

Effluent Quality Assessment

St. Johns River Power Park

Duval County

NPDES #FL0037869

Sampled April 11-12, 2010

July 2010

Biology Section
Bureau of Laboratories
Division of Environmental Assessment and Restoration

Quality Manual No. 870346G
NELAC Certification No. E31780

CONTENTS

Introduction

Methods

Results and Discussion

Literature Cited

Tables

Table 1	Measured algal growth potential (AGP)
Table 2	Effluent limits, Class III Marine Criteria and chemical data

Appendices

Appendix A	Chain of Custody
Appendix B	Bioassay Bench Sheets
Appendix C	SRT Bench Sheets and Statistical Analyses
Appendix D	Organism Receipt
Appendix E	Chemical Analyses of Effluent
Appendix F	Facility Summary, Effluent Limits, and Permit Violations Recorded on Discharge Monitoring Report
Appendix G	EPA End Sheet

St. Johns River Power Park, 11201 New Berlin Road, Jacksonville, Duval County, Florida, 32226. NPDES #FL0037869. Effluent grab samples for bioassay testing were collected on April 11th and 12th, 2010. Samples for all other analyses for this facility were collected on April 12, 2010.

Introduction

St. Johns River Power Park is a coal-fired power plant. Make up cooling water is treated by chlorination. Low volume wastes and metal cleaning wastes are treated in the Central Wastewater Treatment Facility by chemical conditioning and precipitation, clarification and coagulation, multimedia filtration and neutralization (See Appendix F for detailed facility information provided by Edward Jamro of FDEP Northeast District.)

Methods

Samples were collected from the EFF-1 NPDES sampling point for Outfall D-001 by Eesa Ali, Ed Jamro, Anthony Vigliotti, and Sharon Plitz (FDEP Northeast District) following DEP-SOP-001/01 FS 2400 Wastewater Sampling. All DEP SOPs are available on the web at: http://www.floridadep.org/labs/bars/sas/sop/index.htm.

See Appendix A for the completed chain of custody form.

The 96-hour acute screening 4/24 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.

RESULTS and DISCUSSION

Toxicity Test Results

Tests were performed April 13 - 17, 2010.

Americamysis bahia 96-hour acute screening 4/24 bioassay 1 of 4 –
LC_{50} > 100%, 0%* mortality in 100% sample at 96 hours

Menidia beryllina 96-hour acute screening 4/24 bioassay 1 of 4 –
LC_{50} > 100%, 0%* mortality in 100% sample at 96 hours

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

Americamysis bahia 96-hour acute screening 4/24 bioassay 2 of 4 –
LC_{50} > 100%, 0%* mortality in 100% sample at 96 hours

Menidia beryllina 96-hour acute screening 4/24 bioassay 2 of 4 –
LC_{50} > 100%, 0%* mortality in 100% sample at 96 hours

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

Americamysis bahia 96-hour acute screening 4/24 bioassay 3 of 4 –
LC_{50} > 100%, 5%* mortality in 100% sample at 96 hours

Menidia beryllina 96-hour acute screening 4/24 bioassay 3 of 4 –
LC_{50} > 100%, 5%* mortality in 100% sample at 96 hours

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

Americamysis bahia 96-hour acute screening 4/24 bioassay 4 of 4 –
LC_{50} > 100%, 0%* mortality in 100% sample at 96 hours

Menidia beryllina 96-hour acute screening 4/24 bioassay 4 of 4 –
LC_{50} > 100%, 5%* mortality in 100% sample at 96 hours

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

*NOTE: In a 96-hour acute screening test of 100% effluent, mortality of <20% provides confidence that the effluent meets the acute toxicity criterion of Florida's Surface Water Quality Standards (Rule 62-302.500 (1) (a) 4, F.A.C.). Mortality between 20-50% indicates low to moderate levels of toxicity, and further action may be required. Mortality of >50% indicates that the effluent fails to meet the minimum requirement to discharge to waters of the state (Rule 62-4.244(3) (a), F.A.C.).

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

Algal Growth Potential
The effluent Algal Growth Potential (AGP) was 13.6 A (A - Value reported is the mean of two or more determinations) mg dry wt/L of the saltwater species *Dunaliella tertiolecta.* Raschke and Schultz determined 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 ratio (12.5:1) of total nitrogen to total phosphorus suggests that the effluent is co-limited by both nitrogen and phosphorus, but the ratio of inorganic nitrogen to orthophosphate (5.1:1) suggests that the effluent is nitrogen-limited. To determine actual nutrient limitation, a limiting-nutrient algal growth potential test should be performed (Maloney et al. 1974).

See Table 1 for AGP results.

Chemistry Results
Total residual chlorine was not detected, and total ammonia was not measured in the bioassay sample in the laboratory. The total ammonia concentration in the composite sample collected and preserved for chemical analysis was 0.041 mg N/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was < 0.02 mg/L.

Aluminum and selenium were detected in the effluent at levels that comply with Class III marine water quality criteria (62-302.530, F.A.C.). Arsenic and nickel were detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL). Iron (370 µg/L; limit 300 µg/L, 62-302.500 (38), F.AC.) exceeded the Class III criteria for marine water.

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 for this facility on April 11-12, 2010, was not acutely toxic to either test species during the 96-hour acute screening 4/24 bioassays. The effluent AGP result was greater than the “problem” threshold for marine receiving waters. Effluent water quality samples collected on April 12, 2010, exceeded Class III marine water quality standards for iron.

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 St. Johns River Power Park on April 12, 2010.

St. Johns River Power Park NPDES #FL0037869			
Location	**AGP (measured)**	**Inorganic N:P ratio**	**Total N:P ratio**
Effluent	13.6 A	5.1	12.5

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

Table 2. Effluent limits, Class III Criteria for predominantly marine waters and chemical data for samples collected from the St. Johns River Power Park on April 11-12, 2010.

St. Johns River Power Park NPDES # FL0037869	Class III Criteria	Effluent Limits	Effluent	
Metals (µg/L unless otherwise noted)				
Aluminum	≤ 1500	-	1330	
Arsenic	≤ 50	≤ 36 s	1.6	I
Cadmium	≤ 8.8	-	0.09	U
Calcium (mg/L)	-	-	324	
Chromium-III	-	-	1.7	I
Copper	≤ 3.7	-	1.5	U
Iron	≤ 300	-	370	
Lead	≤ 8.5	-	0.6	U
Magnesium (mg/L)	-	-	912	
Mercury	≤ 0.025	≤ 0.025 s	0.12	U
Nickel	≤ 8.3	-	3	I
Selenium	≤ 71	≤ 71 s	15.6	
Silver	≤ 2.3	-	0.075	U
Zinc	≤ 86	-	15	U
Nutrients (mg/L)				
Ortho-phosphate	-	-	0.041	
Total Phosphorus	-	-	0.067	
Total Ammonia	-	Report	0.041	
Un-ionized Ammonia	-	-	≤ 0.02	c
Nitrate and Nitrite	-	Report	0.17	
Total Kjeldahl Nitrogen	-	Report	0.67	
Organic Nitrogen	-	-	0.629	c
Total Nitrogen	-	Report	0.84	c
General Physical and Chemical Parameters				
Dissolved Oxygen (mg/L)	≥ 4.0	-	7.1	
pH (SU)	6.5 - 8.5	6.5 - 8.5	8.1	
Conductivity (µmhos/cm)	-	-	34800	
Temperature (°C)	-	≤ 35.6	20.2	
Salinity	-	-	24.4	c
Total Residual Chlorine (mg/L)	≤ 0.01	≤ 0.01	≤ 0.03	UQ£
Chlorophyll *a* (µg/L) - Corrected	-	-	1.7	I
Phaeophytin (µg/L)	-	-	2.7	
Oils and Greases (mg/L)	≤ 5.0	-	1.4	U
Flow (MGD)	-	Report	31.47	a
Hardness (mg $CaCO_3$)	-	-	4564.64	c

Value exceeds the Class III Water Quality Criteria or permit limits

a - Annual average

c - Value is calculated

s - Single sample

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

£ - Measured in Central Labs and entered into Tox sheets

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2010-04-12-36
St. John's River Power Park

Requester: Michael Tanski
Field Report Prepared By: E Au

Customer: NE-DIST
Collected By: E. Au
Send Final Report To Tom Kallemeyn Kallemeyn

Project ID: FYI3
Sampling Agency: DEP NED

PMAS: 1143

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
	EFF-1 SJRPP	☐ Comp ☑ Grab Date 4/12/10 Time 0810 Eastern Central	Date Time Eastern Central	A
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L) 4.35	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C) 26.12	pH 7.35	Sample Depth ☑ m (faucet) ☐ ft 40500 ☐ Salinity (PPTh) ☑ Sp Conductance (umho/cm) NPDES Number
	Latitude o ' "	Longitude o ' "	Comments Toxicity 1/4	

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
	EFF-1 SJRPP	☐ Comp ☑ Grab Date 4/12/10 Time 0900 ~~0940~~ Eastern Central	Date Time Eastern Central	A
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L) 4.98	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C) ~~27.73~~	pH ~~8.11~~	Sample Depth ☑ m (faucet) ☐ ft ~~38100~~ 40800 ☐ Salinity (PPTh) ☑ Sp Conductance (umho/cm) NPDES Number
	Latitude o ' "	Longitude o ' "	Comments Toxicity 2/4	

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
	EFF-1 SJRPP	☐ Comp ☑ Grab Date 4/12/10 Time 600 Eastern Central	Date Time Eastern Central	A
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L) 4.98	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C) 27.73	pH 8.11	Sample Depth ☑ m (faucet) ☐ ft 38100 ☐ Salinity (PPTh) ☑ Sp Conductance (umho/cm) NPDES Number
	Latitude o ' "	Longitude o ' "	Comments Toxicity 3/4	

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
	EFF-1 SJRPP	☐ Comp ☑ Grab Date 4/12/10 Time 1130 Eastern Central	Date Time Eastern Central	A
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L) 7.01	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C) 20.16	pH 8.08	Sample Depth ☑ m (faucet) ☐ ft 34800 ☐ Salinity (PPTh) ☑ Sp Conductance (umho/cm) NPDES Number
	Latitude o ' "	Longitude o ' "	Comments Toxicity 4/4 + rest of samples	

Relinquished By:	Date/Time	Shipping Method	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
E Au	4/12/10	Fed ex						4/13/10 9:30am

VB blanks Rec'd rate by JD 4/13/10 10:29

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Page 1 of 3

Tox taken @ 1200 4/12/10

Blanks taken @ 1120am 4/12/10

FDEP Biology Laboratory - Acute Screen 4/24 Bioassay Bench Sheets

Facility: JEA St. Johns River Power Park MF JEA WWTF

Address: 11201 New Berlin Road

City: Jacksonville County: Duval 32226

Contact/District: Eosa Ati / Northeast

NPDES Permit #: FL 0037869

LIMS Job #: JEA-2010-04-13-68 LIMS Sample #: 1263695

Lims Data Entry: 4-28-10 MF Data Entry Verification: 4.21.10 BA

Sample Collection: Date: 4/12/10 Time: 1810

Hold Time Start: Date: 4-12-10 Time: 1200

Sample: 1 of 4

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.
Light Intensity : 50 - 100 ft. candles.
Photoperiod : 16 hours light 8 hours dark.

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 #: 25 [ ] Waterbath #:

Initial sample handling:

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

Aeration : (yes) no Initial DO: 9.2 mg/L Final DO: 7.5 mg/L Duration: 15 minutes Rate: ~ 100 bubbles/min

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

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

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

Sample Validation:

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)

Light Intensity : 50 - 100 ft. candles
Photoperiod : 16 light 8 dark
Temperature Range °C: (If used)
Incubator # 2 min 23.9 max 27.2 mean 25.6
Incubator # 5 min 24.6 max 27.4 mean 26.0
Waterbath # ____ min. ____ max. ____ mean ____
Room B246 min 25.0 max 25.9 mean 25.5

Investigators' Signatures
James Daniel
Marshall Faircloth
Amelia Rankin
Bruce Alexander

Liz Millan
REVIEWER

Water Quality Parameters	20% DMW	Well Water	Moderately Hard Water	Batch # 4-13-10 Salt Water (ASW) NSW Test 1 and Test 2	Salt Water ASW NSW	Other:	Original Sample	Measured by	Verified by
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	AG-R/MF	ME/JJ
Alkalinity (mg/L as $CaCO_3$):				212			153	AGR	MF
Hardness (mg/L as $CaCO_3$):				—			—	—	—
Total Ammonia (mg/L as N):				—			—	—	—
Conductivity: µmhos (mmhos)				40.1			40.9	BA	MF
Salinity (ppth):				25.5			26.1	BA	MF

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1263695 Test #: 1 SOP#:TA 07 03 Test Started: Date 4-13-10 Time: 1230
Organism/Batch/Age: A bahia / 4-13-10 / 5 days Test Ended: Date 4-17-10 Time: 1330
Chamber/Test Volume: 1000 / 500 ml Diluent/ Batch: ASW 25.5 / 4-13-10 Test Duration: 48 hr / (96 hr) — circled
Food/Batch: [ ] YCT_____ [ ] P.sub_____
[✓] Artemia: 0hr 73-10 24hr 74-10 48hr 75-10 72hr 76-10 Artemia Lot# 23613
Feeding: [✓] Prior to Test [✓] Prior to Renewal [X] 0 hr [X] 24 hr [X] 48 hr [X] 72 hr

Concentration	Replicate	Chamber #	Test Hour: 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	A	20	5	5	5	5	5	5
	B	22	5	5	5	5	5	5
	C	23	5	5	5	5	5	5
	D	24	5	5	5	5	5	5
100%	A	25	5	5	5	5	5	5
	B	26	5	5	5	5	5	5
	C	27	5	5	5	5	5	5
	D	28	5	5	5	5	5	5
Loaded/Verified by: JS / MF		Checked by:	JS	JS	JS	JS	JS	JS

