

Effluent Quality Assessment

Progress Energy Florida – Bartow Power Plant

Pinellas County

NPDES #FL0000132

Sampled September 22, September 29 and October 13, 2008

February 2009

Biology Section
Bureau of Laboratories
Division of Environmental Assessment and Restoration

Quality Manual No. 870346G
NELAC Certification No. E31780

Progress Energy Florida – Bartow Plant, 1601 Weedon Island Drive, St. Petersburg, Pinellas County, Florida, 33702. NPDES #FL0000132. Effluent samples for this facility were collected on September 22, 2008. Additional samples for bioassay testing were collected on September 29, 2008, due to damaged containers/contaminated samples from the September 22nd event. Bioassay samples were also collected on October 13, 2008 due to an invalidated fish bioassay test from the September 29th event.

Introduction

The Progress Energy Florida-Bartow Power Plant is an electric power generating facility. The facility consists of three steam-electric power generating units with a total name plate rating of 495 Megawatts (MW). The plant has a once through condenser cooling water system that uses water from Tampa Bay, a Class II Marine water body. Once through cooling water and auxiliary cooling water from units 1, 2, and 3 is discharged to the facility's discharge canal and then to Tampa Bay through Outfall D-001. Outfall D-001 is located approximately at latitude 27º 51' 52" N, longitude 82º 36' 6.9" W. Effluent discharge from the facility is continuous. The facility does not have a permitted flow capacity and discharge is "report" only. The annual average daily flow (AADF) through the facility from July 2007 through August 2008 was 443 million gallons per day (MGD). Wastewater from the facility consists of:

- once through cooling water;
- intake screen wash water;
- metal cleaning wastes; and,
- low volume wastes; consisting of:
  - boiler blowdown;
  - surface and equipment wash down waste;
  - demineralizer regeneration waste; and,
  - reverse osmosis reject.

Stormwater is discharged to Tampa Bay from plant areas (Outfalls D-100, D-200, D-300, D-400, D-500, and D-600) including the diked petroleum storage and handling areas (Outfall D-00B). Intake screen wash water is also discharged to Tampa Bay via Outfall D-009. Outfall D-00B is located approximately at latitude 27º 51' 52.7" N, longitude 82º 36' 6.9" W. Outfall D-009 is located approximately at latitude 27º 51' 52.9" N, longitude 82º 35' 55.9" W. Cooling water is intermittently treated for bio-fouling control. Metal cleaning wastes and low volume wastes are treated by neutralization and oil separation, as necessary, and discharged to groundwater via the onsite evaporation/percolation pond system.

The facility has no Administrative Orders, Consent Orders or mixing zones. A review of Discharge Monitoring Report (DMR) data did not reveal any violations of permit conditions. (Facility information provided by Jason Cohen of FDEP Southwest District.)

Methods

On September 22, 2008, samples for bioassays and chemical analyses were collected from the EFF-4 NPDES sampling point for Outfall D-001 by Jason Cohen and Peter Wenner (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/qa/sops.htm.

The bioassays for the samples collected on 9/22/08 were not performed due to samples being damaged/contaminated during shipping.

On September 29, 2008, bioassay samples were again collected from the EFF-4 NPDES sampling point for Outfall D-001 by Jason Cohen. Due to an invalid fish bioassay, additional bioassay samples were collected on October 13, 2008, by Jason Cohen.

See Appendix A for the completed chain of custody forms.

The 48-hour screening toxicity tests and algal growth potential test were performed following internal DEP SOPs TA07_03, TA07_04, 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.

Toxicity Test Results

Tests performed September 30 – October 2, 2008.

Americamysis bahia 48-hour acute screening bioassay – LC_{50} > 100%, 0% mortality* in 100% sample t 48 hours

Menidia beryllina 48-hour acute screening bioassay – No Result
Test invalidated at 48 hours due to excess control mortality (15% mortality, 10% control mortality allowed)

Tests performed October 14 - 16, 2008.

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

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

The bioassay samples in the valid tests 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 3.0 AU (A – Value reported is the mean of two or more determinations; 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). The analytical chemistry suggests that the effluent is nitrogen-limited (Table 1; Maloney et al. 1974).

Due to the apparent salinity of the sample, an AGP test with the freshwater species, *Pseudokirchneriella subcapitata*, was not performed.

See Table 1 for AGP results

Chemistry Results

Total residual chlorine and total ammonia were not detected in the bioassay laboratory in the bioassay samples that were collected on September 29 or October 13, 2008. The total ammonia concentration in the sample collected (September 22, 2008) and preserved for chemical analysis was 0.019 mg/L I (I – the reported value is between the laboratory method detection limit (MDL) and the laboratory practical

quantitation limit (PQL)). Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was < 0.02 mg/L.

No substances of concern were detected in the effluent at levels that violate Class II Marine water quality criteria (62-302.530, F.A.C.). Arsenic, nickel and zinc were detected between their respective laboratory MDL(s) and PQL(s).

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 samples collected from Outfall D-001 for this facility on September 29 and October 13, 2008, were not acutely toxic to either test species during the 48-hour acute screening bioassays. The *Menidia beryllina* bioassay performed on September 30, 2008, was invalidated due to excess control mortality. The effluent AGP result was less than the "problem" threshold for marine receiving waters. Effluent water quality samples did not exceed any applicable water quality standards or violate any permit conditions.

Literature Cited

Maloney, T. E., W. E. Miller, and D. T. Specht. 1974. The Marine Algal Assay Procedure: Bottle Test. National Environmental Research Center Office of Research and Development. U. S. EPA, Corvallis, Oregon. 43 p.

Table 1. 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 Progress Energy Florida - Bartow Power Plant on September 22, 2008.

Progress Energy Florida - Bartow Plant			
Location	AGP (measured)	Inorganic N:P ratio	Total N:P ratio
Effluent	3.0 AU	0.3	5.7

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

U - Material was analyzed for but not detected. Value reported is the minimum detection limit.

Table 2. Effluent limits, Class I Criteria for predominantly marine waters and chemical and microbiological data for samples collected from the Progress Energy Florida - Bartow Power Plant on September 22, 2008.

Progress Energy Florida - Bartow Power Plant NPDES# FL0000132	Class III Criteria	Effluent Limits	Effluent D-001	
Organic Constituents (µg/L)				
No samples collected/analyzed	-	-	-	
Metals (µg/L unless otherwise noted)				
Aluminum	≤ 1500	-	180	U
Arsenic	≤ 50	-	2.6	I
Cadmium	≤ 8.8	-	0.06	U
Calcium (mg/L)	-	-	341	
Chromium-III	-	-	1.5	U
Copper	≤ 3.7	-	1.5	U
Iron	≤ 300	-	90	U
Lead	≤ 8.5	-	0.6	U
Magnesium (mg/L)	-	-	1050	
Nickel	≤ 8.3	-	0.82	I
Selenium	≤ 71	-	1.5	U
Silver	≤ 2.3	-	0.075	U
Zinc	≤ 86	-	17	I
Nutrients (mg/L)				
Ortho-phosphate	-	-	0.092	
Total Phosphorus	-	-	0.13	
Total Ammonia	-	-	0.019	I
Un-ionized Ammonia	-	-	≤ 0.02	c
Nitrate and Nitrite	-	-	0.008	I
Total Kjeldahl Nitrogen	-	-	0.73	
Organic Nitrogen	-	-	0.711	c
Total Nitrogen	-	-	0.738	c
General Physical and Chemical Parameters				
Dissolved Oxygen (mg/L)	≥ 4.0	-	5.0	
pH (SU)	6.5 - 8.5	6.5 - 8.5 s	7.7	
Conductivity (µmhos/cm)	-	-	40,909	
Temperature °C	-	Report	36.0	
Sample Depth (m)	-	-	0.2	
Total Residual Chlorine (mg/L)	≤ 0.01	-	≤ 0.03	£QU
Total Residual Oxidants	-	≤ 0.01	-	
Chlorophyll a (µg/L) - Corrected	-	-	2.8	
Phaeophytin (µg/L)	-	-	1.1	
Total Suspended Solids (mg/L)	-	-	5	I
CBOD, 5 day (mg/L), N - inhibited	-	-	3.9	
Flow (MGD)	-	Report	443	a
Hardness (mg $CaCO_3$)	-	-	5175.38	c
Microbiology (Number of colony forming units/100ml)				
Fecal Coliforms	≤ 400s #	-	2	B

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
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
Q - Sample held beyond normal holding time
U - Material analyzed for but not detected; value reported is the method detection limit
- If 10 or fewer samples are taken within a month, the single sample limit is 400 CFU (62-302.530(6), F.A.C.)
£ - Analysis performed in bioassay laboratory

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2008-09-22-15
Progress Energy Florida - Bartow Plant

Requester: Jennifer Paris
Field Report Prepared By:

Customer: SW-DIST
Collected By: PETE WENNER, JASON BOLEN
Send Final Report To Ilia Balcom

