predicted AGP (TN) ± 20%	Inorganic N:P ratio	Total N:P ratio
Efluent	24.9	10.3 ± 2.1	74.9 ± 15.0	1.3	6.6

Table 1b. Measured algal growth potential (AGP; mg dry weight/L) of the saltwater species *Dunaliella tertiolecta* and ratios of nitrogen to phosphorus for samples collected from the Florida Power and Light Company - Fort Myers Plant on July 21, 2008.

Florida Power and Light Company - Fort Myers Plant			
Salinity-adjusted Sample	AGP (measured)	Inorganic N:P ratio	Total N:P ratio
Efluent	3.0 U	1.3	6.6

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

Table 2. Effluent limits, Class III Criteria for predominantly marine waters and chemical and microbiological data for samples collected from the Florida Power and Light Company - Fort Myers Plant on July 21, 2008.

Florida Power and Light Company - Fort Myers Plant NPDES# FL0001490	Class III Criteria	Effluent Limits	Efluent	
Organic Constituents (µg/L)				
Bromacil	-	-	0.59	IJ
Norflurazon	-	-	1.4	
Metals (µg/L unless otherwise noted)				
Aluminum	≤ 1500	-	260	
Arsenic	≤ 50	-	2.2	
Cadmium	≤ 8.8	-	0.02	U
Calcium (mg/L)	-	-	59.8	
Chromium-III	-	-	0.68	I
Copper	≤ 3.7	-	3.1	
Iron	≤ 300	-	430	
Lead	≤ 8.5	-	0.29	I
Magnesium (mg/L)	-	-	13.4	
Nickel	≤ 8.3	-	1.01	
Selenium	≤ 71	-	0.5	U
Silver	≤ 2.3	-	0.025	U
Zinc	≤ 86	-	5	U
Nutrients (mg/L)				
Ortho-phosphate	-	-	0.21	Y
Total Phosphorus	-	-	0.3	Y
Total Ammonia	-	-	0.1	Y
Un-ionized Ammonia	-	-	≤ 0.02	c
Nitrate and Nitrite	-	-	0.17	Y
Total Kjeldahl Nitrogen	-	-	1.8	Y
Organic Nitrogen	-	-	1.7	c
Total Nitrogen	-	-	1.97	c
General Physical and Chemical Parameters				
Dissolved Oxygen (mg/L)	≥ 4.0 s	-	4.9	
pH (SU)	6.5 - 8.5 s	6.5 - 8.5 s	7.5	
Conductivity (µmhos/cm)	-	-	0.34	
Temperature °C	-	Report	35.7	
Sample Depth (m)	-	-	1	
Total Residual Oxidants (mg/L)	≤ 0.01 s	≤ 0.01 s	0	
Chlorophyll a (µg/L) - Corrected	-	-	8.6	AY
Phaeophytin (µg/L)	-	-	3.1	AY
CBOD, 5 day (mg/L), N - inhibited	-	-	1.5	AIY
Oils and Greases (mg/L)	≤ 5.0 s	-	1.8	I
Flow (MGD)	-	-	670.3	a
Hardness (mg $CaCO_3$)	-	-	204.50	c
Microbiology (Number of colony forming units/100ml)				
Fecal Coliforms	≤ 400s #	-	28	B

Value exceeds the Class III Water Quality Criteria or permit limits

a - Annual average
c - Value is calculated
s - Single sample
A - Value reported is the mean of two or more determinations
B - Results based on colony counts outside the acceptance range
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
J - Estimated value
U - Material analyzed for but not detected; value reported is the method detection limit
Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- If 10 or fewer samples are taken within a month, the single sample limit is 400 CFU (62-302.530(6), F.A.C.)

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2008-07-21-39
FPL Fort Myers Plant

Customer: SO-DIST

Project ID: FYI3

PMAS: 1143

Requester: Jennifer Paris
Collected By: Alyssa Mark
Sampling Agency: DEP

Field Report Prepared By: Alyssa Mark
Send Final Report To: Keith Kleinmann

Lab ID *	Location	Comp / Grab	Collection (begin) Eastern Central	Collection (end) Eastern Central	Bottle Group(s)**
	FPL Power Plant discharge canal	☐ Comp ☒ Grab	Date 7-21-08 Time 1:30	Date 7-21-08 Time 1:15	
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	
		0	4.9 mg/L		
	Matrix (Include type e.g. Salt, Fresh, etc) / Temp (C) / pH	Sample Depth ☒ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number	
	35.74C° / 7.52	1	.34	FL0001490	
	Latitude 26 ° 41 ' 49 " N / Longitude 81 ° 46 ' 54 "	Comments			

Lab ID *	Location	Comp / Grab	Collection (begin) Eastern Central	Collection (end) Eastern Central	Bottle Group(s)**
		☐ Comp ☐ Grab	Date Time	Date Time	
	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 ° ' " / Longitude ° ' "	Comments			

Lab ID *	Location	Comp / Grab	Collection (begin) Eastern Central	Collection (end) Eastern Central	Bottle Group(s)**
		☐ Comp ☐ Grab	Date Time	Date Time	
	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 ° ' " / Longitude ° ' "	Comments			

Lab ID *	Location	Comp / Grab	Collection (begin) Eastern Central	Collection (end) Eastern Central	Bottle Group(s)**
		☐ Comp ☐ Grab	Date Time	Date Time	
	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 ° ' " / Longitude ° ' "	Comments			
		1 Biomass Rec'd in lab by JD 10:10 7.22.08			

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
Alyssa Mark	7-21-08 3:30	DHL						7.22.08 8:50a

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

FDEP Biology Laboratory - Acute Screen Bioassay Bench Sheets

Facility: FPL - Fort Meyers

Address: 10650 State Road 80

City: Fort Myers County: Lee Zip 33905

Contact/District: Alyssa North / South

NPDES Permit #: FL 0001490

LIMS Job #: TLH-2008-07-22-10 LIMS Sample #: 1116258

Lims Data Entry: 8-1-08 ML Data Entry Verification: 8-1-08 BA

Sample Collection: Date: 7-21-08 Time: 1130

Hold Time Start: Date: 7-21-08 Time: 1130

Comments:

Instructions (for below): Circle appropriate wording. If yes is circled, complete blanks.

Test Type: (Screen)
(Static) Static Renewal / Flow-through
Test Duration: (48) 96 Hours.

