

June 12, 2015

Test Results of
Second Quarter
Chronic 7-Day Renewal
Biomonitoring Testing
for
Effluent
Searcy, AR

Control No. 191061-1

Prepared for:

Mr. Paul Abernathy
Searcy Water and Sewer System
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Prepared by:

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Searcy Water and Sewer System
ATTN: Mr. Paul Abernathy
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Re: Chronic 7-Day Renewal utilizing *Pimephales promelas* (Fathead minnow) and *Ceriodaphnia dubia*
Effluent - Searcy, AR
NPDES Permit No. AR0021601 AFIN# 73-00055

Dear Mr. Paul Abernathy:

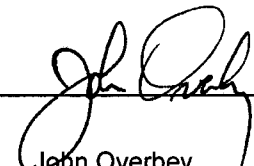
This report is the analytical results and supporting information for the samples submitted to American Interplex Corporation (AIC). The following results are applicable only to the sample identified by the control number referenced above. Accurate assessment of the data requires access to the entire 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 25 % effluent, which is above the critical dilution of 19 %. The NOEC for growth occurred at 25 % effluent, which is above the critical dilution of 19 %. **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 25 % effluent, which is above the critical dilution of 19 %. The NOEC for reproduction occurred at 25 % effluent, which is above the critical dilution of 19 %. **The sample, therefore, PASSED both lethal and sub-lethal effects for the *Ceriodaphnia dubia* test.**

AMERICAN INTERPLEX CORPORATION


John Overbey
Laboratory Director

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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	0.373	PASS
Control Growth CV < or = 40%	7.43	PASS
Growth Minimum Significant Difference 12 to 30%	13.1	PASS
Critical Dilution CV < or = 40%	7.35	PASS

Ceriodaphnia dubia Method 1002.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	100	PASS
Control Reproduction > or = 15 per Surviving Female	18.0	PASS
Control CV < or = 40% per Surviving Female	30.8	PASS
Reproduction Minimum Significant Difference 13 to 47%	34.8	PASS
Critical Dilution CV < or = 40%	20.6	PASS

II. Outlined Report

A. Introduction

1. Permit Number: AR0021601 AFIN# 73-00055
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: Effluent
- b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	7.4	7.9	7.4
pH (standard units)	6.6	6.7	7.0
Alkalinity (mg/l as CaCO ₃)	27	29	29
Hardness (mg/l as CaCO ₃)	40	42	42
Conductivity (umhos/cm)	180	180	200
Residual Chlorine (mg/l)	<0.05	<0.05	<0.05
Ammonia as N (mg/l)	<0.1	0.14	0.23

2. Dilution Water Samples: Synthetic Soft Water #4220

- a. Dates Prepared: May 22 through June 5, 2015
- b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	7.7	7.2	7.8
pH (standard units)	7.4	7.5	7.6
Alkalinity (mg/l as CaCO ₃)	30	30	30
Hardness (mg/l as CaCO ₃)	42	42	43
Conductivity (umhos/cm)	140	140	140
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: June 3, 2015 at 1050
Date & Time Test Terminated: June 10, 2015 at 1020
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: June 3, 2015 at 1530
Date & Time Test Terminated: June 9, 2015 at 1350
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 Bartlett's test and analyzed with Dunnett's 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 May 26, 2015 at 1450 to June 2, 2015 at 1315

The results were as follows: (Control No. 190396-1.)

Survival LC-50: 1884 mg/l

Growth IC-25: 2236 mg/l

Growth PMSD: 17.9

Ceriodaphnia dubia

Chronic reference tests are performed monthly.

A chronic reference test was performed on May 13, 2015 at 1730 to May 19, 2015 at 1630

The results were as follows: (Control No. 190396-2.)

Survival LC-50: 1732 mg/l

Growth IC-25: 928.9 mg/l

Growth PMSD: 12

V. Chemical Analysis/Quality Control

Parameter	Method	% Recovery	Relative % Difference
Alkalinity	SM 2320 B	NA	0.00
Hardness	EPA 200.7	97.7	0.309
pH	SM 4500-H+ B	101	0.00
Conductivity	EPA 120.1	91.8	7.83

VI. Organism History

Pimephales promelas (Fathead minnow)

Date: June 3, 2015

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: June 3, 2015

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

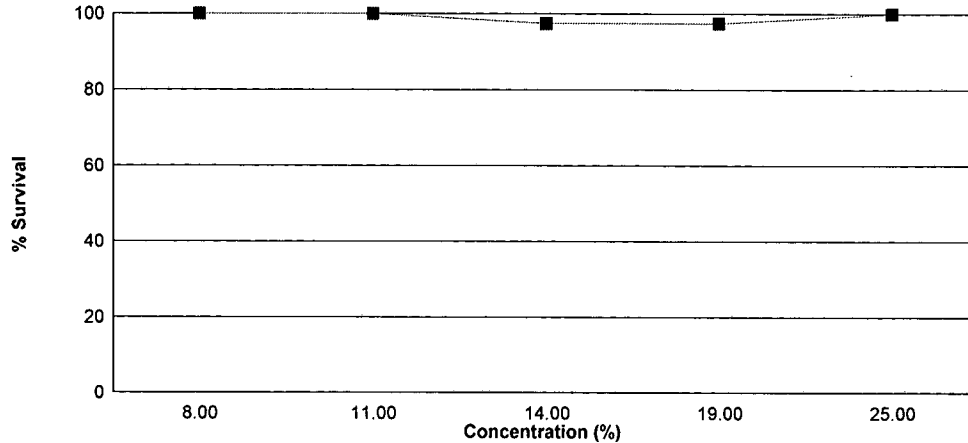
Larvae are exposed in a static renewal system for seven days to different concentrations of effluent with dilution water. Test results are based on the survival and growth (increase in weight) of the larvae.

Effluent dilutions for this test were 8 %, 11 %, 14 %, 19 %, 25 % in accordance with the NPDES permit.

The low flow or 'critical' dilution is specified in the NPDES permit as 19 % effluent.

