

Effluent Quality Assessment

Yara North America, Inc.

(formerly Hydro-Agri; Farmland Hydro)

Hillsborough County

NPDES #FL0038652

Sampled June 21, 2010

October 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

Yara North America, Inc., (formerly Hydro-Agri; Farmland Hydro), 3421 Port Sutton Road, Tampa, Hillsborough County, Florida, 33619. NPDES #FL0038652. Effluent grab samples for bioassay and chemical analyses for this facility were collected on June 21, 2010.

Introduction

Yara North America, Inc. is an anhydrous ammonia storage and transfer facility which discharges non-contact cooling water. (See Appendix F for detailed facility information provided by Jacki Champion of FDEP Southwest District.)

Methods

Samples were collected from the EFF-01 NPDES sampling point for Outfall D-001 by Jacki Champion and Mike Lynch (FDEP Southwest District) following DEP-SOP-001/01 FS 2400 Wastewater Sampling. All DEP SOPs are available on the web at: http://www.floridadep.org/labs/bars/sas/sop/index.htm.

See Appendix A for the completed chain of custody form.

The 48-hour acute screening toxicity tests and algal growth potential test were performed following internal DEP SOPs TA07_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 June 22 - 24, 2010.

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

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

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

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

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

- **Algal Growth Potential**
  The effluent Algal Growth Potential (AGP) was 8.96 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 (3.4:1) of total nitrogen to total phosphorus suggests that the effluent is nitrogen limited (Maloney et al. 1978).

  See Table 1 for AGP results.

- **Chemistry Results**
  Total residual chlorine and total ammonia were not detected in the bioassay sample in the laboratory. The total ammonia concentration in the composite sample collected and preserved for chemical analysis was 0.13 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.

  Atrazine, aluminum, copper, nickel and zinc were detected in the effluent at levels that comply with Class III marine water quality criteria (62-302.530, F.A.C.). Arsenic, atrazine, chromium–III, copper, and nickel were 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-01 for this facility on June 21, 2010, was not acutely toxic to either test species during the 48-hour acute screening bioassays. The effluent AGP result was not greater than the "problem" threshold for fresh receiving waters, suggesting that nutrient enrichment may be an issue. Effluent water quality samples collected on June 21, 2010, did not exceed any applicable water quality standards or violate any permit conditions.

Literature Cited

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

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 Yara North America, Inc., terminal on June 21, 2010.

Yara North America, Inc. NPDES # FL0038652			
Location	**AGP (measured)**	**Inorganic N:P ratio**	**Total N:P ratio**
Effluent	8.96 A	1.0	3.4

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 Yara North America, Inc., terminal on June 21, 2010.

Yara North America, Inc. NPDES # FL0038652	Class III Criteria	Effluent Limits	Effluent	
Organic Constituents (µg/L)				
Atrazine	-	-	0.056	I
Metals (µg/L unless otherwise noted)				
Aluminum	≤ 1,500	-	1,330	
Arsenic	≤ 50	-	2.3	I
Cadmium	≤ 8.8	-	0.09	U
Calcium (mg/L)	-	-	321	
Chromium-III	-	-	1.4	I
Copper	≤ 3.7	-	1.6	I
Iron	≤ 300	-	90	U
Lead	≤ 8.5	-	0.6	U
Magnesium (mg/L)	-	-	986	
Mercury	≤ 0.025	-	-	
Nickel	≤ 8.3	-	1.2	I
Selenium	≤ 71	-	0.6	U
Silver	≤ 2.3	-	0.075	U
Zinc	≤ 86	-	15	U
Nutrients (mg/L)				
Ortho-phosphate	-	-	0.16	
Total Phosphorus	-	Report	0.2	A
Total Ammonia	-	Report	0.13	
Un-ionized Ammonia	-	Report	0.01	c
Nitrate and Nitrite	-	-	0.025	
Total Kjeldahl Nitrogen	-	-	0.66	
Organic Nitrogen	-	-	0.53	c
Total Nitrogen	-	≤ 3.0 s	0.685	c
General Physical and Chemical Parameters				
Dissolved Oxygen (mg/L)	≥ 4.0	-	5.5	
pH (SU)	6.5 - 8.5	6.5 - 8.5	7.9	
Conductivity (µmhos/cm)	-	-	41,553	
Temperature (°C)	-	Report	37.2	
Salinity	-	-	26.8	
Total Residual Chlorine (mg/L)	≤ 0.01	-	< 0.03	U£
Chlorophyll *a* (µg/L) - Corrected	-	-	5.3	
Phaeophytin (µg/L)	-	-	2.4	
CBOD, 5 day (mg/L), N - inhibited	-	-	1.7	I
Oils and Greases (mg/L)	≤ 5.0	-	1.4	U
Chloride (mg/L)	-	-	15,000	
Fluoride (mg/L)	≤ 5.0	-	1.3	
Sulfate (mg/L)	-	-	2,100	
Flow (MGD)	-	Report	1.02	a*
Hardness (mg $CaCO_3$)	-	-	4861.89	c

Value exceeds the Class III Water Quality Criteria or permit limits

a - Annual average

c - Value is calculated

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

I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

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

* - AADF from April '09 to March '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-2010-06-21-23
FY13 for Yara North America - Port Sutton

Requester: Carl Butler
Field Report Prepared By: Jackie Champion
Collected By: Jackie Champion/ Mike Lynch
Send Final Report To: Vishwas Sathe
Sampling Agency: FDEP

Customer: BMR-TAMPA
Project ID: FY15
PMAS: 1143

Lab ID *	Location	Collection (begin) Date Time	Collection (end) Date Time	Bottle Group(s)**
	Yara	☐ Comp ☒ Grab 6/21/10 9:50 Eastern Central	Eastern Central	A
	Field ID: Outfall 001	Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L): 5.58	Storet Station Number:
	Matrix (include type e.g. Salt, Fresh, etc): Salt Water	Temp (C): 37.22	pH: 7.89	Sample Depth ☐ m ☐ ft
				41,553 ☐ Salinity (PPTh) ☒ Sp Conductance (umho/cm)
				NPDES Number:
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments:	

Lab ID *	Location	Collection (begin) Date Time	Collection (end) Date Time	Bottle Group(s)**
	Yara Outfall 001	☐ Comp ☒ Grab 6/21/10 9:50 Eastern Central	Eastern Central	A
	Field ID: Sa Outfall 001	Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L): 5.50	Storet Station Number:
	Matrix (include type e.g. Salt, Fresh, etc): Salt Water	Temp (C): 37.22	pH: 7.89	Sample Depth ☐ m ☐ ft
				41,553 ☐ Salinity (PPTh) ☒ Sp Conductance (umho/cm)
				NPDES Number:
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments: Bioassay Samples	

Lab ID *	Location	Collection (begin) Date Time	Collection (end) Date Time	Bottle Group(s)**
	Yara	☐ Comp ☒ Grab 6/21/10 9:25 Eastern Central	Eastern Central	B
	Field ID: Equipment Blanks	Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L):	Storet Station Number:
	Matrix (include type e.g. Salt, Fresh, etc): Salt Fresh Water	Temp (C):	pH:	Sample Depth ☐ m ☐ ft
				☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)
				NPDES Number:
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments:	

Lab ID *	Location	Collection (begin) Date Time	Collection (end) Date Time	Bottle Group(s)**
		☐ Comp ☐ Grab Eastern Central	Eastern Central	
	Field ID:	Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L):	Storet Station Number:
	Matrix (include type e.g. Salt, Fresh, etc):	Temp (C):	pH:	Sample Depth ☐ m ☐ ft
				☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)
				NPDES Number:
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments: 2 bioassay Rec'd in Tox by JD. 10:00 6.22.10	

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
Jackie Champion	6/21/10 11:00	Fed Ex	AB	6/22/10 09:15				

* 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: Varg North American

Address : 3721 Port Sutton Rd. 33619

City: Tampa **County:** Hillsborough

Contact/District: Jack, champion/Southwest

NPDES Permit #: FL0038652

LIMS Job #: TLH-2010-06-22-01 **LIMS Sample #:** 1280598

Lims Data Entry: 7-13-10 MF Data Entry Verification: 7.13.10 JD

Sample Collection: Date: 6.22.10 Time: 9:15

Hold Time Start: Date: 6.22.10 Time: 9:15

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: ____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:

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:

James Daniels JD

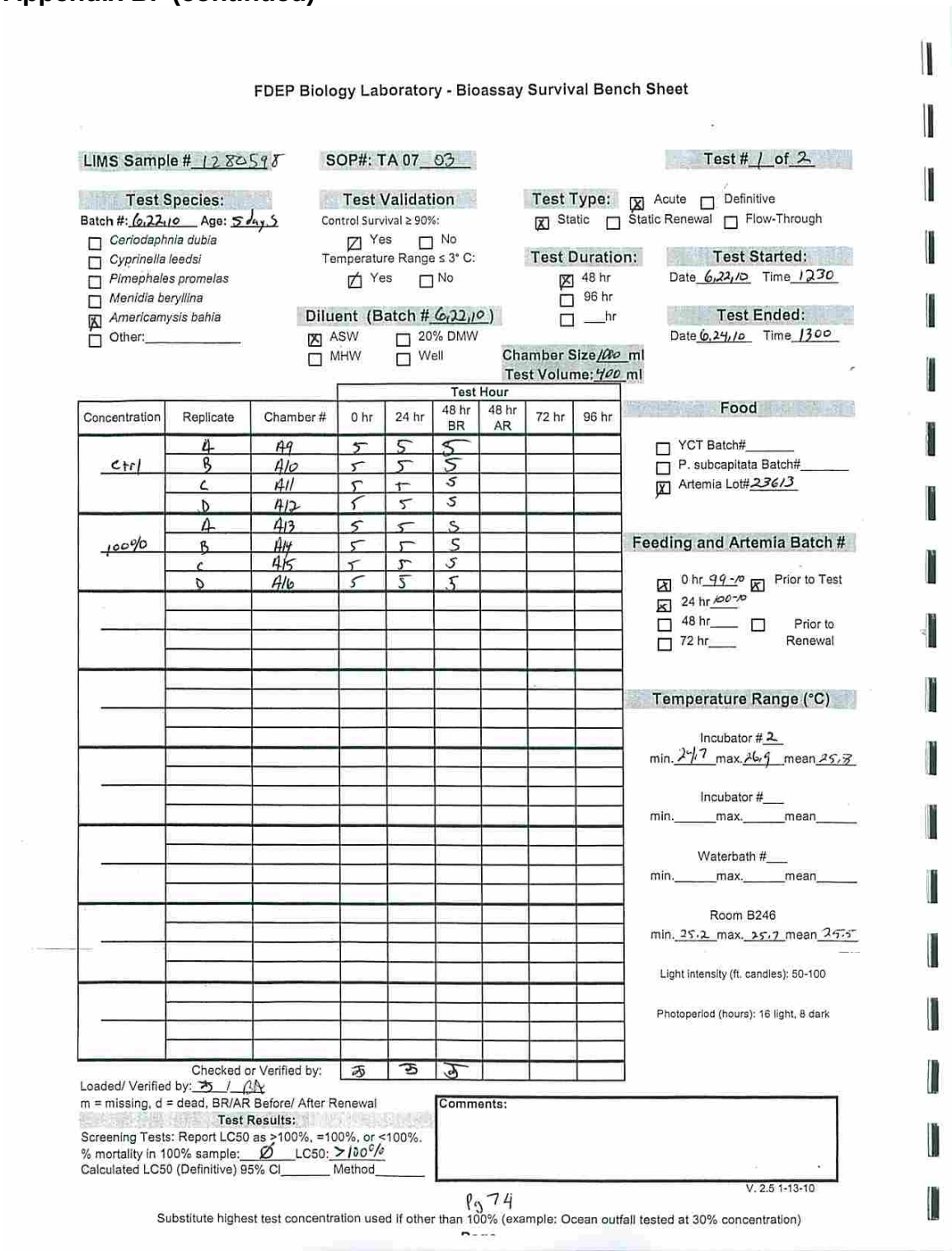
Buck Alexander BA

REVIEWER: Lizy Miller

Diluent/Control Batch#:				6.22.10	6.22.10				
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	BA	
Lab Total Residual Cl_2 (mg/L):				<0.03	<0.03		<0.03	JD	DA
Alkalinity (mg/L as $CaCO_3$):				244	244		161	DA	JD
Hardness (mg/L as $CaCO_3$):				—	—		—	DA	JD
Total Ammonia (mg/L as N):				<0.034	<0.034		<0.034	BA	JD
Conductivity: ☐ µmhos ☒ mmhos				40.7	40.7		41.8	JD	DA
Salinity (ppth):				26.4	26.3		26.8	JD	BA

V 1.8 1/13/10

Appendix B. (continued)



FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample # 1280598 SOP#: TA 07_03 Test # 1 of 2

Test Species:
Batch #: 6.22.10 Age: 5 day 5
- ☐ *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 # 6.22.10)
☒ ASW ☐ 20% DMW ☐ MHW ☐ Well

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

Test Duration: ☒ 48 hr ☐ 96 hr ☐ ___hr

Test Started: Date 6.22.10 Time 1230

Test Ended: Date 6.24.10 Time 1300

Chamber Size 1000 ml
Test Volume: 400 ml

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Ctrl	A	A9	5	5	5			
	B	A10	5	5	5			
	C	A11	5	5	5			
	D	A12	5	5	5			
100%	A	A13	5	5	5			
	B	A14	5	5	5			
	C	A15	5	5	5			
	D	A16	5	5	5			
Checked or Verified by:			JB	JB	JB			

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

Feeding and Artemia Batch #
- ☒ 0 hr 99-10 ☒ Prior to Test
- ☒ 24 hr 100-10
- ☐ 48 hr____ ☐ Prior to Renewal
- ☐ 72 hr____

Temperature Range (°C)
Incubator # 2
min. 24.7 max. 26.9 mean 25.8
Incubator #___
min._____max._____mean_____
Waterbath #___
min._____max._____mean_____
Room B246
min. 25.2 max. 25.7 mean 25.5

Light intensity (ft. candles): 50-100

Photoperiod (hours): 16 light, 8 dark

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

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

Comments:

V. 2.5 1-13-10

Pg 74

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 # 128598 | SOP#: TA 07 04 | Test # 2 of 2

Test Species:
Batch #: 6.22.10 Age: 13 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 # 6.22.10)
☒ ASW ☐ 20% DMW
☐ MHW ☐ Well

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

Test Duration:
☒ 48 hr
☐ 96 hr
☐ __hr

Chamber Size 1000 ml
Test Volume: 400 ml

Test Started: Date 6.22.10 Time 1220

Test Ended: Date 6.24.10 Time 1300

Concentration	Replicate	Chamber #	0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
4rl	A	A1	5	5	5			
	B	A2	5	5	5			
	C	A3	5	5	5			
	D	A4	5	5	5			
100%	A	A5	5	5	5			
	B	A6	5	5	5			
	C	A7	5	5	5			
	D	A8	5	5	5			
Checked or Verified by:			[illegible]	[illegible]	[illegible]			

Loaded/ Verified by: [illegible] / [illegible]
m = missing, d = dead, BR/AR Before/ After Renewal

Test Results:
Screening Tests: Report LC50 as >100%, =100%, or <100%,
% mortality in 100% sample: Ø LC50: >100%
Calculated LC50 (Definitive) 95% CI ______ Method ______

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

Feeding and Artemia Batch #
- ☒ 0 hr 99-10 ☒ Prior to Test
- ☐ 24 hr ____
- ☐ 48 hr ____ ☐ Prior to Renewal
- ☐ 72 hr ____

Temperature Range (°C)

Incubator # 2
min. 24.7 max. 26.9 mean 25.8

Incubator # ___
min. ______ max. ______ mean ______

Waterbath # ___
min. ______ max. ______ mean ______

Room B246
min. 25.2 max. 25.7 mean 25.5

Light Intensity (ft. candles): 50-100

Photoperiod (hours): 16 light, 8 dark

Comments:

V. 2.5 1-13-10

Pg 75

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 # 1280598 Test # 1 of 2

Test Species:

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

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

Concentration	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☒ mmhos	Salinity* (ppth)
	A	0 hr	8.3	25.0	6.8	40.7	26.4
	B	24 hr	8.2	24.6	6.3	41.4	26.3
47%	C	48 hr BR	8.1	24.5	6.8	42.5	27.2
		48 hr AR					
		72 hr					
		96 hr					
	A	0 hr	8.0	25.8	7.0	41.8	26.8
	B	24 hr	8.0	24.5	6.2	42.3	27.1
100%	C	48 hr BR	7.9	24.4	6.5	43.4	27.8
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		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					
		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: [illegible]
24 hr: [illegible]
48 hr BR: [illegible]
48 hr AR:
72 hr:
96 hr:

Page 76 V. 2.3 1-13-10

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Parameter Sheet

LIMS Sample # 128558 Test # 2 of 2

Test Species:

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

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

Concentration	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☒ mmhos	Salinity* (ppth)
	A	0 hr	8.3	25.1	7.0	40.7	26.3
	B	24 hr	8.2	24.4	5.9	41.9	26.7
Ctrl	C	48 hr BR	8.2	24.8	6.6	42.6	27.2
		48 hr AR					
		72 hr					
		96 hr					
	A	0 hr	8.0	25.8	7.1	41.8	26.9
	B	24 hr	7.9	24.5	5.9	42.3	27.1
100%	C	48 hr BR	8.0	24.7	6.5	43.6	27.9
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		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					
		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: [illegible]
24 hr: [illegible]
48 hr BR: [illegible]
48 hr AR:
72 hr:
96 hr:

Page 77 V. 2.3 1-13-10

Appendix B. (continued)

Bioassay Instrument ID

Test ID: Ver 12858 8 Dates: 6/21/10 – 6/24/10

METER / DEVICE	ID	SOP	Parameter	Method	v 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 SP 6.24.10

V 1.1 6/12/08 MF

PAGE 7 8

Appendix C. SRT Bench Sheets and Statistical Analysis

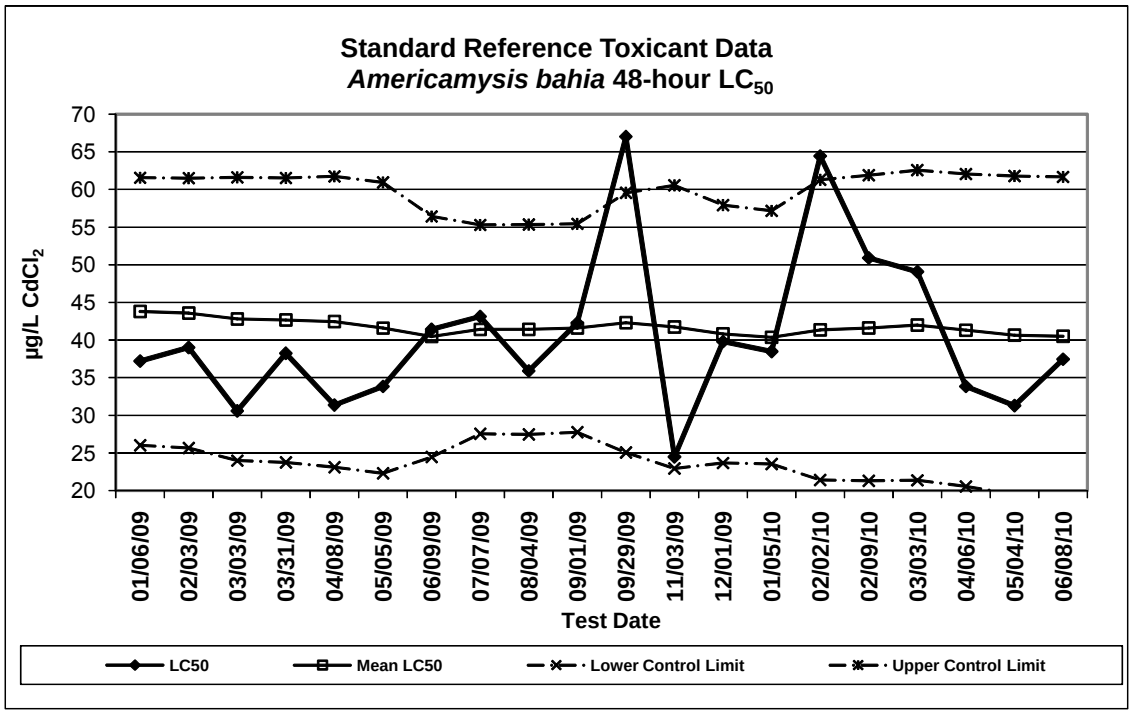
Florida Department of Environmental Protection
Bureau of Laboratories

