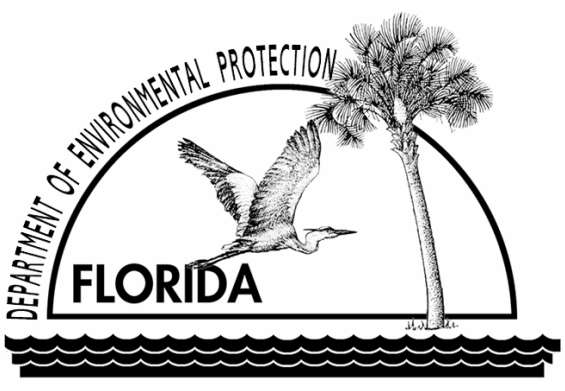


Effluent Quality Assessment

Wellington Arms Wastewater Treatment Facility

Palm Beach County

NPDES #FL0023396

Sampled April 7, 2008

August 2008

Biology Section
Bureau of Laboratories
Division of Environmental Assessment and Restoration

Quality Manual No. 870346G
NELAC Certification No. E31780

Wellington Arms Wastewater Treatment Facility, Wellington Arms Condominium, Inc., 6530 N. Ocean Blvd., Ocean Ridge, Palm Beach County, Florida, 33435. NPDES #FL0023396. Effluent samples for this facility were collected on April 7, 2008.

Introduction

Wellington Arms Wastewater Treatment Facility is an extended-aeration domestic wastewater treatment facility. The facility has a design flow of 0.015 million gallons daily (MGD) three-month average daily flow (TMADF). The TMADF from (January 2008 – March 2008) was 0.0062 MGD. The wastewater treatment facility consists of:

- One 15,000 gallon aeration tank;
- One 3,000 gallon clarifier;
- One 2,000 gallon residual holding tank;
- One 1,000 gallon chlorine contact tank;
- One 500 gallon dechlorination tank.

Calcium hypochlorite is used for chlorination and sodium thiosulfate for dechlorination. Treated effluent is continuously discharged to the Class III marine waters of the Spanish River, thence to the Intracoastal Waterway. Effluent discharges through Outfall D-001, which is approximately 3 m (10 feet) in length, at a depth of approximately 0.3 m (1 foot). The point of discharge is located approximately at latitude 26º 31” 54” N, longitude 80º 02’ 54” W.

The facility has no Administrative Orders, Consent Orders or mixing zones. A review of discharge monitoring report (DMR) data for the past year, revealed no violations of permit conditions. There is no toxicity testing requirement in the facility’s NPDES permit. (Facility information provided by Meghna Pandya of FDEP SE District.)

Methods

Samples were collected from the EFD-01 NPDES sampling point (dechlorinated sampling tap) for Outfall D-001 by Terry Davis (FDEP SE District) following DEP-SOP-001/01 FS 2400 Wastewater Sampling. All DEP SOPs are available on the web at: http://www.floridadep.org/labs/qa/sops.htm.

See Appendix A for the completed chain of custody form.

The 48-hr acute screening toxicity tests and algal growth potential test were performed following internal DEP SOPs TA07_01, TA07_02, and TA08_01 through TA08_09. All internal DEP SOPs are available on the web at: http://www.floridadep.org/labs/cgi-bin/sop/biosop.asp. The Department uses the 48-hour acute screening toxicity test to provide reasonable assurance that the facility does not adversely affect waters of the state.

Total residual chlorine (2.12 mg/L) was detected in the bioassay sample in the laboratory. An aliquot of this sample was dechlorinated by the addition of sodium thiosulfate (0.025 N) at a rate of 2.2 mL per liter of sample to neutralize the chlorine. Bioassays were performed on the dechlorinated aliquot in addition to the bioassays performed on the original sample. The same concentration of sodium thiosulfate was added to the dechlorinated test controls. The purpose of the dechlorinated test controls was to confirm that there was no adverse effect of adding sodium thiosulfate to the sample. There was no mortality in the dechlorinated controls of either test species.

Toxicity Test Results

Tests were performed April 8 - 10, 2008.

Ceriodaphnia dubia 48-hour acute screening bioassay –	LC_{50} < 100%, 100%* mortality in 100% sample within 30 minutes of test initiation

Ceriodaphnia dubia 48-hour acute screening bioassay –	LC_{50} > 100%, 5%* mortality in Dechlorinated 100% sample at 48 hours
Cyprinella leedsi 48-hour acute screening bioassay –	LC_{50} < 100%, 100%* mortality in 100% sample within 30 minutes of test initiation
Cyprinella leedsi 48-hour acute screening bioassay –	LC_{50} > 100%, 0%* mortality in Dechlorinated 100% sample at 48 hours

The bioassay sample was acutely toxic to the test organisms, producing 100% mortality within 30 minutes of test initiation. The dechlorinated sample was not acutely toxic to either test species within 48 hours. The cause of the observed toxicity was primarily attributed to the effluent's total residual chlorine (1.1 mg/L measured in the field; 2.12 mg/L measured in the laboratory). Total residual chlorine levels as low as 0.028 mg/L have been found to be acutely toxic to some freshwater fish and invertebrates (EPA 1986).

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.

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

Algal Growth Potential

The effluent Algal Growth Potential (AGP) was 0.3 U mg dry wt/L of the unicellular green alga, *Pseudokirchneriella subcapitata*, formerly known as *Selenastrum capricornutum*. Raschke and Shultz (1987) found 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. The predicted AGP based on inorganic nitrogen concentrations was 40.7 (±20%) mg dry wt/L (Table 1; Miller et al. 1978).

Differences greater than an order of magnitude between actual and predicted AGP values are considered sufficient evidence to warrant follow up testing with the algal growth inhibition bioassay. True algal growth inhibition can only be determined by performing an actual algal growth inhibition test. Should algal growth inhibition be suspected, the district should request that the algal growth inhibition test be performed as a follow-up to the inspection. One potential cause of the suspected inhibition is the effluent copper (90.7 µg/L) concentration which exceeded values (as low as 20 µg/L) known to inhibit or reduce growth of *S. capricornutum* (USEPA ECOTOX Database, ECOTOX Aquatic Report, June 26, 2008).

A saltwater AGP test was not performed; however, the predicted freshwater AGP values suggest that nutrient enrichment may be an issue.

See Table 1 for AGP results.

Chemistry Results

Total residual chlorine (TRC) was detected in the effluent in the field. TRC and total ammonia were detected in the bioassay sample in the laboratory. Based on the pH, salinity, and temperature of the bioassay sample, the calculated unionized ammonia concentration was ≤ 0.02 mg/L. The total ammonia concentration in the sample collected and preserved for chemical analysis was 0.49 mg/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was ≤ 0.02 mg/L.

The effluent pH as measured in the field (6.08 SU) violated the pH criteria for Class III marine waters (6.5-8.5 SU; 62-302.530(52)(c), F.A.C.) and the permit limit (≤ 0.01 mg/L) at the EFD-01 NPDES sampling point.

Lead and zinc were detected in the effluent at levels that comply with Class III marine water quality criteria (62-302.530, F.A.C.). Chromium-III (1.2 µg/L) was detected between the laboratory method detection limit (MDL) and practical quantitation limit (PQL).

Copper (90.7 µg/L) and iron (380 µg/L) concentrations in the effluent exceeded Class III marine surface water criteria respectively, for copper (≤ 3.7 µg/L; 62-302.530(24)(c), F.A.C.) and iron (≤ 300 µg/L; 62-302.530(39), F.A.C.). Effluent TRC (1.1 mg/L) exceeded both the Class III marine criterion (≤ 0.01 mg/L; 62-302.530(19), F.A.C.) and the permit limit (NPDES permit FL0023396).

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

Conclusion

The effluent sample collected from the EFD-01 NPDES sampling point for Outfall D-001 for this facility on April 7, 2008, was acutely toxic to both test species during the acute screening bioassays. The toxicity was primarily attributed to the effluent total residual chlorine. The dechlorinated aliquots of effluent were not acutely toxic to either test species by 48 hours. The freshwater AGP result suggested possible growth inhibition which could be attributed at least in part to the effluent copper concentration. The predicted AGP values suggest a potential nutrient enrichment issue.

