

Effluent Quality Assessment

Seminole Electric Cooperative Inc.

Putnam County

NPDES #FL0036498

Sampled December 13, 2010

March 2011
(Resubmitted March 2011 with corrected tables)

Biology Section
Bureau of Laboratories
Division of Environmental Assessment and Restoration

Quality Manual No. 870346G
NELAC Certification No. E31780

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Seminole Electric Cooperative, Inc., 890 North Highway 17, Palatka, Putnam County, Florida, 32177. NPDES # FL0036498. Effluent grab and composite samples for bioassay and chemical analyses for this facility were collected on December 13, 2010.

Introduction

Seminole Electric Cooperative, Inc., is a coal-fired power plant which uses multiple treatment systems to treat its low-volume, domestic, cooling tower make-up, and purge stream wastewaters prior to discharge to the St. Johns River. (See Appendix F for detailed facility information provided by Heather Webber of FDEP Northeast District.)

Methods

Samples were collected from the EFF-1 NPDES sampling point for Outfall D-001 by Eesa Ali and Malton Prifti (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 definitive toxicity tests and algal growth potential test were performed following internal DEP SOPs TA07_01, TA07_02, and TA08_01 through TA08_09. All internal DEP SOPs are available on the web at: http://www.floridadep.org/labs/cgi-bin/sop/biosop.asp.

The sample was aerated for 30 minutes at a rate of approximately 100 bubbles per minute to reduce the dissolved oxygen (DO) from 10.5 mg/L to 8.1 mg/L.

The test species, *Ceriodaphnia dubia*, was substituted for the permitted test species, *Daphnia magna.*

The algal growth potential (AGP) sample was salinity-adjusted with artificial sea salts from an apparent salinity of approximately 5.6 parts per thousand (ppth) to a salinity of approximately 7.0 ppth. A freshwater AGP test was not performed due to the apparent salinity of the sample.

Results and Discussion

- **Toxicity Test Results**

  Tests were performed December 14 - 18, 2010.

  Ceriodaphnia dubia 96-hour acute definitive bioassay – LC_{50} > 100%, 30%* mortality in 100% sample at 96 hours

  Pimephales promelas 96-hour acute definitive bioassay – LC_{50} > 100%, 10%* mortality in 100% sample at 96 hours

  The bioassay sample was acutely toxic to the *Ceriodaphnia dubia* test organisms but was not toxic to the *Pimephales promelas* test organisms.

  *NOTE: In a 96-hour acute definitive 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 salinity adjusted effluent Algal Growth Potential (AGP) was 3.0 U (U - Material was analyzed for but not detected; the value reported is the minimum detection limit) 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 (31.8:1) of total nitrogen to total phosphorus suggests that the effluent is phosphorus limited (Maloney et al. 1978).

  See Table 1 for AGP results.

- **Chemistry Results**

  Total residual chlorine was not detected in the bioassay sample in the bioassay laboratory. Total ammonia (1.225 mg N/L) was detected in the bioassay sample in the bioassay laboratory. Based on the pH, salinity and temperature of the effluent at test initiation, the calculated unionized ammonia concentration was ≤ 0.02 mg/L. The total ammonia concentration in the composite sample collected and preserved for chemical analysis was 1.2 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, arsenic, chromium-III, copper, iron, and selenium were detected in the effluent at levels that comply with Class III fresh water quality criteria (62-302.530, F.A.C.) or permit limitations. Beryllium and zinc was detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL).

  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. See Appendix B for bioassay lab equipment.

Conclusion

The effluent sample collected from the EFF-1 NPDES sampling point for Outfall D-001 for this facility on December 13, 2010, was acutely toxic to the *Ceriodaphnia dubia* test organisms but was not acutely toxic to the *Pimephales promelas* test organisms during the 96-hour acute definitive bioassays. The salinity-adjusted effluent AGP result was less than the "problem" threshold for marine receiving waters. Effluent water quality samples collected on December 13, 2010, did not exceed any applicable class III criteria or violate any permit conditions.

Literature Cited

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

Table 1. Measured algal growth potential (AGP; mg dry weight/L) of the saltwater species *Dunaliella tertiolecta* and ratios of nitrogen to phosphorus for samples collected from the Seminole Electric Cooperative, Inc., facility on December 13, 2010.

Seminole Electric Cooperative, Inc. NPDES# FL0036498			
Location	**AGP (measured)**	**Inorganic N:P ratio**	**Total N:P ratio**
Effluent 2	3.0 U*	57.5	31.8

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

* - sample salinity adjusted to 7ppt

Table 2. Effluent limits, Class III Freshwater Criteria and chemical and microbiological data for samples collected from the Seminole Electric Cooperative, Inc. wastewater treatment plant on December 13, 2010.

Seminole Electric Cooperative, Inc. NPDES #FL0036498	Class III Criteria	Effluent Limits	Effluent	
Metals (µg/L unless otherwise noted)				
Aluminum	-	-	780	
Arsenic	≤ 50	-	2.36	
Cadmium	≤ 0.76 b	-	0.36	
Calcium (mg/L)	-	-	645	
Chromium-III	≤ 268.22 b	-	2.3	
Copper	≤ 30.5 b	≤ 139	44	
Iron	≤ 1,000	≤ 1,700	1050	
Lead	≤ 18.58 b	-	1.97	
Magnesium (mg/L)	-	-	106	
Nickel	≤ 168.54 b	-	16.7	
Selenium	≤ 5.0	≤ 11.7	2.89	
Silver	≤ 0.07	≤ 0.07	0.025	U
Zinc	≤ 387.83 b	-	6.4	I
Nutrients (mg/L)				
Ortho-phosphate	-	-	0.028	
Total Phosphorus	-	Report	0.12	
Total Ammonia	-	Report	1.2	
Un-ionized Ammonia	≤ 0.02 s	≤ 0.02 s	≤ 0.02	c
Nitrate and Nitrite	-	Report	0.41	
Total Kjeldahl Nitrogen	-	Report	3.4	
Organic Nitrogen	-	-	2.2	c
Total Nitrogen	-	Report	3.81	c
General Physical and Chemical Parameters				
Dissolved Oxygen (mg/L)	≥ 5.0	-	9.6	
pH (SU)	6.0 - 8.5	6.0 - 8.5	6.7	
Conductivity (µmhos/cm)	≤ 1,275	≤ 8,653	5804	
Temperature (°C)	-	≤ 35.7 d	16.7	
Salinity	-	-	3.8	c
Sample Depth (m)	-	-	0	
Total Residual Chlorine (mg/L)	≤ 0.01	-	≤0.03	UQ£
Chlorophyll *a* (µg/L) - Corrected	-	-	0.92	U
Phaeophytin (µg/L)	-	-	1.8	I
Total Suspended Solids (mg/L)	-	-	22	
CBOD, 5 day (mg/L), N - inhibited	-	-	5.8	A
Oils and Greases (mg/L)	≤ 5.0	≤ 5.0 s	1.4	U
Chloride (mg/L)	-	-	1600	
Cyanide (µg/L)	≤ 5.2	≤ 19.6	0.005	UJ
Fluoride (mg/L)	≤ 10.0	-	1.3	
Sulfate (mg/L)	-	-	700	
Flow (MGD)	-	7.46 a	7.215	a*
Hardness (mg $CaCO_3$)	-	Report	2047.07	c
Microbiology (Number of colony forming units/100ml)				
Fecal Coliforms ¥	≤ 400s #	-	9	B

Value exceeds the Class III Water Quality Criteria or permit limits

a - Annual average
b - Value is calculated based on hardness
c - Value is calculated
d - Daily average
s - Single sample
A - Value reported is the mean of two or more determinations
B - Results based on colony counts outside the acceptance range
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
J - Estimated value
Q - Sample held beyond normal holding time
U - Material analyzed for but not detected; value reported is the method detection limit
¥ - Fecal coliform analysis performed by Central lab
- If 10 or fewer samples are taken within a month, the single sample limit is 400 CFU (62-302.530(6), F.A.C.)
* - AADF from Sept. '09 to Aug. '10
£ - Measured in Central Labs and entered into Tox sheets

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2010-12-13-26
FYI3 inspection for Seminole Electric

Requester: Cari Butler
Field Report Prepared By: E ALI

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

Collected By: VEESA ALJ & MALTON PRIFTI
Send Final Report To: Tom Kallemeyn
Sampling Agency: FDEP NE

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Seminole electric FF-1 D001	Grab	Date 12/13 Time 1550		A
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L) 9.59	Storet Station Number
	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C) 16.7	pH 6.72	Sample Depth X m / ft	Salinity (PPTh) 3.17 / Sp Conductance (umho/cm) 5504
	Latitude dd / dms	Longitude dd / dms		Comments # 5505	NPDES Number

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Seminole Elec FF-1 D001	Grab	Date 12/13 Time 2118	Date 12/13 Time 1418	A
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number
	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth m / ft	Salinity (PPTh) / Sp Conductance (umho/cm)
	Latitude dd / dms	Longitude dd / dms		Comments NUTS, metals	NPDES Number

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Blanks	Grab	Date 12/13 Time 1520		B
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number
	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth m / ft	Salinity (PPTh) / Sp Conductance (umho/cm)
	Latitude dd / dms	Longitude dd / dms		Comments	NPDES Number

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number
	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth m / ft	Salinity (PPTh) / Sp Conductance (umho/cm)
	Latitude dd / dms	Longitude dd / dms		Comments 4 boxes Rec'd in Jax by JD 10:05 12.14.10	NPDES Number

Relinquished By	Date/Time	Shipping Method	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Malton Prifti	12/13/10	FEDEX						12.14.10 9:55

* Shaded Areas for Lab use only

** Please see reverse side for Bottle Group information

last revised October 1, 2003

FDEP Biology Laboratory - Acute Bioassay Bench Sheets

Facility: Seminole Electric Cooperative, Inc.
Address: 890 North Highway 17
City: Palatka County: Putnam
Contact/District: Heather Webber/Northeast
NPDES Permit #: FL 0036498
LIMS Job #: TH-2010-12-14-27
LIMS Sample #: 1318845
Lims Data Entry: 12-21-10 MF
Data Entry Verification: 12.21.10 JD

Sample Collection: Date: 12/13/10 Time: 1550
Hold Time Start: Date: 12/13/10 Time: 1550

Comments:

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

PH adjustment: ☐ yes ☑ no Initial pH: ____ NaOH ____ N HCl ____ N ____ Drops mL Final pH: ____
Aeration: ☑ yes ☐ no Initial DO: 10.5 mg/L Final DO: 8.1 mg/L Duration: 30 minutes Rate: ~100 bubbles/min
Salinity adjusted (Test 1): ☐ yes ☑ no Initial Salinity: ____ Final Salinity: ____ Salts Hypersaline brine
Salinity adjusted (Test 2): ☐ yes ☑ no Initial Salinity: ____ Final Salinity: ____ Salts Hypersaline brine
Dechlorination: ☐ yes ☑ no ____mL of 0.025N Sodium Thiosulfate per liter of sample. Final TRC: ____

Sample Validation:
Instructions: Check yes or no. Fill in temperatures.