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

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
01/06/09	37.22	43.80	8.89	26.01	61.59
02/03/09	39.02	43.57	8.96	25.66	61.49
03/03/09	30.58	42.81	9.40	24.02	61.61
03/31/09	38.24	42.65	9.45	23.76	61.55
04/08/09	31.38	42.44	9.66	23.12	61.76
05/05/09	33.86	41.62	9.66	22.31	60.93
06/09/09	41.42	40.46	8.00	24.47	56.45
07/07/09	43.11	41.44	6.94	27.55	55.32
08/04/09	35.91	41.41	6.97	27.47	55.34
09/01/09	42.29	41.61	6.93	27.76	55.46
09/29/09	67.01	42.30	8.62	25.06	59.54
11/03/09	24.49	41.74	9.40	22.94	60.54
12/01/09	39.81	40.82	8.56	23.70	57.93
01/05/10	38.48	40.36	8.42	23.53	57.19
02/02/10	64.45	41.35	9.97	21.41	61.28
02/09/10	50.93	41.59	10.15	21.30	61.89
03/03/10	49.07	41.98	10.29	21.40	62.55
04/06/10	33.86	41.33	10.37	20.58	62.08
05/04/10	31.29	40.65	10.57	19.51	61.79
06/08/10	37.47	40.49	10.60	19.30	61.69

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

CV = 26.17
EPA reference 75th quartile CV = 26%



Appendix C. (continued)

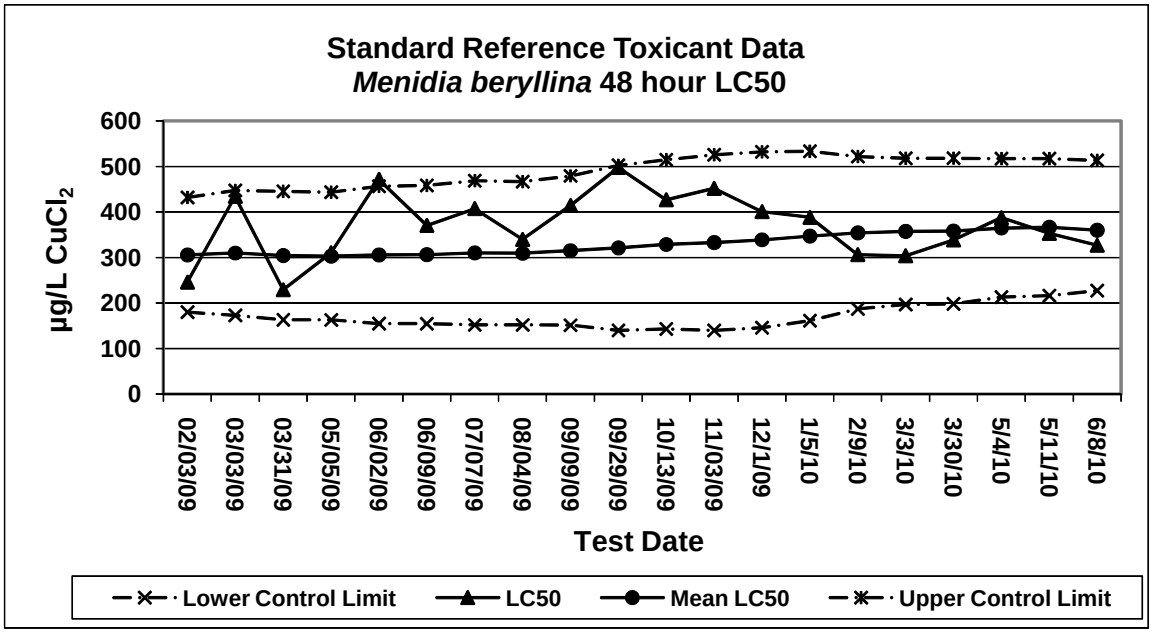
Florida Department of Environmental Protection
Bureau of Laboratories

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

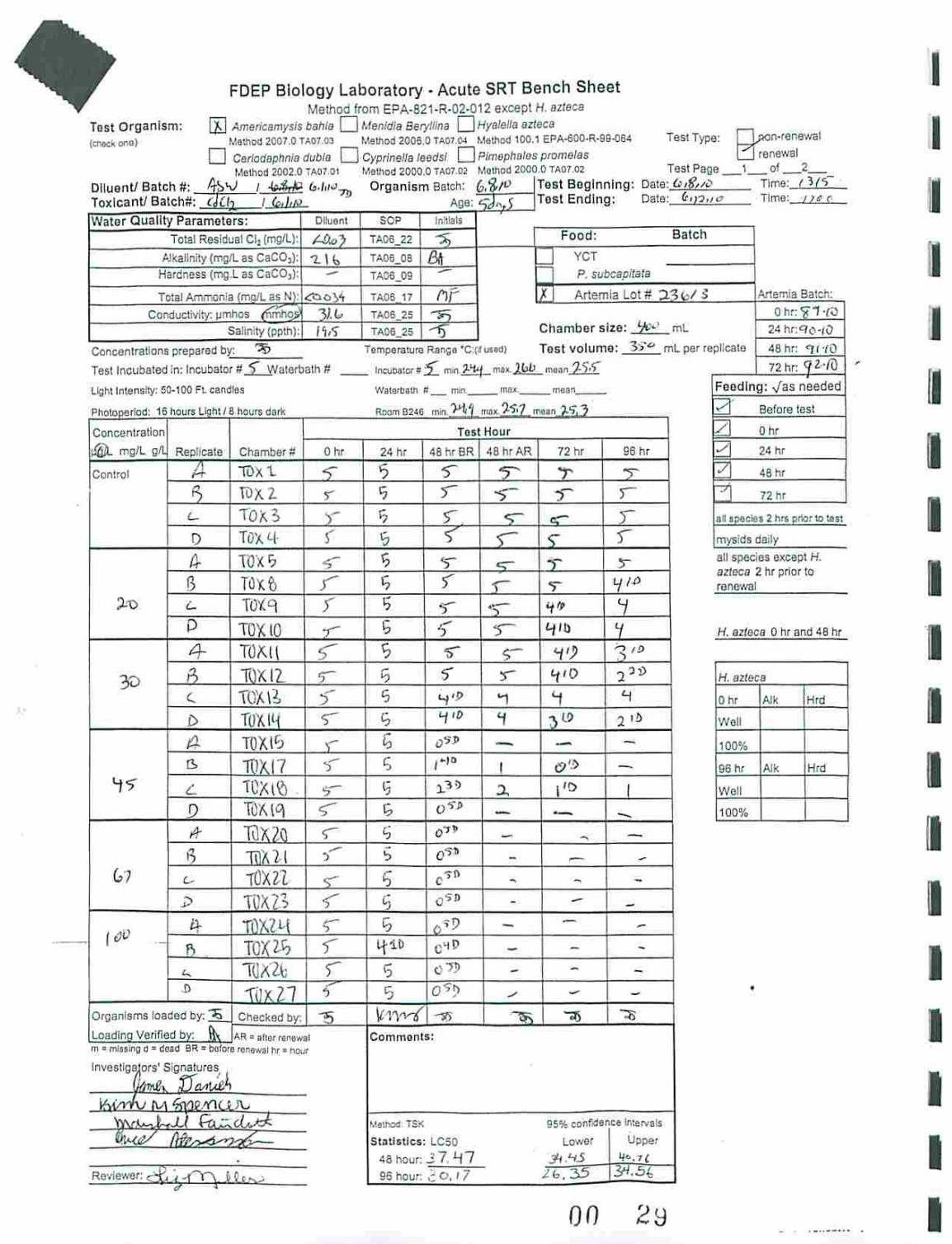
Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
02/03/09	245.51	305.47	62.94	179.59	431.35
03/03/09	433.98	309.64	68.59	172.45	446.82
03/31/09	228.94	304.17	70.52	163.13	445.22
05/05/09	310.12	302.74	70.07	162.60	442.87
06/02/09	471.25	305.32	75.36	154.60	456.04
06/09/09	370.27	306.03	75.93	154.18	457.89
07/07/09	407.17	309.94	79.12	151.71	468.20
08/04/09	339.47	309.04	78.65	151.74	466.34
09/09/09	414.01	314.96	81.97	151.03	478.90
09/29/09	497.50	320.86	90.65	139.57	502.16
10/13/09	426.50	328.56	92.84	142.89	514.24
11/03/09	451.45	332.46	96.39	139.68	525.25
12/1/09	400.34	338.72	96.54	145.64	531.80
1/5/10	387.88	347.06	92.99	161.08	533.03
2/9/10	306.10	353.99	83.59	186.81	521.16
3/3/10	303.50	357.16	80.17	196.82	517.50
3/30/10	338.23	357.79	79.96	197.88	517.71
5/4/10	387.23	364.66	76.00	212.67	516.66
5/11/10	352.66	366.46	75.23	216.00	516.91
6/8/10	326.64	359.94	71.41	227.11	512.76

Means are of the last 20 SRT tests.

EPA reference 75th quartile CV = 21% **CV = 19.30**



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 [✓] renewal

Test Page 1 of 2

Diluent/ Batch #: ASW / 6.110 Organism Batch: 6,8,10 Test Beginning: Date: 6/8/10 Time: 1315

Toxicant/ Batch#: CdCl2 / 6.110 Age: 5d,5 Test Ending: Date: 6/12/10 Time: 1200

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<.003	TA06_22	JS
Alkalinity (mg/L as $CaCO_3$):	216	TA06_08	BH
Hardness (mg.L as $CaCO_3$):	—	TA06_09	—
Total Ammonia (mg/L as N):	<.034	TA06_17	MF
Conductivity: µmhos (mmhos)	31.6	TA06_25	JS
Salinity (ppth):	19.5	TA06_25	JS

Food: Batch

[ ] YCT

[ ] *P. subcapitata*

[X] Artemia Lot # 23613

Artemia Batch:

0 hr: 87-10

24 hr: 90-10

48 hr: 91-10

72 hr: 92-10

Chamber size: 400 mL

Test volume: 350 mL per replicate

Concentrations prepared by: JS

Temperature Range °C: (if used)

Test Incubated in: Incubator # 5 Waterbath # ____ Incubator # 5 min 24 max 26 mean 25.5