The effluent copper (90.7 µg/L), iron (380 µg/L) and total residual chlorine (1.1 mg/L) concentrations and the effluent pH (6.1 SU) exceeded Class III marine criteria and/or permit conditions.

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.

USEPA. 1986. Quality Criteria for Water. EPA 440/5-86-001.

Table 1. 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* for samples collected from Wellington Arms Wastewater Treatment Facility on April 7, 2008.

Wellington Arms Wastewater Treatment Facility					
Location	AGP (measured)	Predicted AGP (TSIN) ± 20%	Predicted AGP (TN) ± 20%	Inorganic N:P ratio	Total N:P ratio
Effluent	0.3 U	40.7 ± 8.1	55.5 ± 11.1	4.9	3.7

Table 2. Effluent limits, Class III Marine Criteria and chemical data for samples collected from Wellington Arms Wastewater Treatment Facility on April 7, 2008.

Wellington Arms WWTF NPDES# FL0023396	Class III Criteria	Effluent Limits	Effluent	
Metals (µg/L unless otherwise noted)				
Aluminum	≤ 1500	-	60	U
Arsenic	≤ 50	-	0.5	U
Cadmium	≤ 8.8	-	0.02	U
Calcium (mg/L)	-	-	30.3	
Chromium-III	-	-	1.2	I
Copper	≤ 3.7	-	90.7	
Iron	≤ 300	-	380	
Lead	≤ 8.5	-	3.9	
Magnesium (mg/L)	-	-	3.7	
Nickel	≤ 8.3	-	0.25	U
Selenium	≤ 71	-	0.5	U
Silver	≤ 2.3	-	0.025	U
Zinc	≤ 86	-	21	
Nutrients (mg/L)				
Ortho-phosphate	-	-	0.22	
Total Phosphorus	-	-	0.4	
Total Ammonia	-	-	0.49	
Un-ionized Ammonia	-	-	≤ 0.02	c
Nitrate and Nitrite	-	-	0.58	
Total Kjeldahl Nitrogen	-	-	0.88	
Organic Nitrogen	-	-	0.39	c
Total Nitrogen	-	-	1.46	c
General Physical and Chemical Parameters				
Dissolved Oxygen (mg/L)	≥ 5.0 s	-	7.5	£
pH (SU)	6.5 - 8.5 s	6.5 - 8.5 s	6.1	
Conductivity (µmhos/cm)	≤ 1,275 s	-	314	
Temperature °C	-	-	26.0	
Salinity	-	-	< 0.15	c
Total Residual Chlorine (mg/L)	≤ 0.01 s	≤ 0.01 s	1.1	
Chlorophyll a (µg/L) - Corrected	-	-	0.55	U
Phaeophytin (µg/L)	-	-	0.24	U
Total Suspended Solids (mg/L)	-	≤ 60 s	4	U
CBOD, 5 day (mg/L), N - inhibited	-	≤ 60 s	6.8	
Flow (MGD)(three month average daily flow)	-	≤ 0.015	0.0062	
Hardness (mg $CaCO_3$)	-	-	90.90	c

Value exceeds the Class III Water Quality Criteria or permit limits

b - Value is calculated based on hardness

c - Value is calculated

s - Single sample

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

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

£ - Measured in Central Laboratories

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2008-04-07-42
Wellington Arms Condo WWTP

Requester: Jennifer Paris
Field Report Prepared By: T. Davis

Customer: SE-DIST
Collected By: T. Davis
Send Final Report To: Todd Brown

Project ID: FYI5
Sampling Agency: Southeast District

PMAS: 1143

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Dechlor sample tap.	☐ Comp ☒ Grab	Date 4/7/08 Time 1030 Central	Date Time Central	
	Field ID: SI-WA-1	Tot Res Chlorine (mg/L): 1.1	Diss Oxygen (mg/L):	Storet Station Number:	
	Matrix (Include type e.g. Salt, Fresh, etc): Water, Fresh	Temp (C): 25.97	pH: 6.08	Sample Depth: ☒ m ☐ ft .01	Salinity (PPTh): ☒ Sp Conductance (umho/cm): 314
	Latitude: o ' "	Longitude: o ' "		Comments: Cl@ dechlor = 0.0 mg/L	NPDES Number:

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Blank	☐ Comp ☒ Grab	Date 4/7/08 Time 1045 Central	Date Time Central	
	Field ID: SI-WA-2	Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L):	Storet Station Number:	
	Matrix (Include type e.g. Salt, Fresh, etc): Water, D.I.	Temp (C):	pH:	Sample Depth: ☒ m ☐ ft .01	Salinity (PPTh): ☐ Sp Conductance (umho/cm):
	Latitude: o ' "	Longitude: o ' "		Comments:	NPDES Number:

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
		☐ Comp ☐ Grab	Date Time Central	Date Time 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):
	Latitude: o ' "	Longitude: o ' "		Comments:	NPDES Number:

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
		☐ Comp ☐ Grab	Date Time Central	Date Time 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):
	Latitude: o ' "	Longitude: o ' "		Comments: 2 bottles picked up 1100 4.8.08 J.D.	NPDES Number:

Relinquished By:	Date/Time:	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
T Davis	4/7/08 1515	DHL						4-8-08 / 9410

* Shaded Areas for Lab use only

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

FDEP Biology Laboratory - Acute Screen Bioassay Bench Sheets

Facility: Wellington Arms WWTF

Address: 6530 N. Ocean Blvd

City: Ocean Ridge County: Palm Beach

Contact/District: T. Davis / Southeast

NPDES Permit #: FL 0023396

LIMS Job #: TLH-2008-04-08-39-et BA LIMS Sample #: 1093110

Lims Data Entry: 4-21-08 MF Data Entry Verification: MF 21-08 BA

Sample Collection: Date: 4.7.08 Time: 10:30

Hold Time Start: Date: 4.7.08 Time: 10:30

Instructions (for below): Circle appropriate wording. If yes is circled, complete blanks.

Test Type: (Screen)
(Static) / Static Renewal / Flow-through
Test Duration: (96) 96 Hours.

Test 1 validation: Test 1: SOP TA 07_01
Control survival ≥90%: (Yes) No
Temperature Range ≤3°C: (Yes) No

Test 2 validation: Test 2: SOP TA 07_02
Control survival ≥90%: (Yes) No
Temperature Range ≤3°C: (Yes) No

Comments:
All test organism in 100% sample died within 30 minutes of loading. JO
aliquot of sample dechlorinated by the addition of 2.2 mL of Sodium-thiosulfate (0.025 N) per liter. Dechlorinated control prepared by adding 2.2mL of 0.025N Sodium-thiosulfate per liter of appropriate control water MF 4/21/08
Test 1-LC50 = <100%; mortality = 100%
Dechlorinated LC50 = >100%; mortality: 5%
TEST 2-LC50 = <100%; mortality = 100%
Dechlorinated LC50 = >100%; mortality = 0%
MF 5-5-08

Initial sample handling:
PH adjustment: yes (no) Initial pH: ____ NaOH N HCl N ____ Drops mL Final pH: ____
Aeration: yes (no) Initial DO: ____mg/L Final DO: ____mg/L Duration: ____minutes Rate: ~____bubbles/min
Salinity adjusted (Test 1): yes (no) Initial Salinity: ____ Final Salinity: ____ Salts Hypersaline brine
Salinity adjusted (Test 2): yes (no) Initial Salinity: ____ Final Salinity: ____ Salts Hypersaline brine
Dechlorination: (yes) no 2.2 mL of 0.025N Sodium Thiosulfate per liter of sample. Final TRC: <0.03

Light Intensity: 50 - 100 ft. candles
Photoperiod: 16 light 8 dark
Temperature Range °C:
Incubator # 2 min 25.9 max 26.5 mean 26.2
Incubator # ____ min. ____ max. ____ mean ____
Room B246 min 24.5 max 25.5 mean 25.0