The test was initiated on June 3, 2015 at 1050 and continued through June 10, 2015 at 1020. Statistical analyses were performed on the observed data and the no observable effects concentrations (NOECs) were as follows:

- a.) NOEC survival = 25 % effluent
- b.) NOEC growth = 25 % effluent



Summary of the 7-day Fathead Minnow Survival and Growth		
Concentration	Percent Survival	Mean Growth (mg)
Control	100	0.373
8 %	100	0.354
11 %	100	0.356
14 %	97.5	0.348
19 %	97.5	0.358
25 %	100	0.352

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

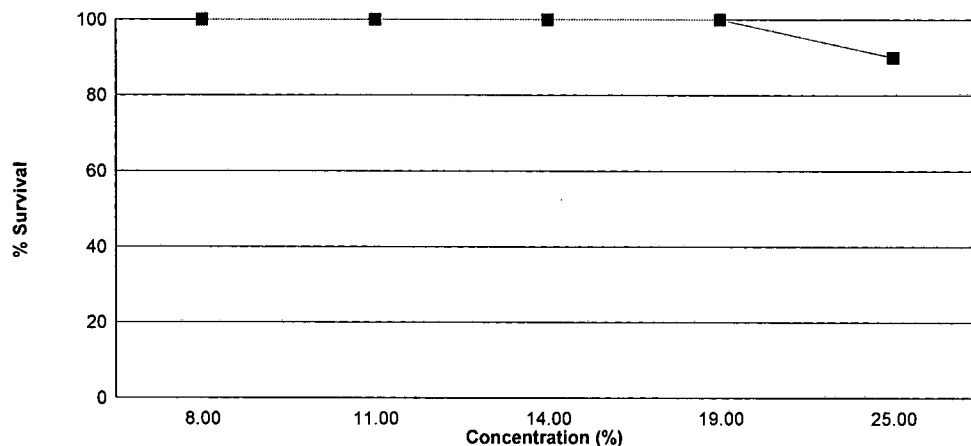
Neonates are exposed in a static renewal system to different concentrations of effluent with dilution water until 60% of surviving control organisms have three broods of offspring with an average of at least 15 young per female.

Effluent dilutions for this test were 8 %, 11 %, 14 %, 19 %, 25 % in accordance with the NPDES permit.

The low flow or 'critical' dilution is specified in the NPDES permit as 19 % effluent.

The test was initiated on June 3, 2015 at 1530 and continued through June 9, 2015 at 1350. Statistical analyses were performed on the observed data and the no observable effects concentrations (NOECs) were as follows:

- a.) NOEC survival = 25 % effluent
- b.) NOEC reproduction = 25 % effluent



Concentration	Percent Survival	Mean Reproduction
Control	100	18.0
8 %	100	18.2
11 %	100	24.0
14 %	100	24.8
19 %	100	26.9
25 %	90.0	24.6

Appendix A1: Test 1000.0

Pimephales promelas (Fathead Minnow) 7-Day Survival

Date and Time Test Initiated: June 3, 2015 at 1050

Date and Time Test Terminated: June 10, 2015 at 1020

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
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
14 %	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	7	7	7	7	7
	E	8	8	8	8	8	8	8
19 %	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	7	7	7	7	7
25 %	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: June 3, 2015 at 1050
Test Terminated: June 10, 2015 at 1020

Drying Started: June 4, 2015 at 1045
Drying Ended: June 11, 2015 at 1425

Concentration	Replicate	Weight of pan	Weight of pan + fish	Total weight of fish (g)	Original # of fish	Mean dry weight (mg)
Control	A	.93451	.93725	0.00274	8	0.342
	B	.93685	.93996	0.00311	8	0.389
	C	.94013	.94323	0.00310	8	0.388
	D	.94149	.94424	0.00275	8	0.344
	E	.94101	.94422	0.00321	8	0.401
8 %	A	.93720	.94002	0.00282	8	0.352
	B	.93762	.94050	0.00288	8	0.360
	C	.94159	.94384	0.00225	8	0.281
	D	.94359	.94692	0.00333	8	0.416
	E	.94631	.94919	0.00288	8	0.360
11 %	A	.94804	.95124	0.00320	8	0.400
	B	.94733	.95013	0.00280	8	0.350
	C	.94320	.94585	0.00265	8	0.331
	D	.94121	.94405	0.00284	8	0.355
	E	.93792	.94066	0.00274	8	0.342
14 %	A	.93782	.94041	0.00259	8	0.324
	B	.93720	.93982	0.00262	8	0.328
	C	.93521	.93844	0.00323	8	0.404
	D	.93501	.93749	0.00248	8	0.310
	E	.93383	.93684	0.00301	8	0.376
19 %	A	.93771	.94086	0.00315	8	0.394
	B	.93900	.94186	0.00286	8	0.358
	C	.93970	.94267	0.00297	8	0.371
	D	.94016	.94278	0.00262	8	0.328
	E	.93632	.93902	0.00270	8	0.338
25 %	A	.93576	.93856	0.00280	8	0.350
	B	.93776	.94063	0.00287	8	0.359
	C	.93869	.94172	0.00303	8	0.379
	D	.94040	.94299	0.00259	8	0.324
	E	.94560	.94840	0.00280	8	0.350

Appendix A1: Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

Date and Time Test Initiated: June 3, 2015 at 1530

Date and Time Test Terminated: June 9, 2015 at 1350

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	10	0.00
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00
3	0	0	4	0	0	4	0	0	0	0	8	10	0.800
4	2	5	0	2	7	0	3	6	5	4	34	10	3.40
5	8	7	8	7	4	7	8	11	5	7	72	10	7.20
6	9	10	10	9	8	11	0	9	0	0	66	10	6.60
7													
8													
TOTAL	19	22	22	18	19	22	11	26	10	11	180	10	18.0

