

December 16, 2014

Test Results of  
Fourth Quarter  
Acute 48 hour Renewal  
Biomonitoring Testing  
for  
Outfall 001  
West Helena Water Utilities

Control No. 185534-1

Prepared for:

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McClelland Consulting Engineers, Inc.  
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Prepared by:

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McClelland Consulting Engineers, Inc.  
ATTN: Mr. Matt Bienvenu  
Post Office Box 34087  
Little Rock, AR 72203-4087

Re: Acute 48 hour Renewal Biomonitoring utilizing *Pimephales promelas* (Fathead Minnow) and *Daphnia pulex*  
Outfall 001 - West Helena Water Utilities  
Client NPDES Permit No. NPDES AR0022021 AFIN 54-00086

Dear Mr. Matt Bienvenu:

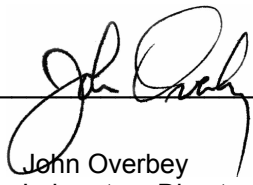
This report is the analytical results and supporting information for the samples submitted to American Interplex Corporation (AIC). The following results are applicable only to the sample identified by the control number referenced above. Accurate assessment of the data requires access to the entire document. Each section of the report has been reviewed and approved by the appropriate laboratory director or qualified designee.

Testing procedures and Quality Assurance were in accordance with "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms" EPA-821-R-02-012, Fifth Edition, October 2002. Test results are summarized below:

Acute *Pimephales promelas* (Fathead Minnow) Survival Test: The No Observable Effects Concentration (NOEC) for survival was 1.3% effluent, and the LC-50 value was >1.3% effluent; the sample, therefore, **PASSED** at low flow of 1.0% effluent for lethal effects.

Acute *Daphnia pulex* Survival Test: The No Observable Effects Concentration (NOEC) for survival was 1.3% effluent, and the LC-50 value was >1.3% effluent; the sample, therefore, **PASSED** at low flow of 1.0% effluent for lethal effects.

**AMERICAN INTERPLEX CORPORATION**

  
\_\_\_\_\_  
John Overbey  
Laboratory Director

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I. Introduction and Summary

Biomonitoring testing of 48-hour renewal definitive toxicity tests using *Daphnia pulex* and *Pimephales promelas* were performed.

The *Daphnia pulex* test was conducted from December 9, 2014 at 1800 to December 11, 2014 at 1600.

The *Pimephales promelas* test was conducted from December 9, 2014 at 1750 to December 11, 2014 at 1600.

The tests were performed in accordance with EPA-821-R-02-012. Statistical analyses were performed on the observed data.

The tests were conducted in temperature and light cycle controlled environmental chamber. The test temperature was 25 degrees C +/- 1 degree for the *Daphnia pulex* and 25 degrees C +/- 1 degree for the *Pimephales promelas*.

II. Control Acceptance Criteria

ORGANISM	CRITERIA	RESULTS	PASS/FAIL
<i>Daphnia pulex</i>	Control Survival >= 90%	100	PASS
<i>Pimephales promelas</i>	Control Survival >= 90%	100	PASS

III. Outlined Report

A. Introduction

1. Permit Number: NPDES AR0022021 AFIN 54-00086
2. Test Requirements: 48-hour renewal definitive toxicity test using:  
*Daphnia pulex*  
*Pimephales promelas*

B. Source of Effluent/Dilution Water

1. Effluent Samples:
  - a. Sampling Point: Outfall 001  
December 9
  - b. Chemical Data:

Analysis	Sample 1	Sample 2
Dissolved oxygen (mg/l)	7.8	8.0
pH (standard units)	8.2	8.1
Alkalinity (mg/l as CaCO <sub>3</sub> )	300	290
Hardness (mg/l as CaCO <sub>3</sub> )	93	89
Conductivity (umhos/cm)	830	830
Residual Chlorine (mg/l)	0.19	0.21

2. Dilution Water Samples: Synthetic Moderately Hard Water #4162  
 a. Dates Collected/Prepared: December 2 through December 14, 2014  
 b. Chemical Data:

Analysis	Sample 1	Sample 2
Dissolved oxygen (mg/l)	8.4	8.9
pH (standard units)	7.7	7.5
Alkalinity (mg/l as CaCO <sub>3</sub> )	58	58
Hardness (mg/l as CaCO <sub>3</sub> )	86	88
Conductivity (umhos/cm)	310	260
Residual Chlorine (mg/l)	<0.05	<0.05