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 000044

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1263695 Test #: 2 SOP#:TA 07 04 Test Started: Date 4-13-10 Time: 1230
Organism/Batch/Age: M. beryllina/4-13-10/13 days Test Ended: Date 4.17.10 Time: 1330
Chamber/Test Volume: 1000 / 500 ml Diluent/ Batch: ASW 25.5 / 4-13-10 Test Duration: 48 hr (96 hr)
Food/Batch: ☐ YCT ☐ P.sub
☑ Artemia: 0hr 73-10 24hr ___ 48hr 75-10 72hr ___ Artemia Lot# 23613
Feeding: ☑ Prior to Test ☑ Prior to Renewal ☑ 0 hr ☐ 24 hr ☑ 48 hr ☐ 72 hr

Concentration	Replicate	Chamber #	0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	A	A1	5	5	5	5	5	5
	B	A2	5	5	5	5	5	5
	C	A3	5	5	5	5	5	5
	D	A4	6	5	5	5	5	5
100%	A	A5	5	5	5	5	5	5
	B	A6	5	5	5	5	5	5
	C	A7	5	5	5	5	5	5
	D	A8	5	5	5	5	5	5
Loaded/Verified by: SH / MF		Checked by:	JD	JD	JD	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: Ø % 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 000045

FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

IMS Sample # : 1263695 Test #: 1 of 2

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

est 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	C	D	A
pH (S.U.)	8.3	8.3	8.0	8.2	8.1	8.0
Temperature °C	24.0	25.0	25.1	24.1	24.9	25.2
Dissolved Oxygen mg/L aerate if < 4	6.5	6.1	4.4	6.3	5.7	5.7
Conductivity µmhos (mmhos)	40.1	40.8	41.3	40.6	41.0	41.6
Salinity ppth	25.5	25.9	26.5	25.9	26.2	26.8
(initials) Measured by:	BA	AOK	AOK	AOK	AOK	3
(initials) Recorded by:	BA	AOK	AOK	AOK	AOK	3

Comments:

Concentration: 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C	C	D	A
pH (S.U.)	8.2	8.1	7.7	8.1	7.8	7.8
Temperature °C	24.0	25.0	25.3	24.7	24.5	25.2
Dissolved Oxygen mg/L aerate if < 4	6.6	6.2	4.4	6.1	5.7	5.5
Conductivity µmhos (mmhos)	41.0	41.5	42.0	41.5	41.9	42.5
Salinity ppth	26.2	26.5	27.0	26.5	26.8	27.0
(initials) Measured by:	BA	AOK	AOK	AOK	AOK	3
(initials) Recorded by:	BA	AOK	AOK	AOK	AOK	3

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 # : 1263695 **Test #:** 2 of 2

TEST SOP #: TA07_ 041 **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	C	D	A
pH (S.U.)	8.3	8.2	8.2	8.2	8.1	8.1
Temperature °C	24.3	24.4	24.7	24.0	24.8	25.3
Dissolved Oxygen mg/L aerate if < 4	6.6	6.2	6.2	6.5	5.8	5.8
Conductivity µmhos (mmhos)	39.7	40.6	41.4	40.6	41.0	41.9
Salinity ppth	25.3	26.0	26.4	25.9	26.2	26.8
(initials) Measured by:	BA	AOK	AOK	AOK	AOK	"
(initials) Recorded by:	BA	AOK	AOK	AOK	AOK	"

Comments:

Concentration 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C	<	D	A
pH (S.U.)	8.2	8.0	8.0	8.1	8.0	7.9
Temperature °C	24.0	24.2	25.0	24.8	24.9	25.3
Dissolved Oxygen mg/L aerate if < 4	6.6	6.2	6.1	6.5	6.0	6.0
Conductivity µmhos (mmhos)	40.9	41.4	41.8	41.5	41.7	42.1
Salinity ppth	26.1	26.5	26.8	26.6	26.7	27.1
(initials) Measured by:	BA	AOK	AOK	AOK	AOK	"
(initials) Recorded by:	BA	AOK	AOK	AOK	AOK	"

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 - Acute Screen 4/24 Bioassay Bench Sheets

Facility: St. Johns River Power Park JEA MF DWTF

Address: 11201 New Berlin Road

City: Jacksonville County: Duval 32226

Contact/District: Eesa Ali / Northeast

NPDES Permit #: FL 0037869 MF

LIMS Job #: TLH-2010-04-13-68 LIMS Sample #: 1263696

Lims Data Entry: 4-21-10 MF Data Entry Verification: BA 4-21-10

Sample Collection: Date: 4-12-10 Time: 0000

Hold Time Start: Date: 4-12-10 Time: 1200

Sample: 2 of 4

Comments:

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

Test 1 validation:
Control survival ≥90%: (Yes) No
Temperature Range ≤3°C: (Yes) No
Test 1: SOP TA 07_03

Test 2 validation:
Control survival ≥90%: (Yes) No
Temperature Range ≤3°C: (Yes) No
Test 2: SOP TA 07_04

(√one)
Test 1 incubated in: [X] Incubator #: 2 [ ] Waterbath #:
Test 2 incubated in: [X] Incubator #: 5 [ ] Waterbath #:

Initial sample handling:
PH adjustment: yes (no) Initial pH: ____ NaOH N HCl N ____ Drops mL Final pH: ____
Aeration: (yes) no Initial DO: 9.1 mg/L Final DO: 6.6 mg/L Duration: 15 minutes Rate: ~100 bubbles/min
Salinity adjusted (Test 1): yes (no) Initial Salinity: ____ Final Salinity: ____ Salts Hypersaline brine
Salinity adjusted (Test 2): yes (no) Initial Salinity: ____ Final Salinity: ____ Salts Hypersaline brine
Dechlorination: yes (no) ____ mL of 0.025N Sodium Thiosulfate per liter of sample. Final TRC: ____

Sample Validation:
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 Darish
Marshall Faircloth
Anshi Rankin
Dave Alexander

Liz Miller
REVIEWER

Water Quality Parameters	Original Sample	Other 4-13-10 ASW25.5	Measured by	Verified by
LAB ~~Field~~ Total Residual Cl_2 (mg/L):	<0.03	<0.03	AGR/MF	MF/BA
Field ~~Lab~~ Total Residual Cl_2 (mg/L):	Not measured	—	—	MF
Alkalinity (mg/L as $CaCO_3$):	159	212	AGR	MF
Hardness (mg/L as $CaCO_3$):	—	—	—	—
Total Ammonia (mg/L as N):	—	—	—	—
Conductivity: µmhos (mmhos)	46.7	40.2	BA	MF
Salinity (ppth):	26.7	25.7	BA	MF

V 2.2 7/8/08

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1263696 Test #: 1 SOP#:TA 07 03 Test Started: Date 4-13-10 Time: 1300

Organism/Batch/Age: A bahia / 4-13-10 / 5 days Test Ended: Date 4/17/10 Time: 1335

Chamber/Test Volume: 1000 / 500 ml Diluent/ Batch: ASW 25.5 / 4-13-10 Test Duration: 48 hr / (96) hr

Food/Batch: ☐ YCT ☐ P.sub

☑ Artemia: 0hr 73-10 24hr 74-10 48hr 75-10 72hr 76-10 Artemia Lot# 23613

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

Concentration	Replicate	Chamber #	0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	A	tox 29	5	5	5	5	5	5
	B	tox 30	5	5	5	5	5	5
	C	tox 31	5	5	5	5	5	5
	D	tox 32	5	5	5	5	5	5
100%	A	tox 33	5	5	5	5	5	5
	B	tox 34	5	5	5	5	5	5
	C	tox 35	5	5	5	5	5	5
	D	tox 36	5	5	5	5	5	5
Loaded/Verified by: S / MF	Checked by:		SO					

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 000049

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1263696 Test #: 2 SOP#:TA 07 04 Test Started: Date 4-13-10 Time: 1300

Organism/Batch/Age: M. beryllina / 4-13-10 / 13 days Test Ended: Date 4-17-10 Time: 1335

Chamber/Test Volume: 1000 / 500 ml Diluent/ Batch: ASW 25.5 / 4-13-10 Test Duration: 48 hr / 96 hr (circled)

Food/Batch: ☐ YCT_____ ☐ P.sub_____

☑ Artemia: 0hr 7340 24hr_____ 48hr 75-10 72hr_____ Artemia Lot# 23613

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
Control	A	A9	5	5	5	5	5	5
	B	A10	5	5	5	5	5	5
	C	A11	5	5	5	5	5	5
	D	A12	5	5	5	5	5	5
100%	A	A13	5	5	5	5	5	5
	B	A14	5	5	5	5	5	5
	C	A15	5	5	5	5	5	5
	D	A16	5	5	5	5	5	5

Loaded/Verified by: JS / MF Checked by: JS JS JS JS JS JS

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

000050

FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

IMS Sample # : 1263696 Test #: 1 of 2

TEST SOP #: TA07_03 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 Ctrl	A	B	C	C	D	A
pH (S.U.)	8.3	8.3	8.0	8.2	8.1	8.0
Temperature °C	24.0	24.9	24.7	24.0	24.4	24.9
Dissolved Oxygen mg/L aerate if < 4	6.6	6.3	4.4	6.0	5.5	5.6
Conductivity µmhos (mmhos)	40.2	40.6	41.1	40.6	40.7	41.4
Salinity ppth	25.7	25.9	26.3	25.9	26.1	26.4
(initials) Measured by:	BA	ADK	ADK	ADK	ADK	3
(initials) Recorded by:	BA	ADK	ADK	ADK	ADK	3

Comments:

Concentration 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C	C	D	A
pH (S.U.)	8.2	8.1	7.9	8.1	8.0	7.8
Temperature °C	24.0	24.8	25.2	24.8	24.8	24.8
Dissolved Oxygen mg/L aerate if < 4	6.6	6.2	4.9	6.1	5.8	5.5
Conductivity µmhos (mmhos)	41.7	42.1	42.6	41.7	41.9	42.5
Salinity ppth	26.7	27.0	27.4	26.7	26.8	27.4
(initials) Measured by:	BA	ADK	ADK	ADK	ADK	3
(initials) Recorded by:	BA	ADK	ADK	ADK	ADK	3

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:

051

FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample # : 1263696 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	C	D	A
pH (S.U.)	8.3	8.2	8.2	8.2	8.1	8.1
Temperature °C	24.0	24.3	24.8	24.1	24.8	25.5
Dissolved Oxygen mg/L aerate if < 4	6.7	6.3	6.2	6.5	5.7	5.8
Conductivity µmhos (mmhos)	39.8	40.3	40.6	40.4	41.1	41.8
Salinity ppth	25.4	25.7	25.9	25.8	26.3	26.8
(initials) Measured by:	BA	ADL	ADL	ADL	ADL	ADL
(initials) Recorded by:	BA	ADL	ADL	ADL	ADL	ADL

Comments:

Concentration 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C	C	D	A
pH (S.U.)	8.2	8.0	8.0	8.1	8.0	7.9
Temperature °C	24.2	24.5	24.5	24.8	24.9	25.6
Dissolved Oxygen mg/L aerate if < 4	6.7	6.2	6.1	6.4	5.6	6.0
Conductivity µmhos (mmhos)	41.6	41.8	42.2	41.7	42.0	42.3
Salinity ppth	26.6	26.8	27.1	26.7	26.9	27.1
(initials) Measured by:	BA	ADL	ADL	ADL	ADL	ADL
(initials) Recorded by:	BA	ADL	ADL	ADL	ADL	ADL

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 - Acute Screen 4/24 Bioassay Bench Sheets

Facility: JEA St. Johns River Power Park ~~JEA~~ MF WWTP

Address: 11201 New Berlin Road

City: Jacksonville County: Duval 32226

Contact/District: Essa Ali / Northeast

NPDES Permit #: FL 0037869

LIMS Job #: FLH-2010-04-13-68 LIMS Sample #: 1263697

Lims Data Entry: 4-21-10 MF Data Entry Verification: BA 4.21.10

Sample Collection: Date: 4-12-10 Time: 0600

Hold Time Start: Date: 4-12-10 Time: 1200

Sample: 3 of 4

Comments:

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

Test 1 validation:
Control survival ≥90%: (Yes) No
Temperature Range ≤3°C: (Yes) No
Test 1: SOP TA 07_03

Test 2 validation:
Control survival ≥90%: (Yes) No
Temperature Range ≤3°C: (Yes) No
Test 2: SOP TA 07_04

(√one)
Test 1 incubated in: [X] Incubator #: 2 [ ] Waterbath #:
Test 2 incubated in: [X] Incubator #: 5 [ ] 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: ____

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
Amaka Parker
Bree Alexander

Liz Miller
REVIEWER

Water Quality Parameters	Original Sample	Other Y-13-10 AW 25.5	Measured by	Verified by
Field Total Residual Cl_2 (mg/L):	Not measured		—	MF
Lab Total Residual Cl_2 (mg/L):	<0.03	<0.03	AGR/MF	MF/ID
Alkalinity (mg/L as $CaCO_3$):	146	212	AGR	MF
Hardness (mg/L as $CaCO_3$):	—	—	—	—
Total Ammonia (mg/L as N):	—	—	—	—
Conductivity: µmhos (mmhos)	39.0	40.0	BA	MF
Salinity (ppth):	24.8	25.5	BA	MF

V 2.2 7/5/08

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1263697 Test #: 1 12 SOP#:TA 07 03 Test Started: Date 4-13-10 Time: 1110

Organism/Batch/Age: A bahia / 84-13-10 / 5day Test Ended: Date 4/17/10 Time: 1340

Chamber/Test Volume: 1000 / 5000 ml Diluent/ Batch: Asw 25.5 / 4-13-10 Test Duration: 48 hr / (96 hr)

