

May 29, 2014

Test Results of
Second Quarter
Chronic 7-Day Renewal
Biomonitoring Testing
for
Outfall 002
Heber Springs, AR

Control No. 178820-1

Prepared for:

Mr. Sam Query
Heber Springs Water & Sewer
1108 West Front Street
Heber Springs, AR 72543

Prepared by:

AMERICAN INTERPLEX CORPORATION
8600 Kanis Road
Little Rock, AR 72204-2322

Heber Springs Water & Sewer
ATTN: Mr. Sam Querry
1108 West Front Street
Heber Springs, AR 72543

Re: Chronic 7-Day Renewal utilizing *Pimephales promelas* (Fathead minnow) and *Ceriodaphnia dubia*
Outfall 002 - Heber Springs, AR
NPDES Permit No. AR0022381 AFIN# 12-00029

Dear Mr. Sam Querry:

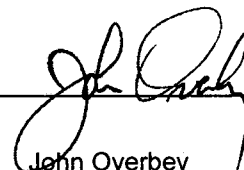
This report is the analytical results and supporting information for the samples submitted to American Interplex Corporation (AIC). The following results are applicable only to the sample identified by the control number referenced above. Accurate assessment of the data requires access to the entire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

Testing procedures and Quality Assurance were in accordance with "Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms" EPA-821-R-02-013, Fourth Edition, October 2002. Test results are summarized below:

Method 1000.0 Chronic *Pimephales promelas* (Fathead minnow) Survival and Growth Test: The No Observable Effects Concentration (NOEC) for survival occurred at 11 % effluent, which is above the critical dilution of 8 %. The NOEC for growth occurred at 11 % effluent, which is above the critical dilution of 8 %. **The sample, therefore, PASSED both lethal and sub-lethal effects for the Fathead minnow test.**

Method 1002.0 Chronic *Ceriodaphnia dubia* Survival and Reproduction Test: The No Observable Effects Concentration (NOEC) for survival occurred at 11 % effluent, which is above the critical dilution of 8 %. The NOEC for reproduction occurred at 11 % effluent, which is above the critical dilution of 8 %. **The sample, therefore, PASSED both lethal and sub-lethal effects for the *Ceriodaphnia dubia* test.**

AMERICAN INTERPLEX CORPORATION



John Overbey
Laboratory Director

PDF cc: Heber Springs Water & Sewer
ATTN: Mr. Sam Querry
kent@heberspringswater.com

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I. Control Acceptance Criteria

Pimephales promelas (Fathead minnow) Method 1000.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	100	PASS
Control Growth > or = 0.25 mg per Surviving minnow	0.432	PASS
Control Growth CV < or = 40%	10.1	PASS
Growth Minimum Significant Difference 12 to 30%	12.6	PASS
Critical Dilution CV < or = 40%	11.8	PASS

Ceriodaphnia dubia Method 1002.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	100	PASS
Control Reproduction > or = 15 per Surviving Female	20.5	PASS
Control CV < or = 40% per Surviving Female	24.9	PASS
Reproduction Minimum Significant Difference 13 to 47%	20.7	PASS
Critical Dilution CV < or = 40%	7.45	PASS

II. Outlined Report

A. Introduction

1. Permit Number: AR0022381 AFIN# 12-00029
2. Test Requirements: Chronic Biomonitoring, Quarterly Test Methods 1000.0 and 1002.0
3. Receiving Stream: Little Red River

B. Source of Effluent/Dilution Water

1. Effluent Samples:

- a. Sampling Point: Outfall 002
- b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	8.7	7.8	7.9
pH (standard units)	7.1	6.8	7.2
Alkalinity (mg/l as CaCO ₃)	17	17	8.6
Hardness (mg/l as CaCO ₃)	25	28	29
Conductivity (umhos/cm)	180	170	160
Residual Chlorine (mg/l)	0.050	<0.05	<0.05
Ammonia as N (mg/l)	5.1	4.9	4.0

2. Dilution Water Samples: Synthetic Soft Water #4100

- a. Dates Prepared: May 16 through May 30, 2014
- b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	8.5	8.1	8.1
pH (standard units)	7.6	7.2	7.6
Alkalinity (mg/l as CaCO ₃)	30	30	30
Hardness (mg/l as CaCO ₃)	41	45	45
Conductivity (umhos/cm)	170	160	160
Residual Chlorine (mg/l)	<0.05	<0.05	<0.05

C. Test Methods

1. Test methods used:

Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA-821-R-02-013; test Methods 1000.0 and 1002.0, Fathead Minnow Survival and Growth and *Ceriodaphnia dubia* Survival and Reproduction.

2. Endpoint: No Observable Effects Concentration (NOEC)

3. Test Conditions:

Pimephales promelas (Fathead minnow) Survival and Growth Method 1000.0

Date & Time Test Initiated: May 20, 2014 at 1750
Date & Time Test Terminated: May 27, 2014 at 1620
Type & Volume of Test Chamber: 500 ml disposable beaker
Volume of Sample: 250 ml
Number of Organisms per replicate: 8
Number of Replicates per dilution: 5

Ceriodaphnia dubia Survival and Growth Method 1002.0

Date & Time Test Initiated: May 20, 2014 at 1515
Date & Time Test Terminated: May 27, 2014 at 1315
Type & Volume of Test Chamber: 30 ml disposable beaker
Volume of Sample: 15 ml
Number of Organisms per replicate: 1
Number of Replicates per dilution: 10

4. Acclimation of test organisms: Obtained from in-house cultures

5. Test Temperature: 25 +/- 1 degree Celsius

D. Test Organisms

1. Scientific Name

- a. Test 1000.0 *Pimephales promelas*
- b. Test 1002.0 *Ceriodaphnia dubia*

III. Data Analysis

The data was analyzed using American Interplex Corporation's Laboratory Information Management Software based on Toxstat.

Pimephales promelas (Fathead minnow) survival data was transformed using the Arc Sine transformation. Normality and homogeneity of variance were checked using Shapiro-Wilk's. The survival data was then analyzed using Steel's Many-One Rank Test to determine the No Observable Effects Concentration (NOEC).

Fathead minnow growth data was analyzed for normality and homogeneity of variance using Shapiro-Wilk's and Bartlett's test. Dunnett's Test was used to determine the No Observable Effects Concentration (NOEC) for growth.

Ceriodaphnia dubia survival data was analyzed with Fisher's Exact Test. Reproduction data was analyzed using Kolmogorov's Test for Normality and analyzed with Steel's Many-One Rank Test to determine the No Observable Effects Concentration (NOEC) for Reproduction. Dunnett's Test was used to calculate the PMSD.

IV. Standard Reference Toxicants

American Interplex Corporation has an ongoing test organism culturing program. The sensitivity of the offspring is determined by performing a standard reference toxicant test with each effluent test. Sodium chloride in synthetic moderately hard water is used as prescribed in EPA-821-R-02-013.

Pimephales promelas (Fathead minnow)

Chronic reference tests are performed monthly.

A chronic reference test was performed on April 1, 2014 at 1715 to April 8, 2014 at 1655

The results were as follows: (Control No. 177015-1.)

Survival LC-50: 4852.9 mg/l

Growth IC-25: 2979 mg/l

Growth PMSD: 11.8

Ceriodaphnia dubia

Chronic reference tests are performed monthly.

A chronic reference test was performed on April 1, 2014 at 1700 to April 8, 2014 at 1510

The results were as follows: (Control No. 177015-2.)