Temperature: Shipped ≤ 6°C ☑ Yes ☐ No — IF Hand Delivered: Cooling ☐ Yes ☐ No (received ____°C collected ____°C)
Holding Time: ≤ 36 Hours ☑ Yes ☐ No (Composite-end of collection; grab-when collected; 4 in 24 - time last sample collected)

Investigators' Signatures:	Initials:
Kaia Coy	KC
Marshall Faircloth	MF
Amelia Parker	AP
Jenna Davis	JD
Brad Alexander	BA

REVIEWER: Stig Miller

Diluent/Control Batch#:	12-6-10		12/13/10							
Water Quality Parameters	20% DMW	Well Water	Moderately Hard Water	Salt Water ASW NSW Test 1	Salt Water ASW NSW Test 2	Other:	Original Sample	Measured by	Verified by
Field Total Residual Cl_2 (mg/L):	N/A	N/A	N/A	N/A	N/A	N/A	Not measured		MF
Lab Total Residual Cl_2 (mg/L):	<0.03		<0.03				<0.03	KC/MF	KC
Alkalinity (mg/L as $CaCO_3$):	85		81				43	KC	KC
Hardness (mg/L as $CaCO_3$):	92		87				1790	KC	KC
Total Ammonia (mg/L as N):	<0.017		<0.017				1.225	MF	KC
Conductivity: ☒ µmhos ☐ mmhos	~~355~~ 317		317				5830	KC/JD/BA	KC/JD
Salinity (ppth):	—		—				—		

V 1.8 1/13/10

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1318845 SOP#: TA 07 01 Test # 1 of 2

Test Species:
Batch #: 12/13/10 Age: <24hrs
- [x] *Ceriodaphnia dubia*
- [ ] *Cyprinella leedsi*
- [ ] *Pimephales promelas*
- [ ] *Menidia beryllina*
- [ ] *Americamysis bahia*
- [ ] Other:_____

Test Validation
Control Survival ≥ 90%: [x] Yes [ ] No
Temperature Range ≤ 3° C: [x] Yes [ ] No

Diluent (Batch # 12-6-10)
- [ ] ASW
- [x] 20% DMW
- [ ] MHW
- [ ] Well

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

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

Test Started: Date 12-14-10 Time 12:15

Test Ended: Date 12-18-10 Time 1030

Chamber Size: 30 ml
Test Volume: 20 ml

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
ctrl	A	A	5	5	5	5	5	5
	B	B	5	5	5	5	5	5
	C	C	5	5	5	5	5	5
	D	D	5	5	5	5	5	5
6.25%	A	A	5	5	5	5	5	5
	B	B	5	5	5	5	5	5
	C	C	5	5	5	5	5	5
	D	D	5	5	5	5	5	5
12.5%	A	A	5	5	5	5	5	5
	B	B	5	5	5	5	5	5
	C	C	5	5	5	5	5	5
	D	D	5	5	5	5	5	5
25%	A	A	5	5	5	5	5	5
	B	B	5	5	5	5	5	5
	C	C	5	5	5	5	5	4 1D
	D	D	5	5	5	5	5	5
50%	A	A	5	5	5	5	5	5
	B	B	5	5	5	5	5	5
	C	C	5	5	5	5	5	5
	D	D	5	5	5	5	5	5
100%	A	A	5	3 2D	3	3	3	3
	B	B	5	5	4 1D	4	4	4
	C	C	5	4 1D	4	4	4	4
	D	D	5	4 1D	4	4	4	3 1D
Checked or Verified by:			BA	BR2	BA	BA	AR	MF

Food
- [x] YCT Batch# 5/19/10
- [x] P. subcapitata Batch# 6/24/10
- [ ] Artemia Lot#_____

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

Temperature Range (°C)
Incubator # 2
min. 26.2 max. 27.6 mean_____
Incubator #___
min._____max._____mean_____
Waterbath #___
min._____max._____mean_____
Room B246
min. 23.1 max. 26.0 mean_____
Light intensity (ft. candles): 50-100
Photoperiod (hours): 16 light, 8 dark

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

Test Results:
Screening Tests: Report LC50 as >100%, =100%, or <100%.
% mortality in 100% sample: 30% LC50: >100%
Calculated LC50 (Definitive) 95% CI_____ Method_____

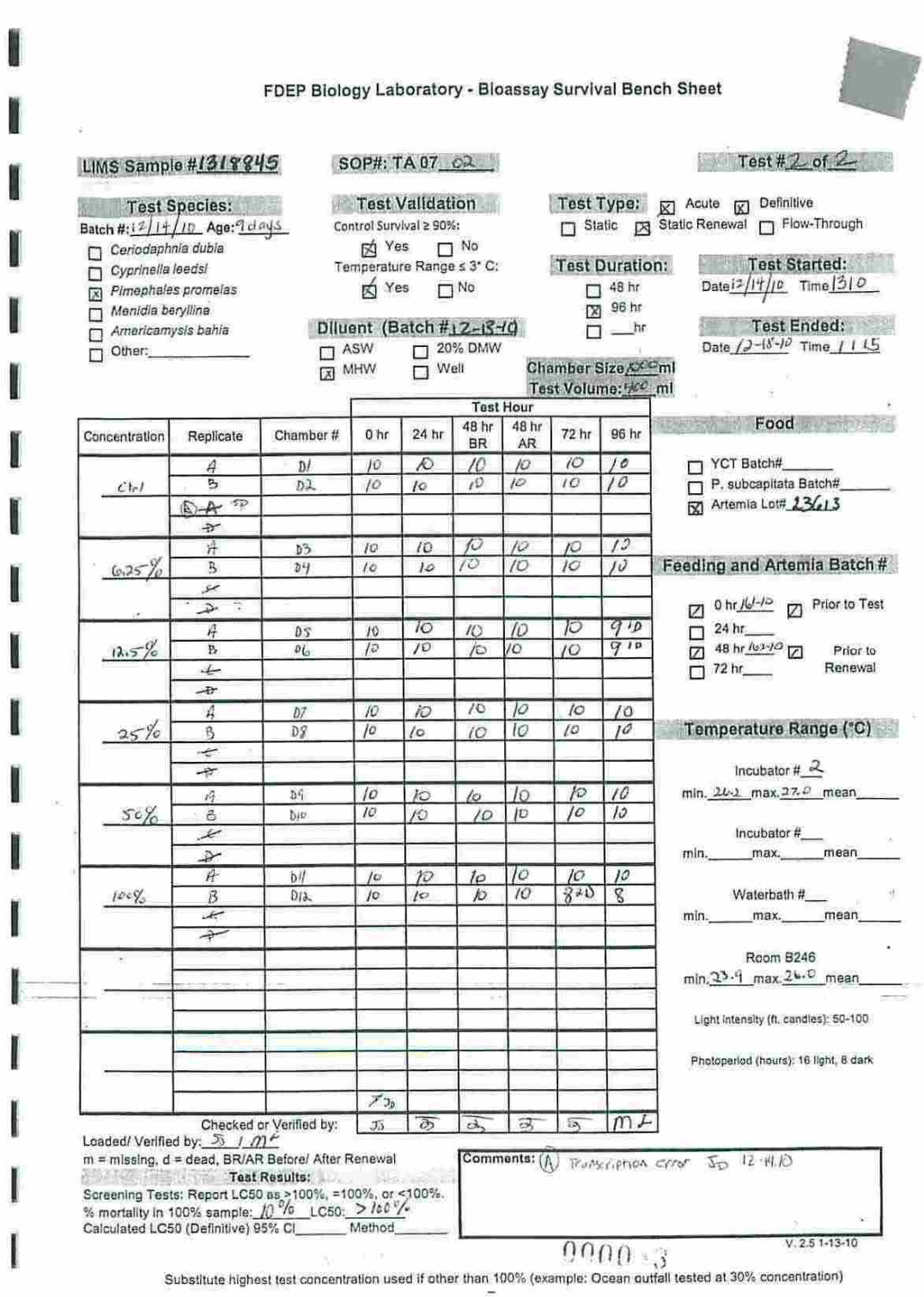
Comments:

V. 2.5 1-13-10

000032

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

Appendix B. (continued)



FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #1318845 SOP#: TA 07_02 Test #2 of 2

Test Species: Batch #: 12/14/10 Age: 9 days
- ☐ Ceriodaphnia dubia
- ☐ Cyprinella leedsi
- ☒ Pimephales promelas
- ☐ Menidia beryllina
- ☐ Americamysis bahia
- ☐ Other:_____

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

Diluent (Batch #12-18-10)
☐ ASW ☐ 20% DMW ☒ MHW ☐ Well

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

Test Duration: ☐ 48 hr ☒ 96 hr ☐ ___hr

Test Started: Date 12/14/10 Time 1310

Test Ended: Date 12-18-10 Time 1115

Chamber Size 300 ml
Test Volume: 200 ml

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Ctrl	A	D1	10	10	10	10	10	10
	B	D2	10	10	10	10	10	10
	~~A~~ SD							
	~~B~~							
6.25%	A	D3	10	10	10	10	10	10
	B	D4	10	10	10	10	10	10
	~~A~~							
	~~B~~							
12.5%	A	D5	10	10	10	10	10	9 1D
	B	D6	10	10	10	10	10	9 1D
	~~A~~							
	~~B~~							
25%	A	D7	10	10	10	10	10	10
	B	D8	10	10	10	10	10	10
	~~A~~							
	~~B~~							
50%	A	D9	10	10	10	10	10	10
	B	D10	10	10	10	10	10	10
	~~A~~							
	~~B~~							
100%	A	D11	10	10	10	10	10	10
	B	D12	10	10	10	10	8 2D	8
	~~A~~							
	~~B~~							
			30					
Checked or Verified by:			JD	JD	JD	JD	JD	ML

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

Test Results:
Screening Tests: Report LC50 as >100%, =100%, or <100%.
% mortality in 100% sample: 10 % LC50: >100 %
Calculated LC50 (Definitive) 95% CI_____ Method_____

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

Feeding and Artemia Batch #
- ☑ 0 hr 12-14-10 ☑ Prior to Test
- ☐ 24 hr___
- ☑ 48 hr 12-14-10 ☑ Prior to Renewal
- ☐ 72 hr___

Temperature Range (°C)
Incubator # 2
min. 26.2 max. 27.0 mean_____
Incubator #___
min._____max._____mean_____
Waterbath #___
min._____max._____mean_____
Room B246
min. 23.9 max. 26.0 mean_____
Light Intensity (ft. candles): 50-100
Photoperiod (hours): 16 light, 8 dark

Comments: (A) Transcription error JD 12-19-10

0000 = 3

V. 2.5 1-13-10

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

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Parameter Sheet

LIMS Sample #1318845 Test #1 of 2

Test Species:

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

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

Concentration	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☑ mmhos	Salinity* (ppth)
	M	0 hr	8.0	24.1	6.9	0.171	
	MF	24 hr		~~24.9~~			
Ctrl	A MF	48 hr BR	8.1	24.0	8.0	0.192	
	M	48 hr AR	8.1	24.9	8.6	0.178	
		72 hr					
	A	96 hr	8.0	25.0	7.6	0.185	
	M	0 hr	7.9	24.7	7.2	0.536	
	MF	24 hr					
6.25%	A MF	48 hr BR	8.3	24.0	8.1	0.628	
	M	48 hr AR	8.0	24.8	8.5	0.575	
		72 hr					
	A	96 hr	8.1	25.0	7.8	0.600	
	M	0 hr	7.9	24.7	7.5	1.02	
	MF	24 hr					
12.5%	A MF	48 hr BR	8.2	24.0	8.3	1.20	
	M	48 hr AR	8.0	24.9	8.4	0.912	
		72 hr					
	A	96 hr	8.0	24.8	7.9	~~1.10~~ MF 1.0	
	M	0 hr	7.8	24.6	7.4	1.71	
	MF	24 hr					
25%	A MF	48 hr BR	8.1	24.0	8.3	1.96	
	M	48 hr AR	7.8	24.7	8.4	1.73	
		72 hr					
	A	96 hr	8.0	24.8	7.9	1.84	
	M	0 hr	7.6	24.7	7.5	3.12	
	MF	24 hr					
50%	A MF	48 hr BR	8.0	24.0	8.3	3.49	
	M	48 hr AR	7.6	24.5	8.4	3.08	
		72 hr					
	A	96 hr	7.9	25.0	7.9	3.35	
	M	0 hr	7.7	25.0	7.9	5.82	
	MF	24 hr					
100%	A MF	48 hr BR	7.6	24.0	8.4	6.06	
	M	48 hr AR	7.7	24.6	8.4	5.68	
		72 hr					
	A	96 hr	7.6	25.2	7.9	5.86	
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

*Measure/ record salinity for marine tests

Comments:

Measured By:
0 hr: BA
24 hr:
48 hr BR: AM/LC
48 hr AR: AM/LC
72 hr:
96 hr: MF

000034

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V. 2.3 1-13-10

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Parameter Sheet

LIMS Sample #1318845 Test # 2 of 2

Test Species:

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

Test aerated: (If DO is < 4.0 mg/L) ☐ Yes ☒ No

Concentration	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☑ mmhos	Salinity* (ppth)
GRI.	A	0 hr	8.0	24.1	7.8	0.317	
	B	24 hr	7.7	25.2	8.2	0.331	
	A	48 hr BR	7.8	25.5	6.6	0.328	
	A	48 hr AR	8.0	24.6	8.0	0.319	
	B	72 hr	7.6	25.6	6.8	0.321	
	A	96 hr	8.0	25.8	7.2	0.332	
6.25%	A	0 hr	7.9	24.6	7.7	0.697	
	B	24 hr	7.6	25.5	7.6	0.700	
	A	48 hr BR	7.7	25.9	7.0	0.696	
	A	48 hr AR	7.9	24.6	7.9	0695	
	B	72 hr	7.5	25.8	6.7	0.700	
	A	96 hr	7.6	25.9	6.8	0.721	
12.5%	A	0 hr	7.8	24.8	8.1	1.095	
	B	24 hr	7.7	~~27~~ 25.7	7.8	1.11	
	A	48 hr BR	7.8	25.7	6.9	~~1.081~~ 1.10 KC	
	A	48 hr AR	7.8	24.7	8.1	1.07	
	B	72 hr	7.5	25.9	6.7	1.07	
	A	96 hr	7.7	25.8	6.7	1.10	
25%	A	0 hr	7.8	24.8	7.9	1.83	
	B	24 hr	7.7	25.4	7.9	1.83	
	A	48 hr BR	7.7	25.7	7.2	1.79	
	A	48 hr AR	7.7	24.8	8.1	~~1.77~~ 1.77 AR	
	B	72 hr	7.6	25.8	6.4	1.77	
	A	96 hr	7.6	26.0	6.5	1.86	
50%	A	0 hr	7.6	24.9	7.7	3.21	
	B	24 hr	7.6	25.8	8.0	3.21	
	A	48 hr BR	7.7	25.8	7.3	3.17	
	A	48 hr AR	7.6	25.3	8.3	~~3.17~~ 3.13 AR	
	B	72 hr	7.4	~~27~~ 25.7	6.6	3.12	
	A	96 hr	7.6	26.1	6.5	3.25	
100%	A	0 hr	7.1	25.9	8.5	5.83	
	B	24 hr	7.2	25.8	7.6	5.83	
	A	48 hr BR	7.3	25.7	7.3	5.68	
	A	48 hr AR	7.2	25.9	8.1	5.69	
	B	72 hr	7.1	25.7	6.4	5.66	
	A	96 hr	7.3	25.9	6.5	5.82	
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

*Measure/ record salinity for marine tests

Comments:

Measured By:
0 hr: KC/ JS
24 hr: AR/KC
48 hr BR: AR/KC
48 hr AR: AR/KC
72 hr: KC/ JS
96 hr: MF

00005

Page

V. 2.3 1-13-10

Appendix B. (continued)

Test ID: Solvinda Edelfisk #1318845 Dates: Dec 14-18, 2010

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

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

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

12.20.10 JD/KC

V 1.1 9/21/10 MF/jd

000036

Appendix C. SRT Bench Sheets and Statistical Analysis

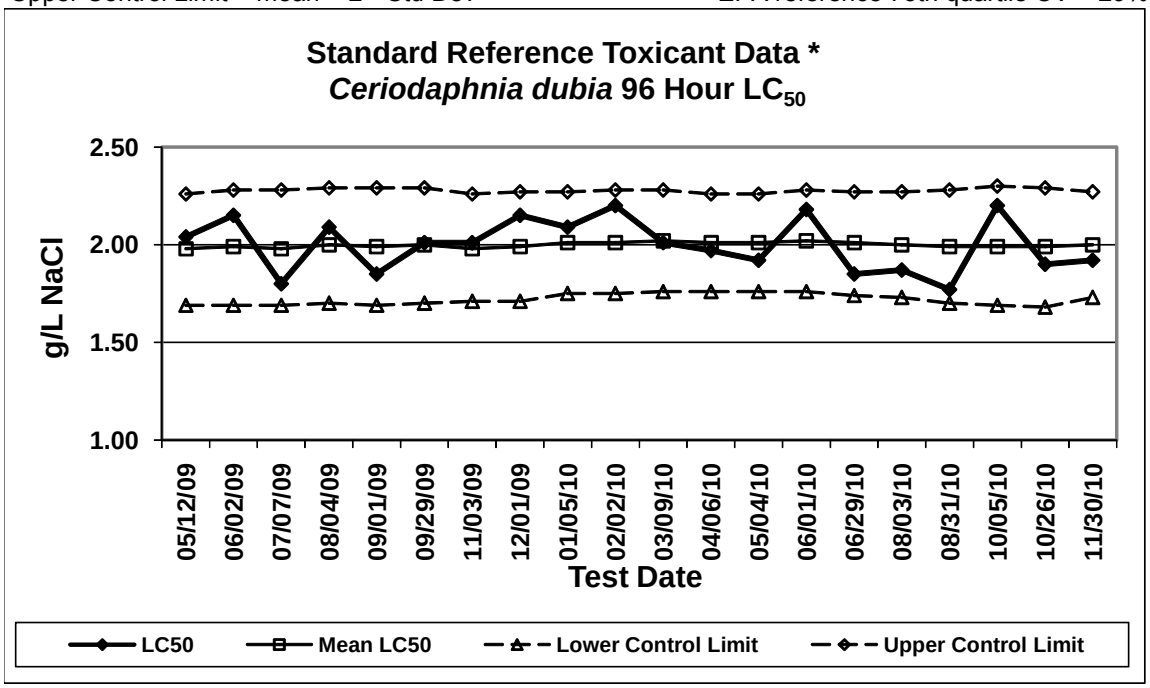
Florida Department of Environmental Protection
Bureau of Laboratories

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

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
05/12/09	2.04	1.98	0.14	1.69	2.26
06/02/09	2.15	1.99	0.15	1.69	2.28
07/07/09	1.80	1.98	0.15	1.69	2.28
08/04/09	2.09	2.00	0.15	1.70	2.29
09/01/09	1.85	1.99	0.15	1.69	2.29
09/29/09	2.01	2.00	0.15	1.70	2.29
11/03/09	2.01	1.98	0.14	1.71	2.26
12/01/09	2.15	1.99	0.14	1.71	2.27
01/05/10	2.09	2.01	0.13	1.75	2.27
02/02/10	2.20	2.01	0.13	1.75	2.28
03/09/10	2.01	2.02	0.13	1.76	2.28
04/06/10	1.97	2.01	0.12	1.76	2.26
05/04/10	1.92	2.01	0.12	1.76	2.26
06/01/10	2.18	2.02	0.13	1.76	2.28
06/29/10	1.85	2.01	0.13	1.74	2.27
08/03/10	1.87	2.00	0.14	1.73	2.27
08/31/10	1.77	1.99	0.14	1.70	2.28
10/05/10	2.20	1.99	0.15	1.69	2.30
10/26/10	1.90	1.99	0.15	1.68	2.29
11/30/10	1.92	2.00	0.14	1.73	2.27

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

CV = 6.83
EPA reference 75th quartile CV = 29%



Appendix C. (continued)

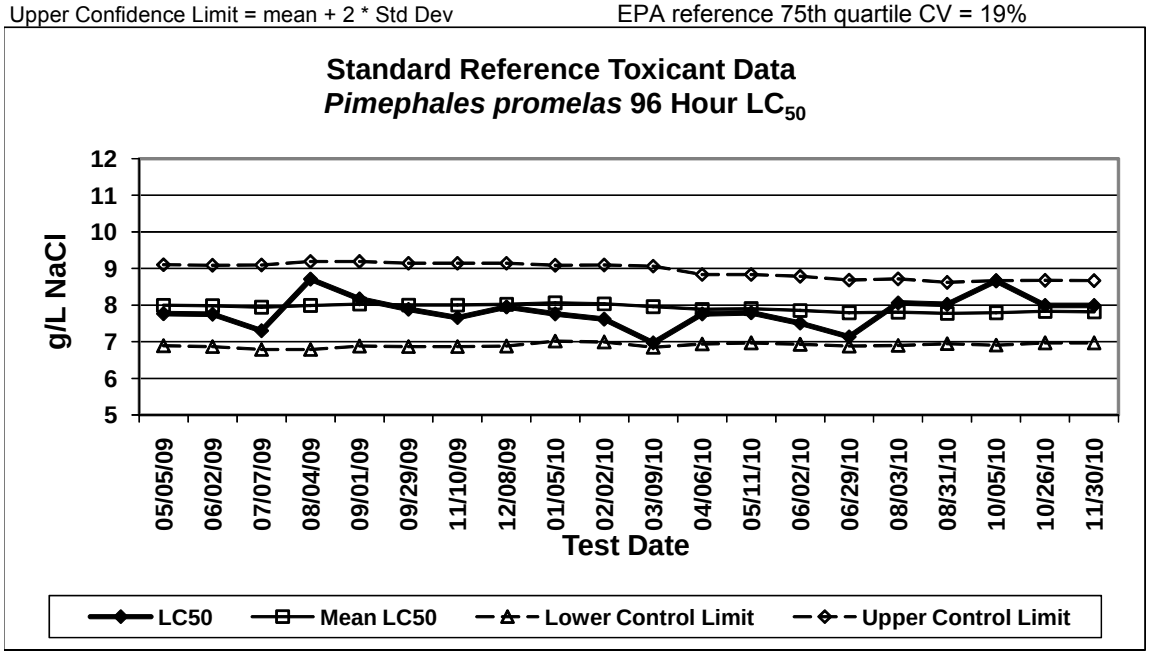
Florida Department of Environmental Protection
Bureau of Laboratories

