

Effluent Quality Assessment

St. Andrews Wastewater Treatment Facility

Bay County

NPDES #FL0020451

Sampled July 18, 20, and 22, 2011

December 2011

Biology Section
Bureau of Laboratories
Division of Environmental Assessment and Restoration

Quality Manual No. 870346G
NELAC Certification No. E31780

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St. Andrews Wastewater Treatment Facility (WWTF), 2226 Michigan Avenue, Panama City, Bay County, Florida, 32405. NPDES #FL0020451. Effluent grab samples for biological and chemical analyses for this facility were collected on July 18, 2011. Composited bioassay samples were collected on July 18, 20, and 22, 2011.

Introduction

St. Andrews WWTF is an advanced wastewater treatment facility which uses the Bardenpho process to treat domestic wastewater. (See Appendix F for detailed facility information provided by Kim Allen of FDEP Northwest District.)

Methods

Samples were collected from the EFD-01 NPDES sampling point for Outfall D-001 by Corinna Clanton and Nathan Mulkey (FDEP Northwest District) following DEP-SOP-001/01 FS 2400 Wastewater Sampling. All DEP SOPs are available on the web at: http://www.floridadep.org/labs/bars/sas/sop/index.htm.

See Appendix A for the completed chain of custody form.

The 7-day chronic definitive toxicity tests and algal growth potential test were performed following internal DEP SOPs TA07_05, TA07_09, 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.

An aliquot of the AGP sample was salinity adjusted by the addition of artificial sea salts from an apparent salinity of approximately 0.15 parts per thousand (ppth) to a salinity of approximately 7.0 ppth to meet the salinity requirements of the test species.

Results and Discussion

- **Toxicity Test Results**
  Test performed July 19 - 27, 2011.

  Ceriodaphnia dubia 7-day chronic definitive bioassay – IC25: > 100%
  NOEC: 100%

  Test performed July 19 – 26, 2011

  Pimephales promelas 7-day chronic definitive bioassay – IC25: >100 %
  NOEC: 100%

  The bioassay samples were not chronically toxic to the test organisms. The *Ceriodaphnia dubia* test was extended to day eight to meet termination criteria.

  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 93.4 mg dry wt/L of the unicellular green alga, *Pseudokirchneriella subcapitata*, formerly known as *Selenastrum capricornutum*. Raschke and Schultz (1987) determined that AGP values above 5.0 mg dry weight/L represent a “problem” threshold for fresh receiving waters, implying nutrient enrichment. The analytical chemistry suggests that the effluent is nitrogen-limited (Miller et al. 1978; Maloney et al. 1978).

The salinity-adjusted effluent AGP was 93.7 mg dry wt/L of the saltwater species *Dunaliella tertiolecta.* Raschke and Schultz determined that AGP values above 10.0 mg dry weight/L represent a “problem” threshold for marine receiving waters, implying nutrient enrichment (personal communication, Marshall Faircloth, et. al. FDEP, with Ron Raschke USEPA Region 4 1987).

See Table 1 for AGP results and qualifiers.

- **Chemistry Results**
  Total residual chlorine and total ammonia were not detected in the three bioassay samples in the laboratory. The total ammonia concentration in the composite sample collected and preserved for chemical analysis was 0.18 mg N/L. Effluent temperature was not measured at the time of sampling, so unionized ammonia could not be calculated.

  Aluminum, arsenic, copper, fluoride and nickel were detected in the effluent at levels that comply with Class III marine water quality criteria (62-302.530, F.A.C.). Silver and zinc were detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL). The effluent’s iron (450 µg/L) exceeded the Class III marine criterion for iron (62-302.530(38) F.A.C.). Chromium III, chloride and sulfate were also detected in the effluent.

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

Conclusion

The effluent sample collected from the EFD-01 NPDES sampling point for Outfall D-001 for this facility on July 18, 20 and 22, 2011, was not chronically toxic to either test species during the chronic definitive bioassays. The results from both the effluent and the salinity-adjusted AGP tests were greater than the "problem” threshold for fresh and marine receiving waters, suggesting that nutrient enrichment may be an issue. Effluent water quality samples collected on July 18, 2011, exceeded applicable water quality standards for iron.

Literature Cited

Miller, W. E., T. E. Maloney, and J. C. Greene. 1978. The *Selenastrum capricornutum* Printz algal assay bottle test. EPA-600/9-78-018. U. S. EPA, Cincinnati, Ohio. 126 p.

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

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

Table 1a. Measured and predicted algal growth potential (AGP; mg dry weight/L) for total soluble inorganic nitrogen (TSIN) and total nitrogen (TN) limitation of the freshwater species *Pseudokirchneriella subcapitata* and ratios of nitrogen to phosphorus for samples collected from the St. Andrews Wastewater Treatment Facility on July 18, 2011.

St. Andrews WWTF NPDES # FL0020451					
Location	AGP (measured)	Predicted AGP (TSIN) ± 20%	Predicted AGP (TN) ± 20%	Inorganic N:P ratio	Total N:P ratio
Effluent	93.4	67.6 ± 13.5	106.4 ± 21.3	1.4	1.8

Table 1b. Measured algal growth potential (AGP; mg dry weight/L) of the saltwater species *Dunaliella tertiolecta* and ratios of nitrogen to phosphorus for samples collected from the St. Andrews Wastewater Treatment Facility on July 18, 2011.

St. Andrews WWTF NPDES# FL0020451			
Location	AGP (measured)	Inorganic N:P ratio	Total N:P ratio
Effluent	93.7	1.4	1.8

* - sample salinity adjusted to 7ppt

Table 2. Effluent limits, Class III Criteria for predominantly marine waters, chemical and microbiological data, and qualifiers for samples collected from the St. Andrews Wastewater Treatment Facility on July 18, 2011.

St. Andrews WWTF NPDES# FL0020451	Class III Criteria	Effluent Limits	Effluent	
Metals (µg/L unless otherwise noted)				
Aluminum	≤ 1500	-	50	
Arsenic	≤ 50	-	1.21	
Cadmium	≤ 8.8	-	0.05	U
Calcium (mg/L)	-	-	23.4	
Chromium-III	-	-	2.7	
Copper	≤ 3.7	-	2.18	
Iron	≤ 300	-	450	
Lead	≤ 8.5	-	0.2	U
Magnesium (mg/L)	-	-	7.43	
Nickel	≤ 8.3	-	1.57	
Selenium	≤ 71	-	0.2	U
Silver	≤ 2.3	-	0.036	I
Zinc	≤ 86	-	15	I
Nutrients (mg/L)				
Ortho-phosphate	-	-	1.3	
Total Phosphorus	-	≤ 4.0 p	1.6	
Total Ammonia	-	≤ 4.0 p	0.18	
Un-ionized Ammonia	-	-	-	*
Nitrate and Nitrite	-	-	1.6	
Total Kjeldahl Nitrogen	-	Report	1.2	
Organic Nitrogen	-	-	1.02	c
Total Nitrogen	-	≤ 16.0 p	2.8	c
General Physical and Chemical Parameters				
Dissolved Oxygen (mg/L)	≥ 4.0	≥ 6.0 s	8.1	
pH (SU)	6.5 - 8.5	6.5 - 8.5	7.1	
Conductivity (µmhos/cm)	-	-	115	
Total Residual Chlorine (mg/L)	≤ 0.01	≤ 0.01	0.03	QU£
Chlorophyll *a* (µg/L) - Corrected	-	-	0.7	I
Phaeophytin (µg/L)	-	-	0.4	U
Total Suspended Solids (mg/L)	-	≤ 20.0 p	4	I
Chloride (mg/L)	-	-	82	
Fluoride (mg/L)	≤ 5.0	-	0.29	
Sulfate (mg/L)	-	-	38	
Flow (MGD)	-	5.0 a	2.77	a†
Hardness (mg $CaCO_3$)	-	-	89.03	c
Microbiology (Number of colony forming units/100ml)				
Fecal Coliforms ¥	≤ 400s #	Report	2	B

Value exceeds the Class III Water Quality Criteria or permit limits

a - Annual average
c - Value is calculated
p -24-hour flow proportioned composite
s - Single sample
B - Results based on colony counts outside the acceptance range
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
Q - Sample held beyond normal holding time
U - Material analyzed for but not detected; value reported is the method detection limit
¥ - Fecal coliform analysis performed by The Water Spigot lab
- If 10 or fewer samples are taken within a month, the single sample limit is 400 CFU (62-302.530(6), F.A.C.)
£ - measurement taken in the FDEP laboratory
* - No temperature recorded during sampling
† - Data measured from 7/31/2010 to 6/30/2011

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2011-07-18-43
FYI3 for St. Andrews WWTF

Requester: Edward Smith
Field Report Prepared By: N. Melby

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

Collected By: Nathan Melby
Send Final Report To: Toni Edwards

Sampling Agency: FDEP

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
	St. Andrews WWTP	☐ Comp ☑ Grab Date 7/18/11 Time 1040 Eastern Central	Date Time Eastern Central	
	Field ID: Effluent	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L): 8.08	Storet Station Number
	Matrix (include type e.g. Salt, Fresh, etc): WASTE	Temp (C)	pH: 7.08	Sample Depth ☑ m ☐ ft: .10
		☐ Salinity (PPTh) ☑ Sp Conductance (umho/cm): 115	NPDES Number	
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments	

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
	St. Andrews WWTF	☑ Comp ☐ Grab Date 7/18/11 Time 6:55 Eastern Central	Date 7/18/11 Time 7:25 Eastern Central	
	Field ID: TOX 1	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number
	Matrix (include type e.g. Salt, Fresh, etc): waste	Temp (C)	pH	Sample Depth ☐ m ☐ ft
		☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number	
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments	

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
	St. Andrews WWTF	☐ Comp ☑ Grab Date 7/18/11 Time 1110 Eastern Central	Date Time Eastern Central	
	Field ID: Blank	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number
	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth ☐ m ☐ ft
		☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number	
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments	

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
		☐ Comp ☐ Grab Date Time Eastern Central	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 ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments: 2 bioassay Rec'd in Tot by JD. 7.19.11 10:16	

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
	7/18/11	Fed Ex	ATB	07-19-11 0935				

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

2011-07-18-43

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ ~~2009-11-09-16~~
~~Cheetawatchee Bay~~

Requester: ~~William Chandler~~ Field Report Prepared By: Corinna Clanton

Customer: NW-DIST

Collected By: Corinna Clanton Send Final Report To ~~Cheryl Bench~~ Toni Edwards

Project ID: ~~DISCRETIONARY~~ FY13

Sampling Agency: FDEP

PMAS: ~~1000~~ 1143

Lab ID *	Location					Bottle Group(s)**
	St. Andrews WWTF			☒ Comp ☐ Grab	Collection (begin) Date 7/19/11 Time 0730 Eastern Central	Collection (end) Date 7/20/11 Time 0730 Eastern Central
	Field ID TOX 2			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		

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 2 bossy Reid in Tox by JA 9:47 7.21.11		

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
Corinna Clanton	7/20/11 11:57	FedEX	[illegible]	07-21-11 09:20				

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

2011-07-18-43

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Request Number: RQ-~~2008-11-69-16~~ ~~Choctawhatchee Bay~~

Event ID *

Requester: ~~William Chandler~~ Field Report Prepared By: Corinna Clanton

Customer: NW-DIST Collected By: Corinna Clanton Send Final Report To ~~Chpt Branch~~ Toni Edwards

Project ID: ~~DISCRETIONARY~~ FY13 Sampling Agency: FDEP

PMAS: ~~1000~~ 1143

Lab ID *	Location			☒ Comp ☐ Grab	Collection (begin) Date Time	Eastern Central	Collection (end) Date Time	Eastern Central	Bottle Group(s)**
	St. Andrews WWTF				7/21/11 Time 6700	Central	7/22/11 Time 0639	Central	
	Field ID			Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)		Storet Station Number		
	70X3								
	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth ☐ m ☐ ft		☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)		NPDES Number	
	Latitude ° ' "	Longitude ° ' "		Comments					

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

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

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

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
Corinna Clanton	7/22/11 9:51	FedEx	M Hamilton	7/23/11 0908				

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

White cooler 1.2 °C MF 7/23/11
Blue cooler 0.9 °C

Appendix B. Bench Sheets

FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia

Facility: St. Andrews UWTF
Address: 2226 Michigan Ave, Panama City, FL 32405
County: Bay
NPDES Permit #: FL 0020451
Contact/District: Nathan Mulkey Corinna Clanton / NW

LIMS entry: 8-9-11 MF verified: 8.15.11 JD

Diluent/ Batch: 20% DMW 7.12.11 Test Days Used: 0-5
20% DMW 7.21.11 Test Days Used: 6-8

SOP#: TA07_05 EPA 821-R-02-013 Method 1002.0

Organism: *Ceriodaphnia dubia*
Organism Batch #: 7-19-1
Organism age : <24 hours
Feeding: Prior to Test and Daily
Food: ☑ YCT ☑ *P. subcapitata*
Food Batch: 5.5.11 5.5.11
Chamber size : 30 ml
Sample volume : 20 ml

Sample Received	LAB Sample #	LIMS JOB #	LIMS SAMPLE #	Collection Date/Time	Received Date/Time
Test Day 0	1	TLH-2011-07-19-28	1364766	7/18/11 0825	7/19/11 @0935
Test Day 2	2	TLH-2011-07-21-36	1365683	7/20/11 0830	7/21/11 @0920
Test Day 4	3	TLH-2011-07-25-06	1366197	7/22/11 ~~0806~~ MF 0739	7/23/11 @0908