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

dechlor: dechlorinated

Water Quality Parameters	20% DMW	Moderately Hard Water/ (Well Water)	Salt Water ASW NSW Test 1	Salt Water ASW NSW Test 2	Other: dechlor sample	Original Sample	Method	Measured by	Verified by
Field Total Residual Cl_2 (mg/L):	N/A	N/A	N/A	N/A	0.0	1.1	Hach	Tony Davis	MF
Lab Total Residual Cl_2 (mg/L):	<0.03	<0.03	—	—	<0.03	2.12	HACH	JD	BA
Alkalinity (mg/L as $CaCO_3$):	90	150	—	—	-	66	HACH	BA	JD
Hardness (mg/L as $CaCO_3$):	81	138	—	—	-	92	HACH	BA (A)	JD
Total Ammonia (mg/L as N):	<0.017	<0.017	—	—	—	0.125	DENVER	~~MF~~ MF	JD
Salinity (ppth):	<1	<1	—	-	—	<1	YSI (Mettler)	64/50	MF

Investigators' Signatures
James Daniels
Buck Atkins
Marshall Faircloth

Loretta C. Wolfe
REVIEWER

(A) smeared / initials MF 4-5-08

V 1.4 9/12/05

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1093110 Test #: 12 SOP#:TA 07 01 Test Started: Date 4.8.08 Time: 13:45
Organism/Batch/Age: Cdubia/13-08/<24hrs Test Ended: Date 4.10.08 Time: 1300
Chamber/Test Volume: 30 / 20 ml Diluent/ Batch: Dmw 14-1-08
Food/Batch: YCT 7-26-08 P.sub 1-31-08 Artemia 0hr — 24hr — 48hr — 72hr — Artemia Lot# —
Feeding: (Prior to Test) Prior to Renewal Daily
dechlor = dechlorinated ctrl = control

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
ctrl	A	A	5	5	5			
	B	B	5	5	5			
	C	C	5	5	5			
	D	D	5	5	5			
100%	A	A	5	— (A)	—			
	B	B	5	—	—			
	C	C	5	—	—			
	D	D	5	—	—			
dechlor ctrl	A	A	5	5	5			
	B	B	5	5	5			
	C	C	5	5	5			
	D	D	5	5	5			
dechlor 100%	A	A	5	5	5			
	B	B	5	5	4D			
	C	C	5	5	5			
	D	D	5	5	5			
Loaded/Verified by: BR / ME		Checked by:	JD	JD	BA			

m = missing d = dead BR/AR = Before/After Renewal

Test Results:
Screening Tests: Report LC50 as >100%, =100%, or <100%.
% mortality in 100% sample: 100% LC50: < 100%
If Calculated: 95% CI_____ Method_____
Substitue highest test concentration used if other than 100% (example: Ocean outfall tested at 30% concentration).

Comments:
dechlorinated 100% sample mortality = ~~0%~~ 5% MF
LC50 = >100%
(A) 100% mortality with 30 minutes of test initiation

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1093110 Test #: 3/2 SOP#:TA 07 02 Test Started: Date 4.8.08 Time: 1345

Organism/Batch/Age: C. leesi / 4-8-08 / 12 days Test Ended: Date 4.10.08 Time: 1300

Chamber/Test Volume: 1000 / 500 ml Diluent/ Batch: Well H2O 14-7-08

Food/Batch: YCT — P.sub — Artemia 0hr 65-08 24hr — 48hr — 72hr — Artemia Lot# 651-536-40

Feeding: (Prior to Test) Prior to Renewal Daily

dechlor = dechlorinated ctrl = control

Concentration	Replicate	Chamber #	0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Ctrl	A	D9	5	5	5			
	B	D10	5	5	5			
	C	D11	5	5	5			
	D	D12	5	5	5			
100%	A	D13	5	–	–			
	B	D14	5	–	–			
	C	D15	5	–	–			
	D	D16	5	–	–			
Dechlor ctrl	A	D17	5	5	5			
	B	D18	5	5	5			
	C	D19	5	5	5			
	D	D20	5	5	5			
Dechlor 100%	A	D21	5	5	5			
	B	D22	5	5	5			
	C	D23	5	5	5			
	D	D24	5	5	5			
Loaded/Verified by: JD / BA		Checked by:	JD	JD	JD			

m = missing d = dead BR/AR = Before/After Renewal

Comments: Dechlorinated sample 0% mortality LC50 >100% mf 4-21-08

Test Results:

Screening Tests: Report LC50 as >100%, =100%, or <100%.

% mortality in 100% sample: 100% LC50: < 100 %

If Calculated: 95% CI ______ Method ______

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

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FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample # : 1093110 **Test #:** 1 of 2

TEST SOP #: TA07_01 **Test Species:** (Ceriodaphnia dubia) *Cyprinella leedsi* *Pimephales promelas* *Americamysis bahia* *Menidia beryllina* Other:_____

Concentration Ctrl	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	M	~~A~~ BA	M			
pH (S.U.)	8.2	–	8.1			
Temperature °C	24.2	~~BA 24.0~~	24.0			
Dissolved Oxygen mg/L	7.6	–	8.1			
Conductivity (µmhos) mmhos	172	~~BA~~ 314	196			
(initials) Measured by:	BA	BA	BA			
(initials) Recorded by:	BA	BA	BA			

Comments: CTRL = Control DCR = Dechlorinated 48 hour Parameters not necessary because test terminated @ 0hr + 30 minutes MF 4-11-08

Concentration 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	M	M				
pH (S.U.)	8.3	7.9				
Temperature °C	24.0	24.5				
Dissolved Oxygen mg/L	7.6	8.0				
Conductivity (µmhos) mmhos	314	326				
(initials) Measured by:	BA	~~BA~~				
(initials) Recorded by:	BA	BA				

Comments:

Concentration DCR ctrl	0 Hr.	~~48 Hr 24 Hr.~~ BA	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	M	M				
pH (S.U.)	8.3	8.1				
Temperature °C	24.0	24.0				
Dissolved Oxygen mg/L	7.6	8.1				
Conductivity µmhos mmhos	182	197				
(initials) Measured by:	BA	BA				
(initials) Recorded by:	BA	BA				

Comments: 48 hour measurements recorded in 24 hour space MF for BA 4-25-08

Concentration DCR 100%	0 Hr.	~~24 Hr~~ 48 hr BA	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	M	M				
pH (S.U.)	8.4	7.9				
Temperature °C	24.0	24.0				
Dissolved Oxygen mg/L	7.6	8.1				
Conductivity (µmhos) mmhos	322	361				
(initials) Measured by:	BA	BA				
(initials) Recorded by:	BA	BA				

Comments:

000024

V 2.0 2/24/04

FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample # : 109310 Test #: 2 of 2

TEST SOP #: TA07_03 Test Species: *Ceriodaphnia dubia* / *Cyprinella leedsi* *Pimephales promelas* *Americamysis bahia* *Menidia beryllina* Other:_____

Concentration Ctrl	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C			
pH (S.U.)	7.9	8.1	8.2			
Temperature °C	24.0	24.3	24.7			
Dissolved Oxygen mg/L	8.4	7.6	7.6			
Conductivity (µmhos) mmhos	273	280	280			
(initials) Measured by:	JD	JD	JD			
(initials) Recorded by:	JD	JD	JD			

Comments: Ctrl = control
dechlor - dechlorinated - Parameters not necessary at 24 & 48 hours because test terminated at 0hr + 30min MF 4-11-08

Concentration 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A					
pH (S.U.)	8.3					
Temperature °C	24.4					
Dissolved Oxygen mg/L	7.5	7.5 Trinity Mark	MF 4-21-08			
Conductivity (µmhos) mmhos	317					
(initials) Measured by:	JD					
(initials) Recorded by:	JD					

Comments:

Concentration dechlor ctr 1	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C			
pH (S.U.)	8.0	8.1	8.3			
Temperature °C	24.1	24.2	24.6			
Dissolved Oxygen mg/L	8.2	7.4	7.5			
Conductivity (µmhos) mmhos	282	290	291			
(initials) Measured by:	JD	JD	JD			
(initials) Recorded by:	JD	JD	JD			

Comments:

Concentration dechlor 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C			
pH (S.U.)	8.6	7.8	7.8			
Temperature °C	24.4	24.1	24.7			
Dissolved Oxygen mg/L	8.0	7.2	7.5			
Conductivity (µmhos) mmhos	328	337	340			
(initials) Measured by:	JD	JD	JD			
(initials) Recorded by:	JD	JD	JD			

Comments:

Appendix C. SRT Bench Sheets and Statistical Analysis

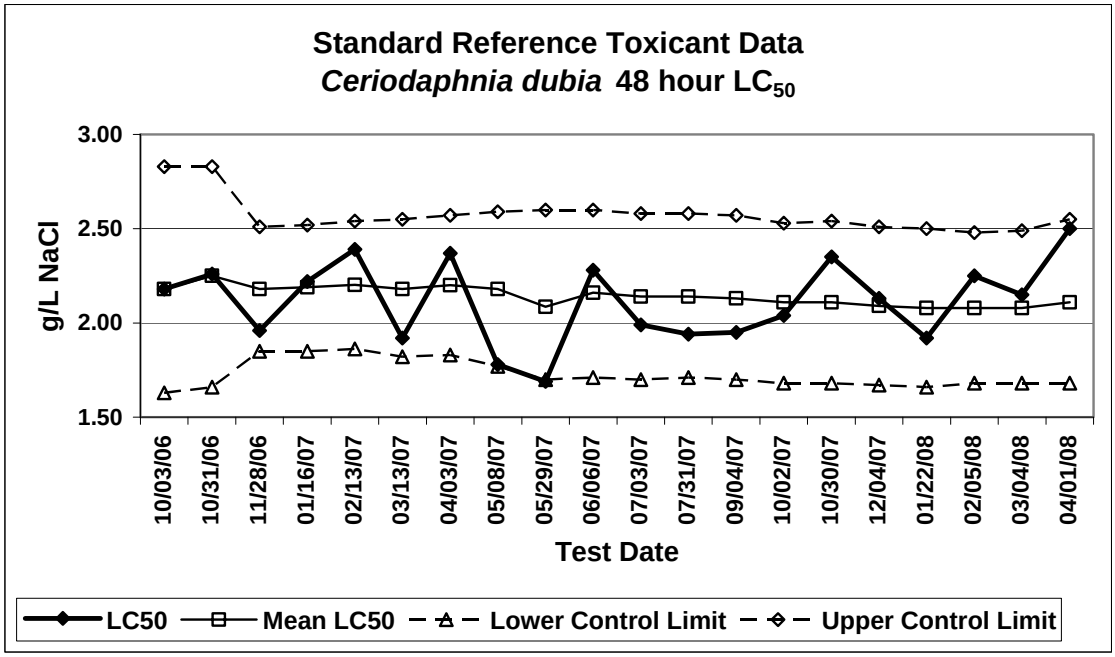
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 48-hour Acute Toxicity
Ceriodaphnia dubia (water flea) - Sodium Chloride (NaCl)

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
10/03/06	2.18	2.18	0.30	1.63	2.83
10/31/06	2.26	2.25	0.29	1.66	2.83
11/28/06	1.96	2.18	0.17	1.85	2.51
01/16/07	2.22	2.19	0.17	1.85	2.52
02/13/07	2.39	2.20	0.17	1.86	2.54
03/13/07	1.92	2.18	0.18	1.82	2.55
04/03/07	2.37	2.20	0.18	1.83	2.57
05/08/07	1.78	2.18	0.21	1.77	2.59
05/29/07	1.69	2.09	0.23	1.70	2.60
06/06/07	2.28	2.16	0.22	1.71	2.60
07/03/07	1.99	2.14	0.22	1.70	2.58
07/31/07	1.94	2.14	0.22	1.71	2.58
09/04/07	1.95	2.13	0.22	1.70	2.57
10/02/07	2.04	2.11	0.21	1.68	2.53
10/30/07	2.35	2.11	0.21	1.68	2.54
12/04/07	2.13	2.09	0.20	1.67	2.51
01/22/08	1.92	2.08	0.20	1.66	2.50
02/05/08	2.25	2.08	0.20	1.68	2.48
03/04/08	2.15	2.08	0.20	1.68	2.49
04/01/08	2.50	2.11	0.22	1.68	2.55

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

CV = 10.29
EPA reference 75th quartile CV = 29%



Appendix C. (continued)

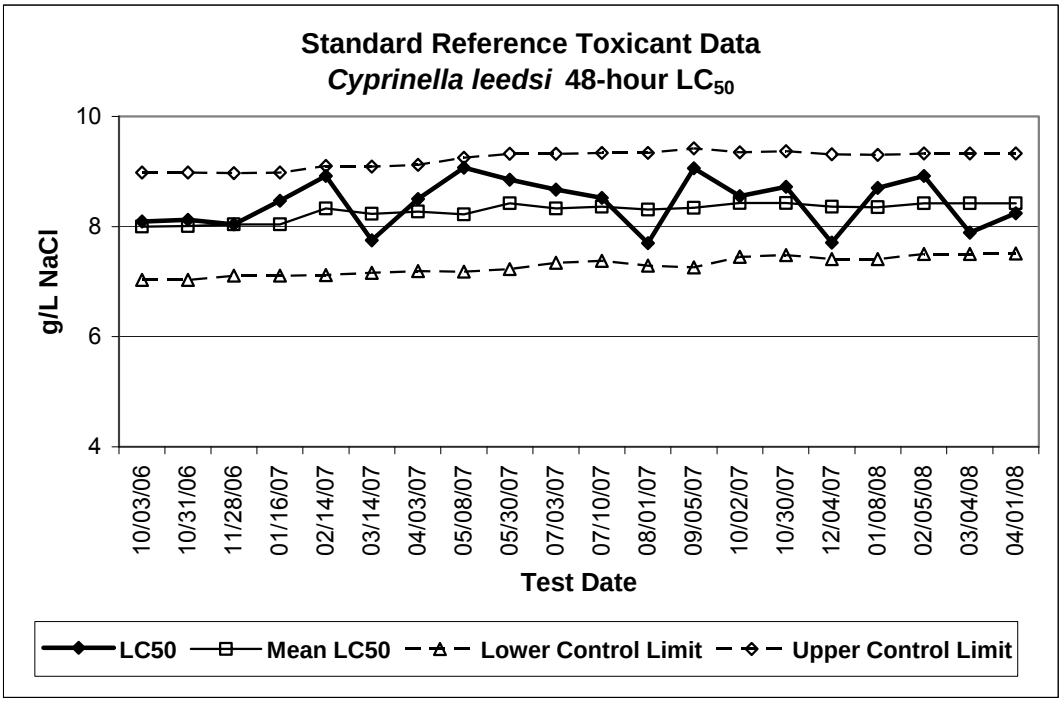
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 48-hour Acute Toxicity
Cyprinella leedsi (bannerfin shiner) - Sodium Chloride (NaCl)

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
10/03/06	8.09	8.00	0.49	7.03	8.98
10/31/06	8.12	8.01	0.49	7.03	8.98
11/28/06	8.04	8.04	0.46	7.11	8.97
01/16/07	8.47	8.04	0.20	7.11	8.98
02/14/07	8.92	8.33	0.37	7.12	9.10
03/14/07	7.75	8.23	0.41	7.16	9.09
04/03/07	8.50	8.27	0.39	7.19	9.12
05/08/07	9.07	8.22	0.52	7.18	9.25
05/30/07	8.85	8.42	0.46	7.23	9.32
07/03/07	8.67	8.33	0.50	7.34	9.32
07/10/07	8.52	8.36	0.49	7.38	9.34
08/01/07	7.7	8.31	0.51	7.29	9.34
09/05/07	9.06	8.34	0.54	7.26	9.42
10/02/07	8.55	8.43	0.47	7.45	9.35
10/30/07	8.72	8.43	0.47	7.48	9.37
12/04/07	7.71	8.36	0.47	7.41	9.31
01/08/08	8.7	8.35	0.47	7.41	9.30
02/05/08	8.92	8.42	0.46	7.50	9.33
03/04/08	7.89	8.42	0.46	7.50	9.33
04/01/08	8.24	8.42	0.45	7.51	9.33

