

Marion Water Department

MAYOR
FRANK A FOGLEMAN

WATER UTILITIES MANAGER
JIM SHERPERT

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WATER & SEWER COMMITTEE

JIM SPENCE, CHAIRMAN
KELLY O'NEAL
CLIFF WOOD

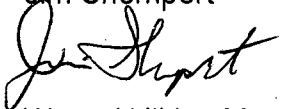
November 18, 2014

Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, Arkansas 72118-5317

Re: October 2014 Non-Compliance Letter

Marion continues to struggle to meet permit on TSS, Ammonia Nitrogen and BOD, due to our draw down of our lagoons for our ongoing pipeline construction project. We anticipate better numbers upon completion.

Jim Shempert



Water Utilities Manager



ENVIRONMENTAL TESTING & CONSULTING, INC.

2790 Whitten Road

Memphis, Tennessee 38133

(901) 213-2400

Fax (901) 213-2440

"A Laboratory Management Partner"

10/31/2014

City of Marion Water Department
Mr. Jim Shempert
PO Box 814
Marion, AR, 72364

Ref: Analytical Testing
ETC Report Number: 14-287-0193
Client Project Description: Bioassay

Dear Mr. Jim Shempert:

The results of this WET (Whole Effluent Toxicity) test are acceptable according to test review criteria. There were no significant deficiencies found in sample handling, test performance, or reporting. The test results are within the limits established by your NPDES permit and were entered into the permittee's records in the database.

Results: CV/NOEL 88%
Permit Limit: 88%

All statistical interpretations generated by CETIS - Comprehensive Environmental Toxicity Information System (v.1.8.6.1). CETIS created by Tidepool Scientific Software

Respectfully,

Connie Cook
Lab Supervisor

Laboratory's liability in any claim relating to analyses performed shall be limited to, at laboratory's option, repeating the analysis in question at laboratory's expense, or the refund of the charges paid for performance of said analysis.

CETIS Test Evaluation Report

Report Date: 31 Oct-14 14:27 (1 of 2)
Test Code: CD 14-287-0193 | 19-5626-6619

Facility: MARION Sample Site: Sample Code: 616B3B1A Sample Date: 14 Oct-14 07:00 Sample Age: 9h (0.9 °C) Project: WET Biannual Compliance Test (2nd)	Test Name: Ceriodaphnia 7-d Survival and Reproduction Test Organism: Ceriodaphnia dubia (Water Flea) Protocol: EPA/821/R-02-013 (2002) Start Date: 14 Oct-14 15:35 End Date: 20 Oct-14 15:00 Duration: 5d 23h Organism Age: < 24
Permitee: City of Marion Water Department Address: P.O. Box 814 Marion, AR 72364 Contact: Mr. Jim Shempert Phone: 870-739-5413 Email:	Laboratory: Environmental Testing and Consulting, Inc. Address: 2790 Whitten Road Memphis, TN 38133 Contact: Connie Cook, Lab Supervisor Phone: 901-213-2454 Email: ccook@etcmemphis.com

Chronic Toxicity Evaluation					
Endpoint	Parameter	C-%	IWC	Pass/Fail	Method
Reproduction	NOEL/LOEL	88/>88	87.99	Pass	Dunnett Multiple Comparison Test

Test Acceptability Criteria				
Endpoint	Attribute	Test Stat	Limits	Pass/Fail
6d Survival Rate	Control CV	0.35	N/A - 0.4	Pass
6d Survival Rate	Control Resp	0.9	0.799 - N/A	Pass
Reproduction	Control CV	0.27	N/A - 0.4	Pass
Reproduction	Control Resp	16	15 - N/A	Pass

CETIS Test Evaluation Report

Report Date: 31 Oct-14 14:27 (2 of 2)
 Test Code: CD 14-287-0193 | 19-5626-6619

6d Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water	10	0.9	0.78	1	0	1	0.1	0.32	35.0%	0.0%
28		10	0.9	0.78	1	0	1	0.1	0.32	35.0%	0.0%
37		10	0.7	0.52	0.88	0	1	0.15	0.48	69.0%	22.0%
50		10	1	1	1	1	1	0	0	0.0%	-11.0%
66		10	0.9	0.78	1	0	1	0.1	0.32	35.0%	0.0%
88		10	1	1	1	1	1	0	0	0.0%	-11.0%

Reproduction Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water	10	16	14	17	10	22	1.3	4.2	27.0%	0.0%
28		10	14	13	15	10	20	0.87	2.7	19.0%	9.6%
37		10	14	13	14	9	16	0.72	2.3	17.0%	14.0%
50		10	14	13	15	10	19	0.94	3	21.0%	9.6%
66		10	14	13	16	10	19	1.1	3.4	24.0%	8.9%
88		10	14	13	15	11	18	0.68	2.2	15.0%	11.0%

CETIS Summary Report

Report Date: 31 Oct-14 14:28 (p 1 of 1)

Test Code: CD 14-287-0193 | 19-5626-6619

Ceriodaphnia 7-d Survival and Reproduction Test Environmental Testing and Consulting, Inc.

