

Effluent Quality Assessment

Dunes Community Development District

Flagler County

NPDES #FL0355259

Sampled December 8, 10 and 12, 2008

May 2009

Biology Section
Bureau of Laboratories
Division of Environmental Assessment and Restoration

Quality Manual No. 870346G
NELAC Certification No. E31780

Dunes Community Development District, 101 Jungle Hut Road, Palm Coast, Flagler County, Florida, NPDES #FL0355259. Effluent samples for chemical analyses and bioassay tests for this facility were collected on December 8, 2008. Additional samples for the bioassay tests were collected on December 10 and 12, 2008.

Introduction

The Dunes Community Development District is a drinking water treatment plant which uses the reverse osmosis process to produce potable water. Effluent discharge from the facility is intermittent. The facility has a permitted discharge limit of 0.25 million gallons per day (MGD) annual average daily flow (AADF). The AADF through the facility from January 2008 through December 2008 was 0.0805 MGD. Effluent, consisting of reject concentrate, is treated by aeration prior to being discharged through Outfall D-001 to the Class III marine waters of the Intracoastal Waterway at the Harbor Village Marina Channel. The D-001 outfall line is approximately 3 m (10 feet) in length and discharges at a depth of approximately 2.27 m (7.5 feet) through a two-port diffuser. The point of discharge for Outfall D-001 is located approximately at latitude 29º 35' 06" N, longitude 81º 11' 39" W.

The facility has no open Administrative Orders (AO) or Consent Orders. The facility had an AO (AO 79-NE) which specified bimonthly toxicity requirements for a 6 month time span. The facility applied for and was granted mixing zones. The AO also allowed total radium and gross alpha particle parameters to be report only until May 2009. A review of Discharge Monitoring Report (DMR) data for the past year, revealed the following permit violations.

Table provided by Brian Kirts FDEP Northeast District

Date	Parameter and Units	Limit	Result
September 2007	DO (mg/L)	5 Min	3
September 2007	Total Recoverable Iron (mg/L)	.3Max	.866
September 2007	Total Copper (mg/L)	3.7Max	42.6
October 2007	DO (mg/L)	5 Min	3.2
November 2007	DO (mg/L)	5 Min	3.8
December 2007	DO (mg/L)	5 Min	4
December 2007	LC50 A. Bahia%	100% Min	10.8%
December 2007	NOEL Stat. A. Bahia%	100% Min	6.25%
December 2007	NOEL Stat. M. beryllina %	100% Min	50
February 2008	DO (mg/L)	5 Min	2
March 2008	Total Radium (pCi/L)	25.3Max	25.5
April 2008	DO (mg/L)	5 Min	1.4
June 2008	DO (mg/L)	5 Min	1
June 2008	LC50 A. Bahia%	100% Min	9
June 2008	NOEL Stat. A. Bahia %	100% Min	6.25

No issues were noted during a compliance enforcement inspection (CEI) which was performed in 2005. (Facility information provided by Brian Kirts of FDEP Northeast District.)

Methods

Samples were collected from the EFF-1 NPDES sampling point for Outfall D-001 by Lisa Crepso and Pat O'Conner (FDEP Northeast District) following DEP-SOP-001/01 FS 2400 Wastewater Sampling. All DEP SOPs are available on the web at: http://www.floridadep.org/labs/qa/sops.htm.

See Appendix A for the completed chain of custody forms.

The 7-day chronic definitive toxicity tests and the algal growth potential test were performed following internal DEP SOPs TA07_15, TA07_14, and TA08_01 through TA08_09. All internal DEP SOPs are available on the web at: http://www.floridadep.org/labs/cgi-bin/sop/biosop.asp.

The bioassay samples were salinity-adjusted from apparent salinities of approximately 10.6 parts per thousand (ppth), 12.1 ppth and 15.2 ppth, respectively, for the bioassay samples collected on December 8, 10 and 12, 2008, to salinities of approximately 20 ppth using 40 Fathoms® artificial sea salts. The salt controls for each test were prepared by diluting 20 ppth artificial seawater (ASW) with well water to the apparent salinity of the bioassay samples, and then salting these solutions with artificial sea salts to match the salinity (approximately 20 ppth) of the test solutions. The purpose of the salt control 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.

Toxcalc® toxicity data analysis software was used to analyze data from these tests.

Toxicity Test Results

Tests were performed December 9 - 16, 2008.

Americamysis bahia 7-day chronic definitive bioassay –	NOEC = 50% sample, for both Survival and Growth
Menidia beryllina 7-day chronic definitive bioassay –	NOEC = 25% sample, for both Survival and Growth

The bioassay samples were chronically toxic to the test organisms.

The chemistry results confirmed that the ion makeup of the sample was not in seawater proportions and that the apparent 10.9 ppth salinity of the sample was due to elevated levels of ground-water ions. The observed mortality in the A. bahia test is likely due to the seawater-ion imbalance of the sample. Previous research conducted by the FDEP Biology Section demonstrated that A. bahia is much more sensitive to seawater-ion imbalances than is M. beryllina (Wolfe, et al. 1995. Protocols for determining Major-Seawater-Ion Toxicity in Membrane-Technology Water-Treatment Concentrate. Florida Department of Environmental Protection, Bureau of Laboratories. 96pp.). The calcium concentration was measured at 899 mg/L at 10.9 ppth salinity (salinity based on conductivity and temperature). This is approximately seven times (7X) the normal concentration for calcium in seawater of this salinity. The elevated calcium concentration is one source of toxicity in this sample, but other unidentified sources of toxicity cannot be ruled out without performing the major-seawater-ion imbalance toxicity testing protocols cited above.

The cause of toxicity noted in the *Menidia beryllina* test was not determined.

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 4.1 mg dry wt/L of the saltwater species *Dunaliella tertiolecta.* Raschke and Shultz found that AGP values above 10.0 mg dry weight/L represent a "problem" threshold for marine receiving waters, implying nutrient enrichment (personal communication, Marshall Faircloth, et. al. FDEP, with Ron Raschke USEPA Region 4 1987). The analytical chemistry suggests that based on the ratio of inorganic nitrogen to orthophosphate the effluent is phosphorus-limited; whereas, based on the ratio of total nitrogen to total phosphorus the effluent is nitrogen-limited (Table 1; Maloney et al. 1978).

Chemistry Results

Total residual chlorine (TRC) was detected in the bioassay samples in the laboratory at concentrations of 0.04 mg/L, 0.085 mg/L, and 0.035 mg/L, respectively, in samples 1, 2, and 3 (in order of collection). The measured TRC was likely the result of interferences within the samples. Total ammonia was detected in the bioassay sample in the laboratory at a concentration of 0.239 mg/L in sample 1 but was not detected in sample 2 and sample 3. The calculated unionized ammonia concentration in the bioassay sample was < 0.02 mg/L. The total ammonia concentration in the sample collected and preserved for chemical analysis was 1.1 mg/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was < 0.02 mg/L.

Fluoride was detected in the effluent at levels that comply with Class III marine water quality criteria (62-302.530, F.A.C.). Aluminum, nickel, selenium, silver, and zinc were detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL). Combined radium 226 and radium 228 (5.8 pCi/L) were detected in the effluent at levels that exceed the Class III marine water quality criteria (≤ 5.0 mg/L; 62-302.530(57), F.A.C.) for combined radium 226 and radium 228.

See Table 2 for results of analytes detected in the effluent, and corresponding limits. See Appendix E for a complete list of chemical analyses performed.

Conclusion

The effluent samples collected from the EFF-1 NPDES sampling point for Outfall D-001 for this facility on December 8, 10 and 12, 2008, was chronically toxic to both test species during the 7-day chronic definitive bioassays. The effluent AGP result was less than the "problem" threshold for marine receiving waters. Combined radium 226 and radium 228 (5.8 pCi/L) was detected in the effluent at levels that exceeded the Class III marine water quality criteria for combined radium 226 and radium 228 (≤ 5.0 mg/L; 62-302.530(57), F.A.C.). Other effluent water quality samples did not exceed any applicable water quality standards or violate any permit conditions.

Literature Cited

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

FDEP. 1995. Protocols for determining Major-Seawater-Ion Toxicity in Membrane-Technology Water-Treatment Concentrate. Biology and Chemistry Section, FDEP Bureau of Laboratories, Tallahassee, Florida. 99 pp.

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 Dunes Community Development District on December 8, 2008.

Dunes Community Development District				
Location	AGP (measured)		Inorganic N:P ratio	Total N:P ratio
Effluent	4.1	A	42.7	6.2

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

Table 2. Effluent limits, Class III Criteria for predominantly marine waters, and chemical and microbiological data for samples collected from the Dunes Community Development District Facility on December 8, 2008.

Dunes Community Development District NPDES# FL0355259	Class III Criteria	Effluent Limits	Effluent	
Organic Constituents (µg/L)				
None Detected	-		None Detected	
Metals (µg/L unless otherwise noted)				
Aluminum	≤ 1,500		80	I
Arsenic	≤ 50		0.75	U
Cadmium	≤ 8.8		0.09	U
Calcium (mg/L)	-		899	
Chromium-III	-		2.1	U
Copper	≤ 3.7	≤ 3.7	1.5	U
Iron	≤ 300	≤ 300	30	U
Lead	≤ 8.5		0.6	U
Magnesium (mg/L)	-		540	
Nickel	≤ 8.3		1.3	I
Selenium	≤ 71		0.97	I
Silver	≤ 2.3		0.038	I
Zinc	≤ 86		5.1	I
Nutrients (mg/L)				
Ortho-phosphate	-	-	0.026	
Total Phosphorus	-	Report	0.31	
Total Ammonia	-	-	1.1	
Un-ionized Ammonia	-	-	≤ 0.02	c
Nitrate and Nitrite	-	-	0.009	I
Total Kjeldahl Nitrogen	-	-	1.9	
Organic Nitrogen	-	-	0.8	c
Total Nitrogen	-	Report	1.909	c
General Physical and Chemical Parameters				
Dissolved Oxygen (mg/L)	≥ 4.0	≥ 5.0 s	6.7	£
pH (SU)	6.5 - 8.5	-	7.0	
Conductivity (µmhos/cm)	-	-	17,938	
Temperature °C	-	-	23.7	
Salinity	-	-	10.9	c
Chlorophyll a (µg/L) - Corrected	-	-	0.55	U
Phaeophytin (µg/L)	-	-	0.24	U
Total Suspended Solids (mg/L)	-	-	9	I
CBOD, 5 day (mg/L), N - inhibited	-	-	1.1	I
Fluoride (mg/L)	≤ 5.0	≤ 5.0 s	1.7	
Unionized Hydrogen Sulfide (mg/L)	-	≤ 5.0 s	-	
Alpha, Total (pCi/L)	≤ 15	Report	21.5	U
Alpha-Counting Error (pCi/L)	-	-	12.6	
Radium 226 (pCi/L)	-	-	4.7	
Radium 226-Counting Error (pCi/L)	-	-	0.3	
Radium 228 (pCi/L)	-	-	1.1	
Radium 228-Counting Error (pCi/L)	-	-	0.6	
Radium 226 + 228 (pCi/L)	≤ 5	Report	5.8	c
Flow (MGD)	-	0.25 a	0.0805	m
Hardness (mg $CaCO_3$)	-	-	4,468.52	c
Microbiology (Number of colony forming units/100ml)				
Fecal Coliforms	≤ 400s #	-	2	U

Value exceeds the Class III Water Quality Criteria or permit limits

c - Value is calculated

m - Monthly average January 2008 - December 2008

s - Single sample

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

- If 10 or fewer samples are taken within a month, the single sample limit is 400 CFU (62-302.530(6), F.A.C.)

£ - Analysis performed in bioassay laboratory

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Request Number: RQ-2008-12-08-42
Dunes Community Development-RO Plant

Event ID *

Requester: Jennifer Paris
Field Report Prepared By: Lisa Crispo
Collected By: Lisa Crispo / Pat O'Connor
Send Final Report To Tom Kallemeyn
Sampling Agency: FDEP-NED

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

Lab ID *	Location						Bottle Group(s)**
	Dunes R.O. Plant	☐ Comp ☑ Grab	Collection (begin) Date 12/8/08 Time 1220 Eastern Central	Collection (end) Date Time Eastern Central			A
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L) 10.60	Storet Station Number		
	Matrix (Include type e.g. Salt, Fresh, etc	Temp (C) 23.72	pH 6.95	Sample Depth 0.01 ☑ m ☐ ft	☑ Salinity (PPTh) 17938 ☑ Sp Conductance (umho/cm)	NPDES Number	
	Latitude o ' " .	Longitude o ' " .	Comments				

Lab ID *	Location						Bottle Group(s)**
	Blank	☐ Comp ☑ Grab	Collection (begin) Date 12/8/08 Time 1230 Eastern Central	Collection (end) Date Time Eastern Central			B
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number		
	Matrix (Include type e.g. Salt, Fresh, etc	Temp (C)	pH	Sample Depth ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number	
	Latitude o ' " .	Longitude o ' " .	Comments				

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

Lab ID *	Location						Bottle Group(s)**
		☐ Comp ☐ Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central			
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number		
	Matrix (Include type e.g. Salt, Fresh, etc	Temp (C)	pH	Sample Depth ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number	
	Latitude o ' " .	Longitude o ' " .	Comments 4 biopassay Rec'd into by J.D. 10:40 12.9.08				

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
			Tahmoures Ebrahimi	9:35 12/09/08				

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Appendix A. (continued)

NLDF3-01-06
1/19/07

Department of Environmental Protection Northeast District Field Sheet

Sample Source: Dunes 120 RQ#: 2007-12-08-42 Date 12-6-07 Page 1 of 1

Meter # Y1 Acid Kit# — Ortho Kit # — Sampling Team LC SW

LAB ID #	Site Name:	Field/Storet #:	Measured By:	Matrix***:
	Dunes 120			

Time	Temp °C	Cond µohm cm⁻¹	Sal %	pH s.u	DO mg/L	DO Sat %	Secchi m	WTR V ft/sec	Tide Ebb/Fld,LS/HS	Total Depth	Sample Depth
0900	24.00	19.2	11.56	6.45	4.30	54.6	—	—	—	—	—

Mode: ☐ Wading ☒ Shore ☐ Gas Motor ☐ Canoe ☐ Bridge ☐ Dock Equipment: ☒ Grab ☐ Horizontal Sampler ☐ Pole Sampler

Parameters / Method	Preserve*	Suite**	Initials
Preserved Nutrients: ☐ N/A ☐ All ☐ TKN ☐ NO_2-NO_3 ☐ NH_3 ☐ TOC ☐ TP	☐ Ice ☐ H_2SO_4 ☐ pH<2		
Filtered Nutrients: ☐ N/A ☐ oP ☐ Other: _____	☐ Ice ☐ 0.45µm flt		
BOD: ☐ N/A ☐ CBOD-Inhb ☐ BOD-Unin	☐ Ice		
Chlorophyll: ☐ N/A ☐ CHL-PPTN-W	☐ Ice		
Physical/Aggregate Properties: ☐ N/A ☐ All ☐ TSS ☐ Turbidity ☐ W-Cl-IC ☐ W-F ☐ W-SO_4-IC ☐ Color ☐ TDS ☐ Alk	☐ Ice		
Metals: ☐ N/A ☐ W-ICP ☐ W-FIAS ☐ W-ICPMS ☐ W-ICP-Tr	☐ Ice ☐ HNO_3 ☐ pH <2		
AGP/Other: ☐ N/A ☐ AA-AGP ☐ AA-Lim-Nut ☐ Other SM CS-MFS/ISSY-CS-may	☒ Ice	A	C
Micro: ☐ N/A ☐ All ☐ T Coli ☐ F Coli	☐ Ice		
Comments and conditions: Cloudy			

LAB ID #	Site Name:	Field/Storet #:	Measured By:	Matrix***:

Time	Temp °C	Cond µohm cm⁻¹	Sal %	pH s.u	DO mg/L	DO Sat %	Secchi m	WTR V ft/sec	Tide Ebb/Fld,LS/HS	Total Depth	Sample Depth

Mode: ☐ Wading ☐ Shore ☐ Gas Motor ☐ Canoe ☐ Bridge ☐ Dock Equipment: ☐ Grab ☐ Horizontal Sampler ☐ Pole Sampler

Parameters / Method	Preserve*	Suite**	Initials
Preserved Nutrients: ☐ N/A ☐ All ☐ TKN ☐ NO_2-NO_3 ☐ NH_3 ☐ TOC ☐ TP	☐ Ice ☐ H_2SO_4 ☐ pH <2		
Filtered Nutrients: ☐ N/A ☐ oP ☐ Other: _____	☐ Ice ☐ 0.45µm flt		
BOD: ☐ N/A ☐ CBOD-Inhb ☐ BOD-Unin	☐ Ice		
Chlorophyll: ☐ N/A ☐ CHL-PPTN-W	☐ Ice		
Physical/Aggregate Properties: ☐ N/A ☐ All ☐ TSS ☐ Turbidity ☐ W-Cl-IC ☐ W-F ☐ W-SO_4-IC ☐ Color ☐ TDS ☐ Alk	☐ Ice		
Metals: ☐ N/A ☐ W-ICP ☐ W-FIAS ☐ W-ICPMS ☐ W-ICP-Tr	☐ Ice ☐ HNO_3 ☐ pH <2		
AGP/Other: ☐ N/A ☐ AA-AGP ☐ AA-Lim-Nut ☐ Other	☐ Ice		
Micro: ☐ N/A ☐ All ☐ T Coli ☐ F Coli	☐ Ice		
Comments and conditions:			

LAB ID #	Site Name:	Field/Storet #:	Measured By:	Matrix***:

Time	Temp °C	Cond µohm cm⁻¹	Sal %	pH s.u	DO mg/L	DO Sat %	Secchi m	WTR V ft/sec	Tide Ebb/Fld,LS/HS	Total Depth	Sample Depth

Mode: ☐ Wading ☐ Shore ☐ Gas Motor ☐ Canoe ☐ Bridge ☐ Dock Equipment: ☐ Grab ☐ Horizontal Sampler ☐ Pole Sampler

Parameters / Method	Preserve*	Suite**	Initials
Preserved Nutrients: ☐ N/A ☐ All ☐ TKN ☐ NO_2-NO_3 ☐ NH_3 ☐ TOC ☐ TP	☐ Ice ☐ H_2SO_4 ☐ pH<2		
Filtered Nutrients: ☐ N/A ☐ oP ☐ Other: _____	☐ Ice ☐ 0.45µm flt		
BOD: ☐ N/A ☐ CBOD-Inhb ☐ BOD-Unin	☐ Ice		
Chlorophyll: ☐ N/A ☐ CHL-PPTN-W	☐ Ice		
Physical/Aggregate Properties: ☐ N/A ☐ All ☐ TSS ☐ Turbidity ☐ W-Cl-IC ☐ W-F ☐ W-SO_4-IC ☐ Color ☐ TDS ☐ Alk	☐ Ice		
Metals: ☐ N/A ☐ W-ICP ☐ W-FIAS ☐ W-ICPMS ☐ W-ICP-Tr	☐ Ice ☐ HNO_3 ☐ pH <2		
AGP/Other: ☐ N/A ☐ AA-AGP ☐ AA-Lim-Nut ☐ Other	☐ Ice		
Micro: ☐ N/A ☐ All ☐ T Coli ☐ F Coli	☐ Ice		
Comments and conditions:			

*Preservatives: 1mL added per 500 mL sample unless otherwise noted; iced within 15 minutes ** J: samples run in Jacksonville Lab
***Matrix: SWF=Surface Water, Fresh SWS=Surface Water, Salt GW=Ground Water Sed=Sediment Other=Write in

Relinquished:	Date: 12-12-7	Time: 1500	Received: FED 12/11/06 1300	☐ < 6°C ☐ on ice ☐ < 2 p
Relinquished:	Date:	Time:	Received:	Shipping FEDEX

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Request Number: RQ-2008-12-08-42
Dunes Community Development-RO Plant

Event ID *

Requester: Jennifer Paris
Field Report Prepared By: Lisa Crspo

Customer: NE-DIST
Collected By: Lisa Crspo
Send Final Report To Tom Kallemeyn

Project ID: FYI3
Sampling Agency: DEP-NED

PMAS: 1143

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time	Eastern Central	Collection (end) Date Time	Eastern Central	Bottle Group(s)**
	Dunes R.O. Plant	☐ Comp ☑ Grab	12/12/08 1020				A
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)		Storet Station Number		
	Matrix (Include type e.g. Salt, Fresh, etc) Eff	Temp (C) 23.51	pH 7.26	Sample Depth ☐ m ☐ ft 15.10	☑ Salinity (PPTh) 34816 ☑ Sp Conductance (umho/cm)	NPDES Number	
	Latitude o ' " .	Longitude o ' " .		Comments			

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

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

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

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
	12/10/08 1200	FedEx	M. Lovett	12/13/08 0920	M.F. pick up at Fedex office.			