C. Test Methods

1. Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, (Fifth Ed.), EPA-821-R-02-012, 48-hour acute definitive test.  
 a. Endpoints:  
 Death; the criteria employed to establish death are:  
 i. No movement  
 ii. No reaction to gentle prodding

Criteria	<i>Pimephales promelas</i>	<i>Daphnia pulex</i>
Type and Volume of Test Chamber	500 ml disposable beaker	30 ml disposable beaker
Volume of Sample	250 ml	25 ml
Organisms per chamber	8	8
Replicates per dilution	5	5
Test Temperature	25 deg. C	25 deg. C
Test Initiated	December 9, 2014 at 1750	December 9, 2014 at 1800
Test Terminated	December 11, 2014 at 1600	December 11, 2014 at 1600
Feeding	None required	None required
Age of Test Organisms	2 days	<24 hours

2. Chemical Methods Employed:

Analysis	Method
Dissolved oxygen (mg/l)	SM 4500-O C
pH (standard units)	SM 4500-H+ B
Alkalinity (mg/l as CaCO <sub>3</sub> )	SM 2320 B
Hardness (mg/l as CaCO <sub>3</sub> )	EPA 200.7
Conductivity (umhos/cm)	EPA 120.1
Residual Chlorine (mg/l)	SM 4500-CL- F
Temperature (deg.C)	EPA 170.1

D. Test Organisms

1. Scientific Name

*Daphnia pulex*

*Pimephales promelas*

2. Acclimation of test organisms:

*Daphnia pulex*

Organisms were obtained from in-house cultures. The organisms were raised in moderately hard reconstituted water.

*Pimephales promelas*

Organisms were obtained from in-house cultures. The organisms were raised in moderately hard reconstituted water.

E. Quality Assurance

1. Toxicity Tests

a. Reference Toxicant: Sodium Chloride

b. Date of test:

*Daphnia pulex*: November 18, 2014 at 1515 to November 20, 2014 at 1355

*Pimephales promelas*: November 18, 2014 at 1600 to November 20, 2014 at 1600

c. Synthetic moderately hard dilution water used

Organism	LC50	Warning Limits
<i>Daphnia pulex</i>	1.72 g/l	1.39-2.32 g/l
<i>Pimephales promelas</i>	7.16 g/l	5.32-8.80 g/l

2. Chemical and Physical Analyses

Analysis	% Recovery	Relative % Difference
Alkalinity	NA	0.00
Hardness	101	1.50
pH	101	0.268
Conductivity	104	2.65

F. Organism History

*Daphnia pulex*

Date: December 9, 2014 at 1800

Age: <24 hours

Source: In-house culture

Water Chemistry Record:

Alkalinity: 57-64 mg/l

Hardness: 80-100 mg/l

Temperature: 25 deg.C

*Pimephales promelas* (Fathead minnow)

Date: December 9, 2014 at 1750

Age: 2 days

Source: In-house culture

Water Chemistry Record:

Alkalinity: 57-64 mg/l

Hardness: 80-100 mg/l

Temperature: 25 deg.C

IV. Results Summary

*Daphnia pulex* and *Pimephales promelas* are exposed in a static renewal system to different concentrations of effluent and dilution water. Effluent dilutions for this test were 0.4%, 0.6%, 0.8%, 1.0%, 1.3%. The low-flow concentration was 1.0%. Test results were based on survival.

*Daphnia pulex*

The *Daphnia pulex* test was conducted from December 9, 2014 at 1800 to December 11, 2014 at 1600.

Statistical analyses:

NOEC = 1.3%

LC50 = >1.3%

Concentration	24 hour % Survival	48 hour % Survival
Control	100	100
0.4%	100	100
0.6%	100	100
0.8%	100	100
1.0%	100	100
1.3%	100	97.5

*Pimephales promelas*

The *Pimephales promelas* test was conducted from December 9, 2014 at 1750 to December 11, 2014 at 1600.