Batch ID: 03-6088-7236	Test Type: Reproduction-Survival (7d)	Analyst: Connie Cook
Start Date: 14 Oct-14 15:35	Protocol: EPA/821/R-02-013 (2002)	Diluent: Mod-Hard Synthetic Water
Ending Date: 20 Oct-14 15:00	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 5d 23h	Source: In-House Culture	Age: < 24

Sample ID: 16-3441-7434	Code: 616B3B1A	Client: City of Marion Water Department
Sample Date: 14 Oct-14 07:00	Material: POTW Effluent	Project: WET Biannual Compliance Test (2nd)
Receive Date: 14 Oct-14 13:40	Source: MARION (AR0021971)	
Sample Age: 9h (0.9 °C)	Station:	

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
00-4686-3215	6d Survival Rate	88	>88	NA	NA	1.136	Fisher Exact/Bonferroni-Holm Test
18-8935-8872	Reproduction	88	>88	NA	19.8%	1.136	Dunnett Multiple Comparison Test

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
00-4686-3215	6d Survival Rate	Control CV	0.35	NL - 0.4	Yes	Passes Acceptability Criteria
18-8935-8872	Reproduction	Control CV	0.27	NL - 0.4	Yes	Passes Acceptability Criteria
00-4686-3215	6d Survival Rate	Control Resp	0.9	0.799 - NL	Yes	Passes Acceptability Criteria
18-8935-8872	Reproduction	Control Resp	16	15 - NL	Yes	Passes Acceptability Criteria

6d Survival Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water	10	0.9	0.67	1	0	1	0.1	0.32	35.0%	0.0%
28		10	0.9	0.67	1	0	1	0.1	0.32	35.0%	0.0%
37		10	0.7	0.35	1	0	1	0.15	0.48	69.0%	22.0%
50		10	1	1	1	1	1	0	0	0.0%	-11.0%
66		10	0.9	0.67	1	0	1	0.1	0.32	35.0%	0.0%
88		10	1	1	1	1	1	0	0	0.0%	-11.0%

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water	10	16	13	19	10	22	1.3	4.2	27.0%	0.0%
28		10	14	12	16	10	20	0.87	2.7	19.0%	9.6%
37		10	14	12	15	9	16	0.72	2.3	17.0%	14.0%
50		10	14	12	16	10	19	0.94	3	21.0%	9.6%
66		10	14	12	17	10	19	1.1	3.4	24.0%	8.9%
88		10	14	12	16	11	18	0.68	2.2	15.0%	11.0%

6d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Lab Water	1	1	1	1	1	1	1	0	1	1
28		1	1	1	0	1	1	1	1	1	1
37		0	1	0	0	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
66		1	1	1	1	1	1	1	1	1	0
88		1	1	1	1	1	1	1	1	1	1

Reproduction Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Lab Water	15	18	22	14	18	12	12	10	14	22
28		16	15	12	10	14	15	20	15	12	13
37		9	12	13	11	15	15	16	14	16	14
50		10	17	12	12	16	11	19	13	16	16
66		19	18	14	16	19	12	11	12	12	10
88		12	12	13	14	16	14	14	11	18	16

CETIS Measurement Report

Report Date: 31 Oct-14 14:28 (p 1 of 8)
Test Code: CD 14-287-0193 | 19-5626-6619

Ceriodaphnia 7-d Survival and Reproduction Test		Environmental Testing and Consulting, Inc.	
Batch ID: 03-6088-7236	Test Type: Reproduction-Survival (7d)	Analyst: Connie Cook	
Start Date: 14 Oct-14 15:35	Protocol: EPA/821/R-02-013 (2002)	Diluent: Mod-Hard Synthetic Water	
Ending Date: 20 Oct-14 15:00	Species: Ceriodaphnia dubia	Brine: Not Applicable	
Duration: 5d 23h	Source: In-House Culture	Age: < 24	
Sample ID: 16-3441-7434	Code: 616B3B1A	Client: City of Marion Water Department	
Sample Date: 14 Oct-14 07:00	Material: POTW Effluent	Project: WET Biannual Compliance Test (2nd)	
Receive Date: 14 Oct-14 13:40	Source: MARION (AR0021971)		
Sample Age: 9h (0.9 °C)	Station:		

CETIS Measurement Report

Report Date: 31 Oct-14 14:28 (p 2 of 8)

Test Code: CD 14-287-0193 | 19-5626-6619

Ceriodaphnia 7-d Survival and Reproduction Test	Environmental Testing and Consulting, Inc.
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Alkalinity (CaCO3)-mg/L								
C-%	Control Type	Reading Time	Measure	QA	Diff-%	Inst ID	Analyst	Notes
0	Lab Water	1	62					
0	Lab Water	2	61					
0	Lab Water	3	60					
0	Lab Water	4	62					
0	Lab Water	5	59					
0	Lab Water	6	63					
0	Lab Water	7	61					

Total Residual Chlorine-mg/L								
C-%	Control Type	Reading Time	Measure	QA	Diff-%	Inst ID	Analyst	Notes
0	Lab Water	1	0					
88			0					
0	Lab Water	2	0					
88			0					
0	Lab Water	3	0					
88			0					
0	Lab Water	4	0					
88			0					
0	Lab Water	5	0					
88			0					
0	Lab Water	6	0					
88			0					
0	Lab Water	7	0					
88			0					

Conductivity-µS/cm								
C-%	Control Type	Reading Time	Measure	QA	Diff-%	Inst ID	Analyst	Notes
0	Lab Water	1	167					
88			415					
0	Lab Water	2	166					
88			410					
0	Lab Water	3	167					
88			406					
0	Lab Water	4	167					
88			440					
0	Lab Water	5	167					
88			437					
0	Lab Water	6	167					
88			439					
0	Lab Water	7	167					
88			425					

CETIS Measurement Report

Report Date: 31 Oct-14 14:28 (p 3 of 8)

Test Code: CD 14-287-0193 | 19-5626-6619

Ceriodaphnia 7-d Survival and Reproduction Test Environmental Testing and Consulting, Inc.