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	4	4	0	5	0	0	0	0	13	10	1.30
4	4	2	0	0	6	0	6	5	6	5	34	10	3.40
5	8	7	7	8	7	8	7	0	8	9	69	10	6.90
6	11	11	12	11	0	11	10	0	0	0	66	10	6.60
7													
8													
TOTAL	23	20	23	23	13	24	23	5	14	14	182	10	18.2

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	3	0	2	2	5	4	0	0	0	0	16	10	1.60
4	0	2	0	0	0	0	7	3	5	2	19	10	1.90
5	10	10	7	12	10	12	10	7	11	7	96	10	9.60
6	11	13	13	17	16	13	12	0	0	14	109	10	10.9
7													
8													
TOTAL	24	25	22	31	31	29	29	10	16	23	240	10	24.0

Appendix A1: Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

Date and Time Test Initiated: June 3, 2015 at 1530

Date and Time Test Terminated: June 9, 2015 at 1350

Concentration: 14 %														
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	2	2	4	4	3	4	0	0	0	0	19	10	1.90	
4	0	0	0	0	0	0	6	6	7	5	24	10	2.40	
5	8	7	10	10	9	6	7	8	10	8	83	10	8.30	
6	13	14	19	17	15	14	9	0	12	9	122	10	12.2	
7														
8														
TOTAL	23	23	33	31	27	24	22	14	29	22	248	10	24.8	

Concentration: 19 %													
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	3	4	5	5	5	4	0	0	0	0	26	10	2.60
4	0	0	0	0	0	0	5	6	5	6	22	10	2.20
5	7	8	10	11	10	10	11	9	10	8	94	10	9.40
6	14	19	16	18	13	13	14	10	10	0	127	10	12.7
7													
8													
TOTAL	24	31	31	34	28	27	30	25	25	14	269	10	26.9

Concentration: 25 %													
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	X	0	0	0	0	9	0.00
3	5	5	6	4	4	3	X	0	0	0	27	9	3.00
4	0	0	0	0	0	0	X	4	5	5	14	9	1.56
5	11	11	11	11	10	8	X	12	7	10	91	9	10.1
6	15	13	15	17	15	17	X	12	10	0	114	9	12.7
7													
8													
TOTAL	31	29	32	32	29	28	0	28	22	15	246	10	24.6

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	8 %	1	1.00000	1.39310
2	8 %	2	1.00000	1.39310
2	8 %	3	1.00000	1.39310
2	8 %	4	1.00000	1.39310
2	8 %	5	1.00000	1.39310
3	11 %	1	1.00000	1.39310
3	11 %	2	1.00000	1.39310
3	11 %	3	1.00000	1.39310
3	11 %	4	1.00000	1.39310
3	11 %	5	1.00000	1.39310
4	14 %	1	1.00000	1.39310
4	14 %	2	1.00000	1.39310
4	14 %	3	1.00000	1.39310
4	14 %	4	0.87500	1.20940
4	14 %	5	1.00000	1.39310
5	19 %	1	1.00000	1.39310
5	19 %	2	1.00000	1.39310
5	19 %	3	1.00000	1.39310
5	19 %	4	1.00000	1.39310
5	19 %	5	0.87500	1.20940
6	25 %	1	1.00000	1.39310
6	25 %	2	1.00000	1.39310
6	25 %	3	1.00000	1.39310
6	25 %	4	1.00000	1.39310
6	25 %	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 = 0.05399 W = 0.5466 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	8 %	27.50	16.00	5.00	
3	11 %	27.50	16.00	5.00	
4	14 %	25.00	16.00	5.00	
5	19 %	25.00	16.00	5.00	
6	25 %	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 = 0.02578 W = 0.9797 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 = 3.868 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	0.001787	0.0003574	0.3328	
Within (Error)	24	0.02578	0.001074		
Total	29	0.02757			
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	0.3728	0.3728		
2	8 %	0.3538	0.3538	0.9167	
3	11 %	0.3556	0.3556	0.8298	
4	14 %	0.3484	0.3484	1.177	
5	19 %	0.3578	0.3578	0.7237	
6	25 %	0.3524	0.3524	0.9842	
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	8 %	5	0.04892	13.1	0.019
3	11 %	5	0.04892	13.1	0.0172
4	14 %	5	0.04892	13.1	0.0244
5	19 %	5	0.04892	13.1	0.015
6	25 %	5	0.04892	13.1	0.0204

Appendix A2: Statistics

Ceriodaphnia dubia Survival

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.

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.

Fisher's Exact Test			
Identification	Alive	Dead	Total Animals
Control	10	0	10
14 %	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
19 %	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
25 %	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.

Summary of Fisher's Exact Test				
Group	Identification	Exposed	Dead	Sig 0.05
0	Control	10	0	
1	8 %	10	0	
2	11 %	10	0	
3	14 %	10	0	
4	19 %	10	0	
5	25 %	10	1	

Appendix A2: Statistics

Ceriodaphnia dubia Reproduction

Kolmogorov Test for Normality	No Transformation
<p>D = 0.1318 D* = 1.034 Critical D* = 1.035 (alpha = 0.01, N = 60)</p> <p>Data PASS normality test (alpha = 0.01).</p>	

Bartlett's Test for Homogeneity of Variance	No Transformation
<p>Calculated B1 statistic = 5.623 Critical B = 15.086 (alpha = 0.01, df = 5)</p> <p>Data PASS B1 homogeneity test at 0.01 level.</p>	

Appendix A2: Statistics

Ceriodaphnia dubia Reproduction

ANOVA Table				No Transformation	
SOURCE	DF	SS	MS	F	
Between	5	696.8	139.4	2.992	
Within (Error)	54	2516	46.59		
Total	59	3213			
Critical F = 3.38 (alpha = 0.01, df = 5,54)					
2.38 (alpha = 0.05, df = 5,54)					
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	18	18		
2	8 %	18.2	18.2	-0.06552	
3	11 %	24	24	-1.966	
4	14 %	24.8	24.8	-2.228	
5	19 %	26.9	26.9	-2.916	
6	25 %	24.6	24.6	-2.162	
Dunnett's critical value = 2.31 (1 Tailed, alpha = 0.05, df [used] = 5,40) (Actual df = 5,54)					

