

Effluent Quality Assessment

Mosaic Fertilizer, L.L.C.

Riverview Chemical Complex

Hillsborough County

NPDES #FL0000761

Sampled March 8, 2010

May 2010

Biology Section
Bureau of Laboratories
Division of Environmental Assessment and Restoration

Quality Manual No. 870346G
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Mosaic Fertilizer, L.L.C. Riverview Chemical Complex, 8813 U.S. Highway 41 South, Riverview, Hillsborough County, Florida, 33569. NPDES #FL0000761. Effluent samples for bioassay and chemical analyses for this facility were collected on March 8, 2010.

Introduction

Mosaic Fertilizer, L.L.C. Riverview Chemical Complex is a fertilizer manufacturing facility. The facility produces sulfuric acid, phosphoric acid, fluoride products, ammoniated phosphates, micronutrient-added fertilizers and animal feed phosphates. The facility has no Administrative Orders. Consent Orders that were issued in January 2007 and May 2008 regarding various spills and/or releases of process water have been closed. The Consent Order issued in September 2004 regarding a 65 million gallon spill of low pH water is still open with the restoration effort through the creation of wetlands ongoing. The facility has mixing zones for copper, iron, nickel, fluoride, and zinc. (See Appendix F for detailed facility information provided by Jacki Champion FDEP Southwest District Bureau of Mining & Minerals Regulation Phosphate Management Program.)

Methods

Samples for bioassay and chemical analyses were collected from the EFF-05B NPDES sampling point for Outfall D-005B. Additional samples for chemical analyses were collected from the SWD-05C NPDES sampling point for the Barge Slip. Sample collection was performed by Jacki Champion and Mike Lynch (FDEP Southwest District Bureau of Mining & Minerals Regulation Phosphate Management Program), following DEP-SOP-001/01 FS 2400 Wastewater Sampling. All DEP SOPs are available on the web at: http://www.floridadep.org/labs/qa/sops.htm.

See Appendix A for the completed chain of custody forms.

The marine acute screening toxicity tests were performed following internal DEP SOPs TA07_01 and TA07_02. All internal DEP SOPs are available on the web at: http://www.floridadep.org/labs/cgi-bin/sop/biosop.asp.

Aliquots of the bioassay sample were salinity-adjusted from an apparent salinity of approximately 1.3 parts per thousand (ppth) to a salinity of approximately 7.5 ppth for the *Americamysis bahia* test and to a salinity of approximately 2.3 ppth for the *Menidia beryllina test*. Forty Fathoms® marine mix artificial sea salts was used for the salinity adjustments. The salinity adjustments were performed to ensure that the minimum salinity of the bioassay samples based on known seawater-ion content met the salinity requirements of the test species (6 ppth for *Americamysis bahia* and 1 ppth for *Menidia beryllina*). The salt control used for each test was prepared by diluting 20 ppth salinity artificial seawater (ASW) with well water to a salinity of approximately 1.3 ppth then salting this solution with artificial sea salts to match the salinity of the appropriate test solution. The purpose of the salt controls was to confirm that there was no effect of adding artificial sea salts to the sample. There was no mortality in the salt controls of the *Americamysis bahia* test and 5% mortality in the salt controls of the *Menidia beryllina* test.

The sample was aerated for 10 minutes at a rate of approximately 100 bubbles per minute to decrease the dissolved oxygen (DO) from 10.4 mg/L to 7.3 mg/L.

The algal growth potential (AGP) sample was also salinity-adjusted with artificial sea salts from an apparent salinity of approximately 1.3 parts per thousand (ppth) to a salinity of approximately 7.0 ppth.

Results and Discussion

Toxicity Test Results

Tests performed March 9 - 13, 2010, with salinity-adjusted effluent for both test species and original effluent for the *Menidia beryllina* test organisms.

Americamysis bahia 96-hour acute screening bioassay – LC_{50} > 100%, 10% mortality in 100% salinity adjusted sample at 96 hours

Menidia beryllina 96-hour acute screening bioassay – LC_{50} > 100%, 0% mortality in 100% sample at 96 hours

Menidia beryllina 96-hour acute screening bioassay – LC_{50} > 100%, 0% mortality in 100% salinity adjusted sample at 96 hours

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

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

Algal Growth Potential

The effluent Algal Growth Potential (AGP) was 40 mg dry wt/L of the saltwater species *Dunaliella tertiolecta.* Raschke and Schultz found that AGP values above 10.0 mg dry weight/L represent a “problem” threshold for marine receiving waters, implying nutrient enrichment (personal communication, Marshall Faircloth, et. al. FDEP, with Ron Raschke USEPA Region 4 1987). The ratio (1:1) of total nitrogen to total phosphorus suggests that the effluent is nitrogen limited (Maloney et al. 1978).

See Table 1 for predicted AGP.

Chemistry Results

Total residual chlorine was not detected in the bioassay sample in the bioassay laboratory. Total ammonia (4.87 mg N/L) was detected in the bioassay sample in the bioassay laboratory. Based on the pH, salinity, and temperature of the bioassay sample, the calculated unionized ammonia concentration was 0.075 mg N/L. The total ammonia concentration in the sample collected and preserved for chemical analysis was 4 mg N/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was < 0.02 mg N/L.

Outfall D-005B

Aluminum, arsenic, chromium, copper, nickel, zinc, combined radium 226 and 228, and gross alpha particle activity were detected in the effluent at levels that comply with Class III marine surface water quality criteria (62-302.530, F.A.C.) and permitted limits. The iron concentration at this Outfall (2,700 µg/L) exceeded the Class III marine surface water criterion of 300 µg/L (62-302.530 (38) F.A.C.)), but did not cause an exceedance of permitted conditions in the final discharge into the Barge Slip. Cadmium, lead and selenium were detected between the laboratory method detection limits (MDL) and the laboratory practical quantification limits (PQL).

Barge Slip

Aluminum was detected in the effluent (SWD-05C NPDES sampling point) at levels that comply with Class III marine surface water quality criteria (62-302.530, F.A.C.). Effluent iron (430 µg/L) exceeded the Class III marine surface water criterion of 300 µg/L (62-

302.530 (38) F.A.C.)), but did not exceed the permit limit (1,044 µg/L) at the SWB-05C compliance sampling point. Arsenic and nickel were detected between the laboratory MDL and the laboratory 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.

Conclusion

The effluent sample collected from the EFF-05B NPDES sampling point for Outfall D-005B for this facility on March 8, 2010, was not acutely toxic to the bioassay test organisms at 96-hours. The bioassay sample was salinity adjusted prior to bioassay initiation. The effluent Algal Growth Potential, 40 mg dry wt/L of the saltwater species *Dunaliella tertiolecta,* exceeds the 10.0 mg dry weight/L "problem" threshold for marine receiving waters, implying nutrient enrichment. Effluent iron (430 µg/L) although exceeding the class III marine surface water quality criterion for iron (300 µg/L, 62-302.530 (38) F.A.C.)), did not exceed the permit limit of 1,044 µg/L at the SWB-05C NPDES sampling point. Additional effluent water quality samples did not violate water quality criteria or permit limits.

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 Mosaic Fertilizer, L.L.C., Riverview Chemical Complex facility on March 8, 2010.

Mosaic Fertilizer, L.L.C., Riverview Chemical Complex			
Location	**AGP (measured)**	**Inorganic N:P ratio**	**Total N:P ratio**
Outfall D-005-B	40.0	1.0	0.9

Table 2. Effluent limits, Class III Criteria for predominantly marine waters and chemical data for samples collected from the Mosaic Fertilizer, L.L.C., Riverview Chemical Complex facility on March 8, 2010.

Mosaic Fertilizer, L.L.C., Riverview Chemical Complex NPDES# FL0000761	Class III Criteria	Effluent Limits	Outfall D-005B		Barge Slip	
Organic Constituents (µg/L)						
None Detected	-	-	-		-	
Metals (µg/L unless otherwise noted)						
Aluminum	≤ 1500	≤ 1500 dmp	330	A	1230	
Arsenic	≤ 50	-	2.09	A	1.2	I
Cadmium	≤ 8.8	-	0.034	I	0.09	U
Calcium (mg/L)	-	-	189	A	314	
Chromium-III	-	-	2.9	A	0.9	U
Copper	≤ 3.7	≤ 209 dmp	7.71	A	1.5	U
Iron	≤ 300	≤ 1044 dmp	2700	A	430	
Lead	≤ 8.5	-	0.34	I	0.6	U
Magnesium (mg/L)	-	-	45.9	A	943	
Nickel	≤ 8.3	-	7.29	A	0.91	I
Selenium	≤ 71	-	0.38	I	0.6	U
Silver	≤ 2.3	-	0.025	U	0.075	U
Zinc	≤ 86	≤ 104 dmp	21	A	15	U
Nutrients (mg/L)						
Ortho-phosphate	-	Report	5.4		-	
Total Phosphorus	-	120* p	7		-	
Total Ammonia	-	≤ 20* dm	4		-	
Un-ionized Ammonia	-	Report	0.02	c	-	
Nitrate and Nitrite	-	-	1.2		-	
Total Kjeldahl Nitrogen	-	-	4.9		-	
Organic Nitrogen	-	-	0.9	c	-	
Total Nitrogen	-	100* p	6.1	c	-	
General Physical and Chemical Parameters						
Dissolved Oxygen (mg/L)	≥ 4.0	-	6.9		7.8	
pH (SU)	6.5 - 8.5	6.5 - 8.5 s	7.1		7.6	
Conductivity (µmhos/cm)	-	Report	2652		39747	
Temperature (°C)	-	Report	18.2		15.2	
Salinity	-	-	1.27	£	32	c
Total Residual Chlorine (mg/L)	≤ 0.01	-	0.03	UQ£	-	
Chlorophyll *a* (µg/L) - Corrected	-	Report	22		-	
Phaeophytin (µg/L)	-	-	4.3		-	
Total Suspended Solids (mg/L)	-	≤ 150 s	12	I	-	
Total Dissolved Solids (mg/L)	-	-	1650	A	-	
Turbidity (NTU)	< 29 t	-	26	A	-	
CBOD, 5 day (mg/L), N - inhibited	-	-	1.6	I	-	
Chloride (mg/L)	-	-	490		-	
Fluoride (mg/L)	≤ 5.0	≤ 5.7 dmp	3.8		-	
Sulfate (mg/L)	-	Report	540		-	
Alpha, Total (pCi/L)	≤ 15	-	4.2		-	
Alpha-Counting Error (pCi/L)	-	-	2.7		-	
Radium 226 (pCi/L)	-	-	0.6		-	
Radium 226-Counting Error (pCi/L)	-	-	0.2		-	
Radium 228 (pCi/L)	-	-	1.1		-	
Radium 228-Counting Error (pCi/L)	-	-	0.6		-	
Radium 226 + 228 (pCi/L)	≤ 5	≤ 5.0 dmp	1.7	c	-	
Flow (MGD)	-	Report	0.187	a	-	
Hardness (mg $CaCO_3$)	-	-	660.95	c	4667.33	c