Food/Batch: ☐ YCT_____ ☐ P.sub_____

☑ Artemia: 0hr 73-10 24hr 74-10 48hr 75-10 72hr 76-10 Artemia Lot# 23613

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
Control	A	Tox 37	5	5	5	5	5	5
	B	tox 38	5	5	5	5	5	5
	C	tox 42	5	5	5	5	5	5
	D	tox 43	5	5	5	5	5	5
100%	A	tox 44	5	5	5	5	5	5
	B	tox 45	5	5	5	5	4/1D	4
	C	tox 46	5	5	5	5	5	5
	D	tox 47	5	5	5	5	5	5
Loaded/Verified by: BA / MT		Checked by:	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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: 5% 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 000054

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1263697 Test #: 2/2 SOP#:TA 07 04 Test Started: Date 4-13-10 Time: 1100

Organism/Batch/Age: M. beryllina / 4-13-10 / 13 day Test Ended: Date 4/17/10 Time: 1345

Chamber/Test Volume: 1000 / 500 ml Diluent/ Batch: Fx 355 / 4/13/10 Test Duration: 48 hr (96 hr)

Food/Batch: ☐ YCT______ ☐ P.sub______

☑ Artemia: 0hr 73-10 24hr______ 48hr 75-10 72hr______ Artemia Lot# 23613

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
Control	A	A17	5	JD ~~5~~ 5 JD	5	5	5	5
	B	A18	5	5	5	5	5	5
	C	A19	5	5	5	5	5	5
	D	A20	5	5	5	5	5	5
100%	A	A21	5	5	4 1D	4	4	~~5~~ 4 JD
	B	A22	5	5	5	5	5	5
	C	A23	5	5	5	5	5	5
	D	A24	5	5	5	5	5	5
Loaded/Verified by: JD / MW		Checked by:	JD	JD	JD	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: 5% 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 000055

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample #: 126367 Test #: 1 of 2

TEST SOP #: TA07_03 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	C	D	A
pH (S.U.)	8.3	8.3	8.2	8.3	8.1	8.0
Temperature °C	24.0	24.8	24.6	24.0	25.7	24.5
Dissolved Oxygen mg/L aerate if < 4	6.5	6.4	5.7	6.4	[illegible] 6.55	5.5
Conductivity µmhos (mmhos)	40.2	40.4	40.8	40.6	41.0	39.8
Salinity ppth	25.2	25.7	26.1	25.9	26.3	25.3
(initials) Measured by:	BA	ABC	ABC	ABC	ABC	ABC
(initials) Recorded by:	BA	ABC	ABC	ABC	ABC	ABC

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 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C	C	D	A
pH (S.U.)	8.2	8.1	7.8	8.0	7.8	7.7
Temperature °C	24.0	24.9	25.1	25.5	25.8	24.6
Dissolved Oxygen mg/L aerate if < 4	6.6	6.3	5.2	6.3	5.4	5.5
Conductivity µmhos (mmhos)	39.0	39.3	39.5	39.1	39.2	40.1
Salinity ppth	24.7	25.0	25.2	24.9	24.9	25.6
(initials) Measured by:	BA	ABC	ABC	ABC	ABC	BA
(initials) Recorded by:	BA	ABC	ABC	ABC	ABC	BA

Comments:

056

FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample # : 1263697 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	C	D	A
pH (S.U.)	8.3	8.2	8.2	8.3	8.2	8.0
Temperature °C	24.0	25.1	25.9	24.0	25.9	25.1
Dissolved Oxygen mg/L aerate if < 4	6.8	6.3	6.1	6.5	6.1	5.7
Conductivity µmhos (mmhos)	40.0	40.7	41.2	40.7	41.3	41.8
Salinity ppth	25.5	26.0	26.4	26.0	26.4	26.9
(initials) Measured by:	BA	ADL	ADL	ADL	ADL	J
(initials) Recorded by:	BA	ADL	ADL	ADL	ADL	J

Comments:

Concentration 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C	C	D	A
pH (S.U.)	8.1	8.0	8.0	8.1	8.0	7.7
Temperature °C	24.0	25.1	25.4	25.7	25.9	25.9
Dissolved Oxygen mg/L aerate if < 4	6.7	6.2	6.0	6.7	6.2	6.1
Conductivity µmhos (mmhos)	39.0	39.4	39.7	39.0	38.9	39.1
Salinity ppth	24.8	25.1	25.3	24.8	24.8	25.4
(initials) Measured by:	BA	ADL	ADL	ADL	ADL	J
(initials) Recorded by:	BA	ADL	ADL	ADL	ADL	J

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 - Acute Screen 4/24 Bioassay Bench Sheets

Facility: JEA St. Johns River Power Park — JEA WWTF (MF)

Address: 11201 New Berlin Road

City: Jacksonville County: Duval

Contact/District: Esa ali / Northeast

NPDES Permit #: FL 0037869

LIMS Job #: TLH-2010-04-13-68 LIMS Sample #: 1263694

Lims Data Entry: 4-21-10 MF Data Entry Verification: BA 4.21.10

Sample Collection: Date: 4-12-10 Time: 1200

Hold Time Start: Date: 4-12-10 Time: 1200

Sample: 4 of 4

Comments:

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

Test 1 validation:
Control survival ≥90%: (Yes) No
Temperature Range ≤3°C: (Yes) No
Test 1: SOP TA 07_03

Test 2 validation:
Control survival ≥90%: (Yes) No
Temperature Range ≤3°C: (Yes) No
Test 2: SOP TA 07_04

(√one)
Test 1 incubated in: [X] Incubator #: 2 [ ] Waterbath #:
Test 2 incubated in: [X] Incubator #: 5 [ ] 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: ____

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 Fairchild
Amelia Rankin
Drew Alexander

Liz Miller
REVIEWER

Water Quality Parameters	Original Sample	Other 25.5 @5.0 4-13-10	Measured by	Verified by
Field Total Residual Cl_2 (mg/L):	not measured	measured	—	MF
Lab Total Residual Cl_2 (mg/L):	<0.03	<0.03	AGR/MF	MF/BA
Alkalinity (mg/L as $CaCO_3$):	144	212	AGR	MF
Hardness (mg/L as $CaCO_3$):	—	—	—	—
Total Ammonia (mg/L as N):	—	—	—	—
Conductivity: µmhos (mmhos)	39.5	40.4	BA	MF
Salinity (ppth):	25.2	25.7	BA	MF

V 2.2 7/8/08

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1263694 Test #: 1 SOP#:TA 07 03 Test Started: Date 4-13-10 Time: 1120

Organism/Batch/Age: A. bahia / 4-13-10/5days Test Ended: Date 4/17/10 Time: 1345

Chamber/Test Volume: 1000 / 500 ml Diluent/ Batch: ASW25.5 / 4-13-10 Test Duration: 48 hr / (96) hr

Food/Batch: ☐ YCT______ ☐ P.sub______

☑ Artemia: 0hr 73-10 24hr 74-10 48hr 75-10 72hr 76-10 Artemia Lot# 23613

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
Control	A	Tox 100	5	5	5	5	5	5
	B	tox 101	5	5	5	5	5	5
	C	tox 102	5	5	5	5	5	5
	D	tox 103	5	5	5	5	5	5
100%	A	tox 104	5	5	5	5	5	5
	B	tox 105	5	5	5	5	5	5
	C	tox 106	5	5	5	5	5	5
	D	tox 107	5	5	5	5	5	5
Loaded/Verified by: JS / MF		Checked by:	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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: Ø 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 000059

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1263694 Test #: 2 SOP#:TA 07 04 Test Started: Date 4-13-10 Time: 1115
Organism/Batch/Age: M. bahia / 4-13-10 / 13 days Test Ended: Date 4/17/10 Time: 1350
Chamber/Test Volume: 1000 / 500 ml Diluent/ Batch: ASW 25.5 / 4-13-10 Test Duration: 48 hr 96 hr
Food/Batch: ☐ YCT_____ ☐ P.sub_____
☑ Artemia: 0hr 13-10 24hr_____ 48hr 15-10 72hr_____ Artemia Lot# 23613
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
Control	A	B1	5	4D	4	4	4	4
	B	B2	5	5	5	5	5	5
	C	B3	5	5	5	5	5	5
	D	B4	5	4D	4	4	4	4
100%	A	B5	5	5	5	5	5	5
	B	B6	5	5	5	5	5	5
	C	B7	5	5	5	5	5	5
	D	B8	5	4D	4	4	4	4
			5	5	3	5	5	5

Loaded/Verified by: JS / mt Checked by:
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).

Page 000060

FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

IMS Sample # : 1263694 Test #: 1 of 2

TEST SOP #: TA07 03 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	C	D	A
pH (S.U.)	8.3	8.2	8.1	8.24	8.1	8.1
Temperature °C	24.0	25.9	25.4	24.0	25.0	25.5
Dissolved Oxygen mg/L aerate if < 4	6.4	6.4	5.3	6.2	5.6	5.6
Conductivity µmhos (mmhos)	40.4	40.7	40.9	40.5	40.9	40.4
Salinity ppth	25.7	25.9	26.2	25.8	26.1	25.7
(initials) Measured by:	BA	ATR	ATR	ATR	ATR	3
(initials) Recorded by:	BA	ATR	ATR	ATR	ATR	3

Comments:

Concentration 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C	C	D	A
pH (S.U.)	8.2	8.1	7.8	8.1	7.9	7.8
Temperature °C	24.0	25.9	25.6	25.8	24.3	24.1
Dissolved Oxygen mg/L aerate if < 4	6.6	6.2	5.1	6.5	5.7	5.6
Conductivity µmhos (mmhos)	39.5	39.8	40.3	39.7	39.9	41.4
Salinity ppth	25.2	25.4	25.7	25.3	25.4	26.5
(initials) Measured by:	BA	ATR	ATR	ATR	ATR	3
(initials) Recorded by:	BA	ATR	ATR	ATR	ATR	3

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:

061

FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample # : 1263694 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	C	D	A
pH (S.U.)	8.3	8.2	8.2	8.3	8.2	8.1
Temperature °C	24.0	25.1	25.7	24.1	25.9	25.7
Dissolved Oxygen mg/L aerate if < 4	6.8	6.2	6.1	6.4	6.1	6.2
Conductivity µmhos (mmhos)	40.3	40.5	40.8	40.5	40.6	41.4
Salinity ppth	25.7	25.8	26.1	25.9	25.9	26.5
(initials) Measured by:	BA	KDL	KDL	KDL	KDL	J
(initials) Recorded by:	BA	KDL	KDL	KDL	KDL	J

Comments:

Concentration 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C	C	D	A
pH (S.U.)	8.2	8.0	8.0	8.1	8.0	8.0 ~~7.9~~ 8.0
Temperature °C	24.0	25.7	25.9	25.8	25.9	25.9
Dissolved Oxygen mg/L aerate if < 4	6.7	6.2	6.0	6.4	6.0	6.3
Conductivity µmhos (mmhos)	39.6	39.9	40.1	39.4	39.9	40.7
Salinity ppth	25.2	25.4	25.6	25.1	25.4	25.9
(initials) Measured by:	BA	KDL	KDL	KDL	KDL	J
(initials) Recorded by:	BA	KDL	KDL	KDL	KDL	J

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: JEA St. Johns River Power Park WWTF Dates: August 13-17, 2010

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)

Entered by TJ 4-16-10 by MF

V 1.1 6/12/08 MF

PAGE

000063

Appendix C. SRT Bench Sheets and Statistical Analysis

Florida Department of Environmental Protection
Bureau of Laboratories

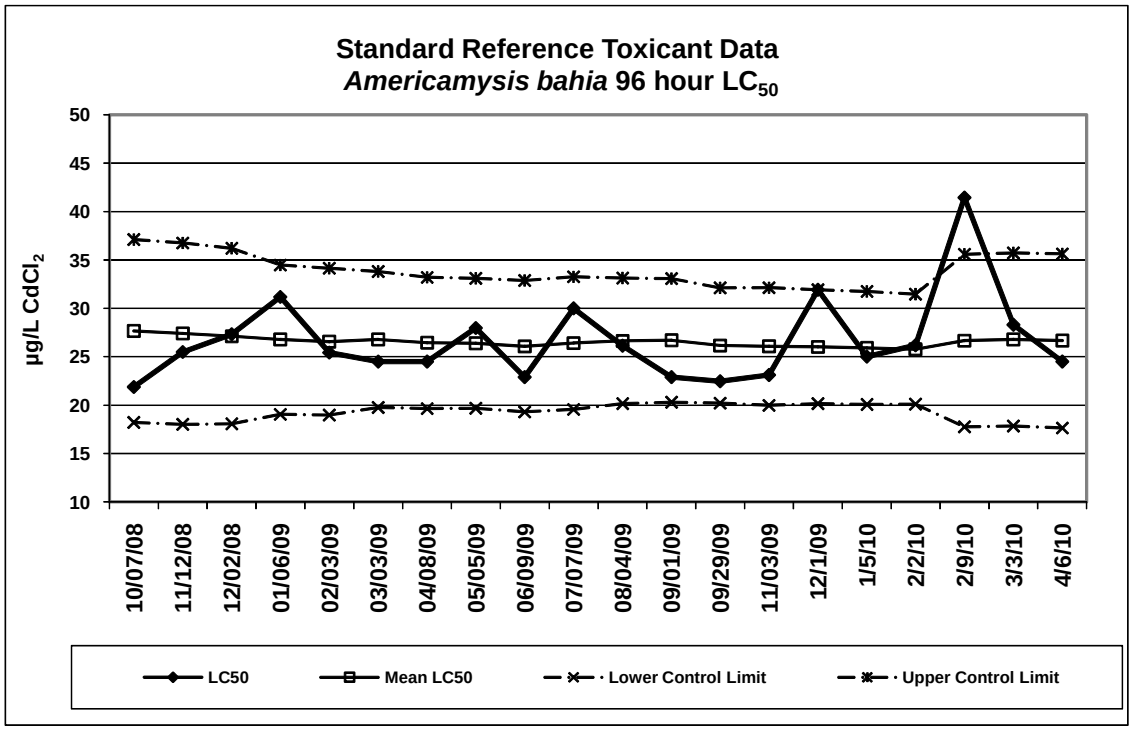
Standard Reference Toxicant (SRT) Test Data - 96-hour Acute Toxicity
Americamysis bahia (mysid shrimp) - Cadmium Chloride ($CdCl_2$)