Statistical analyses:

NOEC = 1.3%

LC50 = >1.3%

Concentration	24 hour % Survival	48 hour % Survival
Control	100	100
0.4%	100	100
0.6%	100	100
0.8%	95.0	95.0
1.0%	100	100
1.3%	100	95.0

Appendix: A1

*Daphnia pulex*  
Survival Data

Number of organisms per chamber: 8  
Volume of test chamber: 30 ml

Age of organisms: <24 hours  
Volume of test solution: 25 ml

Effluent Concentration		Number of Survivors		% Survival	CV %
		24 Hours	48 Hours		
Control	rep. A	8	8	100	0.00
	rep. B	8	8		
	rep. C	8	8		
	rep. D	8	8		
	rep. E	8	8		
0.4%	rep. A	8	8	100	0.00
	rep. B	8	8		
	rep. C	8	8		
	rep. D	8	8		
	rep. E	8	8		
0.6%	rep. A	8	8	100	0.00
	rep. B	8	8		
	rep. C	8	8		
	rep. D	8	8		
	rep. E	8	8		
0.8%	rep. A	8	8	100	0.00
	rep. B	8	8		
	rep. C	8	8		
	rep. D	8	8		
	rep. E	8	8		
1.0%	rep. A	8	8	100	0.00
	rep. B	8	8		
	rep. C	8	8		
	rep. D	8	8		
	rep. E	8	8		
1.3%	rep. A	8	8	97.5	5.73
	rep. B	8	8		
	rep. C	8	8		
	rep. D	8	7		
	rep. E	8	8		

CV = Coefficient of variance = standard deviation X 100/mean



Appendix: A1

*Pimephales promelas*  
Survival Data

Number of organisms per chamber: 8  
Volume of test chamber: 500 ml

Age of organisms: 2 days  
Volume of test solution: 250 ml

Effluent Concentration		Number of Survivors		% Survival	CV %
		24 Hours	48 Hours		
Control	rep. A	8	8	100	0.00
	rep. B	8	8		
	rep. C	8	8		
	rep. D	8	8		
	rep. E	8	8		
0.4%	rep. A	8	8	100	0.00
	rep. B	8	8		
	rep. C	8	8		
	rep. D	8	8		
	rep. E	8	8		
0.6%	rep. A	8	8	100	0.00
	rep. B	8	8		
	rep. C	8	8		
	rep. D	8	8		
	rep. E	8	8		
0.8%	rep. A	8	8	95.0	7.21
	rep. B	8	8		
	rep. C	7	7		
	rep. D	8	8		
	rep. E	7	7		
1.0%	rep. A	8	8	100	0.00
	rep. B	8	8		
	rep. C	8	8		
	rep. D	8	8		
	rep. E	8	8		
1.3%	rep. A	8	7	95.0	7.21
	rep. B	8	7		
	rep. C	8	8		
	rep. D	8	8		
	rep. E	8	8		

CV = Coefficient of variance = standard deviation X 100/mean

Appendix A2: Statistics

*Daphnia pulex*

Transformation of Data			Transform: Arc Sin(Square Root(Y))	
Group	Identification	Rep	Value	Transformed
1	Control	1	1.00000	1.39310
1	Control	2	1.00000	1.39310
1	Control	3	1.00000	1.39310
1	Control	4	1.00000	1.39310
1	Control	5	1.00000	1.39310
2	0.4%	1	1.00000	1.39310
2	0.4%	2	1.00000	1.39310
2	0.4%	3	1.00000	1.39310
2	0.4%	4	1.00000	1.39310
2	0.4%	5	1.00000	1.39310
3	0.6%	1	1.00000	1.39310
3	0.6%	2	1.00000	1.39310
3	0.6%	3	1.00000	1.39310
3	0.6%	4	1.00000	1.39310
3	0.6%	5	1.00000	1.39310
4	0.8%	1	1.00000	1.39310
4	0.8%	2	1.00000	1.39310
4	0.8%	3	1.00000	1.39310
4	0.8%	4	1.00000	1.39310
4	0.8%	5	1.00000	1.39310
5	1%	1	1.00000	1.39310
5	1%	2	1.00000	1.39310
5	1%	3	1.00000	1.39310
5	1%	4	1.00000	1.39310
5	1%	5	1.00000	1.39310
6	1.3%	1	1.00000	1.39310
6	1.3%	2	1.00000	1.39310
6	1.3%	3	1.00000	1.39310
6	1.3%	4	0.87500	1.20940
6	1.3%	5	1.00000	1.39310

Appendix A2: Statistics

*Daphnia pulex*

Shapiro - Wilk's Test for Normality		Transform: Arc Sin(Square Root(Y))
<p>D = 0.027 W = 0.4161 Critical W = 0.9 (alpha = 0.01, N = 30) Critical W = 0.927 (alpha = 0.05, N = 30)</p> <p>Data FAIL normality test (alpha = 0.01).</p>		