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

Photoperiod: 16 hours Light / 8 hours dark Room B246 min 24.9 max 25.7 mean 25.3

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	TOX 1	5	5	5	5	5	5
	B	TOX 2	5	5	5	5	5	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	5
	B	TOX 6	5	5	5	5	5	4 1D
	C	TOX 9	5	5	5	5	4 1D	4
	D	TOX 10	5	5	5	5	4 1D	4
30	A	TOX 11	5	5	5	5	4 1D	3 1D
	B	TOX 12	5	5	5	5	4 1D	2 2D
	C	TOX 13	5	5	4 1D	4	4	4
	D	TOX 14	5	5	4 1D	4	3 1D	2 1D
45	A	TOX 15	5	5	0 5D	—	—	—
	B	TOX 17	5	5	1 4D	1	0 5D	—
	C	TOX 18	5	5	2 3D	2	1 1D	1
	D	TOX 19	5	5	0 5D	—	—	—
67	A	TOX 20	5	5	0 5D	—	—	—
	B	TOX 21	5	5	0 5D	—	—	—
	C	TOX 22	5	5	0 5D	—	—	—
	D	TOX 23	5	5	0 5D	—	—	—
100	A	TOX 24	5	5	0 5D	—	—	—
	B	TOX 25	5	4 1D	0 4D	—	—	—
	C	TOX 26	5	5	0 3D	—	—	—
	D	TOX 27	5	5	0 5D	—	—	—
Organisms loaded by: JS		Checked by:	JS	KMS	JS	JS	JS	JS

Loading Verified by: AR = after renewal

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

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

Comments:

Investigators' Signatures

James Daniels

Kristin M Spencer

Marshall Faircloth

Bruce Pierson

Reviewer: Lizy Miller

Method: TSK

Statistics: LC50

	95% confidence Intervals Lower	Upper
48 hour: 37.47	34.45	40.76
96 hour: 30.17	26.35	34.56

00 29

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: 6,8,10 Time: 1315
Test Ending: Date: 6,12,10 Time: 1100

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

hr = hour AR = after renewal BR = before renewal

Concentration (100) 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	25.1	6.5	34.6	19.5
	B	24 hr	8.3	24.3	6.7	32.8	20.4
	C	48 hr BR	8.2	25.4	6.0	34.1	21.3
	C	48 hr AR	8.3	24.1	6.7	32.4	20.1
	D	72 hr	8.1	24.8	6.4	32.7	20.2
	A	96 hr	8.0	25.3	6.3	34.1	21.1
20	A	0 hr	8.3	25.2	6.6	32.4	20.3
	B	24 hr	8.3	24.0	6.7	33.0	20.6
	C	48 hr BR	8.2	25.7	6.0	34.2	21.4
	C	48 hr AR	8.3	24.3	6.6	32.5	20.3
	D	72 hr	8.1	24.9	5.5	33.5	20.9
	A	96 hr	8.0	~~25.6~~ @	5.7	34.8	21.8
30	A	0 hr	8.3	25.2	6.5	32.3	20.2
	B	24 hr	8.3	24.0	6.8	33.8	21.2
	C	48 hr BR	8.1	25.7	5.6	35.0	21.9
	C	48 hr AR	8.3	24.4	6.6	32.6	20.3
	D	72 hr	8.1	25.0	5.9	33.2	20.8
	A	96 hr	8.0	25.2	5.4	34.7	21.8
45	A	0 hr	8.3	25.3	6.6	32.4	20.3
	B	24 hr	8.3	24.0	6.8	33.4	20.9
	C	48 hr BR	8.2	25.7	5.5	34.1	21.4
	C	48 hr AR	8.3	24.2	6.6	32.4	20.2
	C	72 hr	8.2	24.3	6.1	33.4	20.9
	C	96 hr	8.1	25.0	5.5	34.6	21.7
67	A	0 hr	8.3	25.5	6.5	32.3	20.2
	B	24 hr	8.3	24.0	6.8	33.7	21.1
	C	48 hr BR	8.2	25.7	5.8	34.2	21.5
	C	48 hr AR	—	—	—	—	—
		72 hr	—	—	—	—	—
		96 hr					
100	A	0 hr	8.3	25.8	6.5	32.4	20.3
	B	24 hr	8.3	24.2	6.8	33.6	20.9
	C	48 hr BR	8.2	25.8	6.0	34.4	21.6
	C	48 hr AR	—	—	—	—	—
		72 hr	—	—	—	—	—
		96 hr					

Investigators Signatures
Tonia Daniels
Kim M Spencer
Bruce Alexander
Marshall Faircloth

Reviewed By: Lisa Miller

Measured by:
0 hr: TD
24 hr: KMS
48 hr BR: KMS
48 hr AR: KMS
72 hr: TD
96 hr: TD

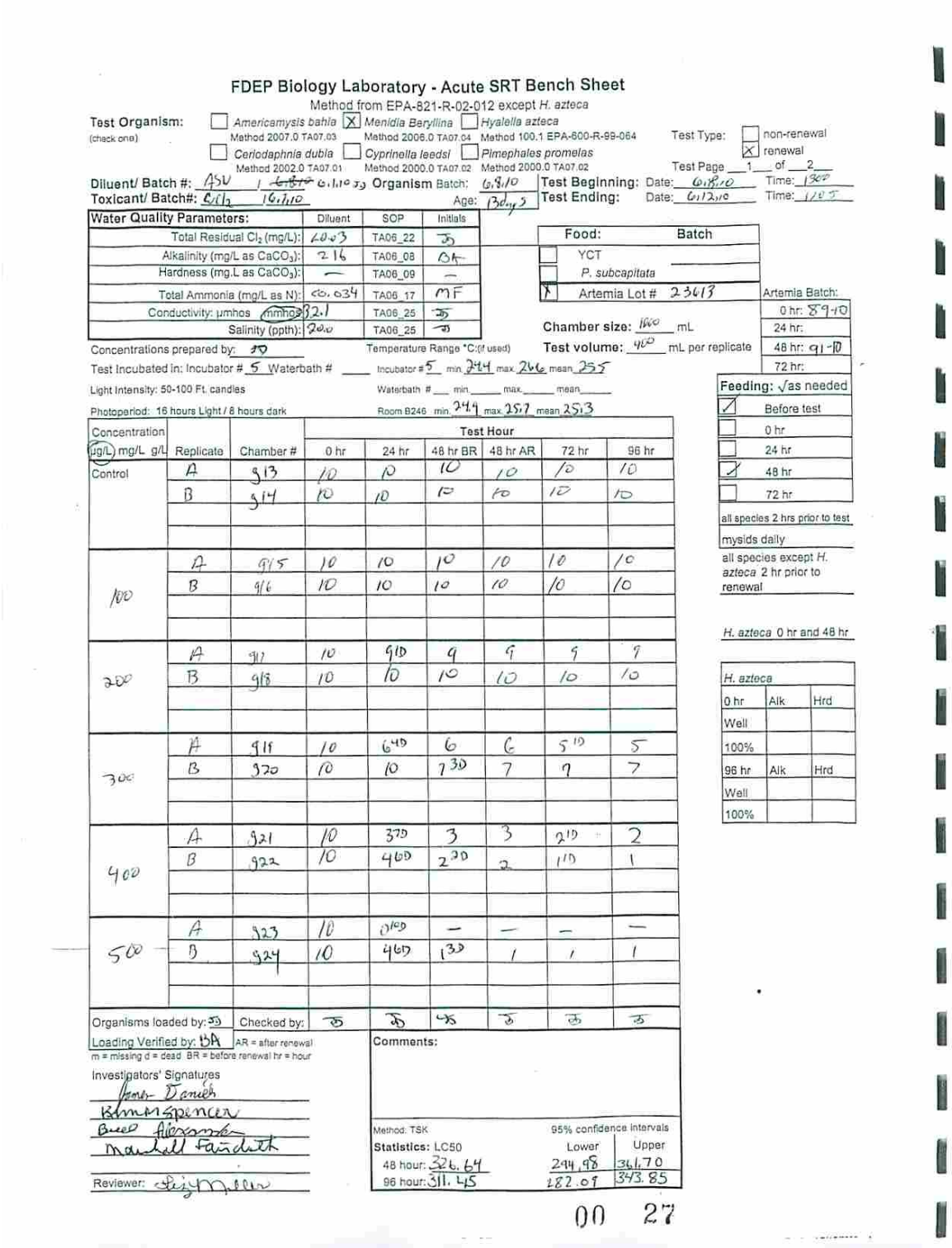
Measure/record salinity for marine tests

Comments: @ Temp 96hr 20A - 25.6 TD.

PAGE 00 30

Revised 07/15/2008 MF

Appendix C. (continued)



FDEP Biology Laboratory - Acute SRT Bench Sheet

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

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

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

Diluent/ Batch #: ASW / ~~GB50~~ 6.1.10 33 Organism Batch: 6.8.10 Test Beginning: Date: 6.18.10 Time: 1300
Toxicant/ Batch#: $CaCl_2$ 16.7.10 Age: 3day 3 Test Ending: Date: 6.12.10 Time: 1205

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	JD
Alkalinity (mg/L as $CaCO_3$):	216	TA06_08	DA
Hardness (mg.L as $CaCO_3$):	—	TA06_09	—
Total Ammonia (mg/L as N):	<0.034	TA06_17	MF
Conductivity: µmhos (mmhos)	32.1	TA06_25	JD
Salinity (ppth):	20.0	TA06_25	JD

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

Artemia Batch:
0 hr: 89-10
24 hr:
48 hr: 91-10
72 hr:

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

Concentrations prepared by: JD
Temperature Range °C:(if used)
Test Incubated in: Incubator # 5 Waterbath # ____ Incubator # 5 min. 24.4 max. 26.6 mean 25.5
Light Intensity: 50-100 Ft. candles Waterbath # ___ min. ____ max. ____ mean ____
Photoperiod: 16 hours Light / 8 hours dark Room B246 min. 24.9 max. 25.7 mean 25.3

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	913	10	10	10	10	10	10
	B	914	10	10	10	10	10	10
100	A	915	10	10	10	10	10	10
	B	916	10	10	10	10	10	10
200	A	917	10	9D	9	9	9	9
	B	918	10	10	10	10	10	10
300	A	919	10	6D	6	6	5D	5
	B	920	10	10	7D	7	7	7
400	A	921	10	3D	3	3	2D	2
	B	922	10	4D	2D	2	1D	1
500	A	923	10	0D	—	—	—	—
	B	924	10	4D	1D	1	1	1

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

Investigators' Signatures
Jason Daniels
Kimm Spencer
Brent Alexander
Marshall Faircloth