Water Quality Parameters	Batch # 7.12.11 20% DMW	7.21.11 20% DMW	NA Sample 1	NA Sample 2	NA Sample 3	Other:	Measured By:	Verified by:
Field Total Residual Cl_2 (mg/L):	NA	NA	not measured	—	—		n/a	KC
Lab Total Residual Cl_2 (mg/L):	<0.03	<0.03	<0.03	<0.03	<0.03		KC	KC
Alkalinity (mg/L as $CaCO_3$):	80	80	54	54	55		KC	KC
Hardness (mg/L as $CaCO_3$):	83	81	100	91	93		KC	KC
Total Ammonia (mg/L as N):	<0.017	<0.017	<0.017	<0.017	<0.017		BA	KC
Conductivity: (umhos) mmhos:	177	181	591	513	567		KC/MF	KC
Salinity (ppth):	—	—					— BA	—

Test Incubated in: Incubator #: 5

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:
Incubator # 5 min. 23.9 max. 25.3 mean —
Room B246 min. 23.7 max. 25.3 mean —
Test min. ____ max. ____ mean ____

Loaded by: MF

Test Replicates	Loaded from culture vial
1	A21
2	A20
3	A17
4	B20
5	A22
6	A14
7	B16
8	B23
9	B28
10	B19

Results	
Control % CV:	24.6 %
Dunnetts PMSD:	35.98%
Reproduction NOEC:	100%
Reproduction LOEC:	> 100%
Survival NOEC:	100 %
Survival LOEC:	> 100 %
ICP_{20}:	> 100 %
ICP_{25}:	> 100 %

Investigators' signatures
Karla Cox
Marshall Faircloth
Bruce Wells
James Dimond

REVIEWER

Comments:

Test Page 1 of 6 PAGE 000067 revised 07/15/08 MF

FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia Survival and Reproduction

SOP TA07_05

Facility: ST. Andrews WWTF

LIMS Sample #: 1364766 for lab sample #1

Start Date: 7-19-11 Time: 1130

End Date: 7-27-11 Time: 1000

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving adults	Neonates per adult
Control	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	4	4	8	10	0.8
	4	5	5	5	4	6	4	0	0	0	0	29	10	2.9
	5	7	5	7	9	7	0	8	7	7	3	mf 60	10	6.0
	6	0	0	0	0	0	8	0	0	0	10	fem 18	10	1.8
	7	5	0	0	0	0	0	0	0	0	0	5	10	0.5
	8	0	5	4	6	10	8	10	0	8	5*	51	10	5.1
	Total	17	15	16	19	23	20	18	7	19	17	171	10	17.1

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving adults	Neonates per adult
6.25%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	0	0	0	10	0
	4	2	0	4	4	2	2	3	3	2	0	22	10	2.2
	5	0	0	3	6	9	0	6	6	3	6	39	10	3.9
	6	6	3	0	0	0(4th)	4(mf)	0	0	0	9	22	10	2.2
	7	0	0	6	0	0	8	6	0	0	0	14	10	1.4
	8	0	8	7*	5	6	0	6	0	11	8	44	10	4.4
	Total	8	11	13	15	17	14	15	9	16	23	141	10	14.1

Organisms loaded by: MF		
Day	Counted/ verified by:	Concentrations prepared by:
0	BA	MF
1	BA	BA
2	BA	BA
3	BA	BA
4	MF	MF
5	MF	MF
6	MF	MF
7	MF	MF
8	MF	—

Concentration	Mean neonates /adult	% survival
Control	17.1	100
6.25%	14.1	100
12.50%	19.9	100
25%	18.5	100
50%	16.5	80
100%	17.8	90

Test acceptability	
Mean control reproduction 15/female	(yes) no
3rd brood in 60% of surviving females	(yes) no
Control survival ≥ 80%:	(yes) no

Comments: *7/27/11 Fourth broods not counted/MF

*Day 0 is test initiation day
X = Dead (original organism)

Test Page 2 of 6

PAGE

FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia Survival and Reproduction

SOP TA07_05

Facility: St. Andrews WWTF

LIMS Sample # : 13MF64762 for lab sample #1

Start Date: 7-19-11 MF Time: 1130

End Date: 7-27-11 Time: 1000

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving Adults	Neonates per adult
12.50%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	4	3	7	10	0.7
	4	0	0	2	5	0	0	0	3	0	0	10	10	0.1
	5	1	6	9	9	9	0	8	8	9	6	65	10	6.5
	6	0	0	0	0	8	7	9	9	9	10	52	10	5.2
	7	9	0	0	5	0	6	0	0	0	0	20	10	2.0
	8	7	8	10	8*	9	4	7	9*	8*	3*	45	10	4.5
	Total	17	14	21	19	26	17	24	20	22	19	19.9 /MF	10	19.9

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving Adults	Neonates per adult
25%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	0	0	0	0	0	0	3	0	~~0~~ 3	10	0.3
	4	3	4	0	4	0	0	0	1	0	0	12	10	1.2
	5	4	9	2	8	5	0	7	3	7	7	52	10	5.2
	6	9	0	9	10	0	5	6	0	10	10	59	10	5.9
	7	0	0	0	0	0	0	7	0	0	0	7	10	0.7
	8	X10	8	11	X12	10	10	X10	6	X10	8	53	10	5.3
	Total	16	21	22	22	15	15	20	9 10	20 BA	25	~~185~~ 185	10	~~18.5~~ 18.6

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving Adults	Neonates per adult
50%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	2	1	0	0	0	4	0	3	0	10	10	0.1
	4	0	0	2	4	3	0	0	0	0	0	9	10	0.9
	5	5	9	8	7	10	5	8	8	X	3	63	9	6.3
	6	10	9	X9	3X	0	0	8	12	1	6	48	8	4.8
	7	0	X5	0	1	3	0	0	0	1	5	8	8	0.8
	8	7	0	X6	1	9*	10	18*	10	1	0	27	8	2.7
	Total	22	20	11	14	16	15	20	30	3	14	165	8 (10)	16.5

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving Adults	Neonates per adult
100%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	2	0	0	0	0	0	1	0	0	3	10	0.3
	4	0	0	4	0	3	4	4	0X	0	2	17	9	1.7
	5	3	0	0	6	10	0	0	1	7	6	32	9	3.2
	6	10	0	7	12	11	7	5	1	11	8	71	9	7.1
	7	0	0	12	0	0	8	5	1	0	0	25	9	2.5
	8	10	0	X10	9	13*	12*	X7	1	11	10*	30	9	3.0
	Total	23	2	23	27	24	19	14	1	29	16	178	9	17.8

Comments: *7-27-11 fourth broods not counted: MF

*Day 0 is test initiation day
X = Dead (original organism)

Appendix B. (continued)

FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia Parameters

Facility: St. Andrews WWTF SOP TA07_05

LIMS Sample #: 1364766 for lab sample 1

Circle µmhos-cm or mmhos-cm

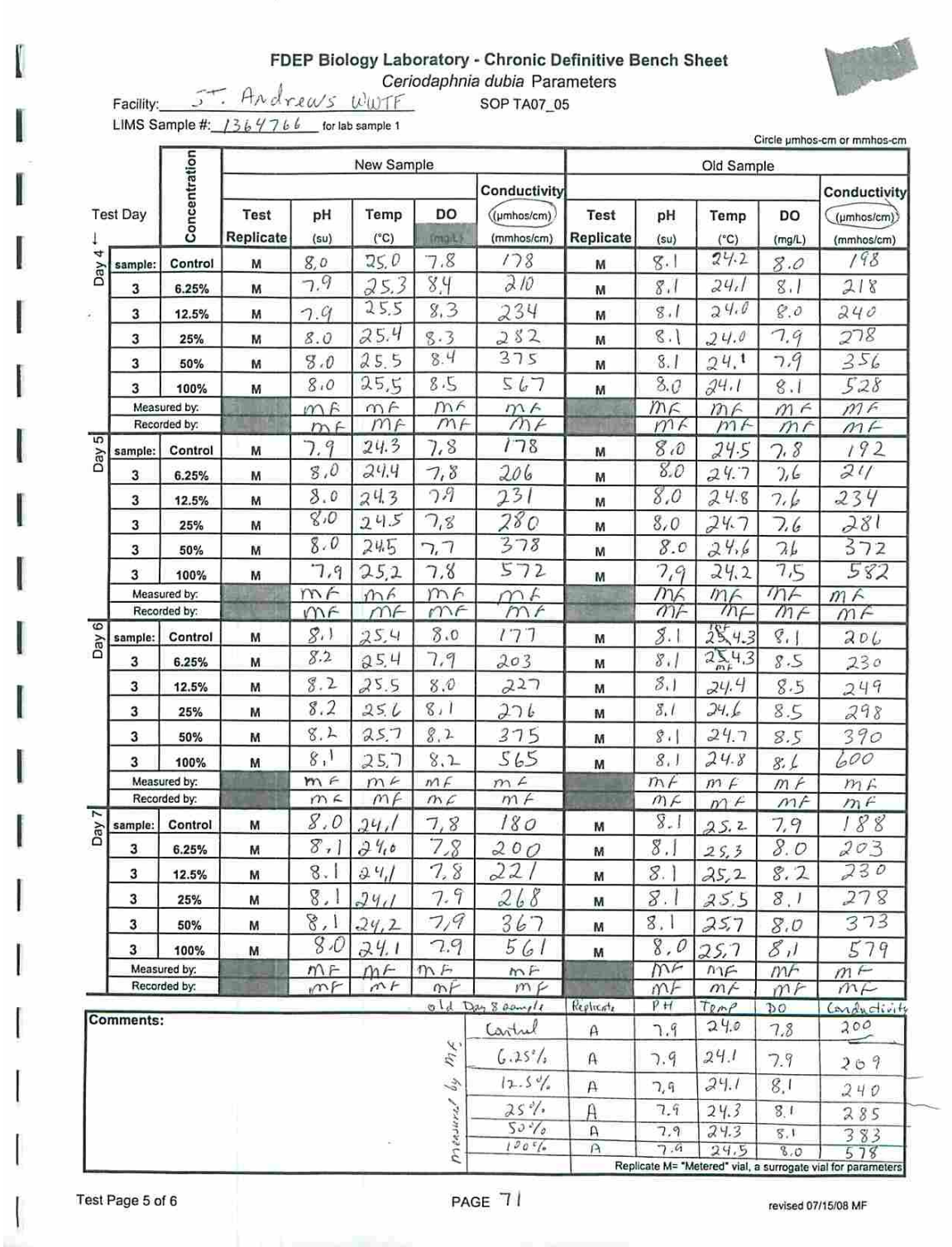
Test Day ↓		Concentration	New Sample					Old Sample				
			Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)	Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)
Day 0	sample	Control	M	7.9	24.0	7.1	181					
	1	6.25%	M	7.9	24.0	8.2	212					
	1	12.5%	M	7.9	24.0	8.2	237					
	1	25%	M	8.0	24.0	8.3	288					
	1	50%	M	8.0	24.0	8.5	389					
	1	100%	M	8.0	24.0	8.5	591					
	Measured by:			KC	KC	KC	KC					
	Recorded by:			KC	KC	KC	KC					
Day 1	sample:	Control	M	8.0	24.5	7.0	178	M	7.9	24.0	7.0	188
	1	6.25%	M	8.0	24.9	7.4	204	M	7.9	24.0	7.2	211
	1	12.5%	M	8.0	24.9	7.5	230	M	8.0	24.0	7.2	237
	1	25%	M	8.1	24.8	7.6	282	M	8.0	24.0	7.0	293
	1	50%	M	8.1	24.4	7.6	384	M	8.0	24.0	6.9	392
	1	100%	M	8.0	24.1	7.6	595	M	8.0	24.0	7.0	589
	Measured by:			BA	BA	BA	BA		BA	BA	BA	BA
	Recorded by:			BA	BA	BA	BA		BA	BA	BA	BA
Day 2	sample:	Control	M	7.9	24.1	6.7	172	M	7.9	24.0	6.9	189
	2	6.25%	M	8.0	24.8	7.1	198	M	8.0	24.0	7.2	211
	2	12.5%	M	8.0	24.8	7.2	219	M	8.0	24.0	7.2	239
	2	25%	M	8.0	24.8	7.4	260	M	8.0	24.0	7.6	295
	2	50%	M	8.0	24.8	7.5	340	M	8.0	24.0	7.4	397
	2	100%	M	8.0	24.8	7.7	513	M	7.9	24.0	7.5	621
	Measured by:			BA	BA	BA	BA		BA	BA	BA	BA
	Recorded by:			BA	BA	BA	BA		BA	BA	BA	BA
Day 3	sample:	Control	M	8.0	24.0	7.3	174	M	8.0	24.0	7.2	183
	2	6.25%	M	8.0	24.1	7.3	199	M	8.0	24.0	7.2	204
	2	12.5%	M	8.0	24.0	7.4	220	M	8.0	24.0	7.2	224
	2	25%	M	8.0	24.0	7.6	262	M	8.0	24.0	7.3	267
	2	50%	M	8.0	24.0	7.6	341	M	8.0	24.0	7.3	347
	2	100%	M	8.0	24.0	7.6	504	M	8.0	24.0	7.4	509
	Measured by:			BA	BA	BA	BA		BA	BA	BA	BA
	Recorded by:			BA	BA	BA	BA		BA	BA	BA	BA

Comments:

Replicate M= "Metered" vial, a surrogate vial for parameters

Test Page 4 of 6 PAGE 000170 revised 07/15/08 MF

Appendix B. (continued)



FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia Parameters

Facility: St. Andrews WWTF SOP TA07_05

LIMS Sample #: 1364766 for lab sample 1

Circle µmhos-cm or mmhos-cm

Test Day ←		Concentration	New Sample: Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)	Old Sample: Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)
Day 4	sample:	Control	M	8.0	25.0	7.8	178	M	8.1	24.2	8.0	198
	3	6.25%	M	7.9	25.3	8.4	210	M	8.1	24.1	8.1	218
	3	12.5%	M	7.9	25.5	8.3	234	M	8.1	24.0	8.0	240
	3	25%	M	8.0	25.4	8.3	282	M	8.1	24.0	7.9	278
	3	50%	M	8.0	25.5	8.4	375	M	8.1	24.1	7.9	356
	3	100%	M	8.0	25.5	8.5	567	M	8.0	24.1	8.1	528
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF
Day 5	sample:	Control	M	7.9	24.3	7.8	178	M	8.0	24.5	7.8	192
	3	6.25%	M	8.0	24.4	7.8	206	M	8.0	24.7	7.6	211
	3	12.5%	M	8.0	24.3	7.9	231	M	8.0	24.8	7.6	234
	3	25%	M	8.0	24.5	7.8	280	M	8.0	24.7	7.6	281
	3	50%	M	8.0	24.5	7.7	378	M	8.0	24.6	7.6	372
	3	100%	M	7.9	25.2	7.8	572	M	7.9	24.2	7.5	582
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF
Day 6	sample:	Control	M	8.1	25.4	8.0	177	M	8.1	25.4.3 (MF)	8.1	206
	3	6.25%	M	8.2	25.4	7.9	203	M	8.1	25.4.3 (MF)	8.5	230
	3	12.5%	M	8.2	25.5	8.0	227	M	8.1	24.4	8.5	249
	3	25%	M	8.2	25.6	8.1	276	M	8.1	24.6	8.5	298
	3	50%	M	8.2	25.7	8.2	375	M	8.1	24.7	8.5	390
	3	100%	M	8.1	25.7	8.2	565	M	8.1	24.8	8.6	600
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF
Day 7	sample:	Control	M	8.0	24.1	7.8	180	M	8.1	25.2	7.9	188
	3	6.25%	M	8.1	24.0	7.8	200	M	8.1	25.3	8.0	203
	3	12.5%	M	8.1	24.1	7.8	221	M	8.1	25.2	8.2	230
	3	25%	M	8.1	24.1	7.9	268	M	8.1	25.5	8.1	278
	3	50%	M	8.1	24.2	7.9	367	M	8.1	25.7	8.0	373
	3	100%	M	8.0	24.1	7.9	561	M	8.0	25.7	8.1	579
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF

Comments:

Measured by MF.

old Day 8 sample	Replicate	PH	Temp	DO	Conductivity
Control	A	7.9	24.0	7.8	200
6.25%	A	7.9	24.1	7.9	209
12.5%	A	7.9	24.1	8.1	240
25%	A	7.9	24.3	8.1	285
50%	A	7.9	24.3	8.1	383
100%	A	7.9	24.5	8.0	578

Replicate M= "Metered" vial, a surrogate vial for parameters

Test Page 5 of 6 PAGE 71 revised 07/15/08 MF

Appendix B. (continued)

Test ID: St. Andrews WWTF Dates: 7.19.11 – 7.27.11

METER / DEVICE	ID	SOP	Parameter	Method	√ used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
YSI DO Probe	5905	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
Accumet AR-10 pH Meter	93312105	TA06_23	pH	SM 4500 H+	✓
Mettler-Toledo SevenMulti Conductivity Meter	SN 1225117049 Probe H04257	TA06_25	Conductivity Salinity	SM 2510 B SM 2520 B	✓
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	✓
Traceable Thermometer	#1-SN101686412 #2-SN221295527 #3-SN240116020 #4-SN803617795 (#5) SN619990624	TA06_05	Temperature	SM-2530B modified DEP SOP-001/01 FT1400	✓ #5
Hach Pocket Colorimeter II	05050C026378	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	✓
Alkalinity (Hach Kit)	No SN	TA06_08	Alkalinity	SM 2320 B	✓
Hardness (Hach Kit)	No SN	TA06_09	Hardness	SM 2340 C	✓
OHAUS Balance 250D	1125481084	TA06_21 TA06_27	Weight	-	
S-Weights	BIO-S-WEIGHTS-01	NA	Balance check	-	

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

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

Entered By: Kara Cope 8/3/11

V 1.1 9/21/10 MF/jd

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Appendix B. (continued)

FDEP Biology Laboratory - Chronic Bioassay Bench Sheet

Pimphales promelas or Menidia beryllina

Facility: St. Andrews WWTF
Address: 2226 Michigan Ave., Panama City, FL 32405
County: Bay
NPDES Permit #: FL0026451
Contact/District: Nathan Mulkey/Northwest

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: 7.19.11 Time: 1300
End Date: 7.26.11 Time: 1100

Diluent/ Batch:
MHW / 7.18.11 Test Days Used: 0-7
MHW /_____ Test Days Used: _____
ASW /_____ Test Days Used: _____
ASW /_____ Test Days Used: _____

Organism age : <24 hrs. ~~days~~
Feeding Prior to Test and Daily
Artemia Lot #: 23613
Chamber size : 1000 ml
Test volume : 500 ml

Artemia Batch #		Day 3	7.21.11
Day 0	7.23.11	Day 4	7.22.11
Day 1	7.24.11	Day 5	7.25.11
Day 2	7.25.11	Day 6	7.26.11

Sample Received	Lab Sample #	LIMS Job #	LIMS Sample #	Collection Date/Time	Received Date/Time
Test Day 0	1	TLH-2011-07-19-28	13647666	07.18.11 0825	07.19.11 0935
Test Day 2	2	TLH-2011-07-21-36	13656883	07.20.11 0830	07.21.11 0920
Test Day 4	3	TLH-2011-07-25-06	13666197	~~07.21.11 0800~~ 07.22.11 0734 KC	07.23.11 0908

Water Quality Parameters	Field Chlorine (mg/L)			Lab Chlorine (mg/L)			Alkalinity (mg/L as $CaCO_3$)			Hardness (mg/L as $CaCO_3$)		
Lab Sample #:	1	2	3	1	2	3	1	2	3	1	2	3
Sample:	not measured			<0.03	<0.03	<0.03	54	54	55	100	91	93
Diluent/Control:				<0.03	<0.03	<0.03	73	73	73	91	91	91
Method:	n/a			Hach	Hach	Hach	Hach	Hach	Hach	Hach	Hach	Hach
Measured by:	n/a			KC	KC	KC	KC	KC	KC	KC	KC	KC
Verified by:	KC	KC	KC	KC	KC	KC	KC	KC	KC	KC	KC	KC

	Conductivity (circle one) (umhos-cm) mmhos-cm)			Ammonia (mg/L)			Salinity (ppth)		
Lab Sample#:	1	2	3	1	2	3	1	2	3
Sample:	26604	531	555	<0.017	<0.017	<0.017			
Diluent/Control:	337	319	331	<0.017	<0.017	<0.017			
Method:	Mettler	Mettler	Mettler	Denver	Denver	Denver	Mettler	Mettler	Mettler
Measured by:	KC	KC	BA	BA	BA	BA			
Verified by:	KC	KC	KC	KC	KC	KC			

Statistics	
Growth NOEC:	100%
Growth LOEC:	>100%
Growth IC_{20}:	>100%
Growth IC_{25}:	>100%
Ctrl % CV:	3.224%
Dunnetts PMSD:	32.9%
Survival NOEC:	100%
Survival LOEC:	>100%

Light Intensity : 50 - 100 ft. candles
Photoperiod : 16 light 8 dark
Temperature Range °C:
Incubator # 3 min 24.7 max 26.7 mean —
Water bath # ___ min.____ max.____ mean____
Room B246 min 20.1 max 25.3 mean —

Limsentry: 8-19-11 MF
Verification: 8-19-11 JD by MF

Investigators' signatures
James Daniels
Dana Cox
Brent Aldridge
Marshall Faircloth

REVIEWER

Comments:

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revised 08/24/06 MF/SP

Appendix B. (continued)

Chronic Bioassay Survival Benchsheet

Facility: St. Andrews WWTF

LIMS Sample Number: 13647646
(for Lab Sample # 1)

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

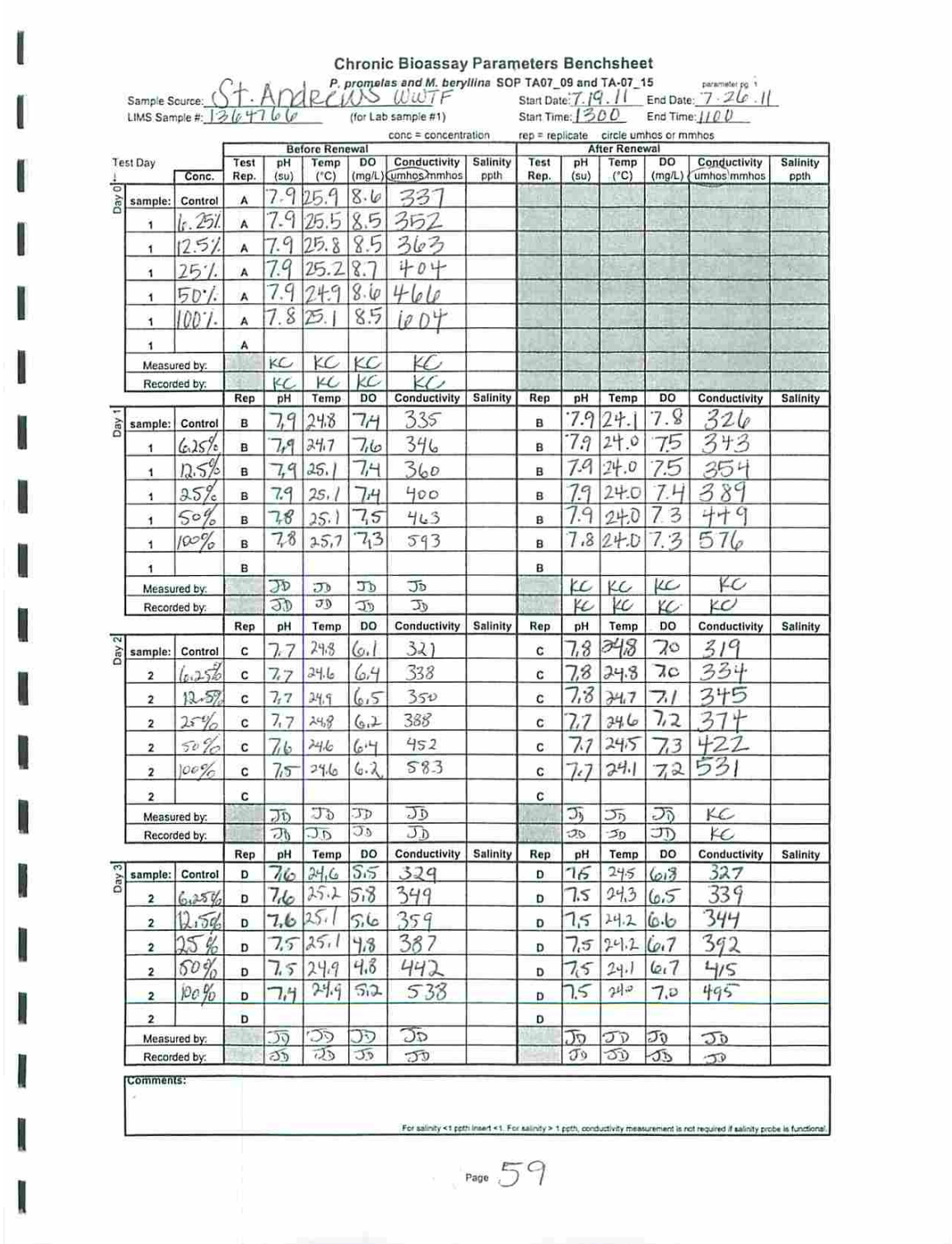
Organism: (*P. promelas*) *M.beryllina* (circle one)

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

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: St. Andrews WWTF — Start Date: 7.19.11 — End Date: 7.26.11

LIMS Sample #: 1364766 (for Lab sample #1) — Start Time: 1300 — End Time: 1100

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

Test Day		Conc.	Before Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth	After Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth
Day 0	sample:	Control	A	7.9	25.9	8.6	337							
	1	6.25%	A	7.9	25.5	8.5	352							
	1	12.5%	A	7.9	25.8	8.5	363							
	1	25%	A	7.9	25.2	8.7	404							
	1	50%	A	7.9	24.9	8.6	466							
	1	100%	A	7.8	25.1	8.5	604							
	1		A											
	Measured by:			KC	KC	KC	KC							
	Recorded by:			KC	KC	KC	KC							
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 1	sample:	Control	B	7.9	24.8	7.4	335		B	7.9	24.1	7.8	326	
	1	6.25%	B	7.9	24.7	7.6	346		B	7.9	24.0	7.5	343	
	1	12.5%	B	7.9	25.1	7.4	360		B	7.9	24.0	7.5	354	
	1	25%	B	7.9	25.1	7.4	400		B	7.9	24.0	7.4	389	
	1	50%	B	7.8	25.1	7.5	463		B	7.9	24.0	7.3	449	
	1	100%	B	7.8	25.7	7.3	593		B	7.8	24.0	7.3	576	
	1		B						B					
	Measured by:			JD	JD	JD	JD			KC	KC	KC	KC	
	Recorded by:			JD	JD	JD	JD			KC	KC	KC	KC	
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 2	sample:	Control	C	7.7	24.8	6.1	321		C	7.8	24.8	7.0	319	
	2	6.25%	C	7.7	24.6	6.4	338		C	7.8	24.8	7.0	334	
	2	12.5%	C	7.7	24.9	6.5	350		C	7.8	24.7	7.1	345	
	2	25%	C	7.7	24.8	6.2	388		C	7.7	24.6	7.2	374	
	2	50%	C	7.6	24.6	6.4	452		C	7.7	24.5	7.3	422	
	2	100%	C	7.5	24.6	6.2	583		C	7.7	24.1	7.2	531	
	2		C						C					
	Measured by:			JD	JD	JD	JD			JD	JD	JD	KC	
	Recorded by:			JD	JD	JD	JD			JD	JD	JD	KC	
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 3	sample:	Control	D	7.6	24.6	5.5	329		D	7.5	24.5	6.8	327	
	2	6.25%	D	7.6	25.2	5.8	349		D	7.5	24.3	6.5	339	
	2	12.5%	D	7.6	25.1	5.6	359		D	7.5	24.2	6.6	344	
	2	25%	D	7.5	25.1	4.8	387		D	7.5	24.2	6.7	392	
	2	50%	D	7.5	24.9	4.8	442		D	7.5	24.1	6.7	415	
	2	100%	D	7.4	24.9	5.2	538		D	7.5	24.0	7.0	495	
	2		D						D					
	Measured by:			JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by:			JD	JD	JD	JD			JD	JD	JD	JD	