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
10/07/08	21.89	27.66	4.73	18.21	37.11
11/12/08	25.50	27.40	4.69	18.01	36.78
12/02/08	27.31	27.13	4.53	18.07	36.20
01/06/09	31.20	26.79	3.86	19.07	34.50
02/03/09	25.44	26.56	3.79	18.97	34.15
03/03/09	24.49	26.78	3.52	19.75	33.81
04/08/09	24.49	26.45	3.39	19.66	33.23
05/05/09	27.98	26.39	3.36	19.68	33.10
06/09/09	22.89	26.09	3.39	19.32	32.87
07/07/09	30.00	26.43	3.43	19.57	33.28
08/04/09	26.14	26.65	3.24	20.16	33.13
09/01/09	22.89	26.69	3.19	20.30	33.07
09/29/09	22.46	26.17	2.97	20.22	32.11
11/03/09	23.12	26.08	3.04	20.00	32.15
12/1/09	31.91	26.03	2.94	20.16	31.91
1/5/10	25.00	25.91	2.92	20.06	31.75
2/2/10	26.18	25.77	2.84	20.09	31.46
2/9/10	41.45	26.68	4.46	17.76	35.59
3/3/10	28.31	26.78	4.47	17.84	35.72
4/6/10	24.49	26.66	4.50	17.66	35.65

CV = 16.88

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

EPA reference 75th quartile CV = 26%



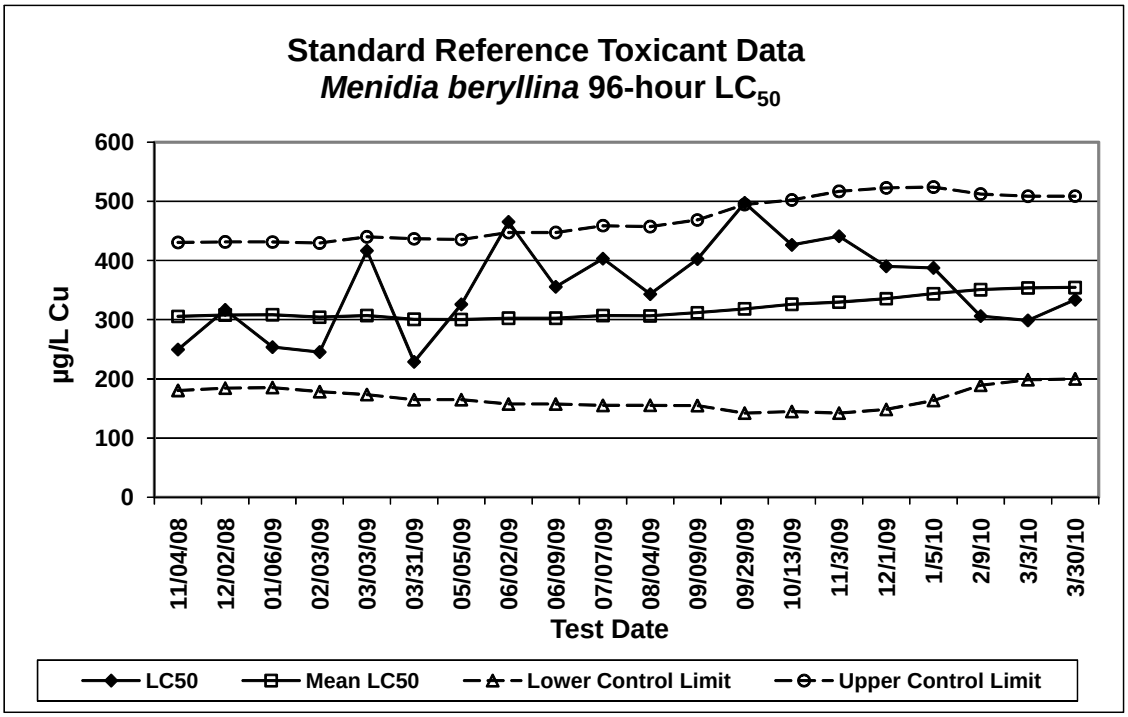
Appendix C. (continued)

Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 96-hour Acute Toxicity
Menidia beryllina (inland silverside) - Copper Chloride ($CuCl_2$) as Cu

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
11/04/08	249.81	305.57	62.50	180.57	430.57
12/02/08	316.79	308.13	61.82	184.48	431.78
01/06/09	253.83	308.45	61.51	185.44	431.46
02/03/09	245.51	304.15	62.80	178.55	429.74
03/03/09	416.64	307.01	66.63	173.74	440.27
03/31/09	228.94	300.89	67.96	164.97	436.80
05/05/09	326.07	300.24	67.64	164.97	435.52
06/02/09	465.39	302.54	72.50	157.54	447.53
06/09/09	355.67	302.52	72.48	157.55	447.48
07/07/09	403.35	307.19	75.91	155.37	459.02
08/04/09	343.29	306.49	75.48	155.52	457.45
09/09/09	402.57	311.84	78.40	155.03	468.65
09/29/09	497.5	318.42	88.10	142.21	494.62
10/13/09	426.5	326.12	90.57	144.97	502.27
11/3/09	441.06	329.60	93.69	142.22	516.99
12/1/09	390.28	335.59	93.54	148.51	522.68
1/5/10	387.66	343.92	90.17	163.57	524.26
2/9/10	306.1	350.85	80.73	189.39	512.30
3/3/10	298.9	353.79	77.48	198.82	508.76
3/30/10	333.83	354.48	77.23	200.03	508.94

CV = 21.79
EPA reference 75th quartile CV = 21%



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 29ppth / 3-29-10

Toxicant/ Batch#: CdCl / 1-4-5-10

Organism Batch: 46-10 (30) Age: 5 Days

Test Beginning: Date: 4-6-10 Time: 1340

Test Ending: Date: 4-10-10 Time: 1345

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	JD
Alkalinity (mg/L as $CaCO_3$):	228	TA06_08	MF
Hardness (mg.L as $CaCO_3$):	—	TA06_09	MF
Total Ammonia (mg/L as N):	<0.054	TA06_17	MF
Conductivity: µmhos (mmhos)	31.4	TA06_25	MF
Salinity (ppth):	19.4	TA06_25	MF

Food:	Batch
[ ] YCT	
[ ] *P. subcapitata*	
[X] Artemia Lot #	23613

Artemia Batch:

0 hr: 69-10

24 hr: 70-10

48 hr: 71-10

72 hr: 72-10

Chamber size: 1000 mL

Test volume: 500 mL per replicate

Concentrations prepared by: MF

Test Incubated In: Incubator # 2 Waterbath # ____ Incubator # 2 min. 25.3 max. 26.9 mean 26.1

Light Intensity: 50-100 Ft. candles Waterbath # ___ min. ____ max. ____ mean ____

Photoperiod: 16 hours Light / 8 hours dark Room B248 min. 25.1 max. 25.9 mean 25.5

Temperature Range °C: (if used)

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

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

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	Tox 1	5	5	5	5	5	5
	B	Tox 2	5	5	5	5	5	3 2D 5
	C	Tox 3	5	5	5	5	5	5
	D	Tox 4	5	5	5	5	5	5
20	A	Tox 5	5	5	5	5	5	4 1D
	B	Tox 6	5	5	5	5	5	3 2D
	C	Tox 7	5	5	5	5	5	5
	D	Tox 8	5	5	5	5	5	3 2D
30	A	Tox 11	5	5	3 2D	3	2 1D	2
	B	Tox 12	5	5	2 3D	2	2	1 1D
	C	Tox 13	5	5	3 2D	3	0 3D	—
	D	Tox 14	5	5	4 1D	4	4	2 2D
45	A	Tox 15	5	4 1D	1 3D	1	0 1D	—
	B	Tox 16	5	5	1 4D	1	0 0D	—
	C	Tox 17	5	5	1 4D	1	1	1
	D	Tox 18	5	4 1D	1 3D	1	1	1
67	A	Tox 19	5	3 2D	0 3D	—	—	—
	B	Tox 20	5	4 1D	0 4D	—	—	—
	C	Tox 21	5	4 1D	0 4D	—	—	—
	D	Tox 22	5	5	0 5D	—	—	—
100	A	Tox 25	5	5	0 5D	—	—	—
	B	Tox 26	5	1 4D	0 1D	—	—	—
	C	Tox 27	5	5	0 5D	—	—	—
	D	Tox 28	5	5	0 5D	—	—	—
Organisms loaded by: JD		Checked by:	MF	~~D~~	~~D~~	~~D~~	~~D~~	BA

Loading Verified by: MF AR = after renewal

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

Investigators' Signatures

Marshall Faircloth

Andria Rankin

Bree Alexander

Jenna Daniels

Reviewer: Liz Miller

Comments: (A) Transcription error BA

Repeat of 3-30-10 test Page 49 MF 4-14-10

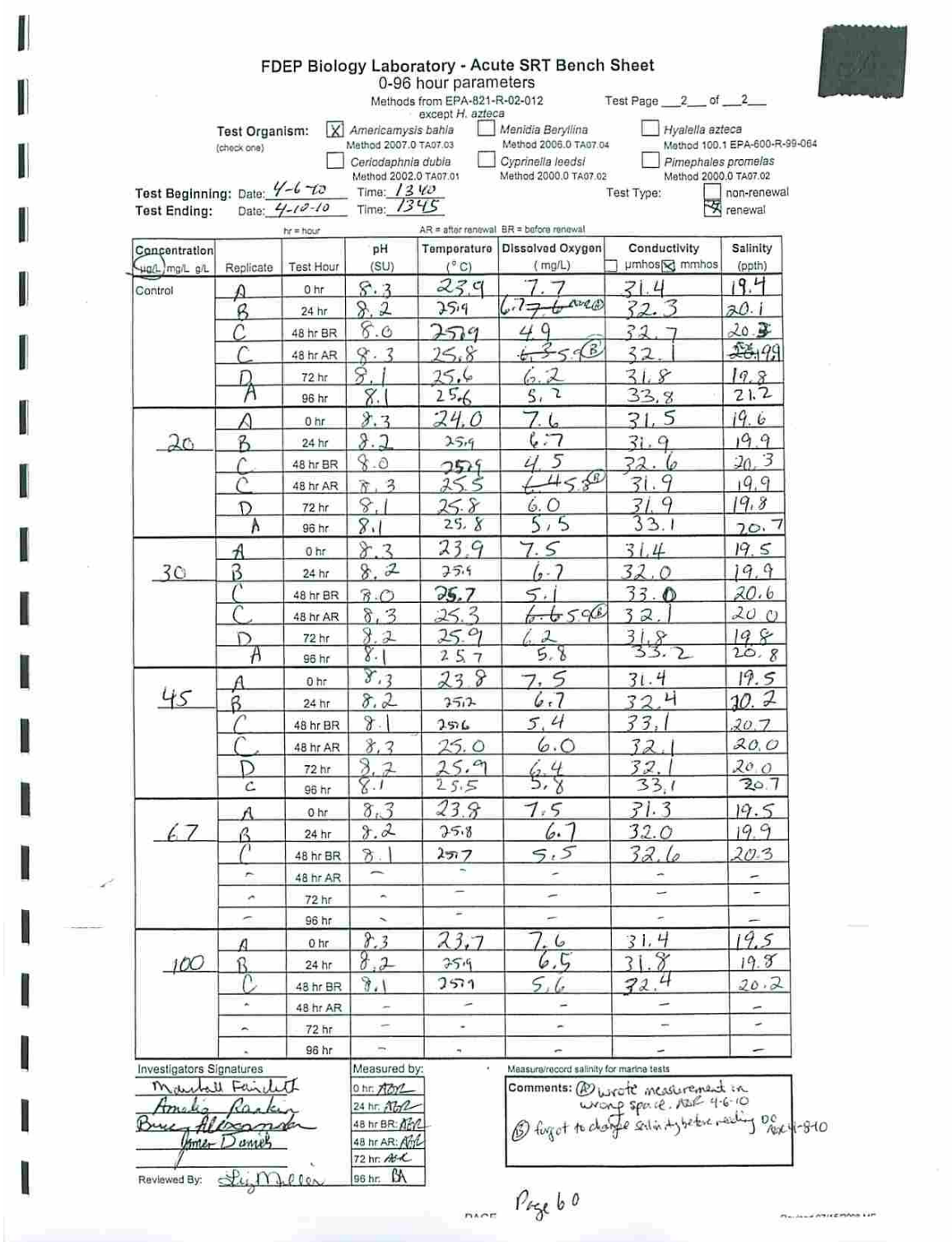
Method: TSK

Statistics: LC50	95% confidence intervals Lower	Upper
48 hour: 33.86	30.20	37.95
96 hour: 24.49	21.92	27.37

Page 59

Revised 7/15/2008 mf

Appendix C. (continued)