Steel's Many-One Rank Test				Transform: Arc Sin(Square Root(Y))	
Ho:Control<Treatment					
Group	Identification	Rank Sum	Critical Value	DF	Sig 0.05
1	Control				
2	0.4%	27.50	16.00	5.00	
3	0.6%	27.50	16.00	5.00	
4	0.8%	27.50	16.00	5.00	
5	1%	27.50	16.00	5.00	
6	1.3%	25.00	16.00	5.00	
Critical values are 1 tailed (k=5)					

Appendix A2: Statistics

*Pimephales promelas*

Transformation of Data				Transform: Arc Sin(Square Root(Y))	
Group	Identification	Rep	Value	Transformed	
1	Control	1	1.00000	1.39310	
1	Control	2	1.00000	1.39310	
1	Control	3	1.00000	1.39310	
1	Control	4	1.00000	1.39310	
1	Control	5	1.00000	1.39310	
2	0.4%	1	1.00000	1.39310	
2	0.4%	2	1.00000	1.39310	
2	0.4%	3	1.00000	1.39310	
2	0.4%	4	1.00000	1.39310	
2	0.4%	5	1.00000	1.39310	
3	0.6%	1	1.00000	1.39310	
3	0.6%	2	1.00000	1.39310	
3	0.6%	3	1.00000	1.39310	
3	0.6%	4	1.00000	1.39310	
3	0.6%	5	1.00000	1.39310	
4	0.8%	1	1.00000	1.39310	
4	0.8%	2	1.00000	1.39310	
4	0.8%	3	0.87500	1.20940	
4	0.8%	4	1.00000	1.39310	
4	0.8%	5	0.87500	1.20940	
5	1%	1	1.00000	1.39310	
5	1%	2	1.00000	1.39310	
5	1%	3	1.00000	1.39310	
5	1%	4	1.00000	1.39310	
5	1%	5	1.00000	1.39310	
6	1.3%	1	0.87500	1.20940	
6	1.3%	2	0.87500	1.20940	
6	1.3%	3	1.00000	1.39310	
6	1.3%	4	1.00000	1.39310	
6	1.3%	5	1.00000	1.39310	

Appendix A2: Statistics

*Pimephales promelas*

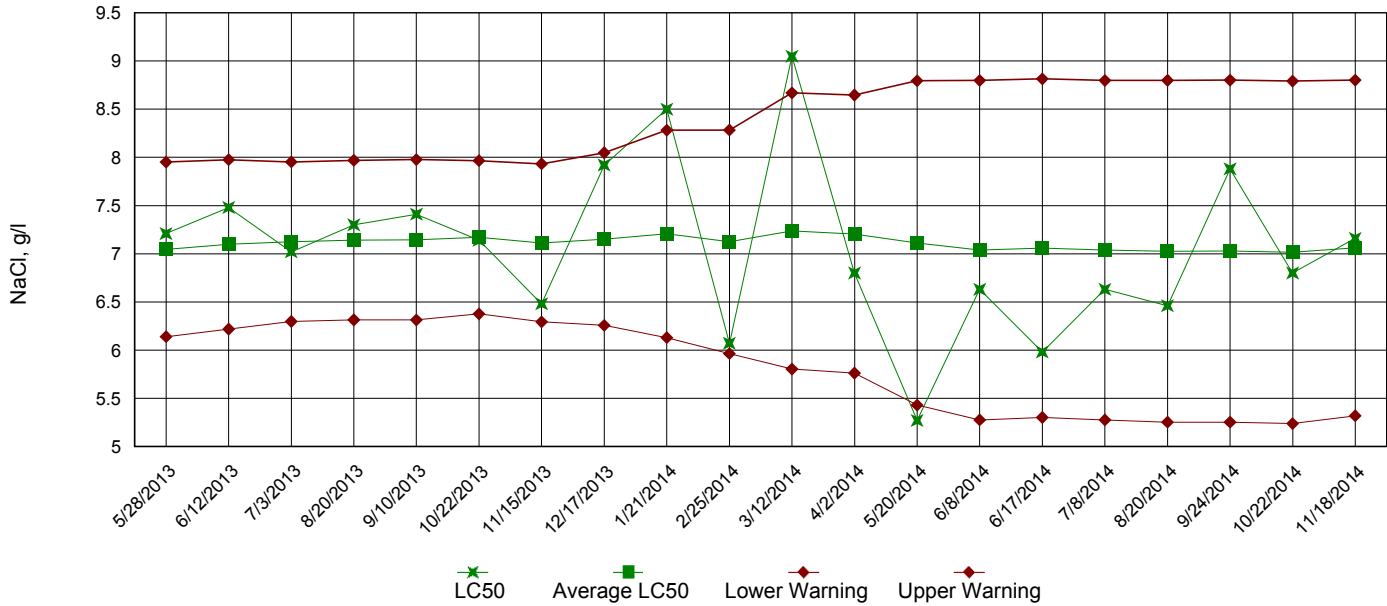
Shapiro - Wilk's Test for Normality		Transform: Arc Sin(Square Root(Y))
<p>D = 0.08099  W = 0.7296  Critical W = 0.9 (alpha = 0.01, N = 30)  Critical W = 0.927 (alpha = 0.05, N = 30)</p> <p>Data FAIL normality test (alpha = 0.01).</p>		