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

FDEP Biology Laboratory - Chronic Bioassay Bench Sheet

Americamysis bahia

SOP#: TA07_15 EPA-821-R-02-014 Method 1007.0

Facility: Dunes Community Development District
Address: 101 Jungle Hut Road, Palm Coast
County: Flagler 32137
NPDES Permit #: FL0355259
Contact/District: Brian Kirts / North east

Start Date: 12-9-08 Time: 1330
End Date: 12-16-08 Time: 1315

Diluent/ Batch:
ASW / 12-9-08 Test Days Used: 0-1
ASW / 12-10-08 Test Days Used: 2-4 mf placed wrong day used,
ASW / 12-12-08 Test Day Used 5-6

Organism batch: 12-9-08
Organism age : 7 days
Feeding Prior to Test and Daily
Artemia Lot # : 38438
Chamber size : 400 ml
Test volume : 250 ml

Artemia Batch #		Day 3	182
Day 0	179	Day 4	183
Day 1	180	Day 5	184
Day 2	181	Day 6	185

LIMS:	Date	Initials
Entry:	12.29.08	mF
Verification:	12.29.08	JD

Sample Received	Lab Sample #	LIMS Job #	LIMS Sample #	Collection Date/Time	Received Date/Time
Test Day 0	1	TLH-2008-12-09-03	1151711	12-8-08 1220	12-9-08 / 1040
Test Day 2	2	TLH-2008-12-11-76	1153038	12-10-08 0900	12-11-08 / 1321
Test Day 4	3	TLH-2008-12-15-01	1153498	12-12-08 1020	12-13-08 / 0920

Batch #			12-9-08	12-10-08	NA	NA	NA			
Water Quality Parameters			☑ ASW	☑ ASW	Sample 1 1151711	Sample 2 1153038	Sample 3 1153498	Other: ASW 12-12-08	Measured by:	Verified by:
Field Total Residual Cl_2 (mg/L):			NA	NA	Not measured			NA	NA	MF
Lab Total Residual Cl_2 (mg/L):			<0.03	<0.03	0.04	0.035	0.035	<0.03	JD/MF	MF/BA
Alkalinity (mg/L as $CaCO_3$):			245	200	354	441	531	200	BA	MF
Hardness (mg/L as $CaCO_3$):			NA	NA	—	—	—	—	—	—
Total Ammonia (mg/L as N):			<0.034	<0.034	0.239	<0.034	<0.034	<0.034	MF	BA
Conductivity: µmhos (mmhos)			31.2	32.7	18.04	20.3	25.1	32.2	BA/JD/MF	MF/BA
Original Salinity ppth:			19.5	20.4	10.6	12.12	15.2	20.1	BA/JD/MF	MF/BA
Adjusted Salinity (ppth):			NA	NA	19.6	20.2	20.2	—	BA/JD/MF	MF/BA

Temperature Shipped ≤6° C (all samples) (yes) no
Holding Time ≤36 hours (yes) no
Light Intensity : 50 - 100 ft. candles
Photoperiod : 16 light 8 dark

Temperature Range °C: (if used)
Incubator # 3 min. 26.8 max. 27.0 mean 26.9
Water bath # ___ min. ___ max. ___ mean ___
Room B248 min. 24.4 max. 26.2 mean 25.3

Test Incubated in: ☑ Incubator #: 3
☐ Waterbath #: ___

Investigators' signatures
Marshall Faircloth
Jana Daniels
Bruce Adams

REVIEWER Loretta C. Wolfe

Statistics	
Control %cv:	12.2%
Dunnetts PMSD:	17.5%
Survival NOEC:	50 %
Survival LOEC:	100 %
Growth NOEC:	50 %
Growth LOEC:	100 %

Comments: 121608 Sample 2 and Sample 3 residual chlorine likely the result of interference within the sample ; Precipitate formed when powder added, particularly sample # 3 mF 12-16-08
Lab: IC20 = 58.5 % IC25 = 61.1 %
Survival: IC20 = 57.9 % IC25 = 60.5 %

Appendix B. (continued)

Chronic Survival Benchsheet

A. bahia SOP TA07_15

Start Date: 12.9.08 Time: 1330
End Date: 12-16-08 Time: 1315
Concentration:

Facility ID: Dunes Community Development District
LIMS Sample # 1151711 (1st sample)
D = dead M = missing

Concentration	Replicate	Chamber	TEST DAY 0	1	2	3	4	5	6	7
Control	A	25	5	5	5	5	5	5	5	5
	B	26	5	5	5	5	5	5	5	5
	C	27	5	5	5	5	5	5	5	5
	D	28	5	5	5	5	5	5	5	5
	E	29	5	5	5	5	5	5	5	5
	F	30	5	5	5	5	5	5	5	5
	G	31	5	5	5	5	5	5	5	5
	H	32	5	5	5	5	5	5	5	5
6.25%	A	33	5	5	5	5	5	5	5	5
	B	35	5	5	5	5	5	5	5	5
	C	34	5	5	5	5	5	5	5	5
	D	36	5	5	5	5	5	5	5	5
	E	37	5	5	5	5	5	5	5	5
	F	38	5	5	5	5	5	5	5	5
	G	39	5	5	5	5	5	5	5	5
	H	130	5	5	5	5	5	5	5	5
12.5%	A	41	5	5	5	5	5	5	5	5
	B	42	5	5	5	5	5	5	5	5
	C	43	5	5	5	5	5	5	5	5
	D	44	5	5	5	5	5	5	5	5
	E	45	5	5	5	5	5	5	5	5
	F	46	5	5	5	5	5	5	5	5
	G	47	5	5	5	5	5	5	5	5
	H	48	5	5	5	5	5	5	5	5
25%	A	100	5	5	5	5	5	5	5	5
	B	101	5	5	5	5	5	5	5	5
	C	102	5	5	5	5	5	5	5	5
	D	103	5	5	5	5	5	5	5	5
	E	104	5	5	5	5	5	5	5	5
	F	105	5	5	5	5	5	5	5	5
	G	106	5	5	5	5	5	5	5	5
	H	107	5	5	5	5	5	5	5	5
Loaded by (0 hr): JD		Checked by:	JD	JD	MF	MF	JD	JD	BA	
Verified by (0 hr): BA			—	—	—	—	~~JD~~	~~JD~~	~~BA~~	
Concentrations prepared by:			JD	BA	MF	MF	JD	JD	—	

Comments:

revised 7/15/08 MF

Test Page 2 of 10

00_002
PAGE

Appendix B. (continued)

Chronic Survival Benchsheet

A. bahia SOP TA07_15

Start Date: 12/4/08 Time: 1330
End Date: 12-16-08 Time: 1315

Facility ID: Dunes Community Development District
LIMS Sample # 1151711 (1st sample)

Concentration:

D = dead M = missing

			TEST DAY							
Concentration	Replicate	Chamber	0	1	2	3	4	5	6	7
50%	A	108	5	5	5	5	5	5	5	5
	B	109	5	5	5	5	5	5	5	4 1D
	C	110	5	5	5	5	5	5	5	5
	D	111	5	5	5	5	5	5	5	5
	E	112	5	5	5	5	5	5	5	5
	F	113	5	5	5	5	5	5	5	4 1D
	G	114	5	5	5	5	5	5	5	5
	H	116	5	5	5	5	5	5	5	5
100%	A	119	5	4 1D	1 3D	0 1D	–			
	B	120	5	4 1D	0 4D	—	–			
	C	121	5	4 1D	0 4D	–	–			
	D	122	5	3 2D	1 2D	1	0 1D			
	E	123	5	5	1 4D	1	0 1D			
	F	124	5	5	2 3D	1 1D	0 1D			
	G	127	5	5	1 4D	0 1D	–			
	H	Tox132	5	3 2D	2 1D	2	0 2D			
Salt control	A	tox135	5	5	5	5	5	5	5	5
	B	tox136	5	5	5	5	5	5	5	5
	C	tox137	5	5	5	5	5	5	5	5
	D	tox138	5	5	5	5	5	5	5	5
	E	tox9	5	5	5	5	5	5	5	5
	F	tox7	5	5	5	5	5	5	5	5
	G	tox15	5	5	5	5	5	5	5	5
	H	tox2	5	5	5	5	5	5	5	5
	A		5							
	B		5							
	C		5							
	D		5							
	E		5							
	F		5							
	G		5							
	H		5							
Loaded by (0 hr): JD		Checked by*:		JD	JD	MF	MF	JD	JD	BB
Verified by (0 hr): BA										

Comments:

revised 7/15/08 MF

Test Page 3 of 10

PAGE 00 003

Appendix B. (continued)

A. bahia Chronic Parameters Benchsheet
SOP TA07_15

Start Date: 12.9.08 Time: 1330 Facility ID: Dunes Community Development District
End Date: 12-16 08 Time: 1315 LIMS Sample # 1151711 (1st sample)

Test Day		Before Renewal						Test Start and After Renewal					
↓	Conc	Test Rep	pH (su)	Temp (°C)	DO (mg/L)	Cond (mmhos-cm)	Sal (ppth)	Test Rep	pH (su)	Temp (°C)	DO (mg/L)	Cond (mmhos-cm)	Sal (ppth)
Day 0	Control							A	8.4	24.7	6.8	31.2 mf	19.5
	6.25%							A	8.3	24.9	6.7	31.7 mf	19.7
	12.5% mf							A	8.3	25.0	6.7	31.7	19.7
	25%							A	8.1	25.1	6.8	31.6	19.7
	50%							A	7.9	25.4	6.8	31.7	19.6
	100%							A	7.5	25.8	6.6	31.7	19.6
	SALT							A	8.3	25.3	6.7	32.8	20.4
	Measured by:								MF	MF	MF	MF	MF
	Recorded by:								MF	MF	MF	MF	MF
		Rep	pH	Temp	DO	Cond	Sal	Rep	pH	Temp	DO	Cond	Sal
Day 1	Control	B	8.2	24.5	5.0	31.9	19.8	B	8.3	24.0	6.0	31.1	19.3
	6.25 %	B	8.1	24.0	4.7	32.3	20.2	B	8.2	24.0	6.0	31.4	19.6
	12.5 %	B	8.1	24.2	5.0	32.6	20.5	B	8.2	24.0	5.8	31.4	19.6
	25 %	B	8.1	24.6	5.3	32.5	20.3	B	8.2	24.0	5.8	31.9	20.0
	50 %	B	8.1	24.7	5.2	32.4	20.3	B	8.0	24.0	5.8	31.9	20.0
	100%	B	8.0	24.6	5.2	32.2	20.1	B	7.9	24.2	5.9	32.6	20.4
	SALT	B	8.4	24.7	5.3	32.3	20.3	B	8.4	24.3	5.8	31.3	19.8
	Measured by:		JS	JS	JS	JS	JS		JS	JS	JS	JS	JS
	Recorded by:		JS	JS	JS	JS	JS		JS	JS	JS	JS	JS
	Conc	Rep	pH	Temp	DO	Cond	Sal	Rep	pH	Temp	DO	Cond	Sal
Day 2	Control	C	8.2	24.8	5.6	33.3	20.8	C	8.4	24.0	6.4	32.7	20.4
	6.25 %	C	8.1	24.7	5.2	32.7	20.5	C	8.3	24.0	6.5	32.7	20.3
	12.5 %	C	8.2	25.3	5.2	34.3	21.4	C	8.3	24.0	6.5	32.8	20.4
	25 %	C	8.2	24.8	5.3	33.5	20.9	C	8.2	24.2	6.5	32.7	20.4
	50 %	C	8.1	24.4	5.8	33.7	21.1	C	8.1	24.7	6.4	32.8	20.5
	100%	C	8.1	24.4	5.8	35.0	22.1	C	7.9	24.8	6.3	33.3	20.8
	SALT	C	8.3	24.6	5.8	31.8	19.9	C	8.4	25.9	7.0	32.2	20.5
	Measured by:		JS	JS	JS	JS	JS		MF	MF	MF	MF	MF
	Recorded by:		JS	JS	JS	JS	JS		MF	MF	MF	MF	MF
	Conc	Rep	pH	Temp	DO	Cond	Sal	Rep	pH	Temp	DO	Cond	Sal
Day 3	Control	D	8.2	24.4	5.6	32.6	19.9	D	8.3	24.0	6.7	31.9	19.8
	6.25 %	D	8.2	24.4	5.7	32.0	20.0	D	8.3	24.0	6.7	31.8	19.8
	12.5 %	D	8.2	24.3	5.7	32.5	20.2	D	8.3	24.0	6.5	31.8	19.8
	25 %	D	8.2	24.2	5.7	32.6	20.3	D	8.2	24.0	6.5	31.7	19.7
	50 %	D	8.2	24.2	5.6	32.3	20.2	D	8.0	24.0	6.5	31.6	19.7
	100%	D	8.1	24.2	5.7	32.4	20.5	D	7.9	24.0	6.5	31.6	19.7
	salt ctrl	D	8.3	24.5	6.0	32.8	20.4	D	8.4	24.0	6.5	32.3	20.1
	Measured by:		MF	MF	MF	MF	MF		BA	BA	BA	BA	BA
	Recorded by:		MF	MF	MF	MF	MF		BA	BA	BA	BA	BA

conc = concentration rep = replicate cond = conductivity Sal = salinity

Comments:

revised 6/11/07 MF

Appendix B. (continued)

A. bahia Chronic Parameters Benchsheet
SOP TA07_15

Start Date: 12-9-08 Time: 1330 Facility ID: Dunes Community Development District
End Date: 12-16-08 Time: 1315 LIMS Sample # 1151711 (1st sample)

Test Day		Before Renewal						Test Start and After Renewal					
	Conc	Test Rep	pH (su)	Temp (°C)	DO (mg/L)	Cond (mmhos-cm)	Sal (ppth)	Test Rep	pH (su)	Temp (°C)	DO (mg/L)	Cond (mmhos-cm)	Sal (ppth)
Day 4	Control	E	8.2	24.3	5.3	32.0	20.2	E	8.3	24.8	6.5	33.2	19.5
	6.25 %	E	8.2	24.9	5.2	33.2	20.5	E	8.3	24.4	6.5	33.1	20.7
	12.5 %	E	8.2	24.9	5.3	32.8	20.4	E	8.4	24.5	6.5	32.7	20.8
	25 %	E	8.1	24.5	5.2	32.2	20.1	E	8.3	24.7	6.4	32.7	19.9
	50 %	E	8.1	24.5	5.1	32.4	20.1	E	8.4	24.8	6.4	32.4	19.9
	100 %	E	8.1	24.8	5.5	32.5	20.2	E	—	—	—	—	—
	Salt	E	8.2	24.5	4.8	32.4	20.2	E	8.4	25.1	6.5	32.2	20.0
	Measured by:		MF	MF	MF	MF	MF		MF	MF	MF	MF	MF
	Recorded by:		MF	MF	MF	MF	MF		MF	MF	MF	MF	MF
		Rep	pH	Temp	DO	Cond	Sal	Rep	pH	Temp	DO	Cond	Sal
Day 5	Control	F	8.3	25.2	6.4	32.2	20.1	F	8.3	24.0	6.6	31.7	20.1
	6.25 %	F	8.2	24.4	5.8	34.4	21.4	F	8.3	24.1	6.5	33.8	20.9
	12.5 %	F	8.3	24.3	5.9	33.8	21.1	F	8.3	24.3	6.5	33.3	20.3
	25 %	F	8.2	24.7	5.9	34.3	21.4	F	8.2	24.2	6.5	33.4	20.4
	50 %	F	8.2	24.9	5.9	32.6	20.4	F	8.1	24.0	6.6	32.1	20.1
		F						F					
	Salt Ctl	F	8.3	24.7	5.9	33.0	20.6	F	8.4	24.0	6.6	32.4	20.4
	Measured by:		JB	JB	JB	JB	JB		JB	JB	JB	JB	JB
	Recorded by:		JB	JB	JB	JB	JB		JB	JB	JB	JB	JB
	Conc	Rep	pH	Temp	DO	Cond	Sal	Rep	pH	Temp	DO	Cond	Sal
Day 6	Control	G	8.2	24.3	6.0	31.6	19.6	G	8.3	24.0	6.4	33.4	20.9
	6.25 %	G	8.3	24.3	6.0	35.2	22.1	G	8.3	24.0	6.2	34.1	21.4
	12.5 %	G	8.3	24.5	5.9	32.5	20.4	G	8.3	24.0	6.2	33.6	21.0
	25 %	G	8.2	24.3	5.9	32.1	20.2	G	8.2	24.0	6.3	33.3	20.8
	50 %	G	8.2	24.2	5.9	32.4	20.3	G	8.2	24.1	6.4	33.3	20.8
		G						G					
	Salt Ctl	G	8.3	24.2	5.9	33.1	20.7	G	8.3	24.1	6.5	33.0	20.6
	Measured by:		BA	BA	BA	BA	BA		BA	BA	BA	BA	BA
	Recorded by:		BA	BA	BA	BA	BA		BA	BA	BA	BA	BA
	Conc	Rep	pH	Temp	DO	Cond	Sal	Rep	pH	Temp	DO	Cond	Sal
Day 7	Control							H	8.2	24.4	5.8	34.1	21.3
	6.25 %							H	8.2	25.0	5.7	35.1	22.0
	12.5 %							H	8.3	24.5	5.7	34.3	21.5
	25 %							H	8.3	24.4	5.6	34.0	21.3
	50 %							H	8.3	24.8	5.7	34.3	21.5
								H	—	—	—	—	—
	SALT							H	8.3	25.1	5.7	33.9	21.2
	Measured by:								BA	BA	BA	BA	BA
	Recorded by:								BA	BA	BA	BA	BA

conc = concentration rep = replicate cond = conductivity Sal = salinity

Comments:

revised 6/11/07 MF

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Appendix B. (continued)