Project ID: FYI3
Sampling Agency: FDEP SW DISTRICT

PMAS: 1143

Lab ID *	Location		Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	D-001	36782	☐ Comp ☑ Grab	Date 9/22/08 Time 1210 Eastern Central	Date Time Eastern Central	A
	Field ID: 36782		Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L): 4.98	Storet Station Number:	
	Matrix (Include type e.g. Salt, Fresh, etc): SALT	Temp (C): 36.00	pH: 7.74	Sample Depth: 0.2 ☑ m ☐ ft	25.95 / 40909 ☑ Salinity (PPTh) ☑ Sp Conductance (umho/cm)	NPDES Number:
	Latitude: 27 51 50.8	Longitude: 82 36 06.7		Comments: DO% 83.4 Acid Time 1017		

Lab ID *	Location		Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	BLANK	36783	☐ Comp ☑ Grab	Date 9/22/08 Time 947 Eastern Central	Date Time Eastern Central	B
	Field ID: 36783		Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L):	Storet Station Number:	
	Matrix (Include type e.g. Salt, Fresh, etc): LAB DI WATER	Temp (C):	pH:	Sample Depth: ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number:
	Latitude: o ' "	Longitude: o ' "		Comments: Acid Time 951		

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

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
		☐ Comp ☐ Grab	Date Time Eastern Central	Date Time Eastern Central	
	Field ID	Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L):	Storet Station Number:	
	Matrix (Include type e.g. Salt, Fresh, etc): Temp (C): pH:	Sample Depth: ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number:	
	Latitude: o ' " Longitude: o ' "	Comments: Thursday Receipt Tox by -JP 9.23.08 1130			

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
	09/22/08 1700	DHL						9.23.08 10:20

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Request Number: RQ-2008-09-22-15
Progress Energy Florida - Bartow Plant

Event ID *

Requester: Jennifer Paris
Field Report Prepared By:

Customer: SW-DIST
Collected By: PETE WENNER
Send Final Report To: Ilia Balcom

Project ID: FYI3
Sampling Agency: DEP SW DISTRICT

PMAS: 1143

Lab ID *	Location				Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	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 27° 51' 50.8"	Longitude 82° 36' 06.7"			Comments	No YSI AVAILABLE		
	Location				☐ Comp ☐ Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	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 o ' "	Longitude o ' "			Comments			
	Location				☐ Comp ☐ Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	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 o ' "	Longitude o ' "			Comments			
	Location				☐ Comp ☐ Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	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 o ' "	Longitude o ' "			Comments			

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
	9/29/08	DHL	RLW	9/30/08 840A				

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2008-09-22-15
Progress Energy Florida - Bartow Plant

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

Requester: Jennifer Paris
Collected By: P WENNER, J COHEN
Sampling Agency: FDEP SW DISTRICT

Field Report Prepared By:
Send Final Report To Ilia Balcom

Lab ID *	Location		Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	D001	36851	☐ Comp ☑ Grab	Date 10/13/08 Time 1050 Central	Date Time Central	A
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L) 2.28	Storet Station Number	
	Matrix (Include type e.g. Salt, Fresh, etc) SALT	Temp (C) 35.65 pH 7.97	Sample Depth 0.2 ☑ m ☐ ft	27.71 / 43540 ☑ Salinity (PPTh) ☑ Sp Conductance (umho/cm)	NPDES Number	
	Latitude 27° 51' 50.8"	Longitude 82° 36' 06.7"	Comments 38.3 DO%			

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

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

Lab ID *	Location		Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
			☐ Comp ☐ Grab	Date Time Central	Date Time Central	
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	
	Matrix (Include type e.g. Salt, Fresh, etc	Temp (C) pH	Sample Depth ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number	
	Latitude ° ' "	Longitude ° ' "	Comments 2 bioassay Rec'd via Fax by SD 10/14/08 0940			

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
	10/13/08 1500	DHL	Tahmoures Ebrahimi	10/14/08 8:45				

* 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: Progress Energy Bartow
Address: 1601 Weedon Island Drive
City: St. Petersburg County: Pinellas 33702
Contact/District: Peter Wagner / Southwest
NPDES Permit #: FL 0000132
LIMS Job #: TLH-2008-09-30-01 LIMS Sample #: 1136316
Lims Data Entry: MF 10-9-08 Data Entry Verification: BA 10-9-08

Sample Collection: Date: 9-29-08 Time: 1305
Hold Time Start: Date: 9-29-08 Time: 1305

Comments:
Remdis beryllium test invalidated at 48 hours due to excess control mortality MF 10-7-08
NCR 2952 created.

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 03
Control survival ≥90%: Yes No
Temperature Range ≤3°C: Yes No

Test 2 validation: Test 2: SOP TA 07 04
Control survival ≥90%: Yes No 15% mortality at 48hours
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. 25.0 max. 25.8 mean 25.4
Incubator # ____ min. ____ max. ____ mean ____
Waterbath # ____ min. ____ max. ____ mean ____
Room B246 min. 25.3 max. 26.4 mean 25.8

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
James David
Marshall Fairchild
Sue Ann
Lolitta Culaff
REVIEWER

Batch #				9-30-08	9-30-08				
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	N/A	Not measured		MF
Lab Total Residual Cl_2 (mg/L):				<0.03	<0.03		<0.03	JD	BA
Alkalinity (mg/L as $CaCO_3$):				224	224		140	BA	MF
Hardness (mg/L as $CaCO_3$):				—	—		—	—	—
Total Ammonia (mg/L as N):				<0.034	<0.034	(A) <0.85 ~~0.034~~ 0.051		MF	BA
Conductivity: µmhos (mmhos)				38.2	38.2		43.1	JD	BA
Salinity (ppth):				24.2	24.2		28.0	JD	BA

(A) Forgot to multiply by dilution factor of 3. MF. 9-30-08

V1.6 7/8/08

Page MF 10-23-08 Registration correction
~~0000025~~ 00 031

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 113636   Test #: 1/2   SOP#:TA 07 03   Test Started: Date 9-30-08 Time: 1150
Organism/Batch/Age: Abahis / 9-30-08 / 5 days   Test Ended: Date 10-2-08 Time: 1045
Chamber/Test Volume: 1000 / 500 ml   Diluent/ Batch: 25‰ ASW / 9.22.08   Test Duration: 48 hr / 96 hr

Food/Batch: [ ] YCT____ [ ] P.sub____
[X] Artemia Lot# 38438   Batch #: 0hr 141 24hr 142 48hr____ 72hr____

Feeding: [X] Prior to Test [X] 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	C17	5	5	5			
	B	C18	5	5	5			
	C	C19	5	5	5			
	D	C20	5	5	5			
100%	A	C21	5	5	5			
	B	C22	5	5	5			
	C	C23	5	5	5			
	D	C24	5	5	5			
Loaded/Verified by: / mF		Checked by:	MF	SP	MF			

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%
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).

MF 10-23-08 Pagination correction

00 032 Page ~~000026~~

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1136316 Test #: 2/2 SOP#:TA 07 04 Test Started: Date 9-30-08 Time: 1145

Organism/Batch/Age: M.beryllina / 9-30-08 / 13 days Test Ended: Date 10-2-08 Time: 1045

Chamber/Test Volume: 1000 / 500 ml Diluent/ Batch: 20‰ ASW / 9.22.08 Test Duration: (48) hr 96 hr

Food/Batch: [ ] YCT____ [ ] P.sub____

[X] Artemia Lot# 38438 Batch #: 0hr 141 24hr____ 48hr____ 72hr____

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

Concentration	Replicate	Chamber #	Test Hour 0 hr (A)	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
ctrl	A	B1	(A) ~~10~~ 10	10	8			
	B	B2	(A) ~~10~~ 10	9 1D	9			
	C	~~B3~~ (B)	(A) ~~10~~					
	D	~~B4~~	(A) ~~10~~					
100%	A	B5	(A) ~~10~~ 10	9 1D	9			
	B	B6	(A) ~~10~~ 10	8 2D	8			
	C	~~B7~~	(A) ~~10~~					
	D	~~B8~~	(A) ~~10~~					
			(A) MF recorded cancelled in error	2#'s 10-2-08				

Loaded/Verified by: / MF Checked by: MF | JD | MF | mf 10-2-08 initial cancelled in error MF

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

Comments: (A) recorded wrong #'s MF -9-30-08 (B) chambers B3 B4 B7 B8 not used. JD 9.30.08

Test Results:

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

% mortality in 100% sample: 15 LC50: NO Result

If Calculated: 95% CI______ Method______

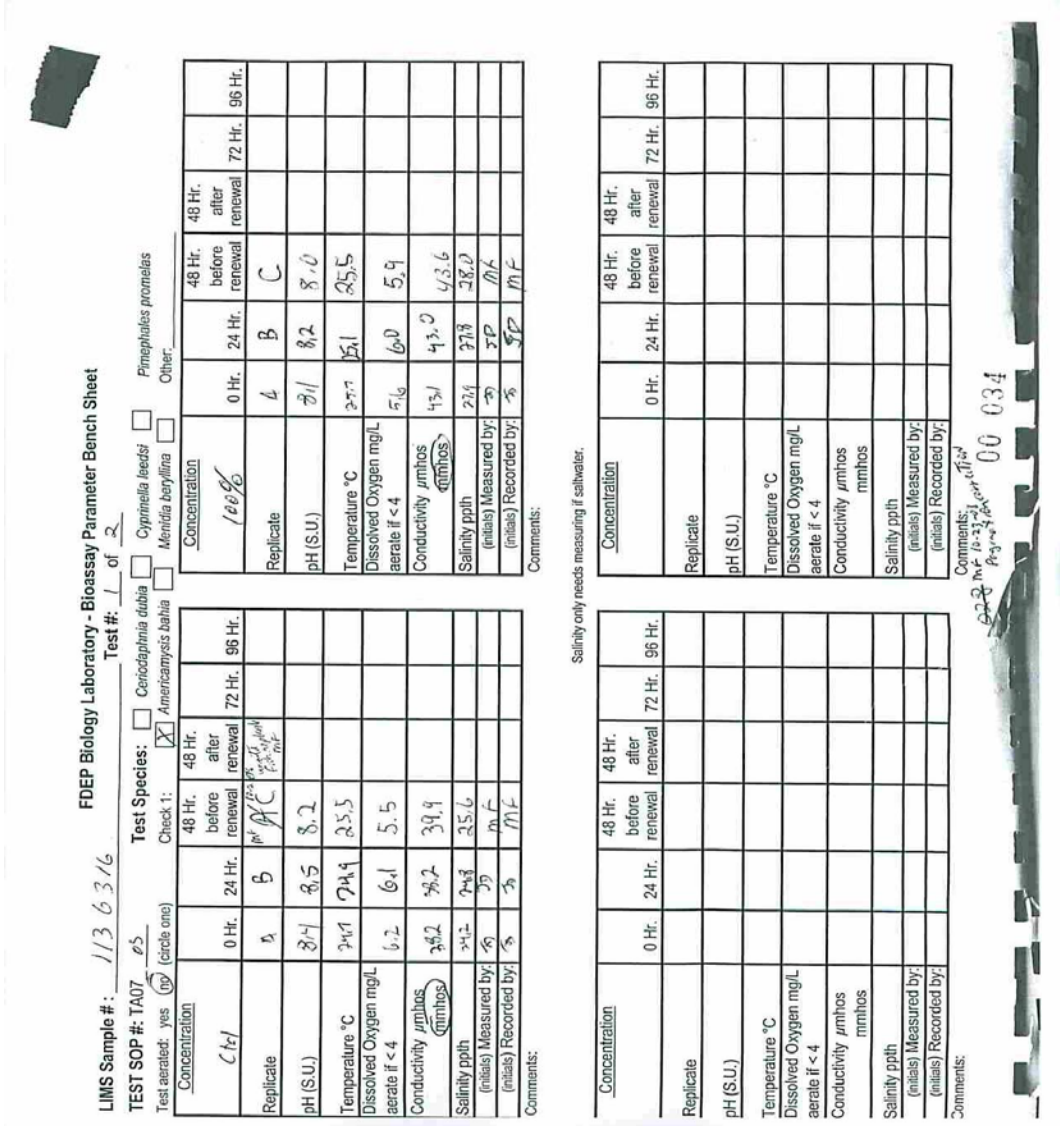
Test invalid excess control mortality at 48 hours MF 12-1-08

V 2.3 7/15/2008

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

Page ~~000027~~ MF 10-23-08 Pagination correction 00 033

Appendix B. (continued)



FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample #: 113 6316 Test #: 1 of 2

TEST SOP #: TA07 05 Test Species: ☐ Ceriodaphnia dubia ☐ Cyprinella leedsi ☐ Pimephales promelas

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

Concentration Ctrl	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	MF 10:45 MC			
pH (S.U.)	8.4	8.5	8.2			
Temperature °C	24.1	24.9	25.5			
Dissolved Oxygen mg/L aerate if < 4	6.2	6.1	5.5			
Conductivity µmhos (mmhos)	38.2	38.2	39.9			
Salinity ppth	24.2	24.3	25.6			
(initials) Measured by:	AC	JP	MF			
(initials) Recorded by:	AC	AC	MF			

Comments:

Concentration 100%	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	8.2	8.0			
Temperature °C	23.7	25.1	25.5			
Dissolved Oxygen mg/L aerate if < 4	5.6	6.0	5.9			
Conductivity µmhos (mmhos)	43.1	43.0	43.6			
Salinity ppth	23.9	27.8	28.0			
(initials) Measured by:	AC	JP	MF			
(initials) Recorded by:	AC	JP	MF			

Comments:

Salinity only needs measuring if saltwater.

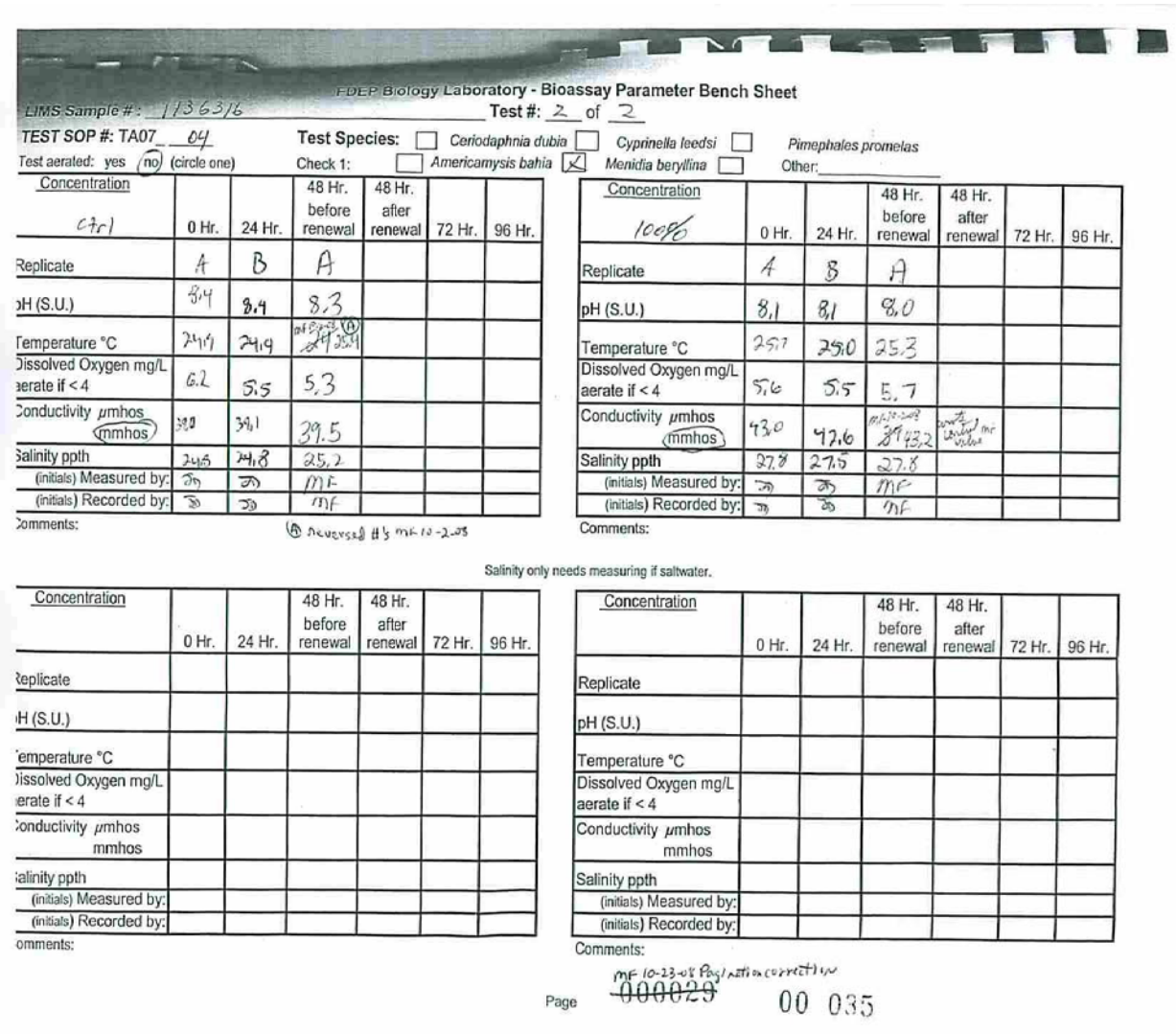
Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate						
pH (S.U.)						
Temperature °C						
Dissolved Oxygen mg/L aerate if < 4						
Conductivity µmhos mmhos						
Salinity ppth						
(initials) Measured by:						
(initials) Recorded by:						

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:

0034



FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample #: 113316 Test #: 2 of 2

TEST SOP #: TA07_04 Test Species: ☐ Ceriodaphnia dubia ☐ Cyprinella leedsi ☐ Pimephales promelas