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 Bioassay Parameters Benchsheet

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

Sample Source: St. Andrews WWTF — Start Date: 7.19.11 — End Date: 7.26.11

LIMS Sample #: 1304706 (for Lab sample #1) — Start Time: 1300 — End Time: 1100

conc = concentration — rep = replicate

Test Day	Conc.	Before Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (umhos/mmhos)	Salinity ppth	After Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (umhos/mmhos)	Salinity ppth
Day 4	sample: Control	A	7.3	25.2	6.5	337		A	7.9	25.4	6.8	331	
	3 6.25%	A	7.3	25.5	6.8	480302		A	8.0	25.4	7.3	348	
	3 12.5%	A	7.4	25.4	7.6	363		A	7.9	25.3	7.3	358	
	3 25%	A	7.4	25.3	6.4	389		A	7.9	25.2	7.2	391	
	3 50%	A	7.4	25.1	6.7	436		A	7.9	25.1	7.4	445	
	3 100%	A	7.3	25.1	6.2	537		A	7.8	25.0	7.4	555	
	3	A						A					
	Measured by:		KC	KC	KC	KC			BA	BA	BA	BA	
	Recorded by:		KC	KC	KC	KC			BA	BA	BA	BA	
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 5	sample: Control	B	7.7	24.0	7.3	333		B	7.8	25.0	7.5	335	
	3 6.25%	B	7.8	24.1	6.5	355		B	7.8	25.4	7.4	352	
	3 12.5%	B	7.8	24.0	6.5	363		B	7.8	25.3	7.4	356	
	3 25%	B	7.6	24.3	6.6	395		B	7.8	25.4	7.3	381	
	3 50%	B	7.6	24.6	6.5	453		B	7.7	25.5	7.3	439	
	3 100%	B	7.6	24.0	6.5	570		B	7.7	25.4	7.3	571	
	3	B						B					
	Measured by:		JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by:		JD	JD	JD	JD			JD	JD	JD	JD	
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 6	sample: Control	C	7.6	25.0	5.9	349		C	7.5	24.6	7.2	334	
	3 6.25%	C	7.6	25.2	6.1	367		C	7.6	24.7	7.1	346	
	3 12.5%	C	7.6	25.5	6.2	376		C	7.6	24.7	7.1	356	
	3 25%	C	7.6	25.1	6.4	421		C	7.6	24.5	7.3	387	
	3 50%	C	7.6	25.1	6.5	474		C	7.6	24.2	7.3	444	
	3 100%	C	7.5	25.0	6.3	589		C	7.6	24.0	7.4	555	
	3	C						C					
	Measured by:		JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by:		JD	JD	JD	JD			JD	JD	JD	JD	
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 7	sample: Control	D	7.5	24.1	6.0	348		D					
	3 6.25%	D	7.4	24.4	6.0	364		D					
	3 12.5%	D	7.5	24.0	5.7	369		D					
	3 25%	D	7.4	24.2	5.5	410		D					
	3 50%	D/BD	7.4	24.2	5.5	459		D					
	3 100%	D	7.4	24.5	5.6	582		D					
	3							D					
	Measured by:		JD	JD	JD	JD							
	Recorded by:		JD	JD	JD	JD							

Comments:

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

Page 6 0

Appendix B. (continued)

Chronic Definitive Bioassay Weighing Benchsheet

Facility: St. Andrews WWTF

LIMS Sample Number: 1364766 (for Lab Sample # 1)

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

Concentration	Replicate	Pan #	Pan wt. g (mean wt = fish wt divided by 10; convert g to mg: move decimal 3 places to right)	Pan + Fish g	Fish wt. g	Original # Fish	Mean wt. mg	
Control	A	1	0.03060	0.03835	0.00775	10	.775	
	B	2	0.03016	0.03627	0.00611	10	.611	
	C	3	0.02760	0.03358	0.00598	10	.598	
	D	4	0.02865	0.03114	0.00249	10	.249	.558
sample 6.25 %	A	5	0.03076	0.03690	0.00614	10	.614	
	B	6	0.02950	0.03561	0.00611	10	.611	
	C	7	0.03162	0.03816	0.00654	10	.654	
	D	8	0.02877	0.03475	0.00598	10	.598	.619
sample 12.5 %	A	9	0.02542	0.03225	0.00683	10	.683	
	B	10	0.03302	0.03840	0.00538	10	.538	
	C	11	0.02693	0.03434	0.00741	10	.741	
	D	12	0.02986	0.03677	0.00691	10	.691	.663
sample 25 %	A	13	0.02744	0.03397	0.00653	10	.653	
	B	14	0.03033	0.03671	0.00638	10	.638	
	C	15	0.02802	0.03478	0.00676	10	.676	
	D	16	0.02958	0.03754	0.00796	10	.796	.696
sample 50 %	A	17	0.02922	0.03703	0.00781	10	.781	
	B	18	0.02905	0.03698	0.00793	10	.793	
	C	19	0.03010	0.03669	0.00659	10	.659	
	D	20	0.03289	0.03982	0.00693	10	.693	.731
sample 100 %	A	21	0.02744	0.03469	0.00725	10	.725	
	B	22	0.02913	0.03635	0.00722	10	.722	
	C	23	0.02584	0.03285	0.00701	10	.701	
	D	24	0.02977	0.03573	0.00596	10	.596	.686
sample %	A					10		
	B					10		
	C					10		
	D					10		
	Weighed by initials:		DS	DS		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: St. Andrews WWTF

LIMS Sample Number: 1364766 le
(for Lab Sample # 1)

P. promelas and M. beryllina Bench sheet
SOPs TA07_09, TA07_14 and TA06_21

Drying Oven ID:	BO 34000	Tare weighed by:	JD
Temperature °C:	100	Final weighed by:	JD
Hours:	8		
Tare Weighing Date:	7.25.11	Final Weighing Date:	7.28.11

			Measured Value (g)		S-weight Value (g)
Tare Pan 1 after Pan 5 (g)	0.03761	@ 0.03660	S-weights	@	
Tare Pan 1 after Pan 10 (g)	0.003062	@ 0.03660	at tare	@	
Tare Pan 1 after Pan 15 (g)	0.003062	@ 0.03660	S-weights	@	
Tare Pan 1 after Pan 20 (g)	0.003064	@ 0.03660	at final	@	
Tare Pan 1 after Pan 25 (g)	0.03763	@ 0.03660			
Tare Pan 1 after Pan 30 (g)		@	Balance: Ohaus 250D Ser# 1125481084		
Tare Pan 1 after Pan 35 (g)		@	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)	0.03834	@ 0.03835			
Final Pan 1 after Pan 10 (g)	0.03834	@ 0.03835			
Final Pan 1 after Pan 15 (g)	0.03837	@ 0.03835			
Final Pan 1 after Pan 20 (g)	0.03836	@ 0.03835			
Final Pan 1 after Pan 25 (g)	0.03838	@ 0.03835			
Final Pan 1 after Pan 30 (g)		@			
Final Pan 1 after Pan 35 (g)		@			
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 le 2

Appendix B. (continued)

Test ID: St. Andrews WWTF Dates: 7.19.11 – 7.26-11

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

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

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

entered by Kara Cox 8/3/11

V 1.1 9/21/10 MFjd

page 1 of 3

Appendix C. SRT Bench Sheets and Statistical Analysis

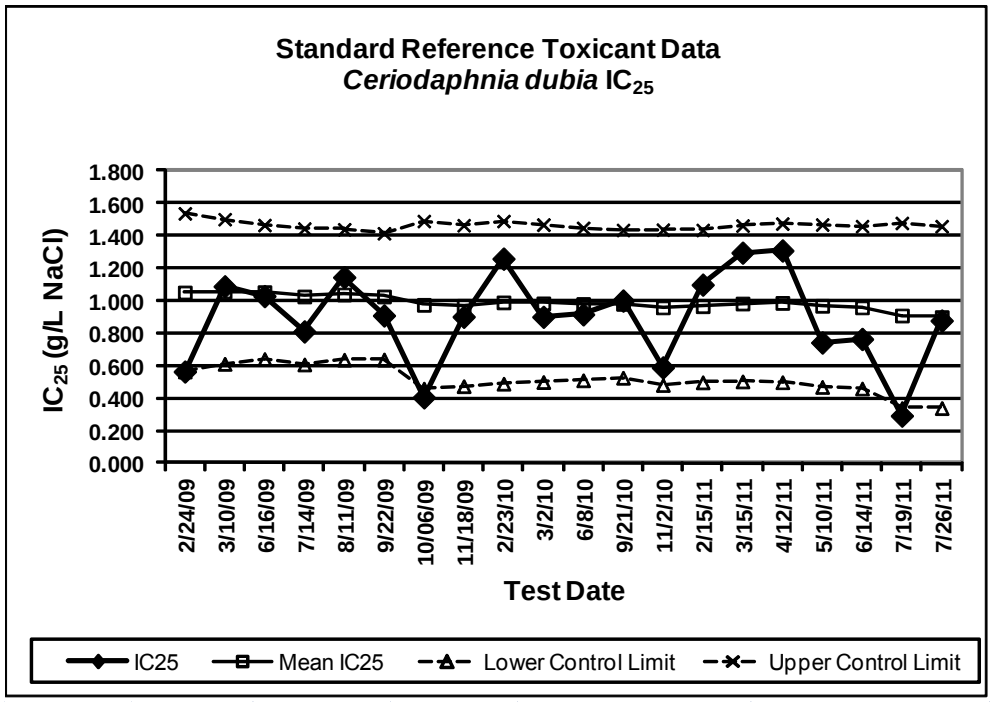
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 7-Day Chronic Toxicity
Ceriodaphnia dubia (water flea) - Sodium Chloride (NaCl)

Date	IC25	Mean IC25	Std Dev	Lower Control Limit	Upper Control Limit
2/24/09	0.565	1.05	0.24	0.57	1.54
3/10/09	1.090	1.06	0.22	0.61	1.50
6/16/09	1.030	1.05	0.21	0.64	1.47
7/14/09	0.812	1.03	0.21	0.61	1.45
8/11/09	1.146	1.04	0.20	0.64	1.44
9/22/09	0.911	1.03	0.19	0.64	1.42
10/06/09	0.406	0.98	0.26	0.46	1.49
11/18/09	0.903	0.97	0.25	0.47	1.47
2/23/10	1.260	0.99	0.25	0.49	1.49
3/2/10	0.902	0.98	0.24	0.50	1.47
6/8/10	0.917	0.98	0.23	0.51	1.45
9/21/10	1.002	0.98	0.23	0.53	1.44
11/2/10	0.590	0.96	0.24	0.48	1.44
2/15/11	1.100	0.97	0.23	0.50	1.44
3/15/11	1.297	0.98	0.24	0.50	1.46
4/12/11	1.310	0.99	0.24	0.50	1.48
5/10/11	0.744	0.97	0.25	0.47	1.47
6/14/11	0.765	0.96	0.25	0.46	1.46
7/19/11	0.293	0.91	0.28	0.34	1.48
7/26/11	0.879	0.90	0.28	0.34	1.46

Means are of the last 20 SRT tests.
Lower Confidence Limit = mean - 2 * Std Dev
Upper Confidence Limit = mean + 2 * Std Dev

EPA 75th Percentile %CV for Reproduction **45%**
Lab %CV Reproduction : **31.30%**

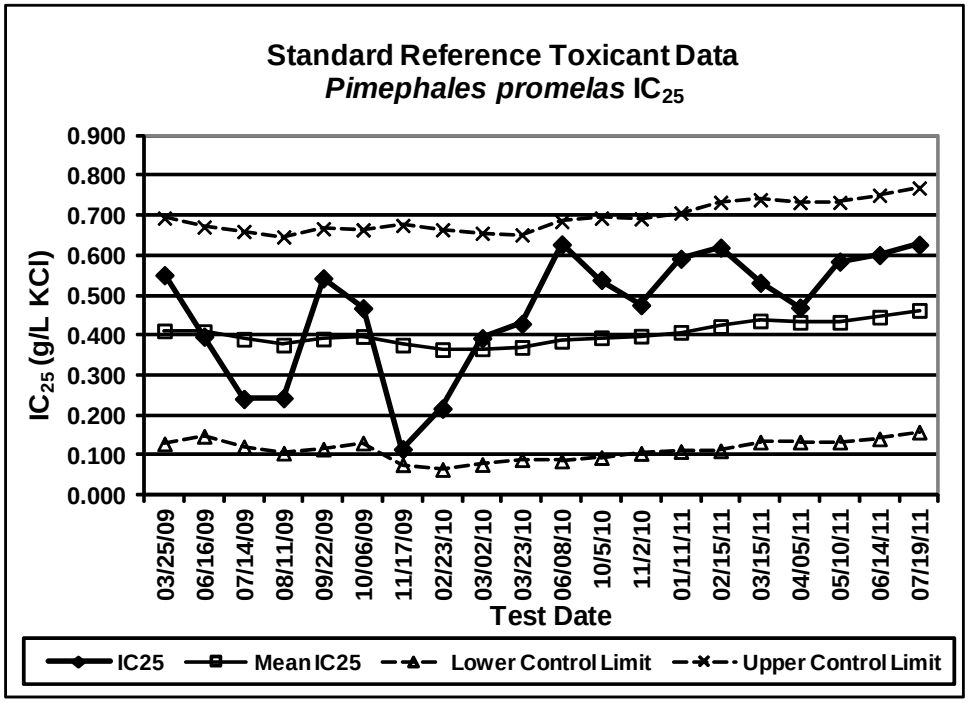


Appendix C. (continued)