Steel's Many-One Rank Test				Transform: Arc Sin(Square Root(Y))	
Ho:Control<Treatment					
Group	Identification	Rank Sum	Critical Value	DF	Sig 0.05
1	Control				
2	0.4%	27.50	16.00	5.00	
3	0.6%	27.50	16.00	5.00	
4	0.8%	22.50	16.00	5.00	
5	1%	27.50	16.00	5.00	
6	1.3%	22.50	16.00	5.00	
Critical values are 1 tailed (k=5)					

Appendix: A3

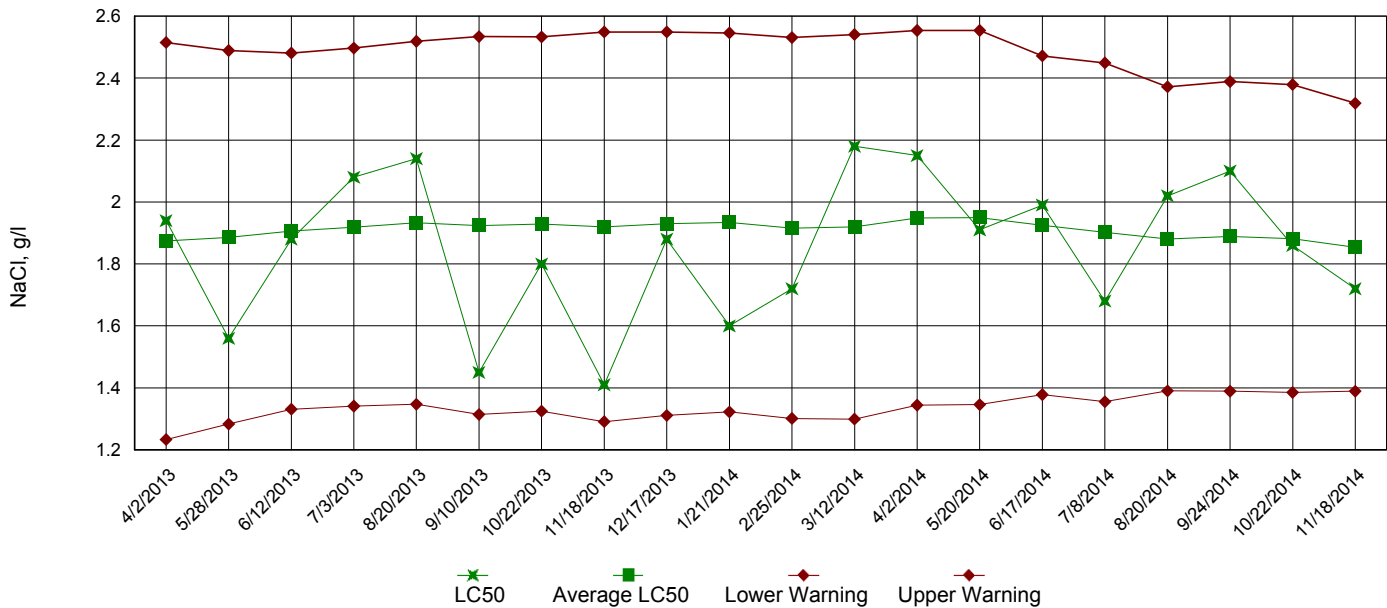
Acute Reference Toxicant, *Pimephales promelas* (Fathead Minnow)