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

Concentration ctrl	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	A			
pH (S.U.)	8.4	8.4	8.3			
Temperature °C	24.9	24.9	24.9 (A)			
Dissolved Oxygen mg/L aerate if < 4	6.2	5.5	5.3			
Conductivity µmhos (mmhos)	39.0	39.1	39.5			
Salinity ppth	24.5	24.8	25.2			
(initials) Measured by:	JD	JD	MF			
(initials) Recorded by:	JD	JD	MF			

Comments: (A) reversed #'s MF 10-2-08

Concentration 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	A			
pH (S.U.)	8.1	8.1	8.0			
Temperature °C	25.1	25.0	25.3			
Dissolved Oxygen mg/L aerate if < 4	5.6	5.5	5.7			
Conductivity µmhos (mmhos)	43.0	42.6	MF 10-2-08 39 43.2	correct reading MF		
Salinity ppth	27.8	27.5	27.8			
(initials) Measured by:	JD	JD	MF			
(initials) Recorded by:	JD	JD	MF			

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: MF 10-23-08 Pagination correction

Page ~~000029~~ 00 035

Appendix B. (continued)

Bioassay Instrument ID

Test ID: Progress Energy Bartow Dates: 9-30-08 — 10-2-08

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

MF 10-23-08 Registration correction
~~000050~~ 00 036

PAGE

FDEP Biology Laboratory - Acute Screen Bioassay Bench Sheets

Facility: Barton, Progress Energy

Address: 1601 Weedon Island Drive

City: St. Petersburg County: Pinellas 33702

Contact/District: Peter Wenner / Southwest

NPDES Permit #: FL 0000132

LIMS Job #: 1138632 (MF sample # in TOB spreadsheet MF 10-16-08) TLH-2008-10-14-15

LIMS Sample #: MF 1138632

Lims Data Entry: 10-16-08 MF

Data Entry Verification: JD 10.16.08

Sample Collection: Date: 10-13-08 Time: 1050

Hold Time Start: Date: 10-13-08 Time: 1050

Comments: Retest of Samples tested on 9-30-08 in which there was a control failure in the Menidia beryllina test. MF 10-14-08

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_03
Control survival ≥90%: (Yes) No
Temperature Range ≤3°C: (Yes) No

Test 2 validation:
Test 2: SOP TA 07_04
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. 25.7 max 26.5 mean 26.1
Incubator # ____ min._____ max._____ mean_____
Waterbath # ____ min._____ max._____ mean_____
Room B246 min. 25.1 max. 25.7 mean 25.4

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

James Daniel

Marshall Faircloth

Bruce Neal

Kristin C. Wolfe

REVIEWER

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
Batch #				10-13-08					
Field Total Residual Cl_2 (mg/L):	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	JD	MF
Alkalinity (mg/L as $CaCO_3$):				226	226		140	BA	MF
Hardness (mg/L as $CaCO_3$):				—	—		—	—	—
Total Ammonia (mg/L as N):				<0.051	<0.051		<0.051	MF	BA
Conductivity: µmhos (mmhos)				42.6	42.6		44.0	JD	BA
Salinity (ppth):				27.5	27.5		28.1	JD	BA

V 1.6 7/8/08

Appendix B. (continued)

[redacted]

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1138632 Test #: 1/2 SOP#:TA 07 03 Test Started: Date 10.14.08 Time: 1230

Organism/Batch/Age: A.bahia/10.14.08/5days Test Ended: Date 10.16.08 Time: 1030

Chamber/Test Volume: 1000 / 500 ml Diluent/ Batch: ASW 30‰ / 9.30.08 Test Duration: 48 hr (48) hr JD 10/16 10.14.08

Food/Batch: ☐ YCT____ ☐ P.sub____

☑ Artemia: 0hr 179 24hr 150 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	A9	5	5	5			
	B	A10	5	5	5			
	C	A11	5	5	5			
	D	A12	5	5	5			
100%	A	A13	5	5	5			
	B	A14	5	5	5			
	C	A15	5	5	5			
	D	A16	5	5	5			
Loaded/Verified by: JD / KB		Checked by:	JD	JD	JD			

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).

Page

00 002

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1138632 Test #: 2/2 SOP#:TA 07_04 Test Started: Date 10.14.08 Time: 1355

Organism/Batch/Age: Abery/lim/10.14.08/13 days Test Ended: Date 10.16.08 Time: 1035

Chamber/Test Volume: 1000 / 500 ml Diluent/ Batch: ASU 30‰ 9.30.08 Test Duration: 48 hr / 96 hr

Food/Batch: ☐ YCT____ ☐ P.sub____

☑ Artemia: 0hr 149 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	A17	5	5	5			
	B	A18	5	5	5			
	C	A19	5	4/D	4			
	D	A20	5	5	5			
100%	A	A21	5	5	5			
	B	A22	5	5	5			
	C	A23	5	5	5			
	D	A24	5	5	5			
Loaded/Verified by: JD / BD		Checked by:	JD	JD	JD			

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).

Page 00 003

FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

MS Sample #: 1138632 Test #: 1 of 2

ST SOP #: TA07_03 Test Species: ☐ Ceriodaphnia dubia ☐ Cyprinella leedsi ☐ Pimephales promelas

st aerated: yes no (circle one) Check 1: ☒ Americamysis bahia ☐ Menidia beryllina ☐ Other:

Concentration Ctrl	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
eplicate	A	B	C			
H (S.U.)	8.3	8.2	8.0			
emperature °C	24.2	24.1	24.2			
Dissolved Oxygen mg/L erate if < 4	6.5	5.1	5.7			
Conductivity µmhos (mmhos)	42.6	42.9	44.4			
Salinity ppth	27.5	27.8	29.0			
(initials) Measured by:	JD	JD	JD			
(initials) Recorded by:	JD	JD	JD			

Comments:

Concentration 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C			
pH (S.U.)	8.2	8.0	7.9			
Temperature °C	24.9	24.5	24.2			
Dissolved Oxygen mg/L aerate if < 4	5.7	5.3	5.2			
Conductivity µmhos (mmhos)	44.5	43.8	45.0			
Salinity ppth	28.1	28.1	29.4			
(initials) Measured by:	JD	JD	JD			
(initials) Recorded by:	JD	JD	JD			

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:

FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample # : 1138632 Test #: 2 of 2

TEST SOP #: TA07_ 04 **Test Species:** ☐ *Ceriodaphnia dubia* ☐ *Cyprinella leedsi* ☐ *Pimephales promelas*

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

Concentration ctrl	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C			
pH (S.U.)	8.3	8.3	8.3			
Temperature °C	24.0	24.1	24.2			
Dissolved Oxygen mg/L aerate if < 4	6.3	5.7	5.7			
Conductivity ~~µmhos~~ A ~~mmhos~~	42.9	44.5	45.5			
Salinity ppth	28.1	28.5	29.2			
(initials) Measured by:	JD	JD	JD			
(initials) Recorded by:	JD	JD	JD			

Comments: (A) 10.14.08 JD wrong circle.

Concentration 100%	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	8.1			
Temperature °C	25.9	24.5	24.2			
Dissolved Oxygen mg/L aerate if < 4	5.6	5.8	6.0			
Conductivity µmhos ~~mmhos~~	44.0	43.8	44.9			
Salinity ppth	28.1	28.1	29.1			
(initials) Measured by:	JD	JD	JD			
(initials) Recorded by:	JD	JD	JD			

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: Passaic Energy Barrier P/Acut Dates: 10-14-08 - 10-16-08

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

PAGE 00 006

Appendix C. SRT Bench Sheets and Statistical Analysis

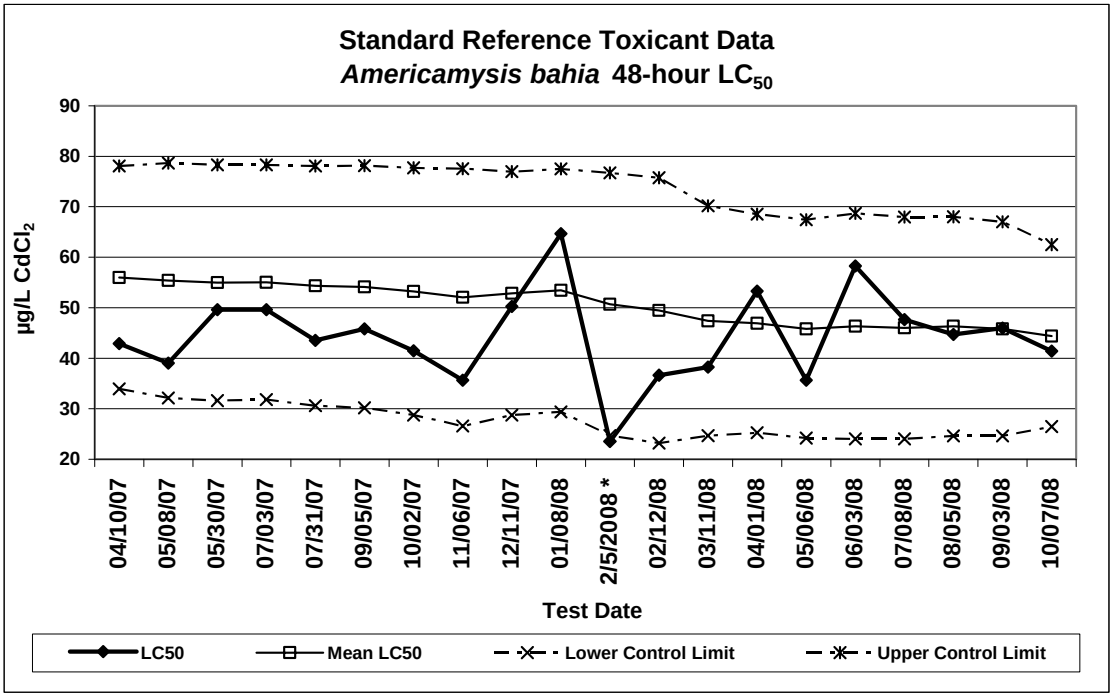
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 48-hour Acute Toxicity
Americamysis bahia (mysid shrimp) - Cadmium Chloride ($CdCl_2$)