Survival LC-50: 1968 mg/l

Growth IC-25: 1264 mg/l

Growth PMSD: 14.6

V. Chemical Analysis/Quality Control

Parameter	Method	% Recovery	Relative % Difference
Alkalinity	SM 2320 B	NA	0.00
Hardness	EPA 200.7	102	1.04
pH	SM 4500-H+ B	100	0.805
Conductivity	EPA 120.1	102	0.660

VI. Organism History

Pimephales promelas (Fathead minnow)

Date: May 20, 2014

Age: <24 hours

Source: In-house culture

Water Chemistry Record:

Alkalinity: 57-64 mg/l

Hardness: 80-100 mg/l

Temperature: 25 deg.C

Ceriodaphnia dubia

Date: May 20, 2014

Age: <24 hours

Source: In-house culture

Water Chemistry Record:

Alkalinity: 57-64 mg/l

Hardness: 80-100 mg/l

Temperature: 25 deg.C

VII. Results Summary *Pimephales promelas*, Fathead minnow Larval Survival and Growth Test -- Method 1000.0

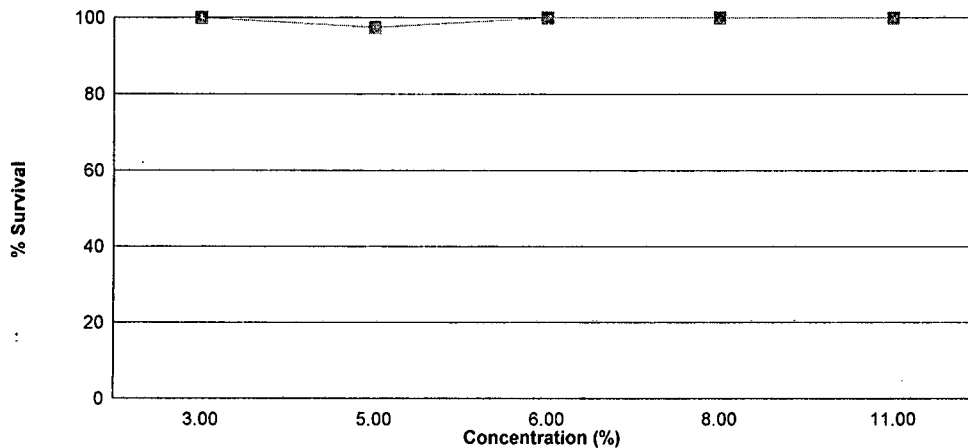
Larvae are exposed in a static renewal system for seven days to different concentrations of effluent with dilution water. Test results are based on the survival and growth (increase in weight) of the larvae.

Effluent dilutions for this test were 3 %, 5 %, 6 %, 8 %, 11 % in accordance with the NPDES permit.

The low flow or 'critical' dilution is specified in the NPDES permit as 8 % effluent.

The test was initiated on May 20, 2014 at 1750 and continued through May 27, 2014 at 1620. Statistical analyses were performed on the observed data and the no observable effects concentrations (NOECs) were as follows:

- a.) NOEC survival = 11 % effluent
- b.) NOEC growth = 11 % effluent



Summary of the 7-day Fathead Minnow Survival and Growth		
Concentration	Percent Survival	Mean Growth (mg)
Control	100	0.432
3 %	100	0.424
5 %	97.5	0.426
6 %	100	0.415
8 %	100	0.439
11 %	100	0.418

VII. Results Summary *Ceriodaphnia dubia*, Cladoceran Survival and Reproduction Test -- Method 1002.0

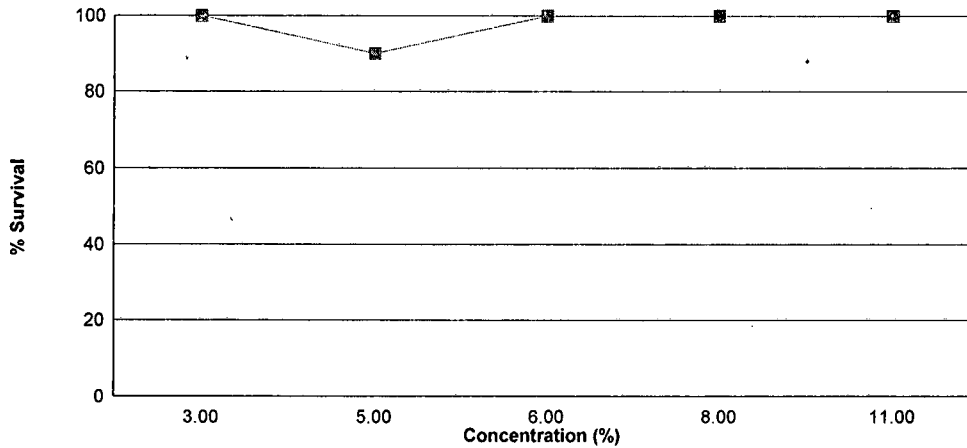
Neonates are exposed in a static renewal system to different concentrations of effluent with dilution water until 60% of surviving control organisms have three broods of offspring with an average of at least 15 young per female.

Effluent dilutions for this test were 3 %, 5 %, 6 %, 8 %, 11 % in accordance with the NPDES permit.

The low flow or 'critical' dilution is specified in the NPDES permit as 8 % effluent.

The test was initiated on May 20, 2014 at 1515 and continued through May 27, 2014 at 1315. Statistical analyses were performed on the observed data and the no observable effects concentrations (NOECs) were as follows:

- a.) NOEC survival = 11 % effluent
- b.) NOEC reproduction = 11 % effluent



Concentration	Percent Survival	Mean Reproduction
Control	100	20.5
3 %	100	30.8
5 %	90.0	24.8
6 %	100	28.8
8 %	100	29.0
11 %	100	29.3

Appendix A1: Test 1000.0

Pimephales promelas (Fathead Minnow) 7-Day Survival

Date and Time Test Initiated: May 20, 2014 at 1750

Date and Time Test Terminated: May 27, 2014 at 1620

Concentration	Replicate	Number of Survivors						
		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Control	A	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8
3 %	A	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8
5 %	A	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8
	C	8	8	7	7	7	7	7
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8
6 %	A	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8
8 %	A	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8
11 %	A	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8

Appendix A1: Test 1000.0

Pimephales promelas (Fathead Minnow) 7-Day Growth

Test Initiated: May 20, 2014 at 1750
Test Terminated: May 27, 2014 at 1620

Drying Started: May 22, 2014 at 1605
Drying Ended: May 28, 2014 at 1550

Concentration	Replicate	Weight of pan	Weight of pan + fish	Total weight of fish (g)	Original # of fish	Mean dry weight (mg)
Control	A	.91790	.92076	0.00286	8	0.358
	B	.92034	.92414	0.00380	8	0.475
	C	.92117	.92474	0.00357	8	0.446
	D	.92825	.93174	0.00349	8	0.436
	E	.93030	.93385	0.00355	8	0.444
3 %	A	.92704	.93040	0.00336	8	0.420
	B	.92576	.92905	0.00329	8	0.411
	C	.92630	.92965	0.00335	8	0.419
	D	.92464	.92819	0.00355	8	0.444
	E	.91822	.92163	0.00341	8	0.426
5 %	A	.91998	.92305	0.00307	8	0.384
	B	.91961	.92284	0.00323	8	0.404
	C	.92339	.92685	0.00346	8	0.432
	D	.92353	.92704	0.00351	8	0.439
	E	.92643	.93021	0.00378	8	0.472
6 %	A	.92433	.92751	0.00318	8	0.398
	B	.92810	.93094	0.00284	8	0.355
	C	.92657	.93023	0.00366	8	0.458
	D	.92492	.92831	0.00339	8	0.424
	E	.92301	.92654	0.00353	8	0.441
8 %	A	.92510	.92817	0.00307	8	0.384
	B	.92471	.92787	0.00316	8	0.395
	C	.92293	.92639	0.00346	8	0.432
	D	.92260	.92662	0.00402	8	0.502
	E	.92542	.92926	0.00384	8	0.480
11 %	A	.92733	.93066	0.00333	8	0.416
	B	.92758	.93101	0.00343	8	0.429
	C	.92567	.92897	0.00330	8	0.412
	D	.92735	.93090	0.00355	8	0.444
	E	.92612	.92922	0.00310	8	0.388