Final Dissolved Oxygen-mg/L								
C-%	Control Type	Reading Time	Measure	QA	Diff-%	Inst ID	Analyst	Notes
0	Lab Water	1	7.8					
28			8					
37			8.1					
50			8.1					
66			8.3					
88			7.7					
0			Lab Water	2	7.7			
28	8.4							
37	8.6							
50	8.5							
66	8.5							
88	7.9							
0	Lab Water	3			7.9			
28			8.2					
37			8.3					
50			8.3					
66			8.5					
88			8					
0			Lab Water	4	7.9			
28	8.6							
37	8.4							
50	8.4							
66	8.2							
88	7.9							
0	Lab Water	5			8.5			
28			8.3					
37			8.2					
50			8.1					
66			7.7					
88			7.9					
0			Lab Water	6	8.4			
28	8.3							
37	8.3							
50	8.2							
66	8.2							
88	7.9							

CETIS Measurement Report

Report Date: 31 Oct-14 14:28 (p 4 of 8)

Test Code: CD 14-287-0193 | 19-5626-6619

Ceriodaphnia 7-d Survival and Reproduction Test Environmental Testing and Consulting, Inc.

Initial Dissolved Oxygen-mg/L							
C-%	Control Type	Reading Time	Measure	QA	Diff-%	Inst ID	Analyst Notes
0	Lab Water	1	8.6				
28			8.8				
37			8.9				
50			8.9				
66			9				
88			7.5				
0			Lab Water	2	8.8		
28	8.8						
37	8.9						
50	8.9						
66	9						
88	7.4						
0	Lab Water	3			8.7		
28			9				
37			9				
50			9.1				
66			9.4				
88			7.4				
0			Lab Water	4	8.2		
28	8.9						
37	9						
50	9						
66	9.4						
88	7.7						
0	Lab Water	5			8.1		
28			8.7				
37			9				
50			9.1				
66			9.2				
88			7.7				
0			Lab Water	6	8.6		
28	8.9						
37	9						
50	9						
66	9.4						
88	7.6						
0	Lab Water	7			8.7		
28			8.8				
37			8.8				
50			8.7				
66			8.7				
88			7.3				

Hardness (CaCO3)-mg/L							
C-%	Control Type	Reading Time	Measure	QA	Diff-%	Inst ID	Analyst Notes
0	Lab Water	1	92				
0	Lab Water	2	90				
0	Lab Water	3	89				
0	Lab Water	4	92				
0	Lab Water	5	90				
0	Lab Water	6	93				
0	Lab Water	7	91				

CETIS Measurement Report

Report Date: 31 Oct-14 14:28 (p 5 of 8)

Test Code: CD 14-287-0193 | 19-5626-6619

Ceriodaphnia 7-d Survival and Reproduction Test							Environmental Testing and Consulting, Inc.
Final pH-Units							
C-%	Control Type	Reading Time	Measure	QA	Diff-%	Inst ID	Analyst Notes
0	Lab Water	1	7.8				
28			7.7				
37			7.7				
50			7.7				
66			7.7				
88			8.1				
0			Lab Water	2	8		
28	7.9						
37	7.9						
50	7.9						
66	7.9						
88	8.5						
0	Lab Water	3			8.1		
28			8				
37			8				
50			7.9				
66			8				
88			8.5				
0			Lab Water	4	7.9		
28	7.9						
37	7.9						
50	7.9						
66	7.9						
88	8.2						
0	Lab Water	5			7.8		
28			7.7				
37			7.8				
50			7.8				
66			7.8				
88			8				
0			Lab Water	6	8		
28	7.9						
37	7.9						
50	7.8						
66	7.9						
88	8.1						

CETIS Measurement Report

Report Date: 31 Oct-14 14:28 (p 6 of 8)
 Test Code: CD 14-287-0193 | 19-5626-6619

Ceriodaphnia 7-d Survival and Reproduction Test				Environmental Testing and Consulting, Inc.			
Initial pH-Units							
C-%	Control Type	Reading Time	Measure	QA	Diff.-%	Inst ID	Analyst Notes
0	Lab Water	1	7.7				
28			7.5				
37			7.5				
50			7.5				
66			7.5				
88			9				
0	Lab Water	2	7.6				
28			7.5				
37			7.5				
50			7.4				
66			7.4				
88			9				
0	Lab Water	3	7.8				
28			7.6				
37			7.6				
50			7.5				
66			7.5				
88			9.4				
0	Lab Water	4	8.1				
28			7.9				
37			7.8				
50			7.8				
66			7.7				
88			9.4				
0	Lab Water	5	8.1				
28			7.7				
37			7.7				
50			7.6				
66			7.6				
88			9.2				
0	Lab Water	6	8.2				
28			7.8				
37			7.7				
50			7.7				
66			7.7				
88			9.4				
0	Lab Water	7	7.6				
28			7.5				
37			7.4				
50			7.4				
66			7.4				
88			8.7				

CETIS Measurement Report

Report Date: 31 Oct-14 14:28 (p 7 of 8)

Test Code: CD 14-287-0193 | 19-5626-6619

Ceriodaphnia 7-d Survival and Reproduction Test Environmental Testing and Consulting, Inc.

Final Temperature-°C						
C-%	Control Type	Reading Time	Measure	QA	Diff-%	Inst ID Analyst Notes
0	Lab Water	1	23			
28			23			
37			23			
50			23			
66			23			
88			23			
0			Lab Water	2	23	
28	23					
37	23					
50	23					
66	23					
88	23					
0	Lab Water	3			23	
28			23			
37			23			
50			23			
66			23			
88			23			
0			Lab Water	4	23	
28	23					
37	23					
50	23					
66	23					
88	23					
0	Lab Water	5			23	
28			23			
37			23			
50			23			
66			23			
88			23			
0			Lab Water	6	23	
28	23					
37	23					
50	23					
66	23					
88	23					

CETIS Measurement Report

Report Date: 31 Oct-14 14:28 (p 8 of 8)
 Test Code: CD 14-287-0193 | 19-5626-6619