Test 1 validation: Test 1: SOP TA 07_01
Control survival ≥90%: (Yes) No
Temperature Range ≤3°C: (Yes) No

Test 2 validation: Test 2: SOP TA 07_02
Control survival ≥90%: (Yes) No
Temperature Range ≤3°C: (Yes) No

(√one)
Test 1 incubated in: [√] Incubator #: 2 [ ] Waterbath #:_____
Test 2 incubated in: [√] Incubator #: 2 [ ] Waterbath #:_____

Initial sample handling:

PH adjustment : yes (no) Initial pH: ____ NaOH N HCl N ____ Drops mL Final pH: ____

Aeration : yes (no) Initial DO: ____mg/L Final DO: ____mg/L Duration: ____minutes Rate: ~____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: ____

Light Intensity : 50 - 100 ft. candles

Photoperiod : 16 light 8 dark

Temperature Range °C: (If used)

Incubator # 2 min. 25.4 max. 26.8 mean 26.1

Incubator # ____ min. ____ max. ____ mean ____

Waterbath # ____ min. ____ max. ____ mean ____

Room B246 min. 25.0 max. 25.5 mean 25.3

Sample Validation:

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

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

Investigators' Signatures

Jamie Ehrich
Marshall Faircloth
Brad Ashe

Loretta A. Mulcahy
REVIEWER

Batch #		7-19-08	7-22-08							
Water Quality Parameters	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	—	0	Alyssa North	MF
Lab Total Residual Cl_2 (mg/L):	<0.03	<0.03					<0.03	JD	MF
Alkalinity (mg/L as $CaCO_3$):	85	152					153	BA	MF
Hardness (mg/L as $CaCO_3$):	81	137					197	BA	MF
Total Ammonia (mg/L as N):	<0.017	<0.017					<0.017	MF	JD
Conductivity: (umhos) mmhos	180	271					719	JD	MF
Salinity (ppth):	<1	<1					0.3	JD	MF

M 1.6 7/8/08

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: mf Ctrl 1116258 Test #: 1 SOP#:TA 07 01 Test Started: Date 7-22-08 Time: 12:45

Organism/Batch/Age: Ceriodaphnia dubia/7-22-08/<24 hours Test Ended: Date 7-24-08 Time: 11:30

Chamber/Test Volume: 30 / 20 ml Diluent/ Batch: 20% DMW / 7-19-08 Test Duration: (48 hr) 96 hr

Food/Batch: [✓] YCT 6-18-08 [✓] P.sub 7-18-08

[ ] Artemia: 0hr____ 24hr____ 48hr____ 72hr____ Artemia Lot#____

Feeding: [✓] Prior to Test [ ] Prior to Renewal [ ] 0 hr [ ] 24 hr [ ] 48 hr [ ] 72 hr

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Ctrl	A	A	5	5	5			
	B	B	5	5	5			
	C	C	5	5	5			
	D	D	5	5	5			
100%	A	A	5	5	5			
	B	B	5	5	5			
	C	C	5	5	5			
	D	D	5	5	5			
Loaded/Verified by: BA / JD		Checked by:	JD	BA	BA			

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

Comments:

Test Results:

Screening Tests: Report LC50 as >100%, =100%, or <100%.

% mortality in 100% sample: 0 % LC50: >100%

If Calculated: 95% CI________ Method________ V 2.3 7/15/2008

Substitue 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 #: 1116258 Test #: Ø2 (mb) SOP#:TA 07 02 Test Started: Date 7-22-08 Time: 1230

Organism/Batch/Age: C. leedsi / 7-22-08 / 11 days Test Ended: Date 7-24-08 Time: 1300

Chamber/Test Volume: B/1000 / 500 ml Diluent/ Batch: Well / 7-22-08 Test Duration: (48 hr) 96 hr

Food/Batch: ☐ YCT______ ☐ P.sub______

☑ Artemia: 0hr 117 24hr______ 48hr______ 72hr______ Artemia Lot# 38438

Feeding: ☑ Prior to Test ☐ Prior to Renewal ☑ 0 hr ☐ 24 hr ☐ 48 hr ☐ 72 hr

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Ctrl	A	B9	5	5	5			
	B	B10	5	5	5			
	C	B11	5	5	5			
	D	B12	5	5	5			
100%	A	B13	5	5	5			
	B	B14	5 4+D 3D	4 1D	4			
	C	B15	5	5	5			
	D	B16	5	5	5			
Loaded/Verified by: JD / RA		Checked by:	JD	JD	JD			

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

Test Results:

Screening Tests: Report LC50 as >100%, =100%, or <100%.

% mortality in 100% sample: 5 % LC50: > 100%

If Calculated: 95% CI__________ Method__________

Comments:

V 2.3 7/15/2008

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

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FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample # : 116258 Ft Myers **Test #:** 1 of 2

TEST SOP #: TA07_81 **Test Species:** ☑ *Ceriodaphnia dubia* ☐ *Cyprinella leedsi* ☐ *Pimephales promelas*

Test aerated: yes (no) (circle one) Check 1: ☐ *Americamysis bahia* ☐ *Menidia beryllina* ☐ Other:_____

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	M		M			
pH (S.U.)	8.1		8.3			
Temperature °C	24.6		24.0			
Dissolved Oxygen mg/L aerate if < 4	7.7		7.4			
Conductivity (µmhos) mmhos	180		213			
Salinity ppth	<1		<1			
(initials) Measured by:	BA		BA			
(initials) Recorded by:	BA		BA			

Comments:

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	M		M			
pH (S.U.)	8.2		8.6			
Temperature °C	26.0		24.0			
Dissolved Oxygen mg/L aerate if < 4	7.9		7.3			
Conductivity (µmhos) mmhos	722		745			
Salinity ppth	<1		<1			
(initials) Measured by:	BA		BA			
(initials) Recorded by:	BA		BA			

Comments:

Salinity only needs measuring if saltwater.

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate						
pH (S.U.)						
Temperature °C						
Dissolved Oxygen mg/L aerate if < 4						
Conductivity µmhos mmhos						
Salinity ppth						
(initials) Measured by:						
(initials) Recorded by:						

Comments:

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate						
pH (S.U.)						
Temperature °C						
Dissolved Oxygen mg/L aerate if < 4						
Conductivity µmhos mmhos						
Salinity ppth						
(initials) Measured by:						
(initials) Recorded by:						

Comments: 00 040

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FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample # : 116258 **Test #:** 2 of 2

TEST SOP #: TA07_02 **Test Species:** ☐ *Ceriodaphnia dubia* ☑ *Cyprinella leedsi* ☐ *Pimephales promelas*

Test aerated: yes (no) (circle one) Check 1: ☐ *Americamysis bahia* ☐ *Menidia beryllina* ☐ Other:_____

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C			
pH (S.U.)	7.8	8.1	8.4			
Temperature °C	24.8	24.4	24.3			
Dissolved Oxygen mg/L aerate if < 4	7.6	6.9	7.2			
Conductivity (µmhos) mmhos	271	280	314			
Salinity ppth						
(initials) Measured by:	JB	JB	JB			
(initials) Recorded by:	JB	JB	JB			

Comments:

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C			
pH (S.U.)	8.1	8.1	8.4			
Temperature °C	25.9	24.5	24.2			
Dissolved Oxygen mg/L aerate if < 4	8.1	6.9	7.0			
Conductivity (µmhos) mmhos	720	716	768			
Salinity ppth						
(initials) Measured by:	JB	JB	JB			
(initials) Recorded by:	JB	JB	JB			

Comments:

Salinity only needs measuring if saltwater.