Appendix A1: Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

Date and Time Test Initiated: May 20, 2014 at 1515

Date and Time Test Terminated: May 27, 2014 at 1315

Concentration: Control														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
2	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
3	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
4	3	4	4	4	3	2	2	4	4	3	33	10	3.30	
5	9	9	9	10	0	5	8	9	7	8	74	10	7.40	
6	0	0	0	0	5	0	0	0	0	0	5	10	0.500	
7	10	12	10	11	0	9	13	9	10	9	93	10	9.30	
8														
TOTAL	22	25	23	25	8	16	23	22	21	20	205	10	20.5	

Concentration: 3 %														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
3	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
4	5	4	4	2	4	2	3	4	4	5	37	10	3.70	
5	14	12	12	12	13	10	11	13	12	13	122	10	12.2	
6	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
7	10	11	14	16	17	17	15	17	16	16	149	10	14.9	
8														
TOTAL	29	27	30	30	34	29	29	34	32	34	308	10	30.8	

Concentration: 5 %														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
3	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
4	5	4	4	4	3	4	3	5	5	6	43	10	4.30	
5	11	0	10	13	9	12	9	11	10	13	98	10	9.80	
6	0	X	16	0	0	0	0	0	0	0	16	9	1.78	
7	15	X	14E	0	13	16	14	0	17	16	91	9	10.1	
8														
TOTAL	31	4	30	17	25	32	26	16	32	35	248	10	24.8	

E = Excluded fourth brood neonates

Appendix A1: Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

Date and Time Test Initiated: May 20, 2014 at 1515

Date and Time Test Terminated: May 27, 2014 at 1315

Concentration: 6 %														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
2	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
3	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
4	4	6	5	3	4	4	3	5	6	5	45	10	4.50	
5	12	11	13	10	11	10	10	10	9	13	109	10	10.9	
6	0	10	0	0	0	0	0	0	0	17	27	10	2.70	
7	13	0	10	10	15	14	14	16	15	0	107	10	10.7	
8														
TOTAL	29	27	28	23	30	28	27	31	30	35	288	10	28.8	

Concentration: 8 %													
Day	Replicate										No. of Young	No. of Adults	Young per Adult
	1	2	3	4	5	6	7	8	9	10			
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00
3	0	0	0	0	0	0	0	0	0	0	0	10	0.00
4	4	4	4	5	6	2	5	4	5	5	44	10	4.40
5	11	11	11	9	8	10	12	10	11	10	103	10	10.3
6	0	12	16	13	0	0	0	0	0	15	56	10	5.60
7	14	0	0	0	15	13	15	15	15	0	87	10	8.70
8													
TOTAL	29	27	31	27	29	25	32	29	31	30	290	10	29.0

Concentration: 11 %													
Day	Replicate										No. of Young	No. of Adults	Young per Adult
	1	2	3	4	5	6	7	8	9	10			
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00
3	0	0	0	0	0	0	0	0	0	0	0	10	0.00
4	5	4	4	3	5	5	5	5	3	5	44	10	4.40
5	9	11	8	13	10	11	10	10	12	11	105	10	10.5
6	0	12	13	18	0	0	0	15	0	13	71	10	7.10
7	13	0	0	0	13	14	16	0	17	0	73	10	7.30
8													
TOTAL	27	27	25	34	28	30	31	30	32	29	293	10	29.3

Appendix A2: Statistics

Pimephales promelas (Fathead minnow) Survival

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	3 %	1	1.00000	1.39310
2	3 %	2	1.00000	1.39310
2	3 %	3	1.00000	1.39310
2	3 %	4	1.00000	1.39310
2	3 %	5	1.00000	1.39310
3	5 %	1	1.00000	1.39310
3	5 %	2	1.00000	1.39310
3	5 %	3	0.87500	1.20940
3	5 %	4	1.00000	1.39310
3	5 %	5	1.00000	1.39310
4	6 %	1	1.00000	1.39310
4	6 %	2	1.00000	1.39310
4	6 %	3	1.00000	1.39310
4	6 %	4	1.00000	1.39310
4	6 %	5	1.00000	1.39310
5	8 %	1	1.00000	1.39310
5	8 %	2	1.00000	1.39310
5	8 %	3	1.00000	1.39310
5	8 %	4	1.00000	1.39310
5	8 %	5	1.00000	1.39310
6	11 %	1	1.00000	1.39310
6	11 %	2	1.00000	1.39310
6	11 %	3	1.00000	1.39310
6	11 %	4	1.00000	1.39310
6	11 %	5	1.00000	1.39310

Appendix A2: Statistics

Pimephales promelas (Fathead minnow) Survival

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	3 %	27.50	16.00	5.00	
3	5 %	25.00	16.00	5.00	
4	6 %	27.50	16.00	5.00	
5	8 %	27.50	16.00	5.00	
6	11 %	27.50	16.00	5.00	
Critical values are 1 tailed (k=5)					

Appendix A2: Statistics

Pimephales promelas (Fathead minnow) Growth

Shapiro - Wilk's Test for Normality	No Transformation
<p>D = 0.03175 W = 0.9736 Critical W = 0.9 (alpha = 0.01, N = 30) Critical W = 0.927 (alpha = 0.05, N = 30)</p> <p>Data PASS normality test (alpha = 0.01).</p>	

Bartlett's Test for Homogeneity of Variance	No Transformation
<p>Calculated B1 statistic = 7.794 Critical B = 15.086 (alpha = 0.01, df = 5)</p> <p>Data PASS B1 homogeneity test at 0.01 level.</p>	

Appendix A2: Statistics

Pimephales promelas (Fathead minnow) Growth

ANOVA Table				No Transformation	
SOURCE	DF	SS	MS	F	
Between	5	0.001897	0.0003794	0.2868	
Within (Error)	24	0.03175	0.001323		
Total	29	0.03365			
Critical F = 3.9 (alpha = 0.01, df = 5,24)					
2.62 (alpha = 0.05, df = 5,24)					
Since F < Critical F FAIL TO REJECT Ho: All equal (alpha = 0.05)					

Dunnett's Test - Table 1 of 2					No Transformation
Ho:Control<Treatment					
Group	Identification	Transformed Mean	Mean In Original Units	T Stat	Sig 0.05
1	Control	0.4318	0.4318		
2	3 %	0.424	0.424	0.3391	
3	5 %	0.4262	0.4262	0.2434	
4	6 %	0.4152	0.4152	0.7216	
5	8 %	0.4386	0.4386	-0.2956	
6	11 %	0.4178	0.4178	0.6086	
Dunnett's critical value = 2.36 (1 Tailed, alpha = 0.05, df = 5,24)					

Dunnett's Test - Table 2 of 2					No Transformation	
Ho:Control<Treatment						
Group	Identification	Num of Reps	Min Sig Diff (In Orig. Units)	% of Control	Difference From Control	
1	Control	5				
2	3 %	5	0.05429	12.6	0.0078	
3	5 %	5	0.05429	12.6	0.0056	
4	6 %	5	0.05429	12.6	0.0166	
5	8 %	5	0.05429	12.6	-0.0068	
6	11 %	5	0.05429	12.6	0.014	

Appendix A2: Statistics

Ceriodaphnia dubia Survival

Fisher's Exact Test			
Identification	Alive	Dead	Total Animals
Control	10	0	10
3 %	10	0	10
Total	20	0	20

Critical Fisher's value (10,10,10) ($\alpha=0.05$) is 6. b value is 10. Since b is greater than 6 there is NO SIGNIFICANT DIFFERENCE between CONTROL and TREATMENT at the 0.05 level.