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

Test Organism: (check one)
- [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: 4-6-10 Time: 1340
Test Ending: Date: 4-10-10 Time: 1345
Test Type: [ ] non-renewal [X] renewal

hr = hour AR = after renewal BR = before renewal

Concentration µg/L mg/L g/L	Replicate	Test Hour	pH (SU)	Temperature (° C)	Dissolved Oxygen (mg/L)	Conductivity [ ] µmhos [X] mmhos	Salinity (ppth)
Control	A	0 hr	8.3	23.9	7.7	31.4	19.4
	B	24 hr	8.2	25.9	6.7 ~~6.6~~ (A)	32.3	20.1
	C	48 hr BR	8.0	25.9	4.9	32.7	20.3
	C	48 hr AR	8.3	25.8	~~6.35~~ (B)	32.1	~~20.19~~
	D	72 hr	8.1	25.6	6.2	31.8	19.8
	A	96 hr	8.1	25.6	5.2	33.8	21.2
20	A	0 hr	8.3	24.0	7.6	31.5	19.6
	B	24 hr	8.2	25.9	6.7	31.9	19.9
	C	48 hr BR	8.0	25.9	4.5	32.6	20.3
	C	48 hr AR	8.3	25.5	~~6.45~~ (B)	31.9	19.9
	D	72 hr	8.1	25.8	6.0	31.9	19.8
	A	96 hr	8.1	25.8	5.5	33.1	20.7
30	A	0 hr	8.3	23.9	7.5	31.4	19.5
	B	24 hr	8.2	25.9	6.7	32.0	19.9
	C	48 hr BR	8.0	25.7	5.1	33.0	20.6
	C	48 hr AR	8.3	25.3	~~6.65~~ (B)	32.1	20.0
	D	72 hr	8.2	25.9	6.2	31.8	19.8
	A	96 hr	8.1	25.7	5.8	33.2	20.8
45	A	0 hr	8.3	23.8	7.5	31.4	19.5
	B	24 hr	8.2	25.2	6.7	32.4	20.2
	C	48 hr BR	8.1	25.6	5.4	33.1	20.7
	C	48 hr AR	8.3	25.0	6.0	32.1	20.0
	D	72 hr	8.2	25.9	6.4	32.1	20.0
	C	96 hr	8.1	25.5	5.8	33.1	20.7
67	A	0 hr	8.3	23.8	7.5	31.3	19.5
	B	24 hr	8.2	25.8	6.7	32.0	19.9
	C	48 hr BR	8.1	25.7	5.5	32.6	20.3
	-	48 hr AR	-	-	-	-	-
	-	72 hr	-	-	-	-	-
	-	96 hr	-	-	-	-	-
100	A	0 hr	8.3	23.7	7.6	31.4	19.5
	B	24 hr	8.2	25.9	6.5	31.8	19.8
	C	48 hr BR	8.1	25.9	5.6	32.4	20.2
	-	48 hr AR	-	-	-	-	-
	-	72 hr	-	-	-	-	-
	-	96 hr	-	-	-	-	-

Investigators Signatures
Marshall Faircloth
Amelia Parker
Bruce Alexander
James Daniels

Reviewed By: Liz Miller

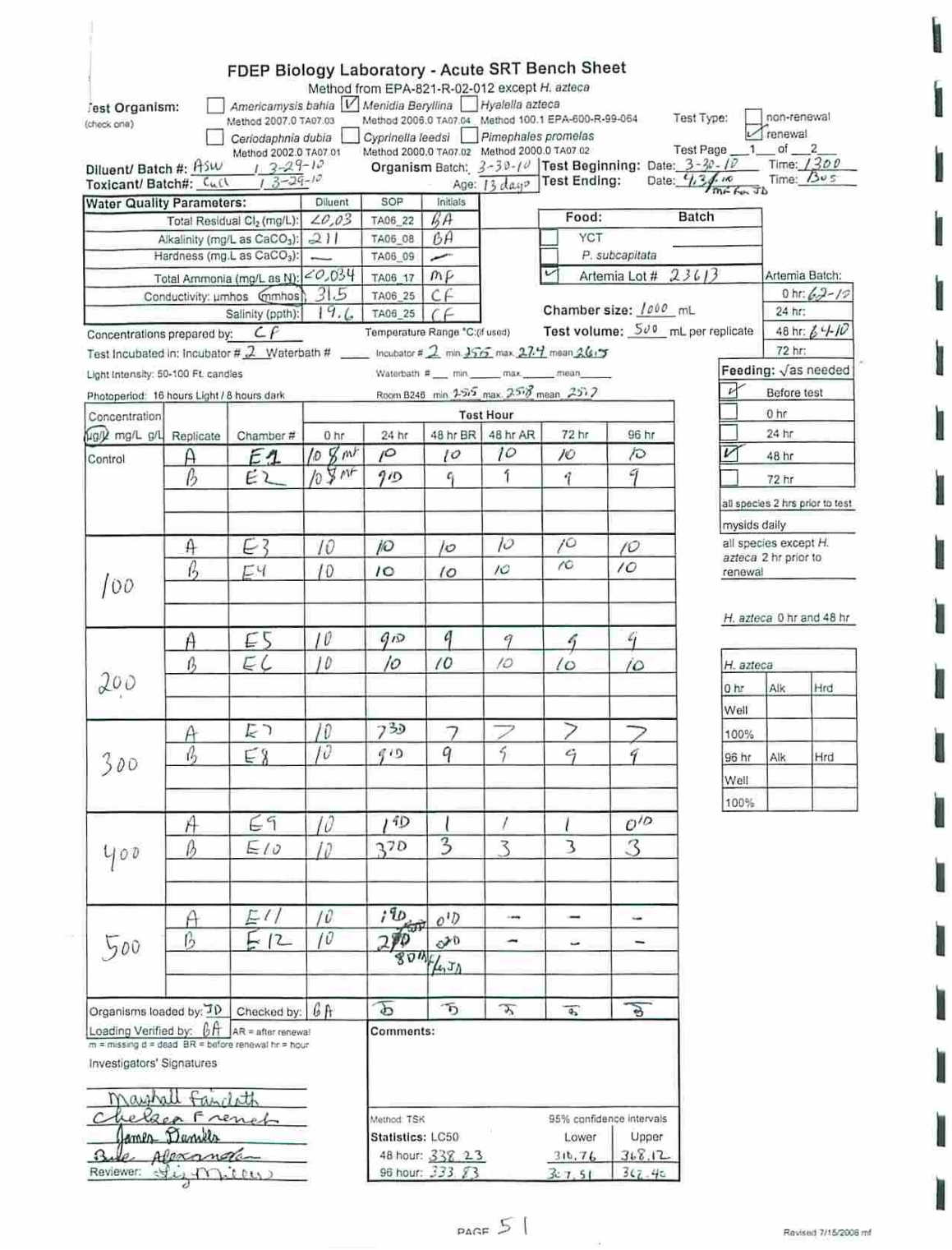
Measured by:
0 hr: AMP
24 hr: AMP
48 hr BR: AMP
48 hr AR: AMP
72 hr: AMP
96 hr: BA

Measure/record salinity for marine tests

Comments: (A) wrote measurement in wrong space. AMP 4-6-10
(B) forgot to change salinity before reading DO AMP 4-8-10

Page 60

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 1.3-29-10

Toxicant/ Batch#: CuCl 1.3-29-10

Organism Batch: 3-30-10 Age: 13 days

Test Beginning: Date: 3-30-10 Time: 1300

Test Ending: Date: 4.3.10 Time: 1305

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	BA
Alkalinity (mg/L as $CaCO_3$):	211	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)	31.5	TA06_25	CF
Salinity (ppth):	19.6	TA06_25	CF

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

Artemia Batch: 0 hr: 62-12; 24 hr: ; 48 hr: 64-10; 72 hr:

Chamber size: 1000 mL

Test volume: 500 mL per replicate

Concentrations prepared by: CF

Temperature Range °C:(if used)

Test Incubated in: Incubator # 2 Waterbath # ____ Incubator # 2 min 25.5 max 27.4 mean 26.5

Light Intensity: 50-100 Ft. candles Waterbath # ___ min ____ max ____ mean ____

Photoperiod: 16 hours Light / 8 hours dark Room B246 min 25.5 max 25.8 mean 25.7

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	E1	10 8 mf	10	10	10	10	10
	B	E2	10 8 mf	9 D	9	9	9	9
100	A	E3	10	10	10	10	10	10
	B	E4	10	10	10	10	10	10
200	A	E5	10	9 D	9	9	9	9
	B	E6	10	10	10	10	10	10
300	A	E7	10	7 D	7	7	7	7
	B	E8	10	9 D	9	9	9	9
400	A	E9	10	1 D	1	1	1	0 D
	B	E10	10	3 D	3	3	3	3
500	A	E11	10	1 D	0 D	—	—	—
	B	E12	10	2 D 80%	0 D	—	—	—

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

Organisms loaded by: JD Checked by: BA

Loading Verified by: BA AR = after renewal

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

Comments:

Investigators' Signatures

Marshall Faircloth

Chelsea French

James Daniels

Julie Alexander

Reviewer: Liz Miller

Method: TSK

Statistics: LC50	95% confidence intervals Lower	Upper
48 hour: 338.23	316.76	368.12
96 hour: 333.83	307.51	362.40

PAGE 51

Revised 7/15/2008 mf

Appendix C. (continued)

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

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

Test Page 2 of 2

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

Test Beginning: Date: 3-30-10 Time: 1300
Test Ending: Date: 4.3.10 Time: 1305

Test Type: ☐ non-renewal ☑ renewal

hr = hour AR = after renewal BR = before renewal

Concentration µg/L mg/L g/L	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☒ mmhos	Salinity (ppth)
Control	A	0 hr	8.3	25.8	7.4	31.5	19.6
	B	24 hr	8.2	24.8	7.0	32.2	20.0
	A	48 hr BR	8.2	25.6	6.9	32.6	20.3
	A	48 hr AR	8.3	24.4	7.3	31.5	19.6
	B	72 hr	8.2	25.2	7.2	31.9	19.9
	A	96 hr	8.2	24.9	7.5	33.3	20.6
100	A	0 hr	8.3	25.6	7.4	31.8	19.8
	B	24 hr	8.2	24.7	6.6	32.3	20.2
	A	48 hr BR	8.2	25.6	6.6	32.9	20.5
	A	48 hr AR	8.3	24.3	7.2	31.9	19.9
	B	72 hr	8.2	25.3	7.2	31.9	19.9
	A	96 hr	8.2	24.8	7.4	32.9	20.5
200	A	0 hr	8.3	25.1	7.4	32.0	20.0
	B	24 hr	8.3	24.6	6.6	32.7	20.4
	A	48 hr BR	8.2	25.2	6.5	33.3	20.8
	A	48 hr AR	8.3	24.1	7.1	32.1	20.0
	B	72 hr	8.2	25.3	7.2	32.1	20.0
	A	96 hr	8.2	24.7	7.4	33.2	20.6
300	A	0 hr	8.3	25.8	7.4	32.3	20.1
	B	24 hr	8.3	24.5	6.7	32.9	20.5
	A	48 hr BR	8.2	25.1	6.6	33.7	21.0
	A	48 hr AR	8.3	24.0	7.1	32.1	20.0
	B	72 hr	8.2	25.5	7.2	32.3	20.1
	A	96 hr	8.2	24.7	7.4	33.4	20.9
400	A	0 hr	8.3	25.6	7.4	32.5	20.3
	B	24 hr	8.3	24.3	6.8	33.2	20.7
	A	48 hr BR	8.2	25.2	6.7	33.6	21.0
	A	48 hr AR	8.3	24.0	7.1	32.4	20.2
	B	72 hr	8.2	25.3	7.5	32.3	20.1
	A	96 hr	8.2	24.8	7.3	33.6	21.1
500	A	0 hr	8.3	25.5	7.4	32.7	20.4
	B	24 hr	8.2	24.1	6.9	33.7	21.1
	A	48 hr BR	8.2	25.2	6.8	34.2	21.4
	–	48 hr AR	–	–	–	–	–
	–	72 hr	–	–	–	–	–
	–	96 hr	–	–	–	–	–

Investigators Signatures
Marshall Frinkloth
Chelsea French
James Daniels
Blue Alexander

Reviewed By: Leigh Miller

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

Measure/record salinity for marine tests

Comments:

PAGE 52

Revised 07/15/2008 MF

Appendix C. (continued)

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

DATE: 4-6-10 DURATION: 96 hr TOXICANT: $CdCl_2$
SPECIES: *Americamysis bahia*

RAW DATA: Concentration (µg/L)	Number Exposed	Mortalities
.00	20	0
20.00	20	5
30.00	20	15
45.00	20	18
67.00	20	20
100.00	20	20

SPEARMAN-KARBER TRIM: 25.00%

SPEARMAN-KARBER ESTIMATES: LC50: **24.49**
95% LOWER CONFIDENCE: 21.92
95% UPPER CONFIDENCE: 27.37

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

DATE: 3-30-10 DURATION: 96 hr TOXICANT: $CuCl_2$
SPECIES: *Menidia beryllina*

RAW DATA: Concentration (µg/L)	Number Exposed	Mortalities
.00	20	1
100.00	20	0
200.00	20	1
300.00	20	4
400.00	20	17
500.00	20	20

SPEARMAN-KARBER TRIM: 0%

SPEARMAN-KARBER ESTIMATES: LC50: **333.83**
95% LOWER CONFIDENCE: 307.51
95% UPPER CONFIDENCE: 362.40

NOTE: MORTALITY PROPORTIONS WERE NOT MONOTONICALLY INCREASING. ADJUSTMENTS WERE MADE PRIOR TO SPEARMAN-KARBER ESTIMATION.