Ceriodaphnia 7-d Survival and Reproduction Test				Environmental Testing and Consulting, Inc.				
Initial Temperature-°C								
C-%	Control Type	Reading Time	Measure	QA	Diff-%	Inst ID	Analyst	Notes
0	Lab Water	1	23					
28			23					
37			23					
50			23					
66			23					
88			23					
0			Lab Water	2	23			
28	23							
37	23							
50	23							
66	23							
88	23							
0	Lab Water	3			23			
28			23					
37			23					
50			23					
66			23					
88			23					
0			Lab Water	4	23			
28	23							
37	23							
50	23							
66	23							
88	23							
0	Lab Water	5			23			
28			23					
37			23					
50			23					
66			23					
88			23					
0			Lab Water	6	23			
28	23							
37	23							
50	23							
66	23							
88	23							
0	Lab Water	7			23			
28			23					
37			23					
50			23					
66			23					
88			23					

CETIS Test Evaluation Report

Report Date: 31 Oct-14 14:29 (1 of 2)

Test Code: FH 14-287-0193 | 02-5921-4040

Facility: MARION Sample Site: Sample Code: 616B3B1A Sample Date: 14 Oct-14 07:00 Sample Age: 10h (0.9 °C) Project: WET Biannual Compliance Test (2nd)	Test Name: Fathead Minnow 7-d Larval Survival and Growth Test Organism: Pimephales promelas (Fathead Minnow) Protocol: EPA/821/R-02-013 (2002) Start Date: 14 Oct-14 16:50 End Date: 21 Oct-14 13:48 Duration: 6d 21h Organism Age: < 24
Permitee: City of Marion Water Department Address: P.O. Box 814 Marion, AR 72364 Contact: Mr. Jim Shempert Phone: 870-739-5413 Email:	Laboratory: Environmental Testing and Consulting, Inc. Address: 2790 Whitten Road Memphis, TN 38133 Contact: Connie Cook, Lab Supervisor Phone: 901-213-2454 Email: ccook@etcmemphis.com

Chronic Toxicity Evaluation

Endpoint	Parameter	C-%	IWC	Pass/Fail	Method
7d Survival Rate	NOEL/LOEL	88/>88	87.99	Pass	Dunnett Multiple Comparison Test
Mean Dry Weight-mg	NOEL/LOEL	88/>88	87.99	Pass	Dunnett Multiple Comparison Test

Test Acceptability Criteria

Endpoint	Attribute	Test Stat	Limits	Pass/Fail
7d Survival Rate	Control CV	0.1	N/A - 0.4	Pass
7d Survival Rate	Control Resp	0.88	0.8 - N/A	Pass
Mean Dry Weight-mg	Control CV	0.049	N/A - 0.4	Pass
Mean Dry Weight-mg	Control Resp	0.38	0.25 - N/A	Pass

CETIS Test Evaluation Report

Report Date: 31 Oct-14 14:29 (2 of 2)
 Test Code: FH 14-287-0193 | 02-5921-4040

7d Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water	5	0.88	0.84	0.91	0.75	1	0.04	0.088	10.0%	0.0%
28		5	0.93	0.9	0.95	0.88	1	0.031	0.068	7.4%	-5.7%
37		5	0.93	0.9	0.95	0.88	1	0.031	0.068	7.4%	-5.7%
50		5	0.88	0.83	0.92	0.75	1	0.056	0.13	14.0%	0.0%
66		5	0.83	0.77	0.88	0.63	1	0.064	0.14	17.0%	5.7%
88		5	0.78	0.74	0.81	0.63	0.88	0.047	0.1	13.0%	11.0%

Mean Dry Weight-mg Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water	5	0.38	0.37	0.38	0.35	0.4	0.0083	0.019	4.9%	0.0%
28		5	0.35	0.32	0.38	0.29	0.47	0.033	0.074	21.0%	7.3%
37		5	0.36	0.33	0.38	0.3	0.43	0.026	0.059	17.0%	6.0%
50		5	0.43	0.41	0.45	0.35	0.47	0.022	0.049	11.0%	-13.0%
66		5	0.41	0.38	0.44	0.31	0.51	0.037	0.082	20.0%	-7.9%
88		5	0.42	0.39	0.45	0.33	0.51	0.037	0.083	20.0%	-11.0%

CETIS Summary Report

Report Date: 31 Oct-14 14:29 (p.1 of 1)
 Test Code: FH 14-287-0193 | 02-5921-4040

Fathead Minnow 7-d Larval Survival and Growth Test Environmental Testing and Consulting, Inc.

Batch ID: 09-4629-1912	Test Type: Growth-Survival (7d)	Analyst: Connie Cook
Start Date: 14 Oct-14 16:50	Protocol: EPA/821/R-02-013 (2002)	Diluent:
Ending Date: 21 Oct-14 13:48	Species: Pimephales promelas	Brine: Not Applicable
Duration: 6d 21h	Source: Aquatic Biosystems, CO	Age: < 24

Sample ID: 16-3441-7434	Code: 616B3B1A	Client: City of Marion Water Department
Sample Date: 14 Oct-14 07:00	Material: POTW Effluent	Project: WET Biannual Compliance Test (2nd)
Receive Date: 14 Oct-14 13:40	Source: MARION (AR0021971)	
Sample Age: 10h (0.9 °C)	Station:	

Comparison Summary							
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
12-4304-1749	7d Survival Rate	88	>88	NA	18.3%	1.136	Dunnett Multiple Comparison Test
03-2870-8252	Mean Dry Weight-mg	88	>88	NA	25.8%	1.136	Dunnett Multiple Comparison Test

Test Acceptability						
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
12-4304-1749	7d Survival Rate	Control CV	0.1	NL - 0.4	Yes	Passes Acceptability Criteria
03-2870-8252	Mean Dry Weight-mg	Control CV	0.049	NL - 0.4	Yes	Passes Acceptability Criteria
12-4304-1749	7d Survival Rate	Control Resp	0.88	0.8 - NL	Yes	Passes Acceptability Criteria
03-2870-8252	Mean Dry Weight-mg	Control Resp	0.38	0.25 - NL	Yes	Passes Acceptability Criteria