Chronic Test Weighing Benchsheet

A. bahia

SOPs TA07_15 and TA06_21

Facility ID: Dunes Community Development District

LIMS Sample # 1151711 (1st sample)

mean wt =Mysid wt divided by 5

convert g to mg: move decimal 3 places to right

Concentration	Replicate	Pan #	Pan wt. (g)	Pan + mysid (g)	Mysid wt. (g)	Original # mysids	Mean wt. (mg)
Control	A	77	0.02152	0.02309	0.00157	5	0.314
	B	78	0.02103	0.02261	0.00153	5	0.306
	C	79	0.02239	0.02359	0.00120	5	0.240
	D	80	0.02111	0.02257	0.00146	5	0.292
	E	81	0.02239	0.02417	0.00178	5	0.356
	F	82	0.02358	0.02489	0.00131	5	0.262
	G	83	0.02311	0.02459	0.00148	5	0.296
	H	84	0.02303	0.02438	0.00135	5	0.270
6.25	A	85	0.02123	0.02235	0.00112	5	0.224
	B	86	0.02159	0.02295	0.00136	5	0.272
	C	87	0.02382	0.02510	0.00128	5	0.256
	D	88	0.02549	0.02682	0.00133	5	0.266
	E	89	0.02336	0.02502	0.00166	5	0.332
	F	90	0.02383	0.02539	0.00156	5	0.312
	G	91	0.02447	0.02575	0.00128	5	0.256
	H	92	0.02294	0.02435	0.00141	5	0.282
12.5	A	93	0.02363	0.02506	0.00143	5	0.286
	B	94	0.02189	0.02319	0.00130	5	0.260
	C	95	0.02190	0.02321	0.00131	5	0.262
	D	96	0.02067	0.02226	0.00159	5	0.318
	E	97	0.02233	0.02381	0.00148	5	0.296
	F	98	0.02121	0.02263	0.00142	5	0.284
	G	99	0.02152	0.02283	0.00131	5	0.262
	H	100	0.02256	0.02370	0.00114	5	0.228
25	A	101	0.02344	0.02464	0.00120	5	0.240
	B	102	0.02145	0.02304	0.00159	5	0.318
	C	103	0.02152	0.02287	0.00135	5	0.270
	D	104	0.02154	0.02372	0.00178	5	0.356
	E	105	0.02150	0.02271	0.00121	5	0.242
	F	106	0.02284	0.02421	0.00137	5	0.274
	G	107	0.02091	0.02231	0.00140	5	0.280
	H	108	0.02115	0.02260	0.00145	5	0.290
Weighed by initials:							

Comments:

S-Weights: BIO-S-WEIGHTS-01

Balance: Ohaus 250D Ser# 1125481084

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Appendix B. (continued)

Chronic Test Weighing Benchsheet

A. bahia

SOPs TA07_15 and TA06_21

Facility ID: Dupes Community Development District

LIMS Sample # 1151711 (1st sample)

mean wt =Mysid wt divided by 5

convert g to mg: move decimal 3 places to right

Concentration	Replicate	Pan #	Pan wt. (g)	Pan + mysid (g)	Mysid wt. (g)	Original # mysids	Mean wt. (mg)
90 %	A	109	0.02424	0.02581	0.00157	5	0.314
	B	110	0.02304	0.02481	0.00177	5	0.354
	C	111	0.02324	0.02470	0.00146	5	0.292
	D	112	0.02324	0.02518	0.00194	5	0.388
	E	113	0.02091	0.02210	0.00119	5	0.238
	F	114	0.02127	0.02225	0.00098	5	0.196
	G	115	0.02290	0.02470	0.00180	5	0.360
	H	116	0.02307	0.02405	0.00098	5	0.196
C.H CH)	A	117	0.02139	0.02238	0.00099	5	0.198
	B	118	0.02218	0.02323	0.00105	5	0.210
	C	119	0.02170	0.02262	0.00092	5	0.184
	D	120	0.02238	0.02346	0.00108	5	0.216
	E	121	0.02113	0.02223	0.00110	5	0.220
	F	122	0.02342	0.02432	0.00090	5	0.180
	G	123	0.02165	0.02252	0.00087	5	0.174
	H	124	0.02392	0.02544	0.00152	5	0.304
	A					5	
	B					5	
	C					5	
	D					5	
	E					5	
	F					5	
	G					5	
	H					5	
	A					5	
	B					5	
	C					5	
	D					5	
	E					5	
	F					5	
	G					5	
	H					5	
Weighed by initials:			TD	TM			

Comments:

☑ S-Weights: BIO-S-WEIGHTS-01

☑ Balance: Ohaus 250D Ser# 1125481084

revised 7/15/08 MF

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Appendix B. (continued)

Chronic Test Weighing Benchsheet
Quality Control

A. bahia

SOPs TA07_15 and TA06_21

Dunes Community Development District start 12-9-08 1330

FirstLims# 1151711

All weights in grams

Empty Pan Weights Date: 12/6/08 By: JB

Weights in grams	Pan 1 wt.		Pan 1 initial wt.
after Pan 5	0.02152	@	0.02152
after Pan 10	0.02152	@	0.02152
after Pan 15	0.02152	@	0.02152
after Pan 20	0.02155	@	0.02143
after Pan 25	0.02155	@	0.02152
after Pan 30	0.02156	@	0.02152
after Pan 35	0.02155	@	0.02152
after Pan 40	0.02155	@	0.02152
after Pan 45	0.02152	@	0.02152
after Pan 48	0.02152	@	0.02152

	Measured Value (g)		S-weight Value (g)
S-weights	0.01	@	0.01
	0.03002	@	0.03

S-Weights: BIO-S-WEIGHTS-01
Balance: Ohaus 250D
Ser# 1125481084

Fish + Pan Weights Date: 12,23,08 By: JB

Weights in grams	Pan 1 wt.		Pan 1 initial wt.
after Pan 5	0.02309	@	0.02309
after Pan 10	0.02310	@	0.02309
after Pan 15	0.02313	@	0.02309
after Pan 20	0.02311	@	0.02309
after Pan 25	0.02312	@	0.02309
after Pan 30	0.02313	@	0.02309
after Pan 35	0.02312	@	0.02309
after Pan 40	0.02312	@	0.02309
after Pan 45	0.02313	@	0.02309
after Pan 48	0.02311	@	0.02309

	Measured Value (g)		S-weight Value (g)
S-weights	0.02	@	0.02
	0.05	@	0.05

Drying Oven ID: VWR #2
Temperature °C: 105
Drying Hours: 8

Note: Pan number (5, 10, etc.) refers to sequence of weighing as actual Pan #s may differ.

Comments:

revised 7/15/08 MF

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Appendix B. (continued)

Bioassay Instrument ID

Test ID: Dunes Community Development District 1st sample ED — 115174 Dates: 12-9-2008 — 12-16-2008

METER / DEVICE	ID	SOP	Parameter	Method	√used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
Accumet AR-10 pH Meter	93312105	TA06_23	pH	SM 4500 H+	✓
Mettler-Toledo SevenMulti Conductivity Meter	SN 1225117049 Probe H04257	TA06_25	Conductivity	SM 2510 B	✓
			Salinity	SM 2520 B	✓
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	✓
Thermometer (DO probe)	YSI 5750 SN 05J1720	TA06_05	Temperature	SM-2530B modified DEP SOP-001/01 FT1400	✓
Hach Pocket Colorimeter II	05050C026378	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	✓
Alkalinity (Hach Kit)	No SN	TA06_08	Alkalinity	SM 2320 B	✓
Hardness (Hach Kit)	No SN	TA06_09	Hardness	SM 2340 C	N/A
OHAUS Balance 250D	1125481084	TA06_21 TA06_27	Weight	-	✓
S-Weights	BIO-S-WEIGHTS-01	NA	Balance check	-	✓
JMRH2 Daytime	DEP1216	—	Dayton Rows	—	✓

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

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

V 1.1 6/12/08 MF

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Test Page 10 of 10 PAGE

FDEP Biology Laboratory - Chronic Bioassay Bench Sheet

Pimphales promelas or Menidia beryllina

Facility: Daes Community Development District
Address: 101 Jungle Hut Road, Palm Coast
County: Flagler 32137
NPDES Permit #: FL 0355259
Contact/District: Brian Kitts / Northeast

Test Species (circle one)
P. promelas SOP#: TA07_09 EPA-821-R-02-013 Method 1000.0
M. beryllina SOP#: TA07_14 EPA-821-R-02-014 Method 1006.0

Start Date: 12-9-08 Time: 1305
End Date: 12-16-08 Time: 1300

Diluent/ Batch: MHW /_____ Test Days Used:_____
MHW /_____ Test Days Used:_____
ASW / 12-9-08 Test Days Used: 0-1
ASW / 12-10-08 Test Days Used: 2-4
ASW 12-12-08 5-6

Organism Batch #: 12-9-08 Organism age: 10 days
Feeding Prior to Test and Daily Artemia Lot #: 38438
Chamber size: 1000 ml
Test volume: 500 ml

Artemia Batch #			
Day 0	179	Day 3	182
Day 1	180	Day 4	183
Day 2	181	Day 5	184
		Day 6	185

LIMS Entry: Date 12.29.08 Initials MF
Verification: 12.29.08 JD

Sample Received	Lab Sample #	LIMS Job #	LIMS Sample #	Collection Date/Time	Received Date/Time
Test Day 0	1	TLH-2008-12-09-03	1151711	12-8-08 1220	12-9-08 / 1040
Test Day 2	2	TLH-2008-12-11-76	1153038	12-10-08 0900	12-11-08 / 1321
Test Day 4	3	TLH-2008-12-15-01	1153498	12-12-08 1020	12-13-08 / 0820

Water Quality Parameters	Batch #	12-9-08 MHW ☐ ASW ☑	12-10-08 MHW ☐ ASW ☑	NA Sample 1 1151711	NA Sample 2 1153038	NA Sample 3 1153498	Other: ASW 12-12-08	Measured by:	Verified by:
Field Total Residual Cl_2 (mg/L):		NA	NA	Not	measured		NA	NA	MF
Lab Total Residual Cl_2 (mg/L):		<0.03	<0.03	0.04	0.085	0.035	<0.03	SD/MF	MF/BA
Alkalinity (mg/L as $CaCO_3$):		245	200	354	441	531	200	BA	MF
Hardness (mg/L as $CaCO_3$):		—	—	—	—	—	—	—	—
Total Ammonia (mg/L as N):		<0.034	<0.034	0.239	<0.034	<0.034	<0.034	MF	BA
Conductivity: µmhos (mmhos):		31.2	~~18.04 31.2~~	18.04	20.3	25.1	20.1 mS	BA/SD/MF	MF/BA
Salinity (ppth):		19.5 (BA)	~~10.6 19.5~~	10.6	12.12	15.2	32.2	BA/SD/MF 12-16-08	MF/BA
adjusted Salinity @			~~19.9~~ NA	19.6	20.2				

SAmple #3 adjusted salinity = 20.2 ppth mf 12/13/08

Temperature Shipped ≤6° C (all samples) (yes) no
Holding Time ≤36 hours (yes) no
Light Intensity : 50 - 100 ft. candles
Photoperiod : 16 light 8 dark

Temperature Range °C: (if used)
Incubator # 2 min. 25.1 max. 26.2 mean 25.6
Water bath # ____ min.____ max.____ mean____
Room B246 min. 23.4 max. 26.2 mean 25.3

Test Incubated in: ☑ Incubator #: 2 ☐ Waterbath #:____

Investigators' signatures
Jason David
Marshall Faircloth
Brad Allen
REVIEWER Loretta L. Wolfe

Statistics	
Control %cv:	13%
Dunnetts PMSD:	27.2%
Survival NOEC:	25%
Survival LOEC:	50%
Growth NOEC:	100%
Growth LOEC:	100%

mf 1-5-09
25%*
50%

Comments: (A) ASW 12-10-08 20.4 ppth Salinity 32.7 mmhos-cm Conductivity mf 12-16-08
12-16-08 Sample 2 and Sample 3 had residual chlorine likely the result of interference with the sample - precipitate formed when powder added, partially purple # 3. mf 12-16-08
Interrupted Dose response for Survival.
* No observed effect for growth is 25% since survival effect concentration not included in calculations - mf 1-5-09

revised 7/15/08 MF

Appendix B. (continued)

Chronic Bioassay Survival Benchsheet

Facility: Dunes Community Development District

LIMS Sample Number: 1151711
(for Lab Sample # 1)

Department of Environmental Protection
Biology Laboratory Chronic Screening Bioassay
P. promelas SOP TA07_09 *M. beryllina* SOP TA07_14

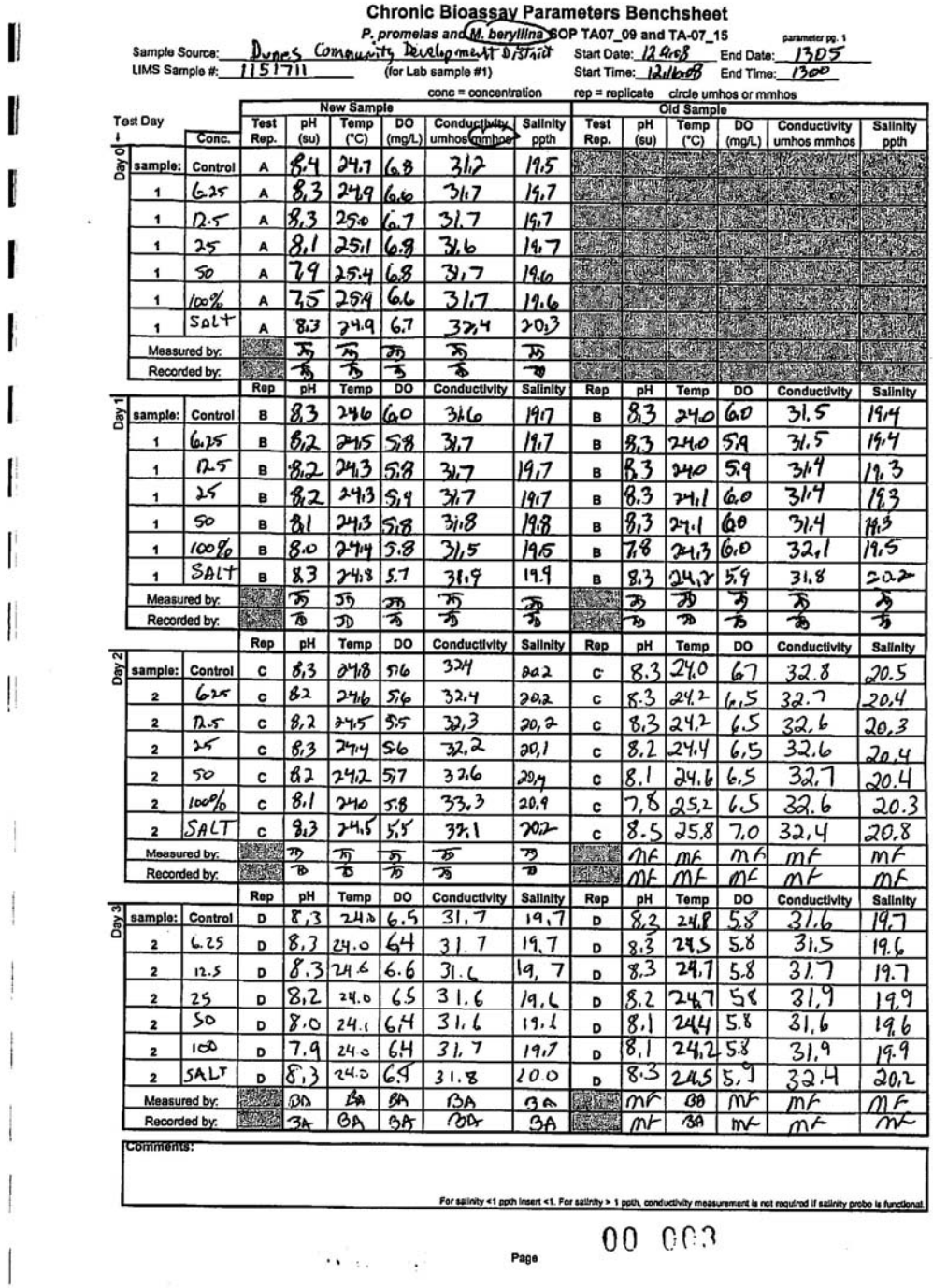
Organism: *P. promelas* (*M.beryllina*) (circle one)

		TEST DAY							
Concentration	Replicate	0	1	2	3	4	5	6	7
Control	A	10	10	10	10	10	10	10	10
	B	10	9 10	9	9	9	9	9	9
	C	10	9 10	9	9	9	9	9	9
	D	10	9 10	9	8 1D	8	8	8	8
Sample 6.25%	A	10	10	8 3D	8	8	8	8	8
	B	10	8 2D	7 1D	6 1D	6	6	6	6
	C	10	9 1D	8 1D	8	8	8	8	8
	D	10	9 1D	7 2D	7	7	7	7	7
Sample 12.5%	A	10	9 1D	6 3D	6	6	6	6	6
	B	10	10	8 2D	8	8	8	8	8
	C	10	9 1D	7 2D	7	7	7	7	7
	D	10	10	6 4D	6	6	6	6	6
Sample 25 %	A	10	9 1D	8 1D	8	8	8	8	8
	B	10	7 3D	6 1D	6	6	6	6	6
	C	10	7 3D	4 3D	4	4	4	4	4
	D	10	10	9 1D	9	9	9	9	9
Sample 50 %	A	10	5 3D	4 1D	4	4	4	4	4
	B	10	8 2D	5 3D	5	5	5	5	5
	C	10	9 1D	8 1D	8	8	8	8	8
	D	10	10	6 4D	6	6	6	6	6
Sample 100 %	A	10	10	9 1D	9	9	9	9	9
	B	10	10	9 1D	8 1D	8	8	8	8
	C	10	10	7 3D	5 2D	5	5	5	5
	D	10	10	9 1D	9	9	9	9	9
Sample % Salt Control	A	10	10	10	9 1D	9	9	9	9
	B	10	10	10	9 1D	9	9	9	9
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
Loaded by: TD	Checked by: [redacted]		TD	TD	BA	BA	MF	TD	TD
Verified by: MF									