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate						
pH (S.U.)						
Temperature °C						
Dissolved Oxygen mg/L aerate if < 4						
Conductivity µmhos mmhos						
Salinity ppth						
(initials) Measured by:						
(initials) Recorded by:						

Comments:

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate						
pH (S.U.)						
Temperature °C						
Dissolved Oxygen mg/L aerate if < 4						
Conductivity µmhos mmhos						
Salinity ppth						
(initials) Measured by:						
(initials) Recorded by:						

Comments:

Appendix B. (continued)

Bioassay Instrument ID

Test ID: FPL FT Myers Dates: July 22-24 2008

METER / DEVICE	ID	SOP	Parameter	Method	√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	SM 2510 B	✓
			Salinity	SM 2520 B	✓
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	✓
Thermometer (DO probe)	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 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)

V 1.1 6/12/08 MF

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00 042

Appendix C. SRT Bench Sheets and Statistical Analysis

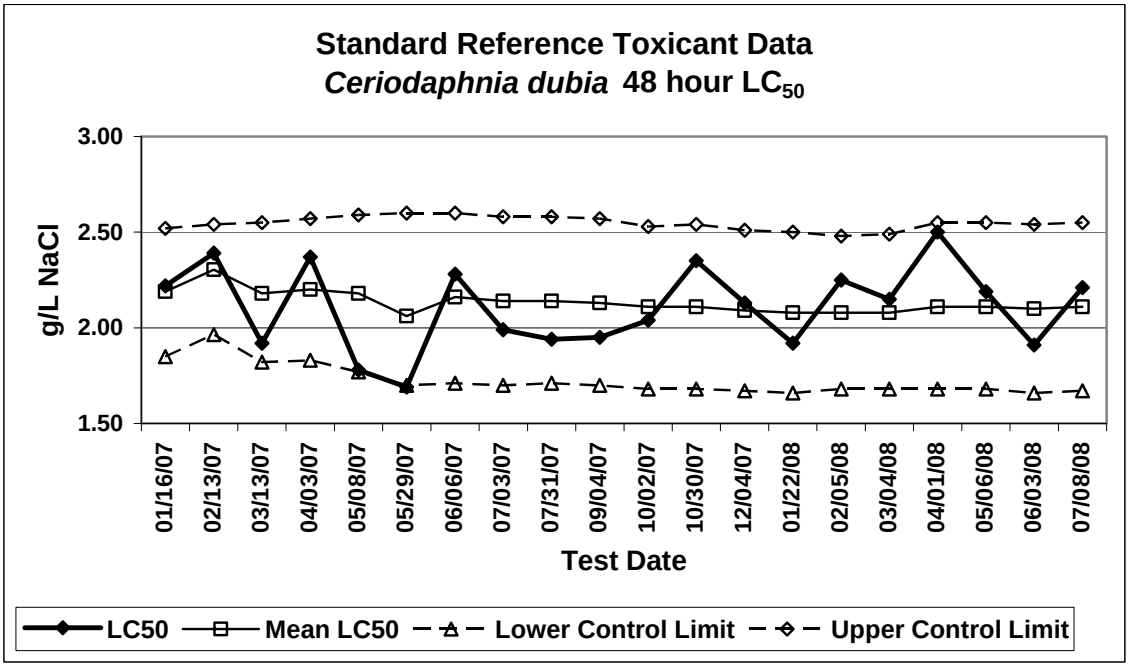
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 48-hour Acute Toxicity
Ceriodaphnia dubia (water flea) - Sodium Chloride (NaCl)

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
01/16/07	2.22	2.19	0.17	1.85	2.52
02/13/07	2.39	2.31	0.17	1.97	2.54
03/13/07	1.92	2.18	0.18	1.82	2.55
04/03/07	2.37	2.20	0.18	1.83	2.57
05/08/07	1.78	2.18	0.21	1.77	2.59
05/29/07	1.69	2.06	0.23	1.70	2.60
06/06/07	2.28	2.16	0.22	1.71	2.60
07/03/07	1.99	2.14	0.22	1.70	2.58
07/31/07	1.94	2.14	0.22	1.71	2.58
09/04/07	1.95	2.13	0.22	1.70	2.57
10/02/07	2.04	2.11	0.21	1.68	2.53
10/30/07	2.35	2.11	0.21	1.68	2.54
12/04/07	2.13	2.09	0.20	1.67	2.51
01/22/08	1.92	2.08	0.20	1.66	2.50
02/05/08	2.25	2.08	0.20	1.68	2.48
03/04/08	2.15	2.08	0.20	1.68	2.49
04/01/08	2.50	2.11	0.22	1.68	2.55
05/06/08	2.19	2.11	0.22	1.68	2.55
06/03/08	1.91	2.10	0.22	1.66	2.54
07/08/08	2.21	2.11	0.22	1.67	2.55

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

CV = 10.35
EPA reference 75th quartile CV = 29%



Appendix C. (continued)

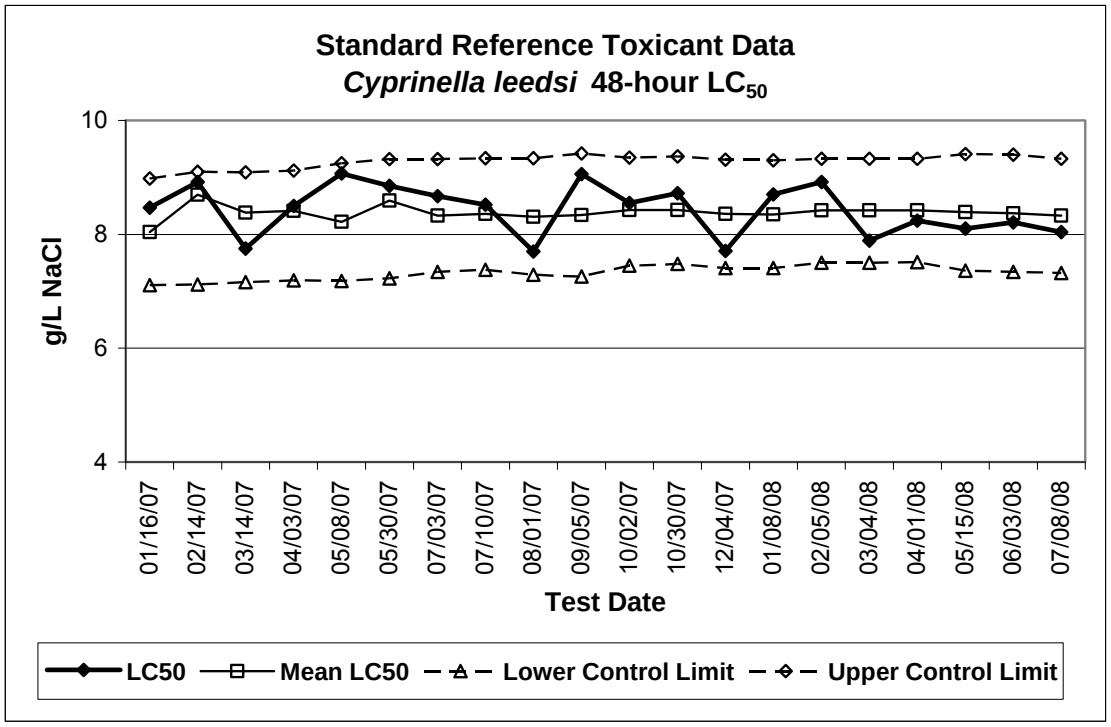
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 48-hour Acute Toxicity
Cyprinella leedsi (bannerfin shiner) - Sodium Chloride (NaCl)