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

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
05/05/09	7.77	8	0.55	6.89	9.11
06/02/09	7.75	7.98	0.56	6.87	9.09
07/07/09	7.30	7.94	0.58	6.79	9.10
08/04/09	8.71	7.99	0.60	6.79	9.19
09/01/09	8.17	8.03	0.58	6.88	9.19
09/29/09	7.89	8.01	0.57	6.87	9.15
11/10/09	7.66	8.01	0.57	6.87	9.15
12/08/09	7.95	8.02	0.57	6.88	9.15
01/05/10	7.76	8.06	0.52	7.02	9.09
02/02/10	7.62	8.04	0.53	6.99	9.10
03/09/10	6.97	7.96	0.56	6.85	9.07
04/06/10	7.76	7.89	0.48	6.94	8.84
05/11/10	7.79	7.9	0.47	6.97	8.84
06/02/10	7.51	7.86	0.46	6.93	8.79
06/29/10	7.14	7.79	0.45	6.88	8.69
08/03/10	8.06	7.81	0.45	6.9	8.72
08/31/10	8.02	7.78	0.42	6.95	8.62
10/05/10	8.66	7.79	0.44	6.91	8.67
10/26/10	7.99	7.83	0.43	6.97	8.68
11/30/10	7.99	7.82	0.42	6.97	8.67

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

CV = 5.43
EPA reference 75th quartile CV = 19%



Appendix C. (continued)

FDEP Biology Laboratory - Acute SRT Bench Sheet

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

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

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

Diluent/ Batch #: 20ppt NW / 11-24-10 **Organism Batch:** 11.29.10 **Test Beginning:** Date: 11.30.10 Time: 12:30
Toxicant/ Batch#: N.Cl / ~~11.29.10~~ 11.29.10 **Age:** < 24hr **Test Ending:** Date: 12.4.10 Time: 14:10

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	DP
Alkalinity (mg/L as $CaCO_3$):	91	TA06_08	AMP
Hardness (mg/L as $CaCO_3$):	82	TA06_09	AMP
Total Ammonia (mg/L as N):	<0.017	TA06_17	MF
Conductivity: µmhos ~~mmhos~~	0.179	TA06_25	BA
Salinity (ppth):	—	TA06_25	—

Food:	Batch
☒ YCT	5.19.10
☒ *P. subcapitata*	6.24.10
☐ Artemia Lot #	

Artemia Batch:

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

0 hr:	
24 hr:	
48 hr:	
72 hr:	

Concentrations prepared by: BA / DD Temperature Range °C: (if used)
Test Incubated in: Incubator # 2 Waterbath # ____ Incubator # 2 min 26.0 max 27.1 mean ____
Light Intensity: 50-100 Ft. candles Waterbath # ___ min ____ max ____ mean ____
Photoperiod: 16 hours Light / 8 hours dark Room B246 min 22.3 max 25.3 mean ____

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	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control		A	A	5	5	5	5	5	5
		B	B	5	5	5	5	5	5
		C	C	5	5	5	5	5	5
		D	D	5	5	5	5	5	5
1.5		A	A	5	5	5	5	5	5
		B	B	5	5	5	5	5	5
		C	C	5	5	5	5	5	5
		D	D	5	5	5	5	5	5
2.0		A	A	5	5	3 2D	3	3	3
		B	B	5	5	4 1D	4	2 2D	2
		C	C	5	5	3 2D	3	1 2D	1
		D	D	5	5	4 1D	4	3 1D	2 1D
2.5		A	A	5	4 1D	0 4D	—	—	—
		B	B	5	5	1 4D	1	0 1D	—
		C	C	5	5	0 5D	—	—	—
		D	D	5	5	1 4D	1	0 1D	—
3.0		A	A	5	4 1D	0 4D	—	—	—
		B	B	5	5	0 5D	—	—	—
		C	C	5	4 1D	0 4D	—	—	—
		D	D	5	3 2D	0 3D	—	—	—
4.0		A	A	5	0 5D	—	—	—	—
		B	B	5	0 5D	—	—	—	—
		C	C	5	0 5D	—	—	—	—
		D	D	5	0 5D	—	—	—	—
Organisms loaded by: BA			Checked by:	BA	BA	BA	DD	DD	BA

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

Loading Verified by: MF AR = after renewal
m = missing d = dead BR = before renewal hr = hour

Comments:

Investigators' Signatures
Bess Ausley
Marshall Faircloth
Sandra Rakis
Diane Rowe
James Daniel
Reviewer: Liz Hilton

Method: TSK

Statistics: LC50	95% confidence intervals Lower	Upper
48 hour: 2.11	1.99	2.24
96 hour: 1.92	1.81	2.03

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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: 11.30.10 Time: 12:30
Test Ending: Date: 12.4.10 Time: 14.10

Test Type: ☐ non-renewal ☒ renewal

hr = hour AR = after renewal BR = before renewal

Concentration µg/L mg/L g/L	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☒ mmhos	Salinity (ppth)
Control	M	0 hr	8.1	24.5	7.7	0.179	-
	—	24 hr	—	—	—	—	-
	A	48 hr BR	8.1	24.0	7.1	0.201	-
	M	48 hr AR	7.9	24.0	6.9	0.178	-
	—	72 hr	—	—	—	—	-
	A	96 hr	8.0	24.0	5.1	0.200	-
1.5	M	0 hr	8.0	24.0	7.4	3.07	-
	—	24 hr	—	—	—	—	-
	A	48 hr BR	8.1	24.0	7.4	3.47	-
	M	48 hr AR	7.9	24.1	7.3	3.09	-
	—	72 hr	—	—	—	—	-
	A	96 hr	8.0	24.0	7.0	3.59	-
2.0	M	0 hr	8.0	24.0	7.3	3.98	-
	—	24 hr	—	—	—	—	-
	A	48 hr BR	8.2	24.0	7.2	4.62	-
	M	48 hr AR	8.0	24.0	7.3	4.19	-
	—	72 hr	—	—	—	—	-
	A	96 hr	8.0	24.0	6.1	4.59	-
2.5	M	0 hr	8.0	24.0	7.3	4.88	-
	—	24 hr	—	—	—	—	-
	A	48 hr BR	8.2	24.0	6.9	5.85	-
	M	48 hr AR	8.0	24.0	7.3	4.96	-
	BMBA	72 hr	8.0	24.0	8.5	4.98	-
	—	96 hr	—	—	—	—	-
3.0	M	0 hr	8.0	24.0	7.3	5.79	-
	—	24 hr	—	—	—	—	-
	A	48 hr BR	8.2	24.1	7.3	7.01	-
	M	48 hr AR	8.1	24.0	7.3	5.99	-
	—	72 hr	—	—	—	—	-
	—	96 hr	—	—	—	—	-
4.0	M	0 hr	8.0	24.0	7.5	7.54	-
	A	24 hr	7.9	24.0	6.1	7.80	-
	—	48 hr BR	—	—	—	—	-
	—	48 hr AR	—	—	—	—	-
	—	72 hr	—	—	—	—	-
	—	96 hr	—	—	—	—	-

Investigators Signatures
Becca Alexander
Amelia Bahin
Dianne Bowers
James Samuels
Marshall Faircloth

Reviewed By: Lisa Miller

Measured by:
0 hr: BA
24 hr: BA
48 hr BR: BA
48 hr AR: BA
72 hr: RP/DD
96 hr: BA

Measure/record salinity for marine tests

Comments:

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Appendix C. (continued)

FDEP Biology Laboratory - Acute SRT Bench Sheet

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

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

Test Type: ☐ non-renewal ☒ renewal

Test Page 1 of 2

Diluent/ Batch #: MHW / 11-09-10
Toxicant/ Batch#: NaCl / 10.29.10
Organism Batch: 11-30-10 **Age:** 9 days
Test Beginning: Date: 12-30-10 Time: 1305
Test Ending: Date: 12.4.10 Time: 1945

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	DP
Alkalinity (mg/L as $CaCO_3$):	82	TA06_08	NDP
Hardness (mg/L as $CaCO_3$):	84	TA06_09	NDP
Total Ammonia (mg/L as N):	<0.07	TA06_17	MF
Conductivity: µmhos mmhos	0.328	TA06_25	DP
Salinity (ppth):	—	TA06_25	—

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

Concentrations prepared by: DP
Temperature Range °C: (if used)
Chamber size: 1000 mL
Test volume: 400 mL per replicate

0 hr:	1554
24 hr:	
48 hr:	1564
72 hr:	

Test Incubated in: Incubator # 5 Waterbath # ____ Incubator # 5 min 23.4 max 26.9 mean ____
Light Intensity: 50-100 Ft. candles Waterbath # ___ min ____ max ____ mean ____
Photoperiod: 16 hours Light / 8 hours dark Room B246 min 22.3 max 25.3 mean ____

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	A13	10	10	10	10	10	10
			B	A14	10	10	10	10	10	10
6			A	A15	10	10	10	10	10	10
			B	A16	10	10	10	10	10	10
7			A	A17	10	10	10	10	10	9 1D
			B	A18	10	10	10	10	10	8 2D
8			A	A19	10	10	10	10	10	10
			B	A20	10	10	10	10	8 2D	3 5D
9			A	A21	10	4 6D	3 1D	3	3	1 2D
			B	A22	10	2 8D	1 1D	1	1	0 1D
10			A	A23	10	0 10D	0	—	—	—
			B	A24	10	2 8D	0 2D	—	—	—

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

Organisms loaded by: DS Checked by: DS DS JD DS DS BA
Loading Verified by: DP AR = after renewal
m = missing d = dead BR = before renewal hr = hour

Comments:

Investigators' Signatures
Diane Power
Amelia Rankin
Brian Abramowski
James Daniels
Marshall Faircloth
Reviewer: Lizy Miller

Method: TSK

Statistics: LC50	95% confidence intervals Lower	Upper
48 hour:	8.68	8.51	8.85
96 hour:	7.99	7.70	8.29

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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: 12.3.10 Time: 1305 (11mL for JD)
Test Ending: Date: 12.4.10 Time: 1445