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

CV = 5.4
EPA reference 75th quartile CV = 19%



Appendix C. (continued)

FDEP Biology Laboratory - Acute SRT Bench Sheet

Test Organism: *Americamysis bahia* Method 2007.0 | *Menidia beryllina* Method 2006.0 | *Hyalella azteca* Method 100.1 EPA-600-R-99-064
Ceriodaphnia dubia Method 2002.0 | *Cyprinella leedsi* Method 2000.0 | *Pimephales promelas* Method 2000.0 | Other: _____

Method from EPA-821-R-02-012
Test Type: 48 hour non-renewal / (96) hour renewal
Test Page 1 of 2

Diluent/ Batch #: DMW / 4.1.08
Toxicant/ Batch#: NaCl / ~~1-31-08~~ 4.1.08 (SD)

Test Beginning: Date: 4.1.08 Time: 13:15
Test Ending: Date: 4.5.08 Time: 11:30

Water Quality Parameters	Diluent	Method	Initials
Total Residual Cl_2 (mg/L):	<0.03	Hach	JD
Alkalinity (mg/L as $CaCO_3$):	90	Hach	BA
Hardness (mg.L as $CaCO_3$):	81	Hach	BA
Total Ammonia (mg/L as N):	<0.017	Denver	AE
Salinity (ppth):	<1	Mettler	BA

Organism Batch # Age: 12-07 / <24hrs
Feeding: (Prior to test / Prior to renewal) Daily
Food: (YCT) (P.subcapitata) Artemia: Lot # —
Food Batch: 7-26-07 / 1-31-08 0hr — 24hr — 48hr — 72hr —
Chamber size: 30 mL
Test volume: 20 mL per replicate

Conc. (g/L) µg/L mg/L	Rep.	Chamber #	Number Live 0 hr (~~48 hr~~)	24 hr (~~72 hr~~)	48 hr (~~96 hr~~)	pH (SU) 0 hr (~~48 hr~~)	24 hr (~~72 hr~~)	48 hr (~~96 hr~~)	Temperature (°C) 0 hr (~~48 hr~~)	24 hr (~~72 hr~~)	48 hr (~~96 hr~~)	D.O. (mg/L) 0 hr (~~48 hr~~)	24 hr (~~72 hr~~)	48 hr (~~96 hr~~)	Uncorrected Conductivity µmhos/cm (mmhos/cm) 0 hr (~~48 hr~~)	24 hr (~~72 hr~~)	48 hr (~~96 hr~~)
Control	A	A	5	5	5	7.9		8.0	24.0		24.0	7.8		7.0	0.172		0.183
	B	B	5	5	5												
	C	C	5	5	5												
	D	D	5	5	5												
1.5	A	A	5	5	5	8.0		7.9	24.0		24.0	7.8		7.1	2911		3.07
	B	B	5	5	5												
	C	C	5	5	5												
	D	D	5	5	5												
2.0	A	A	5	5	5	8.1		7.9	24.0		24.0	7.5		7.0	386		4.02
	B	B	5	5	5												
	C	C	5	5	5												
	D	D	5	5	5												
2.5	A	A	5	5	2 3D	8.1		7.9	24.1		24.0	7.7		6.9	4.71		4.93
	B	B	5	5	3 2D												
	C	C	5	5	3 2D												
	D	D	5	4 1D	3 1D												
3.0	A	A	5	3 2D	0 3D	8.1		7.9	24.1		24.0	7.6		6.8	5.51		5.7
	B	B	5	4 1D	0 4D												
	C	C	5	3 2D	0 3D												
	D	D	5	4 1D	0 4D												
4.0	A	A	5	0 5D	—	8.1	8.0	—	24.2	24.0	—	7.7	7.7	—	7.25	7.19	—
	B	B	5	0 5D	—												
	C	C	5	0 5D	—												
	D	D	5	0 5D	—												
	A																
	B																
	C																
	D																
Loaded / measured by:			BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA
Recorded by:			BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA

Investigators' Signatures
Bruce Jack
James Daniel
Marshall Faircloth
Loretta C. Wolfe
REVIEWER

Concentrations prepared by: BA
Loading verified by: JD
Light Intensity: 50-100 Ft. candles
Photoperiod: 16 hours Light / 8 hours dark
Temperature Range °C:
Incubator # 2 min 26.1 max 26.6 mean 26.4
Incubator # ___ min. ___ max. ___ mean ___
Room B246 min. 24.0 max 25.5 mean 25.0

Comments:

Statistics: Method: Spearman-Karber
48 / 96 hour LC_{50}: 2.5
95% Confidence Interval: lower 2.39 upper 2.62

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Appendix C. (continued)

FDEP Biology Laboratory - Acute SRT Bench Sheet

Test Organism: *Americamysis bahia* Method 2007.0 | *Menidia beryllina* Method 2006.0 | *Hyalella azteca* Method 100.1 EPA-600-R-99-064
Ceriodaphnia dubia Method 2002.0 | *Cyprinella leedsi* Method 2000.0 | *Pimephales promelas* Method 2000.0 | Other: _____

Method from EPA-821-R-02-012
Test Type: 48 hour non-renewal / (96) hour renewal
Test Page 1 of 2

Diluent/ Batch #: Well H_2O / 3.31.08
Toxicant/ Batch#: NaCl / 3.31.08

Test Beginning: Date: 4.1.08 Time: 1500
Test Ending: Date: 7.5.08 Time: 1200

Water Quality Parameters	Diluent	Method	Initials
Total Residual Cl_2 (mg/L):	2003	Hach	JD
Alkalinity (mg/L as $CaCO_3$):	149	Hach	BA
Hardness (mg.L as $CaCO_3$):	133	Hach	BA
Total Ammonia (mg/L as N):	<0.017	Denver	MF
Salinity (ppth):	21	Mettler	JD

Organism Batch #/ Age: 4.1.08 / 13 days
Feeding: (Prior to test / Prior to renewal) / Daily 6.5L
Food: YCT *P.subcapitata* Artemia: Lot # 651-536-90
Food Batch: — — 0hr 57.8 24hr — 48hr 59.8 72hr ____
Chamber size: 1000 mL
Test volume: 500 mL per replicate