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
01/16/07	8.47	8.04	0.47	7.11	8.98
02/14/07	8.92	8.70	0.32	7.12	9.10
03/14/07	7.75	8.38	0.59	7.16	9.09
04/03/07	8.50	8.41	0.49	7.19	9.12
05/08/07	9.07	8.22	0.52	7.18	9.25
05/30/07	8.85	8.59	0.48	7.23	9.32
07/03/07	8.67	8.33	0.50	7.34	9.32
07/10/07	8.52	8.36	0.49	7.38	9.34
08/01/07	7.7	8.31	0.51	7.29	9.34
09/05/07	9.06	8.34	0.54	7.26	9.42
10/02/07	8.55	8.43	0.47	7.45	9.35
10/30/07	8.72	8.43	0.47	7.48	9.37
12/04/07	7.71	8.36	0.47	7.41	9.31
01/08/08	8.7	8.35	0.47	7.41	9.30
02/05/08	8.92	8.42	0.46	7.50	9.33
03/04/08	7.89	8.42	0.46	7.50	9.33
04/01/08	8.24	8.42	0.45	7.51	9.33
05/15/08	8.1	8.39	0.51	7.36	9.41
06/03/08	8.21	8.37	0.51	7.34	9.40
07/08/08	8.04	8.33	0.50	7.32	9.33

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

CV = 6.03
EPA reference 75th quartile CV = 19%



Appendix C. (continued)

000031

FDEP Biology Laboratory - Acute SRT Bench Sheet

Test Organism: *Americamysis bahia* Method 2007.0 | *Menidia beryllina* Method 2006.0 | *Hyalella azteca* Method 100.1 EPA-600-R-99-064
Ceriodaphnia dubia Method 2002.0 | *Cyprinella leedsi* Method 2000.0 | *Pimephales promelas* Method 2000.0 | Other: _____

Method from EPA-821-R-02-012
Test Type: 48 hour non-renewal / ~~96~~ 96 hour renewal
Test Page 1 of 2

Diluent/ Batch #: DMW / 6.3.08
Toxicant/ Batch#: NaCl / ~~7.8~~ 7.7 7.7.08 SS

Test Beginning: Date: 7.8.08 Time: 1140
Test Ending: Date: 7-12-08 Time: 1140

Water Quality Parameters	Diluent	Method	Initials
Total Residual Cl_2 (mg/L):	<0.03	Hach	JD
Alkalinity (mg/L as $CaCO_3$):	90	Hach	90 BA (A)
Hardness (mg.L as $CaCO_3$):	86	Hach	~~86~~ 85 BA
Total Ammonia (mg/L as N):	<0.07	Denver	mF
Salinity (ppth):	21	Mettler	JD

Organism Batch #/ Age: 24-08 / <24 hours
Feeding: (Prior to test) (Prior to renewal) / Daily
Food: (YCT) (C.subcapitata) Artemia: Lot #____
Food Batch: 7.21.07 / 1.31.08 0hr____ 24hr____ 48hr____ 72hr____
Chamber size: 30 mL
Test volume: 20 mL per replicate

Conc.			Number Live			pH (SU)			Temperature (° C)			D.O. (mg/L)			Uncorrected Conductivity µmhos/cm (mmhos/cm)		
	Rep.	Chamber #	~~0~~ hr	~~24~~ hr	~~48~~ hr	~~0~~ hr	~~24~~ hr	~~48~~ hr	~~0~~ hr	~~24~~ hr	~~48~~ hr	~~0~~ hr	~~24~~ hr	~~48~~ hr	~~0~~ hr	~~24~~ hr	~~48~~ hr
µg/L mg/L			~~48~~ hr	~~72~~ hr	~~96~~ hr	~~48~~ hr	~~72~~ hr	~~96~~ hr	~~48~~ hr	~~72~~ hr	~~96~~ hr	~~48~~ hr	~~72~~ hr	~~96~~ hr	~~48~~ hr	~~72~~ hr	~~96~~ hr
Control	A	A	5	5	5	8.1		8.1	25.6		24.4	7.7		7.4	0.181		0.195
	B	B	5	5	5												
	C	C	5	5	5												
	D	D	5	5	5												
1.5	A	A	5	5	5	8.0		8.1	24.9		24.3	7.6		7.7	2.38		2.88
	B	B	5	5	5												
	C	C	5	5	5												
	D	D	5	5	5												
2.0	A	A	5	5	5	8.1		8.1	24.7		24.4	7.5		7.5	3.73		3.81
	B	B	5	5	5												
	C	C	5	5	5												
	D	D	5	5	4 1D												
2.5	A	A	5	3 2D	0 3D	8.1		8.1	24.6		24.4	7.5		7.4	4.66		4.83
	B	B	5	5	0 5D												
	C	C	5	3 2D	0 3D												
	D	D	5	2 3D	0 2D												
3.0	A	A	5	2 3D	0 2D	8.1		8.1	24.5		24.4	7.4		7.4	5.58		5.77
	B	B	5	3 2D	0 3D												
	C	C	5	1 4D	0 1D												
	D	D	5	1 4D	0 1D												
4.0	A	A	5	0 5D	—	8.1		—	24.4		—	7.3		—	7.29		—
	B	B	5	0 5D	—		8.0			24.0			20			7.49	
	C	C	5	0 5D	—												
	D	D	5	0 5D	—												
	A																
	B																
	C																
	D																
Loaded / measured by:			BA	mF	mF	BA	JD	mF	BA	JD	mF	BA	JD	mF	BA	JD	mF
Recorded by:			BA	mF	mF	BA	JD	mF	BA	JD	mF	BA	JD	mF	BA	JD	mF

Investigators' Signatures
James Daniels
Brad [illegible]
Marshall Faircloth

Concentrations prepared by: BA
Loading verified by: JD
Light Intensity: 50-100 Ft. candles
Photoperiod: 16 hours Light / 8 hours dark
Temperature Range °C:
Incubator # 2 min 25.7 max 26.7 mean 26.2
Incubator # ___ min _____ max _____ mean _____
Room B246 min 22.7 max 25.7 mean 24.2

Comments: (A) Parameters written in wrong space Measured by BA

Statistics: Method: Spearman-Karber
(AB) 96 hour LC_{50}: 2.21
95% Confidence Interval: lower 2.15 upper 2.26

REVIEWER

Appendix C. (continued)