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
dm - daily maximum
p - 24-hour time proportional composite
Q - Sample held beyond normal holding time
s - Single sample
t - Shall not exceed 29 NTUs above background
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
* LBS/Day
£ - Analysis performed in bioassay laboratory

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2010-03-08-44
Mosaic fertilizer - Riverview Chemical Plant

Requester: Michael Tanski
Field Report Prepared By: Jachi Champion

Customer: BMR-TAMPA
Project ID: FYI3
PMAS: 1163

Collected By: Jachi Champion / Mike Lynch
Sampling Agency: FDEP-PM
Send Final Report To Vishwas Sathe

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
	Mosaic Riverview	☐ Comp ☒ Grab Date 3/8/10 Time 10:10 Eastern Central	Date Time Eastern Central	A
	Field ID: Outfall D-005B	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L): 6.90	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc): Salt H2O	Temp (C): 18.19	pH: 7.13	Sample Depth ☐ m ☐ ft: 2,652 ☐ Salinity (PPTh) ☒ Sp Conductance (umho/cm)	NPDES Number: FL0000761
	Latitude o ' "	Longitude o ' "	Comments	

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
	Mosaic Riverview	☐ Comp ☒ Grab Date 3/8/10 Time 10:10 Eastern Central	Date Time Eastern Central	A
	Field ID: Outfall D-005B	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L): 6.90	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc): Salt H2O	Temp (C): 18.19	pH: 7.13	Sample Depth ☐ m ☐ ft: 2,652 ☐ Salinity (PPTh) ☒ Sp Conductance (umho/cm)	NPDES Number: FL0000761
	Latitude o ' "	Longitude o ' "	Comments: Bioassay Sample	

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
	Mosaic Riverview	☐ Comp ☒ Grab Date 3/8/10 Time 9:35 Eastern Central	Date Time Eastern Central	B
	Field ID: BLANKS	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc): Fresh	Temp (C)	pH	Sample Depth ☐ m ☐ ft ☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number: FL0000761
	Latitude o ' "	Longitude o ' "	Comments	

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
	Mosaic Riverview	☐ Comp ☒ Grab Date 3/8/10 Time 11:15 Eastern Central	Date Time Eastern Central	C
	Field ID: Barge Slip	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L): 7.80	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc): Salt water	Temp (C): 15.18	pH: 7.60	Sample Depth ☐ m ☐ ft: 39,747 ☐ Salinity (PPTh) ☒ Sp Conductance (umho/cm)	NPDES Number: FL0000761
	Latitude o ' "	Longitude o ' "	Comments: 24 hour comp Rec'd intact by J.D. 10:23 3.9.10	

Relinquished By	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
JMC	3/8/10 12:00pm	Fed Ex						3.9.10/9:10a

* 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: Mosaic Fertilizer, LLC. Riverview Chemical Complex

Address : 8813 U.S. Highway 41 South

City: Riverview **County:** Hillsborough 33569

Contact/District: Jacki Champion

NPDES Permit #: FL 0000761

LIMS Job #: TLH-2010-03-09-38 **LIMS Sample #:** 1255292

Lims Data Entry: 3-16-10 MF Data Entry Verification: BA 3-16-10

Sample Collection: Date: 3-8-10 Time: 1010

Hold Time Start: Date: 3-8-10 Time: 1010

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: 10.4 mg/L Final DO: 7.3 mg/L Duration: 10 minutes Rate: ~ 100 bubbles/min

Salinity adjusted (Test 1): ☑ yes ☐ no Initial Salinity: 1.27 Final Salinity: 7.7 (Salts) Hypersaline brine

Salinity adjusted (Test 2): ☑ yes ☐ no Initial Salinity: 1.27 Final Salinity: 2.24 (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:
Marshall Faircloth	MF
John Scott	JS
James Daniels	JD
Brian Akers	BA
REVIEWER: Liz Miller	

Diluent/Control Batch#:	3-5-10			3-9-10	3-9-10				
Water Quality Parameters	20ppth ASW ~~20% DMW~~	Well Water	Moderately Hard Water	Salt Water (ASW) NSW Test 1	Salt Water (ASW) NSW Test 2	Other: mys. Salt control	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		<0.03	BA	JD
Alkalinity (mg/L as $CaCO_3$):	211			-	-		167	CF	JD
Hardness (mg/L as $CaCO_3$):	-			-	-		7400	CF/BA	JD
Total Ammonia (mg/L as N):	<0.034			<0.017	<0.017		4.87	MF	JD
Conductivity: ☐ µmhos ☑ mmhos	~ 32.0			13.1	2.53	13.2	2.50	JD/BA	BA/SD
Salinity (ppth):	~20 ppt			~~2.50~~ 1.60	~~2.50~~ 1.60	7.69	1.27	BA/SD	SD/BA

V 1.8 1/13/10

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample # 1255292   SOP#: TA 07_03   Test # 1 of 2

Test Species:
Batch #: 3-9-10 Age: 5 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 # 3-5-10)
☑ 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: 500 ml

Test Started:
Date 3-9-10 Time 13:10

Test Ended:
Date 3-13-10 Time 0930

Concentration	Replicate	Chamber #	0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Ctrl	A	C 13	5	5	5	5	5	5
	B	C 14	5	5	5	5	5	5
	C	C 15	5	5	5	5	5	5
	D	C 16	5	5	5	5	5	5
SaltCtrl	A	C 17	5	5	5	5	5	5
	B	C 18	5	5	5	5	5	5
	C	C 19	5	5	5	5	5	5
	D	C 20	5	5	5	5	5	5
100% Salted	A	C 21	5	5	5	5	5	5
	B	C 22	5	5	5	5	3 2D	3
	C	C 23	5	5	5	5	5	5
	D	C 24	5	5	5	5	5	5
		Checked or Verified by:	BA	SD	JW	JD	JW	DF

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

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

Feeding and Artemia Batch #
- ☑ 0 hr 4-7-10 ☑ Prior to Test
- ☑ 24 hr 4-8-10
- ☑ 48 hr 4-9-10 ☑ Prior to Renewal
- ☑ 72 hr 5-0-10

Temperature Range (°C)

Incubator # 2
min. 26.5 max. 27.9 mean 27.2

Incubator #___
min.____ max.____ mean____

Waterbath #___
min.____ max.____ mean____

Room B246
min. 25.2 max. 26.0 mean 25.6

Light intensity (ft. candles): 50-100

Photoperiod (hours): 16 light, 8 dark

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

Comments:

V. 2.5 1-13-10

Pg 20

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 # 1255292 | SOP#: TA 07 04 | Test # 2 of 2

Test Species:
Batch #: 3-9-10 Age: 13day
- ☐ *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 # 3-5-10)
☑ ASW ☐ 20% DMW ☐ MHW ☐ Well

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

Test Duration: ☐ 48 hr ☑ 96 hr ☐ ___hr

Test Started: Date 3-9-10 Time 13:30

Test Ended: Date 3-13-10 Time 0930

Chamber Size 100ml
Test Volume: 500ml

Concentration	Replicate	Chamber # (A)	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Ctrl	A	C B1	10	9 10	9	9	9 10	9
	B	C B2	10	10	10	10	10	10
Salt Ctrl	A	C B3	10	10	10	10	10	9 10
	B	C B4	10	10	10	10	10	10
100% Sample	A	C B5	10	10	10	10	10	10
	B	C B6	10	10	10	10	10	10
100% Salinity adjusted	A	C B7	10	10	10	10	10	10
	B	C B8	10	10	10	10	10	10
Checked or Verified by:			JD	JD	JW	JD	JW	MF

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

Feeding and Artemia Batch #
- ☑ 0 hr 47-10 ☑ Prior to Test
- ☐ 24 hr___
- ☑ 48 hr 49-10 ☑ Prior to Renewal
- ☐ 72 hr___

Temperature Range (°C)
Incubator #2
min. 26.5 max. 27.9 mean 27.2

Incubator #___
min.____max.____mean____

Waterbath #___
min.____max.____mean____

Room B246
min. 25.2 max. 26.0 mean 25.6

Light intensity (ft. candles): 50-100

Photoperiod (hours): 16 light, 8 dark

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

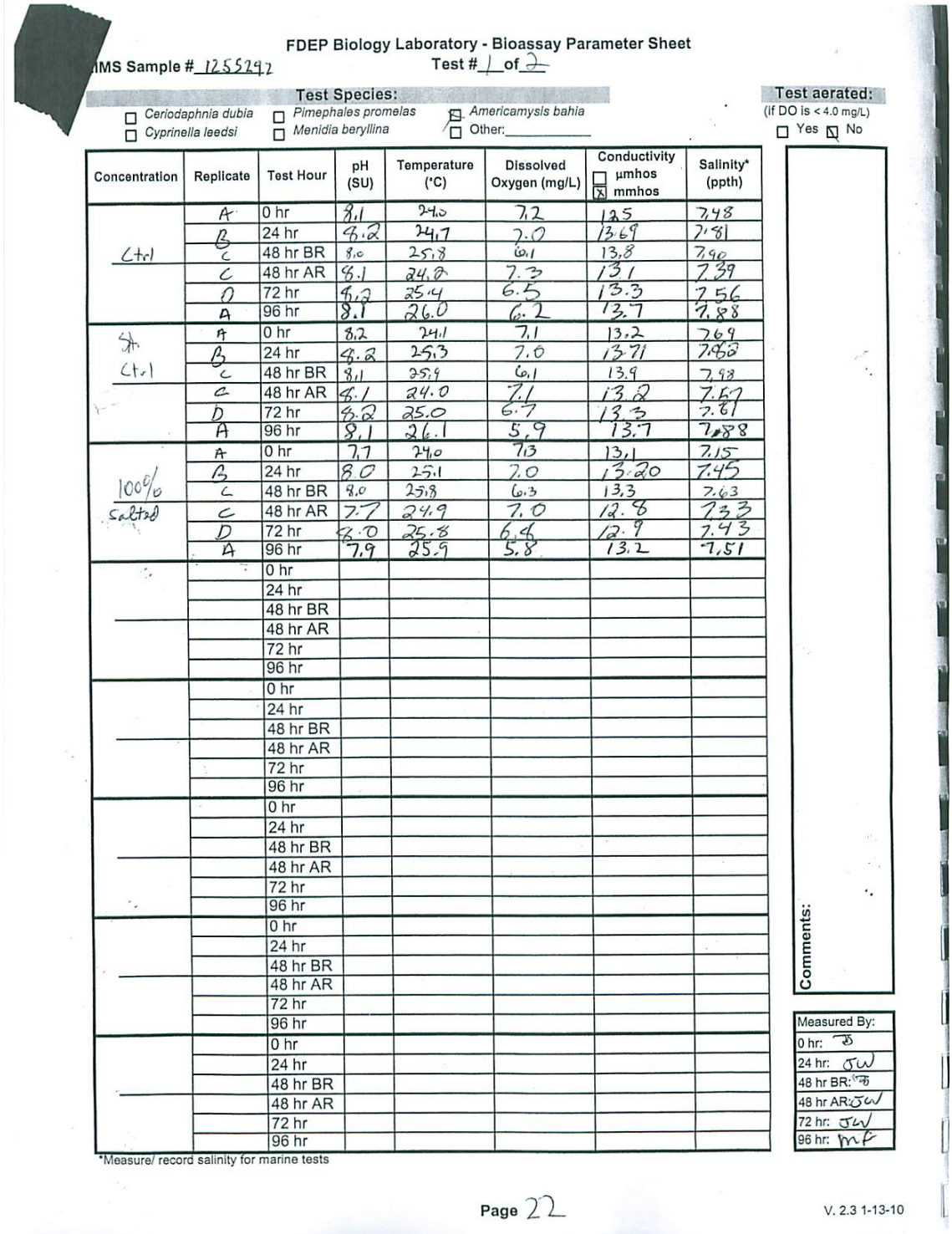
Test Results:
Screening Tests: Report LC50 as >100%, =100%, or <100%.
% mortality in 100% sample: 0 % LC50: > 100%
Calculated LC50 (Definitive) 95% CI_____ Method_____