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
04/10/07	42.91	56.00	11.04	33.91	78.08
05/08/07	39.00	55.42	11.63	32.16	78.68
05/30/07	49.64	54.95	11.67	31.62	78.29
07/03/07	49.64	55.04	11.62	31.80	78.27
07/31/07	43.54	54.34	11.88	30.58	78.10
09/05/07	45.79	54.15	11.99	30.17	78.13
10/02/07	41.44	53.25	12.24	28.76	77.73
11/06/07	35.65	52.06	12.76	26.55	77.57
12/11/07	50.27	52.86	12.06	28.75	76.98
01/08/08	64.65	53.42	12.03	29.36	77.48
2/5/2008 *	23.52	50.68	13.02	24.64	76.72
02/12/08	36.63	49.45	13.14	23.17	75.74
03/11/08	38.21	47.42	11.38	24.66	70.19
04/01/08	53.27	46.90	10.82	25.26	68.53
05/06/08	35.65	45.82	10.81	24.19	67.45
06/03/08	58.28	46.36	11.17	24.03	68.69
07/08/08	47.67	46.00	10.99	24.02	67.98
08/05/08	44.68	46.32	10.84	24.63	68.01
09/03/08	45.94	45.82	10.60	24.62	67.02
10/07/08	41.43	44.39	8.96	26.47	62.51

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

CV = 20.18
EPA reference 75th quartile CV = 26%



* Test result exceeded control limits on 2/5/2008. Test repeated on 2/12/2008.

Appendix C. (continued)

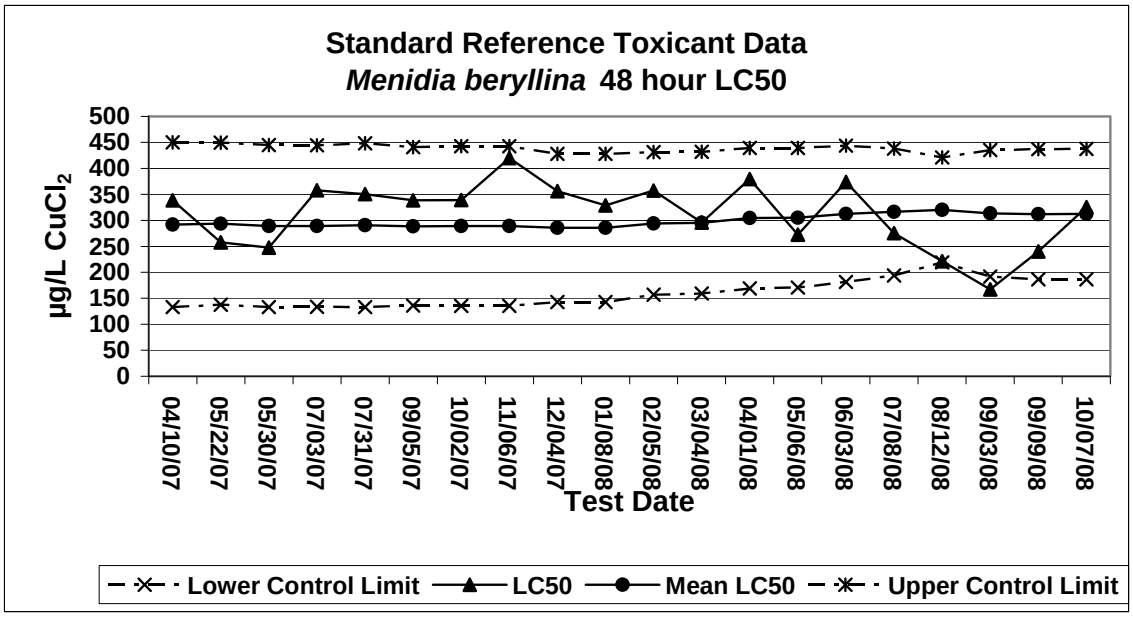
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - Acute Toxicity
Menidia beryllina (Inland silverside) - Copper Chloride ($CuCl_2$)

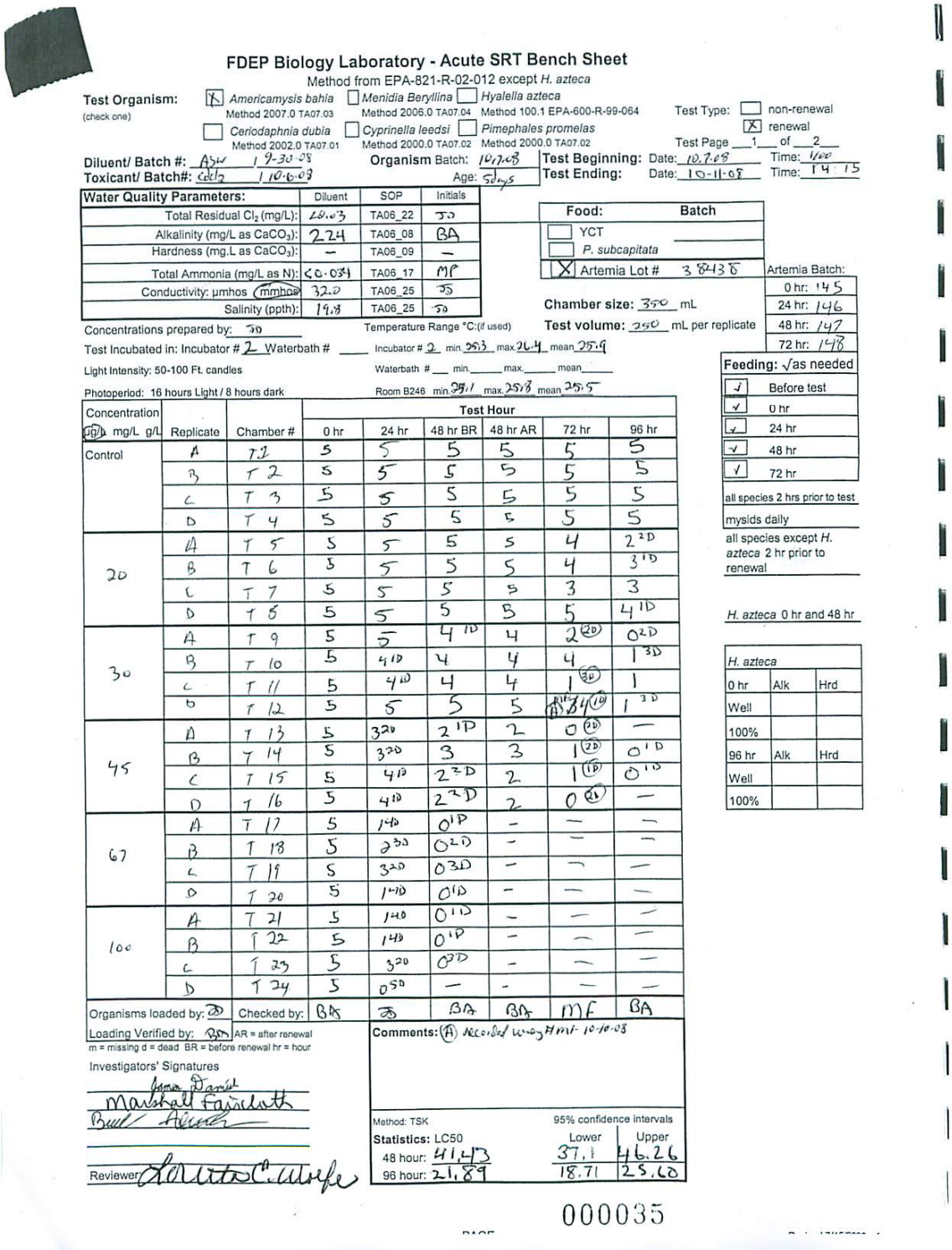
Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
04/10/07	338.35	291.67	79.2	133.3	450.0
05/22/07	257.44	293.42	77.9	137.6	449.3
05/30/07	247.36	289.10	78.0	133.2	445.0
07/03/07	357.65	288.79	77.7	133.4	444.1
07/31/07	350.68	290.88	78.8	133.3	448.5
09/05/07	338.18	288.38	76.3	135.8	441.0
10/02/07	338.90	289.15	76.7	135.7	442.6
11/06/07	419.55	289.15	76.7	135.7	442.6
12/04/07	356.07	285.50	71.3	143.0	428.0
01/08/08	329.03	285.29	71.1	143.0	427.5
02/05/08	357.47	294.07	68.5	157.1	431.0
03/04/08	295.52	295.31	68.1	159.3	431.9
04/01/08	379.50	304.05	67.5	169.0	439.1
05/06/08	272.50	304.73	67.1	170.5	438.9
06/03/08	373.47	312.52	65.5	181.5	443.5
07/08/08	275.20	316.13	61.0	194.2	438.1
08/12/08	221.17	320.17	50.5	219.2	421.1
09/03/08	167.46	313.48	60.9	191.7	435.3
09/09/08	240.07	311.58	62.6	186.3	436.9
10/07/08	325.55	312.05	62.7	186.6	437.5

Means are of the last 20 SRT tests.