Comments:

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Appendix B. (continued)



Chronic Bioassay Parameters Benchsheet

P. promelas and *M. beryllina* SOP TA07_09 and TA-07_15 parameter pg. 1

Sample Source: Dunes Community Development District — Start Date: 12/4/08 — End Date: 12/5

LIMS Sample #: 1151711 (for Lab sample #1) — Start Time: 12:40:08 — End Time: 13:00

conc = concentration — rep = replicate — circle umhos or mmhos

Test Day		Conc.	New Sample: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos/mmhos	Salinity ppth	Old Sample: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth
Day 0	sample:	Control	A	8.4	24.7	6.8	31.2	19.5						
	1	6.25	A	8.3	24.9	6.6	31.7	19.7						
	1	12.5	A	8.3	25.0	6.7	31.7	19.7						
	1	25	A	8.1	25.1	6.8	31.6	19.7						
	1	50	A	7.9	25.4	6.8	31.7	19.60						
	1	100%	A	7.5	25.4	6.6	31.7	19.6						
	1	SALT	A	8.3	24.9	6.7	32.4	20.3						
	Measured by:			JD	JD	JD	JD	JD						
	Recorded by:			JD	JD	JD	JD	JD						
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 1	sample:	Control	B	8.3	24.6	6.0	31.6	19.7	B	8.3	24.0	6.0	31.5	19.4
	1	6.25	B	8.2	24.5	5.8	31.7	19.7	B	8.3	24.0	5.9	31.5	19.4
	1	12.5	B	8.2	24.3	5.8	31.7	19.7	B	8.3	24.0	5.9	31.4	19.3
	1	25	B	8.2	24.3	5.9	31.7	19.7	B	8.3	24.1	6.0	31.4	19.3
	1	50	B	8.1	24.3	5.8	31.8	19.8	B	8.3	24.1	6.0	31.4	19.3
	1	100%	B	8.0	24.4	5.8	31.5	19.5	B	7.8	24.3	6.0	32.1	19.5
	1	SALT	B	8.3	24.8	5.7	38.9	19.9	B	8.3	24.2	5.9	31.8	20.2
	Measured by:			JD	JD	JD	JD	JD		JD	JD	JD	JD	JD
	Recorded by:			JD	JD	JD	JD	JD		JD	JD	JD	JD	JD
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 2	sample:	Control	C	8.3	24.8	5.6	32.4	20.2	C	8.3	24.0	6.7	32.8	20.5
	2	6.25	C	8.2	24.6	5.6	32.4	20.2	C	8.3	24.2	6.5	32.7	20.4
	2	12.5	C	8.2	24.5	5.5	32.3	20.2	C	8.3	24.2	6.5	32.6	20.3
	2	25	C	8.3	24.4	5.6	32.2	20.1	C	8.2	24.4	6.5	32.6	20.4
	2	50	C	8.2	24.2	5.7	32.6	20.4	C	8.1	24.6	6.5	32.7	20.4
	2	100%	C	8.1	24.0	5.8	33.3	20.9	C	7.8	25.2	6.5	32.6	20.3
	2	SALT	C	8.3	24.5	5.5	32.1	20.2	C	8.5	25.8	7.0	32.4	20.8
	Measured by:			JD	JD	JD	JD	JD		MF	MF	MF	MF	MF
	Recorded by:			JD	JD	JD	JD	JD		MF	MF	MF	MF	MF
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 3	sample:	Control	D	8.3	24.8	6.5	31.7	19.7	D	8.3	24.8	5.8	31.6	19.7
	2	6.25	D	8.3	24.0	6.4	31.7	19.7	D	8.3	24.5	5.8	31.5	19.6
	2	12.5	D	8.3	24.6	6.6	31.6	19.7	D	8.3	24.7	5.8	31.7	19.7
	2	25	D	8.2	24.0	6.5	31.6	19.6	D	8.2	24.7	5.8	31.9	19.9
	2	50	D	8.0	24.1	6.4	31.6	19.6	D	8.1	24.4	5.8	31.6	19.6
	2	100	D	7.9	24.0	6.4	31.7	19.7	D	8.1	24.2	5.8	31.9	19.9
	2	SALT	D	8.3	24.0	6.4	31.8	20.0	D	8.3	24.5	5.9	32.4	20.2
	Measured by:			BA	BA	BA	BA	BA		MF	BA	MF	MF	MF
	Recorded by:			BA	BA	BA	BA	BA		MF	BA	MF	MF	MF

Comments:

For salinity <1 ppth insert <1. For salinity > 1 ppth, conductivity measurement is not required if salinity probe is functional.

00 003

Page

Appendix B. (continued)

Chronic Bioassay Parameters Benchsheet

P. promelas and M. beryllina SOP TA07_09 and TA-07_15 parameter pg. 2

Sample Source: Dunes Community Development District — Start Date: 12-9-08 — End Date: 12/16/08

LIMS Sample #: 151711 (for Lab sample #1) — Start Time: 1305 — End Time: 1300

conc = concentration — rep = replicate

Test Day ↓		Conc.	New Sample: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos/mmhos	Salinity ppth	Old Sample: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos/mmhos	Salinity ppth
Day 4	sample:	Control	A	8.4	24.7	6.5	31.8	20.0	A	8.2	24.3	6.1	32.0	19.8
	3	6.25	A	8.3	24.7	6.5	32.1	20.1	A	8.2	24.5	5.9	31.6	19.7
	3	12.5	A	8.2	24.7	6.4	32.1	20.1	A	8.2	24.7	5.8	31.6	19.7
	3	25	A	8.2	24.7	6.5	31.9	20.1	A	8.2	24.6	5.8	31.3	19.7
	3	50	A	8.1	24.6	6.5	31.9	19.9	A	8.1	24.6	5.7	31.4	19.5
	3	100	A	7.7	24.5	6.5	32.0	20.0	A	8.1	24.7	5.7	31.4	19.4
	3	SALT	A	8.3	24.6	6.6	32.1	20.0	A	8.3	24.6	5.7	32.4	20.1
	Measured by:			MF	MF	MF	MF	MF		BA	BA	BA	BA	BA
	Recorded by:			MF	MF	MF	MF	MF		BA	BA	BA	BA	BA
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 5	sample:	Control	B	8.3	24.0	6.1	32.5	20.1	B	8.3	24.0	6.4	31.7	20.1
	3	6.25	B	8.3	24.1	5.8	32.7	20.5	B	8.3	24.1	6.6	33.8	20.9
	3	12.5	B	8.3	24.2	5.6	32.6	20.4	B	8.3	24.2	6.6	32.6	20.3
	3	25	B	8.2	24.1	5.8	32.6	20.4	B	8.2	24.1	6.6	32.3	20.4
	3	50	B	8.2	24.1	5.7	32.9	20.7	B	8.2	24.3	6.7	32.4	20.1
	3	100%	B	8.1	24.1	5.4	32.9	20.7	B	8.0	24.2	6.6	32.1	20.0
	3	SALT (ctrl)	B	8.3	24.1	6.0	32.6	20.4	B	8.4	24.0	6.7	32.2	20.1
	Measured by:			TS	TS	TS	TS	TS		TS	TS	TS	TS	TS
	Recorded by:			TS	TS	TS	TS	TS		TS	TS	TS	TS	TS
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 6	sample:	Control	C	8.3	24.0	6.4	31.4	19.3	C	8.3	24.0	6.0	33.4	20.8
	3	6.25	C	8.2	24.0	5.5	33.2	20.7	C	8.3	24.0	6.2	33.7	21.1
	3	12.5	C	8.3	24.0	5.4	33.3	20.8	C	8.3	24.0	6.3	33.6	21.0
	3	25	C	8.2	24.0	5.6	32.9	20.6	C	8.2	24.0	6.5	33.5	20.1
	3	50	C	8.2	24.0	5.7	32.8	20.5	C	8.1	24.0	6.5	33.0	20.6
	3	100%	C	8.1	24.0	5.7	32.2	20.0	C	8.0	24.0	6.5	32.0	19.9
	3	SALT (ctrl)	C	8.3	24.0	5.7	32.1	20.0	C	8.3	24.0	6.5	32.7	20.4
	Measured by:			TS	TS	TS	TS	TS		BA	BA	BA	BA	BA
	Recorded by:			TS	TS	TS	TS	TS		BA	BA	BA	BA	BA
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 7	sample:	Control							D	8.2	24.4	5.7	33.7	21.0
	3	6.25							D	8.2	24.3	5.6	33.9	21.3
	3	12.5							D	8.2	24.5	5.6	34.0	21.3
	3	25							D	8.2	24.5	5.7	33.8	21.2
	3	50							D	8.2	24.5	5.7	33.8	20.8
	3	100%							D	8.1	24.4	5.7	32.2	20.1
	3	SALT (ctrl)							D	8.2	24.5	5.6	33.0	20.6
	Measured by:									TS	TS	TS	TS	TS
	Recorded by:									TS	TS	TS	TS	TS

Comments:

For salinity <1 ppth insert <1. For salinity > 1 ppth, conductivity measurement is not required if salinity probe is functional

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Appendix B. (continued)

Chronic Definitive Bioassay Weighing Benchsheet

Facility: Dunes Community Development District

LIMS Sample Number: 115711
(for Lab Sample # 1)

P. promelas and *M. beryllina* Bench Sheet
SOP TA06_21

Concentration	Replicate	Pan #	Pan wt. g	Pan + Fish g	Fish wt. g	Original # Fish	Mean wt. mg
			mean wt = fish wt divided by 10 convert g to mg: move decimal 3 places to right				
Control	A	17	~~0.02138~~ 0.02138	0.03050	0.00912	10	0.912
	B	19	0.02140	0.02929	0.00789	10	0.789
	C	19	0.02421	0.03361	0.00940	10	0.940
	D	20	0.02702	0.03786	0.01084	10	1.09
sample 62.5 %	A	21	0.02290	0.03156	0.00866	10	0.866
	B	22	0.02222	0.03175	0.00953	10	0.953
	C	23	0.02236	0.03183	0.00947	10	0.947
	D	24	0.01963	0.02823	0.00860	10	0.860
sample 125 %	A	25	0.02296	0.02917	0.00621	10	0.621
	B	26	0.02109	0.03069	0.00960	10	0.960
	C	27	0.02165	0.03122	0.00957	10	0.957
	D	28	0.02245	0.03165	0.00920	10	0.920
sample 25 %	A	29	0.02213	0.03124	0.00911	10	0.911
	B	30	0.02118	0.02840	0.00722	10	0.722
	C	31	0.02165	0.02779	0.00614	10	0.614
	D	32	0.02184	0.03364	0.01180	10	1.18
sample 50 %	A	33	0.01962	0.02520	0.00558	10	0.558
	B	34	0.02418	0.03098	0.00680	10	0.680
	C	35	0.02082	0.02936	0.00854	10	0.854
	D	36	0.02255	0.03024	0.00769	10	0.769
sample 100 %	A	37	0.02476	0.03292	0.00816	10	0.816
	B	38	0.02258	0.03090	0.00832	10	0.832
	C	39	0.02245	0.02909	0.00664	10	0.664
	D	40	0.02326	0.03220	0.00894	10	~~0.894~~ 0.894
sample %	A	41	0.02362	~~0.03306~~ 0.03306	0.00944	10	0.944
Salt Ctrl	B	42	0.02093	0.02788	0.00695	10	0.695
	C	43	0.02514	0.03441	0.00927	10	0.927
	D	44	0.02297	0.03224	0.00927	10	0.927
	Weighed by initials:		[illegible]	[illegible]	revised 7/16/08 mf		

Comments:

Balance: Ohaus 250D Ser# 1125481084
S-Weights: BIO-S-Weights-01

Note: Pan number (#) refers to actual Pan number.

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Appendix B. (continued)

Chronic Bioassay Weighing Benchsheet

Quality Control

Facility: Duwes Community Development District

LIMS Sample Number: 115111 (for Lab Sample # 1)

P. promelas and M. beryllina **Bench sheet**

SOPs TA07_09, TA07_14 and TA06_21

Drying Oven ID:	WVR # 2	Tare weighed by:	JB
Temperature °C:	100.2	Final weighed by:	JB
Hours:	8		
Tare Weighing Date: 12-15-08	Final Weighing Date: 12-23-08		

		Measured Value (g)		S-weight Value (g)
Tare Pan 1 after Pan 5 (g)	0.02138 @ 0.02138	S-weights	0.00994	@ 0.010
Tare Pan 1 after Pan 10 (g)	0.02135 @ 0.02138	at tare	0.002997	@ 0.003
Tare Pan 1 after Pan 15 (g)	0.02137 @ 0.02138	S-weights	0.01991	@ 0.02
Tare Pan 1 after Pan 20 (g)	0.02141 @ 0.02138	at final	0.05004	@ 0.05
Tare Pan 1 after Pan 25 (g)	0.02141 @ 0.02138			
Tare Pan 1 after Pan 30 (g)	0.02140 @ 0.02138	Balance: Ohaus 250D Ser# 1125481084		
Tare Pan 1 after Pan 35 (g)	0.02141 @ 0.02138	S-Weights: BIO-S-Weights-01		
Tare Pan 1 after Pan 40 (g)	@			
Tare Pan 1 after Pan 45 (g)	@			
Tare Pan 1 after Pan 48 (g)	@			
Final Pan 1 after Pan 5 (g)	0.03052 @ 0.03052			
Final Pan 1 after Pan 10 (g)	0.03052 @ 0.03052			
Final Pan 1 after Pan 15 (g)	0.03055 @ 0.03052			
Final Pan 1 after Pan 20 (g)	0.03054 @ 0.03052			
Final Pan 1 after Pan 25 (g)	0.03055 @ 0.03052			
Final Pan 1 after Pan 30 (g)	0.03057 @ 0.03052			
Final Pan 1 after Pan 35 (g)	0.03057 @ 0.03052			
Final Pan 1 after Pan 40 (g)	@			
Final Pan 1 after Pan 45 (g)	@			
Final Pan 1 after Pan 48 (g)	@			

Note: Pan numbers (5, 10, etc.) for Tare and Final refers to sequence of weighing as actual Pan #s may differ.

Comments:

revised 7/16/08 MF

Page 00 006

Appendix B. (continued)

Bioassay Instrument ID

Sample #'s — 11s1711

Test ID: Dunes Community Development District Dates: 12-9-08 — 12-16-08

METER / DEVICE	ID	SOP	Parameter	Method	√used	
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	✓	
Accumet AR-10 pH Meter	93312105	TA06_23	pH	SM 4500 H+	✓	
Mettler-Toledo SevenMulti Conductivity Meter	SN 1225117049 Probe H04257	TA06_25	Conductivity/Salinity	SM 2510 B 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	✓	hardness not measured (high conductivity)
OHAUS Balance 250D	1125481084	TA06_21 TA06_27	Weight	-	✓	
S-Weights (2) (corrected to 126.1g)	BIO-S-WEIGHTS-01	NA	Balance check	-	✓	
VMR #1 Dan Gowen	FDEP 126 126	—	Weights/Dupes	—	✓	

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

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

V 1.1 6/12/08 MF

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Appendix C. SRT Bench Sheets and Statistical Analysis

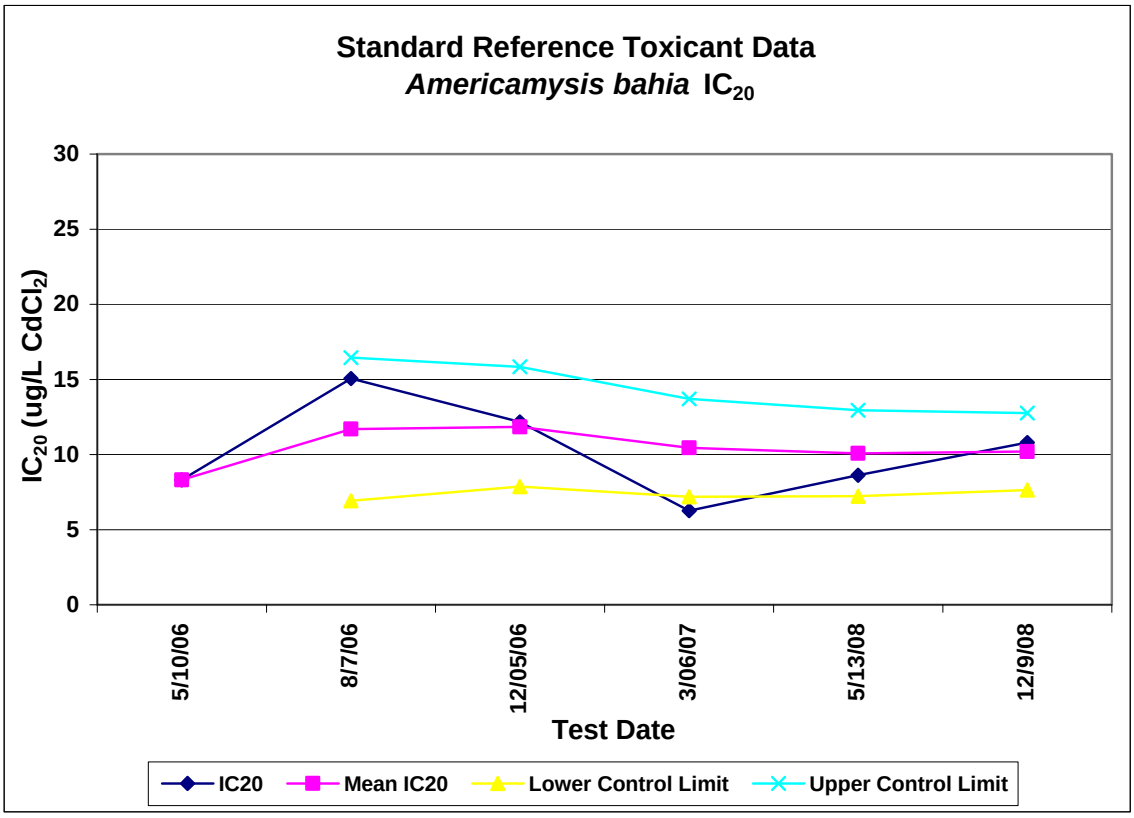
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 7-Day Chronic Toxicity

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

Date	IC20	Mean IC20	Std Dev	Lower Control Limit	Upper Control Limit
5/10/06	8.3284	11.70			
8/7/06	15.064	15.06	2.38	10.30	19.83
12/05/06	12.168	13.62	1.02	11.57	15.66
3/06/07	6.27	11.17	1.97	7.23	15.11
5/13/08	8.63	10.53	2.12	6.30	14.76
12/9/08	10.8	10.59	2.04	6.51	14.67