Florida Department of Environmental Protection
Bureau of Laboratories
Standard Reference Toxicant (SRT) Test Data - 7-Day Chronic Toxicity
Pimephales promelas (fathead minnow) - Potassium Chloride (KCl)

Date	IC25	Mean IC25	Std Dev	Lower Control Limit	Upper Control Limit
03/25/09	0.551	0.411	0.14	0.129	0.694
06/16/09	0.397	0.410	0.13	0.148	0.671
07/14/09	0.241	0.391	0.13	0.121	0.660
08/11/09	0.243	0.376	0.14	0.105	0.647
09/22/09	0.543	0.391	0.14	0.115	0.667
10/06/09	0.468	0.398	0.13	0.131	0.664
11/17/09	0.115	0.376	0.15	0.076	0.676
02/23/10	0.217	0.365	0.15	0.064	0.665
03/02/10	0.393	0.366	0.14	0.077	0.656
03/23/10	0.429	0.370	0.14	0.089	0.652
06/08/10	0.628	0.385	0.15	0.086	0.685
10/05/10	0.539	0.394	0.15	0.094	0.694
11/02/10	0.476	0.398	0.15	0.105	0.692
01/11/11	0.592	0.408	0.15	0.109	0.707
02/15/11	0.620	0.422	0.16	0.111	0.733
03/15/11	0.532	0.436	0.15	0.133	0.740
04/05/11	0.470	0.433	0.15	0.133	0.733
05/10/11	0.585	0.433	0.15	0.133	0.733
06/14/11	0.601	0.446	0.15	0.141	0.751
07/19/11	0.627	0.463	0.15	0.158	0.769

Means are from the last 20 SRTs.
Lower Confidence Limit = mean - 2 * Std Dev
Upper Confidence Limit = mean + 2 * Std Dev



FDEP Biology Laboratory - Chronic SRT Bench Sheet

Ceriodaphnia dubia

Diluent/ Batch: 20% DMW / 7-21-11 Test Days Used: D-3
20% DMW / 7.28.11 Test Days Used: 4-6
Toxicant/ Batch: NaCl / 7-26-11

SOP # : TA 07_05
EPA-821-R-02-013 Method 1002.0

Organism: *Ceriodaphnia dubia*
Organism Batch #/ Age: 7.26.11 / <24 hr.
Feeding: Prior to Test and Daily
Food: ☑ YCT ☑ *P. subcapitata*
Food Batch: 5.5.11 ~~#18~~ 5.5.11 KC
Chamber size: 30 mL
Test Volume: 20 mL

Start Date: 7-26-11 Time: 1230
End Date: 8-1-11 Time: 1000

Batch:	7.21.11	7.28.11			
Water Quality Parameters	20% DMW	20% DMW	Other	Measured by:	Verified by:
Lab Total Residual Cl_2 (mg/L):	<0.03	<0.03		KC	KC
Alkalinity (mg/L as $CaCO_3$):	80	78		KC	KC
Hardness (mg/L as $CaCO_3$):	81	80		KC	KC
Total Ammonia (mg/L as N):	<0.017	<0.017		BA/MF	KC
Conductivity ~~µmhos-cm~~ mmhos-cm :	180	179		MF/BA	KC

Loaded by: KC

Day	Concentrations prepared by	Counted by
0	MF	KC
1	KC	KC/BA
2	BA	~~BA~~ BA
3	KC/BA	KC
4	KC/BA	BA
5	KC/BA	MF
6	MF	MF
7		
8		

Test Replicate	Loaded from culture vial
1	B8
2	A18
3	B4
4	A19
5	B17
6	B10
7	A22
8	A21
9	B4
10	A19

Results	
Control % CV:	15.8%
Dunnetts PMSD:	19.1%
Reproduction NOEC:	0.59 g/L
Reproduction LOEC:	0.89 g/L
Survival NOEC:	3 g/L
Survival LOEC:	3 g/L
0.766 g/L IC_{20}:	MF ~~0.564~~ g/L*
0.879 g/L IC_{25}:	MF ~~0.656~~ g/L*

* Calculated 2 mail MF 8-1-11

Comments:

Investigators' signatures

Marshall Faircloth
Kara Key
Bree Test
James Daniels

Liz Miller
REVIEWER

Test Incubated in: Incubator: # 2
Light Intensity : 50 - 100 ft. candles
Photoperiod : 16 light 8 dark
Temperature Range °C:
Incubator # 2 min. 24.4 max 27.7 mean –
Room B248 ~~21.6~~ 22 min. 24.0 max. 25.7 mean –
Test min. ____ max. ____ mean ____

Appendix C. (continued)

Ceriodaphnia dubia Survival and Reproduction

Start Date: 7.26.11 Time: 1230 Loaded by: KC
End Date: 8-1-11 Time: 1000 Verified by: MF

Concentration	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Live adults	Neonates per adult
Control	0												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	—
	3	0	0	3	0	0	3	0	0	4	5	15	10	1.5
	4	0	0	0	8	4	0	0	9	0	10	31	10	3.1
	5	7	6	8	2	7	7	7	0	8	0	52	10	5.2
	6	11	9	8	12	9	7	12	9	10	11	98	10	9.8
	7													
	8													
	Total	18	15	19	22	20	17	19	18	22	26	196	10	19.6
0.59 g/L	0												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	—
	3	0	0	0	0	0	2	1	20	2	0	5	10	0.6
	4	0	0	0	7	3	0	1	9	0	0	19	10	1.9
	5	7	6	0	0	6	5	6	7	7	6	43	10	4.3
	6	11	10	0	10	13	9	10	9	8	7	87	10	8.7
	7			MAY										
	8													17.2
	Total	18	16	0	17	22	16	18	18	17	13	155	10(9)	15.5
0.89 g/L	0												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	—
	3	0	0	0	0	0	0	3	0	0	0	3	10	0.3
	4	6	0	0	0	0	0	0	0	8	7	21	10	2.1
	5	0	7	0	7	4	4	5	8	10	0	45	10	4.5
	6	9	9	7	9	7	5	13	9	0	9	77	10	7.7
	7													
	8													
	Total	15	16	7	16	11	9	21	17	18	16	146	10	14.6

Comments: S = split brood MF 7-30-11
0.59 g/L Rep 3 F Died as Male by M. Heyn 8-1-11 MF

Test Page 2 of 6 PAGE 14 07/15/08 MF

Appendix C. (continued)

FDEP Biology Laboratory - Chronic SRT Bench Sheet

Ceriodaphnia dubia Survival and Reproduction

Concentration	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Live adults	Neonates per adult
1.3 g/L	0												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	—
	3	0	0	0	1	0	4	0	0	0	1	6	10	0,6
	4	0	4	0	0	0	0	0	6	3	0	13	10	1.3
	5	7	0	1	0	3	5	6	5	0	7	34	10	3.4
	6	2	6	6	0	6	5	6	7	6	7	51	10	5.1
	7													
	8													
	Total	9	10	7	1	9	14	12	18	9	15	104	10	10,4
2.0 g/L	0												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	—
	3	0	0	0	0	0	0	0	2	0	0	2	10	0.2
	4	0	0	0	0	0	0	0	0	0	0	0	10	0
	5	2 X out	1	2	1	4	2	2	1	0	3	18	10	1.8
	6	2	4	0	3	0	2	6	4	0	4	25	10	2.5
	7									male				
	8													5
	Total	4	5	2	4	4	4	8	7	0	7	45	10 [9]	~~4,5~~
3.0 g/L	0												10	
	1		\				X						8	
	2	X	\	X	X	X		X	X	X	X	0	0	
	3													
	4													
	5													
	6													
	7													
	8													
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments: 2.0 g/L Rep 9 Tdied as male by M. Hoyn 8-1-11 MF

Test Page 3 of 6

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07/15/08 MF

Appendix C. (continued)

FDEP Biology Laboratory - Chronic SRT Bench Sheet

Ceriodaphnia dubia Parameters

Test Day		New Sample				Conductivity	Old Sample				Conductivity
↓	Conc.	Replicate	pH (su)	Temp (°C)	DO (mg/L)	(µmhos/cm) (mmhos/cm)	Replicate	pH (su)	Temp (°C)	DO (mg/L)	(µmhos/cm) (mmhos/cm)
Day 0	Control	M	7.9	24.7	7.9	180					
	0.59	M	7.9	24.7	7.8	1324					
	0.89	M	7.9	24.5	7.8	1882					
	1.3	M	7.9	24.5	7.9	2670					
	2.0	M	8.0	24.4	7.8	3830					
	3.0	M	8.0	24.2	7.8	5550					
	Measured by:		MF	MF	MF	MF					
	Recorded by:		MF	MF	MF	MF					
Day 1	Control	M	8.2	24.6	7.9	180	A	8.2	25.1	8.3	187
	0.59	M	8.2	24.4	7.9	1334	A	8.2	25.2	8.1	1352
	0.89	M	8.2	24.3	7.9	1892	A	8.2	25.1	8.0	1894
	1.3	M	8.2	24.2	8.0	2700	A	8.2	25.1	8.0	2690
	2.0	M	8.2	24.1	8.0	3870	A	8.2	25.0	8.0	3920
	3.0	M	8.2	24.0	8.0	5680	A	8.2	25.0	7.9	5790
	Measured by:		KC	KC	KC	KC		KC	KC	KC	KC
	Recorded by:		KC	KC	KC	KC		KC	KC	KC	KC
Day 2	Control	M	7.8	24.3	6.8	179	A	8.0	24.0	7.8	194
	0.59	M	7.8	25.2	7.1	1353	A	8.0	24.0	7.7	1450
	0.89	M	7.9	24.2	7.2	1902	A	8.0	24.2	7.6	1921
	1.3	M	7.9	24.1	6.7	2710	A	8.0	24.3	7.6	2730
	2.0	M	7.9	24.4	7.2	3950	A	8.0	24.2	7.7	3960
	3.0	M	7.9	24.4	7.3	5660	A	8.0	24.1	7.7	5950
	Measured by:		BA	BA	BA	BA		BA	BA	BA	BA
	Recorded by:		BA	BA	BA	BA		BA	BA	BA	BA
Day 3	Control	M	8.1	24.5	8.5	178	A	8.0	24.0	8.5	196
	0.59	M	8.1	24.3	8.4	1319	A	8.1	24.0	8.5	1384
	0.89	M	8.1	24.1	8.4	1863	A	8.1	24.0	8.5	1937
	1.3	M	8.1	24.0	8.4	2640	A	8.1	24.0	8.3	2770
	2.0	M	8.1	24.0	8.5	3790	A	8.1	24.0	8.3	3980
		M									
	Measured by:		KC	KC	KC	KC		KC	KC	KC	KC
	Recorded by:		KC	KC	KC	KC		KC	KC	KC	KC

Comments: Test Terminated on DAY 6 after New Sample concentrations poured and parameters measured. MF 8-1-11

M= "Metered" vial, a surrogate vial for parameters

Test Page 4 of 6 PAGE 16 07/15/08 MF

Appendix C. (continued)

FDEP Biology Laboratory - Chronic SRT Bench Sheet

Ceriodaphnia dubia Parameters

Test Day ↓	Conc.	Replicate	New Sample pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)	Replicate	Old Sample pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)
Day 4	Control	M	7.9	25.1	7.5	179	A	7.9	24.0	7.6	187
	0.59	M	7.9	25.6	7.7	1353	A	7.9	24.0	7.6	1324
	0.89	M	7.9	26.0	7.8	1921	A	7.9	24.0	7.7	1882
	1.3	M	7.9	25.7	7.9	2590	A	7.9	24.0	7.7	2660
	2.0	M	8.0	25.6	8.0	3800	A	7.9	24.0	7.5	3950
		M									
	Measured by:		BA	BA	BA	BA		BA	BA	BA	BA
	Recorded by:		BA	BA	BA	BA		BA	BA	BA	BA
Day 5	Control	M	8.0	25.4	7.7	179	A	8.1	24.8	7.9	196
	0.59	M	8.0	25.3	7.6	1293	A	8.1	25.1	7.9	1370
	0.89	M	8.0	25.1	7.5	1850	A	8.1	25.4	7.8	1930
	1.3	M	8.0	25.3	7.6	2500	A	8.1	25.6	7.9	2640
	2.0	M	8.0	25.5	7.6	3790	A	8.1	25.7	7.9	3910
		M									
	Measured by:		MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:		MF	MF	MF	MF		MF	MF	MF	MF
Day 6	Control	M	8.2	25.2	7.7	180	A	8.1	25.0	7.7	193
	0.59	M	8.2	25.2	7.7	1303	A	8.2	25.1	7.7	1380
	0.89	M	8.2	24.8	7.9	1832	A	8.2	25.4	7.8	1949
	1.3	M	8.2	24.6	7.9	2600	A	8.2	25.6	7.8	2650
	2.0	M	8.2	24.7	7.9	3750	A	8.2	24.9	7.8	3980
		M									
	Measured by:		MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:		MF	MF	MF	MF		MF	MF	MF	MF
Day 7	Control	M									
		M									
		M									
		M									
		M									
		M									
	Measured by:										
	Recorded by:										
Day 8	Control	M									
		M									
		M									
		M									
		M									
		M									
	Measured by:										
	Recorded by:										

Replicate M= "Metered" vial, a surrogate vial for parameters

Test Page 5 of 6

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07/15/08 MF

Appendix C. (continued)

Test ID: C. dubia Chronic SRT July 11 Report Dates: 7-26-11 — 8-1-11

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

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

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

entered by M. Fairchild 8-1-11

V 1.1 9/21/10 MF/jd

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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: MHW/7.18.11 Test Days Used: 0-7 Start Date: 7.19.11 Time: 1315