EPA reference 75th quartile CV = 21% **CV = 20.10**



Appendix C. (continued)



FDEP Biology Laboratory - Acute SRT Bench Sheet

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

Test Organism: (check one) [X] *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 [X] renewal

Test Page 1 of 2

Diluent/ Batch #: ASW 19-30-08

Toxicant/ Batch#: $CdCl_2$ 110-6-08

Organism Batch: 10.7.08 Age: 5 days

Test Beginning: Date: 10.7.08 Time: 1100

Test Ending: Date: 10-11-08 Time: 14:15

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	JD
Alkalinity (mg/L as $CaCO_3$):	224	TA06_08	BA
Hardness (mg.L as $CaCO_3$):	—	TA06_09	—
Total Ammonia (mg/L as N):	<0.03	TA06_17	MF
Conductivity: µmhos (mmhos)	32.0	TA06_25	JD
Salinity (ppth):	19.8	TA06_25	JD

Food:	Batch
[ ] YCT	
[ ] *P. subcapitata*	
[X] Artemia Lot #	38436

Artemia Batch:

0 hr: 145

24 hr: 146

48 hr: 147

72 hr: 148

Concentrations prepared by: JD

Test Incubated in: Incubator # 2 Waterbath # ____

Temperature Range °C:(if used)

Incubator # 2 min 25.3 max 26.4 mean 25.9

Waterbath # ___ min.____ max.____ mean____

Room B246 min 25.1 max 25.8 mean 25.5

Chamber size: 350 mL

Test volume: 250 mL per replicate

Light Intensity: 50-100 Ft. candles

Photoperiod: 16 hours Light / 8 hours dark

Feeding: √as needed

- [√] Before test
- [√] 0 hr
- [√] 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 (ppb) mg/L g/L	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	A	T1	5	5	5	5	5	5
	B	T2	5	5	5	5	5	5
	C	T3	5	5	5	5	5	5
	D	T4	5	5	5	5	5	5
20	A	T5	5	5	5	5	4	2 2D
	B	T6	5	5	5	5	4	3 1D
	C	T7	5	5	5	5	3	3
	D	T8	5	5	5	5	5	4 1D
30	A	T9	5	5	4 1D	4	2 (2D)	0 2D
	B	T10	5	4 1D	4	4	4	1 3D
	C	T11	5	4 1D	4	4	1 (3D)	1
	D	T12	5	5	5	5	A:3 4 (1D)	1 3D
45	A	T13	5	3 2D	2 1D	2	0 (2D)	—
	B	T14	5	3 2D	3	3	1 (2D)	0 1D
	C	T15	5	4 1D	2 2D	2	1 (1D)	0 1D
	D	T16	5	4 1D	2 2D	2	0 (2D)	—
67	A	T17	5	1 4D	0 1D	—	—	—
	B	T18	5	2 3D	0 2D	—	—	—
	C	T19	5	3 2D	0 3D	—	—	—
	D	T20	5	1 4D	0 1D	—	—	—
100	A	T21	5	1 4D	0 1D	—	—	—
	B	T22	5	1 4D	0 1D	—	—	—
	C	T23	5	3 2D	0 3D	—	—	—
	D	T24	5	0 5D	—	—	—	—
Organisms loaded by: JD		Checked by:	BA	JD	BA	BA	MF	BA

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

Loading Verified by: BA AR = after renewal

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

Comments: (A) Recorded wrong Hmf 10-10-08

Investigators' Signatures

James Daniel

Marshall Faircloth

Brad Hems

Reviewer Charlotte C. Wolfe

Method: TSK

Statistics: LC50

	95% confidence intervals Lower	Upper
48 hour: 41.43	37.1	46.26
96 hour: 21.89	18.71	25.60

000035

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)
- [X] *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: 10.7.08 Time: 1100
Test Ending: Date: 10.11.08 Time: 1415

Test Type: [ ] non-renewal [X] renewal

hr = hour AR = after renewal BR = before renewal

corrected in imprint error MF 10-13-08

Concentration µg/L mg/L g/L	Replicate	Test Hour	pH (SU)	Temperature (° C)	Dissolved Oxygen (mg/L)	Conductivity [ ] µmhos [X] mmhos	Salinity (ppth)
Control	A	0 hr	8.4	24.1	6.7	32.0	19.8
	B	24 hr	8.2	24.3	5.5	32.2	20.2
	C	48 hr BR	8.0	24.2	5.0	33.0	20.6
	C	48 hr AR	8.3	24.0	6.3	31.7	19.8
	D	72 hr	8.2	24.0	5.4	32.2	20.1
	A	96 hr	8.1	24.0	5.3	33.1	20.8
20	A	0 hr	8.4	24.2	6.7	32.1	20.0
	B	24 hr	8.2	24.2	5.4	32.5	20.4
	C	48 hr BR	8.1	24.3	4.8	33.2	20.8
	C	48 hr AR	8.4	24.0	6.3	32.2	20.1
	D	72 hr	8.1	24.0	5.2	32.4	20.2
	A	96 hr	8.1	24.2	5.3	33.1	20.7
30	A	0 hr	8.4	24.3	6.8	32.1	20.1
	B	24 hr	8.2	24.1	5.3	32.6	20.4
	C	48 hr BR	8.1	24.1	4.9	33.0	20.6
	C	48 hr AR	8.4	24.1	6.3	32.3	20.1
	D	72 hr	8.2	24.1	4.9	32.5	20.3
	A	96 hr	8.1	24.1	5.1	33.0	20.6
45	A	0 hr	8.4	24.2	6.9	32.2	20.1
	B	24 hr	8.2	24.1	5.2	32.7	20.5
	C	48 hr BR	8.1	24.1	4.9	33.2	20.7
	C	48 hr AR	8.4	24.1	6.3	32.3	20.1
	D	72 hr	8.2	24.1	5.0	32.4	20.2
	A	96 hr	8.1	24.1	5.2	33.1	20.7
67	A	0 hr	8.4	24.2	7.0	31.6	19.6
	B	24 hr	8.2	24.1	5.2	32.2	20.1
	C	48 hr BR	8.2	24.1	4.9	32.4	20.2
		48 hr AR		Tot trans mort MF for JD 10-13-08			
		72 hr					
		96 hr					
100	A	0 hr	8.4	24.2	7.0	32.3	20.2
	B	24 hr	8.2	24.0	5.4	33.7	21.2
	C	48 hr BR	8.2	24.1	5.1	33.1	20.7
		48 hr AR					
		72 hr					
		96 hr					

Investigators Signatures
James Daniel
Marshall Faircloth
Bruce Ace

Reviewed By: Loretta C. Wolf

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

Measure/record salinity for marine tests

Comments:
Meter ID's Page 77 MF

000036

PAGE

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 #: ASW 1-30-08 **Organism** Batch: 10.7.08
Toxicant/ Batch#: CuSO4 1-18-08 Age: 12 days

Test Beginning: Date: 10.7.08 Time: 1110
Test Ending: Date: 10-11-08 Time: 1405

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	JD
Alkalinity (mg/L as $CaCO_3$):	224	TA06_08	BA
Hardness (mg.L as $CaCO_3$):	—	TA06_09	—
Total Ammonia (mg/L as N):	<0.034	TA06_17	MF
Conductivity: µmhos mmhos	31.8	TA06_25	JD
Salinity (ppth):	14.7	TA06_25	JD

Food:	Batch
☐ YCT	
☐ *P. subcapitata*	
☑ Artemia Lot #	38438

Artemia Batch:
0 hr: 145
24 hr:
48 hr: 147
72 hr:

Chamber size: 1000 mL
Test volume: 500 mL per replicate

Concentrations prepared by: JD
Temperature Range °C:(if used)
Test Incubated in: Incubator # 2 Waterbath # ___ Incubator # 2 min 25.3 max 26.4 mean 25.9
Light Intensity: 50-100 Ft. candles Waterbath # ___ min ___ max ___ mean ___
Photoperiod: 16 hours Light / 8 hours dark Room B246 min 25.1 max 25.5 mean 25.5