Fisher's Exact Test			
Identification	Alive	Dead	Total Animals
Control	10	0	10
5 %	9	1	10
Total	19	1	20

Critical Fisher's value (10,10,10) ($\alpha=0.05$) is 6. b value is 9. Since b is greater than 6 there is NO SIGNIFICANT DIFFERENCE between CONTROL and TREATMENT at the 0.05 level.

Fisher's Exact Test			
Identification	Alive	Dead	Total Animals
Control	10	0	10
6 %	10	0	10
Total	20	0	20

Critical Fisher's value (10,10,10) ($\alpha=0.05$) is 6. b value is 10. Since b is greater than 6 there is NO SIGNIFICANT DIFFERENCE between CONTROL and TREATMENT at the 0.05 level.

Fisher's Exact Test			
Identification	Alive	Dead	Total Animals
Control	10	0	10
8 %	10	0	10
Total	20	0	20

Critical Fisher's value (10,10,10) ($\alpha=0.05$) is 6. b value is 10. Since b is greater than 6 there is NO SIGNIFICANT DIFFERENCE between CONTROL and TREATMENT at the 0.05 level.

Appendix A2: Statistics

Ceriodaphnia dubia Survival

Fisher's Exact Test			
Identification	Alive	Dead	Total Animals
Control	10	0	10
11 %	10	0	10
Total	20	0	20

Critical Fisher's value (10,10,10) ($\alpha=0.05$) is 6. b value is 10. Since b is greater than 6 there is NO SIGNIFICANT DIFFERENCE between CONTROL and TREATMENT at the 0.05 level.

Summary of Fisher's Exact Test				
Group	Identification	Exposed	Dead	Sig 0.05
0	Control	10	0	
1	3 %	10	0	
2	5 %	10	1	
3	6 %	10	0	
4	8 %	10	0	
5	11 %	10	0	

Appendix A2: Statistics

Ceriodaphnia dubia Reproduction

Kolmogorov Test for Normality	No Transformation
D = 0.1656 D* = 1.299 Critical D* = 1.035 (alpha = 0.01, N = 60)	
Data FAIL normality test (alpha = 0.01).	

Steel's Many-One Rank Test				No Transformation	
Ho: Control < Treatment					
Group	Identification	Rank Sum	Critical Value	DF	Sig 0.05
1	Control				
2	3 %	155.00	75.00	10.00	
3	5 %	127.50	75.00	10.00	
4	6 %	152.00	75.00	10.00	
5	8 %	154.00	75.00	10.00	
6	11 %	154.00	75.00	10.00	

Critical values are 1 tailed (k=5)

Appendix A2: Statistics

Ceriodaphnia dubia Reproduction

Dunnett's Test for PMSD Calculation (excluding deaths if applicable)

ANOVA Table				No Transformation	
SOURCE	DF	SS	MS	F	
Between	5	671.5	134.3	8.368	
Within (Error)	53	850.5	16.05		
Total	58	1522			
Critical F = 3.39 (alpha = 0.01, df = 5,53)					
2.39 (alpha = 0.05, df = 5,53)					
Since F > Critical F REJECT Ho: All equal (alpha = 0.05)					

Dunnett's Test - Table 1 of 2					No Transformation
Ho:Control<Treatment					
Group	Identification	Transformed Mean	Mean In Original Units	T Stat	Sig 0.05
1	Control	20.5	20.5		
2	3 %	30.8	30.8	-5.749	
3	5 %	27.111	27.111	-3.591	
4	6 %	28.8	28.8	-4.633	
5	8 %	29	29	-4.744	
6	11 %	29.3	29.3	-4.912	
Dunnett's critical value = 2.31 (1 Tailed, alpha = 0.05, df [used] = 5,40) (Actual df = 5,53)					
WARNING - Unequal replicate sizes. Critical values assuming equal replicate sizes have been used.					

Dunnett's Test - Table 2 of 2					No Transformation	
Ho:Control<Treatment						
Group	Identification	Num of Reps	Min Sig Diff (In Orig. Units)	% of Control	Difference From Control	
1	Control	10				
2	3 %	10	4.139	20.2	-10.3	
3	5 %	9	4.252	20.7	-6.611	
4	6 %	10	4.139	20.2	-8.3	
5	8 %	10	4.139	20.2	-8.5	
6	11 %	10	4.139	20.2	-8.8	

Appendix A3: Water Chemistry

Routine Chemical and Physical Data

Date and Time Test Initiated: May 20, 2014 at 1127

Date and Time Test Terminated: May 27, 2014 at 1620

Effluent Conc.: Control	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	
DO, mg/l	Initial	8.5	8.1	8.1	7.8	8.1	8.0	8.1
	Final *1	8.0	7.8	7.4	7.4	7.6	8.2	7.0
	Final *2	8.1	8.0	7.8	7.5	7.6	8.0	7.4
pH, units	Initial	7.6	7.2	7.2	7.4	7.6	7.6	7.5
	Final *1	7.4	7.4	7.2	7.2	7.7	7.4	6.8
	Final *2	7.3	7.6	7.4	7.7	7.8	7.6	7.2
Alkalinity, mg CaCO ₃ /l	30	NA	30	NA	30	NA	NA	
Hardness, mg CaCO ₃ /l	41	NA	45	NA	45	NA	NA	
Conductivity, umhos/cm	170	150	160	160	160	160	170	
Res. Chlorine, mg/l	<0.05	NA	<0.05	NA	<0.05	NA	NA	

Effluent Conc.: 3 %	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	
DO, mg/l	Initial	8.7	8.2	8.1	8.0	7.9	7.7	7.9
	Final *1	7.9	7.6	7.4	7.2	7.5	7.9	6.5
	Final *2	8.1	8.0	7.7	7.5	7.5	8.2	7.4
pH, units	Initial	7.6	7.2	7.2	7.3	7.6	7.6	7.4
	Final *1	7.3	7.3	7.1	7.1	7.7	7.4	6.8
	Final *2	7.2	7.5	7.4	7.6	7.7	7.4	7.0

Effluent Conc.: 5 %	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	
DO, mg/l	Initial	8.7	8.2	8.0	8.0	8.2	7.7	8.2
	Final *1	7.6	7.5	7.4	7.0	7.7	8.0	6.3
	Final *2	8.0	8.2	7.8	7.5	7.3	8.0	7.5
pH, units	Initial	7.5	7.2	7.3	7.3	7.5	7.5	7.4
	Final *1	7.3	7.4	7.2	7.2	7.6	7.4	6.8
	Final *2	7.2	7.5	7.4	7.6	7.6	7.4	6.9

Appendix A3: Water Chemistry

Routine Chemical and Physical Data

Date and Time Test Initiated: May 20, 2014 at 1127

Date and Time Test Terminated: May 27, 2014 at 1620

Effluent Conc.: 6 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	8.5	8.4	8.1	7.9	8.2	8.1	8.3
	Final *1	8.0	7.6	7.5	7.4	7.8	7.9	6.3
	Final *2	8.0	7.9	7.7	7.5	7.5	8.1	7.5
pH, units	Initial	7.6	7.2	7.3	7.3	7.6	7.6	7.4
	Final *1	7.4	7.3	7.1	7.2	7.6	7.4	6.8
	Final *2	7.2	7.4	7.4	7.6	7.6	7.4	6.9