Test Type: ☐ non-renewal ☒ renewal

hr = hour AR = after renewal BR = before renewal

Concentration µg/L mg/L (circle)	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☒ mmhos	Salinity (ppth)
Control	A	0 hr	8.1	24.1	8.1	0.328	
	B	24 hr	7.8	24.9	8.5	0.338	
	A	48 hr BR	7.9	24.0	7.9	0.364	
	A	48 hr AR	8.0	24.7	(AR) 9.3	0.350	
	B	72 hr	7.8	24.0	8.4	0.356	
	A	96 hr	7.8	24.0	6.5	0.382	
6	A	0 hr	8.0	24.1	8.3	11.0	
	B	24 hr	7.7	24.9	8.3	11.1	
	A	48 hr BR	7.8	24.5	7.9	11.6	
	A	48 hr AR	7.9	24.8	8.3	11.2	
	B	72 hr	7.8	24.0	8.6	11.6	
	A	96 hr	7.8	24.0	6.5	12.9	
7	A	0 hr	8.0	24.2	8.3	12.4	
	B	24 hr	7.7	25.0	7.8	12.6	
	A	48 hr BR	7.8	24.6	8.0	13.1	
	A	48 hr AR	7.9	24.8	8.5	12.9	
	B	72 hr	7.7	24.0	8.7	13.1	
	A	96 hr	7.8	24.3	6.5	14.0	
8	A	0 hr	8.0	24.2	8.3	13.9	
	B	24 hr	7.7	25.0	7.9	13.9	
	A	48 hr BR	7.8	24.0	8.0	14.5	
	A	48 hr AR	7.8	24.8	7.9	14.6	
	B	72 hr	7.7	24.0	8.6	15.2	
	A	96 hr	7.8	24.0	6.4	16.5	
9	A	0 hr	8.0	24.1	8.3	15.6	
	B	24 hr	7.7	24.9	7.5	15.7	
	A	48 hr BR	7.8	24.0	8.0	16.6	
	A	48 hr AR	7.9	24.9	7.9	16.5	
	B	72 hr	7.8	24.0	9.1	17.3	
	A	96 hr	7.8	24.0	6.4	19.2	
10	A	0 hr	8.0	24.1	8.6	17.6	
	B	24 hr	7.7	24.8	7.4	17.6	
	B	48 hr BR	7.9	24.0	7.9	19.1	
	Stopped Feeding	48 hr AR					
		72 hr					
		96 hr					

Investigators Signatures
Dawn Power
Amelia Rankin
Bryce Anderson
James Daniel
Marshall Faircloth

Reviewed By: Lizy Mateen

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

Measure/record salinity for marine tests

Comments:
(A) recorded cumbi DO: on P. promelas page NM 12/2/10

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Appendix C. (continued)

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

DATE: 11-30-10 DURATION: 96 h TOXICANT : NaCl
SPECIES: *Ceriodaphnia dubia*

RAW DATA: Concentration (g/L)	Number Exposed	Mortalities
.00	20	0
1.50	20	0
2.00	20	12
2.50	20	20
3.00	20	20
4.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: LC50: 1.92
95% LOWER CONFIDENCE: 1.81
95% UPPER CONFIDENCE: 2.03

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

DATE: 11-30-10 DURATION: 96 h TOXICANT : NaCl
SPECIES: *Pimephales promelas*

RAW DATA: Concentration (g/L)	Number Exposed	Mortalities
.00	20	0
6.00	20	0
7.00	20	3
8.00	20	7
9.00	20	19
10.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: LC50: 7.99
95% LOWER CONFIDENCE: 7.70
95% UPPER CONFIDENCE: 8.29

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: 11/29/10

Ship to: FDEP

P.O. No: _____

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia	150	4 DAYS	MS101125	25	8.0	20
Menidia beryllina	150	12 DAYS	SS101117	25	8.0	20
						Hardness mg/L
Cyprinella leedsi	150	12 days	CL 101117	25	7.8	80
Pimephales promelas	150	8 days	FM 101121	25	7.8	80
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

Packed by: PM

Shipped Via: Fed Ex

Notes: _____

Thank you for your order.

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

Appendix D. (continued)

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Shipping Date: 12/13/10

Ship to: FDEP

P.O. No: _____

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia						
Menidia beryllina						
						Hardness mg/L
Cyprinella leedsi	150	12 days	CL 1012.01	25	7.8	80
Pimephales promelas	150	8 days	FM 1012.05	25	7.8	80
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

Packed by: PM

Shipped Via: Fed Ex

Notes: _____

Thank you for your order.

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

Appendix E. Chemical Analyses performed on the effluent from the Seminole Electric Cooperative, Inc., facility Outfall D-001, sampled on December 13, 2010.

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
12/13/2010 15:20	Blanks	Metals	Silver	0.025	U	ug/L	0.025	0.1
12/13/2010 15:20	Blanks	Metals	Zinc	5	U	ug/L	5	20
12/13/2010 15:20	Blanks	Metals	Magnesium	0.04	U	mg/L	0.04	0.16
12/13/2010 15:20	Blanks	Metals	Calcium	0.075	U	mg/L	0.075	0.3
12/13/2010 15:20	Blanks	Metals	Aluminum	60	U	ug/L	60	240
12/13/2010 15:20	Blanks	Metals	Arsenic	0.25	U	ug/L	0.25	1
12/13/2010 15:20	Blanks	Metals	Sodium	0.5	U	mg/L	0.5	2
12/13/2010 15:20	Blanks	Metals	Chromium	0.3	U	ug/L	0.3	1.2
12/13/2010 15:20	Blanks	Metals	Copper	0.5	U	ug/L	0.5	1
12/13/2010 15:20	Blanks	Metals	Cadmium	0.03	U	ug/L	0.03	0.12
12/13/2010 15:20	Blanks	Metals	Beryllium	0.025	U	ug/L	0.025	0.1
12/13/2010 15:20	Blanks	Metals	Nickel	0.25	U	ug/L	0.25	1
12/13/2010 15:20	Blanks	Metals	Iron	30	U	ug/L	30	120
12/13/2010 15:20	Blanks	Metals	Lead	0.2	U	ug/L	0.2	0.8
12/13/2010 15:20	Blanks	Metals	Selenium	0.2	U	ug/L	0.2	0.8
12/13/2010 15:20	Blanks	Nutrients	O-Phosphate-P	0.004	U	mg P/L	0.004	0.01
12/13/2010 15:20	Blanks	Nutrients	Alkalinity	0.65	U	mg CaCO3/L	0.65	2.5
12/13/2010 15:20	Blanks	Nutrients	Total-P	0.004	U	mg P/L	0.004	0.01
12/13/2010 15:20	Blanks	Nutrients	Fluoride	0.035	U	mg F/L	0.035	0.1
12/13/2010 15:20	Blanks	Nutrients	Sulfate	0.2	U	mg SO4/L	0.2	0.5
12/13/2010 15:20	Blanks	Nutrients	Organic Carbon	1	U	mg C/L	1	5
12/13/2010 15:20	Blanks	Nutrients	Cyanide	0.005	UJ	mg CN/L	0.005	0.02
12/13/2010 15:20	Blanks	Nutrients	Chloride	0.2	U	mg Cl/L	0.2	0.5
12/13/2010 15:20	Blanks	Nutrients	NO2NO3-N	0.004	U	mg N/L	0.004	0.01
12/13/2010 15:20	Blanks	Nutrients	Kjeldahl Nitrogen	0.08	U	mg N/L	0.08	0.2
12/13/2010 15:20	Blanks	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
12/13/2010 15:20	Blanks	Nutrients	Color (true)	5	U	PCU	5	5
12/13/2010 15:20	Blanks	Overflow	Oil and Grease	1.4	U	mg/L	1.4	5
12/13/2010 15:20	Blanks	Pesticides	Ametryn	0.047	U	ug/L	0.047	0.19
12/13/2010 15:20	Blanks	Pesticides	Atrazine	0.047	U	ug/L	0.047	0.19
12/13/2010 15:20	Blanks	Pesticides	Diazinon	0.047	U	ug/L	0.047	0.19
12/13/2010 15:20	Blanks	Pesticides	Endosulfan Sulfate	0.019	U	ug/L	0.019	0.076
12/13/2010 15:20	Blanks	Pesticides	Butylate	0.19	U	ug/L	0.19	0.76

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
12/13/2010 15:20	Blanks	Pesticides	Fenamiphos	0.19	U	ug/L	0.19	0.76
12/13/2010 15:20	Blanks	Pesticides	Hexazinone	0.095	U	ug/L	0.095	0.38
12/13/2010 15:20	Blanks	Pesticides	Malathion	0.14	U	ug/L	0.14	0.56
12/13/2010 15:20	Blanks	Pesticides	Metalaxyl	0.24	U	ug/L	0.24	0.96
12/13/2010 15:20	Blanks	Pesticides	Phorate	0.047	U	ug/L	0.047	0.19
12/13/2010 15:20	Blanks	Pesticides	Chlorpyrifos Ethyl	0.047	U	ug/L	0.047	0.19
12/13/2010 15:20	Blanks	Pesticides	Fonofos	0.095	U	ug/L	0.095	0.38
12/13/2010 15:20	Blanks	Pesticides	Parathion Ethyl	0.14	U	ug/L	0.14	0.56
12/13/2010 15:20	Blanks	Pesticides	Parathion Methyl	0.095	U	ug/L	0.095	0.38
12/13/2010 15:20	Blanks	Pesticides	Aldrin	0.0095	U	ug/L	0.0095	0.038
12/13/2010 15:20	Blanks	Pesticides	Endosulfan II	0.019	U	ug/L	0.019	0.076
12/13/2010 15:20	Blanks	Pesticides	Alachlor	0.57	UJ	ug/L	0.57	2.3
12/13/2010 15:20	Blanks	Pesticides	Chlorpyrifos Methyl	0.095	U	ug/L	0.095	0.38
12/13/2010 15:20	Blanks	Pesticides	Mevinphos	0.19	U	ug/L	0.19	0.76
12/13/2010 15:20	Blanks	Pesticides	Norflurazon	0.14	U	ug/L	0.14	0.56
12/13/2010 15:20	Blanks	Pesticides	Alpha-BHC	0.0095	U	ug/L	0.0095	0.038
12/13/2010 15:20	Blanks	Pesticides	Beta-BHC	0.0095	U	ug/L	0.0095	0.038
12/13/2010 15:20	Blanks	Pesticides	Endrin Aldehyde	0.019	U	ug/L	0.019	0.076
12/13/2010 15:20	Blanks	Pesticides	Heptachlor	0.0095	U	ug/L	0.0095	0.038
12/13/2010 15:20	Blanks	Pesticides	Metolachlor	0.47	U	ug/L	0.47	1.9
12/13/2010 15:20	Blanks	Pesticides	Metribuzin	0.095	U	ug/L	0.095	0.38
12/13/2010 15:20	Blanks	Pesticides	Simazine	0.047	U	ug/L	0.047	0.19
12/13/2010 15:20	Blanks	Pesticides	DDD-p,p'	0.019	U	ug/L	0.019	0.076
12/13/2010 15:20	Blanks	Pesticides	Gamma-BHC	0.0095	U	ug/L	0.0095	0.038
12/13/2010 15:20	Blanks	Pesticides	Methoxychlor	0.047	U	ug/L	0.047	0.19
12/13/2010 15:20	Blanks	Pesticides	Azinphos Methyl	0.19	UJ	ug/L	0.19	0.76
12/13/2010 15:20	Blanks	Pesticides	Prometryn	0.14	U	ug/L	0.14	0.56
12/13/2010 15:20	Blanks	Pesticides	Chlordane	0.19	U	ug/L	0.19	0.76
12/13/2010 15:20	Blanks	Pesticides	DDT-p,p'	0.028	U	ug/L	0.028	0.11
12/13/2010 15:20	Blanks	Pesticides	Delta-BHC	0.0095	U	ug/L	0.0095	0.038
12/13/2010 15:20	Blanks	Pesticides	Endrin	0.047	U	ug/L	0.047	0.19
12/13/2010 15:20	Blanks	Pesticides	Heptachlor Epoxide	0.019	U	ug/L	0.019	0.076
12/13/2010 15:20	Blanks	Pesticides	Bromacil	0.19	UJ	ug/L	0.19	0.76
12/13/2010 15:20	Blanks	Pesticides	Ethoprop	0.095	U	ug/L	0.095	0.38