LC50 Survival Data



Acute Reference Toxicant, *Daphnia pulex*

LC50 Survival Data



Appendix: A4

Chemical Data for  
*Pimephales promelas*  
and  
*Daphnia pulex*

Day 1		Control	0.4%	0.6%	0.8%	1.0%	1.3%
DO, mg/l	Initial	8.4	8.4	8.3	8.4	8.2	8.3
DO, mg/l	Final 1*	8.0	7.7	7.8	7.8	8.0	7.8
DO, mg/l	Final 2*	7.6	7.4	7.3	7.3	7.2	7.1
pH, su	Initial	7.7	7.7	7.8	7.8	7.8	7.8
pH, su	Final 1*	7.7	7.8	7.7	7.8	7.8	7.8
pH, su	Final 2*	7.6	7.6	7.7	7.8	7.8	7.8
Alkalinity, mg/l		58	NA	NA	NA	63	NA
Hardness, mg/l		86	NA	NA	NA	84	NA
Conductivity, umho/cm		310	310	310	310	310	320
Residual Chlorine, mg/l		<0.05	NA	NA	NA	<0.05	NA

Day 2		Control	0.4%	0.6%	0.8%	1.0%	1.3%
DO, mg/l	Initial	8.9	8.8	8.8	8.8	8.8	8.7
DO, mg/l	Final 1*	7.7	7.6	7.6	7.7	7.6	7.6
DO, mg/l	Final 2*	8.5	8.4	8.4	8.4	8.5	8.5
pH, su	Initial	7.5	7.5	7.5	7.5	7.6	7.6
pH, su	Final 1*	7.6	7.7	7.7	7.7	7.7	7.7
pH, su	Final 2*	7.4	7.5	7.4	7.5	7.5	7.5
Alkalinity, mg/l		58	NA	NA	NA	62	NA
Hardness, mg/l		88	NA	NA	NA	90	NA
Conductivity, umho/cm		260	260	270	270	270	270
Residual Chlorine, mg/l		<0.05	NA	NA	NA	<0.05	NA

\*1 data from *Pimephales promelas*

\*2 data from *Daphnia pulex*

Appendix: B

*Daphnia pulex* Survival Data

Permittee:	McClelland Consulting Engineers, Inc.	Critical Dilution:	1.0%
NPDES No:	NPDES AR0022021 AFIN 54-00086	Sample Source:	Outfall 001
Contact:	Mr. Matt Bienvenu	Species Age:	<24 hours
Test Type:	48-hour renewal definitive toxicity test	Analysts:	280, 304, 310
Dilution Water:	Synthetic Moderately Hard Water #4162		
Test Initiated:	December 9, 2014 at 1800		
Test Terminated:	December 11, 2014 at 1600		

PERCENT SURVIVAL

24 hours	Control	0.4%	0.6%	0.8%	1.0%	1.3%
Rep. A	100	100	100	100	100	100
Rep. B	100	100	100	100	100	100
Rep. C	100	100	100	100	100	100
Rep. D	100	100	100	100	100	100
Rep. E	100	100	100	100	100	100

48 hours	Control	0.4%	0.6%	0.8%	1.0%	1.3%
Rep. A	100	100	100	100	100	100
Rep. B	100	100	100	100	100	100
Rep. C	100	100	100	100	100	100
Rep. D	100	100	100	100	100	87.5
Rep. E	100	100	100	100	100	100

Dunnett's Procedure or Steel's Many-One Rank Test as appropriate. Is the mean survival at 48 hours significantly different (p=0.05) than the control survival for the % effluent corresponding to:

a) Low Flow 1.0%:	_____	Yes	_____ X	No
b) 1/2 Low Flow (NA):	_____	Yes	_____	No

Pass/Fail #TEM3D: 0

NOEL *Daphnia pulex* lethality #TOM3D: 1.3%

Coefficient of variation for *Daphnia pulex* survival #TQM3D: 0

Enter percent effluent corresponding to LC-50 below.

LC-50 effluent: >1.3%  
Method of LC-50 calculation: NA

Reference Toxicity Test Performed on November 18, 2014 at 1515 to November 20, 2014 at 1355:

LC-50 effluent: 1.72 g/l  
Warning Limits: 1.39 to 2.32 g/l



Appendix: B

*Daphnia pulex* Chemical Parameters Chart

Permittee:	McClelland Consulting Engineers, Inc.	Critical Dilution:	1.0%
NPDES No:	NPDES AR0022021 AFIN 54-00086	Sample Source:	Outfall 001
Contact:	Mr. Matt Bienvenu	Species Age:	<24 hours
Test Type:	48-hour renewal definitive toxicity test	Analysts:	280, 304, 310
Dilution Water:	Synthetic Moderately Hard Water #4162		
Test Initiated:	December 9, 2014 at 1800		
Test Terminated:	December 11, 2014 at 1600		