Reviewer: Steve Miller

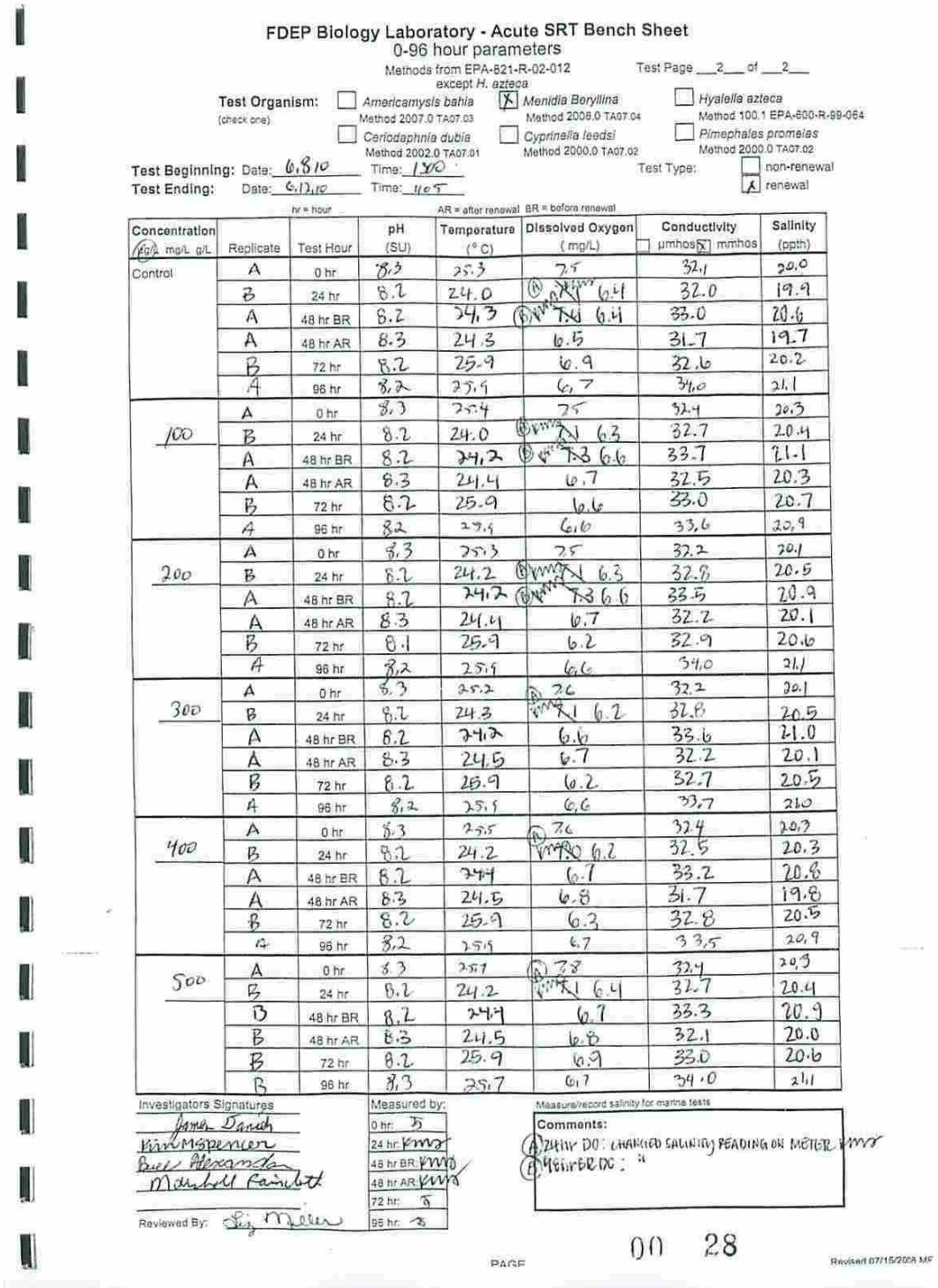
Comments:

Method: TSK
Statistics: LC50

	95% confidence intervals Lower	Upper
48 hour: 326.64	294.98	361.70
96 hour: 311.45	282.09	343.85

00 27

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 2008.0 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: 6.8.10 Time: 1300
Test Ending: Date: 6.12.10 Time: 1405

Test Type: ☐ non-renewal ☒ renewal

hr = hour AR = after renewal BR = before renewal

Concentration (ppt) 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	25.3	7.5	32.1	20.0
	B	24 hr	8.2	24.0	(A) KMR 6.4	32.0	19.9
	A	48 hr BR	8.2	24.3	(B) KMR TM 6.4	33.0	20.6
	A	48 hr AR	8.3	24.3	6.5	31.7	19.7
	B	72 hr	8.2	25.9	6.9	32.6	20.2
	A	96 hr	8.2	25.9	6.7	34.0	21.1
100	A	0 hr	8.3	25.4	7.5	32.4	20.3
	B	24 hr	8.2	24.0	(B) KMR TM 6.3	32.7	20.4
	A	48 hr BR	8.2	24.2	(B) KMR TM 6.6	33.7	21.1
	A	48 hr AR	8.3	24.4	6.7	32.5	20.3
	B	72 hr	8.2	25.9	6.6	33.0	20.7
	A	96 hr	8.2	25.9	6.6	33.6	20.9
200	A	0 hr	8.3	25.3	7.5	32.2	20.1
	B	24 hr	8.2	24.2	(B) KMR TM 6.3	32.8	20.5
	A	48 hr BR	8.2	24.2	(B) KMR TM 6.6	33.5	20.9
	A	48 hr AR	8.3	24.4	6.7	32.2	20.1
	B	72 hr	8.1	25.9	6.2	32.9	20.6
	A	96 hr	8.2	25.9	6.6	34.0	21.1
300	A	0 hr	8.3	25.2	(A) 7.6	32.2	20.1
	B	24 hr	8.2	24.3	KMR TM 6.2	32.8	20.5
	A	48 hr BR	8.2	24.2	6.6	33.6	21.0
	A	48 hr AR	8.3	24.5	6.7	32.2	20.1
	B	72 hr	8.2	25.9	6.2	32.7	20.5
	A	96 hr	8.2	25.9	6.6	33.7	21.0
400	A	0 hr	8.3	25.5	(A) 7.6	32.4	20.3
	B	24 hr	8.2	24.2	KMR TM 6.2	32.5	20.3
	A	48 hr BR	8.2	24.4	6.7	33.2	20.8
	A	48 hr AR	8.3	24.5	6.8	31.7	19.8
	B	72 hr	8.2	25.9	6.3	32.8	20.5
	A	96 hr	8.2	25.9	6.7	33.5	20.9
500	A	0 hr	8.3	25.1	(A) 7.8	32.4	20.3
	B	24 hr	8.2	24.2	KMR TM 6.4	32.7	20.4
	B	48 hr BR	8.2	24.4	6.7	33.3	20.9
	B	48 hr AR	8.3	24.5	6.8	32.1	20.0
	B	72 hr	8.2	25.9	6.9	33.0	20.6
	B	96 hr	8.3	25.7	6.7	34.0	21.1

Investigators Signatures
James Danish
Kim Mospencer
Bill Alexander
Marshall Faircloth
Reviewed By: Liz Miller

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

Measure/record salinity for marine tests

Comments:
(A) 24HR DO: CHANGED SALINITY READING ON METER KMR
(B) 96HR BR DO: "

PAGE 00 28

Revised 07/15/2008 MF

Appendix C. (continued)

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

DATE: 6-8-10 DURATION: 48 h TOXICANT: CdCl2
SPECIES: *Americamysis bahia*

RAW DATA: Concentration (ug/L)	Number Exposed	Mortalities
.00	20	0
20.00	20	0
30.00	20	2
45.00	20	17
67.00	20	20
100.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: LC50: **37.47**
95% LOWER CONFIDENCE: 34.45
95% UPPER CONFIDENCE: 40.76

***Menidia Beryllina* Acute Standard Reference Toxicant Test**

DATE: 6-8-10 DURATION: 48 h TOXICANT: CuCl2
SPECIES: *Menidia beryllina*

RAW DATA: Concentration (ug/L)	Number Exposed	Mortalities
.00	20	0
100.00	20	0
200.00	20	1
300.00	20	7
400.00	20	15
500.00	20	19

SPEARMAN-KARBER TRIM: 5.00%

SPEARMAN-KARBER ESTIMATES: LC50: **326.64**
95% LOWER CONFIDENCE: 294.98
95% UPPER CONFIDENCE: 361.70

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: 6/7/10

Ship to: FDEP

P.O. No:

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia	150	4 DAYS	MS100603	25	8.0	20
Menidia beryllina	150 ac	12 DAYS	SS100528	25	8.0	20
						Hardness mg/L
Cyprinella leedsi						
Pimephales promelas	350	<24 HRS	FM100607-D/Cc	25	7.8	80
				25	7.8	80
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

Packed by: BM

Shipped Via: FedEx

Notes: No charge for mysids

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: 6/21/10

Shipped to: FDEP

P.O. No: _____

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia	100	4 DAYS	MS100617	25	8.0	25
Menidia beryllina	100	12 DAYS	SS100609	25	8.0	25
						Hardness (mg/L)
Cyprinella leedsi						
Pimephales promelas						
Ceriodaphnia dubia						
YCT						
P. subcapitata						

Packed by: DBW

Shipped Via: Fed Ex

Notes: _____

Thank you for your order.

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Appendix E. Chemical Analyses performed on the effluent from the Yara North America, Inc., Plant Outfall D-001, sampled on June 21, 2010.