7d Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water	5	0.88	0.77	0.98	0.75	1	0.04	0.088	10.0%	0.0%
28		5	0.93	0.84	1	0.88	1	0.031	0.068	7.4%	-5.7%
37		5	0.93	0.84	1	0.88	1	0.031	0.068	7.4%	-5.7%
50		5	0.88	0.72	1	0.75	1	0.056	0.13	14.0%	0.0%
66		5	0.83	0.65	1	0.63	1	0.064	0.14	17.0%	5.7%
88		5	0.78	0.65	0.9	0.63	0.88	0.047	0.1	13.0%	11.0%

Mean Dry Weight-mg Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water	5	0.38	0.35	0.4	0.35	0.4	0.0083	0.019	4.9%	0.0%
28		5	0.35	0.26	0.44	0.29	0.47	0.033	0.074	21.0%	7.3%
37		5	0.36	0.28	0.43	0.3	0.43	0.026	0.059	17.0%	6.0%
50		5	0.43	0.37	0.49	0.35	0.47	0.022	0.049	11.0%	-13.0%
66		5	0.41	0.31	0.51	0.31	0.51	0.037	0.082	20.0%	-7.9%
88		5	0.42	0.31	0.52	0.33	0.51	0.037	0.083	20.0%	-11.0%

7d Survival Rate Detail						
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water	0.75	0.88	0.88	0.88	1
28		0.88	0.88	1	1	0.88
37		0.88	1	0.88	1	0.88
50		0.75	1	0.88	1	0.75
66		0.75	0.63	0.88	0.88	1
88		0.88	0.88	0.63	0.75	0.75

Mean Dry Weight-mg Detail						
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water	0.38	0.38	0.39	0.35	0.4
28		0.47	0.35	0.34	0.3	0.29
37		0.31	0.41	0.43	0.32	0.3
50		0.43	0.35	0.46	0.47	0.43
66		0.45	0.34	0.42	0.31	0.51
88		0.51	0.44	0.34	0.48	0.33

CETIS Measurement Report

Report Date: 31 Oct-14 14:29 (p 1 of 8)
Test Code: FH 14-287-0193 | 02-5921-4040

Fathead Minnow 7-d Larval Survival and Growth Test		Environmental Testing and Consulting, Inc.	
Batch ID: 09-4629-1912	Test Type: Growth-Survival (7d)	Analyst: Connie Cook	
Start Date: 14 Oct-14 16:50	Protocol: EPA/821/R-02-013 (2002)	Diluent:	
Ending Date: 21 Oct-14 13:48	Species: Pimephales promelas	Brine: Not Applicable	
Duration: 6d 21h	Source: Aquatic Biosystems, CO	Age: < 24	
Sample ID: 16-3441-7434	Code: 616B3B1A	Client: City of Marion Water Department	
Sample Date: 14 Oct-14 07:00	Material: POTW Effluent	Project: WET Biannual Compliance Test (2nd)	
Receive Date: 14 Oct-14 13:40	Source: MARION (AR0021971)		
Sample Age: 10h (0.9 °C)	Station:		

CETIS Measurement Report

Report Date: 31 Oct-14 14:29 (p 2 of 8)

Test Code: FH 14-287-0193 | 02-5921-4040

Fathead Minnow 7-d Larval Survival and Growth Test							Environmental Testing and Consulting, Inc.
Alkalinity (CaCO3)-mg/L							
C-%	Control Type	Reading Time	Measure	QA	Diff-%	Inst ID	Analyst Notes
0	Lab Water	1	62				
0	Lab Water	2	61				
0	Lab Water	3	60				
0	Lab Water	4	62				
0	Lab Water	5	59				
0	Lab Water	6	63				
0	Lab Water	7	61				
Total Residual Chlorine-mg/L							
C-%	Control Type	Reading Time	Measure	QA	Diff-%	Inst ID	Analyst Notes
0	Lab Water	1	0				
88			0				
0	Lab Water	2	0				
88			0				
0	Lab Water	3	0				
88			0				
0	Lab Water	4	0				
88			0				
0	Lab Water	5	0				
88			0				
0	Lab Water	6	0				
88			0				
0	Lab Water	7	0				
88			0				
Conductivity-µS/cm							
C-%	Control Type	Reading Time	Measure	QA	Diff-%	Inst ID	Analyst Notes
0	Lab Water	1	167				
88			415				
0	Lab Water	2	166				
88			410				
0	Lab Water	3	167				
88			406				
0	Lab Water	4	167				
88			440				
0	Lab Water	5	167				
88			437				
0	Lab Water	6	167				
88			439				
0	Lab Water	7	167				
88			425				

CETIS Measurement Report

Report Date: 31 Oct-14 14:29 (p 3 of 8)

Test Code: FH 14-287-0193 | 02-5921-4040

Fathead Minnow 7-d Larval Survival and Growth Test Environmental Testing and Consulting, Inc.

Final Dissolved Oxygen-mg/L								
C-%	Control Type	Reading Time	Measure	QA	Diff-%	Inst ID	Analyst	Notes
0	Lab Water	1	8					
28			8.3					
37			8.3					
50			8.2					
66			8.2					
88			8.2					
0	Lab Water	2	7.3					
28			8.1					
37			8.6					
50			8.6					
66			8.7					
88			8.7					
0	Lab Water	3	7.4					
28			7.8					
37			7.8					
50			7.7					
66			7.9					
88			7.9					
0	Lab Water	4	8.1					
28			7.8					
37			7.9					
50			7.9					
66			7.8					
88			7.4					
0	Lab Water	5	8					
28			8.3					
37			8.3					
50			8.2					
66			8.2					
88			8					
0	Lab Water	6	7.7					
28			7.6					
37			7.4					
50			7.1					
66			6.9					
88			7.6					
0	Lab Water	7	7.6					
28			7.5					
37			7.3					
50			7.3					
66			7.5					
88			7.4					