Appendix D. Test Organism Receipts

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Shipping Date: 3/29/10

Ship to: FDEP

P.O. No:_____

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia	250	6 DAYS	MS 100323	25°C	8.0 S.U.	20 ‰
	150	4 DAYS	MS 100325	25°C	8.0 S.U.	20 ‰
Menidia beryllina	250	10 DAYS	SS 100319	25°C	8.0 S.U.	20 ‰
	150 ac	10 DAYS	SS 100317	25°C	8.0 S.U.	20 ‰
						Hardness mg/L
Cyprinella leedsi						
Pimephales promelas	100 ac	10 DAYS	FM 100317	25°C	7.8 S.U.	86 mg/L
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

Packed by: PM

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

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Shipping Date: 3/5/10

Ship to: FLDEP

P.O. No:

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia	100 ac	4 DAYS	MS100401	25	8.0	28‰ ✓
	150	4 DAYS	MS100401	25	8.0	20‰ ✓
Menidia beryllina	100 ac	12 DAYS	SS100324	25	8.0	28‰ ✓
						Hardness mg/L
Cyprinella leedsi	150	12 DAYS	CL100324	25	7.8	80 mg
		12 DAYS				
Pimephales promelas	150 ac	8 DAYS	FM100328	25	7.8	80
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

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 D. (continued)

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Date: 3/12/10

Shipped to: FDEP

P.O. No: N/A

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia	250	4 DAYS	MS100408	25	8.0	20
Menidia beryllina	250	12 DAYS	SS100331	25	8.0	20
						Hardness (mg/L)
Cyprinella leedsi						
Pimephales promelas	100	8 DAYS	FM100404	25	7.8	80
Ceriodaphnia dubia						
YCT						
P. subcapitata						

Packed by: PM

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 St. Johns River Power Park Outfall D-001, sampled on April 11-12, 2010.

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
4/12/2010 11:30	EFF-1	AGP/LN	Algal Growth Potential	13.6	A	mg DryWt/L	3	3
4/12/2010 11:30	EFF-1	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	1.7	I	ug/L	0.55	1.7
4/12/2010 11:30	EFF-1	Chlorophyll/Grain Size/BOD	Phaeophytin-a	2.7		ug/L	0.4	1.2
4/12/2010 11:30	EFF-1	Toxicology	Bioassay-Acute-Screen-SW-Fish, LC50	100	L	LC50		
4/12/2010 11:30	EFF-1	Toxicology	Bioassay-Acute-Screen-SW-Mysid, LC50	100	L	LC50		
4/12/2010 11:30	EFF-1	Metals	Arsenic	1.6	I	ug/L	0.75	3
4/12/2010 11:30	EFF-1	Metals	Nickel	3	I	ug/L	0.75	3
4/12/2010 11:30	EFF-1	Metals	Selenium	15.6		ug/L	0.6	2.4
4/12/2010 11:30	EFF-1	Metals	Mercury	0.12	U	ug/L	0.12	0.5
4/12/2010 11:30	EFF-1	Metals	Chromium	1.7	I	ug/L	0.9	3.6
4/12/2010 11:30	EFF-1	Metals	Lead	0.6	U	ug/L	0.6	2.4
4/12/2010 11:30	EFF-1	Metals	Cadmium	0.09	U	ug/L	0.09	0.36
4/12/2010 11:30	EFF-1	Metals	Calcium	324		mg/L	3.7	15
4/12/2010 11:30	EFF-1	Metals	Iron	370		ug/L	30	120
4/12/2010 11:30	EFF-1	Metals	Silver	0.075	U	ug/L	0.075	0.3
4/12/2010 11:30	EFF-1	Metals	Copper	1.5	U	ug/L	1.5	3
4/12/2010 11:30	EFF-1	Metals	Magnesium	912		mg/L	2	8
4/12/2010 11:30	EFF-1	Metals	Zinc	15	U	ug/L	15	60
4/12/2010 11:30	EFF-1	Metals	Aluminum	1330		ug/L	60	240
4/12/2010 11:30	EFF-1	Nutrients	Total-P	0.067		mg P/L	0.008	0.02
4/12/2010 11:30	EFF-1	Nutrients	O-Phosphate-P	0.041		mg P/L	0.008	0.02
4/12/2010 11:30	EFF-1	Nutrients	NO2NO3-N	0.17		mg N/L	0.004	0.01
4/12/2010 11:30	EFF-1	Nutrients	Ammonia-N	0.041		mg N/L	0.01	0.02
4/12/2010 11:30	EFF-1	Nutrients	Kjeldahl Nitrogen	0.67		mg N/L	0.16	0.4
4/12/2010 11:30	EFF-1	Overflow	Oil and Grease	1.4	U	mg/L	1.4	5
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Naphthalene	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	2,4-Dimethylphenol	10	U	ug/L	10	40
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	2,4-Dinitrotoluene	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Benzidine	100	U	ug/L	100	400
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Di-n-octyl phthalate	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Phenanthrene	1	U	ug/L	1	4

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	2,4,6-Trichlorophenol	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Benzo(k)fluoranthene	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Benzo(g,h,i)perylene	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	4-Chloro-3-methylphenol	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	2,6-Dinitrotoluene	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Phenol	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3	U	ug/L	3	12
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2	U	ug/L	2	8
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Acenaphthene	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	15	U	ug/L	15	60
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Hexachlorocyclopentadiene	3	UJ	ug/L	3	12
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	2,4-Dinitrophenol	15	U	ug/L	15	60
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Benzo(b)fluoranthene	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3	U	ug/L	3	12
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Fluorene	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Hexachloroethane	3	U	ug/L	3	12
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	N-Nitrosodimethylamine	2	U	ug/L	2	8
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	3,3'-Dichlorobenzidine	40	U	ug/L	40	160
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Acenaphthylene	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Anthracene	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Benzo(a)anthracene	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	2,4-Dichlorophenol	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	2-Chlorophenol	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Di-n-butyl phthalate	5	U	ug/L	5	20
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Dibenzo(a,h)anthracene	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3	U	ug/L	3	12
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Nitrobenzene	2	U	ug/L	2	8
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Pyrene	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Benzo(a)pyrene	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Butyl benzyl phthalate	5	U	ug/L	5	20

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Chrysene	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Diethyl phthalate	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Fluoranthene	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Isophorone	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2	U	ug/L	2	8
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Pentachlorophenol	3	U	ug/L	3	12
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	2-Chloronaphthalene	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	2-Nitrophenol	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L	15	60
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Dimethyl phthalate	10	U	ug/L	10	40
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Hexachlorobenzene	1	U	ug/L	1	4
4/12/2010 11:30	EFF-1	Priority Organic Pollutants	Hexachlorobutadiene	3	U	ug/L	3	12
4/12/2010 11:30	EFF-1	Field Parameter	Dissolved Oxygen	7.1		mg/L		
4/12/2010 11:30	EFF-1	Field Parameter	pH	8.08				
4/12/2010 11:30	EFF-1	Field Parameter	Temperature	20.16		C		
4/12/2010 11:30	EFF-1	Field Parameter	Specific Conductance	34800		umhos/cm		
4/12/2010 18:00	EFF-1 BSY	Toxicology	Bioassay-Acute-Screen-SW-Fish, LC50	100	L	LC50		
4/12/2010 18:10	EFF-1 BSY	Toxicology	Bioassay-Acute-Screen-SW-Fish, LC50	100	L	LC50		
4/12/2010 0:00	EFF-1 BSY	Toxicology	Bioassay-Acute-Screen-SW-Fish, LC50	100	L	LC50		
4/12/2010 18:00	EFF-1 BSY	Toxicology	Bioassay-Acute-Screen-SW-Mysid, LC50	100	L	LC50		
4/12/2010 0:00	EFF-1 BSY	Toxicology	Bioassay-Acute-Screen-SW-Mysid, LC50	100	L	LC50		
4/12/2010 18:10	EFF-1 BSY	Toxicology	Bioassay-Acute-Screen-SW-Mysid, LC50	100	L	LC50		
4/12/2010 18:10	EFF-1 BSY	Field Parameter	Dissolved Oxygen	4.35		mg/L		
4/12/2010 18:00	EFF-1 BSY	Field Parameter	pH	8.11				
4/12/2010 18:10	EFF-1 BSY	Field Parameter	Temperature	26.12		C		
4/12/2010 18:00	EFF-1 BSY	Field Parameter	Dissolved Oxygen	4.98		mg/L		
4/12/2010 18:00	EFF-1 BSY	Field Parameter	Specific Conductance	38100		umhos/cm		
4/12/2010 18:10	EFF-1 BSY	Field Parameter	pH	7.35				
4/12/2010 18:10	EFF-1 BSY	Field Parameter	Specific Conductance	40500		umhos/cm		
4/12/2010 18:00	EFF-1 BSY	Field Parameter	Temperature	27.23		C		
4/12/2010 11:20	BLANK	Metals	Zinc	5	U	ug/L	5	20
4/12/2010 11:20	BLANK	Metals	Chromium	0.3	U	ug/L	0.3	1.2
4/12/2010 11:20	BLANK	Metals	Lead	0.2	U	ug/L	0.2	0.8

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
4/12/2010 11:20	BLANK	Metals	Silver	0.025	U	ug/L	0.025	0.1
4/12/2010 11:20	BLANK	Metals	Aluminum	60	U	ug/L	60	240
4/12/2010 11:20	BLANK	Metals	Calcium	0.075	U	mg/L	0.075	0.3
4/12/2010 11:20	BLANK	Metals	Mercury	0.12	U	ug/L	0.12	0.5
4/12/2010 11:20	BLANK	Metals	Arsenic	0.25	U	ug/L	0.25	1
4/12/2010 11:20	BLANK	Metals	Selenium	0.2	U	ug/L	0.2	0.8
4/12/2010 11:20	BLANK	Metals	Copper	0.5	U	ug/L	0.5	1
4/12/2010 11:20	BLANK	Metals	Nickel	0.25	U	ug/L	0.25	1
4/12/2010 11:20	BLANK	Metals	Cadmium	0.03	U	ug/L	0.03	0.12
4/12/2010 11:20	BLANK	Metals	Magnesium	0.04	U	mg/L	0.04	0.16
4/12/2010 11:20	BLANK	Metals	Iron	30	U	ug/L	30	120
4/12/2010 11:20	BLANK	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
4/12/2010 11:20	BLANK	Nutrients	Kjeldahl Nitrogen	0.08	U	mg N/L	0.08	0.2
4/12/2010 11:20	BLANK	Nutrients	NO2NO3-N	0.004	U	mg N/L	0.004	0.01
4/12/2010 11:20	BLANK	Nutrients	O-Phosphate-P	0.004	U	mg P/L	0.004	0.01
4/12/2010 11:20	BLANK	Nutrients	Total-P	0.004	U	mg P/L	0.004	0.01
4/12/2010 11:20	BLANK	Overflow	Oil and Grease	1.4	U	mg/L	1.4	5
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Chrysene	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Di-n-octyl phthalate	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Benzo(b)fluoranthene	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Benzo(g,h,i)perylene	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Di-n-butyl phthalate	5.3	U	ug/L	5.3	21
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Hexachlorobutadiene	3.2	U	ug/L	3.2	13
4/12/2010 11:20	BLANK	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3.2	U	ug/L	3.2	13
4/12/2010 11:20	BLANK	Priority Organic Pollutants	2,4-Dinitrophenol	16	U	ug/L	16	63
4/12/2010 11:20	BLANK	Priority Organic Pollutants	4-Nitrophenol	16	U	ug/L	16	63
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Benzidine	110	U	ug/L	110	420
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Benzo(k)fluoranthene	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Dimethyl phthalate	11	U	ug/L	11	42
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Pentachlorophenol	3.2	U	ug/L	3.2	13
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Pyrene	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Fluoranthene	1.1	U	ug/L	1.1	4.2

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
4/12/2010 11:20	BLANK	Priority Organic Pollutants	3,3'-Dichlorobenzidine	42	U	ug/L	42	170
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Dibenzo(a,h)anthracene	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Anthracene	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Acenaphthene	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	2,4-Dimethylphenol	11	U	ug/L	11	42
4/12/2010 11:20	BLANK	Priority Organic Pollutants	2,4-Dichlorophenol	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Naphthalene	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	2,4,6-Trichlorophenol	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	2,6-Dinitrotoluene	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	2-Chloronaphthalene	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Acenaphthylene	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Isophorone	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	N-Nitrosodimethylamine	2.1	U	ug/L	2.1	8.4
4/12/2010 11:20	BLANK	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3.2	U	ug/L	3.2	13
4/12/2010 11:20	BLANK	Priority Organic Pollutants	4-Chloro-3-methylphenol	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	16	U	ug/L	16	63
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Butyl benzyl phthalate	5.3	U	ug/L	5.3	21
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Fluorene	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Hexachlorocyclopentadiene	3.2	UJ	ug/L	3.2	13
4/12/2010 11:20	BLANK	Priority Organic Pollutants	2,4-Dinitrotoluene	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	2-Nitrophenol	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2.1	U	ug/L	2.1	8.4
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Benzo(a)anthracene	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Diethyl phthalate	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Hexachlorobenzene	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2.1	U	ug/L	2.1	8.4
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Nitrobenzene	2.1	U	ug/L	2.1	8.4
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Phenanthrene	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Phenol	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	2-Chlorophenol	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1.1	U	ug/L	1.1	4.2
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Benzo(a)pyrene	1.1	U	ug/L	1.1	4.2

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3.2	U	ug/L	3.2	13
4/12/2010 11:20	BLANK	Priority Organic Pollutants	Hexachloroethane	3.2	U	ug/L	3.2	13

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

Saint Johns River Power Park - JEA – FL0037869 – March-2010

State of Florida
Department of Environmental Protection
Facility Introduction & Summary

PART I: Information gathered prior to sampling event	
Prepared By: Edward Jamro	**Contact Number:** 904-807-3264
Facility Name (as it appears on permit): **St. Johns River Power Park**	**Current Name:** same
NPDES Permit Number: FL0037869	**Permit Expiration Date:** February 9, 2011
Physical Address: **11201 New Berlin Road** **Jacksonville, FL 32226**	
District: Northeast	**County:** Duval
Function of Facility: (SEE NPDES FLOW DIAGRAM ON LAST PAGE OF THIS REPORT) **Main facility is a power plant.** **Make-up cooling water is chlorinated during circulation in the cooling towers. It is discharged at EFF-1 (D-001). Low volume wastes (LVW), metal cleaning wastes (MCW) treated in the Central Wastewater Treatment Facility (CWTF) by chemical conditioning and precipitation, clarification and coagulation, multimedia filtration and neutralization.**	
Facility Type: Industrial Wastewater	**Permitted Capacity (MGD):** 77 MGD @ D-001; (Infrequent, "report only", flows at only at D-004 & D-009)
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): **Outfall D-001 (EFF-1) - (FLW-2) – Jan-09 to Dec-09 -- Maximum flow measured was 50 MGD. Annual Average flow was 31.47 MGD.** **Outfall D-002 (EFF-2) – Monitored quarterly – in 2009 four values – 0.55, 0.55, 7.45, and 2.78 MGD.** **Outfalls D-004 (EFF-4) and D-009 (EFF-9) – No flow in 2009 (NODI = C).**	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months): **NOT APPLICABLE.**	

Page 1

Appendix F. (continued)

Saint Johns River Power Park - JEA – FL0037869 – March-2010

Description of type of Discharge:

☒ Continuous D-001 ☐ Intermittent ☐ Seasonal ☒ Rainfall Dependent D-002, D-004 & D-009 ☐ Other, please specify

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

FLW1 - The flow monitoring location of the feedwater withdrawn from the Northside discharge for the St. Johns River Power Park cooling towers.