Fewer than 20 chronic SRTs (cadmium) have been performed for this species.
Lower Confidence Limit = mean - 2 * Std Dev
Upper Confidence Limit = mean + 2 * Std Dev %CV = 12.5%



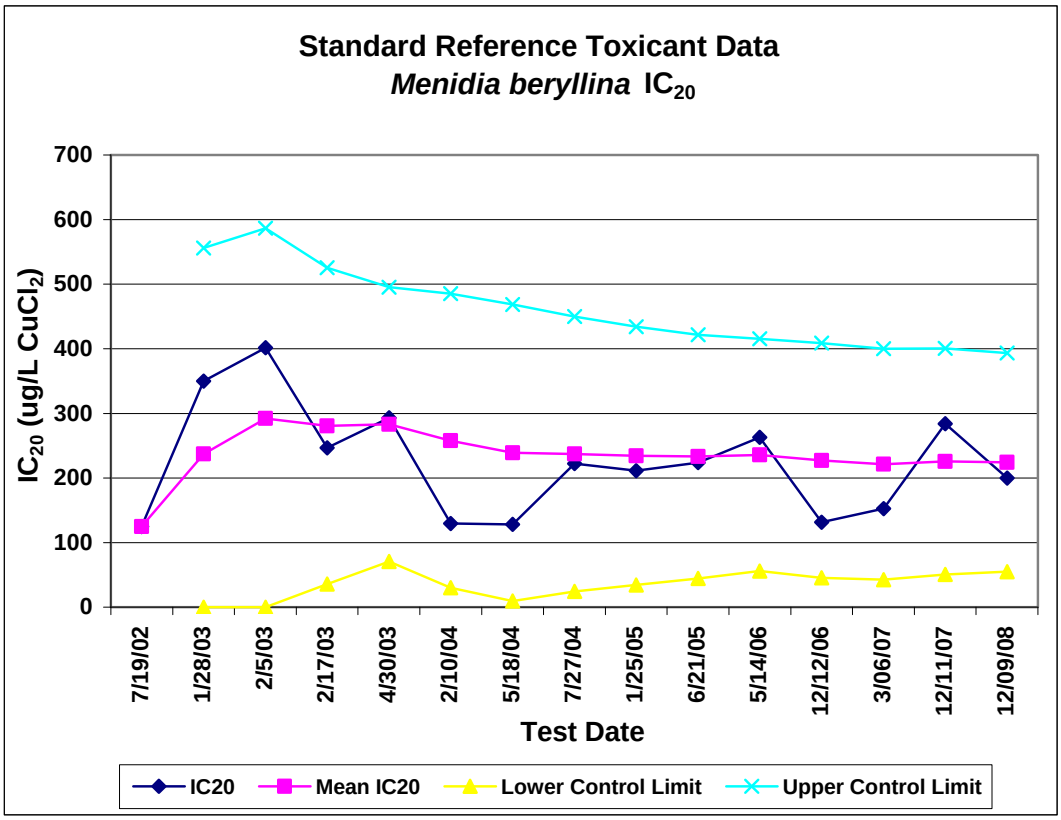
Appendix C. (continued)

Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 7-Day Chronic Toxicity
Menidia beryllina (inland silverside) - Copper Chloride ($CuCl_2$)

Date	IC20	Mean IC20	Std Dev	Lower Control Limit	Upper Control Limit
7/19/02	124.590	124.590			
1/28/03	349.900	237.245	159.32	0.000	555.881
2/5/03	401.600	292.030	147.29	0.000	586.617
2/17/03	246.800	280.723	122.37	35.978	525.467
4/30/03	293.200	283.218	106.12	70.969	495.467
2/10/04	129.780	257.645	113.73	30.191	485.099
5/18/04	128.030	239.129	114.80	9.536	468.721
7/27/04	222.570	237.059	106.44	24.175	449.942
1/25/05	211.523	234.221	99.93	34.361	434.082
6/21/05	223.744	233.174	94.27	44.627	421.720
5/14/06	262.860	235.872	89.88	56.108	415.637
12/12/06	131.470	227.172	90.84	45.483	408.861
3/06/07	152.600	221.436	89.40	42.631	400.240
12/11/07	284.000	225.900	87.51	50.890	400.920
12/09/08	200.000	224.180	84.59	55.000	393.360

Fewer than 20 chronic SRTs have been performed for this species.
Lower Confidence Limit = mean - 2 * Std Dev
Upper Confidence Limit = mean + 2 * Std Dev



Appendix C. (continued)

FDEP Biology Laboratory - Chronic SRT Benchsheet

Americamysis bahia

SOP#: TA07_15 EPA 821-R-02-014 Method 1007.0

Diluent/ Batch: ASW/12.908 Test Days Used: 01 Test Duration: 7 days
Diluent/ Batch: ASW 12-10-08 Test Days Used: 2-4 Organism Batch # : 12.908
Toxicant/ Batch # : CdCl2/12.908 ASW 12-12-08 5-6 Organism Age: 7 days
Artemia Lot # : 38438

Artemia Batch #			
Day 0	179	Day 2	181
Day 1	180	Day 3	182
Feeding: 2 X Daily		Day 4	183
150 artemia/mysid (total)		Day 5	184
		Day 6	185

Start Date: 12.908 Time: 1310
End Date: 12-16-08 Time: 1315

Chamber size : 350 mL (400 recommended)
Sample volume : 250 mL (minimum 150 ml)

Water Quality Parameters	Diluent 12-9-08	Diluent ~~(or other)~~ 12-10-08	Measured by	Verified by	Diluent 12-12-08
Total Residual Cl_2 (mg/L):	<0.03	<0.03	JD/MF	MF/JD	<0.03
Alkalinity (mg/L as $CaCO_3$):	245	200	BA	MF	200
Hardness (mg/L as $CaCO_3$):	—	—	—	—	—
Total Ammonia (mg/L as N):	<0.034	<0.034	MF	BA	<0.034
Conductivity µmhos-cm ~~mmhos-cm~~:	31.2	32.7	BA/JD/MF	MF/JD	32.2
Salinity ppth:	19.5	20.4	BA/JD/MF	MF/JD	20.1

√one ☐ Waterbath: #____
Test Incubated In: ☑ Incubator: # 3

Light Intensity : 50 - 100 ft. candles
Photoperiod : 16 light 8 dark
Temperature Range °C:
(if used) Incubator # 3 min. 26.8 max. 27.0 mean 26.9
(if used) Water bath # ____ min.____ max.____ mean____
Room B246 min. 24.4 max. 26.2 mean 25.3

Results	
Growth NOEC:	7.5 ug/L
Growth LOEC:	15 ug/L
Growth IC_{20}:	10.8 ug/L
Growth IC_{25}:	11.7 ug/L
Ctrl % CV	9.83%
Dunnetts PMSD:	19.6%
Survival NOEC:	7.5 ug/L
Survival LOEC:	15 ug/L

PMSD Bounds for Growth
Lower: 11
Upper: 37

Comments:

Investigators' signatures

James Daniel
Mahatvill Faircloth
Bruce Atkinson

Loretta C. Wolfe
REVIEWER

Test Page 1 of 10 PAGE 00 001 revised 7/15/08 MF

Appendix C. (continued)

Chronic SRT Survival Benchsheet

A. bahia SOP TA07_15

Concentration: µg/L

D = dead M = missing

Concentration	Replicate	Chamber	TEST DAY 0	1	2	3	4	5	6	7
Control	A	P1	5	5	4D	4	4	4	4	4
	B	P2	5	5	5	5	5	5	5	5
	C	P3	5	5	5	5	5	5	5	5
	D	P4	5	5	5	5	5	5	5	5
	E	P5	5	5	5	5	5	5	5	5
	F	P6	5	5	5	5	5	5	5	5
	G	P7	5	5	5	5	5	5	5	5
	H	P8	5	5	5	5	5	5	5	5
3.25	A	P9	5	5	5	5	5	5	5	5
	B	P10	5	5	5	5	5	5	5	5
	C	P11	5	5	5	5	5	5	5	5
	D	P12	5	5	5	5	5	5	5	5
	E	P13	5	5	5	5	5	5	5	5
	F	P14	5	5	5	5	5	5	5	5
	G	P15	5	5	5	5	5	5	5	5
	H	P16	5	5	5	5	5	5	5	5
7.5	A	P17	5	5	5	4D	4	4	4	4
	B	P18	5	5	4D	4	4	4	4	4
	C	P19	5	5	5	5	5	5	5	5
	D	P20	5	5	5	5	5	5	5	5
	E	P21	5	5	5	5	5	4D	4	4
	F	P22	5	5	5	5	5	5	5	5
	G	P23	5	5	5	5	5	5	5	5
	H	P24	5	5	5	5	5	5	5	5
15	A	P25	5	4D	4	4	4	4	0D	1D
	B	P26	5	5	5	5	5	5	5	3D
	C	P27	5	5	5	5	4D	3D	2D	2
	D	P28	5	5	5	5	5	4D	3D	3
	E	P29	5	5	5	4D	4	4	4	3D
	F	P30	5	5	5	5	5	4D	4	4
	G	P31	5	5	5	5	5	2D	1D	1
	H	P32	5	5	5	5	5	4D	4	4
Loaded by (0 hr): JD		Checked by*: MF	JD	JD	BA	BA	BA	BA	BA	
		Concentrations prepared by:	JD	JD	BA	MF	MF	BA	—	

Comments:

*verified by for 0 hr

revised 7/15/08 MF

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Appendix C. (continued)

Chronic SRT Survival Benchsheet

A. bahia SOP TA07_15

Concentration: µg/L

D = dead M = missing

			TEST DAY							
Concentration	Replicate	Chamber	0	1	2	3	4	5	6	7
30	A	P33	5	5	4 1D	1 3D	0 1D	—	—	
	B	P34	5	5	4 1D	1 3D	0 1D	—	—	
	C	P35	5	5	5	1 4D	0 D	—	—	
	D	P36	5	5	4 1D	3 1D	1 2D	0 1D	—	
	E	P37	5	5	1 4D	1	1	1	0 1D	
	F	P38	5	5	3 2D	1 2D	1	0 1D	—	
	G	P39	5	5	3 2D	1 2D	1	0 1D	—	
	H	P40	5	5	3 2D	1 2D	0 1D	—	—	
60	A	P41	5	1 4D	0 1D	—				
	B	P42	5	3 2D	0 3D	—				
	C	P43	5	4 1D	0 4D	—				
	D	P44	5	5	2 3D	0 2D				
	E	P45	5	5	0 5D	—				
	F	P46	5	3 2D	0 3D	—				
	G	P47	5	3 2D	0 3D	—				
	H	P48	5	3 2D	0 3D	—				
	A		5							
	B		5							
	C		5							
	D		5							
	E		5							
	F		5							
	G		5							
	H		5							
	A		5							
	B		5							
	C		5							
	D		5							
	E		5							
	F		5							
	G		5							
	H		5							
Loaded by (0 hr): JD		Checked by*: MF	JD	JD	JD	BA	BA	JD	JD	

Comments:

*verified by for 0 hr

revised 7/15/08 MF

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PAGE 00 003

Appendix C. (continued)

A. bahia Chronic SRT Parameters Benchsheet

SOP TA07_15

Start Date: 12-9-08 Time: 1310 Organism: *A. bahia*

End Date: 12-16-08 Time: 1315 Concentration: µg/L

Test Day		Before Renewal						Test Start and After Renewal					
↓	Conc	Test Rep	pH (su)	Temp (°C)	DO (mg/L)	Cond (mmhos-cm)	Sal (ppth)	Test Rep	pH (su)	Temp (°C)	DO (mg/L)	Cond (mmhos-cm)	Sal (ppth)
Day 0	Control							A	8.3	24.4	6.7	34.8	22.0
	3.25							A	8.3	24.4	6.7	34.8	22.0
	7.5							A	8.3	24.5	6.6	34.5	21.7
	15							A	8.3	24.0	6.7	34.0	21.3
	30							A	8.3	24.2	6.7	33.1	20.7
	60							A	8.4	24.1	6.8	31.3	19.4
								A					
	Measured by:												
	Recorded by:												
		Rep	pH	Temp	DO	Cond	Sal	Rep	pH	Temp	DO	Cond	Sal
Day 1	Control	B	7.9	24.0	4.9	37.7	23.6	B	8.3	24.1	6.2	36.1	14.2
	3.25	B	8.2	24.1	5.6	32.4	23.1	B	8.3	24.0	6.1	32.2	20.1
	7.5	B	8.1	24.4	5.8	35.7	22.4	B	8.3	24.0	6.1	32.0	19.9
	15	B	8.2	24.5	5.8	35.6	22.4	B	8.3	24.0	6.1	32.1	19.9
	30	B	8.2	24.3	5.8	34.2	21.5	B	8.3	24.0	6.0	31.7	19.7
	60	B	8.2	24.6	5.8	35.3	22.0	B	8.3	24.1	6.0	32.8	19.7
		B						B					
	Measured by:												
	Recorded by:												
	Conc	Rep	pH	Temp	DO	Cond	Sal	Rep	pH	Temp	DO	Cond	Sal
Day 2	Control	C	8.3	24.8	6.2	33.0	20.6	C	8.3	24.0	6.7	31.6	19.7
	3.25	C	8.3	24.6	6.2	33.4	20.9	C	8.4	24.0	6.7	32.3	20.2
	7.5	C	8.3	24.5	6.2	34.0	21.3	C	8.4	24.0	6.7	32.3	20.2
	15	C	8.2	24.4	6.1	34.4	21.6	C	8.4	24.0	6.7	32.4	20.2
	30	C	8.3	24.5	6.3	33.9	21.3	C	8.4	24.0	6.7	32.4	20.3
	60	C	8.3	24.9	6.0	33.6	20.8	C	8.4	24.0	6.6	32.5	20.4
		C						C					
	Measured by:												
	Recorded by:												
	Conc	Rep	pH	Temp	DO	Cond	Sal	Rep	pH	Temp	DO	Cond	Sal
Day 3	Control	D	8.3	24.4	6.2	32.4	20.2	D	8.3	24.0	6.1	32.1	19.9
	3.25	D	8.3	24.3	6.2	33.3	19.9	D	8.3	24.0	6.5	32.0	19.9
	7.5	D	8.2	24.3	6.1	32.8	20.3	D	8.3	24.2	6.6	32.1	20.0
	15	D	8.2	24.2	5.9	32.7	20.3	D	8.3	24.0	6.6	32.0	19.9
	30	D	8.2	24.2	5.8	32.4	20.1	D	8.3	24.0	6.6	31.8	19.8
	60	D	8.3	24.2	5.9	32.9	20.2	D	—	—	—	—	—
		D						D					
	Measured by:		MF	MF	MF	MF	MF		BA	BA	BA	BA	BA
	Recorded by:		ML	MF	MF	MF	MF		BA	BA	BA	BA	BA

conc = concentration rep = replicate cond = conductivity Sal = salinity

Comments:

revised 6/11/07 MF

Test Page 4 of 10 PAGE 00 004

Appendix C. (continued)

A. bahia Chronic SRT Parameters Benchsheet

SOP TA07_15

Start Date: 12,9,08 Time: 1310 Organism: *A. bahia*

End Date: 12-16-08 Time: 1315 Concentration: µg/L

Test Day		Before Renewal						Test Start and After Renewal					
↓	Conc	Test Rep	pH (su)	Temp (°C)	DO (mg/L)	Cond (mmhos-cm)	Sal (ppth)	Test Rep	pH (su)	Temp (°C)	DO (mg/L)	Cond (mmhos-cm)	Sal (ppth)
Day 4	Control	E	8.2	25.3	5.8	32.5	20.3	E	8.3	24.9	6.7	33.3	20.7
	3.25	E	8.2	25.1	5.8	33.4	20.9	E	8.3	24.6	6.5	33.2	20.7
	7.5	E	8.2	25.6	5.8	32.3	20.2	E	8.3	24.6	6.5	32.7	20.4
	15	E	8.2	24.9	5.5	33.0	20.6	E	8.2	24.3	6.5	32.6	20.4
	30	E	8.2	26.5	5.3	33.6	21.0	E	8.0	24.1	6.5	32.4	20.4
		E						E					
		E						E					
	Measured by:		BA	BA	BA	BA	BA		MF	MF	MF	MF	MF
	Recorded by:		BA	BA	BA	BA	BA		MF	MF	MF	MF	MF
		Rep	pH	Temp	DO	Cond	Sal	Rep	pH	Temp	DO	Cond	Sal
Day 5	Control	F	8.3	24.6	6.7	33.6	20.9	F	8.4	24.0	6.8	32.9	20.5
	3.25	F	8.3	24.8	5.7	34.2	21.5	F	8.4	24.2	6.7	33.0	21.0
	7.5	F	8.2	25.1	5.7	33.5	20.9	F	8.4	24.2	6.6	33.3	20.9
	15	F	8.2	24.9	5.6	33.2	20.8	F	8.4	24.2	6.7	32.7	20.4
	30	F	8.3	24.7	5.7	33.1	20.7	F	8.4	24.2	6.7	32.5	20.3
		F						F					
		F						F					
	Measured by:		BA	BA	BA	BA	BA		BA	BA	BA	BA	BA
	Recorded by:		BA	BA	BA	BA	BA		BA	BA	BA	BA	BA
	Conc	Rep	pH	Temp	DO	Cond	Sal	Rep	pH	Temp	DO	Cond	Sal
Day 6	Control	G	8.2	24.6	5.8	33.4	20.8	G	8.4	24.0	6.7	33.8	20.9
	3.25	G	8.2	24.2	5.6	34.3	21.5	G	8.4	24.0	6.6	33.8	21.2
	7.5	G	8.2	24.3	5.5	34.1	21.4	G	8.4	24.0	5.8	33.7	21.1
	15	G	8.2	25.1	5.4	33.5	20.9	G	8.4	24.0	6.0	33.3	20.8
	30	G	8.2	24.7	5.6	33.3	20.4	G					
		G						G					
		G						G					
	Measured by:		BA	BA	BA	BA	BA		BA	BA	BA	BA	BA
	Recorded by:		BA	BA	BA	BA	BA		BA	BA	BA	BA	BA
	Conc	Rep	pH	Temp	DO	Cond	Sal	Rep	pH	Temp	DO	Cond	Sal
Day 7	Control							H	8.2	24.2	6.1	34.7	21.8
								H	8.2	24.7	6.1	34.1	22.7
								H	8.2	25.5	6.2	35.4	22.2
								H	8.2	25.8	5.8	34.7	21.8
								H					
								H					
								H					
	Measured by:								BA	BA	BA	BA	BA
	Recorded by:								BA	BA	BA	BA	BA

conc = concentration rep = replicate cond = conductivity Sal = salinity

Comments:

revised 8/11/07 MF

Appendix C. (continued)