Day 1		Control	0.4%	0.6%	0.8%	1.0%	1.3%
DO, mg/l	Initial	8.4	8.4	8.3	8.4	8.2	8.3
DO, mg/l	Final	7.6	7.4	7.3	7.3	7.2	7.1
pH, su	Initial	7.7	7.7	7.8	7.8	7.8	7.8
pH, su	Final	7.6	7.6	7.7	7.8	7.8	7.8
Alkalinity, mg/l		58	NA	NA	NA	63	NA
Hardness, mg/l		86	NA	NA	NA	84	NA
Conductivity, umho/cm		310	310	310	310	310	320
Residual Chlorine, mg/l		<0.05	NA	NA	NA	<0.05	NA

Day 2		Control	0.4%	0.6%	0.8%	1.0%	1.3%
DO, mg/l	Initial	8.9	8.8	8.8	8.8	8.8	8.7
DO, mg/l	Final	8.5	8.4	8.4	8.4	8.5	8.5
pH, su	Initial	7.5	7.5	7.5	7.5	7.6	7.6
pH, su	Final	7.4	7.5	7.4	7.5	7.5	7.5
Alkalinity, mg/l		58	NA	NA	NA	62	NA
Hardness, mg/l		88	NA	NA	NA	90	NA
Conductivity, umho/cm		260	260	270	270	270	270
Residual Chlorine, mg/l		<0.05	NA	NA	NA	<0.05	NA

Appendix: B

*Pimephales promelas* Survival Data

Permittee:	McClelland Consulting Engineers, Inc.	Critical Dilution:	1.0%
NPDES No:	NPDES AR0022021 AFIN 54-00086	Sample Source:	Outfall 001
Contact:	Mr. Matt Bienvenu	Species Age:	2 days
Test Type:	48-hour renewal definitive toxicity test	Analysts:	280, 304, 310
Dilution Water:	Synthetic Moderately Hard Water #4162		
Test Initiated:	December 9, 2014 at 1750		
Test Terminated:	December 11, 2014 at 1600		

PERCENT SURVIVAL

24 hours	Control	0.4%	0.6%	0.8%	1.0%	1.3%
Rep. A	100	100	100	100	100	100
Rep. B	100	100	100	100	100	100
Rep. C	100	100	100	87.5	100	100
Rep. D	100	100	100	100	100	100
Rep. E	100	100	100	87.5	100	100

48 hours	Control	0.4%	0.6%	0.8%	1.0%	1.3%
Rep. A	100	100	100	100	100	87.5
Rep. B	100	100	100	100	100	87.5
Rep. C	100	100	100	87.5	100	100
Rep. D	100	100	100	100	100	100
Rep. E	100	100	100	87.5	100	100

Dunnett's Procedure or Steel's Many-One Rank Test as appropriate. Is the mean survival at 48 hours significantly different (p=0.05) than the control survival for the % effluent corresponding to:

a) Low Flow 1.0%:	_____	Yes	_____ X _____	No
b) 1/2 Low Flow (NA):	_____	Yes	_____	No

Pass/Fail #TEM6C: 0

NOEL *Pimephales promelas* lethality #TOM6C: 1.3%

Coefficient of variation for *Pimephales promelas* survival #TQM6C: 0

Enter percent effluent corresponding to LC-50 below.

LC-50 effluent: >1.3%  
Method of LC-50 calculation: NA

Reference Toxicity Test Performed on November 18, 2014 at 1600 to November 20, 2014 at 1600:

LC-50 effluent: 7.16 g/l  
Warning Limits: 5.32 to 8.80 g/l

## Appendix: B

*Pimephales promelas* Chemical Parameters Chart

Permitee:	McClelland Consulting Engineers, Inc.	Critical Dilution:	1.0%
NPDES No:	NPDES AR0022021 AFIN 54-00086	Sample Source:	Outfall 001
Contact:	Mr. Matt Bienvenu	Species Age:	2 days
Test Type:	48-hour renewal definitive toxicity test	Analysts:	280, 304, 310
Dilution Water:	Synthetic Moderately Hard Water #4162		
Test Initiated:	December 9, 2014 at 1750		
Test Terminated:	December 11, 2014 at 1600		