Conc. µg/L mg/L	Rep.	Chamber #	Number Live 0 hr / 24 hr / 48 hr (48 hr / 72 hr / 96 hr)	pH (SU) 0 hr / 24 hr / 48 hr (48 hr / 72 hr / 96 hr)	Temperature (°C) 0 hr / 24 hr / 48 hr (48 hr / 72 hr / 96 hr)	D.O. (mg/L) 0 hr / 24 hr / 48 hr (48 hr / 72 hr / 96 hr)	Uncorrected Conductivity µmhos/cm (mmhos/cm) 0 hr / 24 hr / 48 hr (48 hr / 72 hr / 96 hr)
Control	A	B1	10 / 10 / 10	8.0 / / 8.2	24.0 / / 24.7	7.7 / / 7.2	0.273 / / 0.282
	B	B2	10 / 10 / 10	/ 8.2 /	/ 24.3 /	/ 7.1 /	/ 0.278 /
	C						
	D						
6	A	B3	10 / 10 / 10	8.0 / / 8.1	24.0 / / 24.7	7.6 / / 6.9	11.6 / / 11.5
	B	B4	10 / 10 / 10	/ 8.1 /	/ 24.4 /	/ 7.0 /	/ 11.5 /
	C						
	D						
7	A	B5	10 / 10 / 10	8.0 / / 8.1	24.0 / / 24.7	7.6 / / 6.8	13.5 / / 13.3
	B	B6	10 / 10 / 9[10]	/ 8.0 /	/ 24.6 /	/ 6.5 /	/ 13.2 /
	C						
	D						
8	A	B7	10 / 730 / 7	8.0 / / 8.1	24.0 / / 24.9	7.6 / / 6.6	15.5 / / 15.2
	B	B8	10 / 6[10] / 6	/ 8.0 /	/ 24.4 /	/ 6.4 /	/ 15.0 /
	C						
	D						
9	A	B9	10 / 370 / 3	8.0 / / 8.1	24.0 / / 24.6	7.6 / / 6.6	16.8 / / 16.7
	B	B10	10 / 19[0] / 1	/ 8.0 /	/ 24.1 /	/ 6.5 /	/ 16.4 /
	C						
	D						
10	A	B11	10 / 0[10] / —	7.9 / /	24.0 / /	7.6 / /	18.7 / /
	B	B12	10 / 0[10] / —	/ 8.0 /	/ 24.5 /	/ 6.4 /	/ 18.3 /
	C						
	D						
	A						
	B						
	C						
	D						
Loaded / measured by:			BA	JD / JD / JD	JD / JD / JD	JD / JD / JD	JD / JD / JD
Recorded by:			JD	JD / JD / JD	JD / JD / JD	JD / JD / JD	JD / JD / JD

Investigators' Signatures
James Daniel
Brent Reeves
Marshall Faircloth
Kristie C. Waltz
REVIEWER

Concentrations prepared by: JD
Loading verified by: MF
Light Intensity: 50-100 Ft. candles
Photoperiod: 16 hours Light / 8 hours dark
Temperature Range °C:
Incubator # 2 min. 26.1 max. 26.6 mean 26.4
Incubator # ___ min. ___ max. ___ mean ___
Room B246 min. 24.6 max. 25.5 mean 25.0

Comments:

Statistics: Method: Spearman-Karber
48 / 96 hour LC_{50}: 8.24
95% Confidence Interval: lower 7.15 upper 9.55

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Appendix C. (continued)

DATE: 4-1-08 DURATION: 48 hr TOXICANT: NaCl
SPECIES: *Ceriodaphnia dubia*

RAW DATA: Concentration (g/L)	Number Exposed	Mortalities
.00	20	0
1.50	20	0
2.00	20	0
2.50	20	9
3.00	20	20
4.00	20	20

SPEARMAN-KARBER TRIM: 0.0%

SPEARMAN-KARBER ESTIMATES: LC50: 2.50
95% LOWER CONFIDENCE: 2.39
95% UPPER CONFIDENCE: 2.62

DATE: 4-1-08 DURATION: 48 hr TOXICANT: NaCl
SPECIES: *Cyprinella leedsi*

RAW DATA: Concentration (g/L)	Number Exposed	Mortalities
.00	20	0
6.00	20	0
7.00	20	1
8.00	20	7
9.00	20	16
10.00	20	20

SPEARMAN-KARBER TRIM: 0.0%

SPEARMAN-KARBER ESTIMATES: LC50: 8.24
95% LOWER CONFIDENCE: 7.95
95% UPPER CONFIDENCE: 8.55

Appendix D. Test Organism Receipts

MBL Aquaculture
4569 Samuel Street
Sarasota, Florida 34233
TEL: (800) 889-0384
FAX: (941) 922-3874
EMAIL: sales@mblaquaculture.com
WEB: www.MBLAquaculture.com

NELAC Accredited

Organism Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Date: 3/31/08

Shipped to: FDEP

P.O. No: N/A

Species	Quantity	Age	Brood Number	Temperature	Salinity
Mysidopsis bahia	150	4 DAYS	MS080327	25°C	20‰
Menidia beryllina	150	12DAYS	SS080319	25°C	20‰
Cyprinella leedsi	200	12DAYS	CL080319	25°C	
Pimephales promelas	150	8 DAYS	FM080323	25°C	

Packed by: AJ

Shipped Via: FedEx

Notes:

Thank you for your order.

Appendix D. (continued)

MBL Aquaculture
4569 Samuel Street
Sarasota, Florida 34233
TEL: (800) 889-0384
FAX: (941) 922-3874
EMAIL: sales@mblaquaculture.com
WEB: www.MBLAquaculture.com

NELAC Accredited

Organism Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Date: 4/7/08

Shipped to: FDEP

P.O. No: N/A

Species	Quantity	Age	Brood Number	Temperature	Salinity
Mysidopsis bahia					
Menidia beryllina					
Cyprinella leedsi	120	11 DA-15	CL080327	25°C	
Pimephales promelas					

Packed by:

Shipped Via: FedEx

Notes:

Thank you for your order.

Appendix E. Chemical Analyses performed on the effluent from the Wellington Arms Wastewater Treatment Facility Outfall D-001, sampled on April 7, 2008.

Field ID	Analysis	Components	Results	Remark	Units	MDL	PQL
EFFLUENT	AGP/LN	Algal Growth Potential	0.3	U	mg DryWt/L	0.3	0.9
EFFLUENT	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	0.55	U	ug/L	0.55	1.7
EFFLUENT	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	6.8		mg/L	0.2	2
EFFLUENT	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.24	U	ug/L	0.24	0.71
EFFLUENT	Toxicology	Bioassy-Acute-Scrn-FW-Cdubia,LC50-dechlr	100	L	LC50		
EFFLUENT	Toxicology	Bioassay-Acute-Screen-FW-C.dubia, LC50	100	K	LC50		
EFFLUENT	Toxicology	Bioassay-Acute-Scrn-FW-Fish,LC50-dechlr	100	L	LC50		
EFFLUENT	Toxicology	Bioassay-Acute-Screen-FW-Fish, LC50	100	K	LC50		
EFFLUENT	Metals	Iron	380		ug/L	30	120
EFFLUENT	Metals	Magnesium	3.7		mg/L	0.04	0.16
EFFLUENT	Metals	Chromium	1.2	I	ug/L	1	4
EFFLUENT	Metals	Nickel	0.25	U	ug/L	0.25	1
EFFLUENT	Metals	Calcium	30.3		mg/L	0.075	0.3
EFFLUENT	Metals	Aluminum	60	U	ug/L	60	240
EFFLUENT	Metals	Silver	0.025	U	ug/L	0.025	0.1
EFFLUENT	Metals	Copper	90.7		ug/L	0.5	2
EFFLUENT	Metals	Cadmium	0.02	U	ug/L	0.02	0.08
EFFLUENT	Metals	Selenium	0.5	U	ug/L	0.5	2
EFFLUENT	Metals	Arsenic	0.5	U	ug/L	0.5	2
EFFLUENT	Metals	Lead	3.9		ug/L	0.2	0.8
EFFLUENT	Metals	Zinc	21		ug/L	5	20
EFFLUENT	Nutrients	Total-P	0.4		mg P/L	0.02	0.06
EFFLUENT	Nutrients	Ammonia-N	0.49		mg N/L	0.01	0.02
EFFLUENT	Nutrients	NO2NO3-N	0.58		mg N/L	0.004	0.01
EFFLUENT	Nutrients	Kjeldahl Nitrogen	0.88		mg N/L	0.08	0.2
EFFLUENT	Nutrients	O-Phosphate-P	0.22		mg P/L	0.008	0.02
EFFLUENT	Nutrients	TSS	4	U	mg/L	4	16
EFFLUENT	Pesticides	Alachlor	0.58	U	ug/L	0.58	2.3
EFFLUENT	Pesticides	Simazine	0.049	U	ug/L	0.049	0.2
EFFLUENT	Pesticides	Malathion	0.15	U	ug/L	0.15	0.6
EFFLUENT	Pesticides	Metribuzin	0.097	U	ug/L	0.097	0.39
EFFLUENT	Pesticides	Azinphos Methyl	0.19	UJ	ug/L	0.19	0.76
EFFLUENT	Pesticides	Chlorpyrifos Methyl	0.097	U	ug/L	0.097	0.39