Chronic SRT Test Weighing Benchsheet

A. bahia

SOPs TA07_15 and TA06_21

Concentration: µg/L

mean wt =Mysid wt divided by 5
convert g to mg: move decimal 3 places to right

Concentration	Replicate	Pan #	Pan wt. (g)	Pan + mysid (g)	Mysid wt. (g)	Original # mysids	Mean wt. (mg)
Control	A	45	0.02226	0.02361	0.00135	5	0.270
	B	46	0.02230	0.02391	0.00161	5	0.322
	C	47	0.02242	0.02409	0.00167	5	0.334
	D	48	0.02149	0.02299	0.00150	5	0.300
	E	49	0.02220	0.02359	0.00139	5	0.278
	F	50	0.02232	0.02371	0.00139	5	0.278
	G	51	0.02084	0.02213	0.00129	5	0.258
	H	52	0.02457	0.02621	0.00164	5	0.328
3.25	A	53	0.02158	0.02311	0.00153	5	0.306
	B	54	0.02140	0.02299	0.00159	5	0.318
	C	55	0.02434	0.02549	0.00115	5	0.230
	D	56	0.02215	0.02337	0.00122	5	0.244
	E	57	0.02219	0.02391	0.00172	5	0.344
	F	58	0.02169	0.02305	0.00136	5	0.272
	G	59	0.02196	0.02353	0.00157	5	0.314
	H	60	0.02038	0.02191	0.00153	5	0.306
7.5	A	61	0.02385	0.02512	0.00127	5	0.254
	B	62	0.02160	0.02291	0.00131	5	0.262
	C	63	0.02126	0.02324	0.00198	5	0.396
	D	64	0.02344	0.02506	0.00162	5	0.324
	E	65	0.02253	0.02369	0.00115	5	0.230
	F	66	0.02275	0.02423	0.00148	5	0.296
	G	67	0.02245	0.02414	0.00169	5	0.338
	H	68	0.02252	0.02434	0.00182	5	0.364
15	A	69	0.02054	0.02087	0.00033	5	0.066
	B	70	0.02404	0.02495	0.00091	5	0.182
	C	71	0.02259	0.02310	0.00051	5	0.102
	D	72	0.02166	0.02249	0.00083	5	0.166
	E	73	0.02373	0.02463	0.00090	5	0.180
	F	74	0.02166	0.02312	0.00146	5	0.292
	G	75	0.02130	0.02175	0.00045	5	0.090
	H	76	0.02169	0.02287	0.00118	5	0.236
Weighed by Initials:			JD	JD			

Comments:

☑ S-Weights: BIO-S-WEIGHTS-01
☑ Balance: Ohaus 250D Ser# 1125481084

Appendix C. (continued)

Chronic SRT Test Weighing Benchsheet
Quality Control
A. bahia
SOPs TA07_15 and TA06_21

Empty Pan Weights Date: 12/16/08 By: JD

Weights in grams	Pan 1 wt.	Pan 1 initial wt.
after Pan 5	0.02226	@ 0.02226
after Pan 10	0.02225	@ 0.02226
after Pan 15	0.02227	@ 0.02226
after Pan 20	0.02227	@ 0.02226
after Pan 25	0.02229	@ 0.02226
after Pan 30	0.02226	@ 0.02226
after Pan 35	0.02226	@ 0.02226
after Pan 40	0.02226	@ 0.02226
after Pan 45		@
after Pan 48		@

S-weights	Measured Value (g)	S-weight Value (g)
	0.01	@ 0.01
	0.03002	@ 0.03

S-Weights: BIO-S-WEIGHTS-01
Balance: Ohaus 250D
Ser# 1125481084

Fish + Pan Weights Date: 12,23,08 By: JD

Weights in grams	Pan 1 wt.	Pan 1 initial wt.
after Pan 5	0.02361	@ 0.02361
after Pan 10	0.02364	@ 0.02361
after Pan 15	0.02362	@ 0.02361
after Pan 20	0.02361	@ 0.02361
after Pan 25	0.02363	@ 0.02361
after Pan 30	0.02363	@ 0.02361
after Pan 35	0.02363	@ 0.02361
after Pan 40	0.02361	@ 0.02361
after Pan 45		@
after Pan 48		@

S-weights	Measured Value (g)	S-weight Value (g)
	0.01999	@ 0.02
	0.05004	@ 0.05

Drying Oven ID: VWR #2
Temperature °C: 100°c
Drying Hours: 8

Note: Pan number (5, 10, etc.) refers to sequence of weighing as actual Pan #s may differ.

Comments:

revised 7/15/08 MF

Appendix C. (continued)

FDEP Biology Laboratory - Chronic SRT Benchsheet

Pimephales promelas or *Menidia beryllina*

Test Species (circle one)

P. promelas	SOP#: TA07_09	EPA-821-R-02-013	Method 1000.0
(*M. beryllina*)	SOP#: TA07_14	EPA-821-R-02-014	Method 1006.0

Diluent/ Batch: ASW/12.9.08 Test Days Used: 0-1
Diluent/ Batch: ASW 12-10-08 Test Days Used: 2-4
Toxicant/ Batch # : CuCl2/12.9.08 ASW 12-12-08 5-6
Artemia Lot # : 38438

Start Date: 12.9.08 Time: 1300
End Date: 12-16-08 Time: 1200
Organism Batch #/ Age: 12.9.08/ 2days

Artemia Batch #	Day 2 181	Day 5 184
Day 0 179	Day 3 182	Day 6 185
Day1 180	Day 4 183	

Chamber size : 1000 ml
Test volume : 500 ml

Feeding: *P. promelas* 0.15 g wet wt. 2X day 6 hour interval
M. beryllina 0.10 g wet wt days 0-2 0.15g wet wt. days 3-7

Water Quality Parameters	ASW Diluent 12-9-08	ASW Diluent 12-10-08 (or other)	Method	Measured by	Verified by	ASW Diluent 12-12-08
Total Residual Cl_2 (mg/L):	<0.03	<0.03	HACH	JD/MF	MF/JD	<0.03
Alkalinity (mg/L as $CaCO_3$):	245	200	HACH	BA	MF	200
Hardness (mg/L as $CaCO_3$):	—	—	HACH	—	—	—
Total Ammonia (mg/L as N):	<0.034	<0.034	DENVER	MF	BA	<0.034
Conductivity µmhos-cm (mmhos-cm)	31.2	32.7	METTLER	BA/JD/MF	MF/JD	32.2
	salinity ppth 19.5	20.4	mettler	BA/JD/MF	MF/JD	20.1

Statistics	
Growth NOEC:	125 ug/L
Growth LOEC:	250 ug/L
Growth IC_{20}:	200 ug/L
Growth IC_{25}:	225 ug/L
Ctrl % CV:	11.9%
Dunnetts PMSD:	21.1%
Survival NOEC:	125 ug/L
Survival LOEC:	250ug/L

Test Incubated in : ☑ Incubator # 2
☐ Waterbath #____

Light Intensity : 50 - 100 ft. candles

Photoperiod : 16 light 8 dark

Temperature Range °C:

Incubator # 2 min. 25.1 max. 26.2 mean 25.6
Water bath # ____ min.____ max. 26.4 JD mean____
Room B246 min. 24.4 max. 26.2 mean 25.3

P. promelas PMSD Bounds for Growth: Lower 12 Upper 30
M. beryllina PMSD Bounds for Growth: Lower 11 Upper 28

Investigators' signatures

Jane Dawd
Marshall Faircloth
Bruce Ayers

Loretta C. Wolfe
REVIEWER

Comments:

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revised 7/16/08 MF

Appendix C. (continued)

FDEP Biology Laboratory - Chronic SRT Benchsheet

Pimephales promelas or Menidia beryllina Survival

Organism: *P. promelas* (*M.beryllina*) (circle one) D = dead M = missing

Concentration: (µg/L) g/L (circle one)

			TEST DAY							
Concentration	Replicate	Chamber	0	1	2	3	4	5	6	7
Control	A	E1	10	9 1D	9	9	9	9	9	9
	B	E2	10	10	10	10	9 1D	9	9	9
	C	E3	10	10	10	10	10	10	10	10
	D	E4	10	9 1D	9	8 1D	8	8	8	8
67.5	A	E5	10	10	6 4D	6	6	6	6	6
	B	E6	10	10	9 1D	9	9	9	9	9
	C	E9	10	8 2D	7 1D	7	7	7	7	7
	D	E8	10	9 1D	8 1D	8	8	8	8	8
125	A	E9	10	10	9 1D	9	9	9	9	9
	B	E10	10	9 1D	9	9	9	9	8 1D	8
	C	E11	10	8 2D	8	8	8	8	8	8
	D	E12	10	8 2D	8	8	7 1D	7	7	7
250	A	E13	10	4 6D	4	4	4	4	4	4
	B	E14	10	6 4D	6	6	6	6	6	6
	C	E15	10	4 6D	4	4	4	4	4	4
	D	E16	10	3 7D	3	3	3	3	3	3
500	A	E17	10	0 10D	—					
	B	E18	10	0 10D	—					
	C	E19	10	0 10D	—					
	D	E20	10	1 9D	0 1D					
1000	A	E21	10	0 10D	—					
	B	E22	10	0 10D	—					
	C	E23	10	0 10D	—					
	D	E24	10	0 10D	—					
	A		10							
	B		10							
	C		10							
	D		10							
Loaded by (0 hr): JD		Checked by:		JD	JD	BA	BA	JD	JD	JD
Verified by (0 hr): MF										
Concentrations prepared by:				JD	JD	MF	MF	MF	JD	JD

Comments:

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revised 7/16/08 MF

Appendix C. (continued)

Chronic SRT Parameters Benchsheet

P. promelas and M. beryllina SOP TA07_09 and TA-07_15 parameter pg. 1

Start Date: 12.9.08 End Date: 12-16-08

Start Time: 1320 End Time: 1200

Conc = mg/L conc = concentration rep = replicate circle umhos or mmhos

Test Day		New Sample						Old Sample					
	Test Conc.	Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos/mmhos	Salinity ppth	Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth
Day 0	Control	A	8.3	24.9	6.8	34.7	21.7						
	62.5	A	8.3	24.9	6.8	34.7	21.7						
	125	A	8.3	24.9	6.8	34.4	21.6						
	250	A	8.3	24.8	6.8	34.0	21.3						
	500	A	8.3	24.8	6.9	33.1	20.7						
	1000	A	8.3	24.5	7.0	31.3	19.4						
		A											
	Measured by												
	Recorded by												
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 1	Control	B	8.2	24.7	5.8	35.0	22.0	B	8.3	24.0	6.1	32.0	19.8
	62.5	B	8.2	24.7	5.8	34.9	22.0	B	8.3	24.0	6.0	31.8	19.7
	125	B	8.2	24.7	5.8	34.8	21.9	B	8.3	24.0	5.9	32.0	19.8
	250	B	8.2	24.7	5.6	34.1	21.5	B	8.3	24.0	5.8	32.1	19.9
	500	B	8.2	24.5	5.2	33.3	20.8	B					
	1000	B	8.3	24.5	5.1	34.6	19.7	B					
		B						B					
	Measured by												
	Recorded by												
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 2	Control	C	8.2	24.5	5.8	33.2	20.7	C	8.3	24.0	6.1	31.7	19.5
	62.5	C	8.3	24.6	5.7	32.9	20.7	C	8.3	24.1	6.2	32.1	20.0
	125	C	8.2	24.5	5.7	33.3	20.7	C	8.3	24.1	6.3	32.2	20.1
	250	C	8.2	24.7	5.7	33.7	21.2	C	8.3	24.1	6.4	31.9	19.7
		C						C					
		C						C					
		C						C					
	Measured by												
	Recorded by												
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 3	Control	D	8.3	24.0	6.7	~~34.7~~ 31.7	19.9	D	8.2	24.9	6.2	31.7	19.8
	62.5	D	8.4	24.0	6.6	31.7	19.7	D	8.2	24.6	6.0	31.7	19.8
	125	D	8.4	24.0	6.6	31.7	19.7	D	8.2	24.3	5.8	31.9	19.8
	250	D	8.4	24.0	6.6	31.5	19.6	D	8.2	24.5	5.9	31.4	19.5
		D						D					
		D						D					
		D						D					
	Measured by		BA	BA	BA	BA	BA		MF	BA	MF	MF	MF
	Recorded by		BA	BA	BA	BA	BA		MF	BA	MF	MF	MF

Comments:

For salinity <1 ppth insert <1. For salinity > 1 ppth, conductivity measurement is not required if salinity probe is functional.

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Appendix C. (continued)

Chronic SRT Parameters Benchsheet

P. promelas and M. beryllina SOP TA07_09 and TA-07_15 parameter pg. 2

Start Date: 12-9-08 End Date: 12-16 08

Start Time: 1300 End Time: 1200

Concentration in mg/L

conc = concentration rep = replicate

Test Day	Conc.	New Sample Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos/mmhos	Salinity ppth	Old Sample Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos/mmhos	Salinity ppth
Day 4	Control	A	8.3	24.0	6.6	32.5	20.3	A	8.2	24.4	6.0	31.3	19.5
	62.5	A	8.4	24.0	6.6	32.4	20.2	A	8.2	24.5	5.7	31.2	19.4
	125	A	8.4	24.0	6.5	32.7	20.4	A	8.2	24.7	5.7	31.3	19.5
	250	A	8.4	24.0	6.5	32.2	20.1	A	8.2	24.8	5.5	31.3	19.4
		A						A					
		A						A					
		A						A					
	Measured by		BA	BA	BA	BA	BA		BA	BA	BA	BA	BA
	Recorded by		BA	BA	BA	BA	BA		BA	BA	BA	BA	BA
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 5	Control	B	8.3	24.5	5.6	33.1	20.5	B	8.4	24.0	7.0	32.9	20.3
	62.5	B	8.3	24.5	5.6	33.1	20.5	B	8.4	24.0	6.6	33.5	20.9
	125	B	8.3	24.5	5.7	33.2	20.8	B	8.4	24.1	6.6	33.4	20.8
	250	B	8.3	24.7	5.8	32.8	20.4	B	8.4	24.1	6.7	33.0	20.6
		B						B					
		B						B					
		B						B					
	Measured by		JJ	JJ	JJ	JJ	JJ		JJ	JJ	JJ	JJ	JJ
	Recorded by		JJ	JJ	JJ	JJ	JJ		JJ	JJ	JJ	JJ	JJ
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 6	Control	C	8.3	24.6	6.3	32.6	20.2	C	8.3	24.0	6.3	33.7	21.0
	62.5	C	8.3	24.6	5.7	33.2	20.8	C	8.4	24.0	6.4	33.8	21.1
	125	C	8.3	24.7	5.6	33.1	20.6	C	8.4	24.0	6.5	33.6	20.1
	250	C	8.3	24.6	5.7	32.8	20.5	C	8.4	24.0	6.6	33.3	20.8
		C						C					
		C						C					
		C						C					
	Measured by		JJ	JJ	JJ	JJ	JJ		BA	BA	BA	BA	BA
	Recorded by		JJ	JJ	JJ	JJ	JJ		BA	BA	BA	BA	BA
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 7	Control							D	8.2	24.7	5.7	33.8	21.2
	62.5							D	8.3	24.7	5.7	34.0	21.3
	125							D	8.3	24.7	5.7	33.7	21.1
	250							D	8.3	24.5	5.7	33.4	20.4
								D					
								D					
								D					
	Measured by								JJ	JJ	JJ	JJ	JJ
	Recorded by								JJ	JJ	JJ	JJ	JJ

For salinity <1 ppth insert <1. For salinity > 1 ppth, conductivity measurement is not required if salinity probe is functional.

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Appendix C. (continued)

FDEP Biology Laboratory - Chronic SRT Benchsheet

Pimephales promelas or *Menidia beryllina* Weights

SOP TA06_21

Organism: *P. promelas* *M.beryllina* (circle one)

Concentration: ~~mg/L~~ ~~g/L~~ (circle one) ug/L mT 12-16-08 struck wrong one

mean wt = fish wt divided by 10

convert g to mg: move decimal 3 places to right

Concentration	Replicate	Pan #	Pan wt. (g)	Pan + Fish (g)	Fish wt. (g)	Original # of fish	Mean wt. (mg)
Control	A	1	0.02303	0.03292	0.00989	10	0.989
	B	2	0.02226	0.03090	0.00864	10	0.864
	C	3	0.02296	0.03306	0.0101	10	1.01
	D	4	0.02192	0.03349	0.01157	10	1.157
67.5	A	5	0.02334	0.03226	0.00892	10	0.892
	B	6	0.02042	0.03043	0.01001	10	1.001
	C	7	0.02411	0.03278	0.00867	10	0.867
	D	8	0.02323	0.03269	0.00946	10	0.946
125	A	9	0.02488	0.03623	0.01135	10	1.135
	B	10	0.02200	0.03146	0.00946	10	0.946
	C	11	0.02304 2180 00	0.03150	0.00970	10	0.970
	D	12	0.02188 53 00	0.03029	0.00876	10	0.876
250	A	13	0.02055	0.02710	0.00655	10	0.655
	B	14	0.02134	0.03110	0.00976	10	0.976
	C	15	0.02044	0.02721	0.00677	10	0.677
	D	16	0.02452	0.02959	0.00507	10	0.507
	A					10	
	B					10	
	C					10	
	D					10	
	A					10	
	B					10	
	C					10	
	D					10	
	A					10	
	B					10	
	C					10	
	D					10	
		Weighed by:					

Comments:

Note: Pan number (#) refers to actual Pan number.

Test Page 5 of 6 PAGE 00 005 revised 8/24/06 MF/SP

Appendix C. (continued)

FDEP Biology Laboratory - Chronic SRT Benchsheet

Pimephales promelas or *Menidia beryllina* QC

SOPs TA07_09, TA07_14 and TA06_21

all weights in grams

Empty Pan Weights Date: 12.15.08 Weighed by: JD

	Pan 1 wt.	Pan 1 initial wt.
after Pan 5	0.02303	@ 0.02303
after Pan 10	0.07304	@ 0.02303
after Pan 15	0.02304	@ 0.02303
after Pan 20	0.02307	@ 0.02303
after Pan 25	0.02307	@ 0.02303
after Pan 30		@
after Pan 35		@
after Pan 40		@
after Pan 45		@
after Pan 48		@

S-weights	Measured Value	S-weight Value
	0.00994	@ 0.01
	0.02497	@ 0.03

Balance: Ohaus 250D Ser# 1125481084

S-Weights: BIO-S-Weights-01

Fish + Pan Weights Date: 12.23.08 Weighed by: JD

	Pan 1 wt.	Pan 1 initial wt.
after Pan 5	0.03292	@ 0.03292
after Pan 10	0.03293	@ 0.03292
after Pan 15	0.03292	@ 0.03292
after Pan 20	0.03295	@ 0.03292
after Pan 25	0.03293	@ 0.03292
after Pan 30		@
after Pan 35		@
after Pan 40		@
after Pan 45		@
after Pan 48		@

S-weights	Measured Value	S-weight Value
	0.02	@ 0.02
	0.05	@ 0.05

revised letter 1/5/09 MF

Drying Oven ID: (WWR #2)

Temperature °C: 100°C

Drying Hours: 8

Note: Pan number (5, 10, etc.) refers to sequence of weighing as actual Pan #s may differ.