000032

FDEP Biology Laboratory - Acute SRT Bench Sheet

Test Organism: *Americamysis bahia* Method 2007.0 | *Menidia beryllina* Method 2006.0 | *Hyalella azteca* Method 100.1 EPA-600-R-99-064
Ceriodaphnia dubia Method 2002.0 | *Cyprinella leedsi* Method 2000.0 | *Pimephales promelas* Method 2000.0 | Other: _____

Method from EPA-821-R-02-012
Test Type: 48 hour non-renewal / (48)hour renewal
Test Page 2 of 2

Diluent/ Batch #: DMW / 6.30.08
Toxicant/ Batch#: NaCl / ~~7.6.08~~ 7.7.08 JD

Test Beginning: Date: 7.8.08 Time: 1300
Test Ending: Date: 7-12-08 Time: 1140

Water Quality Parameters	Diluent	Method	Initials
Total Residual Cl_2 (mg/L):	0.03	Hach	JD
Alkalinity (mg/L as $CaCO_3$):	90	Hach	BAT0 BA
Hardness (mg.L as $CaCO_3$):	86	Hach	8 BA
Total Ammonia (mg/L as N):	0.017	Denver	MF
Salinity (ppth):	21	Mettler	JD

Organism Batch #/ Age: 24-08 / <24 hours
Feeding: (Prior to test) / (Prior to renewal) / Daily
Food: (YCT) (S.subcapitata) Artemia: Lot # ~~1~~
Food Batch: 7-26-07 / 1-31-08 0hr____ 24hr____ 48hr____ 72hr____
Chamber size: 30 mL
Test volume: 20 mL per replicate

Conc. (ID) µg/L mg/L	Rep.	Chamber #	Number Live 0 hr / 24 hr / 48 hr	pH (SU) 0 hr / 24 hr / 48 hr	Temperature (°C) 0 hr / 24 hr / 48 hr	D.O. (mg/L) 0 hr / 24 hr / 48 hr	Uncorrected Conductivity µmhos/cm (mmhos/cm) 0 hr / 24 hr / 48 hr
			~~0 hr~~ / ~~24 hr~~ / ~~48 hr~~	~~0 hr~~ / ~~24 hr~~ / ~~48 hr~~	~~0 hr~~ / ~~24 hr~~ / ~~48 hr~~	~~0 hr~~ / ~~24 hr~~ / ~~48 hr~~	~~0 hr~~ / ~~24 hr~~ / ~~48 hr~~
			(48 hr) / (72 hr) / (96 hr)	(48 hr) / (72 hr) / (96 hr)	(48 hr) / (72 hr) / (96 hr)	(48 hr) / (72 hr) / (96 hr)	(48 hr) / (72 hr) / (96 hr)
Control	A	A	5 / 5 / 5	8.2 / / 8.1 MF	24.1 / / 25.0	7.8 / / 7.7	0.190 / / 0.190
	B	B	5 / 5 / 5				
	C	C	5 / 5 / 5				
	D	D	5 / 5 / 5				
1.5	A	A	5 / 5 / 5	8.1 / / 8.1	24.1 / / 25.0	7.7 / / 7.5	2.82 / / 2.88
	B	B	5 / 5 / 5				
	C	C	5 / 5 / 5				
	D	D	5 / 5 / 5				
2.0	A	A	5 / 5 / 4 ID	8.1 / / 8.1	24.1 / / 24.8	7.7 / / 7.4	3.68 / / 3.81
	B	B	5 / 4 ID / 4				
	C	C	5 / 5 / 5				
	D	D	4 / 3 ID / 3				
2.5	A	A	— / — / —				
	B	B	— / — / —				
	C	C	— / — / —				
	D	D	— / — / —				
3.0	A	A	— / — / —				
	B	B	— / — / —				
	C	C	— / — / —				
	D	D	— / — / —				
4.0	A	A	— / — / —				
	B	B	— / — / —				
	C	C	— / — / —				
	D	D	— / — / —				
	A						
	B						
	C						
	D						
Loaded / measured by:			MF / MF / MF	MF / / MF	MF / / MF	MF / / MF	MF / / MF
Recorded by:			MF / MF / MF	MF / / MF	MF / / MF	MF / / MF	MF / / MF

Investigators' Signatures
James Daniels
Brad Nevels
Marshall Faircloth
Loretta Culpepper
REVIEWER

Concentrations prepared by: MF
Loading verified by: JP
Light Intensity: 50-100 FL candles
Photoperiod: 16 hours Light / 8 hours dark
Temperature Range °C:
Incubator # 7 min. 25.7 max. 26.7 mean 26.2
Incubator # ___ min.____ max.____ mean____
Room B246 min. 22.7 max. 25.7 mean 24.2

Comments: All parameters written in wrong space. Measured by BA

Statistics: Method: Spearman-Karber
48 (96) hour LC_{50}: 2.12
95% Confidence Interval: lower 2.03 upper 2.22

Appendix C. (continued)

000033

FDEP Biology Laboratory - Acute SRT Bench Sheet

Test Organism: *Americamysis bahia* Method 2007.0 | *Menidia beryllina* Method 2006.0 | *Hyalella azteca* Method 100.1 EPA-600-R-99-064
Ceriodaphnia dubia Method 2002.0 | (*Cyprinella leedsi*) Method 2000.0 | *Pimephales promelas* Method 2000.0 | Other: _____

Method from EPA-821-R-02-012
Test Type: 48 hour non-renewal / (96 hour renewal)
Test Page 1 of 2

Diluent/ Batch #: Well H2O 1.7708
Toxicant/ Batch#: NaCl 1.7708

Test Beginning: Date: 7.8.08 Time: 1320
Test Ending: Date: 7-12-08 Time: 1150

Water Quality Parameters	Diluent	Method	Initials
Total Residual Cl_2 (mg/L):	0.05	Hach	JD
Alkalinity (mg/L as $CaCO_3$):	152	Hach	BA
Hardness (mg.L as $CaCO_3$):	139	Hach	BA
Total Ammonia (mg/L as N):	0.017	Denver	MF
Salinity (ppth):	21	Mettler	JS

Organism Batch #/ Age: 7.8.08 / 11days
Feeding: (Prior to test) / (Prior to renewal) / Daily
Food: YCT *P.subcapitata* Artemia Lot # 38438
Food Batch: \ \ 0hr 1/3 24hr – 48hr 1/5 72hr –
Chamber size: 1000 mL
Test volume: 500 mL per replicate