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	8 %	10	7.051	39.2	-0.2
3	11 %	10	7.051	39.2	-6
4	14 %	10	7.051	39.2	-6.8
5	19 %	10	7.051	39.2	-8.9
6	25 %	10	7.051	39.2	-6.6

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	842.8	168.6	4.846	
Within (Error)	53	1844	34.79		
Total	58	2687			
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	18	18			
2	8 %	18.2	18.2	-0.07582		
3	11 %	24	24	-2.275		
4	14 %	24.8	24.8	-2.578		
5	19 %	26.9	26.9	-3.374		
6	25 %	27.333	27.333	-3.444		
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	8 %	10	6.093	33.8	-0.2		
3	11 %	10	6.093	33.8	-6		
4	14 %	10	6.093	33.8	-6.8		
5	19 %	10	6.093	33.8	-8.9		
6	25 %	9	6.26	34.8	-9.333		

Appendix A3: Water Chemistry
Routine Chemical and Physical Data

Date and Time Test Initiated: June 3, 2015 at 1004
Date and Time Test Terminated: June 10, 2015 at 1020

Effluent Conc.: Control	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	
DO, mg/l	Initial	7.7	7.7	7.2	7.7	7.8	7.6	7.6
	Final *1	7.3	6.8	7.3	7.7	7.0	7.0	7.0
	Final *2	7.6	7.5	7.0	7.3	8.0	7.5	
pH, units	Initial	7.4	7.6	7.5	7.6	7.6	7.4	7.4
	Final *1	7.5	7.5	7.4	7.6	7.3	7.3	7.5
	Final *2	7.8	7.7	7.7	7.7	7.8	7.8	
Alkalinity, mg CaCO ₃ /l	30	NA	30	NA	30	NA	NA	
Hardness, mg CaCO ₃ /l	42	NA	42	NA	43	NA	NA	
Conductivity, umhos/cm	140	140	140	130	140	140	120	
Res. Chlorine, mg/l	<0.05	NA	<0.05	NA	<0.05	NA	NA	

Effluent Conc.: 8 %	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	
DO, mg/l	Initial	7.7	7.6	8.3	7.3	7.4	7.6	7.5
	Final *1	7.3	7.1	7.1	7.9	7.0	6.7	7.1
	Final *2	7.3	7.3	7.4	7.7	7.8	7.5	
pH, units	Initial	7.4	7.6	7.5	7.4	7.6	7.3	7.2
	Final *1	7.5	7.4	7.4	7.5	7.2	7.2	7.5
	Final *2	7.8	7.6	7.6	7.6	7.7	7.7	

Effluent Conc.: 11 %	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	
DO, mg/l	Initial	7.6	7.0	8.2	7.3	7.4	7.9	7.6
	Final *1	7.3	6.9	6.9	7.6	7.1	7.0	7.1
	Final *2	7.4	7.3	7.5	7.6	7.7	7.4	
pH, units	Initial	7.4	7.6	7.4	7.4	7.5	7.4	7.4
	Final *1	7.5	7.3	7.3	7.5	7.3	7.4	7.5
	Final *2	7.8	7.7	7.6	7.6	7.7	7.7	

Appendix A3: Water Chemistry

Routine Chemical and Physical Data

Date and Time Test Initiated: June 3, 2015 at 1004
Date and Time Test Terminated: June 10, 2015 at 1020

Effluent Conc.: 14 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.3	7.3	8.3	7.7	7.8	7.7	7.5
	Final *1	7.0	7.2	7.3	7.5	7.2	6.9	6.8
	Final *2	7.6	7.5	7.6	7.7	7.8	7.6	
pH, units	Initial	7.4	7.5	7.4	7.3	7.5	7.3	7.4
	Final *1	7.5	7.3	7.3	7.5	7.3	7.2	7.4
	Final *2	7.7	7.6	7.6	7.6	7.6	7.7	

Effluent Conc.: 19 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.6	7.6	8.2	7.9	7.9	7.7	7.4
	Final *1	7.1	7.2	7.2	7.5	7.4	7.1	7.1
	Final *2	6.9	7.2	7.0	7.5	7.7	7.4	
pH, units	Initial	7.3	7.5	7.4	7.2	7.5	7.3	7.3
	Final *1	7.4	7.3	7.3	7.5	7.3	7.3	7.4
	Final *2	7.7	7.6	7.6	7.6	7.6	7.7	
Alkalinity, mg CaCO ₃ /l		31	NA	34	NA	30	NA	NA
Hardness, mg CaCO ₃ /l		43	NA	46	NA	42	NA	NA
Conductivity, umhos/cm		140	140	140	140	150	150	140
Res. Chlorine, mg/l		<0.05	NA	<0.05	NA	<0.05	NA	NA