FLW2 - The flow monitoring location for the combined discharge of central wastewater treatment facility effluent and St. Johns River Power Park cooling tower blowdown prior to comingling with Northside effluent. (D-001)

INT-1- At the intake structure for cooling towers at St. Johns River Power Park.

EFF-1 – At the main plant discharge prior to entry into the Northside discharge channel. (D-001)

EFF-2 At the point of discharge from the runoff sedimentation pond into borrow pit. (Stormwater – D-002).

EFF-4 At the discharge point from the coal pile runoff sedimentation pond. (D-004)

OUI- 5 At the outlet of each unit, except when flow is the calculated from both units.

OUI-6 From the pump sump discharge, except Oil & Grease shall be monitored at the water surface

EFF-9 At the solid waste runoff sedimentation pond overflow. (D-009)

Description of Permitted Outfall(s): (excerpted from current permit)

Surface Water Discharge:

An existing maximum permitted CTBD and CWTF discharge of 77 MGD to the NGS enclosed discharge basin, and thence to the St. John's River (Class III Marine waters) through **Outfall D-001** located approximately at latitude 30° 24' 56.37" N, longitude 81° 33' 5.36" W.

An existing infrequent coal pile runoff sedimentation pond discharge to Browns Creek (Class III Marine waters) through Outfall **D-004** located approximately at latitude 30° 25' 34.86" N, longitude 81° 32' 45.64" W.

An existing infrequent solid waste runoff sedimentation pond discharge to Browns Creek (Class III Marine waters) through Outfall **D-009** located approximately at latitude 30° 26' 1.64" N, longitude 81° 32' 40.19" W.

Stormwater Outfall:

An existing stormwater discharge associated with runoff sedimentation control pond to Browns Creek (Class III Marine waters) through **Outfall D-002** located approximately at latitude 30° 25' 35.95" N, longitude 81° 32' 39.13"

Internal Outfalls:

An existing Unit 1 and 2 CTBD discharge through Internal Outfall I-005 to Outfall D-001.

An existing CWTF discharge through Internal Outfall I-006 to Outfall D-001.

Appendix F. (continued)

Saint Johns River Power Park - JEA – FL0037869 – March-2010

Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility): (See Flow diagram on Page 13 of this report).

Wastewater consists of cooling tower blowdown (CTBD) from the two natural draft cooling towers, low volume wastes (LVW), metal cleaning wastes (MCW), and other industrial wastewater streams. Make-up water for the SJRPP Units 1 and 2 cooling towers is obtained from the Northside Generating Station (NGS) enclosed cooling water discharge basin. SJRPP does not have a cooling water intake structure (CWIS) that withdraws water from Waters of the State or Waters of United States (U.S.).

WASTEWATER TREATMENT:

Make-up cooling water is chlorinated during circulation in the cooling towers. LVW and MCW are treated in the Central Wastewater Treatment Facility (CWTF) by chemical conditioning and precipitation, clarification and coagulation, multimedia filtration and neutralization.

Saint Johns River Power Park - JEA – FL0037869 – March-2010

	PART I: Continued
	List current Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under. 1. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge from Outfall D-001- Main Plant Discharge to the Northside Generating Station enclosed discharge basin and thence by pipeline to the St. Johns River. Such discharge shall be limited and monitored by the permittee as specified below::

	Effluent Limitations			Monitoring Requirements		
Parameters (units)	Daily Average	Daily Maximum	Other	Monitoring Frequency	Sample Type	Sample Point
Flow (MGD)	--	Report	Report Monthly Average--	Daily	Pump logs	FLW-1 FLW-2
Oxidants, Total Residual (MG/L)	--	0.01	--	See Cond. **I.A.2.**	Grab –See Cond.I.A.4.	EFF-1
Temperature (F), Water (DEG.F)	Report See Cond. I.A.34	96.0 See Cond. **I.A.33.**	--	Continuous	Calculated	EFF-1
pH (SU)	--	8.5	6.5 Daily Minimum	Monthly	Grab	EFF-1
Total Recoverable Arsenic (UG/L)	--	36	--	Monthly, When SCR is in operation and discharging FGD Blowdown	Grab	EFF-1
Total Recoverable Mercury (UG/L)	--	0.025	--	Quarterly, When SCR is in operation and discharging FGD Blowdown	Grab	EFF-1

	PART I: Continued					
	List current Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under. 1. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge from Outfall D-001- Main Plant Discharge to the Northside Generating Station enclosed discharge basin and thence by pipeline to the St. Johns River. Such discharge shall be limited and monitored by the permittee as specified below::					
	Effluent Limitations			**Monitoring Requirements**		
Parameters (units)	**Daily Average**	**Daily Maximum**	**Other**	**Monitoring Frequency**	**Sample Type**	**Sample Point**
Total Recoverable Selenium (UG/L)	--	71	--	Monthly, When SCR is in operation and discharging FGD Blowdown	Grab	EFF-1
Nitrogen, Ammonia (as N) (MG/L)[1]	Report	=	=	Monthly, When SCR is in Operation and Discharging FGD Blowdown	Grab	INT-1 EFF-1
Nitrogen, Kjeldahl (as N) (MG/L)[1]	Report	=	=	Monthly, When SCR is in Operation and Discharging FGD Blowdown	Grab	INT-1 EFF-1
Nitrogen, Nitrate/Nitrite (as N) (MG/L)[1]	Report	=	=	Monthly, When SCR is in Operation and Discharging FGD Blowdown	Grab	INT-1 EFF-1
Nitrogen, Total (as N) (MG/L)[1]	Report	--	--	Monthly, When SCR is in Operation and Discharging FGD Blowdown	Calculated	INT-1 EFF-1
Nitrogen Total, Monthly Net Loading (LBS/MONTH)[1,2]	--	--	Report Monthly Total	Monthly, When SCR is in Operation and Discharging FGD Blowdown	Calculated	INT-1 EFF-1

	PART I: Continued					
	List current Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under. 1. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge from Outfall D-001- Main Plant Discharge to the Northside Generating Station enclosed discharge basin and thence by pipeline to the St. Johns River. Such discharge shall be limited and monitored by the permittee as specified below::					
	Effluent Limitations			**Monitoring Requirements**		
Parameters (units)	**Daily Average**	**Daily Maximum**	**Other**	**Monitoring Frequency**	**Sample Type**	**Sample Point**
Nitrogen Total, Annual Net Loading (LBS/YEAR) [1,3]	--	--	0 Annual Total	Monthly, When SCR is in Operation and Discharging FGD Blowdown	Calculated	INT-1 EFF-1
Acute Whole Effluent Toxicity	See Condition I.A.3					EFF-1

1. *Currently, the Department is evaluating a watershed permitting approach for the JEA facilities discharging nitrogen to the Lower St. Johns River. If a watershed permit is issued and includes JEA St. Johns River Power Park, the monitoring requirements for nitrogen in the watershed permit shall supersede the nitrogen monitoring requirements for Outfall D-001 in this permit.*

2. *The monthly net Total Nitrogen (TN) loading is defined as the pounds of TN discharged at EFF-1 minus the pounds of TN withdrawn at INT-1, over a corresponding period of time. The facility shall report the monthly net TN loading which equals the pounds of TN discharged during a month minus the pounds TN withdrawn during the same month. Monthly TN withdrawn and discharged (in pounds per month) is calculated based on total volume of water/wastewater withdrawn and discharged during that month. Samples at INT-1 and EFF-1 shall be taken concurrently. Intake and discharge TN concentrations for any given month shall be the average of all paired TN samples taken during that month.*

3. *The annual net TN loading (in pounds per year) on any given month is equal to the monthly TN net loading for that month plus the previous eleven monthly TN loadings and is considered a rolling annual maximum value.*

SPECIAL CONDITIONS REFERENCED IN ABOVE TABLE: I.A.

I.A.2 - Total Residual Oxidants (TRO) shall be monitored by multiple grab samples during periods of chlorine addition and TRO discharge from the cooling tower blowdown.

I.A.3 The permittee shall comply with the following requirements to **evaluate acute whole effluent toxicity of the discharge from Outfall D-001.**

a. Effluent Limitation
(1) Mortality of less than or equal to 20% in the 100% effluent concentration in any "routine" test shall constitute compliance with these permit

conditions and Rule 62-302.200(1) and Rule 62-302.500(1)(a)4, F.A.C. Mortality of greater than 20% in the 100% effluent concentration in any test shall constitute unacceptable toxicity. The permittee shall conduct "additional follow-up" tests as described in 8.c. below for any "routine" test for which unacceptable toxicity has been observed.

(2) Whole effluent acute toxicity shall not exceed in any routine test mortality of greater than 50% in the 100% effluent concentration or in any additional follow-up test. [Rule 62-302.200(1), Rule 62-302.500(1)(a)4 and Rule 62-4.244(3)(a), F.A.C.]

b. Monitoring Frequency

(1) "Routine" toxicity tests shall be conducted once a quarter upon initial enriched of the solid fuel for Units 1 and 2 with calcium oxide by addition of limestone or an alternative calcium oxide source for arsenic control, and lasting for the duration of this permit unless a reduction in the frequency of monitoring is granted in writing by the Department.

(2) Upon completion of six consecutive, valid "routine" tests that demonstrate compliance with the effluent limitation specified in 36.a.(1) and (2) above the permittee may submit a written request to the Department for a reduction in monitoring. The Department shall review this request within 45 days of receipt and approve or deny the request in writing. Materials submitted to the Department for review should include a summary of the data and the complete bioassay reports for all tests being considered. In no case shall the frequency of monitoring be reduced to less than annually. Requested reductions in monitoring frequency shall only become effective upon Department approval.

(3) If a test within the sequence of the six is deemed invalid, but is replaced by a repeat valid test initiated within seven days of the invalidation, the invalid test will not be counted against the requirement for six consecutive valid tests for the purpose of evaluating the reduction of monitoring frequency. If two or more invalidations occur, this provision does not apply.

c. Test Requirements

(1) Routine Tests: All routine tests shall be conducted using a control (0% effluent) and one test concentration of 100% final effluent.

(2) Additional Follow-up Tests, if required:

(a) If a routine test does not meet the acute toxicity limitation in 36.a.(1) and (2) above, the permittee shall conduct three additional follow-up tests on each species that failed the test.

(b) The first additional follow-up test shall be conducted using a control (0% effluent) and a minimum of five dilutions: 100%, 50%, 25%, 12.5% and 6.25% effluent. The dilution series may be modified in the second and third tests to more accurately bracket the toxicity, such that at least two dilutions above (not to exceed 100% effluent) and two dilutions below the target concentration and a control (0% effluent) are run. All test results shall be statistically analyzed according to the Appendices in EPA-821-R-02-012.

(c) The first test shall be initiated within two weeks of the end of the failed routine test. The remaining additional follow-up tests shall be conducted weekly thereafter until a total of three valid additional follow-up tests are completed.

(3) The permittee shall conduct 96-hour acute static renewal toxicity tests using the mysid, Americamysis (Mysidopsis) bahia, and the inland silverside, Menidia beryllina, concurrently.

(4) All test species, procedures and quality assurance criteria used shall be in accordance with Methods for Measuring Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, EPA-821-R-02-012. Any deviation of the bioassay procedures outlined herein shall be submitted in writing to the Department for review and approval prior to use. In the event the above method is revised, the permittee shall conduct acute toxicity testing in accordance with the revised method.