Diluent/ Batch: _____ Test Days Used: _____ End Date: 7.26.11 Time: 1030

Toxicant/ Batch # : KCl / # 7.18.11 Organism Batch #/ Age: <24 hrs. 7-19-11

Artemia Lot # : 23613

Artemia Batch #	Day 2 125-11	Day 5 128-11	Chamber size : 1000 ml
Day 0 123-11	Day 3 126-11	Day 6 129-11	Test volume : 500 ml
Day1 124-11	Day 4 127-11		

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	Diluent	Diluent (or other)	Method	Measured by	Verified by
Total Residual Cl_2 (mg/L):	<0.03		HACH	KC	KC
Alkalinity (mg/L as $CaCO_3$):	73		HACH	KC	KC
Hardness (mg/L as $CaCO_3$):	91		HACH	KC	KC
Total Ammonia (mg/L as N):	<0.017		DENVER	BA	KC
Conductivity (µmhos-cm) mmhos-cm:	336		METTLER	KC	KC

Statistics	
Growth NOEC:	0.5 g/L
Growth LOEC:	1 g/L
Growth IC_{20}:	0.601 g/L
Growth IC_{25}:	0.627 g/L
Ctrl % CV:	8.29%
Dunnetts PMSD:	13.7%
Survival NOEC:	0.5 g/L
Survival LOEC:	1 g/L

Test incubated in : ☑ Incubator # 3

☐ Waterbath #____

Light Intensity : 50 - 100 ft. candles

Photoperiod : 16 light 8 dark

Temperature Range °C:

Incubator # 3 min. 24.7 max. 26.7 mean —

Water bath # ____ min.____ max.____ mean____

Room B246 min. 23.7 max. 25.3 mean —

P. promelas PMSD Bounds for Growth: Lower 12 Upper 30

M. beryllina PMSD Bounds for Growth: Lower 11 Upper 28

Investigators' signatures

Kara Coy

Bryce Alaxin

James Daniel

Marshall Fairchild

REVIEWER

Comments:

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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	A 1	10	10	10	10	10	10	10	10
	B	A 2	10	10	10	10	10	10	10	10
	C	A 3	10	10	10	9 1D	9	9	9	9
	D	A 4	10	10	10	10	10	10	10	10
.125	A	A 5	10	10	10	10	10	10	10	10
	B	A 6	10	10	10	10	10	10	10	10
	C	A 7	10	10	10	10	10	10	10	10
	D	A 8	10	10	10	10	10	10	10	10
.25	A	A 9	10	10	10	10	10	10	10	10
	B	A 10	10	10	10	10	10	10	10	10
	C	A 11	10	10	10	10	10	10	10	10
	D	A 12	10	10	10	10	10	10	10	10
.5	A	A 13	10	10	10	10	10	10	10	10
	B	A 14	10	10	10	10	10	10	9 1D	9
	C	A 15	10	10	10	10	10	10	10	10
	D	A 16	10	10	10	10	10	10	10	10
1	A	A 17	10	1 9D	0 1D	—	—	—	—	-
	B	A 18	10	1 9D	1	1	1	1	1	1
	C	A 19	10	JD ~~9D~~ 8D	—	—	—	—	—	—
	D	A 20	10	2 8D	1 1D	0 1D	—	—	—	—
2	A	A 21	10	0 10D						
	B	A 22	10	0 10D						
	C	A 23	10	0 10D						
	D	A 24	10	0 10D						
	A		10							
	B		10							
	C		10							
	D		10							
Loaded by (0 hr): JD			Checked by:	JD	JD	JD	BA	JD	JD	JD
Verified by (0 hr): KO										
			Concentrations prepared by:	JD	JD	JD	RA	JD	JD	JD

Comments:

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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. 1

Start Date: 7.19.11 End Date: 7.26.11

Start Time: 1315 End Time: 1030

conc = concentration rep = replicate circle umhos or mmhos

Test Day	Conc.	Before Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth	After Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth
Day 0	Control	A	7.9	25.9	8.7	336							
	.125	A	8.0	25.9	8.5	513							
	.25	A	8.0	25.7	8.5	776							
	.5	A	8.0	25.7	8.7	1251							
	1	A	8.1	25.6	8.8	2240							
	2	A	8.1	25.8	8.9	4020							
		A											
	Measured by		KC	KC	KC	KC							
	Recorded by		KC	KC	KC	KC							
Day 1		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
	Control	B	7.8	24.4	7.1	323		B	7.8	24.1	7.7	326	
.125	~~6.25%~~	B	7.9	24.0	7.5	491		B	7.9	24.0	7.7	575	
J.D. .25	~~12.5%~~	B	8.0	24.1	7.6	760		B	8.0	24.1	7.5	780	
.50	~~25%~~	B	8.0	24.2	7.5	1218		B	8.0	24.0	7.5	1231	
1	~~50%~~	B	8.0	24.0	7.5	2150		B	8.1	24.0	7.4	1990	
2	~~100%~~	B	8.0	24.6	7.6	3840		B		~~24.0~~	KC		
		B						B					
	Measured by		JD	JD	JD	JD			KC	KC	KC	KC	
	Recorded by		JD	JD	JD	JD			KC	KC	KC	KC	
Day 2		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
	Control	C	8.0	24.0	6.3	318		C	8.0	24.4	7.7	324	
	.125	C	7.9	24.1	6.3	577		C	7.9	24.7	7.6	569	
	.25	C	7.9	24.2	6.2	775		C	7.9	24.7	7.2	782	
	.5	C	7.8	24.2	6.2	1236		C	7.9	24.7	7.2	1248	
	1	D ~~C~~	7.9	24.3	7.0	2150		~~C~~D	7.9	24.6	7.3	2160	
		C						C					
		C						C					
	Measured by		JD	JD	JD	JD			JD	KC	JD	KC	
	Recorded by		JD	JD	JD	JD			JD	KC	JD	KC	
Day 3		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
	Control	D	8.0	24.0	5.5	331		D	7.6	24.3	6.4	326	
	.125	D	7.9	24.0	5.8	582		D	7.6	24.2	7.0	552	
	.25	D	7.9	24.0	6.0	798		D	7.6	24.6	7.0	799	
	.5	D	7.8	24.0	6.0	1275		D	7.7	24.7	7.0	1250	
	1	~~C~~D	7.9	24.1	7.4	2190		~~C~~D	7.8	24.7	6.9	1860	
		D						D					
		D						D					
	Measured by		JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by		JD	JD	JD	JD			JD	JD	JD	JD	

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: 7.19.11 End Date: 7.26.11

Start Time: 1315 End Time: 1030

conc = concentration rep = replicate

Test Day	Conc.	Before Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/ mmhos)	Salinity ppth	After Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/ mmhos)	Salinity ppth
Day 4	Control	A	7.4	24.4	5.9	339		A	7.8	25.1	7.0	335	
	.125	A	7.4	24.3	5.9	566		A	7.9	25.8	6.6	553	
	.25	A	7.4	24.1	6.1	802		A	7.9	26.0	6.9	801	
	.5	A	7.4	24.3	6.4	1273		A	7.9	25.3	7.0	1262	
	1	B/A	7.5	24.0	7.3	1951		B/A	7.8	25.6	7.3	1842	
		A						A					
		A						A					
	Measured by		KC	KC	KC	KC			BA	BA	BA	BA	
	Recorded by		KC	KC	KC	KC			BA	BA	BA	BA	
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 5	Control	B	7.7	24.9	6.6	346		B	7.6	25.5	7.6	338	
	.125	B	7.7	24.8	6.8	577		B	7.7	25.6	7.6	557	
	.25	B	7.7	24.9	6.8	838		B	7.8	25.7	7.5	806	
	.5	B	7.7	25.2	6.7	1321		B	7.8	25.9	7.6	1283	
	1	B	7.8	25.3	6.8	1920		B	7.9	25.8	7.5	2100	
		B						B					
		B						B					
	Measured by		JD	JD	JD	5770			JD	JD	JD		
	Recorded by		JD	JD	JD	JD			JD	JD	JD		
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 6	Control	C	7.6	24.0	6.1	340		C	7.7	24.6	6.6	338	
	.125	C	7.5	24.3	5.9	569		C	7.7	24.5	6.9	547	
	.25	C	7.5	24.0	5.4	811		C	7.7	24.7	7.1	791	
	.5	C	7.6	24.1	5.7	1290		C	7.7	25.2	7.2	1255	
	1	EB	7.7	24.0	7.4	2110		B	7.8	24.8	7.4	1998	
		C						C					
		C						C					
	Measured by		JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by		JD	JD	JD	JD			JD	JD	JD	JD	
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 7	Control	D	7.4	24.1	5.1	333		D					
	.125	D	7.4	24.4	6.1	561		D					
	.25	D	7.5	24.0	6.2	802		D					
	.5	D	7.5	24.0	6.8	1237		D					
	1	B	7.6	24.0	7.2	2050		D					
								D					
								D					
	Measured by		JD	JD	JD	JD							
	Recorded by		JD	JD	JD	JD							

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: µg/L (g/L) (circle 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	25	0.0 2755	0.0 3305	0.00 550	10	.550	
	B	26	0.0 2677	0.0 3297	0.00 620	10	.620	
	C	27	0.0 2771	0.0 3346	0.00 575	10	.575	
	D	28	0.0 3006	0.0 3669	0.00 663	10	.663	.602
.125	A	29	0.0 2792	0.0 3420	0.00 628	10	.628	
	B	30	0.0 3426	0.0 4036	0.00 610	10	.610	
	C	31	0.0 2980	0.0 3612	0.00 632	10	.632	
	D	32	0.0 3082	0.0 3733	0.00 651	10	.651	.630
.25	A	33	0.0 3002	0.0 3568	0.00 566	10	.566	
	B	34	0.0 3006	0.0 3573	0.00 567	10	.567	
	C	35	0.0 3090	0.0 3737	0.00 647	10	.647	
	D	36	0.0 2901	0.0 3460	0.00 559	10	.559	.584
.5	A	37	0.0 2978	0.0 3523	0.00 545	10	.545	
	B	38	0.0 2838	0.0 3580	0.00 692	10	.692	
	C	39	0.0 2683	0.0 3390	0.00 707	10	.707	
	D	40	0.0 3181	0.0 3793	0.00 612	10	.612	.639
1	A	—	—	—	—	10	—	
	B	41	0.0 2817	0.02909	0.00092	10	.092	.092
	C	—	—	—	—	10	—	
	D	—	—	—	—	10	—	
	A					10		
	B					10		
	C					10		
	D					10		
	A					10		
	B					10		
	C					10		
	D					10		
	Weighed by:		JD	JD				

Comments:

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

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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: 7.25.11 Weighed by: JD by MF

	Pan 1 wt.	Pan 1 initial wt.
after Pan 5	0.02756	@ 0.02755
after Pan 10	0.02758 JD	@ 0.02755
after Pan 15	0.02752 JD	@ 0.02755
after Pan 20	0.02754	@ 0.02755
after Pan 25	~~0.02754~~ JD	@
after Pan 30		@
after Pan 35		@
after Pan 40		@
after Pan 45		@
after Pan 48		@

	Measured Value	S-weight Value
S-weights	0.00998	@ 0.01
	0.03004	@ 0.03

Balance: Ohaus 250D Ser# 1125481084

S-Weights: BIO-S-Weights-01

Fish + Pan Weights Date: 7.28.11 Weighed by: JD by MF

	Pan 1 wt.	Pan 1 initial wt.
after Pan 5	0.03305	@ 0.03305
after Pan 10	0.03305	@ 0.03305
after Pan 15	0.03305	@ 0.03305
after Pan 20	0.03305	@ 0.03305
after Pan 25		@
after Pan 30		@
after Pan 35		@
after Pan 40		@
after Pan 45		@
after Pan 48		@

	Measured Value	S-weight Value
S-weights	0.00999	@ 0.01
	0.05005	@ 0.05

Drying Oven ID: ER034000

Temperature °C: 100

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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Test ID: July SRT P. promelas Dates: 7.19.11-7.26.11

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

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

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

information entered by Kara Carp 8/3/11

V 1.1 9/21/10 MF/jd

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Appendix D. Test Organism Receipt

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Shipping Date: 7/18/11

Ship to: FDEP

P.O. No:

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia	100 ac	4DAYS	MS 110714	25	7.9	13
Menidia beryllina	100 ac	12DAYS	SS 110706	25	7.9	13
						Hardness mg/L
Cyprinella leedsi						
Pimephales promelas	600	<24HRS	FM110717-1615	25	7.8(PM)	80
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

Packed by: PM

Shipped Via: Fed Ex

Notes:

Thank you for your order.

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

Appendix E. Chemical Analyses performed on the effluent from the St. Andrews WWTF Outfall D-001, sampled on July 18, 2011.