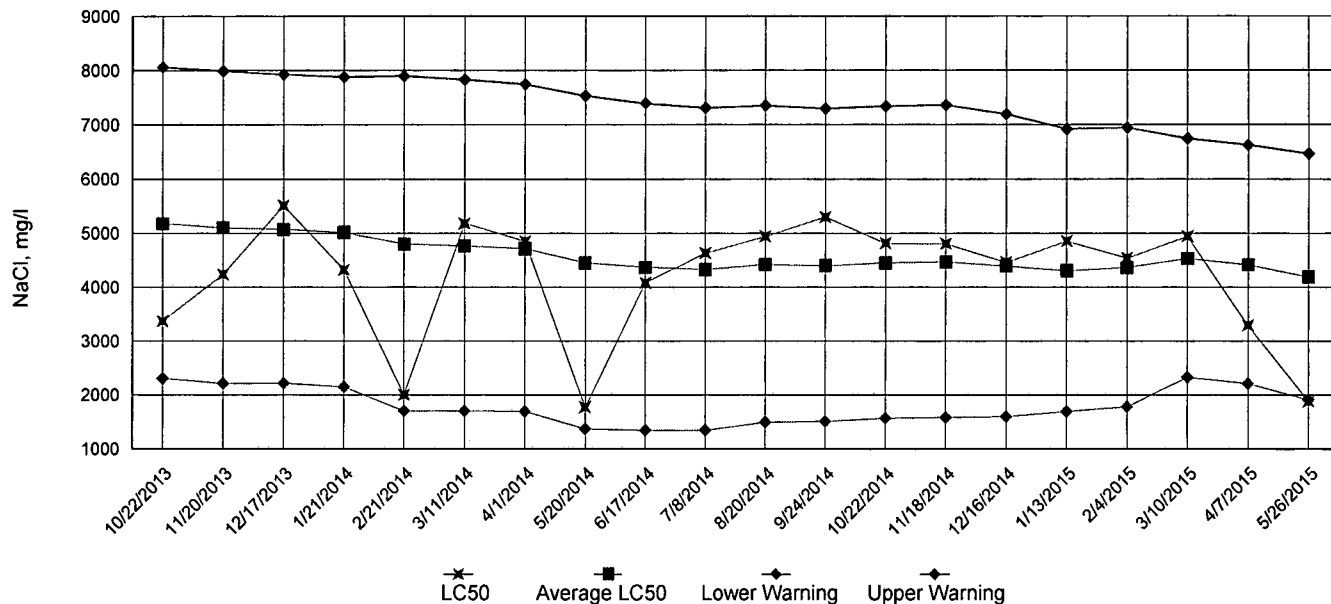
Effluent Conc.: 25 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.6	7.2	8.1	7.4	7.4	7.7	7.4
	Final *1	7.3	6.7	7.2	7.7	7.4	7.2	6.6
	Final *2	7.4	7.5	7.4	7.5	7.8	7.6	
pH, units	Initial	7.2	7.4	7.4	7.2	7.5	7.3	7.2
	Final *1	7.5	7.2	7.3	7.5	7.3	7.3	7.4
	Final *2	7.7	7.6	7.6	7.7	7.6	7.7	