Comments: (A) Chambers C1 - C8 used BA

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

IMS Sample # 1255292 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	8.1	24.0	7.2	12.5	7.48
	B	24 hr	8.2	24.7	7.0	13.69	7.81
Ctrl	C	48 hr BR	8.0	25.8	6.1	13.8	7.90
	C	48 hr AR	8.1	24.8	7.3	13.1	7.39
	D	72 hr	8.2	25.4	6.5	13.3	7.56
	A	96 hr	8.1	26.0	6.2	13.7	7.88
	A	0 hr	8.2	24.1	7.1	13.2	7.69
	B	24 hr	8.2	25.3	7.0	13.71	7.82
Ctrl	C	48 hr BR	8.1	25.9	6.1	13.9	7.98
	C	48 hr AR	8.1	24.0	7.1	13.2	7.57
	D	72 hr	8.2	25.0	6.7	13.3	7.61
	A	96 hr	8.1	26.1	5.9	13.7	7.88
	A	0 hr	7.7	24.0	7.3	13.1	7.15
	B	24 hr	8.0	25.1	7.0	13.20	7.45
100%	C	48 hr BR	8.0	25.8	6.3	13.3	7.63
salted	C	48 hr AR	7.7	24.9	7.0	12.8	7.33
	D	72 hr	8.0	25.8	6.4	12.9	7.43
	A	96 hr	7.9	25.9	5.8	13.2	7.51
		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: JB
24 hr: JW
48 hr BR: JB
48 hr AR: JW
72 hr: JW
96 hr: MF

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V. 2.3 1-13-10

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Parameter Sheet

LIMS Sample # 1255292 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	8.0	24.1	7.7	3.116	1.60
	B	24 hr	8.1	24.9	7.0	3.69	1.87
Ctrl	A	48 hr BR	8.2	25.9	6.6	3.8	1.89
	A	48 hr AR	8.2	24.7	7.5	3.4	1.74
	B	72 hr	8.2	25.2	6.9	3.4	1.74
	A	96 hr	8.2	25.6	6.8	3.49	1.81
25%	A	0 hr	8.4	24.1	7.6	4.33	2.27
	B	24 hr	7.3	24.9	7.0	4.94	2.61
Ctrl	A	48 hr BR	7.6	25.9	6.7	5.1	2.68
	A	48 hr AR	7.7	24.6	7.4	4.6	2.42
	B	72 hr	7.6	25.4	7.2	4.6	2.42
	A	96 hr	7.5	25.9	7.0	4.77	2.53
100%	A	0 hr	7.4	24.1	7.5	2.53	1.29
	B	24 hr	8.0	25.5	7.0	3.01	1.57
RO	A	48 hr BR	8.0	25.9	6.8	3.12	1.62
	A	48 hr AR	7.4	24.9	7.3	2.8 JW	1.44
	B	72 hr	7.8	25.4	7.1	2.8	1.41
	A	96 hr	7.7	25.5	7.0	2.81	1.44
100%	A	0 hr	7.5	24.1	7.7	4.28	2.24
	B	24 hr	8.0	24.5	7.0	4.92	2.59
Salted	A	48 hr BR	8.0	25.9	6.8	4.83	2.55
	A	48 hr AR	7.3	25.9	7.5	4.6	2.41
	B	72 hr	7.8	25.7	7.1	4.6	2.45
	A	96 hr	7.7	25.3	6.4	4.77	2.53
		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: JB
24 hr: JW
48 hr BR: JB
48 hr AR: JW
72 hr: JW
96 hr: MF

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V. 2.3 1-13-10

Appendix B. (continued)

Bioassay Instrument ID

Test ID: 12552 Mosaic Dates: 3-10 – 3.13.10

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 TSK 3-16-10

V 1.1 6/12/08 MF

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Appendix C. SRT Bench Sheets and Statistical Analysis

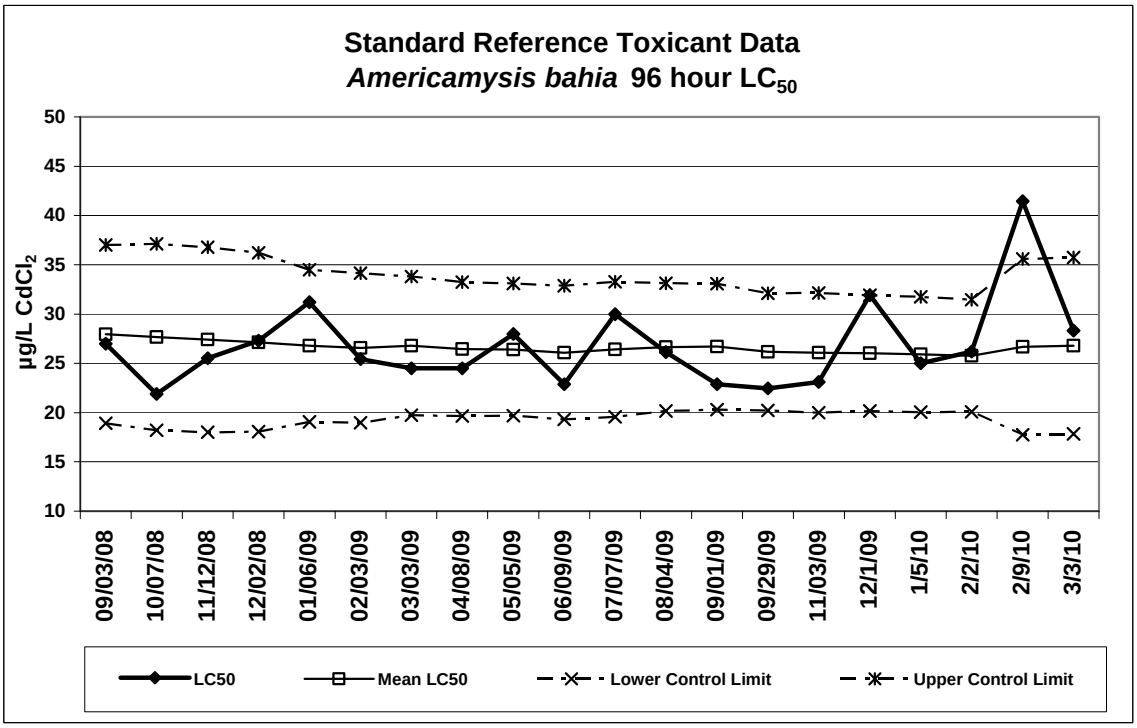
Americamysis bahia (mysid shrimp) - Cadmium Chloride ($CdCl_2$)

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
09/03/08	26.98	27.96	4.53	18.91	37.02
10/07/08	21.89	27.66	4.73	18.21	37.11
11/12/08	25.50	27.40	4.69	18.01	36.78
12/02/08	27.31	27.13	4.53	18.07	36.20
01/06/09	31.20	26.79	3.86	19.07	34.50
02/03/09	25.44	26.56	3.79	18.97	34.15
03/03/09	24.49	26.78	3.52	19.75	33.81
04/08/09	24.49	26.45	3.39	19.66	33.23
05/05/09	27.98	26.39	3.36	19.68	33.10
06/09/09	22.89	26.09	3.39	19.32	32.87
07/07/09	30.00	26.43	3.43	19.57	33.28
08/04/09	26.14	26.65	3.24	20.16	33.13
09/01/09	22.89	26.69	3.19	20.30	33.07
09/29/09	22.46	26.17	2.97	20.22	32.11
11/03/09	23.12	26.08	3.04	20.00	32.15
12/1/09	31.91	26.03	2.94	20.16	31.91
1/5/10	25.00	25.91	2.92	20.06	31.75
2/2/10	26.18	25.77	2.84	20.09	31.46
2/9/10	41.45	26.68	4.46	17.76	35.59
3/3/10	28.31	26.78	4.47	17.84	35.72

CV = 16.69

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

EPA reference 75th quartile CV = 26%



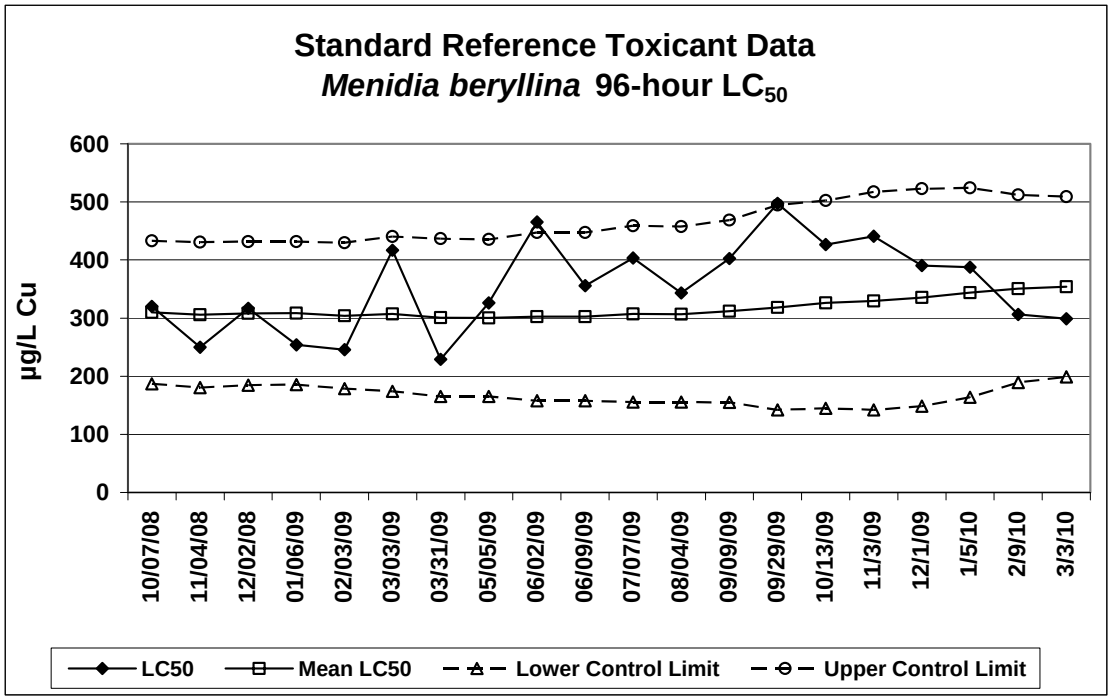
Appendix C. (continued)