Day 1		Control	0.4%	0.6%	0.8%	1.0%	1.3%
DO, mg/l	Initial	8.4	8.4	8.3	8.4	8.2	8.3
DO, mg/l	Final	8.0	7.7	7.8	7.8	8.0	7.8
pH, su	Initial	7.7	7.7	7.8	7.8	7.8	7.8
pH, su	Final	7.7	7.8	7.7	7.8	7.8	7.8
Alkalinity, mg/l		58	NA	NA	NA	63	NA
Hardness, mg/l		86	NA	NA	NA	84	NA
Conductivity, umho/cm		310	310	310	310	310	320
Residual Chlorine, mg/l		<0.05	NA	NA	NA	<0.05	NA

Day 2		Control	0.4%	0.6%	0.8%	1.0%	1.3%
DO, mg/l	Initial	8.9	8.8	8.8	8.8	8.8	8.7
DO, mg/l	Final	7.7	7.6	7.6	7.7	7.6	7.6
pH, su	Initial	7.5	7.5	7.5	7.5	7.6	7.6
pH, su	Final	7.6	7.7	7.7	7.7	7.7	7.7
Alkalinity, mg/l		58	NA	NA	NA	62	NA
Hardness, mg/l		88	NA	NA	NA	90	NA
Conductivity, umho/cm		260	260	270	270	270	270
Residual Chlorine, mg/l		<0.05	NA	NA	NA	<0.05	NA



CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

PAGE OF

Client: <u>West Helena Water</u>		NO OF BOTTLES		ANALYSES REQUESTED		AIC CONTROL NO: <u>185531</u>	
Project Reference: <u>BID-MON.</u>		SAMPLE MATRIX				AIC PROPOSAL NO:	
Project Manager: <u>Ken Fratesi</u>		WATER				Carrier/Tracking No.:	
Sampled By: <u>Jody P. Warren</u>		SOIL				Received Temperature C <u>0.3c</u>	
AIC No. <u>01</u>		COMPOST				Remarks	
Date/Time Collected: <u>12-9-14/8:00AM</u>		24 ✓				Field pH calibration on @	
Container Type		ice				Buffer:	
Preservative		V = VOA vials N = Nitric acid pH2				T = Sodium Thiosulfate Z = Zinc acetate	
G = Glass NO = none P = Plastic S = Sulfuric acid pH2		Relinquished		H = HCl to pH2 B = NaOH to pH12		Date/Time	
Turnaround Time Requested: (Please circle) <b>(NORMAL)</b> or EXPEDITED IN _____ DAYS		By: <u>Jody P. Warren</u>		Date/Time: <u>12-9-14/12:18</u>		Received By: <u>Jessie Brown</u>	
Expedited results requested by:		Relinquished		Date/Time		Received in Lab	
Who should AIC contact with questions: <u>Ken Fratesi</u>		By: <u>Jessie Brown</u>		Date/Time: <u>12-9-14/15:30</u>		Received By: <u>Jessie Brown</u>	
Phone: <u>870-572-6714</u> Fax:		Comments:				Date/Time: <u>12-9-14</u>	
Report Attention to: <u>Ken Fratesi</u>						Date/Time: <u>15:30</u>	
Report Address to: <u>92 Plaza St. West Helena, AR 72390</u>							



CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

PAGE OF

Client: West Helena Water		NO OF BOTTLES		ANALYSES REQUESTED												AIC CONTROL NO: 185534	
Project Reference: Bio-Mon.		SAMPLE MATRIX														AIC PROPOSAL NO:	
Project Manager: KEN FRATESI		WATER														Carrier:	
Sampled By: Jody P. Warren		SOIL														Received Temperature C: 8.1°C	
AIC No. 202		GRA B														Remarks:	
Date/Time Collected: 12-9-14/8:00 AM		COMP														Field pH calibration on: ②	
Container Type: Preservative		24 ✓														Buffer:	
G = Glass NO = none		P = Plastic S = Sulfuric acid pH2														T = Sodium Thiosulfate Z = Zinc acetate	
Turnaround Time Requested: (Please circle) NORMAL or EXPEDITED IN ___ DAYS		V = VOA vials N = Nitric acid pH2														Received Date/Time: 12-9-14/12:12	
Expedited results requested by: Ken Fratesi		Relinquished By: Jody Warren														Received in Lab Date/Time: 12-19-14	
Who should AIC contact with questions: Ken Fratesi		Comments: Jody Warren														By: Jody Warren	
Phone: 870-572-6714 Fax:		Relinquished Date/Time: 12/9/14 1530														By: Jody Warren	
Report Attention to: Ken Fratesi																	
Report Address to: 92 Plaza 5r																	
West Helena, AR 72390																	

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