CETIS Measurement Report

Report Date: 31 Oct-14 14:29 (p 4 of 8)
 Test Code: FH 14-287-0193 | 02-5921-4040

Fathead Minnow 7-d Larval Survival and Growth Test							Environmental Testing and Consulting, Inc.
Initial Dissolved Oxygen-mg/L							
C-%	Control Type	Reading Time	Measure	QA	Diff-%	Inst ID	Analyst Notes
0	Lab Water	1	8.6				
28			8.8				
37			8.9				
50			8.9				
66			9				
88			7.5				
0			Lab Water	2	8.8		
28	8.8						
37	8.9						
50	8.9						
66	9						
88	7.4						
0	Lab Water	3			8.7		
28			9				
37			9				
50			9.1				
66			9.4				
88			7.4				
0			Lab Water	4	8.2		
28	8.9						
37	9						
50	9						
66	9.4						
88	7.7						
0	Lab Water	5			8.1		
28			8.7				
37			9				
50			9.1				
66			9.2				
88			7.7				
0			Lab Water	6	8.6		
28	8.9						
37	9						
50	9						
66	9.4						
88	7.6						
0	Lab Water	7			8.7		
28			8.8				
37			8.8				
50			8.7				
66			8.7				
88			7.3				
Hardness (CaCO3)-mg/L							
C-%	Control Type	Reading Time	Measure	QA	Diff-%	Inst ID	Analyst Notes
0	Lab Water	1	92				
0	Lab Water	2	90				
0	Lab Water	3	89				
0	Lab Water	4	92				
0	Lab Water	5	90				
0	Lab Water	6	93				
0	Lab Water	7	91				

CETIS Measurement Report

Report Date: 31 Oct-14 14:29 (p 5 of 8)

Test Code: FH 14-287-0193 | 02-5921-4040

Fathead Minnow 7-d Larval Survival and Growth Test				Environmental Testing and Consulting, Inc.			
Final pH-Units							
C-%	Control Type	Reading Time	Measure	QA	Diff-%	Inst ID	Analyst Notes
0	Lab Water	1	7.8				
28			7.6				
37			7.6				
50			7.6				
66			7.6				
88			7.6				
0			Lab Water	2	7.8		
28	7.6						
37	7.7						
50	7.7						
66	7.7						
88	7.7						
0	Lab Water	3			7.3		
28			7.4				
37			7.4				
50			7.4				
66			7.4				
88			7.5				
0			Lab Water	4	7.5		
28	7.6						
37	7.6						
50	7.6						
66	7.6						
88	7.5						
0	Lab Water	5			8		
28			7.8				
37			7.8				
50			7.8				
66			7.7				
88			7.8				
0			Lab Water	6	7.5		
28	7.5						
37	7.5						
50	7.5						
66	7.6						
88	7.4						
0	Lab Water	7			7.5		
28			7.5				
37			7.5				
50			7.4				
66			7.4				
88			7.3				

CETIS Measurement Report

Report Date: 31 Oct-14 14:29 (p 6 of 8)
 Test Code: FH 14-287-0193 | 02-5921-4040

Fathead Minnow 7-d Larval Survival and Growth Test				Environmental Testing and Consulting, Inc.			
Initial pH-Units							
C-%	Control Type	Reading Time	Measure	QA	Diff-%	Inst ID	Analyst Notes
0	Lab Water	1	7.7				
28			7.5				
37			7.5				
50			7.5				
66			7.5				
88			9				
0			Lab Water	2	7.6		
28	7.5						
37	7.5						
50	7.4						
66	7.4						
88	9						
0	Lab Water	3			7.8		
28			7.6				
37			7.6				
50			7.5				
66			7.5				
88			9.4				
0			Lab Water	4	8.1		
28	7.9						
37	7.8						
50	7.8						
66	7.7						
88	9.4						
0	Lab Water	5			8.1		
28			7.7				
37			7.7				
50			7.6				
66			7.6				
88			9.2				
0			Lab Water	6	8.2		
28	7.8						
37	7.7						
50	7.7						
66	7.7						
88	9.4						
0	Lab Water	7			7.6		
28			7.5				
37			7.4				
50			7.4				
66			7.4				
88			8.7				

CETIS Measurement Report

Report Date: 31 Oct-14 14:29 (p 7 of 8)

Test Code: FH 14-287-0193 | 02-5921-4040

Fathead Minnow 7-d Larval Survival and Growth Test				Environmental Testing and Consulting, Inc.			
Final Temperature-°C							
C-%	Control Type	Reading Time	Measure	QA	Diff-%	Inst ID	Analyst Notes
0	Lab Water	1	23				
28			23				
37			23				
50			23				
66			23				
88			23				
0			Lab Water	2	23		
28	23						
37	23						
50	23						
66	23						
88	23						
0	Lab Water	3			23		
28			23				
37			23				
50			23				
66			23				
88			23				
0			Lab Water	4	23		
28	23						
37	23						
50	23						
66	23						
88	23						
0	Lab Water	5			23		
28			23				
37			23				
50			23				
66			23				
88			23				
0			Lab Water	6	23		
28	23						
37	23						
50	23						
66	23						
88	23						
0	Lab Water	7			23		
28			23				
37			23				
50			23				
66			23				
88			23				

CETIS Measurement Report

Report Date: 31 Oct-14 14:29 (p 8 of 8)
 Test Code: FH 14-287-0193 | 02-5921-4040