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

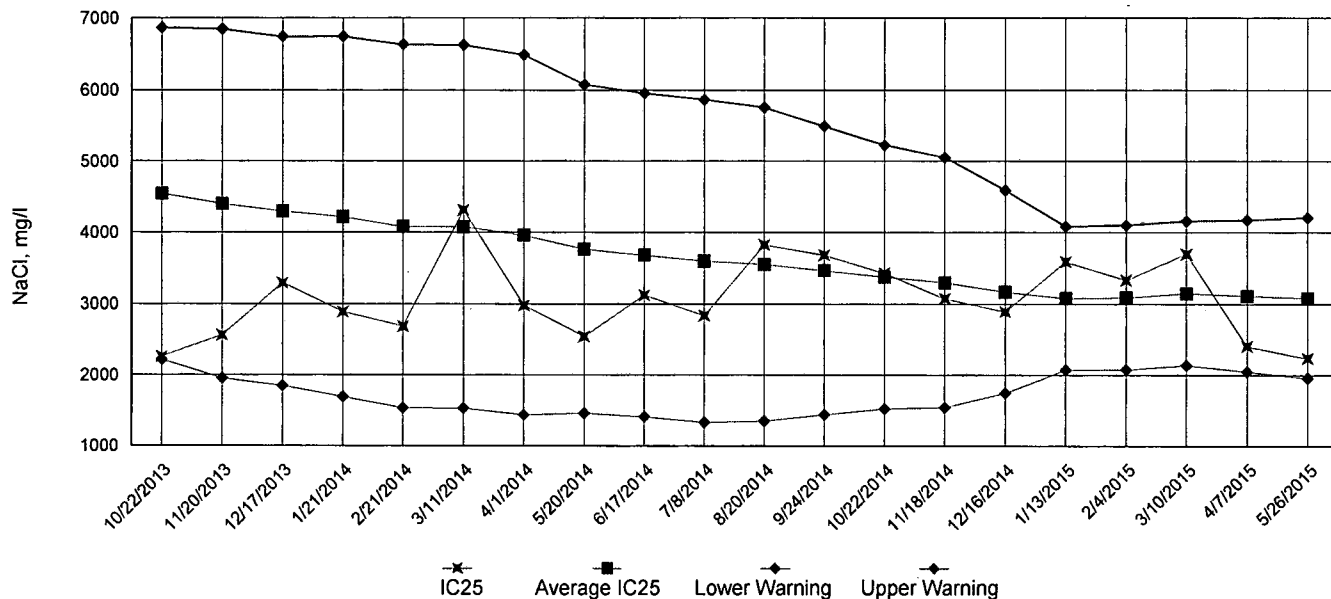
Appendix A4: Test 1000.0

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

LC50 Survival Data

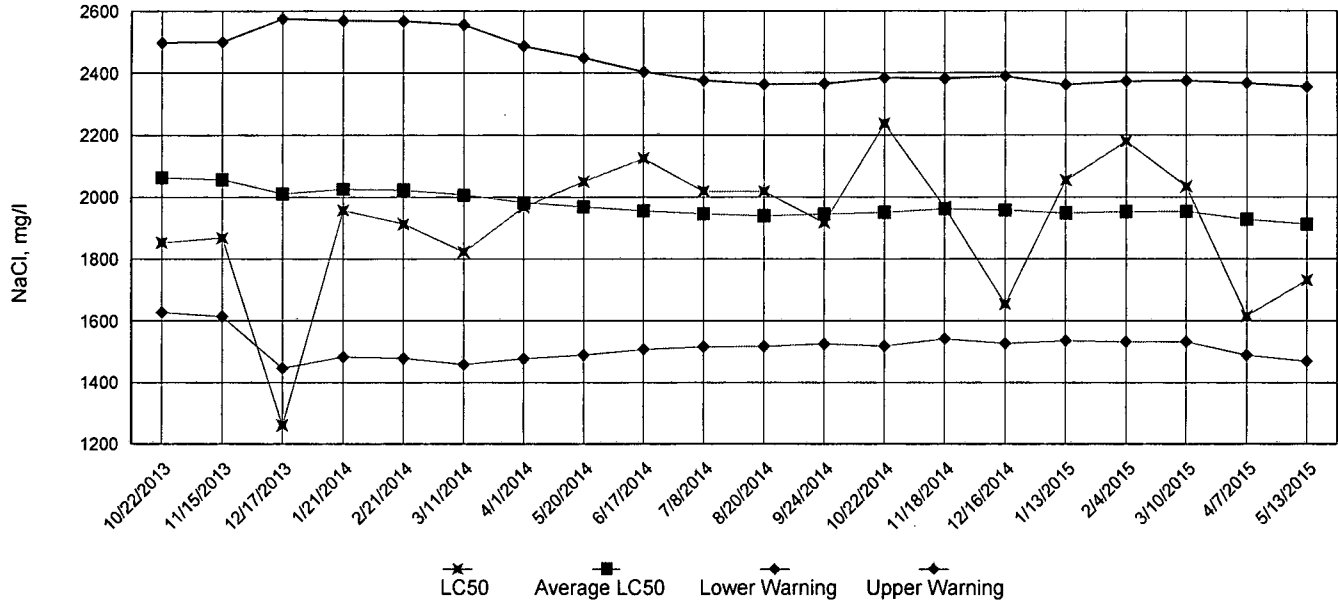


IC25 Growth Data

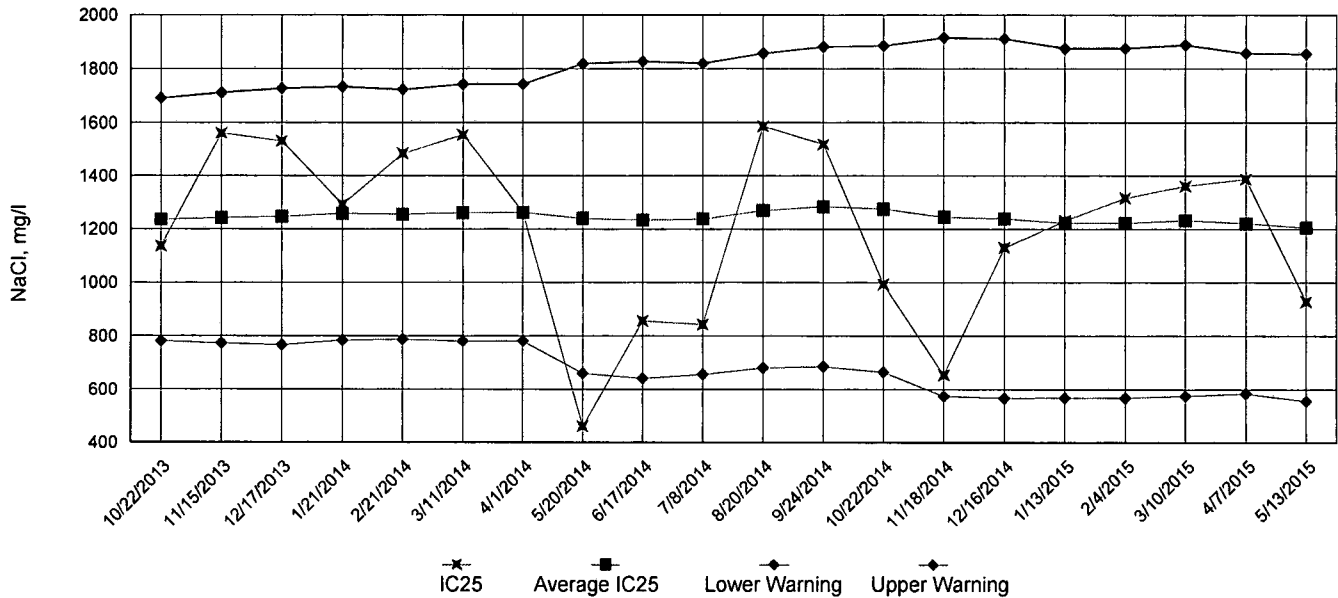


Appendix A4: Test 1002.0
Chronic Reference Toxicant, *Ceriodaphnia dubia*

LC50 Survival Data



IC25 Reproduction Data



Appendix B: Test 1000.0

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

Permittee: Searcy Water and Sewer System

NPDES No.: AR0021601 AFIN# 73-00055

Date and Time Test Initiated: June 3, 2015 at 1050

Date and Time Test Terminated: June 10, 2015 at 1020

Dilution water used: Synthetic Soft Water #4220

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
8 %	100	100	100	100	100	100	100	100	0.00
11 %	100	100	100	100	100	100	100	100	0.00
14 %	100	100	100	87.5	100	100	100	97.5	5.73
19 %	100	100	100	100	87.5	100	100	97.5	5.73
25 %	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	0.342	0.389	0.388	0.344	0.401	0.373	7.43
8 %	0.352	0.360	0.281	0.416	0.360	0.354	13.6
11 %	0.400	0.350	0.331	0.355	0.342	0.356	7.43
14 %	0.324	0.328	0.404	0.310	0.376	0.348	11.4
19 %	0.394	0.358	0.371	0.328	0.338	0.358	7.35
25 %	0.350	0.359	0.379	0.324	0.350	0.352	5.62

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	(19 %)	<u> </u> YES	<u> X </u> NO
b.) 1/2 LOW FLOW DILUTION	(NA)	<u> </u> YES	<u> </u> 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	(19 %)	<u> </u> YES	<u> X </u> NO
b.) 1/2 LOW FLOW DILUTION	(NA)	<u> </u> YES	<u> </u> 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: 25 % (TOP6C)

6. LOEC Pimephales Lethality: 25 % (TXP6C)

7. NOEC Pimephales Sublethality: 25 % (TPP6C)

8. LOEC Pimephales Sublethality: 25 % (TYP6C)

9. Coefficient of variation for Pimephales growth: 7.43 (TQP6C)

Appendix B: Test 1000.0

CHRONIC TOXICITY SUMMARY FORM
Pimephales promelas (Fathead minnow)
CHEMICAL PARAMETERS CHART