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
6/21/2010 9:25	Blank	Metals	Sodium	0.5	U	mg/L	0.5	2
6/21/2010 9:25	Blank	Metals	Arsenic	0.25	U	ug/L	0.25	1
6/21/2010 9:25	Blank	Metals	Aluminum	60	U	ug/L	60	240
6/21/2010 9:25	Blank	Metals	Iron	30	U	ug/L	30	120
6/21/2010 9:25	Blank	Metals	Zinc	5	U	ug/L	5	20
6/21/2010 9:25	Blank	Metals	Cadmium	0.03	U	ug/L	0.03	0.12
6/21/2010 9:25	Blank	Metals	Selenium	0.2	U	ug/L	0.2	0.8
6/21/2010 9:25	Blank	Metals	Silver	0.025	U	ug/L	0.025	0.1
6/21/2010 9:25	Blank	Metals	Lead	0.2	U	ug/L	0.2	0.8
6/21/2010 9:25	Blank	Metals	Copper	0.5	U	ug/L	0.5	1
6/21/2010 9:25	Blank	Metals	Magnesium	0.04	U	mg/L	0.04	0.16
6/21/2010 9:25	Blank	Metals	Nickel	0.25	U	ug/L	0.25	1
6/21/2010 9:25	Blank	Metals	Chromium	0.3	U	ug/L	0.3	1.2
6/21/2010 9:25	Blank	Metals	Calcium	0.075	U	mg/L	0.075	0.3
6/21/2010 9:25	Blank	Nutrients	Total-P	0.004	U	mg P/L	0.004	0.01
6/21/2010 9:25	Blank	Nutrients	Kjeldahl Nitrogen	0.08	U	mg N/L	0.08	0.2
6/21/2010 9:25	Blank	Nutrients	Sulfate	0.27	I	mg SO4/L	0.2	0.5
6/21/2010 9:25	Blank	Nutrients	O-Phosphate-P	0.008	I	mg P/L	0.004	0.01
6/21/2010 9:25	Blank	Nutrients	NO2NO3-N	0.004	U	mg N/L	0.004	0.01
6/21/2010 9:25	Blank	Nutrients	Fluoride	0.035	U	mg F/L	0.035	0.1
6/21/2010 9:25	Blank	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
6/21/2010 9:25	Blank	Nutrients	Chloride	0.2	U	mg Cl/L	0.2	0.5
6/21/2010 9:25	Blank	Overflow	Oil and Grease	1.4	U	mg/L	1.4	5
6/21/2010 9:25	Blank	Pesticides	Atrazine	0.048	U	ug/L	0.048	0.19
6/21/2010 9:25	Blank	Pesticides	Norflurazon	0.14	U	ug/L	0.14	0.56
6/21/2010 9:25	Blank	Pesticides	Mevinphos	0.19	UJ	ug/L	0.19	0.76
6/21/2010 9:25	Blank	Pesticides	Metribuzin	0.095	U	ug/L	0.095	0.38
6/21/2010 9:25	Blank	Pesticides	Chlorpyrifos Ethyl	0.048	U	ug/L	0.048	0.19
6/21/2010 9:25	Blank	Pesticides	Naled	0.76	UJ	ug/L	0.76	3
6/21/2010 9:25	Blank	Pesticides	Malathion	0.14	U	ug/L	0.14	0.56
6/21/2010 9:25	Blank	Pesticides	Ethion	0.048	U	ug/L	0.048	0.19

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
6/21/2010 9:25	Blank	Pesticides	Ametryn	0.048	U	ug/L	0.048	0.19
6/21/2010 9:25	Blank	Pesticides	Parathion Ethyl	0.14	U	ug/L	0.14	0.56
6/21/2010 9:25	Blank	Pesticides	Hexazinone	0.095	U	ug/L	0.095	0.38
6/21/2010 9:25	Blank	Pesticides	Parathion Methyl	0.095	U	ug/L	0.095	0.38
6/21/2010 9:25	Blank	Pesticides	Diazinon	0.048	UJ	ug/L	0.048	0.19
6/21/2010 9:25	Blank	Pesticides	Bromacil	0.19	UJ	ug/L	0.19	0.76
6/21/2010 9:25	Blank	Pesticides	Metalaxyl	0.24	UJ	ug/L	0.24	0.96
6/21/2010 9:25	Blank	Pesticides	Fonofos	0.095	U	ug/L	0.095	0.38
6/21/2010 9:25	Blank	Pesticides	Chlorpyrifos Methyl	0.095	U	ug/L	0.095	0.38
6/21/2010 9:25	Blank	Pesticides	Azinphos Methyl	0.19	UJ	ug/L	0.19	0.76
6/21/2010 9:25	Blank	Pesticides	Prometryn	0.14	U	ug/L	0.14	0.56
6/21/2010 9:25	Blank	Pesticides	Phorate	0.048	UJ	ug/L	0.048	0.19
6/21/2010 9:25	Blank	Pesticides	Metolachlor	0.48	UJ	ug/L	0.48	1.9
6/21/2010 9:25	Blank	Pesticides	Butylate	0.19	UJ	ug/L	0.19	0.76
6/21/2010 9:25	Blank	Pesticides	Simazine	0.048	U	ug/L	0.048	0.19
6/21/2010 9:25	Blank	Pesticides	Fenamiphos	0.19	U	ug/L	0.19	0.76
6/21/2010 9:25	Blank	Pesticides	Alachlor	0.57	UJ	ug/L	0.57	2.3
6/21/2010 9:25	Blank	Pesticides	Ethoprop	0.095	UJ	ug/L	0.095	0.38
6/21/2010 9:25	Blank	Priority Organic Pollutants	2,4-Dinitrophenol	15	U	ug/L	15	58
6/21/2010 9:25	Blank	Priority Organic Pollutants	2-Chloronaphthalene	0.97	U	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	Benzo(a)anthracene	0.97	UJ	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	Diethyl phthalate	0.97	UJ	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.97	UJ	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	2-Nitrophenol	0.97	U	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.97	U	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L	2.9	12
6/21/2010 9:25	Blank	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.8
6/21/2010 9:25	Blank	Priority Organic Pollutants	2,4-Dinitrotoluene	0.97	U	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	2,6-Dinitrotoluene	0.97	U	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L	15	58
6/21/2010 9:25	Blank	Priority Organic Pollutants	Chrysene	0.97	UJ	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9	UJ	ug/L	2.9	12
6/21/2010 9:25	Blank	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.97	U	ug/L	0.97	3.9

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
6/21/2010 9:25	Blank	Priority Organic Pollutants	2,4-Dichlorophenol	0.97	U	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	2-Chlorophenol	0.97	U	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L	2.9	12
6/21/2010 9:25	Blank	Priority Organic Pollutants	Anthracene	0.97	UJ	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.97	U	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	15	UJ	ug/L	15	58
6/21/2010 9:25	Blank	Priority Organic Pollutants	Hexachlorobenzene	0.97	UJ	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	Phenol	0.97	UJ	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.97	U	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	UJ	ug/L	1.9	7.8
6/21/2010 9:25	Blank	Priority Organic Pollutants	Acenaphthene	0.97	U	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	Benzidine	97	UJ	ug/L	97	390
6/21/2010 9:25	Blank	Priority Organic Pollutants	Benzo(a)pyrene	0.97	UJ	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	Butyl benzyl phthalate	4.9	UJ	ug/L	4.9	19
6/21/2010 9:25	Blank	Priority Organic Pollutants	Fluorene	0.97	UJ	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L	2.9	12
6/21/2010 9:25	Blank	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	U	ug/L	2.9	12
6/21/2010 9:25	Blank	Priority Organic Pollutants	Acenaphthylene	0.97	U	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.97	UJ	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	Di-n-butyl phthalate	4.9	UJ	ug/L	4.9	19
6/21/2010 9:25	Blank	Priority Organic Pollutants	Fluoranthene	0.97	UJ	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L	2.9	12
6/21/2010 9:25	Blank	Priority Organic Pollutants	Isophorone	0.97	U	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	Naphthalene	0.97	U	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	2,4-Dimethylphenol	9.7	U	ug/L	9.7	39
6/21/2010 9:25	Blank	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.97	UJ	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.97	U	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	Benzo(k)fluoranthene	0.97	UJ	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	Di-n-octyl phthalate	0.97	UJ	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	Dimethyl phthalate	9.7	UJ	ug/L	9.7	39
6/21/2010 9:25	Blank	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L	2.9	12
6/21/2010 9:25	Blank	Priority Organic Pollutants	Phenanthrene	0.97	UJ	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	Pyrene	0.97	UJ	ug/L	0.97	3.9

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
6/21/2010 9:25	Blank	Priority Organic Pollutants	3,3'-Dichlorobenzidine	39	UJ	ug/L	39	160
6/21/2010 9:25	Blank	Priority Organic Pollutants	Benzo(b)fluoranthene	0.97	UJ	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.97	UJ	ug/L	0.97	3.9
6/21/2010 9:25	Blank	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.8
6/21/2010 9:25	Blank	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L	1.9	7.8
6/21/2010 9:50	Effluent	AGP/LN	Algal Growth Potential	8.96	A	mg DryWt/L	3	3
6/21/2010 9:50	Effluent	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.7	I	mg/L	0.2	2
6/21/2010 9:50	Effluent	Chlorophyll/Grain Size/BOD	Phaeophytin-a	2.4		ug/L	0.4	1.2
6/21/2010 9:50	Effluent	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	5.3		ug/L	0.55	1.7
6/21/2010 9:50	Effluent	Toxicology	Bioassay-Acute-Screen-SW-Fish, LC50	100	L	LC50		
6/21/2010 9:50	Effluent	Toxicology	Bioassay-Acute-Screen-SW-Mysid, LC50	100	L	LC50		
6/21/2010 9:50	Effluent	Metals	Cadmium	0.09	U	ug/L	0.09	0.36
6/21/2010 9:50	Effluent	Metals	Nickel	1.2	I	ug/L	0.75	3
6/21/2010 9:50	Effluent	Metals	Arsenic	2.3	I	ug/L	0.75	3
6/21/2010 9:50	Effluent	Metals	Silver	0.075	U	ug/L	0.075	0.3
6/21/2010 9:50	Effluent	Metals	Zinc	15	U	ug/L	15	60
6/21/2010 9:50	Effluent	Metals	Copper	1.6	I	ug/L	1.5	3
6/21/2010 9:50	Effluent	Metals	Iron	90	U	ug/L	90	360
6/21/2010 9:50	Effluent	Metals	Aluminum	1330		ug/L	180	720
6/21/2010 9:50	Effluent	Metals	Lead	0.6	U	ug/L	0.6	2.4
6/21/2010 9:50	Effluent	Metals	Sodium	8470		mg/L	25	100
6/21/2010 9:50	Effluent	Metals	Magnesium	986		mg/L	2	8
6/21/2010 9:50	Effluent	Metals	Selenium	0.6	U	ug/L	0.6	2.4
6/21/2010 9:50	Effluent	Metals	Chromium	1.4	I	ug/L	0.9	3.6
6/21/2010 9:50	Effluent	Metals	Calcium	321		mg/L	0.22	0.9
6/21/2010 9:50	Effluent	Nutrients	O-Phosphate-P	0.16		mg P/L	0.008	0.02
6/21/2010 9:50	Effluent	Nutrients	NO2NO3-N	0.025		mg N/L	0.004	0.01
6/21/2010 9:50	Effluent	Nutrients	Ammonia-N	0.13		mg N/L	0.01	0.02
6/21/2010 9:50	Effluent	Nutrients	Sulfate	2100		mg SO4/L	40	100
6/21/2010 9:50	Effluent	Nutrients	Kjeldahl Nitrogen	0.66		mg N/L	0.16	0.4
6/21/2010 9:50	Effluent	Nutrients	Total-P	0.2	A	mg P/L	0.01	0.1
6/21/2010 9:50	Effluent	Nutrients	Fluoride	1.3		mg F/L	0.18	0.5
6/21/2010 9:50	Effluent	Nutrients	Chloride	15000		mg Cl/L	40	100