(5) The control water and dilution water used will be moderately hard water as described in EPA-821-R-02-012, Table 7.

d. Sampling Requirements
   (1) **Routine tests shall be conducted on four separate grab samples collected at evenly-spaced (6-hr) intervals over a 24-hour period and used in four separate test in order to catch any peaks of toxicity and to account for daily variations in effluent quality. If the duration of the discharge is less than 24-hours, the duration of discharge shall be documented on the chain of custody.**
   (2) For additional follow-up tests, the first test shall be conducted on four separate grab samples collected at evenly-spaced (6-hr) intervals over a 24-hour period. Each sample shall be run as a separate test. The second and third additional follow-up tests shall be run on a single grab sample collected on the day and time when the greatest toxicity was identified in the first additional follow-up test. Results for each additional test shall include the determination of LC50 values with 95% confidence limits.

e. Quality Assurance Requirements
   (1) A standard reference toxicant (SRT) quality assurance (QA) acute toxicity test shall be conducted with each species used in the required toxicity tests either concurrently or started no more than 30 days before the date of each routine or additional follow-up test conducted. The SRT-QA data shall be included in the reports for each companion routine or additional follow-up test required.
   (2) If the mortality in the control (0% effluent) exceeds 10% for either species in any test, the test for that species (including the control) shall invalidated and the test repeated.
   (3) If, during any routine separate grab sample test, 100% mortality occurs prior to the end of the test and control mortality is less than 10% at that time, that test (including the control) shall be terminated with the conclusion that the test fails and constitutes non-compliance.
   (4) Additional follow-up tests shall be evaluated for acceptability based on the concentration-response relationship, as required by EPA-821-R-02-012, Section 12.2.6.2., and included with the bioassay reports.

f. Reporting Requirements
   (1) Results from all required tests shall be reported on the Discharge Monitoring Report (DMR) as follows:
      (a) Routine Test Results: If 50% or less mortality occurs in all four separate grab sample tests for the test species, ">100%" should be entered on the DMR for that test species. If greater than 50% mortality occurs in any of the four separate grab sample tests for the test species, "<100%" should be entered.
      (b) Additional Follow-up Test Results: Report the calculated LC50 value for that test species and the 95% confidence limits.
   (2) A bioassay laboratory report for the routine test shall be prepared according to EPA-821-R-02-012, Section 12, Report Preparation and Test Review and mailed to the Department at the address below within 30 days of the completion of the test.
   (3) For additional follow-up tests, a single bioassay laboratory report shall be prepared according to EPA-821-R-02-012, Section 12, and mailed within 45 days of completion of the third valid additional follow-up test. If any additional follow-up test or two consecutive routine tests do not meet either the 20% or 50% effluent limitation specified in 36.a.(1) and (2) above, the permittee shall contact the Department within 30 days of the laboratory report submittal to discuss the corrective actions necessary to remedy the observed acute toxicity.
   (4) All bioassay laboratory reports shall be sent to:

Florida Department of Environmental Protection
Northeast District Office
7825 Baymeadows Way, Ste., 200B
Jacksonville, FL 32256

I.A.4 - Total Residual Oxidants (TRO) sampling shall be performed by multiple grab samples. Multiple grab samples shall consist of not less than two grab samples. Samples shall be collected at approximately the beginning of any period of TRO discharge, and once every fifteen minutes thereafter until no TRO discharge is detected.

I.A.33 - For the purposes of condition I.A.1, "Daily Maximum" shall be the highest daily average (mean) temperature throughout a given calendar month. The daily mean temperature shall be calculated as the sum of all temperature measurements during a given 24 hour day (12:00 am-11:59 pm) divided by the number of measurements during the same period.

I.A.34 - For the purposes of condition I.A.1, "Daily Average" (mean) shall be calculated as the sum of all temperature measurements during a given 24- hour period (12:00 am-11:59 pm) divided by the number of measurements during that same period.

	PART I: Continued
	Note – Outfalls I-005 and I-006 are Internal outfalls and will not be sampled. **Note – Outfalls D-002 (Runoff Sedimentation Pond), D-004 (Coal Pile Runoff Sedimentation Pond) and D-009 (Solid Waste Runoff Sedimentation) are intermittent outfalls and will not be sampled.** **These outfalls are shown in the NPDES flow diagram on the last page of this report.**

Appendix F. (continued)

Saint Johns River Power Park - JEA – FL0037869 – March-2010

PART I: Continued	
Receiving Waters: St. Johns River	**Classification (indicate whether fresh or marine):** Class III Marine water
Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.): See Item I.A.3. on pages 6-8 of this document.	
Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.): None during this permit cycle.	
Facility Mixing Zone Details (if applicable): For temperature – Under permit FL0001031, JEA's Northside Generating Station is required to comply with thermal discharge limitations and a thermal mixing zone pursuant to Department Rules 62-302.520(1) and (6)(a), F.A.C. and Section 316(a) of the Clean Water Act (CWA).	
List Permit Violations (DMR data) and plant upsets that occurred at the plant within the last year: @D-001 For December 1, 2008 to February 28, 2010	

Date	Parameter and Units	Limit	Result
6/30/09	Selenium, ug/l	71	100
7/31/09	Selenium, ug/l	71	123
NA	NA	NA	NA

Appendix F. (continued)

Saint Johns River Power Park - JEA – FL0037869 – March-2010

Describe previous FYI and WQBEL study:

Last Biological Assessment sampling was done by FDEP ON July 19, 2004 (See Bio-Assessment #2004-4723). The below descriptions were excerpted from the facility permit fact sheet dated January 5, 2005.

a. Reasonable Assurance: The facility has provided reasonable assurance that the discharge will not adversely affect the designated use of receiving water. Inspection data, as well as all other available data, have been evaluated in accordance with the Department's reasonable assurance procedures to ensure that no limits other than those included in this permit are needed to maintain Florida's water quality standards

b. WQBEL Considerations: A Level I WQBEL was performed for the discharge, and is embodied in this Fact Sheet based on historical discharge monitoring data, available inspection reports, and the effluent characterization provided with the application.

c. Impaired Water Considerations: Cooling tower blowdown (CTBD) from SJRPP discharges via Outfall D-001 into the enclosed discharge basin of the adjacent JEA Northside Generating Station (NGS), where it mixes with once-through cooling water (OTCW) and other industrial wastewater from NGS. The combined wastestreams discharge to the St. Johns River within water body identification (WBID) 2213B, which is listed in the Group 2, 2004 verified list of impaired waters for the Lower St. Johns Basin, as impaired for copper, iron, lead, and nickel. The JEA NGS wastewater permit (FL0001031), which is currently being renewed, requires monitoring of these constituents in both the NGS intake and discharge on a monthly basis. Since the SJRPP intake and discharge are both within the NGS enclosed discharge basin, the NGS intake and discharge monitoring will also provide data for the impaired constituents in SJRPP discharge. SJRPP also has emergency discharges via Outfalls D-002 (uncontaminated stormwater), D-004 (coal pile sedimentation pond), and D-009 (treated low volume wastewater) to Brown' s Creek within WBID 2216, which is not listed on the 2004 303(d) verified list impaired waters. Although these outfalls on Brown's Creek rarely discharge, they have extensive monitoring requirements which include (for D-004 and D-009) the metals that are of concern in the St. Johns River. These and other metals are also monitored at Internal Outfall I-006 (Central Wastewater Treatment Facility). Appropriate monitoring would be performed and reported on the DMR, in the event of an emergency discharge.

Additionally, the main stem of the Lower St. Johns River, including WBID 2213B, has been verified as impaired for nutrients, pursuant to a Department Final Order dated September 4, 2003. A Total Daily Maximum Load (TMDL) is currently being established for that portion of the St. Johns River. Industrial Wastewater Staff consulted with the Department's Basin Coordinator for the Lower St. Johns River, who noted that JEA SJRPP and JEA NGS, and other Steam Electric Power Plants discharging to the Lower St. Johns River are not included in development of the TMDL, because they are not considered to be sources of nutrient discharge. This determination is supported by data from the permit renewal applications for both SJRPP and NGS, current and historic monitoring data, and inspection reports. Therefore, monitoring and limitations for nutrients at SJRPP are unnecessary.

d. Thermal Considerations: This facility is authorized to discharge a maximum of 72 MGD of CTBD to the Northside Generating Station's enclosed discharge basin, where it mixes with a maximum discharge of 827 MGD from NGS, which operates under a separate permit (FL0001031). The SJRPP discharge is approximately 8.0% of the combined total discharge. At its point of discharge into the NGS discharge basin, CTBD from SJRPP must meet a maximum temperature limitation of 96° F. The combined NG S and SJRPP effluent discharges to the St. Johns River via an approximately 3,500 foot pipeline. Under permit FL0001031 NGS is required to comply with thermal discharge limitations and a thermal mixing zone pursuant to Department Rules 62-302.520(1) and (6)(a), F.A.C. and Section 316(a) of the Clean Water Act (CWA). Additionally, JEA must evaluate potential thermal impacts to the receiving water and verify compliance with the thermal mixing zone under NGS permit FL0001031. Since both facilities discharge via the same discharge pipeline, a separate evaluation is not needed for SJRPP.

Describe previous or current Enforcement Actions (including WLs):

There have been no enforcement actions regarding SJRPP during the current permit cycle.

Describe any violations or problems noted in previous inspection:

The facility effluent showed high selenium in June & July 2009.
Tallahassee permitting is modifying the JEA Northside and the SJRPP permits at this time.

Discuss whether DMR trends within previous five years are improving or declining: NO COMMENTS.

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

Once through non-contact cooling water (OTCW) is not changing.

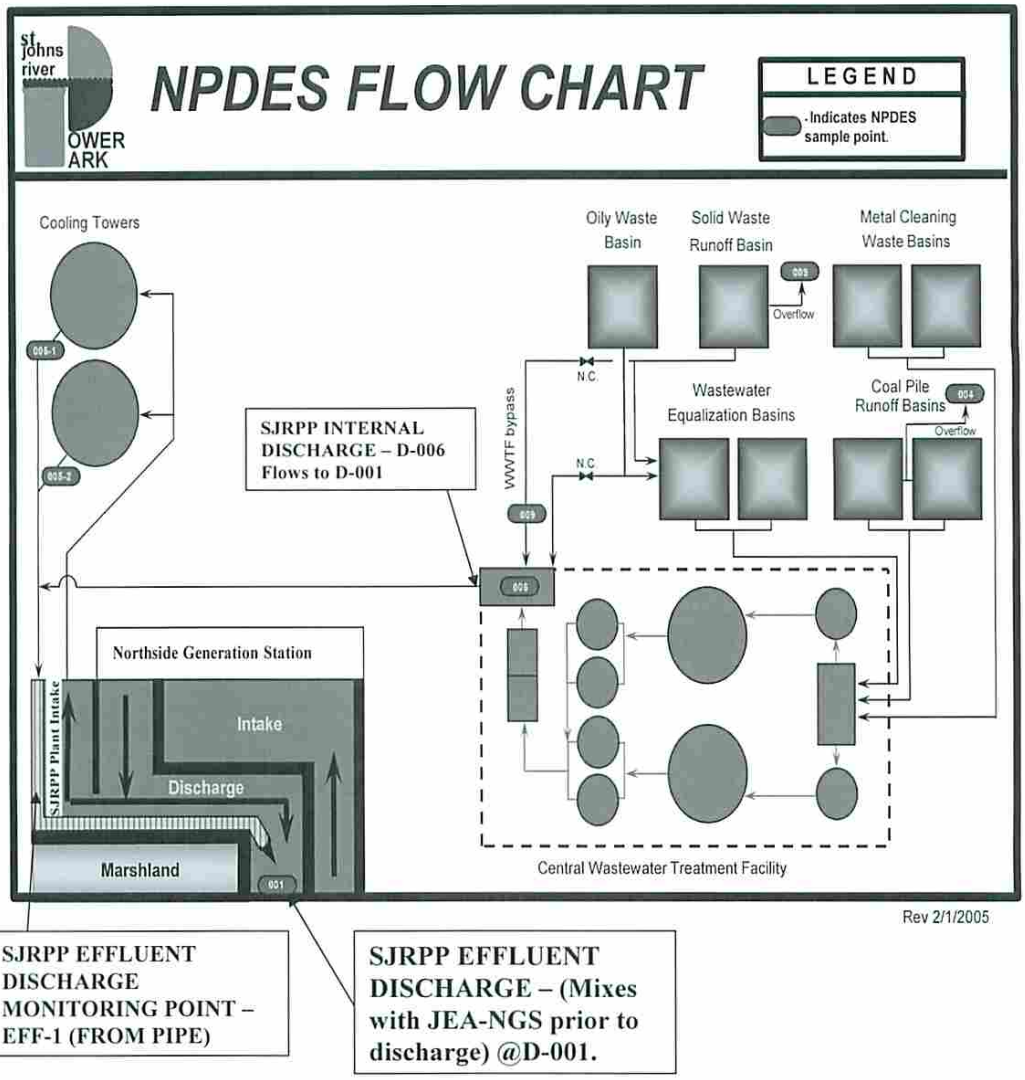
Appendix F. (continued)

Saint Johns River Power Park - JEA – FL0037869 – March-2010

PART II: Sampling Event Information	
Date(s) sample collected: 4/11/2010 to 4/12/2010	**Sampler(s):** Eesa Ali, Ed Jamro, Anthony Vigliotti, Sharon Plitz
Temperature (Deg C):	**pH (SU):**
Dissolved Oxygen (mg/L):	**Conductivity (umhos/cm):**
Total Residual Chlorine (mg/L):	**Total Residual Chlorine - after Disinfection (mg/L):**
Method of Chlorination: Chlorine/Bromine cpds. –	**Method of De-chlorination:** Not Applicable
Flow During Sample Collection for each outfall(MGD): (D-001 only) **Flow was ??? MGD.**	
Mean Flow for each outfall for previous 12 months based on sampling date (If samples are taken on more than one day, indicate Mean Flow for each day): Very stable at ???? MGD.	
Describe Discharge during Sampling Event: **X Continuous** ☐ Intermittent ☐ Seasonal ☐ Rainfall Dependent ☐ Other, please specify	
Describe any conditions, difficulties or abnormal events that occurred during the sample collection and any other additional comments here: Describe appearance of final effluent on day of sampling…..	

Appendix F. (continued)

Saint Johns River Power Park - JEA – FL0037869 – March-2010



Appendix G. EPA End Sheet

The Bioassay of St. Johns River Power Park effluent sampled on April 11-12, 2008. NPDES #FL0037869.

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 3 7 8 6 9 11	12 1 0 0 4 1 1	18 B	19 S	20 2

Remarks

66

The Priority Pollutants Analysis of St. Johns River Power Park effluent sampled on April 12, 2008. NPDES #FL0037869.

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 3 7 8 6 9 11	12 1 0 0 4 1 2	18 X	19 S	20 2

Remarks

66

Biological Analyses of St. Johns River Power Park effluent sampled on April 12, 2008. NPDES #FL0037869.

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 3 7 8 6 9 11	12 1 0 0 4 1 2	18 S	19 S	20 2

Remarks

66