PERMITTEE: Searcy Water and Sewer System SAMPLE No. 1 COLLECTED ending: DATE: June 2, 2015 TIME: 1145
 NPDES NO.: AR0021601 AFIN# 73-00055 SAMPLE No. 2 COLLECTED ending: DATE: June 4, 2015 TIME: 1145
 CONTACT: Mr. Paul Abernathy SAMPLE No. 3 COLLECTED ending: DATE: June 7, 2015 TIME: 1145
 ANALYST: 280, 304, 310, 314 Test Initiated: DATE: June 3, 2015 TIME: 1050
 Test Terminated: DATE: June 10, 2015 TIME: 1020

DILUTION Control	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	7.7	7.2	7.7	7.8	7.6	7.6
Final	7.3	6.8	7.3	7.7	7.0	7.0	7.0
pH Initial	7.4	7.6	7.5	7.6	7.6	7.4	7.4
Final	7.5	7.5	7.4	7.6	7.3	7.3	7.5
Alkalinity	30	NA	30	NA	30	NA	NA
Hardness	42	NA	42	NA	43	NA	NA
Conductivity	140	140	140	130	140	140	120
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 8 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	7.6	8.3	7.3	7.4	7.6	7.5
Final	7.3	7.1	7.1	7.9	7.0	6.7	7.1
pH Initial	7.4	7.6	7.5	7.4	7.6	7.3	7.2
Final	7.5	7.4	7.4	7.5	7.2	7.2	7.5
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	140	140	140	140	140	140	140
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 11 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.6	7.0	8.2	7.3	7.4	7.9	7.6
Final	7.3	6.9	6.9	7.6	7.1	7.0	7.1
pH Initial	7.4	7.6	7.4	7.4	7.5	7.4	7.4
Final	7.5	7.3	7.3	7.5	7.3	7.4	7.5
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	140	140	140	140	140	140	140
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 14 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.3	7.3	8.3	7.7	7.8	7.7	7.5
Final	7.0	7.2	7.3	7.5	7.2	6.9	6.8
pH Initial	7.4	7.5	7.4	7.3	7.5	7.3	7.4
Final	7.5	7.3	7.3	7.5	7.3	7.2	7.4
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	140	140	140	140	150	150	140
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 19 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.6	7.6	8.2	7.9	7.9	7.7	7.4
Final	7.1	7.2	7.2	7.5	7.4	7.1	7.1
pH Initial	7.3	7.5	7.4	7.2	7.5	7.3	7.3
Final	7.4	7.3	7.3	7.5	7.3	7.3	7.4
Alkalinity	31	NA	34	NA	30	NA	NA
Hardness	43	NA	46	NA	42	NA	NA
Conductivity	140	140	140	140	150	150	140
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 25 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.6	7.2	8.1	7.4	7.4	7.7	7.4
Final	7.3	6.7	7.2	7.7	7.4	7.2	6.6
pH Initial	7.2	7.4	7.4	7.2	7.5	7.3	7.2
Final	7.5	7.2	7.3	7.5	7.3	7.3	7.4
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	150	140	150	150	160	150	150
Chlorine	NA	NA	NA	NA	NA	NA	NA

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

Permittee: Searcy Water and Sewer System

NPDES No.: AR0021601 AFIN# 73-00055

Date and Time Test Initiated: June 3, 2015 at 1530

Date and Time Test Terminated: June 9, 2015 at 1350

Dilution water used: Synthetic Soft Water #4220

PERCENT SURVIVAL

Time of Reading	Control	Percent Effluent				
		8 %	11 %	14 %	19 %	25 %
24 hour	100	100	100	100	100	100
48 hour	100	100	100	100	100	90.0
6 day	100	100	100	100	100	90.0

NUMBER OF YOUNG PRODUCED PER FEMALE @ 6 DAYS

Replicates	Control	Percent Effluent				
		8 %	11 %	14 %	19 %	25 %
A	19	23	24	23	24	31
B	22	20	25	23	31	29
C	22	23	22	33	31	32
D	18	23	31	31	34	32
E	19	13	31	27	28	29
F	22	24	29	24	27	28
G	11	23	29	22	30	0
H	26	5	10	14	25	28
I	10	14	16	29	25	22
J	11	14	23	22	14	15
Mean per Adult	18.0	18.2	24.0	24.8	26.9	24.6
Mean per Surviving Adult	18.0	18.2	24.0	24.8	26.9	27.3
CV %	30.8	35.0	28.3	22.0	20.6	20.2

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	(19 %)	<u> </u> YES	<u> X </u> NO
b.) 1/2 LOW FLOW DILUTION	(NA)	<u> </u> YES	<u> </u> NO

2. Dunnett's 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	(19 %)	<u> </u> YES	<u> X </u> NO
b.) 1/2 LOW FLOW DILUTION	(NA)	<u> </u> YES	<u> </u> 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: 25 % (TOP3B)

6. LOEC Ceriodaphnia Lethality: 25 % (TXP3B)

7. NOEC Ceriodaphnia Sublethality: 25 % (TPP3B)

8. LOEC Ceriodaphnia Sublethality: 25 % (TYP3B)

9. Coefficient of variation for Ceriodaphnia Reproduction: 30.8 (TQP3B)

Appendix B: Test 1002.0

CHRONIC TOXICITY SUMMARY FORM
Ceriodaphnia dubia
CHEMICAL PARAMETERS CHART

PERMITTEE: Searcy Water and Sewer System SAMPLE No. 1 COLLECTED ending: DATE: June 2, 2015 TIME: 1145
 NPDES NO.: AR0021601 AFIN# 73-00055 SAMPLE No. 2 COLLECTED ending: DATE: June 4, 2015 TIME: 1145
 CONTACT: Mr. Paul Abernathy SAMPLE No. 3 COLLECTED ending: DATE: June 7, 2015 TIME: 1145
 ANALYST: 280, 304, 310, 314 Test Initiated: DATE: June 3, 2015 TIME: 1530
 Test Terminated: DATE: June 9, 2015 TIME: 1350