Florida Department of Environmental Protection
Bureau of Laboratories

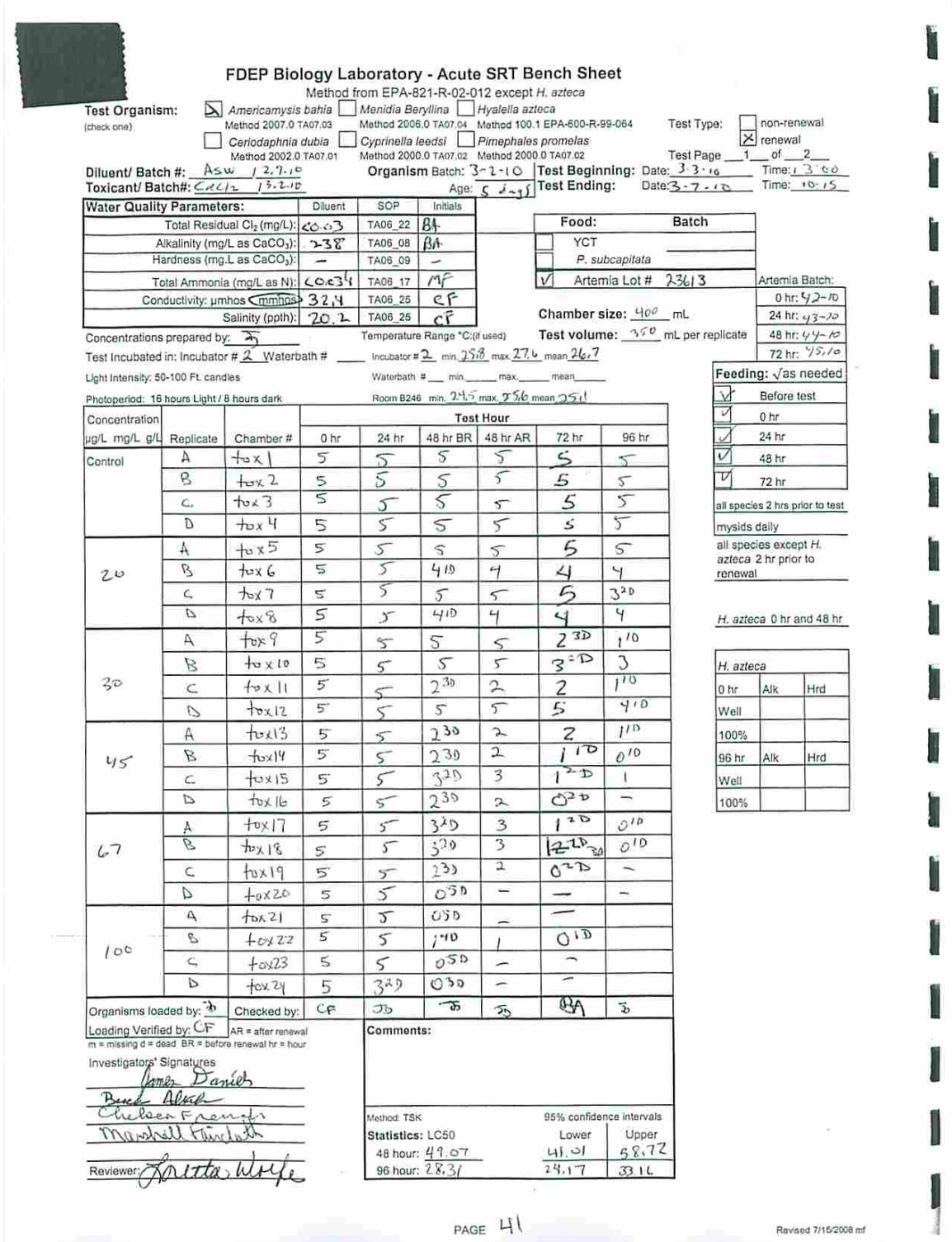
Standard Reference Toxicant (SRT) Test Data - 96-hour Acute Toxicity
Menidia beryllina (inland silverside) - Copper Chloride ($CuCl_2$) as Cu

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
10/07/08	319.95	310.00	61.47	187.06	432.94
11/04/08	249.81	305.57	62.50	180.57	430.57
12/02/08	316.79	308.13	61.82	184.48	431.78
01/06/09	253.83	308.45	61.51	185.44	431.46
02/03/09	245.51	304.15	62.80	178.55	429.74
03/03/09	416.64	307.01	66.63	173.74	440.27
03/31/09	228.94	300.89	67.96	164.97	436.80
05/05/09	326.07	300.24	67.64	164.97	435.52
06/02/09	465.39	302.54	72.50	157.54	447.53
06/09/09	355.67	302.52	72.48	157.55	447.48
07/07/09	403.35	307.19	75.91	155.37	459.02
08/04/09	343.29	306.49	75.48	155.52	457.45
09/09/09	402.57	311.84	78.40	155.03	468.65
09/29/09	497.5	318.42	88.10	142.21	494.62
10/13/09	426.5	326.12	90.57	144.97	502.27
11/3/09	441.06	329.60	93.69	142.22	516.99
12/1/09	390.28	335.59	93.54	148.51	522.68
1/5/10	387.66	343.92	90.17	163.57	524.26
2/9/10	306.1	350.85	80.73	189.39	512.30
3/3/10	298.9	353.79	77.48	198.82	508.76

CV = 21.90
EPA reference 75th quartile CV = 21%



Appendix C. (continued)



FDEP Biology Laboratory - Acute SRT Bench Sheet

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

Test Organism: (check one) ☒ *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 12.7.10 Toxicant/ Batch#: CaCl2 13.2.10

Organism Batch: 3-2-10 Age: 5 days

Test Beginning: Date: 3-3-10 Time: 13:00

Test Ending: Date: 3-7-10 Time: 10:15

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	BA
Alkalinity (mg/L as $CaCO_3$):	238	TA06_08	BA
Hardness (mg.L as $CaCO_3$):	–	TA06_09	–
Total Ammonia (mg/L as N):	<0.034	TA06_17	MF
Conductivity: µmhos (mmhos)	32.4	TA06_25	CF
Salinity (ppth):	20.2	TA06_25	CF

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

Artemia Batch:
0 hr: 42-10
24 hr: 43-10
48 hr: 44-10
72 hr: 45,10

Chamber size: 400 mL

Test volume: 350 mL per replicate

Concentrations prepared by: JS

Temperature Range °C:(if used)

Test Incubated in: Incubator # 2 Waterbath # ____ Incubator # 2 min 25.8 max 27.6 mean 26.7

Light Intensity: 50-100 Ft. candles

Waterbath # ___ min.____ max.____ mean____

Photoperiod: 16 hours Light / 8 hours dark

Room B246 min: 24.5 max 25.6 mean 25.1

Feeding: √as needed

☑	Before test
☑	0 hr
☑	24 hr
☑	48 hr
☑	72 hr

all species 2 hrs prior to test

mysids daily

all species except *H. azteca* 2 hr prior to renewal

H. azteca 0 hr and 48 hr

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

Concentration µg/L mg/L g/L	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	A	tox 1	5	5	5	5	5	5
	B	tox 2	5	5	5	5	5	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	4 1D	4	4	4
	C	tox 7	5	5	5	5	5	3 2D
	D	tox 8	5	5	4 1D	4	4	4
30	A	tox 9	5	5	5	5	2 3D	1 1D
	B	tox 10	5	5	5	5	3 2D	3
	C	tox 11	5	5	2 3D	2	2	1 1D
	D	tox 12	5	5	5	5	5	4 1D
45	A	tox 13	5	5	2 3D	2	2	1 1D
	B	tox 14	5	5	2 3D	2	1 1D	0 1D
	C	tox 15	5	5	3 2D	3	1 2D	1
	D	tox 16	5	5	2 3D	2	0 2D	–
67	A	tox 17	5	5	3 2D	3	1 2D	0 1D
	B	tox 18	5	5	3 2D	3	1 2D 3D	0 1D
	C	tox 19	5	5	2 3D	2	0 2D	–
	D	tox 20	5	5	0 3D	–	–	–
100	A	tox 21	5	5	0 3D	–	–	
	B	tox 22	5	5	1 1D	1	0 1D	
	C	tox 23	5	5	0 3D	–	–	
	D	tox 24	5	3 2D	0 3D	–	–	
Organisms loaded by: JB		Checked by:	CF	JB	JB	JB	RA	JB

Loading Verified by: CF AR = after renewal

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

Comments:

Investigators' Signatures

James Daniels

Buck Alred

Chelsea Frenzer

Marshall Flinchum

Reviewer: Krista Wolfe

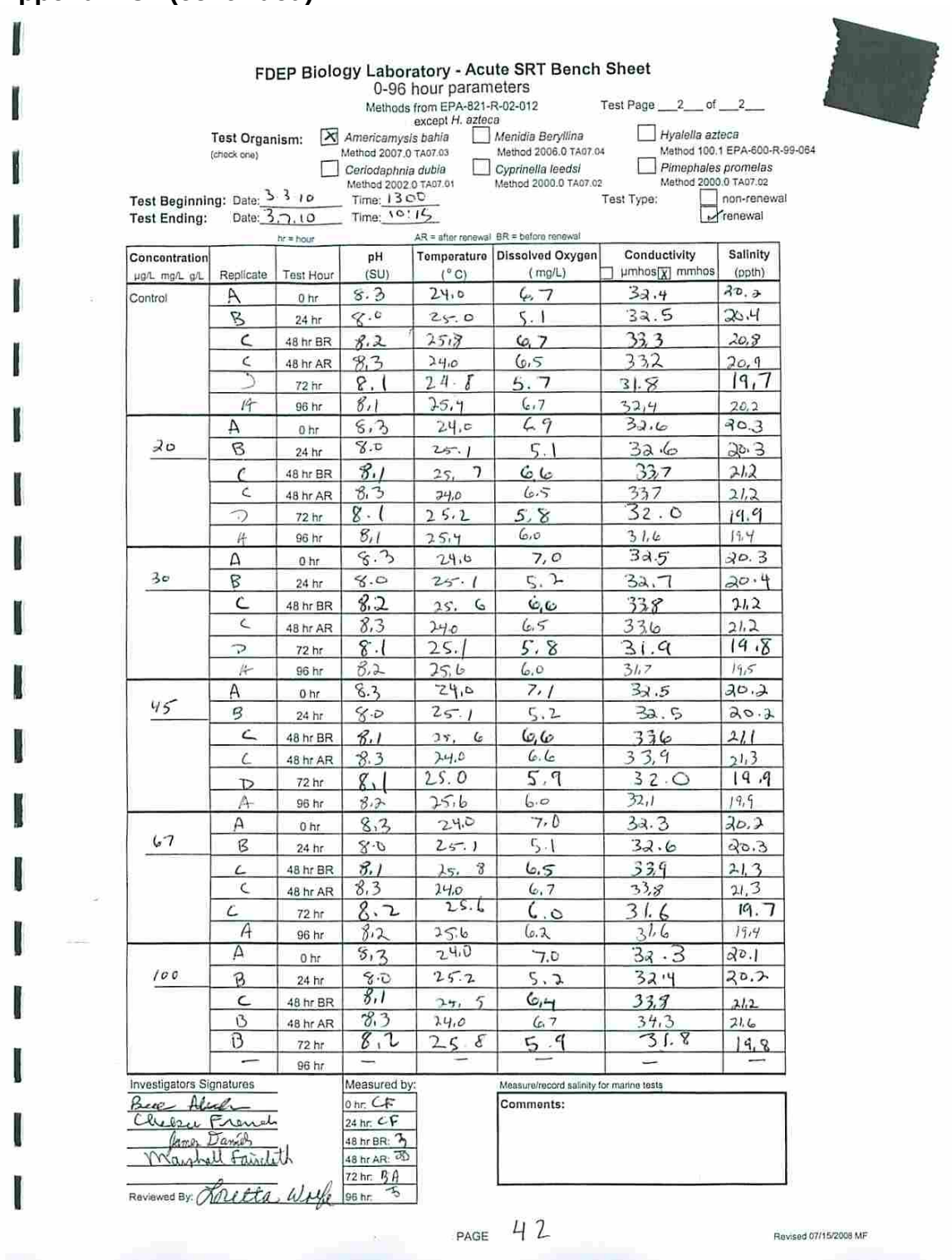
Method: TSK

Statistics: LC50	95% confidence intervals Lower	Upper
48 hour: 49.07	41.01	58.72
96 hour: 28.31	24.17	33.16