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
12/13/2010 15:20	Blanks	Pesticides	Naled	0.76	UJ	ug/L	0.76	3
12/13/2010 15:20	Blanks	Pesticides	DDE-p,p'	0.019	U	ug/L	0.019	0.076
12/13/2010 15:20	Blanks	Pesticides	Dieldrin	0.019	U	ug/L	0.019	0.076
12/13/2010 15:20	Blanks	Pesticides	Ethion	0.047	U	ug/L	0.047	0.19
12/13/2010 15:20	Blanks	Pesticides	Endosulfan I	0.019	U	ug/L	0.019	0.076
12/13/2010 15:20	Blanks	Pesticides	Toxaphene	0.71	U	ug/L	0.71	2.8
12/13/2010 15:20	Blanks	Priority Organic Pollutants	2,4-Dinitrophenol	14	U	ug/L	14	57
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Pentachlorophenol	2.8	U	ug/L	2.8	11
12/13/2010 15:20	Blanks	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L	1.9	7.5
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Benzo(a)pyrene	0.19	U	ug/L	0.19	0.75
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Benzo(k)fluoranthene	0.19	U	ug/L	0.19	0.75
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Di-n-butyl phthalate	4.7	U	ug/L	4.7	19
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.19	U	ug/L	0.19	0.75
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Isophorone	0.94	U	ug/L	0.94	3.8
12/13/2010 15:20	Blanks	Priority Organic Pollutants	2-Chloronaphthalene	0.94	U	ug/L	0.94	3.8
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Acenaphthene	0.19	U	ug/L	0.19	0.75
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Dimethyl phthalate	9.4	U	ug/L	9.4	38
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Phenol	0.94	U	ug/L	0.94	3.8
12/13/2010 15:20	Blanks	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.94	U	ug/L	0.94	3.8
12/13/2010 15:20	Blanks	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.8	U	ug/L	2.8	11
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Fluoranthene	0.19	U	ug/L	0.19	0.75
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.8	U	ug/L	2.8	11
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.94	U	ug/L	0.94	3.8
12/13/2010 15:20	Blanks	Priority Organic Pollutants	2-Nitrophenol	0.94	U	ug/L	0.94	3.8
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L	1.9	7.5
12/13/2010 15:20	Blanks	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.94	U	ug/L	0.94	3.8
12/13/2010 15:20	Blanks	Priority Organic Pollutants	2,6-Dinitrotoluene	0.94	U	ug/L	0.94	3.8
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Benzidine	94	U	ug/L	94	380
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Chrysene	0.19	U	ug/L	0.19	0.75
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Hexachlorobenzene	0.94	U	ug/L	0.94	3.8
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.8	U	ug/L	2.8	11
12/13/2010 15:20	Blanks	Priority Organic Pollutants	2,4-Dinitrotoluene	0.94	U	ug/L	0.94	3.8
12/13/2010 15:20	Blanks	Priority Organic Pollutants	2-Chlorophenol	0.94	U	ug/L	0.94	3.8
12/13/2010 15:20	Blanks	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.8	U	ug/L	2.8	11

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
12/13/2010 15:20	Blanks	Priority Organic Pollutants	4-Nitrophenol	14	U	ug/L	14	57
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Butyl benzyl phthalate	4.7	U	ug/L	4.7	19
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Hexachloroethane	2.8	U	ug/L	2.8	11
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Pyrene	0.19	U	ug/L	0.19	0.75
12/13/2010 15:20	Blanks	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.94	U	ug/L	0.94	3.8
12/13/2010 15:20	Blanks	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.94	U	ug/L	0.94	3.8
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Acenaphthylene	0.19	U	ug/L	0.19	0.75
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.94	U	ug/L	0.94	3.8
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Fluorene	0.19	U	ug/L	0.19	0.75
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.19	U	ug/L	0.19	0.75
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.19	U	ug/L	0.19	0.75
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Di-n-octyl phthalate	0.94	U	ug/L	0.94	3.8
12/13/2010 15:20	Blanks	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.5
12/13/2010 15:20	Blanks	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.5
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Phenanthrene	0.19	U	ug/L	0.19	0.75
12/13/2010 15:20	Blanks	Priority Organic Pollutants	2,4-Dichlorophenol	0.94	U	ug/L	0.94	3.8
12/13/2010 15:20	Blanks	Priority Organic Pollutants	2,4-Dimethylphenol	9.4	U	ug/L	9.4	38
12/13/2010 15:20	Blanks	Priority Organic Pollutants	3,3'-Dichlorobenzidine	38	U	ug/L	38	150
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Anthracene	0.19	U	ug/L	0.19	0.75
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Benzo(a)anthracene	0.19	U	ug/L	0.19	0.75
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Benzo(b)fluoranthene	0.19	U	ug/L	0.19	0.75
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	14	U	ug/L	14	57
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Diethyl phthalate	0.94	U	ug/L	0.94	3.8
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Hexachlorobutadiene	2.8	U	ug/L	2.8	11
12/13/2010 15:20	Blanks	Priority Organic Pollutants	Naphthalene	0.19	U	ug/L	0.19	0.75
12/13/2010 13:00	Effluent	Overflow	Fecal Coliforms-Membrane Filter	9	B	cfu/100 mL	9	
12/13/2010 15:50	Effluent	AGP/LN	Algal Growth Potential	3	U	mg DryWt/L	3	3
12/13/2010 15:50	Effluent	Chlorophyll/Grain Size/BOD	Phaeophytin-a	1.8	I	ug/L	0.67	2
12/13/2010 15:50	Effluent	Chlorophyll/Grain Size/BOD	BOD-5 Day,N-Inhib	5.8	A	mg/L	0.2	2
12/13/2010 15:50	Effluent	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	0.92	U	ug/L	0.92	2.8
12/13/2010 15:50	Effluent	Toxicology	Bioassay-Acute-Def-FW-C.dubia, LC50	100	L	LC50		
12/13/2010 15:50	Effluent	Toxicology	Bioassay-Acute-Def-FW-Fish, LC50	100	L	LC50		
12/13/2010 15:50	Effluent	Metals	Aluminum	780		ug/L	60	240
12/13/2010 15:50	Effluent	Metals	Calcium	645		mg/L	0.75	3

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
12/13/2010 15:50	Effluent	Metals	Sodium	424		mg/L	5	20
12/13/2010 15:50	Effluent	Metals	Beryllium	0.072	I	ug/L	0.025	0.1
12/13/2010 15:50	Effluent	Metals	Copper	44		ug/L	0.5	1
12/13/2010 15:50	Effluent	Metals	Nickel	16.7		ug/L	0.25	1
12/13/2010 15:50	Effluent	Metals	Selenium	2.89		ug/L	0.2	0.8
12/13/2010 15:50	Effluent	Metals	Zinc	6.4	I	ug/L	5	20
12/13/2010 15:50	Effluent	Metals	Cadmium	0.36		ug/L	0.03	0.12
12/13/2010 15:50	Effluent	Metals	Lead	1.97		ug/L	0.2	0.8
12/13/2010 15:50	Effluent	Metals	Silver	0.025	U	ug/L	0.025	0.1
12/13/2010 15:50	Effluent	Metals	Arsenic	2.36		ug/L	0.25	1
12/13/2010 15:50	Effluent	Metals	Iron	1050		ug/L	30	120
12/13/2010 15:50	Effluent	Metals	Magnesium	106		mg/L	0.4	1.6
12/13/2010 15:50	Effluent	Metals	Chromium	2.3		ug/L	0.3	1.2
12/13/2010 7:18	Effluent	Nutrients	NO2NO3-N	0.41		mg N/L	0.004	0.01
12/13/2010 15:50	Effluent	Nutrients	O-Phosphate-P	0.028		mg P/L	0.004	0.01
12/13/2010 15:50	Effluent	Nutrients	Color (true)	15	A	PCU	5	5
12/13/2010 15:50	Effluent	Nutrients	Fluoride	1.3		mg F/L	0.035	0.1
12/13/2010 7:18	Effluent	Nutrients	Total-P	0.12		mg P/L	0.005	0.05
12/13/2010 7:18	Effluent	Nutrients	Organic Carbon	24		mg C/L	1	5
12/13/2010 15:50	Effluent	Nutrients	Sulfate	700		mg SO4/L	4	10
12/13/2010 15:50	Effluent	Nutrients	Chloride	1600		mg Cl/L	4	10
12/13/2010 7:18	Effluent	Nutrients	Ammonia-N	1.2		mg N/L	0.05	0.1
12/13/2010 15:50	Effluent	Nutrients	TSS	22		mg/L	4	16
12/13/2010 15:50	Effluent	Nutrients	Alkalinity	30	A	mg CaCO3/L	0.65	2.5
12/13/2010 15:50	Effluent	Nutrients	Cyanide	0.005	UJ	mg CN/L	0.005	0.02
12/13/2010 7:18	Effluent	Nutrients	Kjeldahl Nitrogen	3.4		mg N/L	0.08	0.2
12/13/2010 15:50	Effluent	Overflow	Oil and Grease	1.4	U	mg/L	1.4	5
12/13/2010 15:50	Effluent	Pesticides	Naled	0.75	UJ	ug/L	0.75	3
12/13/2010 15:50	Effluent	Pesticides	Aldrin	0.0094	U	ug/L	0.0094	0.038
12/13/2010 15:50	Effluent	Pesticides	Endosulfan I	0.019	U	ug/L	0.019	0.076
12/13/2010 15:50	Effluent	Pesticides	Atrazine	0.047	U	ug/L	0.047	0.19
12/13/2010 15:50	Effluent	Pesticides	Butylate	0.19	U	ug/L	0.19	0.76
12/13/2010 15:50	Effluent	Pesticides	Chlorpyrifos Ethyl	0.047	U	ug/L	0.047	0.19
12/13/2010 15:50	Effluent	Pesticides	Ethion	0.047	U	ug/L	0.047	0.19