Effluent Conc.: 8 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	8.6	8.3	8.2	7.9	8.0	8.0	8.1
	Final *1	7.9	7.6	7.2	7.0	7.7	8.0	6.7
	Final *2	8.1	8.0	7.8	7.5	7.7	8.2	7.3
pH, units	Initial	7.5	7.2	7.3	7.3	7.5	7.5	7.4
	Final *1	7.4	7.3	7.2	7.1	7.6	7.4	7.0
	Final *2	7.2	7.4	7.4	7.6	7.6	7.4	6.9
Alkalinity, mg CaCO ₃ /l		33	NA	45	NA	33	NA	NA
Hardness, mg CaCO ₃ /l		39	NA	41	NA	39	NA	NA
Conductivity, umhos/cm		170	150	160	160	160	170	180
Res. Chlorine, mg/l		<0.05	NA	<0.05	NA	<0.05	NA	NA

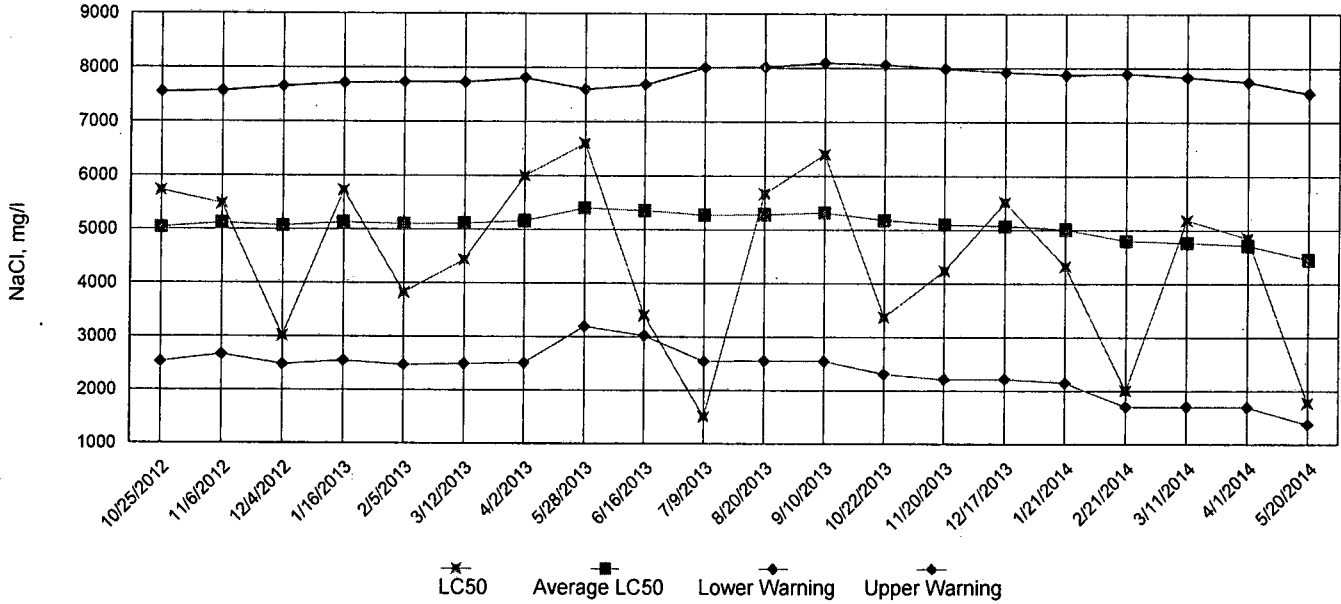
Effluent Conc.: 11 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	8.6	8.2	8.0	8.0	8.0	7.7	7.9
	Final *1	7.9	7.7	7.3	7.3	7.7	8.0	6.3
	Final *2	7.9	8.0	7.7	7.5	7.6	8.1	7.4
pH, units	Initial	7.5	7.2	7.2	7.3	7.5	7.5	7.3
	Final *1	7.4	7.4	7.2	7.2	7.6	7.4	6.8
	Final *2	7.2	7.5	7.4	7.6	7.7	7.4	6.9

*1 = data from the *Pimephales promelas* (Fathead Minnow) test *2 = data from the *Ceriodaphnia dubia* test