Conc.			Number Live			pH (SU)			Temperature (° C)			D.O. (mg/L)			Uncorrected Conductivity µmhos/cm mmhos/cm		
% µg/L mg/L	Rep.	Chamber #	0hr 48 hr	24hr 72 hr	48hr 96 hr	0hr 48 hr	24hr 72 hr	48hr 96 hr	0hr 48 hr	24hr 72 hr	48hr 96 hr	0hr 48 hr	24hr 72 hr	48hr 96 hr	0hr 48 hr	24hr 72 hr	48hr 96 hr
Control	A	C1	10	10	10	7.9		8.2	24.3		24.3	7.4		6.8	0.279		9.317
	B	C2	10	10	10		8.1			24.1			7.5			9.490	
	C																
	D																
6	A	C3	10	10	9	7.9		8.2	24.3		24.6	7.0		6.6	9.94		10.7
	B	C4	10	10	9		8.0			24.1			6.9			11.3	
	C																
	D																
7	A	C5	10	9	9	7.9		8.2	24.3		24.6	7.3		6.6	12.5		13.2
	B	C6	10	8	8		8.0			24.2			6.8			13.3	
	C																
	D																
8	A	C7	10	7	7	7.9		8.1	24.2		24.3	7.3		6.7	14.4		14.3
	B	C8	10	5	4		8.0			24.3			6.6			14.9	
	C																
	D																
9	A	C9	10	4	3	7.9		8.1	24.1		24.5	7.3		6.6	15.72		16.3
	B	C10	10	1	1		8.0			24.3			6.5			16.3	
	C																
	D																
10	A	C11	10	0	–	7.8			24.1			7.3			17.8		
	B	C12	10	0	–		8.0			24.2			6.3			18.2	
	C																
	D																
	A																
	B																
	C																
	D																
Loaded / measured by:			BA	JD	JD	JD	JD	JD	JD	JD	JD	JD	JD	JD	JD	JD	JD
Recorded by:			JD	JD	JD	JD	JD	JD	JD	JD	JD	JD	JD	JD	JD	JD	JD

Investigators' Signatures
Tonia David
Marshall Faircloth
Laurie Cutsufe
REVIEWER

Concentrations prepared by: JD
Loading verified by: JD
Light Intensity: 50-100 Ft. candles
Photoperiod: 16 hours Light / 8 hours dark
Temperature Range °C:
Incubator # 2 min. 25.7 max. 26.1 mean 26.2
Incubator # ___ min. _____ max. _____ mean _____
Room B248 min. 22.1 max. 25.1 mean 24.2

Comments:

Statistics: Method: Spearman-Karber
48/ 96 hour LC_{50}: 8.04
95% Confidence Interval: lower 7.44 upper 8.47

Appendix C. (continued)

000034

FDEP Biology Laboratory - Acute SRT Bench Sheet

Test Organism: *Americamysis bahia* Method 2007.0 | *Menidia beryllina* Method 2006.0 | *Hyalella azteca* Method 100.1 EPA-600-R-99-064
Ceriodaphnia dubia Method 2002.0 | (*Cyprinella leedsi*) Method 2000.0 | *Pimephales promelas* Method 2000.0 | Other: _____

Method from EPA-821-R-02-012
Test Type: 48 hour non-renewal / (96) hour renewal
Test Page 2 of 2

Diluent/ Batch #: Well H2O / 7.708
Toxicant/ Batch#: NaCl / 7.708

Test Beginning: Date: 7.8.08 Time: 1320
Test Ending: Date: 7-12-08 Time: 1150

Water Quality Parameters	Diluent	Method	Initials
Total Residual Cl_2 (mg/L):	<.05	Hach	JD
Alkalinity (mg/L as $CaCO_3$):	152	Hach	BA
Hardness (mg.L as $CaCO_3$):	134	Hach	BA
Total Ammonia (mg/L as N):	<0.017	Denver	MF
Salinity (ppth):	21	Mettler	JD

Organism Batch #/ Age: 7.8.08 / 1100hrs
Feeding: (Prior to test) / (Prior to renewal) Daily
Food: YCT *P.subcapitata* (Artemia) Lot # 38438
Food Batch: _____ / _____ 0hr 113 24hr — 48hr 115 72hr —
Chamber size: 1000 mL
Test volume: 500 mL per replicate

Conc.			Number Live			pH (SU)			Temperature (° C)			D.O. (mg/L)			Uncorrected Conductivity µmhos/cm (mmhos/cm)		
(%) µg/L mg/L	Rep.	Chamber #	~~0 hr.~~ (48 hr)	~~24 hr.~~ (72 hr)	~~48 hr.~~ (96 hr)	~~0 hr.~~ (48 hr)	~~24 hr.~~ (72 hr)	~~48 hr.~~ (96 hr)	~~0 hr.~~ (48 hr)	~~24 hr.~~ (72 hr)	~~48 hr.~~ (96 hr)	~~0 hr.~~ (48 hr)	~~24 hr.~~ (72 hr)	~~48 hr.~~ (96 hr)	~~0 hr.~~ (48 hr)	~~24 hr.~~ (72 hr)	~~48 hr.~~ (96 hr)
Control	A	C1	10	10		8.1		8.1	24.0		25.2	7.7		6.1	0.205		0.292
	B	C2	10	10			7.9			24.2			7.0			0.287	
	C																
	D																
6	A	C3	9	9		8.1		8.0	24.0		25.4	7.4		6.1	10.9		11.1
	B	C4	9	9			7.9			24.7			5.8			10.9	
	C																
	D																
7	A	C5	9	9		8.1		8.0	24.0		25.2	7.4		5.9	13.4		13.2
	B	C6	8	8			8.0			24.5			6.4			13.2	
	C																
	D																
8	A	C7	7	0 1D	5 1D	8.0		8.1	24.0		25.3	7.4		6.1	15.0		14.8
	B	C8	7	4	3 1D		8.0			24.4			6.5			14.8	
	C																
	D																
9	A	C9	3	3	3	8.0		8.1	24.0		25.0	7.3		6.4	16.8		16.5
	B	C10	1	1	0 1D		8.1			24.5			6.5			16.5	
	C																
	D																
10	A	C11															
	B	C12															
	C																
	D																
	A																
	B																
	C																
	D																
Loaded / measured by:			JD	JD	MF	JD	JD	MF	JD	JD	MF	JD	JD	MF	JD	JD	MF
Recorded by:			JD	JD	MF	JD	JD	MF	JD	JD	MF	JD	JD	MF	JD	JD	MF

Investigators' Signatures
Anna Sand
Brent Aaron
Marshall Fairchild
_____
_____
Lorette C Wolfe
REVIEWER

Concentrations prepared by: JD
Loading verified by: JD
Light Intensity: 50-100 Ft. candles
Photoperiod: 16 hours Light / 8 hours dark
Temperature Range °C:
Incubator # 2 min 25.7 max 26.7 mean 26.2
Incubator # ___ min ___ max ___ mean ___
Room B246 min 22.7 max 25.7 mean 24.2

Comments:

Statistics: Method: Spearman-Karber
48 (96) hour LC_{50}: 7.81
95% Confidence Interval: lower 7.43 upper 8.21

Appendix C. (continued)

***Ceriodaphnia dubia* Acute Standard Reference Toxicant Test**

DATE: 7-8-08 DURATION: 48 hr TOXICANT : NaCl
SPECIES: *Ceriodaphnia dubia*

RAW DATA: Concentration (g/L)	Number Exposed	Mortalities
.00	20	0
1.50	20	0
2.00	20	1
2.50	20	20
3.00	20	20
4.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: **LC50: 2.21**
95% LOWER CONFIDENCE: 2.15
95% UPPER CONFIDENCE: 2.26