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Revised 7/15/2008 mf

Appendix C. (continued)



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

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

Test Beginning: Date: 3.3.10 Time: 1300
Test Ending: Date: 3.7.10 Time: 10:15
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 [X] mmhos	Salinity (ppth)
Control	A	0 hr	8.3	24.0	6.7	32.4	20.2
	B	24 hr	8.0	25.0	5.1	32.5	20.4
	C	48 hr BR	8.2	25.8	6.7	33.3	20.8
	C	48 hr AR	8.3	24.0	6.5	33.2	20.9
	D	72 hr	8.1	24.8	5.7	31.8	19.7
	A	96 hr	8.1	25.4	6.7	32.4	20.2
20	A	0 hr	8.3	24.0	6.9	32.6	20.3
	B	24 hr	8.0	25.1	5.1	32.6	20.3
	C	48 hr BR	8.1	25.7	6.6	33.7	21.2
	C	48 hr AR	8.3	24.0	6.5	33.7	21.2
	D	72 hr	8.1	25.2	5.8	32.0	19.9
	A	96 hr	8.1	25.4	6.0	31.6	19.4
30	A	0 hr	8.3	24.0	7.0	32.5	20.3
	B	24 hr	8.0	25.1	5.2	32.7	20.4
	C	48 hr BR	8.2	25.6	6.6	33.8	21.2
	C	48 hr AR	8.3	24.0	6.5	33.6	21.2
	D	72 hr	8.1	25.1	5.8	31.9	19.8
	A	96 hr	8.2	25.6	6.0	31.7	19.5
45	A	0 hr	8.3	24.0	7.1	32.5	20.2
	B	24 hr	8.0	25.1	5.2	32.5	20.2
	C	48 hr BR	8.1	25.6	6.6	33.6	21.1
	C	48 hr AR	8.3	24.0	6.6	33.9	21.3
	D	72 hr	8.1	25.0	5.9	32.0	19.9
	A	96 hr	8.2	25.6	6.0	32.1	19.9
67	A	0 hr	8.3	24.0	7.0	32.3	20.2
	B	24 hr	8.0	25.1	5.1	32.6	20.3
	C	48 hr BR	8.1	25.8	6.5	33.9	21.3
	C	48 hr AR	8.3	24.0	6.7	33.8	21.3
	C	72 hr	8.2	25.6	6.0	31.6	19.7
	A	96 hr	8.2	25.6	6.2	31.6	19.4
100	A	0 hr	8.3	24.0	7.0	32.3	20.1
	B	24 hr	8.0	25.2	5.2	32.4	20.2
	C	48 hr BR	8.1	24.5	6.4	33.8	21.2
	B	48 hr AR	8.3	24.0	6.7	34.3	21.6
	B	72 hr	8.2	25.8	5.9	31.8	19.8
	—	96 hr	—	—	—	—	—

Investigators Signatures
Bruce Abel
Chelsea French
James Daniels
Marshall Faircloth
Reviewed By: Loretta Wolfe

Measured by:
0 hr: CF
24 hr: CF
48 hr BR: 3
48 hr AR: BB
72 hr: BA
96 hr: 3

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 #: ASW2.9.10 / 2.9.10 Organism Batch: 3-2-10 Test Beginning: Date: 3-3-10 Time: 13:00

Toxicant/ Batch#: CuCl2 / 3.2.10 Age: 14 days Test Ending: Date: 3-7-10 Time: 10:00

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	BA
Alkalinity (mg/L as $CaCO_3$):	238	TA06_08	BA
Hardness (mg.L as $CaCO_3$):	—	TA06_09	—
Total Ammonia (mg/L as N):	<0.034	TA06_17	MF
Conductivity: µmhos (mmhos)	32.1	TA06_25	CF
Salinity (ppth):	20.0	TA06_25	CF

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

Artemia Batch:

0 hr: 42-48

24 hr:

48 hr: 44-46

72 hr:

Chamber size: 1000 mL

Test volume: 500 mL per replicate

Concentrations prepared by: JS

Temperature Range °C:(if used)

Test Incubated in: Incubator # 2 Waterbath # ____ Incubator # 2 min. 25.8 max 27.6 mean 26.7

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

Photoperiod: 16 hours Light / 8 hours dark Room B246 min. 24.5 max 25.6 mean 25.1

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	D1	10	9 D	9	9	9	9
	B	D2	10	10	10	10	10	10
100 ~~200~~ ~~50~~	A	D3	10	10	10	10	10	10
	B	D4	10	10	10	10	10	10
200 ~~300~~ ~~50~~	A	D5	10	10	10	10	10	10
	B	D6	10	10	10	10	10	10
300 ~~400~~ ~~50~~	A	D7	10	7 3D	~~5D~~ 7 3D	2	2	2
	B	D8	10	6 4D	~~5D~~ 6 4D	4	4	4
400 ~~500~~ ~~50~~	A	D9	10	5 5D	~~5 3D~~ 5D	3	2 1D	2
	B	D10	10	7 3D	~~4 5D~~ 5D	5	5	5
500 ~~600~~ ~~20~~	A	D11	10	0 10D	—	—	—	
	B	D12	10	2 8D	0 2D	~~X~~ D	~~0~~ D	
Organisms loaded by: CF		Checked by:	D	D	D	D	BA	D

Loading Verified by: BA AR = after renewal

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

Comments:

Investigators' Signatures

James Daniels

Marshall Faircloth

Chelsea French

Bree Alexander

Reviewer: Loretta Wolfe

Method: TSK

Statistics: LC50	95% confidence intervals Lower	Upper
48 hour: 303.5	276.8	332.8
96 hour: 298.9	273	327.2

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Revised 7/15/2008 mf

Appendix C. (continued)

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

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

Test Page 2 of 2

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

Test Beginning: Date: 3.3.10 Time: 1300
Test Ending: Date: 3.7.10 Time: 10 :: 0

Test Type: ☐ non-renewal ☑ renewal

hr = hour AR = after renewal BR = before renewal

Concentration µg/L mg/L g/L	Replicate	Test Hour	pH (SU)	Temperature (° C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☒ mmhos	Salinity (ppth)
Control	A	0 hr	8.3	24.0	6.7	32.1	20.0
	B	24 hr	8.1	24.0	5.9	32.3	20.1
	A	48 hr BR	8.2	24.7	7.1	33.3	20.8
	A	48 hr AR	8.4	24.0	6.7	33.2	20.6
	B	72 hr	8.0	25.2	6.6	31.4	19.5
		96 hr	8.2	25.4	6.3	31.4	19.5
100 ~~700~~	A	0 hr	8.3	24.0	6.9	32.6	20.3
	B	24 hr	8.1	24.1	5.9	32.5	20.3
	A	48 hr BR	8.2	25.3	7.2	34.1	21.3
	A	48 hr AR	8.3	24.0	6.7	33.6	21.2
	B	72 hr	8.1	24.9	6.5	31.4	19.5
		96 hr	8.2	25.5	6.3	31.3	19.4
200 ~~300~~	A	0 hr	8.3	24.0	6.9	32.4	20.2
	B	24 hr	8.1	24.2	5.9	32.6	20.3
	A	48 hr BR	8.2	25.2	7.0	33.9	21.2
	A	48 hr AR	8.3	24.0	6.7	33.7	21.2
	B	72 hr	8.1	24.8	6.3	31.6	19.6
		96 hr	8.2	25.3	6.3	31.3	19.4
300 ~~400~~	A	0 hr	8.3	24.0	7.0	32.4	20.2
	B	24 hr	8.1	24.2	5.9	32.3	20.1
	A	48 hr BR	8.2	25.2	7.0	34.0	21.3
	A	48 hr AR	8.3	24.0	6.7	33.5	21.1
	B	72 hr	8.2	24.8	6.2	31.3	19.5
		96 hr	8.2	25.3	6.3	31.2	19.3
400 ~~500~~	A	0 hr	8.3	24.0	7.0	32.2	20.0
	B	24 hr	8.1	24.4	6.0	32.2	20.0
	A	48 hr BR	8.2	25.3	7.1	33.5	20.9
	A	48 hr AR	8.3	24.0	6.8	33.2	20.6
	B	72 hr	8.2	24.7	6.2	31.1	19.3
		96 hr	8.2	25.3	6.6	31.0	19.9
500 ~~600~~	A	0 hr	8.3	24.0	6.9	32.2	20.1
	B	24 hr	8.1	24.3	6.0	32.2	20.0
	B	48 hr BR	8.2	25.3	7.3	33.5	20.9
		48 hr AR					
		72 hr					
		96 hr					

Investigators Signatures
James Daniel
Chelsea French
Bruce Alexander
Marshall Faircloth

Reviewed By: Lorretta Wolfe

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

Measure/record salinity for marine tests

Comments:

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Revised 07/15/2008 MF

Appendix C. (continued)

DATE: 3-3-10 DURATION: 96 h TOXICANT : CdCl2
SPECIES: *Americamysis bahia*

RAW DATA: Concentration (ug/L)	Number Exposed	Mortalities
.00	20	0
20.00	20	4
30.00	20	11
45.00	20	18
67.00	20	20
100.00	20	20

SPEARMAN-KARBER TRIM: 20.00%

SPEARMAN-KARBER ESTIMATES: **LC50: 28.31**
95% LOWER CONFIDENCE: 24.17
95% UPPER CONFIDENCE: 33.16

DATE: 3-3-10 DURATION: 96 h TOXICANT : CuCl2
SPECIES: *Menidia beryllina*

RAW DATA: Concentration (ug/L)	Number Exposed	Mortalities
.00	20	1
100.00	20	0
200.00	20	0
300.00	20	14
400.00	20	13
500.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: **LC50: 298.87**
95% LOWER CONFIDENCE: 272.99
95% UPPER CONFIDENCE: 327.20

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

Appendix D. Test Organism Receipts

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Shipping Date: 3/1/10

Ship to: FDEP

P.O. No:

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia	150	3 DAYS	MS100226	25	8.0	20
Menidia beryllina	150	12 DAYS	SS100219	25	8.0	20
						Hardness mg/L
Cyprinella leedsi						
Pimephales promelas	450	<24	FM100228-1600	25	7.8	80
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

Packed by: PM

Shipped Via: FedEx P.O.