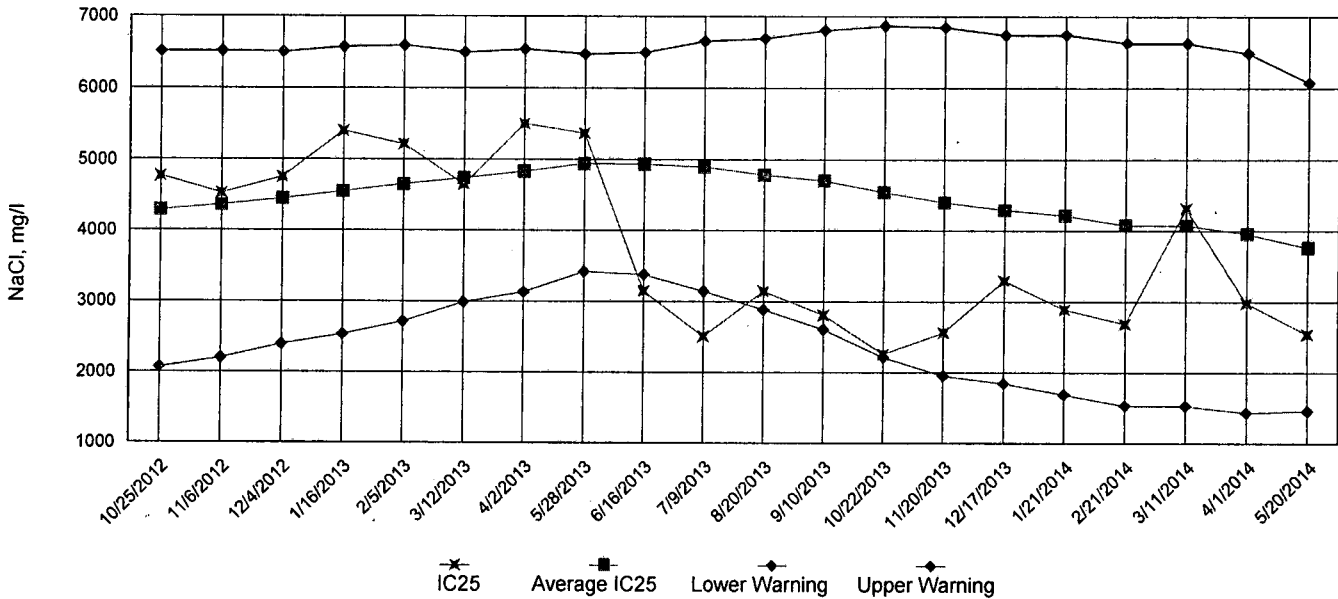
Appendix A4: Test 1000.0

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

LC50 Survival Data

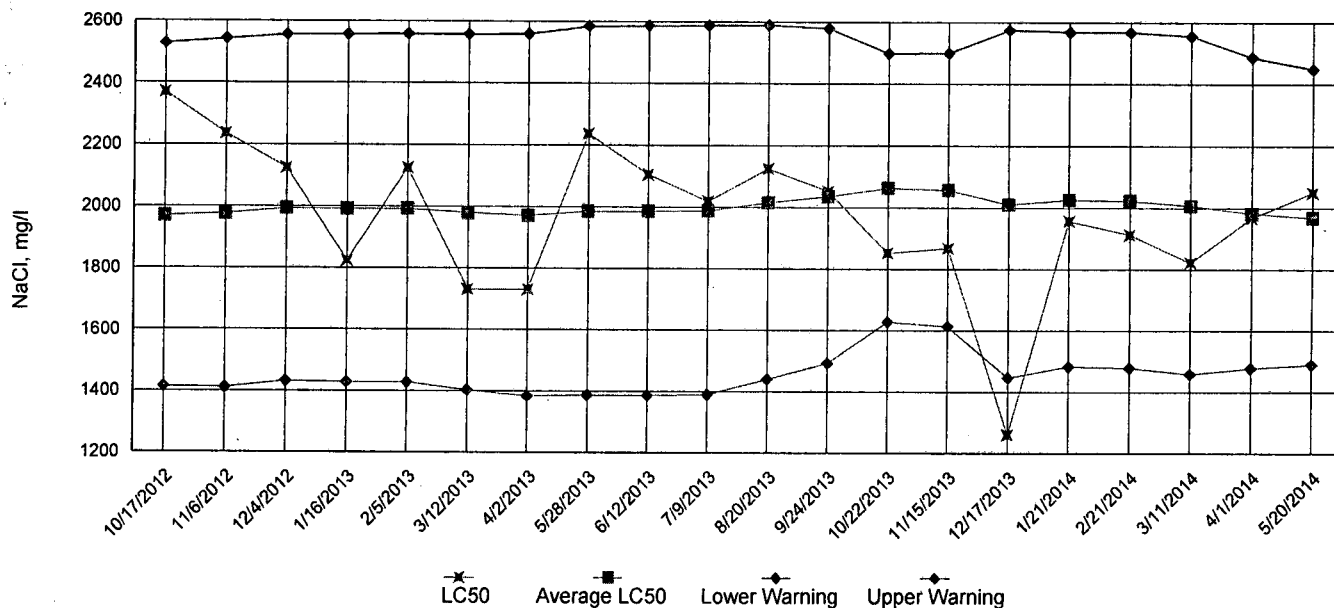


IC25 Growth Data

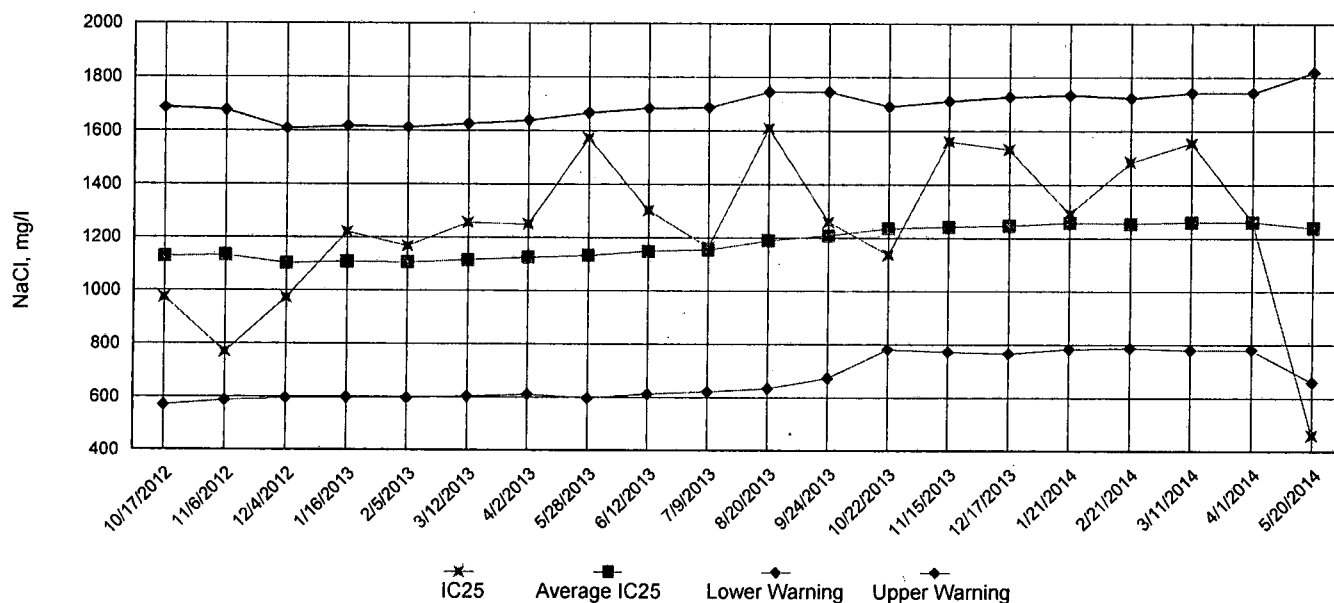


Appendix A4: Test 1002.0
Chronic Reference Toxicant, *Ceriodaphnia dubia*

LC50 Survival Data



IC25 Reproduction Data



Appendix B: Test 1000.0

SUMMARY REPORTING FORMS
CHRONIC BIOMONITORING
Pimephales promelas (Fathead Minnow)
SURVIVAL AND GROWTH

Permittee: Heber Springs Water & Sewer

NPDES No.: AR0022381 AFIN# 12-00029

Date and Time Test Initiated: May 20, 2014 at 1750

Date and Time Test Terminated: May 27, 2014 at 1620

Dilution water used: Synthetic Soft Water #4100

DATA TABLE FOR SURVIVAL

Effluent Conc. %	Percent Survival in replicate chambers					Mean percent survival			CV%
	A	B	C	D	E	24 hr	48 hr	7 days	
Control	100	100	100	100	100	100	100	100	0.00
3 %	100	100	100	100	100	100	100	100	0.00
5 %	100	100	87.5	100	100	100	100	97.5	5.73
6 %	100	100	100	100	100	100	100	100	0.00
8 %	100	100	100	100	100	100	100	100	0.00
11 %	100	100	100	100	100	100	100	100	0.00

DATA TABLE FOR GROWTH

Effluent Conc. %	Average dry weight, mg replicate chambers					Mean dry weight, mg	CV%
	A	B	C	D	E		
Control	0.358	0.475	0.446	0.436	0.444	0.432	10.1
3 %	0.420	0.411	0.419	0.444	0.426	0.424	2.92
5 %	0.384	0.404	0.432	0.439	0.472	0.426	7.93
6 %	0.398	0.355	0.458	0.424	0.441	0.415	9.71
8 %	0.384	0.395	0.432	0.502	0.480	0.439	11.8
11 %	0.416	0.429	0.412	0.444	0.388	0.418	4.99

CV = Coefficient of variation = standard deviation * 100 / mean

Appendix B: Test 1000.0

SUMMARY REPORTING FORMS
CHRONIC BIOMONITORING
Pimephales promelas (Fathead Minnow)
SURVIVAL AND GROWTH

1. Steel's Many-One Rank Test:

Is the mean survival significantly different ($p=0.05$) than the control survival for the % effluent corresponding to (lethality):

a.) LOW FLOW OR CRITICAL DILUTION	(8 %)	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
b.) 1/2 LOW FLOW DILUTION	(NA)	<input type="checkbox"/> YES	<input type="checkbox"/> NO

2. Dunnett's Test:

Is the mean dry weight (growth) significantly different ($p=0.05$) than the control's dry weight (growth) for the % effluent corresponding to (significant non-lethal effects):

a.) LOW FLOW OR CRITICAL DILUTION	(8 %)	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
b.) 1/2 LOW FLOW DILUTION	(NA)	<input type="checkbox"/> YES	<input type="checkbox"/> NO

3. If you answered NO to 1.a) enter [0] otherwise enter [1]: 0 (TLP6C)

4. If you answered NO to 2.a) enter [0] otherwise enter [1]: 0 (TGP6C)

5. NOEC Pimephales Lethality: 11 % (TOP6C)

6. LOEC Pimephales Lethality: 11 % (TXP6C)

7. NOEC Pimephales Sublethality: 11 % (TPP6C)

8. LOEC Pimephales Sublethality: 11 % (TYP6C)

9. Coefficient of variation for Pimephales growth: 11.8 (TQP6C)

Appendix B: Test 1002.0
SUMMARY REPORTING FORMS
CHRONIC BIOMONITORING
Ceriodaphnia dubia
SURVIVAL AND REPRODUCTION