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
6/21/2010 9:50	Effluent	Overflow	Oil and Grease	1.4	U	mg/L	1.4	5
6/21/2010 9:50	Effluent	Pesticides	Chlorpyrifos Methyl	0.1	U	ug/L	0.1	0.4
6/21/2010 9:50	Effluent	Pesticides	Malathion	0.15	U	ug/L	0.15	0.6
6/21/2010 9:50	Effluent	Pesticides	Norflurazon	0.15	U	ug/L	0.15	0.6
6/21/2010 9:50	Effluent	Pesticides	Alachlor	0.6	UJ	ug/L	0.6	2.4
6/21/2010 9:50	Effluent	Pesticides	Chlorpyrifos Ethyl	0.05	U	ug/L	0.05	0.2
6/21/2010 9:50	Effluent	Pesticides	Ethion	0.05	U	ug/L	0.05	0.2
6/21/2010 9:50	Effluent	Pesticides	Fonofos	0.1	U	ug/L	0.1	0.4
6/21/2010 9:50	Effluent	Pesticides	Hexazinone	0.1	U	ug/L	0.1	0.4
6/21/2010 9:50	Effluent	Pesticides	Simazine	0.05	U	ug/L	0.05	0.2
6/21/2010 9:50	Effluent	Pesticides	Butylate	0.2	UJ	ug/L	0.2	0.8
6/21/2010 9:50	Effluent	Pesticides	Metalaxyl	0.25	UJ	ug/L	0.25	1
6/21/2010 9:50	Effluent	Pesticides	Mevinphos	0.2	UJ	ug/L	0.2	0.8
6/21/2010 9:50	Effluent	Pesticides	Bromacil	0.2	UJ	ug/L	0.2	0.8
6/21/2010 9:50	Effluent	Pesticides	Prometryn	0.15	U	ug/L	0.15	0.6
6/21/2010 9:50	Effluent	Pesticides	Atrazine	0.056	I	ug/L	0.05	0.2
6/21/2010 9:50	Effluent	Pesticides	Diazinon	0.05	UJ	ug/L	0.05	0.2
6/21/2010 9:50	Effluent	Pesticides	Ethoprop	0.1	UJ	ug/L	0.1	0.4
6/21/2010 9:50	Effluent	Pesticides	Metribuzin	0.1	U	ug/L	0.1	0.4
6/21/2010 9:50	Effluent	Pesticides	Naled	0.8	UJ	ug/L	0.8	3.2
6/21/2010 9:50	Effluent	Pesticides	Parathion Methyl	0.1	U	ug/L	0.1	0.4
6/21/2010 9:50	Effluent	Pesticides	Azinphos Methyl	0.2	UJ	ug/L	0.2	0.8
6/21/2010 9:50	Effluent	Pesticides	Metolachlor	0.5	UJ	ug/L	0.5	2
6/21/2010 9:50	Effluent	Pesticides	Parathion Ethyl	0.15	U	ug/L	0.15	0.6
6/21/2010 9:50	Effluent	Pesticides	Phorate	0.05	UJ	ug/L	0.05	0.2
6/21/2010 9:50	Effluent	Pesticides	Ametryn	0.05	U	ug/L	0.05	0.2
6/21/2010 9:50	Effluent	Pesticides	Fenamiphos	0.2	U	ug/L	0.2	0.8
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Anthracene	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2.2	U	ug/L	2.2	8.9
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Isophorone	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Fluorene	1.1	UJ	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Dibenzo(a,h)anthracene	1.1	U	ug/L	1.1	4.4

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Di-n-octyl phthalate	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	17	U	ug/L	17	67
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Naphthalene	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Phenol	1.1	UJ	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	3,3'-Dichlorobenzidine	44	UJ	ug/L	44	180
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Butyl benzyl phthalate	5.6	U	ug/L	5.6	22
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Hexachloroethane	3.3	U	ug/L	3.3	13
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Pentachlorophenol	3.3	U	ug/L	3.3	13
6/21/2010 9:50	Effluent	Priority Organic Pollutants	2-Chlorophenol	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	2-Nitrophenol	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	2,4,6-Trichlorophenol	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Benzo(b)fluoranthene	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3.3	U	ug/L	3.3	13
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Di-n-butyl phthalate	5.6	UJ	ug/L	5.6	22
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Hexachlorobenzene	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Hexachlorobutadiene	3.3	U	ug/L	3.3	13
6/21/2010 9:50	Effluent	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3.3	U	ug/L	3.3	13
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Phenanthrene	1.1	UJ	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Benzidine	110	U	ug/L	110	440
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Dimethyl phthalate	11	UJ	ug/L	11	44
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Fluoranthene	1.1	UJ	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	2,4-Dimethylphenol	11	U	ug/L	11	44
6/21/2010 9:50	Effluent	Priority Organic Pollutants	2,4-Dinitrotoluene	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	2,6-Dinitrotoluene	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3.3	U	ug/L	3.3	13
6/21/2010 9:50	Effluent	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	4-Nitrophenol	17	U	ug/L	17	67
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Benzo(g,h,i)perylene	1.1	UJ	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Hexachlorocyclopentadiene	3.3	UJ	ug/L	3.3	13
6/21/2010 9:50	Effluent	Priority Organic Pollutants	N-Nitrosodimethylamine	2.2	U	ug/L	2.2	8.9

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Nitrobenzene	2.2	U	ug/L	2.2	8.9
6/21/2010 9:50	Effluent	Priority Organic Pollutants	2,4-Dichlorophenol	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	4-Chloro-3-methylphenol	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2.2	UJ	ug/L	2.2	8.9
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Benzo(k)fluoranthene	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Chrysene	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Diethyl phthalate	1.1	UJ	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Pyrene	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	2,4-Dinitrophenol	17	U	ug/L	17	67
6/21/2010 9:50	Effluent	Priority Organic Pollutants	2-Chloronaphthalene	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Acenaphthene	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Acenaphthylene	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Benzo(a)anthracene	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Priority Organic Pollutants	Benzo(a)pyrene	1.1	U	ug/L	1.1	4.4
6/21/2010 9:50	Effluent	Field Parameter	pH	7.89				
6/21/2010 9:50	Effluent	Field Parameter	Dissolved Oxygen	5.5		mg/L		
6/21/2010 9:50	Effluent	Field Parameter	Specific Conductance	41553		umhos/cm		
6/21/2010 9:50	Effluent	Field Parameter	Temperature	37.22		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: Jacki Champion	Contact Number: 813-632-7600 X133
Facility Name (as it appears on permit): Yara North America, Inc.	Former Names: Hydro-Agri ; Farmland Hydro
NPDES Permit Number: FL0038652	Permit Expiration Date: June 20, 2011
Physical Address: 3421 Port Sutton Road Tampa, FL 33619	
District: Southwest	County: Hillsborough
Function of Facility: Anhydrous ammonia storage and transfer	
Facility Type: Ammonia Terminal	Permitted Capacity (MGD):n/a
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): 1.02 MGD for April 2009 through March 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): **D-001 (EFF-001)**	
Description of Permitted Outfall(s): **24 inch diameter HDPE pipe**	
Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility): The YARA facility intakes seawater from the Tampa Electric Company (TECO) discharge and pumps the warmed water through two parallel shell and tube type heat exchanger units at a maximum rate of 1,600 gpm. A 15,000-gallon holding/buffer tank is available for the storage of contaminated seawater in the event that an upset occurs in the system. The holding tank is also used to contain non-contact cooling water from the condensers prior to discharge. Potable municipal water is used in the condensers with the addition of anti-scalant, corrosion inhibitors and biocides to enhance the effectiveness of the condensers. The chemical additives used to treat the condenser water are biodegradable. The wastewater system is equipped with a fully automatic differential pH detection and control system consisting of pH detectors before and after the ammonia heaters and a triple redundant pH controller upstream of the I-002 internal insertion point for the stormwater discharge into Outfall D-001. The stormwater at this facility is collected in a 50,000-gallon lined stormwater detention pond located on the south side of the facility near the transfer dock. The water level in the pond is monitored and controlled with a sump pump system. The stormwater is pumped to the discharge pipeline and mixes with the seawater at a location upstream of Outfall D-001. The once-through seawater and stormwater discharges via a 24-inch diameter HDPE pipe through Outfall D-001 into the Port Sutton Channel.	

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

TABLE 4

Parameters (units)	Discharge Limitations			Monitoring Requirements		
	Monthly Average	Daily Maximum	Daily Minimum	Monitoring Frequency	Sample Type	Sample Point
Flow (MGD)	Report	Report	N/A	Continuous	Recorder	INT-001 EFF-001
pH (SU) [See Condition I.A.11.]	Report	8.5	6.5	Continuous	Recorder	INT-001 EFF-001
Temperature (F), Water (DEG.F) [See Conditions I.A.5. & I.A.11.]	Report	Report	N/A	Continuous	Recorder	INT-001 EFF-001
Ammonia, Unionized (as NH_3) (MG/L) [See Condition I.A.11.]	Report	Report	N/A	Weekly	Calculated	INT-001 EFF-001
Nitrogen, Ammonia, Total (as N) (MG/L) [See Condition I.A.11.]	Report	Report	N/A	Weekly	Grab	INT-001 EFF-001
Nitrogen, Total (as N) (MG/L)	Report	3.0	N/A	Weekly	Grab	INT-001 EFF-001
Nitrogen, Total (as N) (LBS/DAY) [See Condition I.A.7.]	Report	Report	N/A	Weekly	Calculation	INT-001 EFF-001
Nitrogen, Total (as N) (LBS/YEAR) [See Conditions I.A.8. & I.A.9.]	N/A	Report	N/A	Annual	Calculation	INT-001 EFF-001
Phosphorus, Total (as P) (MG/L)	Report	Report	N/A	Weekly	Grab	INT-001 EFF-001
Phosphorus, Total (as P) (LBS/DAY) [See Condition I.A.7.]	Report	Report	N/A	Weekly	Calculation	INT-001 EFF-001
Phosphorus, Total (as P) (LBS/YEAR) [See Conditions I.A. 8. & I.A.9.]	N/A	Report	N/A	Annual	Calculation	INT-001 EFF-001
Turbidity (NTUs)	Report	See Condition I.A.12.	N/A	Weekly	Grab	INT-001 EFF-001
Whole Effluent Toxicity–Acute & Chronic	See Permit Conditions I.A.14. & I.A.15. respectively				Grab	INT-001 EFF-001

Appendix F. (continued)

PART I: Continued	
Receiving Waters: Port Sutton Channel	**Classification (indicate whether fresh or marine): Class III Marine**
Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.): Annual acute toxicity LC50>100% Chronic toxicity once per permit cycle NOEC>100% See language below	
Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.): none	
Facility Mixing Zone Details (if applicable): none	
List Permit Violations (DMR data) and plant upsets that occurred at the plant within the last year: none	

Date	Parameter and Units	Limit	Result

Describe previous FYI and WQBEL study: The October 2004 FYI3 detected ammonia at a concentration of 0.15 mg/L. Unionized ammonia was <0.02 mg/L. Total Nitrogen was 0.82 mg/L. Aluminum and Iron were detected and complied with water quality standards.
Describe previous or current Enforcement Actions (including WLs): none
Describe any violations or problems noted in previous inspection: A discrepancy between the permit sampling requirements and the equipment located at the site for flow monitoring and pH sampling at the intake location was noted and is being addressed in a modification.
Discuss whether DMR trends within previous five years are improving or declining: Static.