Notes: MS+SS acute age on 3/3

Thank you for your order.

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

Appendix D. (continued)

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Shipping Date: 3/8/10

Ship to: FDEP

P.O. No: _____

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia	100	4 DAYS	MS100304	25	7.9	≈ 14
Menidia beryllina	100	12 DAYS	SS100224	25	7.9	≈ 14
						Hardness mg/L
Cyprinella leedsi	~~200~~ 150	12 DAYS	CL100224	25	7.8	80
Pimephales promelas	150 ea	7days	FM100301	25	7.8	80
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

Packed by: JC

Shipped Via: FedEx

Notes: _____

Thank you for your order.

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

Appendix E. Chemical Analyses performed on the effluent from the Mosaic Fertilizer, L.L.C. Riverview Chemical Complex, sampled on March 8, 2010.

Date	Field ID	Analysis	Component	Results	Remark	Units	MDL	PQL
3/8/2010 10:10	Outfall D-005B	AGP/LN	Algal Growth Potential	40		mg DryWt/L	3	3
3/8/2010 10:10	Outfall D-005B	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.6	I	mg/L	0.2	2
3/8/2010 10:10	Outfall D-005B	Chlorophyll/Grain Size/BOD	Phaeophytin-a	4.3		ug/L	0.89	2.7
3/8/2010 10:10	Outfall D-005B	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	22		ug/L	1.2	3.8
3/8/2010 10:10	Outfall D-005B	Toxicology	Bioassay-Acute-Screen-SW-Fish, LC50	100	L	LC50		
3/8/2010 10:10	Outfall D-005B	Toxicology	Bioassay-Acute-Screen-SW-Mysid, LC50	100	L	LC50		
3/8/2010 10:10	Outfall D-005B	Metals	Iron	2700	A	ug/L	30	120
3/8/2010 10:10	Outfall D-005B	Metals	Copper	7.71	A	ug/L	0.5	0.5
3/8/2010 10:10	Outfall D-005B	Metals	Lead	0.34	I	ug/L	0.2	0.8
3/8/2010 10:10	Outfall D-005B	Metals	Nickel	7.29	A	ug/L	0.25	1
3/8/2010 10:10	Outfall D-005B	Metals	Selenium	0.38	I	ug/L	0.2	0.8
3/8/2010 10:10	Outfall D-005B	Metals	Aluminum	330	A	ug/L	60	240
3/8/2010 10:10	Outfall D-005B	Metals	Calcium	189	A	mg/L	0.075	0.3
3/8/2010 10:10	Outfall D-005B	Metals	Chromium	2.9	A	ug/L	0.3	1.2
3/8/2010 10:10	Outfall D-005B	Metals	Arsenic	2.09	A	ug/L	0.25	1
3/8/2010 10:10	Outfall D-005B	Metals	Silver	0.025	U	ug/L	0.025	0.1
3/8/2010 10:10	Outfall D-005B	Metals	Zinc	21	A	ug/L	5	20
3/8/2010 10:10	Outfall D-005B	Metals	Cadmium	0.034	I	ug/L	0.03	0.12
3/8/2010 10:10	Outfall D-005B	Metals	Magnesium	45.9	A	mg/L	0.04	0.16
3/8/2010 10:10	Outfall D-005B	Nutrients	Ammonia-N	4		mg N/L	0.05	0.1
3/8/2010 10:10	Outfall D-005B	Nutrients	O-Phosphate-P	5.4		mg P/L	0.16	0.4
3/8/2010 10:10	Outfall D-005B	Nutrients	Fluoride	3.8		mg F/L	0.05	0.1
3/8/2010 10:10	Outfall D-005B	Nutrients	Total-P	7		mg P/L	0.05	0.5
3/8/2010 10:10	Outfall D-005B	Nutrients	Turbidity	26	A	NTU	0.1	0.1
3/8/2010 10:10	Outfall D-005B	Nutrients	Sulfate	540		mg SO4/L	4	10
3/8/2010 10:10	Outfall D-005B	Nutrients	Chloride	490		mg Cl/L	4	10
3/8/2010 10:10	Outfall D-005B	Nutrients	Color (apparent)	80		PCU	20	20
3/8/2010 10:10	Outfall D-005B	Nutrients	NO2NO3-N	1.2		mg N/L	0.04	0.1
3/8/2010 10:10	Outfall D-005B	Nutrients	TDS	1650	A	mg/L	15	60
3/8/2010 10:10	Outfall D-005B	Nutrients	TSS	12	I	mg/L	4	16
3/8/2010 10:10	Outfall D-005B	Nutrients	Kjeldahl Nitrogen	4.9		mg N/L	0.4	1
3/8/2010 10:10	Outfall D-005B	Overflow	Radium 228-Counting Error	0.6		pCi/L		
3/8/2010 10:10	Outfall D-005B	Overflow	Alpha-Counting Error	2.7		pCi/L		

Appendix E. (continued)

Date	Field ID	Analysis	Component	Results	Remark	Units	MDL	PQL
3/8/2010 10:10	Outfall D-005B	Overflow	Radium 226	0.6		pCi/L		
3/8/2010 10:10	Outfall D-005B	Overflow	Radium 226-Counting Error	0.2		pCi/L		
3/8/2010 10:10	Outfall D-005B	Overflow	Alpha, Total	4.2		pCi/L		
3/8/2010 10:10	Outfall D-005B	Overflow	Radium 228	1.1		pCi/L		
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Benzo(a)anthracene	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Benzo(b)fluoranthene	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Isophorone	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Nitrobenzene	2.4	U	ug/L	2.4	9.8
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Phenanthrene	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Phenol	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	2-Chloronaphthalene	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Butyl benzyl phthalate	6.1	U	ug/L	6.1	24
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Diethyl phthalate	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Dimethyl phthalate	12	U	ug/L	12	49
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	N-Nitrosodimethylamine	2.4	U	ug/L	2.4	9.8
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	2,4-Dinitrophenol	18	U	ug/L	18	73
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	2-Chlorophenol	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	3,3'-Dichlorobenzidine	49	UJ	ug/L	49	200
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Benzidine	120	UJ	ug/L	120	490
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Benzo(g,h,i)perylene	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Benzo(k)fluoranthene	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Chrysene	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Di-n-butyl phthalate	6.1	U	ug/L	6.1	24
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Fluoranthene	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3.7	U	ug/L	3.7	15
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	2,4-Dichlorophenol	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Acenaphthene	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Hexachlorobutadiene	3.7	U	ug/L	3.7	15
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Hexachlorocyclopentadiene	3.7	UJ	ug/L	3.7	15
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3.7	U	ug/L	3.7	15
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	4-Nitrophenol	18	U	ug/L	18	73
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Acenaphthylene	1.2	U	ug/L	1.2	4.9

Appendix E. (continued)

Date	Field ID	Analysis	Component	Results	Remark	Units	MDL	PQL
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Anthracene	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Hexachlorobenzene	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Naphthalene	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	2,4,6-Trichlorophenol	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	2-Nitrophenol	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	4-Chloro-3-methylphenol	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2.4	U	ug/L	2.4	9.8
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3.7	U	ug/L	3.7	15
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Di-n-octyl phthalate	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Hexachloroethane	3.7	U	ug/L	3.7	15
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	2,4-Dimethylphenol	12	U	ug/L	12	49
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Benzo(a)pyrene	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	18	U	ug/L	18	73
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Dibenzo(a,h)anthracene	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2.4	U	ug/L	2.4	9.8
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	2,6-Dinitrotoluene	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Pentachlorophenol	3.7	U	ug/L	3.7	15
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Fluorene	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	Pyrene	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Priority Organic Pollutants	2,4-Dinitrotoluene	1.2	U	ug/L	1.2	4.9
3/8/2010 10:10	Outfall D-005B	Field Parameter	Specific Conductance	2652		umhos/cm		
3/8/2010 10:10	Outfall D-005B	Field Parameter	Dissolved Oxygen	6.9		mg/L		
3/8/2010 10:10	Outfall D-005B	Field Parameter	Temperature	18.19		C		
3/8/2010 10:10	Outfall D-005B	Field Parameter	pH	7.13				
3/8/2010 9:35	Blank	Nutrients	Sulfate	0.2	U	mg SO4/L	0.2	0.5
3/8/2010 9:35	Blank	Nutrients	O-Phosphate-P	0.004	U	mg P/L	0.004	0.01
3/8/2010 9:35	Blank	Nutrients	Fluoride	0.05	U	mg F/L	0.05	0.1
3/8/2010 9:35	Blank	Nutrients	Total-P	0.004	U	mg P/L	0.004	0.01
3/8/2010 9:35	Blank	Nutrients	Kjeldahl Nitrogen	0.08	U	mg N/L	0.08	0.2
3/8/2010 9:35	Blank	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
3/8/2010 9:35	Blank	Nutrients	NO2NO3-N	0.004	U	mg N/L	0.004	0.01

Appendix E. (continued)

Date	Field ID	Analysis	Component	Results	Remark	Units	MDL	PQL
3/8/2010 9:35	Blank	Overflow	Radium 226	0.1		pCi/L		
3/8/2010 9:35	Blank	Overflow	Alpha-Counting Error	0.7		pCi/L		
3/8/2010 9:35	Blank	Overflow	Radium 228-Counting Error	0.4		pCi/L		
3/8/2010 9:35	Blank	Overflow	Alpha, Total	1.1	U	pCi/L		
3/8/2010 9:35	Blank	Overflow	Radium 226-Counting Error	0.1		pCi/L		
3/8/2010 9:35	Blank	Overflow	Radium 228	0.7	U	pCi/L		
3/8/2010 9:35	Blank	Priority Organic Pollutants	2,4-Dinitrotoluene	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	2,6-Dinitrotoluene	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Hexachlorobenzene	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Benzo(k)fluoranthene	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	3,3'-Dichlorobenzidine	46	U	ug/L	46	180
3/8/2010 9:35	Blank	Priority Organic Pollutants	2-Chloronaphthalene	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	2,4-Dichlorophenol	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	17	U	ug/L	17	69
3/8/2010 9:35	Blank	Priority Organic Pollutants	Naphthalene	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Phenanthrene	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Acenaphthene	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Anthracene	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Benzidine	110	U	ug/L	110	460
3/8/2010 9:35	Blank	Priority Organic Pollutants	Dibenzo(a,h)anthracene	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Hexachlorobutadiene	3.4	U	ug/L	3.4	14
3/8/2010 9:35	Blank	Priority Organic Pollutants	N-Nitrosodimethylamine	2.3	U	ug/L	2.3	9.2
3/8/2010 9:35	Blank	Priority Organic Pollutants	Nitrobenzene	2.3	U	ug/L	2.3	9.2
3/8/2010 9:35	Blank	Priority Organic Pollutants	Pyrene	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	2,4-Dinitrophenol	17	U	ug/L	17	69
3/8/2010 9:35	Blank	Priority Organic Pollutants	2-Nitrophenol	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Di-n-butyl phthalate	5.7	U	ug/L	5.7	23
3/8/2010 9:35	Blank	Priority Organic Pollutants	Pentachlorophenol	3.4	U	ug/L	3.4	14
3/8/2010 9:35	Blank	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3.4	U	ug/L	3.4	14
3/8/2010 9:35	Blank	Priority Organic Pollutants	4-Chloro-3-methylphenol	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Chrysene	1.1	U	ug/L	1.1	4.6