Permittee: Heber Springs Water & Sewer

NPDES No.: AR0022381 AFIN# 12-00029

Date and Time Test Initiated: May 20, 2014 at 1515

Date and Time Test Terminated: May 27, 2014 at 1315

Dilution water used: Synthetic Soft Water #4100

PERCENT SURVIVAL

Time of Reading	Control	Percent Effluent				
		3 %	5 %	6 %	8 %	11 %
24 hour	100	100	100	100	100	100
48 hour	100	100	100	100	100	100
7 day	100	100	90.0	100	100	100

NUMBER OF YOUNG PRODUCED PER FEMALE @ 7 DAYS

Replicates	Control	Percent Effluent				
		3 %	5 %	6 %	8 %	11 %
A	22	29	31	29	29	27
B	25	27	4	27	27	27
C	23	30	30	28	31	25
D	25	30	17	23	27	34
E	8	34	25	30	29	28
F	16	29	32	28	25	30
G	23	29	26	27	32	31
H	22	34	16	31	29	30
I	21	32	32	30	31	32
J	20	34	35	35	30	29
Mean per Adult	20.5	30.8	24.8	28.8	29.0	29.3
Mean per Surviving Adult	20.5	30.8	27.1	28.8	29.0	29.3
CV %	24.9	8.21	24.9	10.8	7.45	9.11

CV = Coefficient of variation = standard deviation * 100 / mean
(calculated based on young produced by surviving females)

Appendix B: Test 1002.0
SUMMARY REPORTING FORMS
CHRONIC BIOMONITORING
Ceriodaphnia dubia
SURVIVAL AND REPRODUCTION

1. Fisher's Exact Test:

Is the mean survival significantly different ($p=0.05$) than the control survival for the % effluent corresponding to (lethality):

a.) LOW FLOW OR CRITICAL DILUTION	(8 %)	_____ YES	<u> X </u> NO
b.) 1/2 LOW FLOW DILUTION	(NA)	_____ YES	_____ NO

2. Steel's Many-One Rank Test:

Is the mean number of young produced per female significantly different ($p=0.05$) than the control's number of young per female for the % effluent corresponding to (significant non-lethal effects):

a.) LOW FLOW OR CRITICAL DILUTION	(8 %)	_____ YES	<u> X </u> NO
b.) 1/2 LOW FLOW DILUTION	(NA)	_____ YES	_____ NO

3. If you answered NO to 1.a) enter [0] otherwise enter [1]: 0 (TLP3B)
4. If you answered NO to 2.a) enter [0] otherwise enter [1]: 0 (TGP3B)
5. NOEC *Ceriodaphnia* Lethality: 11 % (TOP3B)
6. LOEC *Ceriodaphnia* Lethality: 11 % (TXP3B)
7. NOEC *Ceriodaphnia* Sublethality: 11 % (TPP3B)
8. LOEC *Ceriodaphnia* Sublethality: 11 % (TYP3B)
9. Coefficient of variation for *Ceriodaphnia* Reproduction: 24.9 (TQP3B)

Appendix B: Test 1002.0

CHRONIC TOXICITY SUMMARY FORM

Ceriodaphnia dubia

CHEMICAL PARAMETERS CHART

PERMITTEE: Heber Springs Water & Sewer SAMPLE No. 1 COLLECTED ending: DATE: May 20, 2014 TIME: 0800
 NPDES NO.: AR0022381 AFIN# 12-00029 SAMPLE No. 2 COLLECTED ending: DATE: May 21, 2014 TIME: 0800
 CONTACT: Mr. Sam Querry SAMPLE No. 3 COLLECTED ending: DATE: May 23, 2014 TIME: 0800
 ANALYST: 280, 304, 307, 310 Test Initiated: DATE: May 20, 2014 TIME: 1515
 Test Terminated: DATE: May 27, 2014 TIME: 1315

DILUTION Control	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.5	8.1	8.1	7.8	8.1	8.0	8.1
Final	8.1	8.0	7.8	7.5	7.6	8.0	7.4
pH Initial	7.6	7.2	7.2	7.4	7.6	7.6	7.5
Final	7.3	7.6	7.4	7.7	7.8	7.6	7.2
Alkalinity	30	NA	30	NA	30	NA	NA
Hardness	41	NA	45	NA	45	NA	NA
Conductivity	170	150	160	160	160	160	170
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 3 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.7	8.2	8.1	8.0	7.9	7.7	7.9
Final	8.1	8.0	7.7	7.5	7.5	8.2	7.4
pH Initial	7.6	7.2	7.2	7.3	7.6	7.6	7.4
Final	7.2	7.5	7.4	7.6	7.7	7.4	7.0
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	170	150	160	160	160	160	180
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 5 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.7	8.2	8.0	8.0	8.2	7.7	8.2
Final	8.0	8.2	7.8	7.5	7.3	8.0	7.5
pH Initial	7.5	7.2	7.3	7.3	7.5	7.5	7.4
Final	7.2	7.5	7.4	7.6	7.6	7.4	6.9
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	170	150	160	160	160	170	180
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 6 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.5	8.4	8.1	7.9	8.2	8.1	8.3
Final	8.0	7.9	7.7	7.5	7.5	8.1	7.5
pH Initial	7.6	7.2	7.3	7.3	7.6	7.6	7.4
Final	7.2	7.4	7.4	7.6	7.6	7.4	6.9
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	170	150	160	160	160	170	180
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 8 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.6	8.3	8.2	7.9	8.0	8.0	8.1
Final	8.1	8.0	7.8	7.5	7.7	8.2	7.3
pH Initial	7.5	7.2	7.3	7.3	7.5	7.5	7.4
Final	7.2	7.4	7.4	7.6	7.6	7.4	6.9
Alkalinity	33	NA	45	NA	33	NA	NA
Hardness	39	NA	41	NA	39	NA	NA
Conductivity	170	150	160	160	160	170	180
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 11 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.6	8.2	8.0	8.0	8.0	7.7	7.9
Final	7.9	8.0	7.7	7.5	7.6	8.1	7.4
pH Initial	7.5	7.2	7.2	7.3	7.5	7.5	7.3
Final	7.2	7.5	7.4	7.6	7.7	7.4	6.9
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	170	150	160	160	160	170	180
Chlorine	NA	NA	NA	NA	NA	NA	NA



CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: Heber Springs Water & Sewer			PO No. 14706		NO OF BOTTLES	ANALYSES REQUESTED ¹										AIC CONTROL NO: 178820								
Project: 2ND QUARTER CHRONIC			SAMPLE MATRIX			2ND QTR. BIOMONITORING CHRONIC										AIC PROPOSAL NO:								
Reference: BIOMONITORING			Project													Carrier/Tracking No. HEBER SPRINGS WATER								
Manager: Kent Latch			Sampled By: S.O. & JOY MASSEY												Received Temperature C 0.2 C									
AIC No.	Sample Identification	Date/Time Collected	GRAB	COMP	WATER	SOIL											Remarks							
	OUTFALL CO2A EFFL. H.S. W.WTP.	5/19/14 SAM		✓	✓																			
		5/20/14 SAM		24																				
Container Type			Preservative												Field pH calibration on @ Buffer:									
G = Glass NO = none			P = Plastic S = Sulfuric acid pH2		V = VOA vials. N = Nitric acid pH2		H = HCl to pH2 B = NaOH to pH12				T = Sodium Thiosulfate Z = Zinc acetate													
Turnaround Time Requested: (Please circle) NORMAL or EXPEDITED IN 7 DAYS					Relinquished By: Sam Query					Date/Time 8:11 AM 5-20-14					Received By: Tom Stanford					Date/Time 8:11 AM 5-20-14				
Expedited results requested by: Kent Latch					Relinquished By: Tom Stanford					Date/Time 5-20-14 10:25 AM					Received in Lab By: Query					Date/Time 5/20/14 1025				
Who should AIC contact with questions: SAM QUERY					Comments:																			
Phone: 501-362-3422 Fax: 501-362-3338																								
Report Attention to: Kent Latch																								
Report Address to: Heber Springs Water 1103 W. FRONT ST. Heber Springs, AR. 72543																								

PURCHASE ORDER

178820

HEBER SPRINGS WATER DEPT.