Feeding: √as needed

☑	Before test
☐	0 hr
☐	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 g/L	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	A	B9	10	10	10	10	10	10
	B	B10	10	10	10	10	10	10
100	A	B11	10	10	10	10	10	10
	B	B12	10	10	10	10	10	10
200	A	B13	10	10	10	10	10	10
	B	B14	10	9,10	9	9	9	9
300	A	B15	10	10	10	10	9(10)	9
	B	B16	10	8(10)	8	8	8	8
400	A	B17	10	0,0,0	—	—	—	—
	B	B18	10	1,9,0	0,1,0	—	—	—
500	A	B19	10	0,0,0	—	—	—	—
	B	B20	10	0,0,0	—	—	—	—
Organisms loaded by: JD	Checked by:		BA	JD	BA	BA	MF	BA
Loading Verified by: BA	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:
① Transcription error JD 10.13.08
MAX temp = 25.8

Investigators' Signatures
Marshall Faircloth
James Daniels

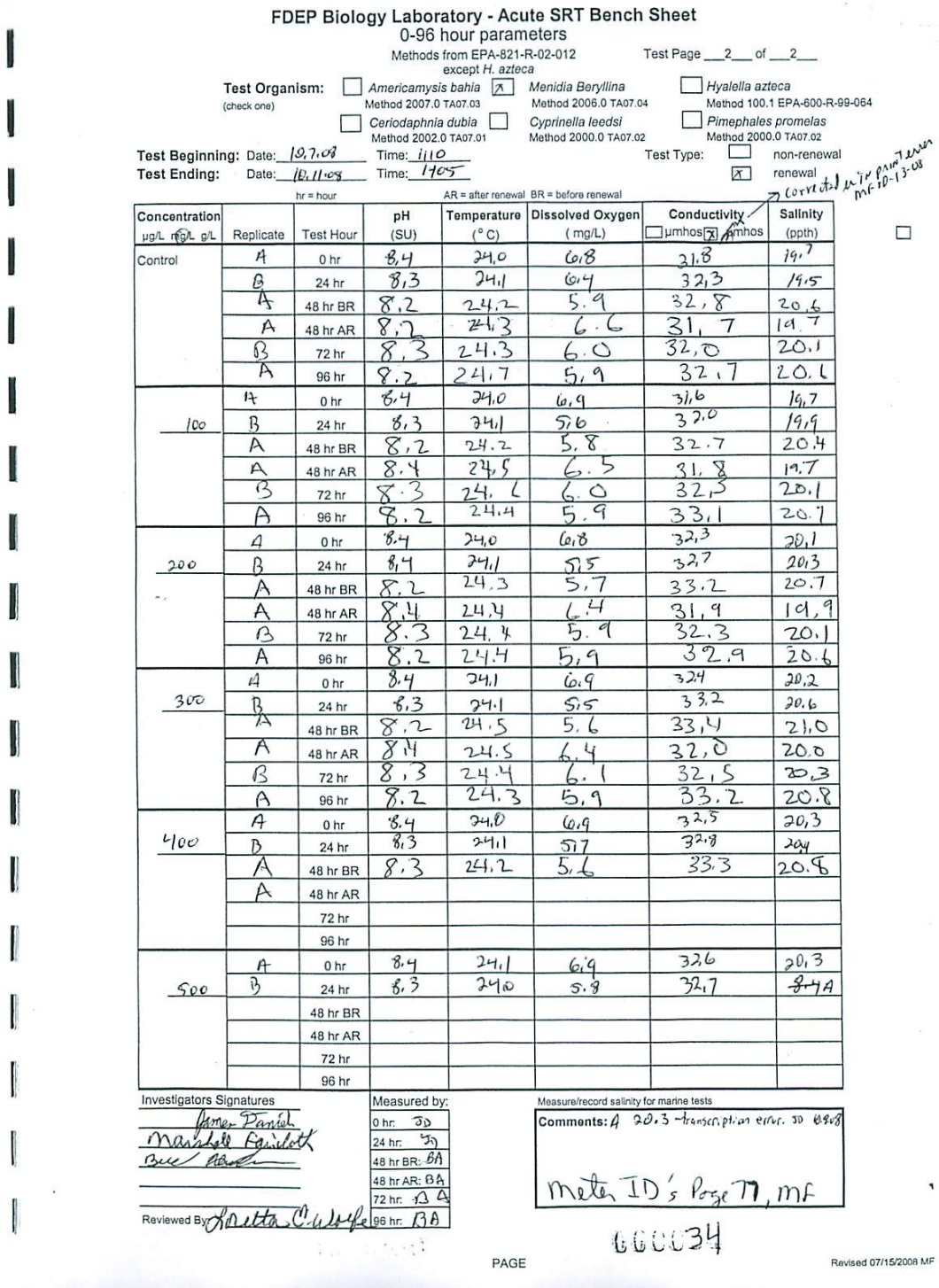
Reviewer: Loretta C. Wolfe

Method: TSK 95% confidence intervals

Statistics: LC50	Lower	Upper
48 hour:	325.55	303.26	349.47
96 hour:	319.95	296.24	345.56

000033

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: 10.7.08 Time: 1110
Test Ending: Date: 10.11.08 Time: 1105
Test Type: ☐ non-renewal ☒ renewal

hr = hour AR = after renewal BR = before renewal

corrected w/ par/Tarsen MF 10-13-08

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	8.4	24.0	6.8	31.8	19.7
	B	24 hr	8.3	24.1	6.4	32.3	19.5
	A	48 hr BR	8.2	24.2	5.9	32.8	20.6
	A	48 hr AR	8.2	24.3	6.6	31.7	19.7
	B	72 hr	8.3	24.3	6.0	32.0	20.1
	A	96 hr	8.2	24.7	5.9	32.7	20.6
100	A	0 hr	8.4	24.0	6.9	31.6	19.7
	B	24 hr	8.3	24.1	5.6	32.0	19.9
	A	48 hr BR	8.2	24.2	5.8	32.7	20.4
	A	48 hr AR	8.4	24.5	6.5	31.8	19.7
	B	72 hr	8.3	24.6	6.0	32.3	20.1
	A	96 hr	8.2	24.4	5.9	33.1	20.7
200	A	0 hr	8.4	24.0	6.8	32.3	20.1
	B	24 hr	8.4	24.1	5.5	32.7	20.3
	A	48 hr BR	8.2	24.3	5.7	33.2	20.7
	A	48 hr AR	8.4	24.4	6.4	31.9	19.9
	B	72 hr	8.3	24.4	5.9	32.3	20.1
	A	96 hr	8.2	24.4	5.9	32.9	20.6
300	A	0 hr	8.4	24.1	6.9	32.4	20.2
	B	24 hr	8.3	24.1	5.5	33.2	20.6
	A	48 hr BR	8.2	24.5	5.6	33.4	21.0
	A	48 hr AR	8.4	24.5	6.4	32.0	20.0
	B	72 hr	8.3	24.4	6.1	32.5	20.3
	A	96 hr	8.2	24.3	5.9	33.2	20.8
400	A	0 hr	8.4	24.0	6.9	32.5	20.3
	B	24 hr	8.3	24.1	5.7	32.8	20.4
	A	48 hr BR	8.3	24.2	5.6	33.3	20.8
	A	48 hr AR					
		72 hr					
		96 hr					
500	A	0 hr	8.4	24.1	6.9	32.6	20.3
	B	24 hr	8.3	24.0	5.8	32.7	~~8.4~~ A
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

Investigators Signatures
James Daniel
Marshall Faircloth
Bill Hanlon

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

Reviewed By: Debbie C. Wolfe

Measure/record salinity for marine tests

Comments: A 20.3 - transcription error. JD 10.9.08

Meter ID's Page 77, MF

000034

PAGE

Revised 07/15/2008 MF

Appendix C. (continued)

***Americamysis bahia* Acute Standard Reference Toxicant Test**

DATE: 10-07-08 DURATION: 48 h TOXICANT : CdCl2
SPECIES: *Americamysis bahia*

RAW DATA: Concentration (ug/L)	Number Exposed	Mortalities
.00	20	0
20.00	20	0
30.00	20	3
45.00	20	11
67.00	20	20
100.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: **LC50: 41.43**
95% LOWER CONFIDENCE: 37.10
95% UPPER CONFIDENCE: 46.26

***Menidia beryllina* Acute Standard Reference Toxicant Test**

DATE: 10-07-08 DURATION: 48 h TOXICANT : CuCl2
SPECIES: *Menidia beryllina*

RAW DATA: Concentration (ug/L)	Number Exposed	Mortalities
.00	20	0
100.00	20	0
200.00	20	1
300.00	20	2
400.00	20	20
500.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES**:** **LC50: 325.55**
95% LOWER CONFIDENCE: 303.26
95% UPPER CONFIDENCE: 349.47