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
12/13/2010 15:50	Effluent	Pesticides	Norflurazon	0.14	U	ug/L	0.14	0.56
12/13/2010 15:50	Effluent	Pesticides	Phorate	0.047	U	ug/L	0.047	0.19
12/13/2010 15:50	Effluent	Pesticides	DDD-p,p'	0.019	U	ug/L	0.019	0.076
12/13/2010 15:50	Effluent	Pesticides	Dieldrin	0.019	U	ug/L	0.019	0.076
12/13/2010 15:50	Effluent	Pesticides	Heptachlor	0.0094	U	ug/L	0.0094	0.038
12/13/2010 15:50	Effluent	Pesticides	Methoxychlor	0.047	U	ug/L	0.047	0.19
12/13/2010 15:50	Effluent	Pesticides	Ametryn	0.047	U	ug/L	0.047	0.19
12/13/2010 15:50	Effluent	Pesticides	Bromacil	0.19	UJ	ug/L	0.19	0.76
12/13/2010 15:50	Effluent	Pesticides	Ethoprop	0.094	U	ug/L	0.094	0.38
12/13/2010 15:50	Effluent	Pesticides	Metribuzin	0.094	U	ug/L	0.094	0.38
12/13/2010 15:50	Effluent	Pesticides	Simazine	0.047	U	ug/L	0.047	0.19
12/13/2010 15:50	Effluent	Pesticides	Alpha-BHC	0.0094	U	ug/L	0.0094	0.038
12/13/2010 15:50	Effluent	Pesticides	Beta-BHC	0.0094	U	ug/L	0.0094	0.038
12/13/2010 15:50	Effluent	Pesticides	Endrin	0.047	U	ug/L	0.047	0.19
12/13/2010 15:50	Effluent	Pesticides	Heptachlor Epoxide	0.019	U	ug/L	0.019	0.076
12/13/2010 15:50	Effluent	Pesticides	Diazinon	0.047	U	ug/L	0.047	0.19
12/13/2010 15:50	Effluent	Pesticides	Fonofos	0.094	U	ug/L	0.094	0.38
12/13/2010 15:50	Effluent	Pesticides	Endosulfan II	0.019	U	ug/L	0.019	0.076
12/13/2010 15:50	Effluent	Pesticides	Gamma-BHC	0.0094	U	ug/L	0.0094	0.038
12/13/2010 15:50	Effluent	Pesticides	Alachlor	0.57	UJ	ug/L	0.57	2.3
12/13/2010 15:50	Effluent	Pesticides	Fenamiphos	0.19	U	ug/L	0.19	0.76
12/13/2010 15:50	Effluent	Pesticides	Hexazinone	0.094	U	ug/L	0.094	0.38
12/13/2010 15:50	Effluent	Pesticides	Chlordane	0.19	U	ug/L	0.19	0.76
12/13/2010 15:50	Effluent	Pesticides	Chlorpyrifos Methyl	0.094	U	ug/L	0.094	0.38
12/13/2010 15:50	Effluent	Pesticides	Metalaxyl	0.24	U	ug/L	0.24	0.96
12/13/2010 15:50	Effluent	Pesticides	Mevinphos	0.19	U	ug/L	0.19	0.76
12/13/2010 15:50	Effluent	Pesticides	DDT-p,p'	0.028	U	ug/L	0.028	0.11
12/13/2010 15:50	Effluent	Pesticides	Parathion Ethyl	0.14	U	ug/L	0.14	0.56
12/13/2010 15:50	Effluent	Pesticides	Prometryn	0.14	U	ug/L	0.14	0.56
12/13/2010 15:50	Effluent	Pesticides	Delta-BHC	0.0094	U	ug/L	0.0094	0.038
12/13/2010 15:50	Effluent	Pesticides	Endrin Aldehyde	0.019	U	ug/L	0.019	0.076
12/13/2010 15:50	Effluent	Pesticides	Azinphos Methyl	0.19	UJ	ug/L	0.19	0.76
12/13/2010 15:50	Effluent	Pesticides	Malathion	0.14	U	ug/L	0.14	0.56
12/13/2010 15:50	Effluent	Pesticides	Metolachlor	0.47	U	ug/L	0.47	1.9

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
12/13/2010 15:50	Effluent	Pesticides	Parathion Methyl	0.094	U	ug/L	0.094	0.38
12/13/2010 15:50	Effluent	Pesticides	DDE-p,p'	0.019	U	ug/L	0.019	0.076
12/13/2010 15:50	Effluent	Pesticides	Endosulfan Sulfate	0.019	U	ug/L	0.019	0.076
12/13/2010 15:50	Effluent	Pesticides	Toxaphene	0.71	U	ug/L	0.71	2.8
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.19	U	ug/L	0.19	0.77
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Phenol	0.96	U	ug/L	0.96	3.8
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Diethyl phthalate	0.96	U	ug/L	0.96	3.8
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Pyrene	0.19	U	ug/L	0.19	0.77
12/13/2010 15:50	Effluent	Priority Organic Pollutants	2,4-Dinitrotoluene	0.96	U	ug/L	0.96	3.8
12/13/2010 15:50	Effluent	Priority Organic Pollutants	2-Chloronaphthalene	0.96	U	ug/L	0.96	3.8
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.96	U	ug/L	0.96	3.8
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L	1.9	7.7
12/13/2010 15:50	Effluent	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.96	U	ug/L	0.96	3.8
12/13/2010 15:50	Effluent	Priority Organic Pollutants	2,4-Dinitrophenol	14	U	ug/L	14	58
12/13/2010 15:50	Effluent	Priority Organic Pollutants	4-Nitrophenol	14	U	ug/L	14	58
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Acenaphthene	0.19	U	ug/L	0.19	0.77
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Anthracene	0.19	U	ug/L	0.19	0.77
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L	2.9	12
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Di-n-butyl phthalate	4.8	U	ug/L	4.8	19
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.19	U	ug/L	0.19	0.77
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L	2.9	12
12/13/2010 15:50	Effluent	Priority Organic Pollutants	2,4-Dimethylphenol	9.6	U	ug/L	9.6	38
12/13/2010 15:50	Effluent	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L	2.9	12
12/13/2010 15:50	Effluent	Priority Organic Pollutants	3,3'-Dichlorobenzidine	38	U	ug/L	38	150
12/13/2010 15:50	Effluent	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.96	U	ug/L	0.96	3.8
12/13/2010 15:50	Effluent	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.96	U	ug/L	0.96	3.8
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Benzo(a)pyrene	0.19	U	ug/L	0.19	0.77
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Chrysene	0.19	U	ug/L	0.19	0.77
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.19	U	ug/L	0.19	0.77
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Di-n-octyl phthalate	0.96	U	ug/L	0.96	3.8
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Dimethyl phthalate	9.6	U	ug/L	9.6	38
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Hexachlorobenzene	0.96	U	ug/L	0.96	3.8
12/13/2010 15:50	Effluent	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.7
12/13/2010 15:50	Effluent	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.96	U	ug/L	0.96	3.8

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
12/13/2010 15:50	Effluent	Priority Organic Pollutants	2-Chlorophenol	0.96	U	ug/L	0.96	3.8
12/13/2010 15:50	Effluent	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L	1.9	7.7
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Benzo(a)anthracene	0.19	U	ug/L	0.19	0.77
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Benzo(k)fluoranthene	0.19	U	ug/L	0.19	0.77
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Fluoranthene	0.19	U	ug/L	0.19	0.77
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Fluorene	0.19	U	ug/L	0.19	0.77
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	U	ug/L	2.9	12
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Isophorone	0.96	U	ug/L	0.96	3.8
12/13/2010 15:50	Effluent	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.7
12/13/2010 15:50	Effluent	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9	U	ug/L	2.9	12
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Phenanthrene	0.19	U	ug/L	0.19	0.77
12/13/2010 15:50	Effluent	Priority Organic Pollutants	2-Nitrophenol	0.96	U	ug/L	0.96	3.8
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Acenaphthylene	0.19	U	ug/L	0.19	0.77
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Benzo(b)fluoranthene	0.19	U	ug/L	0.19	0.77
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	14	U	ug/L	14	58
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Butyl benzyl phthalate	4.8	U	ug/L	4.8	19
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L	2.9	12
12/13/2010 15:50	Effluent	Priority Organic Pollutants	2,4-Dichlorophenol	0.96	U	ug/L	0.96	3.8
12/13/2010 15:50	Effluent	Priority Organic Pollutants	2,6-Dinitrotoluene	0.96	U	ug/L	0.96	3.8
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Benzidine	96	U	ug/L	96	380
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L	2.9	12
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Naphthalene	0.19	U	ug/L	0.19	0.77
12/13/2010 15:50	Effluent	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.96	U	ug/L	0.96	3.8
12/13/2010 15:50	Effluent	Field Parameter	Dissolved Oxygen	9.59		mg/L		
12/13/2010 15:50	Effluent	Field Parameter	Specific Conductance	5804		umhos/cm		
12/13/2010 15:50	Effluent	Field Parameter	pH	6.72				
12/13/2010 15:50	Effluent	Field Parameter	Temperature	16.7		C		

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

State of Florida
Department of Environmental Protection
Facility Introduction & Summary

PART I: Information gathered prior to sampling event	
Prepared By: Heather Webber 10/25/10	**Contact Number:** 904-807-3316
Facility Name (as it appears on permit): Seminole Electric Cooperative, Inc. (SECI)	**Former Names:** N/A
NPDES Permit Number: FL0036498	**Permit Expiration Date:** December 21, 2011
Physical Address: 890 North Highway 17, Palatka, FL 32177	
District: Northeast	**County:** Putnam
Function of Facility: Power Plant	
Facility Type: Industrial Wastewater	**Permitted Capacity (MGD):** 7.46 (Instant Maximum)
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): 7.215 (Instant Maximum) MGD mean flow for September 2009 – August 2010	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months): N/A	
Description of type of Discharge: ☒ **Continuous** ☐ **Intermittent** ☐ **Seasonal** ☐ **Rainfall Dependent** ☐ **Other, please specify**	
Description of Sampling Location(s) - actual permit designation of permitted sampling point(s): EFF-1: At the discharge from the surge tank prior to mixing with the receiving waters. INT-1: At intake to the plant. OUI-1: At a location after low volume wastewater treatment system effluent mixes with the treated Flue Gas Desulfurization (FGD) purge stream but prior to discharge to the surge tank. OUI-2: At the outlet from the domestic wastewater treatment system but prior to discharge to the surge tank. OUI-3, 4: The outlets from Units 1 and 2 cooling towers, respectively, and at a location after dechlorination system prior to discharge to the surge tank. OUI-5: After the discharge from the FGD purge stream wastewater treatment system but prior to mixing with the other low volume wastewater streams.	
Description of Permitted Outfall(s): An existing Combined Plant Discharge from Units 1 & 2 with a maximum permitted discharge of 7.46 MGD and projected annual average daily flow of 5.62 MGD to the St. Johns River (Class III fresh waters) through Outfall D-001 located approximately at latitude 29° 42' 41" N, longitude 81° 38' 14" W.	
Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility): Treatment of coal pile runoff, bottom ash dewatering system flow, water treatment system wastewater and other Low Volume Wastewater (LVW) is achieved by an on-site wastewater treatment system consisting of equalization, neutralization, oil & grease removal, pH adjustment, coagulation/flocculation and sedimentation. Domestic wastewater is treated by an on-site aeration package treatment plant. Cooling tower make-up water is treated for biofouling control with sodium hypochlorite and sodium bromide and the Cooler Tower Blowdown (CTBD) is dehalogenated prior to discharge. The purge stream from the (FGD) system is treated in an on-site wastewater treatment system consisting of chemical precipitation/flocculation, clarification, and filtration. The treated FGD purge stream, CTBD, treated LVW, and treated domestic wastewater are routed to the surge tank and the combined flow is then discharged via Outfall D-001 to the St. Johns River through a 900 foot long submerged pipe.	