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

DATE: 7-8-08 DURATION: 48 hr TOXICANT : NaCl
SPECIES: *Cyprinella leedsi*

RAW DATA: Concentration (g/L)	Number Exposed	Mortalities
0.00	20	0
6.00	20	2
7.00	20	3
8.00	20	9
9.00	20	16
10.00	20	20

SPEARMAN-KARBER TRIM: 0.00%

SPEARMAN-KARBER ESTIMATES: **LC50: 8.04**
95% LOWER CONFIDENCE: 7.64
95% UPPER CONFIDENCE: 8.47

Appendix D. Test Organism Receipt(s)

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Organism Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Date: 7/7/08

Shipped to: FDEP

P.O. No: N/A

Species	Quantity	Age	Brood Number	Temp.	pH	Salinity
Mysidopsis bahia	150	4 DAYS	MS 080703	26°C	8.1 s.u	20‰
Menidia beryllina	150	12 DAYS	SS 080625	25°C	8.0 s.u	20‰
						Hardness
Cyprinella leedsi	150	10 DAYS	CL 080627	26°C	7.9	90mg/L
Pimephales promelas	150	8 DAYS	FM 080629	25°C	7.8	86mg/L

Packed by: JU

Shipped Via: FedEx

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

Organism Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Date: 7/21/08

Shipped to: FDEP

P.O. No: N/A

Species	Quantity	Age	Brood Number	Temp.	pH	Salinity
Mysidopsis bahia	250 acute	4 DAYS	MS080717	25°C	8.0	20‰
Menidia beryllina	250 acute	12 DAYS	SS080709	26°C	7.9	20‰
						Hardness
Cyprinella leedsi	150 acute	10 DAYS	CL080711	25°C	7.8	88 mg/L
Pimephales promelas						

Packed by:

Shipped Via: FedEx

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 Florida Power and Light-Fort Myers Plant Outfall D-010, sampled on July 21, 2008.

Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
7/21/2008 11:30	Efluent	AGP/LN	Algal Growth Potential	24.9		mg DryWt/L	0.3	0.9
7/21/2008 11:30	Efluent	AGP/LN/SA	Algal Growth Potential Salinity-adjusted	3	U	mg DryWt/L	3	3
7/21/2008 11:30	Efluent	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	8.6	AY	ug/L	0.55	1.7
7/21/2008 11:30	Efluent	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.5	AIY	mg/L	0.2	2
7/21/2008 11:30	Efluent	Chlorophyll/Grain Size/BOD	Phaeophytin-a	3.1	AY	ug/L	0.24	0.71
7/21/2008 11:30	Efluent	Overflow	Fecal Coliforms-Membrane Filter	28	B	#/100 mL		
7/21/2008 11:30	Efluent	Toxicology	Bioassay-Acute-Screen-FW-C.dubia, LC50	100	L	LC50		
7/21/2008 11:30	Efluent	Toxicology	Bioassay-Acute-Screen-FW-Fish, LC50	100	L	LC50		
7/21/2008 11:30	Efluent	Metals	Chromium	0.68	I	ug/L	0.5	2
7/21/2008 11:30	Efluent	Metals	Aluminum	260		ug/L	60	240
7/21/2008 11:30	Efluent	Metals	Calcium	59.8		mg/L	0.075	0.3
7/21/2008 11:30	Efluent	Metals	Magnesium	13.4		mg/L	0.04	0.16
7/21/2008 11:30	Efluent	Metals	Arsenic	2.2		ug/L	0.5	2
7/21/2008 11:30	Efluent	Metals	Zinc	5	U	ug/L	5	20
7/21/2008 11:30	Efluent	Metals	Silver	0.025	U	ug/L	0.025	0.1
7/21/2008 11:30	Efluent	Metals	Copper	3.1		ug/L	0.5	2
7/21/2008 11:30	Efluent	Metals	Iron	430		ug/L	30	120
7/21/2008 11:30	Efluent	Metals	Cadmium	0.02	U	ug/L	0.02	0.08
7/21/2008 11:30	Efluent	Metals	Selenium	0.5	U	ug/L	0.5	2
7/21/2008 11:30	Efluent	Metals	Antimony	0.5	U	ug/L	0.5	2
7/21/2008 11:30	Efluent	Metals	Lead	0.29	I	ug/L	0.2	0.8
7/21/2008 11:30	Efluent	Metals	Nickel	1.01		ug/L	0.25	1
7/21/2008 11:30	Efluent	Metals	Beryllium	0.025	U	ug/L	0.025	0.1
7/21/2008 11:30	Efluent	Nutrients	Total-P	0.3	Y	mg P/L	0.02	0.06
7/21/2008 11:30	Efluent	Nutrients	Kjeldahl Nitrogen	1.8	Y	mg N/L	0.08	0.2
7/21/2008 11:30	Efluent	Nutrients	O-Phosphate-P	0.21	Y	mg P/L	0.004	0.01
7/21/2008 11:30	Efluent	Nutrients	NO2NO3-N	0.17	Y	mg N/L	0.004	0.01
7/21/2008 11:30	Efluent	Nutrients	Ammonia-N	0.1	Y	mg N/L	0.01	0.02
7/21/2008 11:30	Efluent	Overflow	Oil and Grease	1.8	I	mg/L	1.4	5
7/21/2008 11:30	Efluent	Pesticides	Ametryn	0.048	U	ug/L	0.048	0.19
7/21/2008 11:30	Efluent	Pesticides	Atrazine	0.048	U	ug/L	0.048	0.19
7/21/2008 11:30	Efluent	Pesticides	Metalaxyl	0.24	U	ug/L	0.24	0.96
7/21/2008 11:30	Efluent	Pesticides	Norflurazon	1.4		ug/L	0.14	0.56