Appendix E. (continued)

Field ID	Analysis	Components	Results	Remark	Units	MDL	PQL
EFFLUENT	Pesticides	Metalaxyl	0.24	U	ug/L	0.24	0.96
EFFLUENT	Pesticides	Norflurazon	0.15	UJ	ug/L	0.15	0.6
EFFLUENT	Pesticides	Parathion Ethyl	0.15	U	ug/L	0.15	0.6
EFFLUENT	Pesticides	Atrazine	0.049	U	ug/L	0.049	0.2
EFFLUENT	Pesticides	Butylate	0.19	U	ug/L	0.19	0.76
EFFLUENT	Pesticides	Ethoprop	0.097	U	ug/L	0.097	0.39
EFFLUENT	Pesticides	Metolachlor	0.49	U	ug/L	0.49	2
EFFLUENT	Pesticides	Mevinphos	0.19	U	ug/L	0.19	0.76
EFFLUENT	Pesticides	Naled	0.78	U	ug/L	0.78	3.1
EFFLUENT	Pesticides	Parathion Methyl	0.097	U	ug/L	0.097	0.39
EFFLUENT	Pesticides	Bromacil	0.19	UJ	ug/L	0.19	0.76
EFFLUENT	Pesticides	Chlorpyrifos Ethyl	0.049	U	ug/L	0.049	0.2
EFFLUENT	Pesticides	Fonofos	0.097	U	ug/L	0.097	0.39
EFFLUENT	Pesticides	Phorate	0.049	U	ug/L	0.049	0.2
EFFLUENT	Pesticides	Ametryn	0.049	U	ug/L	0.049	0.2
EFFLUENT	Pesticides	Diazinon	0.049	U	ug/L	0.049	0.2
EFFLUENT	Pesticides	Ethion	0.049	U	ug/L	0.049	0.2
EFFLUENT	Pesticides	Hexazinone	0.097	UJ	ug/L	0.097	0.39
EFFLUENT	Pesticides	Prometryn	0.15	U	ug/L	0.15	0.6
EFFLUENT	Pesticides	Fenamiphos	0.19	U	ug/L	0.19	0.76
EFFLUENT	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Dimethyl phthalate	9.6	U	ug/L	9.6	38
EFFLUENT	Priority Organic Pollutants	Endosulfan II	3.8	U	ug/L	3.8	15
EFFLUENT	Priority Organic Pollutants	Fluoranthene	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Heptachlor epoxide	1.4	U	ug/L	1.4	5.8
EFFLUENT	Priority Organic Pollutants	Hexachlorobenzene	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	2-Nitrophenol	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Dieldrin	1.4	U	ug/L	1.4	5.8
EFFLUENT	Priority Organic Pollutants	Endosulfan I	3.8	U	ug/L	3.8	15
EFFLUENT	Priority Organic Pollutants	Endosulfan sulfate	1.4	U	ug/L	1.4	5.8
EFFLUENT	Priority Organic Pollutants	Endrin aldehyde	3.8	U	ug/L	3.8	15
EFFLUENT	Priority Organic Pollutants	Fluorene	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Phenol	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	alpha-BHC	1.4	U	ug/L	1.4	5.8

Appendix E. (continued)

Field ID	Analysis	Components	Results	Remark	Units	MDL	PQL
EFFLUENT	Priority Organic Pollutants	beta-BHC	1.4	U	ug/L	1.4	5.8
EFFLUENT	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	2,4-Dichlorophenol	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	2,6-Dinitrotoluene	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	3,3'-Dichlorobenzidine	38	UJ	ug/L	38	150
EFFLUENT	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Chrysene	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Di-n-butyl phthalate	4.8	U	ug/L	4.8	19
EFFLUENT	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.7
EFFLUENT	Priority Organic Pollutants	Pyrene	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	delta-BHC	1.4	U	ug/L	1.4	5.8
EFFLUENT	Priority Organic Pollutants	Benzo(a)anthracene	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Benzo(k)fluoranthene	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Di-n-octyl phthalate	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L	2.9	12
EFFLUENT	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L	1.9	7.7
EFFLUENT	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L	2.9	12
EFFLUENT	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	2,4-Dimethylphenol	9.6	U	ug/L	9.6	38
EFFLUENT	Priority Organic Pollutants	4,4'-DDE	1.4	U	ug/L	1.4	5.8
EFFLUENT	Priority Organic Pollutants	4,4'-DDT	1.4	U	ug/L	1.4	5.8
EFFLUENT	Priority Organic Pollutants	4-Nitrophenol	14	U	ug/L	14	58
EFFLUENT	Priority Organic Pollutants	Aldrin	1.4	U	ug/L	1.4	5.8
EFFLUENT	Priority Organic Pollutants	Benzidine	96	U	ug/L	96	380
EFFLUENT	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L	2.9	12
EFFLUENT	Priority Organic Pollutants	gamma-BHC	1.4	U	ug/L	1.4	5.8
EFFLUENT	Priority Organic Pollutants	2,4-Dinitrophenol	14	U	ug/L	14	58
EFFLUENT	Priority Organic Pollutants	2,4-Dinitrotoluene	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Acenaphthylene	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	14	U	ug/L	14	58
EFFLUENT	Priority Organic Pollutants	Diethyl phthalate	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L	2.9	12

Appendix E. (continued)

Field ID	Analysis	Components	Results	Remark	Units	MDL	PQL
EFFLUENT	Priority Organic Pollutants	Phenanthrene	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Benzo(a)pyrene	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Butyl benzyl phthalate	4.8	U	ug/L	4.8	19
EFFLUENT	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Isophorone	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Naphthalene	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	2-Chlorophenol	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Acenaphthene	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Benzo(b)fluoranthene	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	Endrin	1.4	UJ	ug/L	1.4	5.8
EFFLUENT	Priority Organic Pollutants	Heptachlor	1.4	U	ug/L	1.4	5.8
EFFLUENT	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	U	ug/L	2.9	12
EFFLUENT	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.7
EFFLUENT	Priority Organic Pollutants	2-Chloronaphthalene	0.96	U	ug/L	0.96	3.8
EFFLUENT	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L	2.9	12
EFFLUENT	Priority Organic Pollutants	4,4'-DDD	1.4	U	ug/L	1.4	5.8
EFFLUENT	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L	1.9	7.7
EFFLUENT	Priority Organic Pollutants	Anthracene	0.96	U	ug/L	0.96	3.8
EFFLUENT	Nutrients	Temperature	25.97		C		
EFFLUENT	Nutrients	Total Residual Chlorine	1.1		mg/L		
EFFLUENT	Nutrients	pH	6.08				
EFFLUENT	Nutrients	Specific Conductance	314		umhos/cm		
EFFLUENT	Nutrients	Sample Depth	0.01		m		
BLANK	Metals	Iron	30	U	ug/L	30	120
BLANK	Metals	Silver	0.025	U	ug/L	0.025	0.1
BLANK	Metals	Magnesium	0.04	U	mg/L	0.04	0.16
BLANK	Metals	Selenium	0.5	U	ug/L	0.5	2
BLANK	Metals	Nickel	0.25	U	ug/L	0.25	1
BLANK	Metals	Arsenic	0.5	U	ug/L	0.5	2
BLANK	Metals	Lead	0.2	U	ug/L	0.2	0.8
BLANK	Metals	Aluminum	60	U	ug/L	60	240
BLANK	Metals	Copper	0.5	U	ug/L	0.5	2
BLANK	Metals	Zinc	5	U	ug/L	5	20
BLANK	Metals	Chromium	1	U	ug/L	1	4
BLANK	Metals	Calcium	0.075	U	mg/L	0.075	0.3

Appendix E. (continued)