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: 9/2/08

Shipped to: FDEP

P.O. No: N/A

Species	Quantity	Age	Brood Number	Temp.	pH	Salinity
Mysidopsis bahia	150	4 DAYS	M30808 29	25°C	7.9 s.u.	20‰
Menidia beryllina	150	12 DAYS	SS080821	25°C	7.9 s.u.	20‰
						Hardness
Cyprinella leedsi	150	12 DAYS	CL080821	25°C	7.8 s.u	80mg/L
Pimephales promelas	150	9 DAYS	FM080824	25°C	7.8 s.u	80mg/L

Packed by: MP

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: 9/29/08

Shipped to: FDEP

P.O. No: N/A

Species	Quantity	Age	Brood Number	Temp.	pH	Salinity
Mysidopsis bahia	350	4DAYS	MS080925	25°C	7.9	20‰
Menidia beryllina	350	12 DAYS	SS080917	25°C	7.8	20‰
						Hardness
Cyprinella leedsi						
Pimephales promelas						

Packed by: [signature]

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: 10/6/08

Shipped to: FDEP

P.O. No: N/A

Species	Quantity	Age	Brood Number	Temp.	pH	Salinity
Mysidopsis bahia	150	4 DAYS	MS08002	25°C	8.1	20‰
Menidia beryllina	150	11 DAYS	SS080925	25°C	8.2	20‰
						Hardness
Cyprinella leedsi	150	9 DAYS	CL080727	25°C	7.8 s.u.	80mg/L
Pimephales promelas	150	7 DAYS	FM080929	25°C	7.8 s.u.	80mg/L

Packed by: [signature]

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: 10/13/08

Shipped to: FDEP

P.O. No: N/A

Species	Quantity	Age	Brood Number	Temp.	pH	Salinity
Mysidopsis bahia	100	4 DAYS	MS081009	25°C	8.1 s.u	20‰
Menidia beryllina	100	12 DAYS	SS081001	25°C	8.1 s.u	20‰
						Hardness
Cyprinella leedsi						
Pimephales promelas						

Packed by: [signature]

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 Progress Energy Florida – Bartow Power Plant Outfall D-001, sampled on September 22, 2008.

Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
9/22/2008 10:10	Effluent	AGP/LN	Algal Growth Potential	3	A U	mg DryWt/L	3	3
9/22/2008 10:10	Effluent	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	3.9		mg/L	0.2	2
9/22/2008 10:10	Effluent	Chlorophyll/Grain Size/BOD	Phaeophytin-a	1.1		ug/L	0.24	0.71
9/22/2008 10:10	Effluent	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	2.8		ug/L	0.55	1.7
9/22/2008 10:10	Effluent	Overflow	Fecal Coliforms-Membrane Filter	2	B	#/100 mL	1	
9/22/2008 10:10	Effluent	Metals	Arsenic	2.6	I	ug/L	1.5	6
9/22/2008 10:10	Effluent	Metals	Nickel	0.82	I	ug/L	0.75	3
9/22/2008 10:10	Effluent	Metals	Lead	0.6	U	ug/L	0.6	2.4
9/22/2008 10:10	Effluent	Metals	Calcium	341		mg/L	3.7	15
9/22/2008 10:10	Effluent	Metals	Aluminum	180	U	ug/L	180	720
9/22/2008 10:10	Effluent	Metals	Chromium	1.5	U	ug/L	1.5	6
9/22/2008 10:10	Effluent	Metals	Selenium	1.5	U	ug/L	1.5	6
9/22/2008 10:10	Effluent	Metals	Magnesium	1050		mg/L	2	8
9/22/2008 10:10	Effluent	Metals	Iron	90	U	ug/L	90	360
9/22/2008 10:10	Effluent	Metals	Cadmium	0.06	U	ug/L	0.06	0.24
9/22/2008 10:10	Effluent	Metals	Copper	1.5	U	ug/L	1.5	6
9/22/2008 10:10	Effluent	Metals	Silver	0.075	U	ug/L	0.075	0.3
9/22/2008 10:10	Effluent	Metals	Zinc	17	I	ug/L	15	60
9/22/2008 10:10	Effluent	Nutrients	Ammonia-N	0.019	I	mg N/L	0.01	0.02
9/22/2008 10:10	Effluent	Nutrients	Kjeldahl Nitrogen	0.73		mg N/L	0.08	0.2
9/22/2008 10:10	Effluent	Nutrients	Total-P	0.13		mg P/L	0.02	0.06
9/22/2008 10:10	Effluent	Nutrients	TSS	5	I	mg/L	4	16
9/22/2008 10:10	Effluent	Nutrients	O-Phosphate-P	0.092		mg P/L	0.008	0.02
9/22/2008 10:10	Effluent	Nutrients	NO2NO3-N	0.008	I	mg N/L	0.004	0.01
9/22/2008 10:10	Effluent	Field Parameter	Sample Depth	0.2		m		
9/22/2008 10:10	Effluent	Field Parameter	Dissolved Oxygen	4.98		mg/L		
9/22/2008 10:10	Effluent	Field Parameter	Temperature	36		C		
9/22/2008 10:10	Effluent	Field Parameter	pH	7.74				
9/22/2008 10:10	Effluent	Field Parameter	Specific Conductance	40909		umhos/cm		
9/22/2008 9:47	Blank	Metals	Cadmium	0.02	U	ug/L	0.02	0.08
9/22/2008 9:47	Blank	Metals	Calcium	0.075	U	mg/L	0.075	0.3
9/22/2008 9:47	Blank	Metals	Aluminum	60	U	ug/L	60	240
9/22/2008 9:47	Blank	Metals	Lead	0.2	U	ug/L	0.2	0.8

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
9/22/2008 9:47	Blank	Metals	Iron	30	U	ug/L	30	120
9/22/2008 9:47	Blank	Metals	Zinc	5	U	ug/L	5	20
9/22/2008 9:47	Blank	Metals	Silver	0.025	U	ug/L	0.025	0.1
9/22/2008 9:47	Blank	Metals	Selenium	0.5	U	ug/L	0.5	2
9/22/2008 9:47	Blank	Metals	Magnesium	0.04	U	mg/L	0.04	0.16
9/22/2008 9:47	Blank	Metals	Chromium	0.5	U	ug/L	0.5	2
9/22/2008 9:47	Blank	Metals	Copper	1.6	I	ug/L	0.5	2
9/22/2008 9:47	Blank	Metals	Nickel	0.25	U	ug/L	0.25	1
9/22/2008 9:47	Blank	Metals	Arsenic	0.5	U	ug/L	0.5	2
9/22/2008 9:47	Blank	Nutrients	O-Phosphate-P	0.004	U	mg P/L	0.004	0.01
9/22/2008 9:47	Blank	Nutrients	NO2NO3-N	0.004	U	mg N/L	0.004	0.01
9/22/2008 9:47	Blank	Nutrients	Total-P	0.02	U	mg P/L	0.02	0.06
9/22/2008 9:47	Blank	Nutrients	Kjeldahl Nitrogen	0.08	U	mg N/L	0.08	0.2
9/22/2008 9:47	Blank	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
9/29/2008 13:05	Effluent	Toxicology	Bioassay-Acute-Screen-SW-Mysid, LC50	100	L	LC50		
9/29/2008 13:05	Effluent	Toxicology	Bioassay-Acute-Screen-SW-Fish, LC50	No Result	O	LC50		
9/29/2008 13:05	Effluent	Field Parameter	Sample Depth	0.2		m		
10/13/2008 10:50	Effluent	Toxicology	Bioassay-Acute-Screen-SW-Fish, LC50	100	L	LC50		
10/13/2008 10:50	Effluent	Toxicology	Bioassay-Acute-Screen-SW-Mysid, LC50	100	L	LC50		
10/13/2008 10:50	Effluent	Field Parameter	Specific Conductance	43540		umhos/cm		
10/13/2008 10:50	Effluent	Field Parameter	Dissolved Oxygen	2.28		mg/L		
10/13/2008 10:50	Effluent	Field Parameter	Sample Depth	0.2		m		
10/13/2008 10:50	Effluent	Field Parameter	Temperature	35.65		C		
10/13/2008 10:50	Effluent	Field Parameter	pH	7.97				

The Bioassay of the Progress Energy Bartow Power Plant effluent sampled on October 13, 2008. NPDES #FL0000132.

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 0 0 0 1 3 2 11	12 0 8 1 0 1 3	18 **B**	19 **S**	20 2

Remarks

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The Priority Pollutants Analysis of the Progress Energy Bartow Power Plant effluent sampled on September 22, 2008. NPDES #FL0000132.

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 0 0 0 1 3 2 11	12 0 8 0 9 2 2	18 **X**	19 **S**	20 2

Remarks

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Biological Analyses of the Progress Energy Bartow Power Plant effluent sampled on September 22, 2008. NPDES #FL0000132.

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 0 0 0 1 3 2 11	12 0 8 0 9 2 2	18 **S**	19 **S**	20 2

Remarks

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