Comments:

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revised 7/16/08 MF

Appendix C. (continued)

Bioassay Instrument ID

Test ID: Chronic SRT Dates: 12-9-08 – 12-16-08

METER / DEVICE	ID	SOP	Parameter	Method	√used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
Accumet AR-10 pH Meter	93312105	TA06_23	pH	SM 4500 H+	✓
Mettler-Toledo SevenMulti Conductivity Meter	SN 1225117049 Probe H04257	TA06_25	Conductivity	SM 2510 B	✓
			Salinity	SM 2520 B	✓
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	✓
Thermometer (DO probe)	YSI 5750 SN 05J1720	TA06_05	Temperature	SM-2530B modified DEP SOP-001/01 FT1400	✓
Hach Pocket Colorimeter II	05050C026378	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	✓
Alkalinity (Hach Kit)	No SN	TA06_08	Alkalinity	SM 2320 B	✓
Hardness (Hach Kit)	No SN	TA06_09	Hardness	SM 2340 C	✓
OHAUS Balance 250D	1125481084	TA06_21 TA06_27	Weight	-	✓
S-Weights	BIO-S-WEIGHTS-01	NA	Balance check	-	✓
Daytech 0 VWR	VWR #2	—	Daytech	—	✓

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)

1/21/09

V 1.1 6/12/08 MF

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Appendix C. (continued)

Mysid Survival, Growth and Fecundity Test-Biomass

Start Date:	12/9/2008	Test ID:	120908srt	Sample ID:	REF-Ref Toxicant
End Date:	12/16/2008	Lab ID:	DEP TOXLAB-FDEP Biology To	Sample Type:	CDCL-Cadmium chloride
Sample Date:		Protocol:	EPAMW02-EPA/821/R-02-014	Test Species:	MY-Mysidopsis bahia
Comments:	A. bahia chronic SRT concurrent with Dunes RO bioassay				

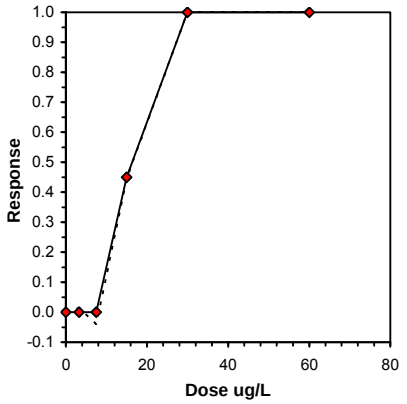
Conc-ug/L	1	2	3	4	5	6	7	8
D-Control	0.2700	0.3220	0.3340	0.3000	0.2780	0.2780	0.2580	0.3280
3.25	0.3060	0.3180	0.2300	0.2440	0.3440	0.2720	0.3140	0.3060
7.5	0.2540	0.2620	0.3960	0.3240	0.2300	0.2960	0.3380	0.3640
15	0.0660	0.1820	0.1020	0.1660	0.1800	0.2920	0.0900	0.2360
30	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
60	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

			Transform: Untransformed					Isotonic	
Conc-ug/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	0.2960	1.0000	0.2960	0.2580	0.3340	9.831	8	0.2986	1.0000
3.25	0.2918	0.9856	0.2918	0.2300	0.3440	13.465	8	0.2986	1.0000
7.5	0.3080	1.0405	0.3080	0.2300	0.3960	18.730	8	0.2986	1.0000
15	0.1643	0.5549	0.1643	0.0660	0.2920	46.638	8	0.1643	0.5501
30	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	8	0.0000	0.0000
60	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	8	0.0000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.981177	0.904	0.223334	0.042894
Bartlett's Test indicates equal variances (p = 0.08)	6.702221	11.34487		

Linear Interpolation (200 Resamples)

Point	ug/L	SD	95% CL		Skew
IC05	8.334	1.773	2.349	8.749	-2.0889
IC10	9.167	0.926	6.376	10.014	-2.9592
IC15	10.001	0.745	8.401	11.308	0.1341
IC20	10.834	0.835	9.377	12.596	1.0702
IC25	11.668	0.956	10.215	13.870	1.1243
IC40	14.168	1.359	12.342	17.278	0.7280
IC50	16.366	1.689	13.594	19.398	0.1802



Appendix C. (continued)

Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:	12/9/2008	Test ID:	mbsrt1208	Sample ID:	REF-Ref Toxicant
End Date:	12/16/2008	Lab ID:	DEP TOXLAB-FDEP Biology To	Sample Type:	CUCL-Copper chloride
Sample Date:		Protocol:	EPAM 94-EPA/600/4-91/003	Test Species:	MI-Menidia menidia
Comments:	M. beryllina chronic SRT concurrent with Dunes RO bioassay				

Conc-ug/L	1	2	3	4
D-Control	0.9890	0.8640	1.0100	1.1570
67.5	0.8920	1.0010	0.8670	0.9460
125	1.1350	0.9460	0.9700	0.8760
250	0.6550	0.9760	0.6770	0.5070
500	0.0000	0.0000	0.0000	0.0000
1000	0.0000	0.0000	0.0000	0.0000

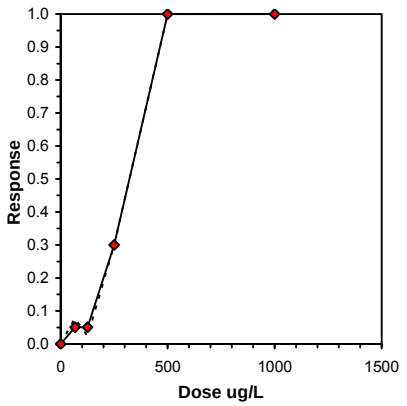
			Transform: Untransformed					Isotonic	
Conc-ug/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	1.0050	1.0000	1.0050	0.8640	1.1570	11.949	4	1.0050	1.0000
67.5	0.9265	0.9219	0.9265	0.8670	1.0010	6.434	4	0.9541	0.9494
125	0.9818	0.9769	0.9818	0.8760	1.1350	11.171	4	0.9541	0.9494
250	0.7038	0.7002	0.7038	0.5070	0.9760	27.932	4	0.7038	0.7002
500	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	4	0.0000	0.0000
1000	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	4	0.0000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.94193	0.844	0.742231	0.864032
Bartlett's Test indicates equal variances (p = 0.33)	3.404111	11.34487		

Linear Interpolation (200 Resamples)

Point	ug/L	SD	95% CL(Exp)		Skew
IC05*	66.67	54.44	0.00	240.32	-0.0295
IC10	149.78	47.56	0.00	284.87	-0.5092
IC15	174.86	36.53	93.98	313.59	0.0542
IC20	199.95	34.17	120.07	320.98	0.2452
IC25	225.04	31.34	144.11	328.37	0.3303
IC40	285.79	26.01	202.24	359.24	-0.0254
IC50	321.49	22.20	251.64	382.70	-0.1224

* indicates IC estimate less than the lowest concentration



Appendix C. (continued)

Mysid Survival, Growth and Fecundity Test-Growth-Weight

Start Date:	12/9/2008 13:30	Test ID:	DuneRO1208	Sample ID:	FL0355259-NPDES Permit #
End Date:	12/16/2008 13:15	Lab ID:	DEP TOXLAB-FDEP Biology To	Sample Type:	EFF2-Industrial
Sample Date:		Protocol:	EPAMW02-EPA/821/R-02-014	Test Species:	MY-Mysidopsis bahia
Comments:	A. bahia chronic bioassay for Dunes RO Dec. 2008				

Conc-%	1	2	3	4	5	6	7	8
S-Control	0.1980	0.2100	0.1840	0.2160	0.2200	0.1800	0.1740	0.3040
D-Control	0.3140	0.3060	0.2400	0.2920	0.3560	0.2620	0.2960	0.2700
6.25	0.2240	0.2720	0.2560	0.2660	0.3400	0.3120	0.2560	0.2820
12.5	0.2860	0.2600	0.2620	0.3180	0.2960	0.2840	0.2620	0.2280
25	0.2400	0.3180	0.2700	0.3560	0.2420	0.2740	0.2800	0.2900
50	0.3140	0.3540	0.2920	0.3880	0.2380	0.1960	0.3600	0.1960
100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
S-Control	0.2108	0.7217	0.2108	0.1740	0.3040	19.632	8			
D-Control	0.2920	1.0000	0.2920	0.2400	0.3560	12.198	8			
6.25	0.2760	0.9452	0.2760	0.2240	0.3400	13.026	8	-2.934	2.226	0.0495
12.5	0.2745	0.9401	0.2745	0.2280	0.3180	9.988	8	-2.866	2.226	0.0495
25	0.2838	0.9717	0.2838	0.2400	0.3560	13.576	8	-3.282	2.226	0.0495
50	0.2923	1.0009	0.2923	0.1960	0.3880	25.709	8	-3.665	2.226	0.0495
100	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.966401	0.929	0.200858	0.299747
Bartlett's Test indicates equal variances (p = 0.11)	9.039273	15.08627		
The control means are significantly different (p = 8.74E-04)	4.209435	2.144787		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test Treatments vs Both Controls	50	100	70.71068	2	0.049503	0.234889	0.009441	0.001979	0.002827	4, 43

Larval Fish Growth and Survival Test-7 Day Biomass

Start Date:	12/9/2008 13:05	Test ID:	Dunemb1208	Sample ID:	FL0355249-NPDES Permit #
End Date:	12/16/2008 13:00	Lab ID:	DEP TOXLAB-FDEP Biology To	Sample Type:	EFF2-Industrial
Sample Date:		Protocol:	EPAMW02-EPA/821/R-02-014	Test Species:	MI-Menidia menidia
Comments:	M. beryllina chronic bioassay for Dunes RO				

Conc-%	1	2	3	4
S-Control	1.1440	0.6950	0.9270	0.9270
D-Control	0.9120	0.7890	0.9400	1.0840
6.25	0.8660	0.9530	0.9470	0.8600
12.5	0.6210	0.9600	0.9570	0.9200
25	0.9110	0.7220	0.6140	1.1800
50	0.5580	0.6800	0.8540	0.7690
100	0.8160	0.8320	0.6640	0.8940

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
S-Control	0.9233	0.9914	0.9233	0.6950	1.1440	19.860	4			
D-Control	0.9313	1.0000	0.9313	0.7890	1.0840	13.007	4			
6.25	0.9065	0.9734	0.9065	0.8600	0.9530	5.554	4	0.158	2.374	0.2514
12.5	0.8645	0.9283	0.8645	0.6210	0.9600	18.895	4	0.555	2.374	0.2514
25	0.8568	0.9200	0.8568	0.6140	1.1800	28.947	4	0.628	2.374	0.2514
50	0.7153	0.7681	0.7153	0.5580	0.8540	17.705	4	1.964	2.374	0.2514
100	0.8015	0.8607	0.8015	0.6640	0.8940	12.183	4	1.149	2.374	0.2514

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.962997	0.896	0.020051	0.217491
Bartlett's Test indicates equal variances (p = 0.34)	6.757438	16.81189		
The control means are not significantly different (p = 0.94)	0.07281	2.446912		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test Treatments vs Both Controls	100	>100		1	0.251446	0.272349	0.028466	0.022444	0.312612	5, 22

Appendix C. (continued)

Mysid Survival, Growth and Fecundity Test-7 Day Survival

Start Date:	12/9/2008 13:30	Test ID:	DuneRO1208	Sample ID:	FL0355259-NPDES Permit #	
End Date:	12/16/2008 13:15	Lab ID:	DEP TOXLAB-FDEP Biology To	Sample Type:	EFF2-Industrial	
Sample Date:		Protocol:	EPAMW02-EPA/821/R-02-014	Test Species:	MY-Mysidopsis bahia	
Comments:	A. bahia chronic bioassay for Dunes RO Dec. 2008					

Conc-%	1	2	3	4	5	6	7	8
S-Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50	1.0000	0.8000	1.0000	1.0000	1.0000	0.8000	1.0000	1.0000
100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
S-Control	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	8		
D-Control	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	8	*	
6.25	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	8	68.00	47.00
12.5	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	8	68.00	47.00
25	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	8	68.00	47.00
50	0.9500	0.9500	1.2857	1.1071	1.3453	8.574	8	60.00	47.00
100	0.0000	0.0000	0.2255	0.2255	0.2255	0.000	8		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.505732	0.919	-2.68369	10.02276
Equality of variance cannot be confirmed				
The control means are not significantly different (p = 1.00)	0	2.144787		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	50	100	70.71068	2
Treatments vs D-Control				

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:	12/9/2008 13:05	Test ID:	Dunemb1208	Sample ID:	FL0355249-NPDES Permit #	
End Date:	12/16/2008 13:00	Lab ID:	DEP TOXLAB-FDEP Biology To	Sample Type:	EFF2-Industrial	
Sample Date:		Protocol:	EPAMW02-EPA/821/R-02-014	Test Species:	MI-Menidia menidia	
Comments:	M. beryllina chronic bioassay for Dunes RO					

Conc-%	1	2	3	4
S-Control	0.9000	0.9000	1.0000	1.0000
D-Control	1.0000	0.9000	0.9000	0.8000
6.25	0.8000	0.6000	0.8000	0.7000
12.5	0.6000	0.8000	0.7000	0.6000
25	0.8000	0.6000	0.4000	0.9000
50	0.4000	0.5000	0.8000	0.6000
100	0.9000	0.8000	0.5000	0.9000

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
S-Control	0.9500	1.0556	1.3305	1.2490	1.4120	7.072	4			
D-Control	0.9000	1.0000	1.2543	1.1071	1.4120	9.935	4	*		
6.25	0.7250	0.8056	1.0229	0.8861	1.1071	10.396	4	1.890	2.410	0.2951
12.5	0.6750	0.7500	0.9676	0.8861	1.1071	10.892	4	2.341	2.410	0.2951
25	0.6750	0.7500	0.9817	0.6847	1.2490	25.264	4	2.226	2.410	0.2951
*50	0.5750	0.6389	0.8658	0.6847	1.1071	20.865	4	3.173	2.410	0.2951
100	0.7750	0.8611	1.0977	0.7854	1.2490	19.920	4	1.279	2.410	0.2951

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.971777	0.884	-0.27624	-0.32872
Bartlett's Test indicates equal variances (p = 0.61)	3.60224	15.08627		
The control means are not significantly different (p = 0.37)	0.976241	2.446912		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	25	50	35.35534	4	0.232792	0.257759	0.070479	0.029985	0.082777	5, 18
Treatments vs D-Control										

Appendix D. Test Organism Receipt

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Organism Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Date: 12/8/08

Shipped to: FDEP

P.O. No: _____

Species	Quantity	Age	Brood Number	Temp.	pH	Salinity
Mysidopsis bahia	500	6 DAYS	MS081202	25°C	8.0 s.u.	20‰
Menidia beryllina	500	9 DAYS	SS081129	25°C	7.9 s.u.	20‰
						Hardness
Cyprinella leedsi	150	10 DAYS	CL081128	25°C	7.8	90 mg/L
Pimephales promelas						

Packed by: DW

Shipped Via: Fed Ex

Notes: _____

Thank you for your order.

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

Appendix E. Chemical Analyses performed on the effluent from the Dunes Community Development District Facility Outfall D-001, sampled on December 8, 2008.

Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
12/8/2008 12:20	Effluent	AGP/LN	Algal Growth Potential	4.07	A	mg DryWt/L	3	3
12/8/2008 12:20	Effluent	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.24	U	ug/L	0.24	0.71
12/8/2008 12:20	Effluent	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	0.55	U	ug/L	0.55	1.7
12/8/2008 12:20	Effluent	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.1	I	mg/L	0.2	2
12/8/2008 12:20	Effluent	Overflow	Fecal Coliforms-Membrane Filter	2	U	#/100 mL	2	
12/8/2008 12:20	Effluent	Toxicology	Bioassay-Chron-Def-SW-Mysid, NOEC	50		NOEC		
12/8/2008 12:20	Effluent	Toxicology	Bioassay-Chron-Def-SW-Fish, NOEC	25		NOEC		
12/8/2008 12:20	Effluent	Metals	Calcium	899		mg/L	1.5	6
12/8/2008 12:20	Effluent	Metals	Iron	30	U	ug/L	30	120
12/8/2008 12:20	Effluent	Metals	Zinc	5.1	I	ug/L	5	20
12/8/2008 12:20	Effluent	Metals	Cadmium	0.09	U	ug/L	0.09	0.36
12/8/2008 12:20	Effluent	Metals	Arsenic	0.75	U	ug/L	0.75	3
12/8/2008 12:20	Effluent	Metals	Aluminum	80	I	ug/L	60	240
12/8/2008 12:20	Effluent	Metals	Lead	0.6	U	ug/L	0.6	2.4
12/8/2008 12:20	Effluent	Metals	Copper	1.5	U	ug/L	1.5	6
12/8/2008 12:20	Effluent	Metals	Magnesium	540		mg/L	0.8	3.2
12/8/2008 12:20	Effluent	Metals	Chromium	2.1	U	ug/L	2.1	8.4
12/8/2008 12:20	Effluent	Metals	Nickel	1.3	I	ug/L	0.75	3
12/8/2008 12:20	Effluent	Metals	Silver	0.038	I	ug/L	0.03	0.12
12/8/2008 12:20	Effluent	Metals	Selenium	0.97	I	ug/L	0.6	2.4
12/8/2008 12:20	Effluent	Nutrients	Total-P	0.31		mg P/L	0.04	0.12
12/8/2008 12:20	Effluent	Nutrients	Ammonia-N	1.1		mg N/L	0.02	0.04
12/8/2008 12:20	Effluent	Nutrients	TSS	9	I	mg/L	4	16
12/8/2008 12:20	Effluent	Nutrients	Fluoride	1.7		mg F/L	0.05	0.1
12/8/2008 12:20	Effluent	Nutrients	O-Phosphate-P	0.026		mg P/L	0.004	0.01
12/8/2008 12:20	Effluent	Nutrients	Sulfide	0.38	I	mg S/L	0.1	0.4
12/8/2008 12:20	Effluent	Nutrients	Kjeldahl Nitrogen	1.9		mg N/L	0.16	0.4
12/8/2008 12:20	Effluent	Nutrients	NO2NO3-N	0.009	I	mg N/L	0.004	0.01
12/8/2008 12:20	Effluent	Overflow	Alpha, Total	21.5	U	pCi/L		
12/8/2008 12:20	Effluent	Overflow	Alpha-Counting Error	12.6		pCi/L		
12/8/2008 12:20	Effluent	Overflow	Radium 228	1.1		pCi/L		
12/8/2008 12:20	Effluent	Overflow	Radium 228-Counting Error	0.6		pCi/L		
12/8/2008 12:20	Effluent	Overflow	Radium 226	4.7		pCi/L		