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
7/18/2011 11:40	Effluent	AGP/LN	Algal Growth Potential-Salinity Adjusted	93.7		mg DryWt/L	3	3
7/18/2011 11:40	Effluent	AGP/LN	Algal Growth Potential	93.4		mg DryWt/L	0.3	0.9
7/18/2011 11:40	Effluent	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.4	U	ug/L	0.4	1.2
7/18/2011 11:40	Effluent	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	0.7	I	ug/L	0.55	1.7
7/18/2011 11:40	Effluent	Overflow	Fecal Coliforms-Membrane Filter	2	B	cfu/100 mL	1	
7/18/2011 11:40	Effluent	Metals	Zinc	15	I	ug/L	5	20
7/18/2011 11:40	Effluent	Metals	Copper	2.18		ug/L	0.5	1
7/18/2011 11:40	Effluent	Metals	Nickel	1.57		ug/L	0.25	1
7/18/2011 11:40	Effluent	Metals	Silver	0.036	I	ug/L	0.025	0.1
7/18/2011 11:40	Effluent	Metals	Arsenic	1.21		ug/L	0.25	1
7/18/2011 11:40	Effluent	Metals	Cadmium	0.05	U	ug/L	0.05	0.2
7/18/2011 11:40	Effluent	Metals	Selenium	0.2	U	ug/L	0.2	0.8
7/18/2011 11:40	Effluent	Metals	Chromium	2.7		ug/L	0.3	1.2
7/18/2011 11:40	Effluent	Metals	Lead	0.2	U	ug/L	0.2	0.8
7/18/2011 11:40	Effluent	Metals	Calcium	23.4		mg/L	0.075	0.3
7/18/2011 11:40	Effluent	Metals	Magnesium	7.43		mg/L	0.04	0.16
7/18/2011 11:40	Effluent	Metals	Sodium	54		mg/L	0.5	2
7/18/2011 11:40	Effluent	Metals	Iron	450		ug/L	30	120
7/18/2011 11:40	Effluent	Metals	Aluminum	50		ug/L	5	20
7/18/2011 11:40	Effluent	Nutrients	Fluoride	0.29		mg F/L	0.035	0.1
7/18/2011 11:40	Effluent	Nutrients	NO2NO3-N	1.6		mg N/L	0.04	0.1
7/18/2011 11:40	Effluent	Nutrients	Sulfate	38		mg SO4/L	0.2	0.5
7/18/2011 11:40	Effluent	Nutrients	Ammonia-N	0.18		mg N/L	0.01	0.02
7/18/2011 11:40	Effluent	Nutrients	Alkalinity	44		mg CaCO3/L	0.65	2.5
7/18/2011 11:40	Effluent	Nutrients	Organic Carbon	10		mg C/L	1	5
7/18/2011 11:40	Effluent	Nutrients	Chloride	82		mg Cl/L	0.2	0.5
7/18/2011 11:40	Effluent	Nutrients	Kjeldahl Nitrogen	1.2		mg N/L	0.08	0.2
7/18/2011 11:40	Effluent	Nutrients	TSS	4	I	mg/L	2	10
7/18/2011 11:40	Effluent	Nutrients	O-Phosphate-P	1.3		mg P/L	0.08	0.2
7/18/2011 11:40	Effluent	Nutrients	Total-P	1.6		mg P/L	0.025	0.25
7/18/2011 11:40	Effluent	Pesticides	Fonofos	0.11	U	ug/L	0.11	0.46

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
7/18/2011 11:40	Effluent	Pesticides	Hexazinone	0.11	U	ug/L	0.11	0.46
7/18/2011 11:40	Effluent	Pesticides	Norflurazon	0.17	U	ug/L	0.17	0.69
7/18/2011 11:40	Effluent	Pesticides	Prometryn	0.17	U	ug/L	0.17	0.69
7/18/2011 11:40	Effluent	Pesticides	Alachlor	0.69	U	ug/L	0.69	2.8
7/18/2011 11:40	Effluent	Pesticides	Ametryn	0.057	U	ug/L	0.057	0.23
7/18/2011 11:40	Effluent	Pesticides	Butylate	0.23	U	ug/L	0.23	0.92
7/18/2011 11:40	Effluent	Pesticides	Diazinon	0.057	U	ug/L	0.057	0.23
7/18/2011 11:40	Effluent	Pesticides	Phorate	0.057	U	ug/L	0.057	0.23
7/18/2011 11:40	Effluent	Pesticides	Simazine	0.057	U	ug/L	0.057	0.23
7/18/2011 11:40	Effluent	Pesticides	Ethoprop	0.11	U	ug/L	0.11	0.46
7/18/2011 11:40	Effluent	Pesticides	Parathion Ethyl	0.17	U	ug/L	0.17	0.69
7/18/2011 11:40	Effluent	Pesticides	Ethion	0.057	U	ug/L	0.057	0.23
7/18/2011 11:40	Effluent	Pesticides	Parathion Methyl	0.11	U	ug/L	0.11	0.46
7/18/2011 11:40	Effluent	Pesticides	Naled	0.92	U	ug/L	0.92	3.7
7/18/2011 11:40	Effluent	Pesticides	Mevinphos	0.23	U	ug/L	0.23	0.92
7/18/2011 11:40	Effluent	Pesticides	Metribuzin	0.11	U	ug/L	0.11	0.46
7/18/2011 11:40	Effluent	Pesticides	Bromacil	0.23	U	ug/L	0.23	0.92
7/18/2011 11:40	Effluent	Pesticides	Metalaxyl	0.29	U	ug/L	0.29	1.1
7/18/2011 11:40	Effluent	Pesticides	Atrazine	0.057	U	ug/L	0.057	0.23
7/18/2011 11:40	Effluent	Pesticides	Fenamiphos	0.23	U	ug/L	0.23	0.92
7/18/2011 11:40	Effluent	Pesticides	Chlorpyrifos Ethyl	0.057	U	ug/L	0.057	0.23
7/18/2011 11:40	Effluent	Pesticides	Metolachlor	0.57	U	ug/L	0.57	2.3
7/18/2011 11:40	Effluent	Pesticides	Malathion	0.17	U	ug/L	0.17	0.69
7/18/2011 11:40	Effluent	Pesticides	Azinphos Methyl	0.23	U	ug/L	0.23	0.92
7/18/2011 11:40	Effluent	Pesticides	Chlorpyrifos Methyl	0.11	U	ug/L	0.11	0.46
7/18/2011 11:40	Effluent	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1.1	U	ug/L	1.1	4.6
7/18/2011 11:40	Effluent	Priority Organic Pollutants	2,4-Dinitrophenol	17	U	ug/L	17	69
7/18/2011 11:40	Effluent	Priority Organic Pollutants	3,3'-Dichlorobenzidine	46	UJ	ug/L	46	180
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.23	U	ug/L	0.23	0.92
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Diethyl phthalate	1.1	U	ug/L	1.1	4.6
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Fluorene	0.23	U	ug/L	0.23	0.92
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.23	U	ug/L	0.23	0.92
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Naphthalene	0.23	U	ug/L	0.23	0.92
7/18/2011 11:40	Effluent	Priority Organic Pollutants	2-Chlorophenol	1.1	U	ug/L	1.1	4.6

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
7/18/2011 11:40	Effluent	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3.4	U	ug/L	3.4	14
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Acenaphthene	0.23	U	ug/L	0.23	0.92
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Chrysene	0.23	U	ug/L	0.23	0.92
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Di-n-butyl phthalate	5.7	U	ug/L	5.7	23
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.23	U	ug/L	0.23	0.92
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Hexachlorocyclopentadiene	3.4	U	ug/L	3.4	14
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Hexachloroethane	3.4	U	ug/L	3.4	14
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Pyrene	0.23	U	ug/L	0.23	0.92
7/18/2011 11:40	Effluent	Priority Organic Pollutants	2,4-Dimethylphenol	11	U	ug/L	11	46
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Anthracene	0.23	U	ug/L	0.23	0.92
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Benzo(k)fluoranthene	0.23	U	ug/L	0.23	0.92
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	1.1	U	ug/L	1.1	4.6
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Hexachlorobenzene	1.1	U	ug/L	1.1	4.6
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Isophorone	1.1	U	ug/L	1.1	4.6
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Pentachlorophenol	3.4	U	ug/L	3.4	14
7/18/2011 11:40	Effluent	Priority Organic Pollutants	2,4-Dinitrotoluene	1.1	U	ug/L	1.1	4.6
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Acenaphthylene	0.23	U	ug/L	0.23	0.92
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Benzo(a)pyrene	0.23	U	ug/L	0.23	0.92
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3.4	U	ug/L	3.4	14
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Hexachlorobutadiene	3.4	U	ug/L	3.4	14
7/18/2011 11:40	Effluent	Priority Organic Pollutants	2,4,6-Trichlorophenol	1.1	U	ug/L	1.1	4.6
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Di-n-octyl phthalate	1.1	U	ug/L	1.1	4.6
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Nitrobenzene	2.3	U	ug/L	2.3	9.2
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Phenanthrene	0.23	U	ug/L	0.23	0.92
7/18/2011 11:40	Effluent	Priority Organic Pollutants	2,6-Dinitrotoluene	1.1	U	ug/L	1.1	4.6
7/18/2011 11:40	Effluent	Priority Organic Pollutants	4-Nitrophenol	17	U	ug/L	17	69
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Benzidine	110	U	ug/L	110	460
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Benzo(a)anthracene	0.23	U	ug/L	0.23	0.92
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Benzo(b)fluoranthene	0.23	U	ug/L	0.23	0.92
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Butyl benzyl phthalate	5.7	U	ug/L	5.7	23
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Dimethyl phthalate	11	U	ug/L	11	46
7/18/2011 11:40	Effluent	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3.4	U	ug/L	3.4	14
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Phenol	1.1	U	ug/L	1.1	4.6
7/18/2011 11:40	Effluent	Priority Organic Pollutants	2,4-Dichlorophenol	1.1	U	ug/L	1.1	4.6

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
7/18/2011 11:40	Effluent	Priority Organic Pollutants	2-Chloronaphthalene	1.1	U	ug/L	1.1	4.6
7/18/2011 11:40	Effluent	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2.3	U	ug/L	2.3	9.2
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1.1	U	ug/L	1.1	4.6
7/18/2011 11:40	Effluent	Priority Organic Pollutants	N-Nitrosodimethylamine	2.3	U	ug/L	2.3	9.2
7/18/2011 11:40	Effluent	Priority Organic Pollutants	2-Nitrophenol	1.1	U	ug/L	1.1	4.6
7/18/2011 11:40	Effluent	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1.1	U	ug/L	1.1	4.6
7/18/2011 11:40	Effluent	Priority Organic Pollutants	4-Chloro-3-methylphenol	1.1	U	ug/L	1.1	4.6
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	17	U	ug/L	17	69
7/18/2011 11:40	Effluent	Priority Organic Pollutants	Fluoranthene	0.23	U	ug/L	0.23	0.92
7/18/2011 11:40	Effluent	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2.3	U	ug/L	2.3	9.2
7/18/2011 11:40	Effluent	Field Parameter	Dissolved Oxygen	8.08		mg/L		
7/18/2011 11:40	Effluent	Field Parameter	Sample Depth	0.1		m		
7/18/2011 11:40	Effluent	Field Parameter	Specific Conductance	115		umhos/cm		
7/18/2011 11:40	Effluent	Field Parameter	pH	7.08				
7/18/2011 8:25	TOX-1	Toxicology	Bioassay-Chron-Def-FW-Fish, NOEC	100		NOEC		
7/18/2011 8:25	TOX-1	Toxicology	Bioassay-Chron-Def-FW-C.dubia, IC25	100	L	IC25		
7/18/2011 8:25	TOX-1	Toxicology	Bioassay-Chron-Def-FW-Fish, IC25	100	L	IC25		
7/18/2011 8:25	TOX-1	Toxicology	Bioassay-Chron-Def-FW-C.dubia, NOEC	100		NOEC		
7/18/2011 11:10	Equipment Blank	Metals	Calcium	0.075	U	mg/L	0.075	0.3
7/18/2011 11:10	Equipment Blank	Metals	Lead	0.2	U	ug/L	0.2	0.8
7/18/2011 11:10	Equipment Blank	Metals	Silver	0.025	U	ug/L	0.025	0.1
7/18/2011 11:10	Equipment Blank	Metals	Magnesium	0.04	U	mg/L	0.04	0.16
7/18/2011 11:10	Equipment Blank	Metals	Nickel	0.25	U	ug/L	0.25	1
7/18/2011 11:10	Equipment Blank	Metals	Arsenic	0.25	U	ug/L	0.25	1
7/18/2011 11:10	Equipment Blank	Metals	Iron	30	U	ug/L	30	120
7/18/2011 11:10	Equipment Blank	Metals	Cadmium	0.05	U	ug/L	0.05	0.2
7/18/2011 11:10	Equipment Blank	Metals	Zinc	5	U	ug/L	5	20
7/18/2011 11:10	Equipment Blank	Metals	Sodium	0.51	I	mg/L	0.5	2
7/18/2011 11:10	Equipment Blank	Metals	Selenium	0.2	U	ug/L	0.2	0.8
7/18/2011 11:10	Equipment Blank	Metals	Copper	0.5	U	ug/L	0.5	1
7/18/2011 11:10	Equipment Blank	Metals	Aluminum	5	U	ug/L	5	20
7/18/2011 11:10	Equipment Blank	Metals	Chromium	0.3	U	ug/L	0.3	1.2
7/18/2011 11:10	Equipment Blank	Nutrients	Sulfate	0.2	U	mg SO4/L	0.2	0.5
7/18/2011 11:10	Equipment Blank	Nutrients	Chloride	0.2	U	mg Cl/L	0.2	0.5