Appendix F. (continued)

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 (Leave cell blank if not applicable)

Parameter (Units)	Effluent Limitations			Monitoring Requirements			
	Maximum Daily Average	Instantaneous Maximum	Other	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Flow (MGD)	Report	7.46	Report Rolling Annual Average	Continuous	Recorder	EFF-1	
Flow (MGD)	Report	Report		Continuous	Recorder	INT-1	
Temperature (F), Water (Discharge) (deg.F)	96.3[1]	98.9		Continuous	Recorder	EFF-1	[1] 6.9 m^2 final mixing zone size
Temperature (F), Water (deg.F)	Report	Report		Continuous	Recorder	INT-1	
Oxidants, Total Residual (mg/l)		0.01		Weekly	See Note 2	EFF-1	[2] Sampling shall be performed by multiple grab samples collected at approximately the beginning, middle, and end of an 8-hour period following initiation of cooling tower blowdown
Turbidity (NTU)		See Note 3		Weekly	Grab	EFF-1	[3] Limit = Background turbidity + 29 NTU
Turbidity (Background) (NTU)		Report		Weekly	Grab	INT-1	
pH (SU)		8.5	6.0 Daily Minimum	Weekly	Grab	EFF-1	
pH (SU)		Report	Report	Weekly	Grab	INT-1	
Nitrite plus Nitrate, Total (as N) (mg/l)		Report		Quarterly	8-hr. flow proportional composite	EFF-1 INT-1	
Ammonia, Unionized (mg/l)		0.02		Quarterly	Calculated	EFF-1	
Ammonia, Unionized (mg/l)		Report		Quarterly	Calculated	INT-1	
Nitrogen, Ammonia, Total (as N) (mg/L)		Report		Quarterly	Grab	EFF-1 INT-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
(Leave cell blank if not applicable)

	Effluent Limitations			Monitoring Requirements			
Parameter (Units)	**Maximum Daily Average**	**Instantaneous Maximum**	**Other**	**Monitoring Frequency**	**Sample Type**	**Monitoring Location Site Number**	**Notes**
Nitrogen, Kjeldahl, Total (as N) (mg/L)		Report		Quarterly	8-hr. flow proportional composite	EFF-1 INT-1	
Nitrogen, Total (mg/L)			Report Monthly Average	Every Two Weeks	8-hr. flow proportional composite	EFF-1 INT-1	
Nitrogen Total, Monthly Net Loading (kg/month)			Report Monthly Total[4]	Monthly	Calculated	EFF-1	[4] Kilograms of TN discharged at EFF-1 minus the kilograms of TN withdrawn at INT-1
Nitrogen Total, Annual Net Loading (kg/year)			Report Annual Max.[4]	Monthly	Calculated	EFF-1	
Nitrogen Total, Combined Annual Net loading (kg/year)			Report Only (through 12/31/10) 14,732 Annual Max[5] (as of 01/01/11)	Monthly	Calculated	EFF-1	[5] Compliance is determined using a combined (air & wastewater) rolling 12-month net TN loading.
Phosphorus, Total (as P) (mg/L)		Report		Quarterly	8-hr. flow proportional composite	EFF-1	
Hardness, Total (as $CaCO_3$) (mg/L)		Report		Quarterly	8-hr. flow proportional composite	EFF-1	
Specific Conductance (umhos/cm)		8,653[6]		Quarterly	8-hr. flow proportional composite	EFF-1	[6] 173 m^2 final mixing zone size
Specific Conductance (umhos/cm)		Report		Quarterly	8-hr. flow proportional composite	INT-1	

Appendix F. (continued)

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 (Leave cell blank if not applicable)

	Effluent Limitations			Monitoring Requirements			
Parameter (Units)	**Maximum Daily Average**	**Instantaneous Maximum**	**Other**	**Monitoring Frequency**	**Sample Type**	**Monitoring Location Site Number**	**Notes**
Oil and Grease (mg/l)		5.0		Weekly	Grab	EFF-1	
Oil and Grease (mg/l)		Report		Weekly	Grab	INT-1	
Beryllium, Total Recoverable (µg/l)			0.13 Annual Average	Quarterly	8-hr. flow proportional	EFF-1	
Copper, Total Recoverable (µg/l)		139.0[7]		Quarterly	8-hr. flow proportional	EFF-1	[7] 253 m^2 final mixing zone size
Copper, Total Recoverable (µg/l)		Report		Quarterly	8-hr. flow proportional	INT-1	
Cyanide, Total (as CN) (µg/l)		19.6[8]		Monthly	Grab	EFF-1	[8] 173 m^2 final mixing zone size
Cyanide, Total (as CN) (µg/l)		Report		Monthly	Grab	INT-1	
Iron, Total Recoverable (mg/l)		1.70[9]		Quarterly	8-hr. flow proportional	EFF-1	[9] 4.9 m^2 final mixing zone size
Iron, Total Recoverable (mg/l)		Report		Quarterly	8-hr. flow proportional	INT-1	
Mercury, Total (µg/l)		0.09[10]		Monthly	Grab	EFF-1	[10] 67,323 m^2 final mixing zone size
Mercury, Total (µg/l)		Report		Monthly	Grab	INT-1	
Nickel, Total Recoverable (µg/l)		See Note 11		Quarterly	8-hr. flow proportional	EFF-1	[11] Limit is calculated using: $Ni \leq e^{(0.846[\ln H] + 0.0584)}$
Selenium, Total Recoverable (µg/l)		11.7[12]		Monthly	8-hr. flow proportional	EFF-1	[12] 19.3 mg^2 final mixing zone size
Selenium, Total Recoverable		Report		Monthly	8-hr. flow proportional	INT-1	
Silver, Total Recoverable (µg/l)		0.07		Quarterly	8-hr. flow proportional	EFF-1	

Appendix F. (continued)

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 (Leave cell blank if not applicable)

Parameter (Units)	Effluent Limitations			Monitoring Requirements			
	Maximum Daily Average	Instantaneous Maximum	Other	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Zinc, Total Recoverable (µg/l)		See Note 13		Quarterly	8-hr. flow proportional	EFF-1	[13] Limit is calculated using: $Zn \leq e^{(0.8473[\ln H] + 0.884)}$
Zinc, Total Recoverable (µg/l)		Report		Quarterly	8-hr. flow proportional	INT-1	
Time of Chlorine Discharge (min/day/unit)		120[14]		Daily	Logs	EFF-1	[14] Neither Free Available Oxidant (FAO) nor Total Residual Oxidant (TRO) shall be discharge from any one unit for more than two hours in any one day and not more than one unit shall discharge FAO or TRO at any one time.
Whole Effluent Toxicity	See below						

Appendix F. (continued)

PART I: Continued	
Receiving Waters: St. Johns River	**Classification (indicate whether fresh or marine):** Class III fresh waters

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

Effluent Limitation:

Mortality ≤ 20% in the 100% effluent concentration in any "routine" test shall constitute compliance. Mortality of >20% shall constitute unacceptable toxicity. "Additional follow-up" tests shall be conducted for any "routine" test for which unacceptable toxicity has been observed.

Mortality ≤ 50% in the 100% effluent concentration for whole effluent acute toxicity or in any additional follow-up test.

Monitoring Frequency

"Routine" toxicity tests shall be conducted once every two months.

Test Requirements

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

Additional Follow-up Tests, if required: If a routine test does not meet the acute toxicity limitation, three additional follow-up tests shall be conducted on each species that failed the test.

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.

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.

96-hour acute static renewal toxicity tests shall be conducted using the daphnia, Daphnia magna, and the fathead minnow, Pimephales promelas, concurrently.

The control water and dilution water used moderately hard water.

Sampling Requirements

All tests will be conducted on a single grab sample of final effluent collected four hours after cooling tower blowdown has been initiated and prior to the when cooling tower blowdown is complete.

For additional follow-up tests, the first test shall be conducted a total of 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.

Quality Assurance Requirements

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.

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 be invalidated and the test repeated.

If, during any routine 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.

Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.):

Administrative Order No. AO016TL – revised and executed 07/02/09. Provides interim limits (report only) for combined annual total nitrogen net load limitation until 01/01/11. Cyanide and total recoverable selenium. interim limits (report only) expired 10/01/10. New influent flow meters required prior to 06/30/10 were installed.

Appendix F. (continued)

Facility Mixing Zone (MZ) Details (if applicable):

Parameter	Total Recoverable Copper	Total Cyanide	Total Recoverable Iron	Total Recoverable Mercury	Total Recoverable Selenium	Specific Conductance	Temperature
Final MZ Size (m^2)	253	173	4.9	67,323	19.3	173	6.9

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

Date	Parameter and Units	Limit	Result
04/30/10	Total Recoverable Mercury	0.09µg	0.1460

Describe previous FYI and WQBEL study:
Note: the 2004 bioassessment results are listed on the DEP website under the wrong permit number (FL0036495). The effluent samples collected for this facility on January 12, 2004, showed unacceptable acute toxicity to the test species *Americamysis bahia* and *Daphnia pulex* during the 96-hour acute bioassay tests. The elevated calcium concentration is one source of toxicity in the effluent, but other unidentified sources of toxicity cannot be ruled out without performing the major-seawater-ion imbalance toxicity testing protocols. Metals in the effluent complied with Class III Freshwater Quality Criteria and facility permit limits. The effluent AGP result was not reported due to contamination found in the sample flask.

Describe previous or current Enforcement Actions (including WLs):
No Enforcement since 2001 (re: unionized ammonia exceedances).
No Warning Letters since 2004 (re: air preheater wash water discharges).

Describe any violations or problems noted in previous inspection:
None – September 1, 2010 inspection found the facility to be 'In Compliance'.

Discuss whether DMR trends within previous five years are improving or declining:
Total nitrogen appears to be trending downwards. Other parameters show no trend.

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

Appendix F. (continued)

PART II: Sampling Event Information	
Date(s) sample collected:	Sampler(s):
Temperature (Deg C):	pH (SU):
Dissolved Oxygen (mg/L):	Conductivity (umhos/cm):
Total Residual Chlorine (mg/L):	Total Residual Chlorine - after Disinfection (mg/L):
Method of Chlorination:	Method of De-chlorination:
Flow During Sample Collection for each outfall(MGD):	
Mean Flow for each outfall for previous 12 months based on sampling date (If samples are taken on more than one day, indicate Mean Flow for each day):	
Describe Discharge during Sampling Event: ☐ Continuous ☐ Intermittent ☐ Seasonal ☐ Rainfall Dependent ☐ Other, please specify	
Describe any conditions, difficulties or abnormal events that occurred during the sample collection and any other additional comments here:	

Appendix G. EPA End Sheet

The Bioassay of Seminole Electric Cooperative, Inc. plant effluent sampled on December 13, 2010. NPDES #FL0036498.

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

Remarks

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The Priority Pollutants Analysis of Seminole Electric Cooperative, Inc. plant effluent sampled on December 13, 2010. NPDES #FL0036498.

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

Remarks

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Biological Analyses of Seminole Electric Cooperative, Inc. plant effluent sampled on December 13, 2010. NPDES #FL0036498.

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

Remarks

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