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
12/8/2008 12:20	Effluent	Overflow	Radium 226-Counting Error	0.3		pCi/L		
12/8/2008 12:20	Effluent	Pesticides	Metribuzin	0.095	U	ug/L	0.095	0.38
12/8/2008 12:20	Effluent	Pesticides	Hexazinone	0.095	U	ug/L	0.095	0.38
12/8/2008 12:20	Effluent	Pesticides	Ethion	0.048	U	ug/L	0.048	0.19
12/8/2008 12:20	Effluent	Pesticides	Simazine	0.048	U	ug/L	0.048	0.19
12/8/2008 12:20	Effluent	Pesticides	Phorate	0.048	U	ug/L	0.048	0.19
12/8/2008 12:20	Effluent	Pesticides	Naled	0.76	U	ug/L	0.76	3
12/8/2008 12:20	Effluent	Pesticides	Malathion	0.14	U	ug/L	0.14	0.56
12/8/2008 12:20	Effluent	Pesticides	Bromacil	0.19	U	ug/L	0.19	0.76
12/8/2008 12:20	Effluent	Pesticides	Azinphos Methyl	0.19	U	ug/L	0.19	0.76
12/8/2008 12:20	Effluent	Pesticides	Atrazine	0.048	U	ug/L	0.048	0.19
12/8/2008 12:20	Effluent	Pesticides	Alachlor	0.57	U	ug/L	0.57	2.3
12/8/2008 12:20	Effluent	Pesticides	Prometryn	0.14	U	ug/L	0.14	0.56
12/8/2008 12:20	Effluent	Pesticides	Metalaxyl	0.24	U	ug/L	0.24	0.96
12/8/2008 12:20	Effluent	Pesticides	Fonofos	0.095	U	ug/L	0.095	0.38
12/8/2008 12:20	Effluent	Pesticides	Ethoprop	0.095	U	ug/L	0.095	0.38
12/8/2008 12:20	Effluent	Pesticides	Butylate	0.19	U	ug/L	0.19	0.76
12/8/2008 12:20	Effluent	Pesticides	Ametryn	0.048	U	ug/L	0.048	0.19
12/8/2008 12:20	Effluent	Pesticides	Parathion Methyl	0.095	U	ug/L	0.095	0.38
12/8/2008 12:20	Effluent	Pesticides	Chlorpyrifos Ethyl	0.048	U	ug/L	0.048	0.19
12/8/2008 12:20	Effluent	Pesticides	Norflurazon	0.14	U	ug/L	0.14	0.56
12/8/2008 12:20	Effluent	Pesticides	Fenamiphos	0.19	U	ug/L	0.19	0.76
12/8/2008 12:20	Effluent	Pesticides	Diazinon	0.048	U	ug/L	0.048	0.19
12/8/2008 12:20	Effluent	Pesticides	Mevinphos	0.19	U	ug/L	0.19	0.76
12/8/2008 12:20	Effluent	Pesticides	Metolachlor	0.48	U	ug/L	0.48	1.9
12/8/2008 12:20	Effluent	Pesticides	Parathion Ethyl	0.14	U	ug/L	0.14	0.56
12/8/2008 12:20	Effluent	Pesticides	Chlorpyrifos Methyl	0.095	U	ug/L	0.095	0.38
12/8/2008 12:20	Effluent	Priority Organic Pollutants	3,3'-Dichlorobenzidine	39	UJ	ug/L	39	160
12/8/2008 12:20	Effluent	Priority Organic Pollutants	4,4'-DDT	1.5	U	ug/L	1.5	5.8
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Fluoranthene	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Fluorene	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Heptachlor	1.5	U	ug/L	1.5	5.8
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Heptachlor epoxide	1.5	U	ug/L	1.5	5.8

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L	1.9	7.8
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Pyrene	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	2-Chloronaphthalene	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Endosulfan I	3.9	U	ug/L	3.9	16
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L	2.9	12
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Acenaphthene	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Anthracene	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Benzo(b)fluoranthene	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L	2.9	12
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Phenol	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	delta-BHC	1.5	U	ug/L	1.5	5.8
12/8/2008 12:20	Effluent	Priority Organic Pollutants	2,4-Dimethylphenol	9.7	U	ug/L	9.7	39
12/8/2008 12:20	Effluent	Priority Organic Pollutants	2,6-Dinitrotoluene	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	4,4'-DDE	1.5	U	ug/L	1.5	5.8
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Benzo(a)pyrene	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Butyl benzyl phthalate	4.9	U	ug/L	4.9	19
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Di-n-octyl phthalate	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Dimethyl phthalate	9.7	UJ	ug/L	9.7	39
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Endosulfan sulfate	1.5	U	ug/L	1.5	5.8
12/8/2008 12:20	Effluent	Priority Organic Pollutants	alpha-BHC	1.5	U	ug/L	1.5	5.8
12/8/2008 12:20	Effluent	Priority Organic Pollutants	beta-BHC	1.5	U	ug/L	1.5	5.8
12/8/2008 12:20	Effluent	Priority Organic Pollutants	2,4-Dinitrotoluene	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	2-Nitrophenol	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	4,4'-DDD	1.5	U	ug/L	1.5	5.8
12/8/2008 12:20	Effluent	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L	15	58
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Acenaphthylene	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Aldrin	1.5	U	ug/L	1.5	5.8
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Benzo(a)anthracene	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Benzo(k)fluoranthene	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	15	U	ug/L	15	58
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Endrin aldehyde	3.9	U	ug/L	3.9	16

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L	2.9	12
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Isophorone	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.8
12/8/2008 12:20	Effluent	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	2,4-Dichlorophenol	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L	1.9	7.8
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Benzidine	97	U	ug/L	97	390
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Dieldrin	1.5	U	ug/L	1.5	5.8
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Endrin	1.5	U	ug/L	1.5	5.8
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	U	ug/L	2.9	12
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L	2.9	12
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Naphthalene	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	gamma-BHC	1.5	U	ug/L	1.5	5.8
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Chrysene	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Di-n-butyl phthalate	4.9	U	ug/L	4.9	19
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Endosulfan II	3.9	U	ug/L	3.9	16
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Hexachlorobenzene	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	2,4-Dinitrophenol	15	U	ug/L	15	58
12/8/2008 12:20	Effluent	Priority Organic Pollutants	2-Chlorophenol	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L	2.9	12
12/8/2008 12:20	Effluent	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Diethyl phthalate	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.8
12/8/2008 12:20	Effluent	Priority Organic Pollutants	Phenanthrene	0.97	U	ug/L	0.97	3.9
12/8/2008 12:20	Effluent	Field Parameter	pH	6.95				
12/8/2008 12:20	Effluent	Field Parameter	Specific Conductance	17938		umhos/cm		
12/8/2008 12:20	Effluent	Field Parameter	Temperature	23.72		C		
12/8/2008 12:20	Effluent	Field Parameter	Sample Depth	0.01		m		
12/8/2008 12:30	blank	Metals	Copper	0.5	U	ug/L	0.5	2
12/8/2008 12:30	blank	Metals	Zinc	5	U	ug/L	5	20
12/8/2008 12:30	blank	Metals	Nickel	0.25	U	ug/L	0.25	1

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
12/8/2008 12:30	blank	Metals	Lead	0.2	U	ug/L	0.2	0.8
12/8/2008 12:30	blank	Metals	Aluminum	60	U	ug/L	60	240
12/8/2008 12:30	blank	Metals	Calcium	0.075	U	mg/L	0.075	0.3
12/8/2008 12:30	blank	Metals	Silver	0.1		ug/L	0.01	0.04
12/8/2008 12:30	blank	Metals	Cadmium	0.03	U	ug/L	0.03	0.12
12/8/2008 12:30	blank	Metals	Iron	30	U	ug/L	30	120
12/8/2008 12:30	blank	Metals	Arsenic	0.25	U	ug/L	0.25	1
12/8/2008 12:30	blank	Metals	Selenium	0.2	U	ug/L	0.2	0.8
12/8/2008 12:30	blank	Metals	Magnesium	0.04	U	mg/L	0.04	0.16
12/8/2008 12:30	blank	Metals	Chromium	0.7	U	ug/L	0.7	2.8
12/8/2008 12:30	blank	Nutrients	Fluoride	0.05	U	mg F/L	0.05	0.1
12/8/2008 12:30	blank	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
12/8/2008 12:30	blank	Nutrients	Kjeldahl Nitrogen	0.08	U	mg N/L	0.08	0.2
12/8/2008 12:30	blank	Nutrients	O-Phosphate-P	0.004	U	mg P/L	0.004	0.01
12/8/2008 12:30	blank	Nutrients	Total-P	0.02	U	mg P/L	0.02	0.06
12/8/2008 12:30	blank	Nutrients	NO2NO3-N	0.004	U	mg N/L	0.004	0.01
12/8/2008 12:30	blank	Nutrients	Sulfide	0.05	U	mg S/L	0.05	0.2
12/8/2008 12:30	blank	Pesticides	Metalaxyl	0.24	U	ug/L	0.24	0.96
12/8/2008 12:30	blank	Pesticides	Metribuzin	0.097	U	ug/L	0.097	0.39
12/8/2008 12:30	blank	Pesticides	Ametryn	0.048	U	ug/L	0.048	0.19
12/8/2008 12:30	blank	Pesticides	Butylate	0.19	U	ug/L	0.19	0.76
12/8/2008 12:30	blank	Pesticides	Ethion	0.048	U	ug/L	0.048	0.19
12/8/2008 12:30	blank	Pesticides	Chlorpyrifos Ethyl	0.048	U	ug/L	0.048	0.19
12/8/2008 12:30	blank	Pesticides	Atrazine	0.048	U	ug/L	0.048	0.19
12/8/2008 12:30	blank	Pesticides	Prometryn	0.14	U	ug/L	0.14	0.56
12/8/2008 12:30	blank	Pesticides	Phorate	0.048	U	ug/L	0.048	0.19
12/8/2008 12:30	blank	Pesticides	Parathion Ethyl	0.14	U	ug/L	0.14	0.56
12/8/2008 12:30	blank	Pesticides	Mevinphos	0.19	U	ug/L	0.19	0.76
12/8/2008 12:30	blank	Pesticides	Malathion	0.14	U	ug/L	0.14	0.56
12/8/2008 12:30	blank	Pesticides	Diazinon	0.048	U	ug/L	0.048	0.19
12/8/2008 12:30	blank	Pesticides	Parathion Methyl	0.097	U	ug/L	0.097	0.39
12/8/2008 12:30	blank	Pesticides	Simazine	0.048	U	ug/L	0.048	0.19
12/8/2008 12:30	blank	Pesticides	Metolachlor	0.48	U	ug/L	0.48	1.9
12/8/2008 12:30	blank	Pesticides	Hexazinone	0.097	U	ug/L	0.097	0.39

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
12/8/2008 12:30	blank	Pesticides	Ethoprop	0.097	U	ug/L	0.097	0.39
12/8/2008 12:30	blank	Pesticides	Azinphos Methyl	0.19	U	ug/L	0.19	0.76
12/8/2008 12:30	blank	Pesticides	Alachlor	0.58	U	ug/L	0.58	2.3
12/8/2008 12:30	blank	Pesticides	Fenamiphos	0.19	U	ug/L	0.19	0.76
12/8/2008 12:30	blank	Pesticides	Chlorpyrifos Methyl	0.097	U	ug/L	0.097	0.39
12/8/2008 12:30	blank	Pesticides	Bromacil	0.19	U	ug/L	0.19	0.76
12/8/2008 12:30	blank	Pesticides	Naled	0.77	U	ug/L	0.77	3.1
12/8/2008 12:30	blank	Pesticides	Fonofos	0.097	U	ug/L	0.097	0.39
12/8/2008 12:30	blank	Pesticides	Norflurazon	0.14	U	ug/L	0.14	0.56
12/8/2008 12:30	blank	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	2,4-Dinitrotoluene	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3	U	ug/L	3	12
12/8/2008 12:30	blank	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Hexachlorobenzene	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Hexachlorocyclopentadiene	3	U	ug/L	3	12
12/8/2008 12:30	blank	Priority Organic Pollutants	Nitrobenzene	2	U	ug/L	2	8
12/8/2008 12:30	blank	Priority Organic Pollutants	Phenanthrene	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	4,4'-DDD	1.5	U	ug/L	1.5	6
12/8/2008 12:30	blank	Priority Organic Pollutants	Acenaphthene	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Benzo(a)anthracene	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Endosulfan sulfate	1.5	U	ug/L	1.5	6
12/8/2008 12:30	blank	Priority Organic Pollutants	Endrin	1.5	U	ug/L	1.5	6
12/8/2008 12:30	blank	Priority Organic Pollutants	Naphthalene	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Pentachlorophenol	3	U	ug/L	3	12
12/8/2008 12:30	blank	Priority Organic Pollutants	alpha-BHC	1.5	U	ug/L	1.5	6
12/8/2008 12:30	blank	Priority Organic Pollutants	beta-BHC	1.5	U	ug/L	1.5	6
12/8/2008 12:30	blank	Priority Organic Pollutants	gamma-BHC	1.5	U	ug/L	1.5	6
12/8/2008 12:30	blank	Priority Organic Pollutants	2,4-Dichlorophenol	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	2,6-Dinitrotoluene	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	2-Chloronaphthalene	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	4,4'-DDE	1.5	U	ug/L	1.5	6
12/8/2008 12:30	blank	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L	15	60

Appendix E. (continued)

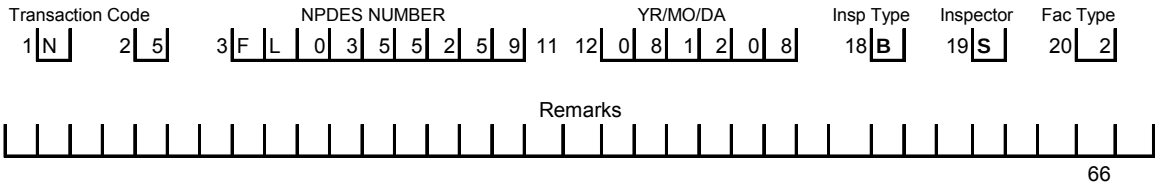
Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
12/8/2008 12:30	blank	Priority Organic Pollutants	Butyl benzyl phthalate	5	U	ug/L	5	20
12/8/2008 12:30	blank	Priority Organic Pollutants	Di-n-octyl phthalate	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Dieldrin	1.5	U	ug/L	1.5	6
12/8/2008 12:30	blank	Priority Organic Pollutants	Dimethyl phthalate	9.9	UJ	ug/L	9.9	40
12/8/2008 12:30	blank	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Pyrene	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Endosulfan II	4	U	ug/L	4	16
12/8/2008 12:30	blank	Priority Organic Pollutants	Phenol	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Benzo(b)fluoranthene	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Hexachloroethane	3	U	ug/L	3	12
12/8/2008 12:30	blank	Priority Organic Pollutants	N-Nitrosodimethylamine	2	U	ug/L	2	8
12/8/2008 12:30	blank	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	2,4-Dimethylphenol	9.9	U	ug/L	9.9	40
12/8/2008 12:30	blank	Priority Organic Pollutants	2,4-Dinitrophenol	15	U	ug/L	15	60
12/8/2008 12:30	blank	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Acenaphthylene	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Anthracene	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Benzidine	99	U	ug/L	99	400
12/8/2008 12:30	blank	Priority Organic Pollutants	Benzo(a)pyrene	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Benzo(k)fluoranthene	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Fluoranthene	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Fluorene	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Heptachlor epoxide	1.5	U	ug/L	1.5	6
12/8/2008 12:30	blank	Priority Organic Pollutants	Hexachlorobutadiene	3	U	ug/L	3	12
12/8/2008 12:30	blank	Priority Organic Pollutants	Isophorone	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2	U	ug/L	2	8
12/8/2008 12:30	blank	Priority Organic Pollutants	delta-BHC	1.5	U	ug/L	1.5	6
12/8/2008 12:30	blank	Priority Organic Pollutants	2-Nitrophenol	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	3,3'-Dichlorobenzidine	40	UJ	ug/L	40	160
12/8/2008 12:30	blank	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2	U	ug/L	2	8
12/8/2008 12:30	blank	Priority Organic Pollutants	Aldrin	1.5	U	ug/L	1.5	6
12/8/2008 12:30	blank	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3	U	ug/L	3	12

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
12/8/2008 12:30	blank	Priority Organic Pollutants	Di-n-butyl phthalate	5	U	ug/L	5	20
12/8/2008 12:30	blank	Priority Organic Pollutants	Diethyl phthalate	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Endosulfan I	4	U	ug/L	4	16
12/8/2008 12:30	blank	Priority Organic Pollutants	Heptachlor	1.5	U	ug/L	1.5	6
12/8/2008 12:30	blank	Priority Organic Pollutants	2-Chlorophenol	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	4,4'-DDT	1.5	U	ug/L	1.5	6
12/8/2008 12:30	blank	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	15	U	ug/L	15	60
12/8/2008 12:30	blank	Priority Organic Pollutants	Chrysene	0.99	U	ug/L	0.99	4
12/8/2008 12:30	blank	Priority Organic Pollutants	Endrin aldehyde	4	U	ug/L	4	16
12/10/2008 9:00	Effluent 2	Field Parameter	Temperature	24		C		
12/10/2008 9:00	Effluent 2	Field Parameter	Dissolved Oxygen	4.3		mg/L		
12/10/2008 9:00	Effluent 2	Field Parameter	Specific Conductance	194		umhos/cm		
12/10/2008 9:00	Effluent 2	Field Parameter	pH	6.95				
12/12/2008 10:20	Effluent 3	Field Parameter	Temperature	23.51		C		
12/12/2008 10:20	Effluent 3	Field Parameter	Specific Conductance	24816		umhos/cm		
12/12/2008 10:20	Effluent 3	Field Parameter	pH	7.26				

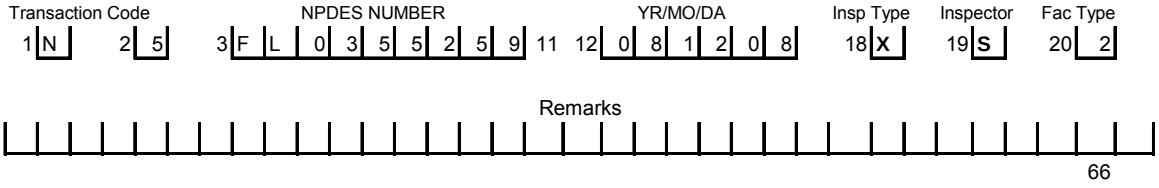
The Bioassay of the Dunes Community Development District RO Plant effluent sampled on December 8, 10 and 12, 2008. NPDES #FL0355259.

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



The Priority Pollutants Analyses of the Dunes Community Development District RO Plant effluent sampled on December 8, 2008. NPDES #FL0355259.

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



Biological Analyses of the Dunes Community Development District RO Plant effluent sampled on December 8, 2008. NPDES #FL0355259.

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