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
7/18/2011 11:10	Equipment Blank	Nutrients	Alkalinity	0.97	I	mg CaCO3/L	0.65	2.5
7/18/2011 11:10	Equipment Blank	Nutrients	NO2NO3-N	0.004	U	mg N/L	0.004	0.01
7/18/2011 11:10	Equipment Blank	Nutrients	O-Phosphate-P	0.004	U	mg P/L	0.004	0.01
7/18/2011 11:10	Equipment Blank	Nutrients	Organic Carbon	1	U	mg C/L	1	5
7/18/2011 11:10	Equipment Blank	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
7/18/2011 11:10	Equipment Blank	Nutrients	Fluoride	0.035	U	mg F/L	0.035	0.1
7/18/2011 11:10	Equipment Blank	Nutrients	Kjeldahl Nitrogen	0.08	U	mg N/L	0.08	0.2
7/18/2011 11:10	Equipment Blank	Nutrients	Total-P	0.004	U	mg P/L	0.004	0.01
7/18/2011 11:10	Equipment Blank	Pesticides	Naled	0.87	U	ug/L	0.87	3.5
7/18/2011 11:10	Equipment Blank	Pesticides	Prometryn	0.16	U	ug/L	0.16	0.65
7/18/2011 11:10	Equipment Blank	Pesticides	Ethion	0.054	U	ug/L	0.054	0.22
7/18/2011 11:10	Equipment Blank	Pesticides	Parathion Ethyl	0.16	U	ug/L	0.16	0.65
7/18/2011 11:10	Equipment Blank	Pesticides	Ametryn	0.054	U	ug/L	0.054	0.22
7/18/2011 11:10	Equipment Blank	Pesticides	Ethoprop	0.11	U	ug/L	0.11	0.44
7/18/2011 11:10	Equipment Blank	Pesticides	Butylate	0.22	U	ug/L	0.22	0.87
7/18/2011 11:10	Equipment Blank	Pesticides	Bromacil	0.22	U	ug/L	0.22	0.87
7/18/2011 11:10	Equipment Blank	Pesticides	Simazine	0.054	U	ug/L	0.054	0.22
7/18/2011 11:10	Equipment Blank	Pesticides	Phorate	0.054	U	ug/L	0.054	0.22
7/18/2011 11:10	Equipment Blank	Pesticides	Fenamiphos	0.22	U	ug/L	0.22	0.87
7/18/2011 11:10	Equipment Blank	Pesticides	Hexazinone	0.11	U	ug/L	0.11	0.44
7/18/2011 11:10	Equipment Blank	Pesticides	Chlorpyrifos Methyl	0.11	U	ug/L	0.11	0.44
7/18/2011 11:10	Equipment Blank	Pesticides	Diazinon	0.054	U	ug/L	0.054	0.22
7/18/2011 11:10	Equipment Blank	Pesticides	Metolachlor	0.54	U	ug/L	0.54	2.2
7/18/2011 11:10	Equipment Blank	Pesticides	Parathion Methyl	0.11	U	ug/L	0.11	0.44
7/18/2011 11:10	Equipment Blank	Pesticides	Malathion	0.16	U	ug/L	0.16	0.65
7/18/2011 11:10	Equipment Blank	Pesticides	Metribuzin	0.11	U	ug/L	0.11	0.44
7/18/2011 11:10	Equipment Blank	Pesticides	Azinphos Methyl	0.22	U	ug/L	0.22	0.87
7/18/2011 11:10	Equipment Blank	Pesticides	Alachlor	0.65	U	ug/L	0.65	2.6
7/18/2011 11:10	Equipment Blank	Pesticides	Mevinphos	0.22	U	ug/L	0.22	0.87
7/18/2011 11:10	Equipment Blank	Pesticides	Metalaxyl	0.27	U	ug/L	0.27	1.1
7/18/2011 11:10	Equipment Blank	Pesticides	Chlorpyrifos Ethyl	0.054	U	ug/L	0.054	0.22
7/18/2011 11:10	Equipment Blank	Pesticides	Fonofos	0.11	U	ug/L	0.11	0.44
7/18/2011 11:10	Equipment Blank	Pesticides	Norflurazon	0.16	U	ug/L	0.16	0.65
7/18/2011 11:10	Equipment Blank	Pesticides	Atrazine	0.054	U	ug/L	0.054	0.22

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	2-Chlorophenol	1	U	ug/L	1	4
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	3,3'-Dichlorobenzidine	40	UJ	ug/L	40	160
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	4-Chloro-3-methylphenol	1	U	ug/L	1	4
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Hexachlorobutadiene	3	U	ug/L	3	12
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1	U	ug/L	1	4
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Benzo(k)fluoranthene	0.2	U	ug/L	0.2	0.8
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1	U	ug/L	1	4
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3	U	ug/L	3	12
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Di-n-butyl phthalate	5	U	ug/L	5	20
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Di-n-octyl phthalate	1	U	ug/L	1	4
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Dimethyl phthalate	10	U	ug/L	10	40
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Fluoranthene	0.2	U	ug/L	0.2	0.8
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	N-Nitrosodimethylamine	2	U	ug/L	2	8
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	2-Nitrophenol	1	U	ug/L	1	4
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Acenaphthene	0.2	U	ug/L	0.2	0.8
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.2	U	ug/L	0.2	0.8
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1	U	ug/L	1	4
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	2,4-Dinitrophenol	15	U	ug/L	15	60
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	2,6-Dinitrotoluene	1	U	ug/L	1	4
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2	U	ug/L	2	8
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Benzidine	100	U	ug/L	100	400
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Benzo(a)anthracene	0.2	U	ug/L	0.2	0.8
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	15	U	ug/L	15	60
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Phenol	1	U	ug/L	1	4
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	2,4,6-Trichlorophenol	1	U	ug/L	1	4
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3	U	ug/L	3	12
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L	15	60
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Butyl benzyl phthalate	5	U	ug/L	5	20
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Fluorene	0.2	U	ug/L	0.2	0.8
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Hexachlorocyclopentadiene	3	U	ug/L	3	12
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Pentachlorophenol	3	U	ug/L	3	12
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	2,4-Dinitrotoluene	1	U	ug/L	1	4
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Anthracene	0.2	U	ug/L	0.2	0.8
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Benzo(b)fluoranthene	0.2	U	ug/L	0.2	0.8

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2	U	ug/L	2	8
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Acenaphthylene	0.2	U	ug/L	0.2	0.8
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Benzo(a)pyrene	0.2	U	ug/L	0.2	0.8
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Diethyl phthalate	1	U	ug/L	1	4
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Hexachloroethane	3	U	ug/L	3	12
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.2	U	ug/L	0.2	0.8
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Naphthalene	0.2	U	ug/L	0.2	0.8
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Nitrobenzene	2	U	ug/L	2	8
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Phenanthrene	0.2	U	ug/L	0.2	0.8
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	2,4-Dichlorophenol	1	U	ug/L	1	4
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	2,4-Dimethylphenol	10	U	ug/L	10	40
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	2-Chloronaphthalene	1	U	ug/L	1	4
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	1	U	ug/L	1	4
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Chrysene	0.2	U	ug/L	0.2	0.8
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.2	U	ug/L	0.2	0.8
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Hexachlorobenzene	1	U	ug/L	1	4
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Isophorone	1	U	ug/L	1	4
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3	U	ug/L	3	12
7/18/2011 11:10	Equipment Blank	Priority Organic Pollutants	Pyrene	0.2	U	ug/L	0.2	0.8
7/18/2011 11:41	Duplicate	Overflow	Fecal Coliforms-Membrane Filter	1	U	cfu/100 mL	1	

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

State of Florida
Department of Environmental Protection
Facility Introduction & Summary

PART I: Information gathered prior to sampling event	
Prepared By: Kim Allen	**Contact Number:** 595-0553
Facility Name (as it appears on permit): St. Andrews WWTF	**Former Names:**
NPDES Permit Number: FL0020451	**Permit Expiration Date:** 7/22/13
Physical Address: 2226 Michigan Avenue, Panama City, FL 32405	
District: NWD	**County:** Bay
Function of Facility: Domestic Wastewater Treatment Facility	
Facility Type: DW	**Permitted Capacity (MGD):** 5 mgd
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months):	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months):	
Description of type of Discharge: ☒ **Continuous** ☐ **Intermittent** ☐ **Seasonal** ☐ **Rainfall Dependent** ☐ **Other, please specify**	

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

Monitoring Location Site Number	Description of Monitoring Location
EFA-01	Sample point immediately after disinfection
EFD-01	Sampling point immediately after dechlorination
FLW-01	Flowmeter

Description of Permitted Outfall(s):
An existing 5.0 MGD annual average daily flow (AADF) permitted discharge to St. Andrew Bay, Class III marine waters, at Discharge Location (D-001) which is approximately 2,300 feet in length and discharges at a depth of approximately 16.2 feet. The point of discharge is located approximately at latitude 30 ° 10' 14" N, longitude 85 ° 42' 51" W.

Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility):

A 5.0 MGD annual average daily flow (AADF) advanced wastewater treatment plant using Bardenpho treatment process. The treatment process consists of influent screening and degritting, biological treatment, sedimentation and clarification, intermediate disinfection, dechlorination, solids digestion and dewatering by belt filter press, with the option of using sludge drying beds used as back up.

PART I: Continued

List current Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under
(Leave cell blank if not applicable)

I. RECLAIMED WATER AND EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

A. Surface Water Discharges

1. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge effluent from Outfall D-001 to St. Andrew Bay. Such discharge shall be limited and monitored by the permittee as specified below and reported in accordance with condition I.B.7:

			Effluent Limitations				Monitoring Requirements			
Parameter	Units	Max/Min	Annual Average	Monthly Average	Weekly Average	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Flow	MGD	Maximum	5.0	Report	-	-	Continuous	Recording flow meter and totalizer	FLW-01	See Cond.I.A.4
BOD, Carbonaceous 5 day, 20C	MG/L	Maximum	10.0	12.5	15.0	20.0	5 Days/Week	24-hour flow proportioned composite	EFD-01	
Solids, Total Suspended	MG/L	Maximum	10.0	12.5	15.0	20.0	5 Days/Week	24-hour flow proportioned composite	EFD-01	
pH	SU	Range	-	-	-	6.5 to 8.5	Continuous	Meter	EFD-01	See Cond.I.A.3
Coliform, Fecal	#/100ML	Maximum	See Permit Condition I.A.5				5 Days/Week	Grab	EFD-01	
Total Residual Chlorine (For Disinfection)	MG/L	Minimum	-	-	-	1.0	Continuous	Meter	EFA-01	See Cond.I.A.3, 6
Total Residual Chlorine (For Dechlorination)	MG/L	Maximum	-	-	-	0.01	Daily	Grab	EFD-01	
Oxygen, Dissolved (DO)	MG/L	Minimum	-	-	-	6.0	Daily	Grab	EFD-01	
Nitrogen, Total (as N)	MG/L	Maximum	8.0	10.0	12.0	16.0	5 Days/Week	24-hour flow proportioned composite	EFD-01	
Nitrogen, Ammonia, Total (as N)	MG/L	Maximum	2.0	2.5	3.0	4.0	5 Days/Week	24-hour flow proportioned composite	EFD-01	
Nitrogen, Kjeldahl, Total (as N)	MG/L	Maximum	-	Report	-	-	5 Days/Week	24-hour flow proportioned composite	EFD-01	
Phosphorus, Total (as P)	MG/L	Maximum	2.0	2.5	3.0	4.0	5 Days/Week	24-hour flow proportioned composite	EFD-01	
Enterococci	#/100ML	Maximum	-	35 (Geo. Mean)	-	-	5/Month	Grab	EFD-01	See Cond.I.A.10
Whole Effluent Toxicity (Chronic)	See Permit Condition I.A.7								EFD-01	

Appendix F. (continued)

PART I: Continued	
Receiving Waters: St Andrew Bay	**Classification (indicate whether fresh or marine):** Class III Marine

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

(1) Routine Tests: All routine tests shall be conducted using a control (0% effluent) and a minimum of five test concentrations: **100%**, **50%**, **25%**, **12.5%**, and **6.25%** final effluent.

(2) The permittee shall conduct a daphnid, **Ceriodaphnia dubia**, Survival and Reproduction Test and a fathead minnow, **Pimephales promelas**, Larval Survival and Growth Test, concurrently.

(3) All test species, procedures and quality assurance criteria used shall be in accordance with **Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms**, 4th ed., EPA-821-R-02-013. Any deviation of the bioassay procedures outlined herein shall be submitted in writing to the Department for review and approval prior to use. In the event the above method is revised, the permittee shall conduct chronic toxicity testing in accordance with the revised method.

(4) The control water and dilution water used shall be moderately hard water as described in EPA-821-R-02-013, Section 7.

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

Facility Mixing Zone Details (if applicable):

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

Date	Parameter and Units	Limit	Result

Describe previous FYI and WQBEL study:

Describe previous or current Enforcement Actions (including WLs):

Describe any violations or problems noted in previous inspection:

Appendix F. (continued)

Discuss whether DMR trends within previous five years are improving or declining:	
Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse):	
PART II: Sampling Event Information	
Date(s) sample collected: 7/18/2011	Sampler(s): Nathan Mulkey/Corinna Clanton
Temperature (Deg C):	pH (SU): 7.08
Dissolved Oxygen (mg/L): 8.08	Conductivity (umhos/cm): 115
Total Residual Chlorine (mg/L):	Total Residual Chlorine - after Disinfection (mg/L):
Method of Chlorination:	Method of De-chlorination:
Flow During Sample Collection for each outfall(MGD):	
Mean Flow for each outfall for previous 12 months based on sampling date (If samples are taken on more than one day, indicate Mean Flow for each day):	
Describe Discharge during Sampling Event: ☒ Continuous ☐ Intermittent ☐ Seasonal ☐ Rainfall Dependent ☐ Other, please specify	

Appendix F. (continued)

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

Appendix G. EPA End Sheet

The Bioassay of St. Andrews WWTF effluent sampled on July 18, 20, and 22, 2011. NPDES #FL0020451.

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

Transaction Code		NPDES NUMBER											YR/MO/DA						Insp Type	Inspector	Fac Type
1	N	2	5	3	F	L	0	0	2	0	4	5	1	11	12	1	1	0	7	1	8	18 **B**	19 **S**	20 1

Remarks

66

The Priority Pollutants Analysis of St. Andrews WWTF effluent sampled on July 18, 2011. NPDES #FL0020451.

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

Transaction Code		NPDES NUMBER											YR/MO/DA						Insp Type	Inspector	Fac Type
1	N	2	5	3	F	L	0	0	2	0	4	5	1	11	12	1	1	0	7	1	8	18 **X**	19 **S**	20 1

Remarks

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Biological Analyses of St. Andrews WWTF effluent sampled on July 18, 2011. NPDES #FL0020451.

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

Transaction Code		NPDES NUMBER											YR/MO/DA						Insp Type	Inspector	Fac Type
1	N	2	5	3	F	L	0	0	2	0	4	5	1	11	12	1	1	0	7	1	8	18 **S**	19 **S**	20 1

Remarks

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