Appendix E. (continued)

Date	Field ID	Analysis	Component	Results	Remark	Units	MDL	PQL
3/8/2010 9:35	Blank	Priority Organic Pollutants	Diethyl phthalate	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Dimethyl phthalate	11	U	ug/L	11	46
3/8/2010 9:35	Blank	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2.3	U	ug/L	2.3	9.2
3/8/2010 9:35	Blank	Priority Organic Pollutants	Phenol	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	2-Chlorophenol	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Benzo(b)fluoranthene	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Benzo(g,h,i)perylene	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3.4	U	ug/L	3.4	14
3/8/2010 9:35	Blank	Priority Organic Pollutants	Hexachlorocyclopentadiene	3.4	UJ	ug/L	3.4	14
3/8/2010 9:35	Blank	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	2,4-Dimethylphenol	11	U	ug/L	11	46
3/8/2010 9:35	Blank	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	4-Nitrophenol	17	U	ug/L	17	69
3/8/2010 9:35	Blank	Priority Organic Pollutants	Acenaphthylene	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Butyl benzyl phthalate	5.7	U	ug/L	5.7	23
3/8/2010 9:35	Blank	Priority Organic Pollutants	Di-n-octyl phthalate	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Fluoranthene	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Isophorone	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3.4	U	ug/L	3.4	14
3/8/2010 9:35	Blank	Priority Organic Pollutants	2,4,6-Trichlorophenol	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2.3	U	ug/L	2.3	9.2
3/8/2010 9:35	Blank	Priority Organic Pollutants	Benzo(a)anthracene	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Benzo(a)pyrene	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Fluorene	1.1	U	ug/L	1.1	4.6
3/8/2010 9:35	Blank	Priority Organic Pollutants	Hexachloroethane	3.4	U	ug/L	3.4	14
3/8/2010 11:15	Barge Slip	Metals	Calcium	314		mg/L	0.22	0.9
3/8/2010 11:15	Barge Slip	Metals	Selenium	0.6	U	ug/L	0.6	2.4
3/8/2010 11:15	Barge Slip	Metals	Cadmium	0.09	U	ug/L	0.09	0.36
3/8/2010 11:15	Barge Slip	Metals	Arsenic	1.2	I	ug/L	0.75	3
3/8/2010 11:15	Barge Slip	Metals	Chromium	0.9	U	ug/L	0.9	3.6
3/8/2010 11:15	Barge Slip	Metals	Silver	0.075	U	ug/L	0.075	0.3
3/8/2010 11:15	Barge Slip	Metals	Lead	0.6	U	ug/L	0.6	2.4
3/8/2010 11:15	Barge Slip	Metals	Zinc	15	U	ug/L	15	60
3/8/2010 11:15	Barge Slip	Metals	Copper	1.5	U	ug/L	1.5	1.5

Appendix E. (continued)

Date	Field ID	Analysis	Component	Results	Remark	Units	MDL	PQL
3/8/2010 11:15	Barge Slip	Metals	Nickel	0.91	I	ug/L	0.75	3
3/8/2010 11:15	Barge Slip	Metals	Aluminum	1230		ug/L	180	720
3/8/2010 11:15	Barge Slip	Metals	Iron	430		ug/L	90	360
3/8/2010 11:15	Barge Slip	Metals	Magnesium	943		mg/L	2	8
3/8/2010 11:15	Barge Slip	Field Parameter	Dissolved Oxygen	7.8		mg/L		
3/8/2010 11:15	Barge Slip	Field Parameter	Temperature	15.18		C		
3/8/2010 11:15	Barge Slip	Field Parameter	pH	7.6				
3/8/2010 11:15	Barge Slip	Field Parameter	Specific Conductance	39747		umhos/cm		

Appendix F. Facility Summary

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): Mosaic Fertilizer, L.L.C. Riverview Chemical Complex	Former Names: Cargill Fertilizer, Inc. Riverview Chemical Complex
NPDES Permit Number: FL0000761	Permit Expiration Date: 12/5/10
Physical Address: 8813 U.S. Hwy 41 South Riverview, FL 33569	
District: SW	County: Hillsborough
Function of Facility: Manufactures sulfuric acid, phosphoric acid, fluoride products, ammoniated phosphates, micronutrient added fertilizers and animal feed phosphates	
Facility Type: Fertilizer manufacture	Permitted Capacity (MGD): No flow limit
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): From 12/08 through 11/09 D-005B-0.187 MGD The mean maximum daily flow for D-012 from 12/08 through 11/09 was 0.133 MGD. All other outfalls had zero discharge.	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months): NA	
Description of type of Discharge: ☒ Continuous ☐ Intermittent ☐ Seasonal ☐ Rainfall Dependent ☐ Other, please specify	

Appendix F. (continued)

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

TABLE 4:

Sample Point	Description of Monitoring Location
EFF-01	Immediately prior to discharge into the Alafia River
EFF-05A	Immediately after the weir before discharge into the Alafia River
EFF-05B	Into the discharge water basin before discharge into disperser pipe of the Barge Slip located on the Alafia River
SWD-05C	Immediately downstream of the disperser ports in the Barge Slip

Description of Permitted Outfall(s):

Outfall D-001 discharges treated process and non-process wastewater, and stormwater into the Alafia River. The facility is proposing to change its operations to reduce the discharge from Outfall D-001 and redirect the discharge to Outfall D-005B. After changes are completed, only during extremely excessive stormwater situations will this outfall discharge.

Outfall D-005A discharges treated process and non-process wastewater, and stormwater into the Alafia River. Only during extremely excessive stormwater situations does this outfall discharge.

Outfall D-005B discharges treated process and non-process wastewater, and stormwater into barge slip and then into the Alafia River.

Internal Monitoring Station I-008 discharges treated process water and stormwater to Outfall D-005B, Outfalls D-001 and D-005A.

Outfall D-021 discharges treated stormwater runoff from the eastern basin of the facility into the Alafia River.

Outfall D-022 discharges treated stormwater runoff from the southern basin of the facility into Hillsborough Bay.

Outfall D-025 discharges treated stormwater runoff from the north stormwater treatment and detention system of the existing lined operating phosphogypsum stack into Archie Creek and thence to Hillsborough Bay.

Outfall D-026 (TO BE CONSTRUCTED) discharges treated stormwater runoff from the south stormwater treatment and detention system of the new lined phosphogypsum stack expansion into Archie Creek and thence to Hillsborough Bay.

Appendix F. (continued)

Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility):
This facility operates with zero discharge of treated process water. If treatment were to become necessary process wastewater is treated using a two-stage liming and acidulation system. Non-process wastewater is treated by settling and pH adjustments when necessary. When non-process wastewater fails to meet the requirements for discharge, it is routed into the process wastewater treatment system. Stormwater is filtered and nutrients are removed in detention ponds.

Appendix F. (continued)

PART I: Continued										
List <u>current</u> 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	Max/Min	Annual Average	Monthly Average	Weekly Average	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes

Appendix F. (continued)

Parameters (units)	Daily Minimum	Monthly Average	Daily Maximum	Monitoring Frequency	Sample Type	Sample Point
Flow* (MGD)	--	Report	Report	Continuous	Recorder	EFF-01 EFF-05A EFF-05B
Ammonia, Unionized (MG/L) (See Condition I.A.7.)	--	Report	Report	1/Month	Calculated	EFF-01 EFF-05A EFF-05B
Phosphate, Ortho (as PO_4) (MG/L)	--	Report	Report	1/Month	Grab	EFF-01 EFF-05A EFF-05B
pH (SU) (See Condition I.A.7.)	6.0	Report	8.5	1/Week	Grab	EFF-01 EFF-05A EFF-05B
Temperature (C), Water (DEG. C) (See Condition I.A.7.)	--	Report	Report	1/Week	Grab	EFF-01 EFF-05A EFF-05B
Solids, Total Suspended (MG/L)	--	50.0	150.0	1/Week	Grab	EFF-01 EFF-05A EFF-05B
Nitrogen, Ammonia, Total (as N) (MG/L) (See Condition I.A.7.)	--	Report	Report	1/Week	Grab	EFF-01 EFF-05A EFF-05B
Nitrogen, Ammonia, Total (as N) (LBS/DAY)	--	10.0	20.0	1/Week	Grab	EFF-01 EFF-05A EFF-05B
Fluoride, Total (as F) (MG/L) [Outfalls D-001 & D-005A]		Report	5.0	1/Week	24-hr. time proportional composite**	EFF-01 EFF-05A
Fluoride, Total (as F) (MG/L) [Outfall D-005B only]		Report	5.7	1/Week	24-hr. time proportional composite**	SWD-05C

Appendix F. (continued)

					composite**	
Nitrogen, Total (as N) (MG/L) (See Condition I.A.16.)	--	Report	Report	1/Week	24-hr. time proportional composite**	EFF-01 EFF-05A EFF-05B
Nitrogen, Total (as N) (LBS/DAY) (See Condition I.A.16.)	--	55.0	100.0	1/Week	24-hr. time proportional composite**	EFF-01 EFF-05A EFF-05B
Phosphorus, Total (as P) (MG/L) (See Condition I.A.16.)	--	Report	Report	1/Week	24-hr. time proportional composite**	EFF-01 EFF-05A EFF-05B
Phosphorus, Total (as P) (LBS/DAY) (See Condition I.A.16.)	--	55.0	120.0	1/Week	24-hr. time proportional composite**	EFF-01 EFF-05A EFF-05B
Chlorine, Total Residual (MG/L)	--	Report	0.01	Monthly	Grab	EFF-01 EFF-05A EFF-05B
Oxygen, Dissolved (DO) (MG/L)	(See Condition I.A.13.)	--	--	Monthly	Grab	EFF-01 EFF-05A EFF-05B
Oil and Grease (MG/L)	--	--	5.0	Monthly	Grab	EFF-01 EFF-05A EFF-05B
Specific Conductance (UMHO/CM)	--	--	Report	Monthly	Grab	EFF-01 EFF-05A EFF-05B
Aluminum, Total Recoverable (MG/L)	--	--	1.50	Monthly	24-hr. time proportional composite**	EFF-01 EFF-05A EFF-05B
Copper, Total Recoverable (UG/L) [Outfalls D-001 & D-005A]	--	--	3.7	Monthly	24-hr. time proportional composite**	EFF-01 EFF-05A
Copper, Total Recoverable (UG/L) [Outfall D-005B only]	--	--	209.0 (See Condition I.A.3.)	Monthly	24-hr. time proportional composite**	SWD-05C