Fathead Minnow 7-d Larval Survival and Growth Test				Environmental Testing and Consulting, Inc.			
Initial Temperature-°C							
C-%	Control Type	Reading Time	Measure	QA	Diff-%	Inst ID	Analyst Notes
0	Lab Water	1	23				
28			23				
37			23				
50			23				
66			23				
88			23				
0	Lab Water	2	23				
28			23				
37			23				
50			23				
66			23				
88			23				
0	Lab Water	3	23				
28			23				
37			23				
50			23				
66			23				
88			23				
0	Lab Water	4	23				
28			23				
37			23				
50			23				
66			23				
88			23				
0	Lab Water	5	23				
28			23				
37			23				
50			23				
66			23				
88			23				
0	Lab Water	6	23				
28			23				
37			23				
50			23				
66			23				
88			23				
0	Lab Water	7	23				
28			23				
37			23				
50			23				
66			23				
88			23				

Environmental Testing and Consulting, Inc.
2790 Whitten Road
Memphis, TN 38133

Additional Toxicity Test Information

1. Methods/Instrumentation used in chemical analysis:
 - Dissolved oxygen: 4500-O G YSI MODEL - 58
 - pH: 4500-H + B JENCO METER 6072
 - Temperature: 2550 B JENCO METER 6072
 - Conductivity: 2510 B CORNING METER 441
 - Alkalinity: 2320 B
 - Hardness: 200.7
 - Total Residual Chlorine: 4500-Cl G - REPORTED VALUE OF "0" INDICATES RESULT BELOW DETECTION LIMIT OF 0.02 mg/L
 - EPA Acute/Chronic Manual Edition and Date: EPA-821-R-02-012
 - OCT 2002 (Fifth edition)
2. Laboratory
 - Temperature: Average - 25 C Range - 23 - 26
 - Light Cycle: 16 hours light/ 8 hours dark
 - Light intensity: 100 foot-candles, average
 - Control Water: Dilute mineral water made with 20 % Perrier in Nanopure
 - Dilution Water: Laboratory control water
 - Pretreatment: none
3. Method 1002.0
 - Test chambers: 30 mL disposable plastic beakers
 - Volume per chamber: 15 mL
 - Number of organisms per chamber: 1
 - Number of replicates: 10
 - Food: Laboratory culture of Selenastrum algae and YCT solution
4. Method 1000.0
 - Test chambers: 20 oz. Disposable plastic cups
 - Volume per chamber: 200 mL
 - Average number of organisms per chamber: 10
 - Number of replicates per concentration: 4
 - Food: Artemia brine shrimp hatched in laboratory
 - Acclimation of organisms: Organisms are allowed to reach test temperature. Dilution water is added at half-hour intervals until organisms are contained in a culture media that consists of 80% dilution water.
5. Indicate below any other relevant information that may aid in the evaluation of this report. Include any deviations from EPA methodology that were necessary for these tests as well as any sample manipulations which were performed, such as aeration, dechlorination with sodium thiosulfate, etc. and the justification for such manipulations or deviations. Attach additional pages as needed.
 - None



ENVIRONMENTAL TESTING & CONSULTING, INC.

www.etcmemphis.com

2790 Whitten Road

Memphis, Tennessee 38133

(901) 213-2400

Fax (901) 213-2440

"A Laboratory Management Partner"

02608

City of Marion Water Department

Mr. Jim Shempert

PO Box 814

Marion, AR 72364

Project Bioassay
Information :

Report Date : 10/31/2014

Report Number : 14-287-0193

REPORT OF ANALYSIS

Received : 10/14/2014

Lab No : 89604

Sample ID : Bio

Matrix: Aqueous

Sampled: 10/14/2014 7:00

Test	Results	Units	MQL	DF	Date / Time Analyzed	By	Analytical Method
Alkalinity (as CaCO3)	122	mg/L	1	1	10/21/14 10:00	CJR	2320B-2011
Total Calcium	15.5	mg/L	0.100	1	10/22/14 11:07	BKN	EPA-200.7
Hardness as CaCO3(SM-2340B)	57.6	mg/L	0.100	1	10/22/14 11:07		EPA-200.7
Total Magnesium	4.58	mg/L	0.100	1	10/22/14 11:07	BKN	EPA-200.7

Lab No : 89815

Sample ID : Bio

Matrix: Aqueous

Sampled: 10/15/2014 7:30

Test	Results	Units	MQL	DF	Date / Time Analyzed	By	Analytical Method
Alkalinity (as CaCO3)	142	mg/L	1	1	10/21/14 10:00	CJR	2320B-2011
Total Calcium	12.8	mg/L	0.100	1	10/22/14 11:20	BKN	EPA-200.7
Hardness as CaCO3(SM-2340B)	46.4	mg/L	0.100	1	10/22/14 11:20		EPA-200.7
Total Magnesium	3.50	mg/L	0.100	1	10/22/14 11:20	BKN	EPA-200.7

Lab No : 90368

Sample ID : Bio

Matrix: Aqueous

Sampled: 10/17/2014 8:15

Test	Results	Units	MQL	DF	Date / Time Analyzed	By	Analytical Method
Alkalinity (as CaCO3)	137	mg/L	1	1	10/21/14 10:00	CJR	2320B-2011
Total Calcium	12.4	mg/L	0.100	1	10/22/14 11:24	BKN	EPA-200.7
Hardness as CaCO3(SM-2340B)	44.8	mg/L	0.100	1	10/22/14 11:24		EPA-200.7
Total Magnesium	3.37	mg/L	0.100	1	10/22/14 11:24	BKN	EPA-200.7

**Qualifiers/
Definitions**

* Outside QC limit
MQL Method Quantitation Limit

DF Dilution Factor



ENVIRONMENTAL TESTING & CONSULTING, INC.