1108 West Front

Heber Springs, AR 72543

14706

Ph: 501-362-3422

Fax: 501-362-3338

5-20-14

TO AMERICAN INTERPLEX			SHIP TO		
ADDRESS			ADDRESS		
CITY	STATE	ZIP	CITY	STATE	ZIP

FOR	REQ. NO.	DATE REQUIRED	HOW SHIP	TERMS	DATE	
QUANTITY		PLEASE SUPPLY ITEMS LISTED BELOW			PRICE	UNIT
ORDERED	RECEIVED					
1						
2		2 ND QUARTER BIOMONITORING				
3						
4		S.Q.				
5		OUTFALL 002A				
6		H.S. W.W.T.P				
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						

IMPORTANT		PLEASE SEND COPIES OF YOUR INVOICE WITH ORIGINAL BILL OF LADING.	
OUR ORDER NUMBER MUST APPEAR ON ALL INVOICES, PACKAGES, ECT.			
PLEASE NOTIFY US IMMEDIATELY IF YOU ARE UNABLE TO SHIP COMPLETE ORDER BY DATE SPECIFIED.		PURCHASING AGENT	



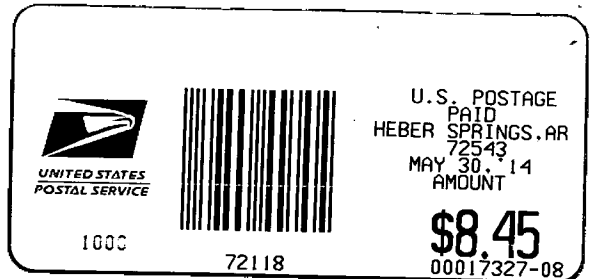
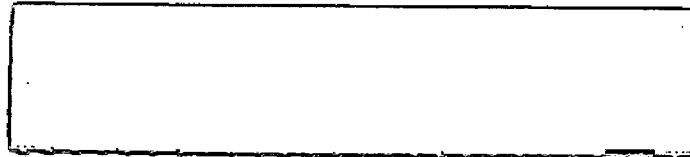
CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: <u>Heber Springs Water & Sewer</u>			PO No. <u>14706</u>		NO OF BOTTLES	ANALYSES REQUESTED <u>2ND QUARTER BIOMONITORING CHRONIC</u>										AIC CONTROL NO: <u>178820</u>		
Project: <u>2ND QUARTER</u>			SAMPLE MATRIX													AIC PROPOSAL NO:		
Reference: <u>BIOMONITORING CHRONIC</u>			Project: <u>Kent Latch</u>			Carrier/Tracking No. <u>Heber Springs W.</u>												
Manager: <u>Kent Latch</u>			By: <u>S.O. & Jory Massey</u>		Received Temperature C <u>11°C</u>													
Sampled			G R A B	C O M P	W A T E R	S O I L											Remarks	
AIC No.	Sample Identification	Date/Time Collected															Remarks	
<u>2</u>	<u>CUTFALL 002A</u> <u>Heber Springs W.</u>	<u>5/20/14 8AM</u> <u>5/21/14 8AM</u>		<u>24 HR</u>	<u>✓</u>													
Container Type			Preservative												Field pH calibration on _____ @ _____			
G = Glass NO = none			P = Plastic S = Sulfuric acid pH2		V = VOA vials N = Nitric acid pH2		H = HCl to pH2 B = NaOH to pH12				T = Sodium Thiosulfate Z = Zinc acetate				Buffer:			
Turnaround Time Requested: (Please circle) NORMAL or EXPEDITED IN <u>7</u> DAYS					Relinquished By: <u>Sam Query</u>			Date/Time <u>5-21-14 8AM</u>			Received By: <u>Tom Stanford</u>			Date/Time <u>5-21-14 8:00 AM</u>				
Expedited results requested by: <u>Kent Latch</u>					Relinquished By: <u>Tom Stanford</u>			Date/Time <u>5-21-14 10:35 AM</u>			Received in Lab By: <u>Jorge Hester</u>			Date/Time <u>5-21-14 1035</u>				
Who should AIC contact with questions: <u>SAM QUERY</u>					Comments:													
Phone: <u>501-362-3423</u> Fax: <u>501-362-3338</u>																		
Report Attention to: <u>Kent Latch</u>																		
Report Address to: <u>Heber Springs Water Dept.</u> <u>1108 W. FRONT ST.</u> <u>Heber Springs, AR. 72543</u>																		



CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: <u>Heber Springs Water & Sewer</u>			PO No. <u>14706</u>		NO OF BOTTLES	ANALYSES REQUESTED <u>2ND QUARTER BIOMONITORING CHRONIC</u>						AIC CONTROL NO: <u>178820</u>	
Project: <u>2ND QUARTER</u>			SAMPLE MATRIX									AIC PROPOSAL NO:	
Reference: <u>BIOMONITORING CHRONIC</u>			WATER		BOTTLES							Carrier/Tracking No. <u>Heber Springs W.S.</u>	
Project Manager: <u>Kent Latch</u>			SOIL									Received Temperature C <u>1.8</u>	
Sampled By: <u>S.O. JOEY MASSERY</u>			G	C	BOTTLES							Remarks	
AIC No.	Sample Identification	Date/Time Collected	A	P								Remarks	
<u>3</u>	<u>W.F. FRONT ST. HEBER SPRINGS, AR</u>	<u>5-22-14 8AM</u> <u>5-23-14 8AM</u>		<u>24 HR</u>	<u>3</u>							Field pH calibration on _____ @ _____ Buffer: _____	
			Container Type										
			Preservative										
G = Glass NO = none			P = Plastic S = Sulfuric acid pH2		V = VOA vials N = Nitric acid pH2		H = HCl to pH2 B = NaOH to pH12		T = Sodium Thiosulfate Z = Zinc acetate				
Turnaround Time Requested: (Please circle) NORMAL or EXPEDITED IN <u>7</u> DAYS					Relinquished By:		Date/Time		Received By:		Date/Time		
Expedited results requested by: <u>Kent Latch</u>					Relinquished By:		Date/Time <u>9:15AM</u>		Received in Lab By: <u>[Signature]</u>		Date/Time <u>8/23/14</u> <u>9:15am</u>		
Who should AIC contact with questions: <u>SAM QUERRY</u>					Comments								
Phone: <u>501-362-3422</u> Fax: <u>501-362-3338</u>													
Report Attention to: <u>Kent Latch</u>													
Report Address to: <u>Heber Springs Water Dept</u> <u>1103 W. FRONT STREET</u> <u>Heber Springs, AR 72543</u>													



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Heber Springs Water & Sewer Dept.
1108 W. Front St.
Heber Springs, AR 72543
PH: 501-362-5501 FAX: 501-362-3338

TO:

ADEQ
5301 Northshore Drive
North Little Rock, AR 72118-5317