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
7/21/2008 11:30	Efluent	Pesticides	Ethion	0.048	U	ug/L	0.048	0.19
7/21/2008 11:30	Efluent	Pesticides	Malathion	0.14	U	ug/L	0.14	0.56
7/21/2008 11:30	Efluent	Pesticides	Phorate	0.048	UJ	ug/L	0.048	0.19
7/21/2008 11:30	Efluent	Pesticides	Alachlor	0.58	U	ug/L	0.58	2.3
7/21/2008 11:30	Efluent	Pesticides	Chlorpyrifos Ethyl	0.048	U	ug/L	0.048	0.19
7/21/2008 11:30	Efluent	Pesticides	Hexazinone	0.096	U	ug/L	0.096	0.38
7/21/2008 11:30	Efluent	Pesticides	Azinphos Methyl	0.19	U	ug/L	0.19	0.76
7/21/2008 11:30	Efluent	Pesticides	Butylate	0.19	U	ug/L	0.19	0.76
7/21/2008 11:30	Efluent	Pesticides	Chlorpyrifos Methyl	0.096	U	ug/L	0.096	0.38
7/21/2008 11:30	Efluent	Pesticides	Mevinphos	0.19	UJ	ug/L	0.19	0.76
7/21/2008 11:30	Efluent	Pesticides	Naled	0.77	U	ug/L	0.77	3.1
7/21/2008 11:30	Efluent	Pesticides	Diazinon	0.048	U	ug/L	0.048	0.19
7/21/2008 11:30	Efluent	Pesticides	Ethoprop	0.096	UJ	ug/L	0.096	0.38
7/21/2008 11:30	Efluent	Pesticides	Simazine	0.048	U	ug/L	0.048	0.19
7/21/2008 11:30	Efluent	Pesticides	Bromacil	0.59	IJ	ug/L	0.19	0.76
7/21/2008 11:30	Efluent	Pesticides	Prometryn	0.14	U	ug/L	0.14	0.56
7/21/2008 11:30	Efluent	Pesticides	Fenamiphos	0.19	U	ug/L	0.19	0.76
7/21/2008 11:30	Efluent	Pesticides	Fonofos	0.096	U	ug/L	0.096	0.38
7/21/2008 11:30	Efluent	Pesticides	Metolachlor	0.48	U	ug/L	0.48	1.9
7/21/2008 11:30	Efluent	Pesticides	Metribuzin	0.096	U	ug/L	0.096	0.38
7/21/2008 11:30	Efluent	Pesticides	Parathion Ethyl	0.14	U	ug/L	0.14	0.56
7/21/2008 11:30	Efluent	Pesticides	Parathion Methyl	0.096	U	ug/L	0.096	0.38
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Benzo(a)pyrene	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Isophorone	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Phenol	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Benzo(b)fluoranthene	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L	2.9	12
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Diethyl phthalate	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Endrin aldehyde	3.8	U	ug/L	3.8	15
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Heptachlor	1.4	U	ug/L	1.4	5.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Phenanthrene	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	2-Nitrophenol	0.96	U	ug/L	0.96	3.8

Appendix E. (continued)

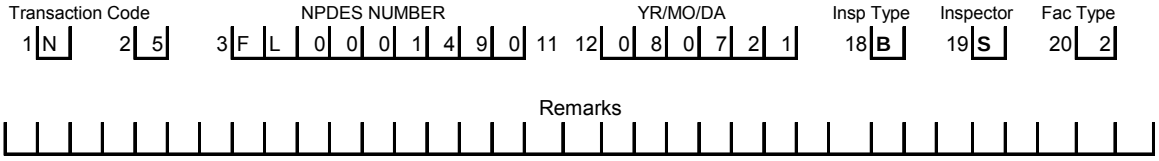
Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
7/21/2008 11:30	Efluent	Priority Organic Pollutants	4,4'-DDT	1.4	U	ug/L	1.4	5.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L	1.9	7.7
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Endosulfan II	3.8	U	ug/L	3.8	15
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Endrin	1.4	U	ug/L	1.4	5.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Naphthalene	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L	2.9	12
7/21/2008 11:30	Efluent	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	2,4-Dimethylphenol	9.6	U	ug/L	9.6	38
7/21/2008 11:30	Efluent	Priority Organic Pollutants	2-Chlorophenol	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L	2.9	12
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Aldrin	1.4	U	ug/L	1.4	5.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Dieldrin	1.4	U	ug/L	1.4	5.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Fluorene	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Heptachlor epoxide	1.4	U	ug/L	1.4	5.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.7
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Acenaphthylene	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Benzo(a)anthracene	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Benzo(k)fluoranthene	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Chrysene	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	U	ug/L	2.9	12
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L	2.9	12
7/21/2008 11:30	Efluent	Priority Organic Pollutants	beta-BHC	1.4	U	ug/L	1.4	5.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Anthracene	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Benzidine	96	U	ug/L	96	380
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	14	U	ug/L	14	58
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Di-n-butyl phthalate	4.8	U	ug/L	4.8	19
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Di-n-octyl phthalate	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Hexachlorobenzene	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L	2.9	12

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L	1.9	7.7
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Pyrene	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	2,4-Dinitrotoluene	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Dimethyl phthalate	9.6	UJ	ug/L	9.6	38
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Endosulfan sulfate	1.4	U	ug/L	1.4	5.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	alpha-BHC	1.4	U	ug/L	1.4	5.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	delta-BHC	1.4	U	ug/L	1.4	5.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	gamma-BHC	1.4	U	ug/L	1.4	5.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	2,4-Dichlorophenol	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	4-Nitrophenol	14	U	ug/L	14	58
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Acenaphthene	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Butyl benzyl phthalate	4.8	U	ug/L	4.8	19
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Endosulfan I	3.8	U	ug/L	3.8	15
7/21/2008 11:30	Efluent	Priority Organic Pollutants	Fluoranthene	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.7
7/21/2008 11:30	Efluent	Priority Organic Pollutants	2,4-Dinitrophenol	14	U	ug/L	14	58
7/21/2008 11:30	Efluent	Priority Organic Pollutants	2,6-Dinitrotoluene	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	2-Chloronaphthalene	0.96	U	ug/L	0.96	3.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	3,3'-Dichlorobenzidine	38	U	ug/L	38	150
7/21/2008 11:30	Efluent	Priority Organic Pollutants	4,4'-DDD	1.4	U	ug/L	1.4	5.8
7/21/2008 11:30	Efluent	Priority Organic Pollutants	4,4'-DDE	1.4	U	ug/L	1.4	5.8
7/21/2008 11:30	Efluent	Field Parameter	Sample Depth	1		m		
7/21/2008 11:30	Efluent	Field Parameter	pH	7.52				
7/21/2008 11:30	Efluent	Field Parameter	Specific Conductance	0.34		umhos/cm		
7/21/2008 11:30	Efluent	Field Parameter	Temperature	35.74		C		
7/21/2008 11:30	Efluent	Field Parameter	Dissolved Oxygen	4.9		mg/L		

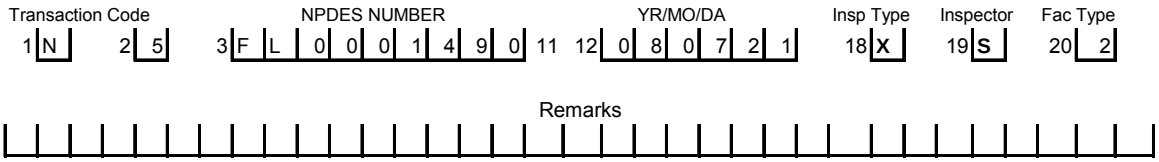
The Bioassay of Florida Power and Light-Fort Myers Plant effluent sampled on July 21, 2008. NPDES #FL0001490.

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



The Priority Pollutants Analysis of Florida Power and Light-Fort Myers Plant effluent sampled on July 21, 2008. NPDES #FL0001490.

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



Biological Analyses of Florida Power and Light-Fort Myers Plant effluent sampled on July 21, 2008. NPDES #FL0001490.

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