2790 Whitten Road, Memphis, Tennessee 38133 (901) 213-2400 Fax (901) 213-2440

CHAIN OF CUSTODY



14-287-0193
02608
10-14-2014
1424 11

City of Marion Water Department
Bioassay

Company Name City of Marion Water Department		Customer Number 02608		Telephone (870) 732-5418		RUSH	ICE
Site Name Semi-annual bio			Project Comment			FID Number	
Project Marion - Bioassay		Project Number		PO Number			
Project Manager / Contact Mr. Jim Shempert				E-mail waterdept@marionarkansas.org			
Sample ID	Container Type	Collected Date / Time	# Cont	Preservative	Grab / Comp	Matrix	Analyses
C3-Outfall 001	Plastic - Pint	10/14/14 7:00am	1	HNO3 - Nitric Acid	C	Aqueous	hardness
C3-Outfall 001	Plastic - Pint	10/14/14 7:00am	1	NONE	C	Aqueous	alkalinity
C3-Outfall 001	Plastic - Gallon	10/14/14 7:00am	3	NONE	C	Aqueous	Chronic CD/FH

Sampled By AP	Method of Shipment	Blank / Cooler Temperature 2.9 C	Remarks Test 4
Relinquished By (sign) <i>[Signature]</i>	Date / Time	Received By (sign) <i>[Signature]</i>	Date / Time 10/14/14 11:10
Relinquished By (sign)	Date / Time	Received By (sign)	Date / Time
Relinquished By (sign) <i>[Signature]</i>	Date / Time 10/14/14 13:48	Received by Lab (sign) <i>[Signature]</i>	Date / Time 10/14/14 13:48



www.etc-usa.com

ENVIRONMENTAL TESTING & CONSULTING, INC.

2790 Whitten Road Memphis, Tennessee 38133 (901) 213-2400 Fax (901) 213-2440

②

14-287-0193
 02608
 10-14-2014
 14:24:14

City of Marion Water Department
 Bioassay

Company Name City of Marion Water Department				Customer Number 02608	Telephone (870) 739-5413	RUSH	ICE
Site Name Semi-annual bio			Project Comment			FID Number	
Project Marion - Bioassay		Project Number		PO Number			
Project Manager / Contact Mr. Jim Shempert				E-mail waterdept@marionarkansas.org			
Sample ID	Container Type	Collected Date / Time	# Cont	Preservative	Grab / Comp	Matrix	Analyses
C2-Outfall 001	Plastic - Pint	10/15/14 7:30A	1	HNO3 - Nitric Acid	C	Aqueous	hardness
C2-Outfall 001	Plastic - Pint	10/15/14 7:30A	1	NONE	C	Aqueous	alkalinity
C2-Outfall 001	Plastic - Gallon	10/15/14 7:30A	2	NONE	C	Aqueous	chronic-QD/FH

Sampled By <i>AP</i>	Method of Shipment	Blank <u>Cooler</u> Temperature <u>8.6°C</u>	Remarks <u>T#5</u>
Relinquished By (sign) <i>Chen P...</i>	Date / Time	Received By (sign) <i>...</i>	Date / Time <u>10/15/14</u>
Relinquished By (sign)	Date / Time	Received By (sign)	Date / Time
Relinquished By (sign) <i>Munga Gile</i>	Date / Time <u>10/15/14</u>	Received by Lab (sign) <i>Munga Gile</i>	Date / Time <u>10/15/14 13:00</u>

1/1

3

CHAIN OF CUSTODY



City of Marion Water Department
Bioassay

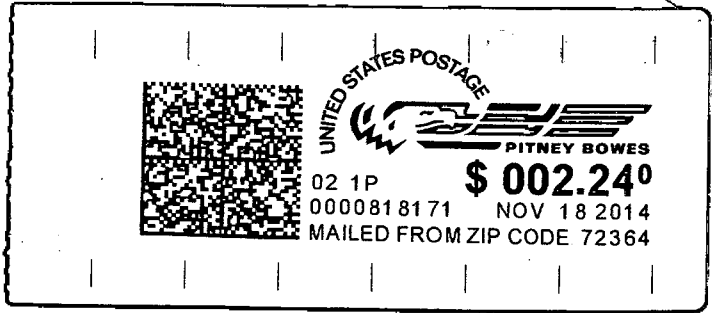
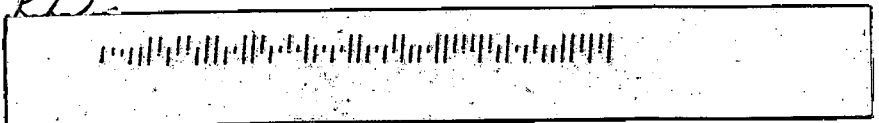
14-287-0193
02608
10-14-2014
14:24:11

Company Name City of Marion Water Department		Customer Number 02608		Telephone (870) 739-5413		RUSH	ICE
Site Name Semi-annual bio			Project Comment			FID Number	
Project Marion - Bioassay		Project Number		PO Number			
Project Manager / Contact Mr. Jim Shempert				E-mail waterdept@marionarkansas.org			
Sample ID	Container Type	Collected Date / Time	# Cont	Preservative	Grab / Comp	Matrix	Analyses
C1 - Outfall 001	Plastic - Pint	10/17/14 8:15 AM	1	HNO3 - Nitric Acid	C	Aqueous	hardness
C1 - Outfall 001	Plastic - Pint	10/17/14 8:15 AM	1	NONE	C	Aqueous	Alkalinity
C1 - Outfall 001	Plastic - Gallon	10/17/14 8:15 AM	2	NONE	C	Aqueous	chronic CD/HH

Sampled By <i>J.P.</i>	Method of Shipment	Blank / Cooler Temperature 14 10°C	Remarks
Relinquished By (sign) <i>Jim Shempert</i>	Date / Time	Received By (sign) <i>[Signature]</i>	Date / Time 1100 10-17-14
Relinquished By (sign)	Date / Time	Received By (sign)	Date / Time
Relinquished By (sign) <i>[Signature]</i>	Date / Time 1235 10/17/14	Received by Lab (sign) <i>[Signature]</i>	Date / Time 1235 10-17-14

31 MILITARY RD.
MARION, AR

72364



ADEQ
5301 NORTHSORE PRIVE
NORTH LITTLE ROCK, AR.
72118-5317