Appendix F. (continued)

Parameters (units)	Discharge Limitations			Monitoring Requirements		
	Daily Minimum	Monthly Average	Daily Maximum	Monitoring Frequency	Sample Type	Sample Point
Copper, Total Recoverable (LBS/DAY) [Outfall D-005B only]	--	--	0.55	Monthly	Calculated	SWD-05C
Iron, Total Recoverable (MG/L) [Outfalls D-001 & D-005A]	--	--	0.3	Monthly	24-hr. time proportional composite**	EFF-01 EFF-05A
Iron, Total Recoverable (UG/L) [Outfall D-005B only]	--	--	1,044.0 (See Condition I.A.4.)	Monthly	24-hr. time proportional composite**	SWD-05C
Iron, Total Recoverable (LBS/DAY) [Outfall D-005B only]	--	--	25.6	Monthly	Calculated	SWD-05C
Nickel, Total Recoverable (UG/L) [Outfalls D-001 & D-005A]	--	--	8.3	Monthly	24-hr. time proportional composite**	EFF-01 EFF-05A
Nickel, Total Recoverable (UG/L) [Outfall D-005B only]	--	--	46.3 (See Condition I.A.4.)	Monthly	24-hr. time proportional composite**	SWD-05C
Sulfate, Total (MG/L)	--	--	Report	Monthly	Grab	EFF-01 EFF-05A EFF-05B
Zinc, Total Recoverable (UG/L) [Outfalls D-001 & D-005A]	--	--	86	Monthly	24-hr. time proportional composite**	EFF-01 EFF-05A
Zinc, Total Recoverable (UG/L) [Outfall D-005B only]	--	--	104.0 (See Condition I.A.4.)	Monthly	24-hr. time proportional composite**	SWD-05C

Appendix F. (continued)

[Outfall D-005B only]			Condition I.A.4.)		composite**	
Radium 226 + Radium 228, Total (PCI/L) (Allow for Gross Alpha screening per condition I.A.14.)	--	--	5.0	Quarterly	24-hr. time proportional composite**	EFF-01 EFF-05A EFF-05B
Chlorophyll-a (UG/L) * **	--	--	Report	Annually	Grab	EFF-01 EFF-05A EFF-05B
Nitrogen, Total (as N) (LBS/DAY) (See Condition I.A.16.)	--	Report 5-year Rolling Annual Average	Report Yearly Total	Annually	Calculated	EFF-01 EFF-05A EFF-05B
Phosphorus, Total (as P) (LBS/DAY) (See Condition I.A.16.)	--	Report 5-year Rolling Annual Average	Report Yearly Total	Annually	Calculated	EFF-01 EFF-05A EFF-05B
Whole Effluent Toxicity - Acute	See Permit Condition I.A.5					EFF-05B

* The combined maximum flow rate, excluding stormwater, shall not exceed 7.2 MGD. Flow monitoring for Outfalls D-001 and D-005A shall be based on instantaneous measurements.

** For Outfall D-001 see Condition I.A.6.

*** The sample shall be taken during July or August of each year.

Appendix F. (continued)

PART I: Continued	
Receiving Waters: Alafia River	Classification (indicate whether fresh or marine): Class III Marine

Appendix F. (continued)

Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.): For Outfall D-005B only. 96-hr Acute testing every six months. Species used in tests depends on effluent salinity.

For Effluent Salinity ≤ one (1) ppt:

i. The permittee shall conduct 96-hour acute static renewal toxicity tests using the daphnid, **Ceriodaphnia dubia**, and the bannerfin shiner, **Cyprinella leedsi**, concurrently. 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, or the most current edition.

ii. The control water and dilution water used will be moderately hard water as described in EPA-821-R-02-012, Table 7, or the most current edition.

For Effluent Salinity > one (1) ppt:

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

ii. The control water and dilution water used will be artificial seawater and diluted to the appropriate test salinity as described below:

The test salinity shall be determined as follows:

- 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 (Mysidopsis) 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.
- When the salinity of the effluent is greater than 7 parts per thousand, no salinity adjustment shall be made and the test shall be run at the effluent salinity.

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

mpling Requirements

All "routine" tests will be conducted on one (1) grab sample of final effluent.

ditional, Follow-up Testing Requirements, if required

- If unacceptable acute toxicity (greater than **20%** mortality of either test species in any single grab sample test) is found in a "routine" test, the permittee shall conduct three additional tests on each species indicating greater than 20% mortality in the 100% effluent concentration.
- Results for each additional test will include the determination of LC50 values with 95% confidence limits.
- Each additional 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 test to more accurately bracket the toxicity, such that at least two dilutions above and two dilutions below the target toxicity and a control (0% effluent) are run.
- For each additional test, the sample collection requirements, the quality assurance criteria, and the test acceptability criteria must be met for the test to be considered valid.
- The first test shall begin within two weeks of the end of the "routine" tests, and shall be conducted weekly thereafter until *three* additional, valid tests are completed. In the event that the discharge ceases before completion of the three additional tests, the permittee shall immediately notify the Department that the discharge has ceased and which additional tests have not been performed. The permittee shall initiate the remaining additional tests during the next discharge event from that outfall.

Appendix F. (continued)

Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.):
In September 2004 there was a 65 million gallon spill of process water with a pH ~ 2.2. Fines were assessed and restoration projects are ongoing.

January 7, 2009 a consent order was issued for the release of process water during the movement of a siphon line on the stack.

May 9, 2008 a consent order was issued to address two releases of process water, on occurring on December 14, 2005 due to a gypsum slurry pipeline rupture and one occurring on February 3, 2006 due to a stormwater overflow of the stack swale.

Facility Mixing Zone Details (if applicable):

Pursuant to the provisions of Section 62-4.244(1), F.A.C., a zone of mixing for copper encompassing the area of the barge slip up to 7,900 square meters (60 meters width by 132 meters length) into the Alafia River (see **Attachment C**) is granted by the Department. During discharges from Outfall D-005B, monitoring for copper

shall be conducted at Sampling Point SWD-05C, at mid-depth and at an equal distance from disperser ports. In order to provide the Department with reasonable assurance that the discharge from Outfall D-005B does not violate water quality standards for copper, the discharge limitation, 209.0 ug/l must be met at SWD-05C. The applicable Class III marine surface water quality standard for copper is 3.7 ug/l.

Pursuant to the provisions of Section 62-4.244(1), F.A.C., zones of mixing for iron, nickel, zinc, and fluoride encompassing the area of the barge slip up to 900.0 square meters (60 meters width by 15 meters length) into the Alafia River (See **Attachment C**) is granted by the Department. During discharges from Outfall D-005B, monitoring for iron, nickel, zinc, and fluoride shall be conducted at Sampling Point SWD-05C, at mid-depth and at an equal distance from disperser ports. In order to provide the Department with reasonable assurance that the discharge from Outfall D-005B does not violate water quality standards for fluoride, the discharge limitation, for iron, nickel, zinc, and fluoride shall be respectively 1,044 ug/l, 46.3 ug/l, 104.0 ug/l, and 5.7 mg/l must be met at SWD-05C. The applicable Class III marine surface water quality standard for iron, nickel, zinc, and fluoride are respectively 0.3 mg/l, 8.3 ug/l, 86 ug/l, and 5.0 mg/l.

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

Date	Parameter and Units	Limit	Result
7/09	**TRC mg/L**	**0.01**	**1306**

Describe previous FYI and WQBEL study: In 2001 D-005B was sampled. Metal values were high but a mixing zone is permitted. In 1996 petite ponar grabs were taken for macroinvertebrates outside the mixing zone and a decrease in the macroinvertebrate population was noted compared to a control site.

Describe previous or current Enforcement Actions (including WLs): All WL have had Consent Orders issued.

Describe any violations or problems noted in previous inspection:
Problems noted include elevated fluoride and sulfate concentrations in downstream sampling sites in Archie Creek. Also engineering controls were suggested to reduce materials loss during loading and unloading of ships.

Appendix F. (continued)

Discuss whether DMR trends within previous five years are improving or declining: **Static**
Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse): **Process water is re-used. Treated process water is on released if necessary due to extreme rainfall events.**

PART II: Sampling Event Information	
Date(s) sample collected: 3/8/10	**Sampler(s): Jacki Champion and Michael Lynch**
Temperature (Deg C): 18.19	**pH (SU):7.13**
Dissolved Oxygen (mg/L):6.90	**Conductivity (umhos/cm):2,652**
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): 0.021 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): The D-005B flow average from January 2009 to December 2009 was 0.2 MGD	
Describe Discharge during Sampling Event: **☒ Continuous ☐ Intermittent ☐ Seasonal ☐ Rainfall Dependent ☐ Other, please specify**	

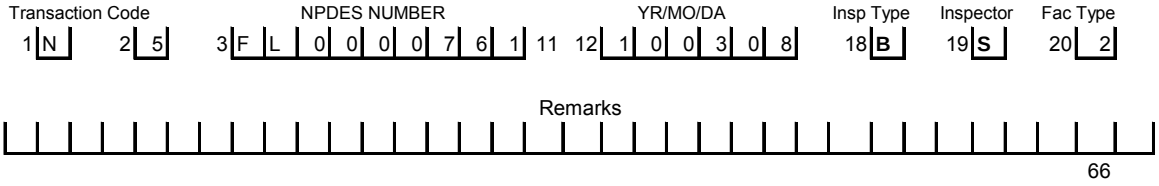
Appendix F. (continued)

Describe any conditions, difficulties or abnormal events that occurred during the sample collection and any other additional comments here:
A separate metals sample was collected in the barge slip for mixing zone compliance.

Appendix G. EPA End Sheet

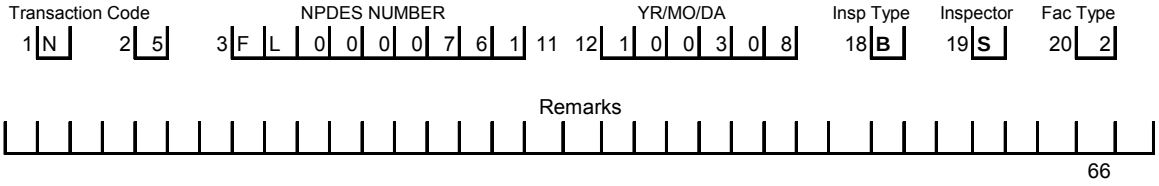
The Bioassay of the Mosaic Fertilizer, L.L.C. - Riverview Chemical Complex, effluent sampled on March 8, 2010. NPDES #FL0000761.

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



The Priority Pollutants Analysis of the Mosaic Fertilizer, L.L.C. - Riverview Chemical Complex, effluent sampled on March 8, 2010. NPDES #FL0000761.

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



Biological Analyses of the Mosaic Fertilizer, L.L.C. - Riverview Chemical Complex, effluent sampled on March 8, 2010. NPDES #FL0000761.

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