Field ID	Analysis	Components	Results	Remark	Units	MDL	PQL
BLANK	Metals	Cadmium	0.02	U	ug/L	0.02	0.08
BLANK	Nutrients	Total-P	0.02	U	mg P/L	0.02	0.06
BLANK	Nutrients	NO2NO3-N	0.004	U	mg N/L	0.004	0.01
BLANK	Nutrients	O-Phosphate-P	0.004	U	mg P/L	0.004	0.01
BLANK	Nutrients	Kjeldahl Nitrogen	0.08	U	mg N/L	0.08	0.2
BLANK	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
BLANK	Nutrients	TSS	4	U	mg/L	4	16
BLANK	Pesticides	Fonofos	0.096	U	ug/L	0.096	0.38
BLANK	Pesticides	Simazine	0.048	U	ug/L	0.048	0.19
BLANK	Pesticides	Alachlor	0.58	U	ug/L	0.58	2.3
BLANK	Pesticides	Butylate	0.19	U	ug/L	0.19	0.76
BLANK	Pesticides	Ethoprop	0.096	U	ug/L	0.096	0.38
BLANK	Pesticides	Norflurazon	0.14	UJ	ug/L	0.14	0.56
BLANK	Pesticides	Chlorpyrifos Ethyl	0.048	U	ug/L	0.048	0.19
BLANK	Pesticides	Parathion Methyl	0.096	U	ug/L	0.096	0.38
BLANK	Pesticides	Ametryn	0.048	U	ug/L	0.048	0.19
BLANK	Pesticides	Atrazine	0.048	U	ug/L	0.048	0.19
BLANK	Pesticides	Azinphos Methyl	0.19	UJ	ug/L	0.19	0.76
BLANK	Pesticides	Ethion	0.048	U	ug/L	0.048	0.19
BLANK	Pesticides	Malathion	0.14	U	ug/L	0.14	0.56
BLANK	Pesticides	Metalaxyl	0.24	U	ug/L	0.24	0.96
BLANK	Pesticides	Parathion Ethyl	0.14	U	ug/L	0.14	0.56
BLANK	Pesticides	Prometryn	0.14	U	ug/L	0.14	0.56
BLANK	Pesticides	Bromacil	0.19	UJ	ug/L	0.19	0.76
BLANK	Pesticides	Metolachlor	0.48	U	ug/L	0.48	1.9
BLANK	Pesticides	Mevinphos	0.19	U	ug/L	0.19	0.76
BLANK	Pesticides	Naled	0.77	U	ug/L	0.77	3.1
BLANK	Pesticides	Phorate	0.048	U	ug/L	0.048	0.19
BLANK	Pesticides	Diazinon	0.048	U	ug/L	0.048	0.19
BLANK	Pesticides	Fenamiphos	0.19	U	ug/L	0.19	0.76
BLANK	Pesticides	Hexazinone	0.096	UJ	ug/L	0.096	0.38
BLANK	Pesticides	Metribuzin	0.096	U	ug/L	0.096	0.38
BLANK	Pesticides	Chlorpyrifos Methyl	0.096	U	ug/L	0.096	0.38
BLANK	Priority Organic Pollutants	Heptachlor epoxide	1.4	U	ug/L	1.4	5.7
BLANK	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L	2.9	11

Appendix E. (continued)

Field ID	Analysis	Components	Results	Remark	Units	MDL	PQL
BLANK	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L	1.9	7.6
BLANK	Priority Organic Pollutants	beta-BHC	1.4	U	ug/L	1.4	5.7
BLANK	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	2,4-Dichlorophenol	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	2,4-Dimethylphenol	9.5	U	ug/L	9.5	38
BLANK	Priority Organic Pollutants	2-Chlorophenol	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	Benzo(a)pyrene	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	Fluorene	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	Hexachlorobenzene	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	4,4'-DDD	1.4	U	ug/L	1.4	5.7
BLANK	Priority Organic Pollutants	Endosulfan II	3.8	U	ug/L	3.8	15
BLANK	Priority Organic Pollutants	Fluoranthene	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	Naphthalene	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	2-Chloronaphthalene	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	2-Nitrophenol	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	Acenaphthylene	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	Anthracene	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	Benzidine	95	U	ug/L	95	380
BLANK	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L	2.9	11
BLANK	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	14	U	ug/L	14	57
BLANK	Priority Organic Pollutants	Dieldrin	1.4	U	ug/L	1.4	5.7
BLANK	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L	2.9	11
BLANK	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.6
BLANK	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L	2.9	11
BLANK	Priority Organic Pollutants	Phenol	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	2,4-Dinitrotoluene	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L	2.9	11
BLANK	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L	1.9	7.6
BLANK	Priority Organic Pollutants	Benzo(a)anthracene	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	Di-n-butyl phthalate	4.8	U	ug/L	4.8	19
BLANK	Priority Organic Pollutants	Diethyl phthalate	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	Dimethyl phthalate	9.5	U	ug/L	9.5	38
BLANK	Priority Organic Pollutants	Endosulfan I	3.8	U	ug/L	3.8	15

Appendix E. (continued)

Field ID	Analysis	Components	Results	Remark	Units	MDL	PQL
BLANK	Priority Organic Pollutants	Heptachlor	1.4	U	ug/L	1.4	5.7
BLANK	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	Isophorone	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	alpha-BHC	1.4	U	ug/L	1.4	5.7
BLANK	Priority Organic Pollutants	delta-BHC	1.4	U	ug/L	1.4	5.7
BLANK	Priority Organic Pollutants	gamma-BHC	1.4	U	ug/L	1.4	5.7
BLANK	Priority Organic Pollutants	2,6-Dinitrotoluene	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	4,4'-DDE	1.4	U	ug/L	1.4	5.7
BLANK	Priority Organic Pollutants	Acenaphthene	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	U	ug/L	2.9	11
BLANK	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.6
BLANK	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	Chrysene	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	Phenanthrene	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	4,4'-DDT	1.4	U	ug/L	1.4	5.7
BLANK	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	4-Nitrophenol	14	U	ug/L	14	57
BLANK	Priority Organic Pollutants	Aldrin	1.4	U	ug/L	1.4	5.7
BLANK	Priority Organic Pollutants	Benzo(b)fluoranthene	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	Benzo(k)fluoranthene	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	Di-n-octyl phthalate	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	Endrin	1.4	UJ	ug/L	1.4	5.7
BLANK	Priority Organic Pollutants	Pyrene	0.95	U	ug/L	0.95	3.8
BLANK	Priority Organic Pollutants	2,4-Dinitrophenol	14	U	ug/L	14	57
BLANK	Priority Organic Pollutants	3,3'-Dichlorobenzidine	38	UJ	ug/L	38	150
BLANK	Priority Organic Pollutants	Butyl benzyl phthalate	4.8	U	ug/L	4.8	19
BLANK	Priority Organic Pollutants	Endosulfan sulfate	1.4	U	ug/L	1.4	5.7
BLANK	Priority Organic Pollutants	Endrin aldehyde	3.8	U	ug/L	3.8	15
BLANK	Nutrients	Sample Depth	0.01		m		

Appendix F. Toxicity Equipment Identification

Facility ID: Wellington Arms WWTF Test Dates: April 8 -10, 2008

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

SM-2530B modified to allow use electronic and non-mercury filled thermometers.
Insert other device information in blank spaces(if used). Test ID = Facility or SRTs (acute SRT--Chronic SRT)

V 1.1 6/12/08 MF

The Bioassay of Wellington Arms Wastewater Treatment Facility effluent sampled on April 7, 2008. NPDES #FL0023396.

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 3 3 9 6 11	12 0 8 0 4 0 7	18 B	19 S	20 1

Remarks

66

The Priority Pollutants Analysis of Wellington Arms Wastewater Treatment Facility effluent sampled on April 7, 2008. NPDES #FL0023396.

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 3 3 9 6 11	12 0 8 0 4 0 7	18 X	19 S	20 1

Remarks

66

Biological Analyses of Wellington Arms Wastewater Treatment Facility effluent sampled on April 7, 2008. NPDES #FL0023396.

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 3 3 9 6 11	12 0 8 0 4 0 7	18 S	19 S	20 1

Remarks

66