Appendix F. (continued)

Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse):	
PART II: Sampling Event Information	
Date(s) sample collected:	Sampler(s):
Temperature (Deg C):	pH (SU):
Dissolved Oxygen (mg/L):	Conductivity (umhos/cm):
Total Residual Chlorine (mg/L):	Total Residual Chlorine - after Disinfection (mg/L):
Method of Chlorination:	Method of De-chlorination:
Flow During Sample Collection for each outfall(MGD):	
Mean Flow for each outfall for previous 12 months based on sampling date (If samples are taken on more than one day, indicate Mean Flow for each day):	
Describe Discharge during Sampling Event: ☐ Continuous ☐ Intermittent ☐ Seasonal ☐ Rainfall Dependent ☐ Other, please specify	

Appendix F. (continued)

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

14. The permittee shall comply with the following requirements to evaluate acute whole effluent toxicity of the discharge from Outfall D-001 and Intake Monitoring Station 001A. The chemical samples specified in Condition I.A.1. above, shall be taken at the same time as the samples for the "routine" toxicity tests specified below.

    a. Effluent Limitation
       (1) Whole effluent acute toxicity shall not exceed in any "routine" test mortality greater than 50% in the 100% effluent concentration or in any "additional follow-up" test an LC50 of less than 100% effluent. [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 annually, the first starting within 60 days of the effective date of the permit, and lasting for the duration of this permit unless a reduction in the frequency of monitoring is granted in writing by the Department.

    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 demonstrates greater than 20% mortality in any grab sample of 100% effluent, 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.

Appendix F. (continued)

(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 shall be artificial seawater and diluted to the test salinity as described in EPA-821-R-02-012, Section 7.2.4. The test salinity shall be determined as follows:

(a) When the salinity of the effluent is between 1 and 7 parts per thousand (ppt), the following salinity adjustment shall be used in the test of 100% effluent. For the **Americamysis bahia** bioassays, the effluent and the control (0% effluent) shall be adjusted to a salinity of 6-7 ppt for the 100% effluent test using artificial sea salts. No salinity adjustment shall be done for the **Menidia beryllina** bioassay test of the 100% effluent.

(b) When the salinity of the effluent is greater than 7 ppt, no salinity adjustment shall be made and the test shall be run at the effluent salinity.

d. Sampling Requirements

(1) Routine tests shall be conducted on a single grab sample.

(2) For additional follow-up tests, the first test shall be conducted on a single grab sample collected at approximately the same time of day as the failed routine sample. The second and third additional follow-up tests shall be run on a single grab sample collected on the same day of the week when the first additional follow-up test sample was taken. 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 be 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 the single grab sample test for the test species, ">100%" should be entered on the DMR for that test species. If greater than 50% mortality occurs in the single 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.

(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 specified in paragraph (4) 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 the effluent limitation specified in 14.a.(1) 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 reports shall be sent to the addresses listed in Condition I.E.4. below.

15. The permittee shall comply with the following requirements to evaluate chronic whole effluent toxicity of the discharge from Outfall D-001 and Intake Monitoring Station 001A. The chemical samples specified in Condition I.A.1. above, shall be taken at the same time as the samples for the "routine" toxicity tests specified below.

Appendix F. (continued)

a. Effluent Limitation

(1) Whole effluent chronic toxicity shall not exceed a No Observed Effect Concentration (NOEC) of less than 100% effluent in any test. [Rule 62-302.530(62), F.A.C.]

b. Monitoring Frequency

(1) "Routine" toxicity tests shall be conducted once per permit cycle (five years), the first starting within 60 days from the effective date of the permit, and lasting for the duration of this permit unless a reduction in the frequency of monitoring is granted in writing by the Department.

c. Test Requirements

(1) Routine Tests: All routine tests shall be conducted using a control (0% effluent) described in c.(5) below, a Salinity Adjustment Control, and one test concentration of Salinity Adjusted **100%** Final Effluent described in c.(6) below.

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

(a) If a routine test does not meet the chronic toxicity limitation in 15.a.(1) above, the permittee shall conduct three additional follow-up tests on each species that failed the test.

(b) The first additional follow-up test on each species shall be conducted using a control (0% effluent) described in c.(5) below, a Salinity Adjustment Control described in c.(6) below, and a minimum of five test concentrations: 100%, 50%, 25%, 12.5%, and 6.25% Salinity Adjusted 100% Final Effluent described in c.(6) below. 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% Salinity Adjusted Effluent) and two dilutions below the target concentration, a control (0% effluent), and a Salinity Adjustment Control are run. All test results shall be statistically analyzed according to the Appendices in EPA-821-R-02-014.

(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 7-day chronic toxicity tests with a mysid shrimp, **Americamysis (Mysidopsis) bahia**, Survival, Growth and Fecundity Test, and an inland silverside, **Menidia beryllina**, Larval Survival and Growth Test, concurrently.

(4) All test species, procedures and quality assurance criteria used shall be in accordance with **Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Saltwater Organisms**, 3rd ed., EPA-821-R-02-014. 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 chronic toxicity testing in accordance with the revised method.

(5) Control/dilution water used shall be adjusted to a salinity of 20 ppt (parts per thousand) using artificial sea salts as described in EPA-821-R-02-014, Section 7.2.

(6) The effluent shall be adjusted to a salinity of 20 ppt by direct addition of artificial sea salts. At the same time the effluent salinity is adjusted, a Salinity Adjustment Control will be prepared by diluting an aliquot of control water from (5) above to match the initial effluent salinity and then adjusting this control to a salinity of 20 ppt using direct addition of artificial sea salts to mimic the effluent salinity adjustment.

d. Sampling Requirements

(1) For each routine or additional follow-up test conducted, a total of three grab samples of final effluent shall be collected and used per the sampling protocol discussed in EPA-821-R-02-014, Section 8.3.

(2) The first grab sample shall be used to initiate the test. The remaining two grab samples shall be collected according to the protocol and used as renewal solutions on Day 3 (48 hours) and Day 5 (96 hours) of the test.

e. Quality Assurance Requirements

(1) A standard reference toxicant (SRT) quality assurance (QA) chronic 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.

Appendix F. (continued)

(2) If the mortality in the control (0% effluent) exceeds 20% for either species in any test or does not meet the "test acceptability criteria", the test for that species (including the control) shall be invalidated and the test repeated. Test acceptability criteria for each species are defined in EPA-821-R-02-014, Section 14.12 (A. bahia) and Section 13.12 (M. beryllina).

(3) If, during any test, 100% mortality occurs in the 100% effluent concentration prior to the end of the test and control mortality is less than 20% 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 observed dose-response relationship and the percent minimum significant difference (PMSD), as required by EPA-821-R-02-014, Sections 10.2.6 and 10.2.8, respectively. Results from these evaluations shall be 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 the NOEC of a test species is greater than or equal to 100% effluent, ">100%" should be entered on the DMR for that test species. If the NOEC of a test species is less than 100% effluent, "<100%" should be entered.

(b) Additional Follow-up Test Results: Report the % effluent determined to be the NOEC endpoint of the test.

(2) A bioassay laboratory report for each routine test shall be prepared according to EPA-821-R-02-014, Section 10, Report Preparation and Test Review, and mailed to the Department at the address specified in paragraph (4) below within 30 days of the completion of the test.

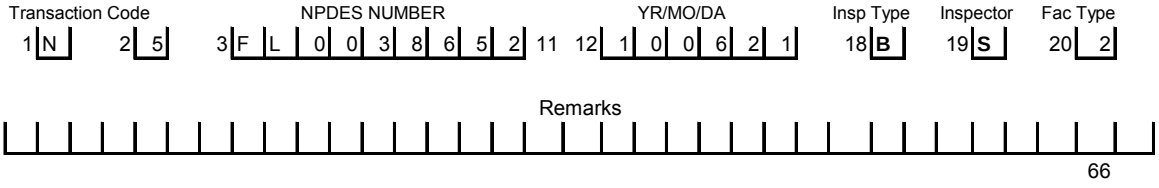
(3) For additional follow-up tests, a single bioassay laboratory report shall be prepared according to EPA-821-R-02-014, Section 10, and mailed within 45 days of completion of the third valid additional follow-up test. If any additional follow-up test or two consecutive routine tests do not meet the effluent limitation specified in 15.a.(1) above, the permittee shall contact the Department within 30 days of the laboratory report submittal to discuss the appropriate corrective actions necessary to remedy the observed chronic toxicity.

(4) All bioassay reports shall be sent to the addresses listed in Condition I.E.4. below.

Appendix G. EPA End Sheet

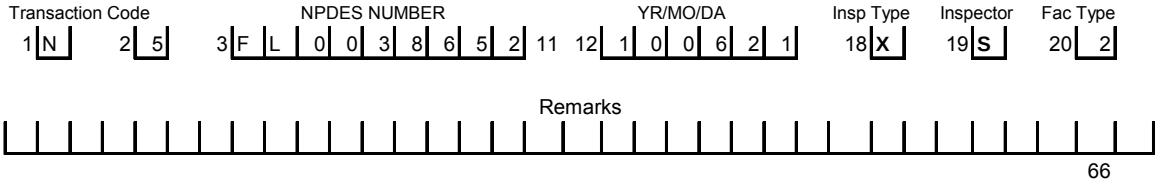
The Bioassay of Yara North America, Inc., Plant effluent sampled on June 21, 2010. NPDES #FL0038652.

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



The Priority Pollutants Analysis of Yara North America, Inc., Plant effluent sampled on June 21, 2010. NPDES #FL0038652.

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



Biological Analyses of Yara North America, Inc., Plant effluent sampled on June 21, 2010. NPDES #FL0038652.

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