DILUTION Control	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	7.7	7.2	7.7	7.8	7.6	7.6
Final	7.6	7.5	7.0	7.3	8.0	7.5	--
pH Initial	7.4	7.6	7.5	7.6	7.6	7.4	7.4
Final	7.8	7.7	7.7	7.7	7.8	7.8	--
Alkalinity	30	NA	30	NA	30	NA	NA
Hardness	42	NA	42	NA	43	NA	NA
Conductivity	140	140	140	130	140	140	120
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 8 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	7.6	8.3	7.3	7.4	7.6	7.5
Final	7.3	7.3	7.4	7.7	7.8	7.5	--
pH Initial	7.4	7.6	7.5	7.4	7.6	7.3	7.2
Final	7.8	7.6	7.6	7.6	7.7	7.7	--
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	140	140	140	140	140	140	140
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 11 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.6	7.0	8.2	7.3	7.4	7.9	7.6
Final	7.4	7.3	7.5	7.6	7.7	7.4	--
pH Initial	7.4	7.6	7.4	7.4	7.5	7.4	7.4
Final	7.8	7.7	7.6	7.6	7.7	7.7	--
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	140	140	140	140	140	140	140
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 14 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.3	7.3	8.3	7.7	7.8	7.7	7.5
Final	7.6	7.5	7.6	7.7	7.8	7.6	--
pH Initial	7.4	7.5	7.4	7.3	7.5	7.3	7.4
Final	7.7	7.6	7.6	7.6	7.6	7.7	--
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	140	140	140	140	150	150	140
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 19 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.6	7.6	8.2	7.9	7.9	7.7	7.4
Final	6.9	7.2	7.0	7.5	7.7	7.4	--
pH Initial	7.3	7.5	7.4	7.2	7.5	7.3	7.3
Final	7.7	7.6	7.6	7.6	7.6	7.7	--
Alkalinity	31	NA	34	NA	30	NA	NA
Hardness	43	NA	46	NA	42	NA	NA
Conductivity	140	140	140	140	150	150	140
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 25 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.6	7.2	8.1	7.4	7.4	7.7	7.4
Final	7.4	7.5	7.4	7.5	7.8	7.6	--
pH Initial	7.2	7.4	7.4	7.2	7.5	7.3	7.2
Final	7.7	7.6	7.6	7.7	7.6	7.7	--
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	150	140	150	150	160	150	150
Chlorine	NA	NA	NA	NA	NA	NA	NA



CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: <u>Searcy</u>			PO No.		NO OF BOTTLES	ANALYSES REQUESTED												AIC CONTROL NO: <u>191061</u>				
Project Reference:						Bio-monitoring													AIC PROPOSAL NO:			
Project Manager: <u>Paul Abernethy</u>			MATRIX																Carrier:			
Sampled By: <u>Tom Hartsfield</u>			G R A B	C O M P	W A T E R	S O I L													Received Temperature C <u>2.2</u>			
AIC No.	Sample Identification	Date/Time Collected																	Remarks			
<u>1</u>	<u>EFF STAN 6-7-15 / 11:45 AM</u> <u>STG 6-2-15 / 11:45 AM</u>			<input checked="" type="checkbox"/>			<u>2</u>	<input checked="" type="checkbox"/>														
Container Type															Field pH calibration							
Preservative															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		A=(NH ₄) ₂ SO ₄ , NH ₄ OH											
Turnaround Time Requested: (Please circle) NORMAL or EXPEDITED IN _____ DAYS					Relinquished By: <u>Tom Hartsfield</u>		Date/Time: <u>6-3-15</u> <u>6:00 AM</u>		Received By: <u>[Signature]</u>		Date/Time: <u>6-3-15</u> <u>6:00 AM</u>											
Expedited results requested by: _____					Relinquished By: <u>[Signature]</u>		Date/Time: <u>6-3-15</u> <u>8:35 AM</u>		Received in Lab By: <u>Danny Brown</u>		Date/Time: <u>6-3-15</u> <u>0835</u>											
Who should AIC contact with questions: Phone: _____ Fax: _____					Comments:																	
Report Attention to: <u>Searcy Water Utilities</u>																						
Report Address to: <u>P.O. Box 138</u>																						
Email Address: <u>Searcy WA 72145</u>																						



CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: <u>Searcy</u>			PO No.		NO OF BOTTLES	ANALYSES REQUESTED										AIC CONTROL NO: <u>191061</u>		
Project Reference:			MATRIX			2	<div style="display: flex; justify-content: space-between;"> Biomonitoring </div>										AIC PROPOSAL NO:	
Project Manager: <u>Paul Abernathy</u>																	Carrier:	
Sampled By: <u>Tom Hartstield</u>			G	C	2											Received Temperature C <u>3.3</u>		
AIC No.	Sample Identification	Date/Time Collected	A	M												Remarks		
<u>2</u>	<u>EFF.</u>	<u>6-3-15/11:45 AM</u>		<input checked="" type="checkbox"/>														
	EFF.	6-4-15/11:45 AM		<input checked="" type="checkbox"/>														
	EFF.	6-3-15/11:31 AM		<input checked="" type="checkbox"/>														
			Container Type		<u>P</u>											Field pH calibration on _____ @ _____		
			Preservative		<u>NO</u>											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		A = (NH ₄) ₂ SO ₄ , NH ₄ OH					
Turnaround Time Requested: (Please circle) NORMAL or EXPEDITED IN _____ DAYS					Relinquished By: <u>Tom Hartstield</u>		Date/Time <u>6-5-15</u> <u>6:00 AM</u>		Received By: <u>[Signature]</u>		Date/Time <u>6-5-15</u> <u>6:00 AM</u>							
Expedited results requested by: _____					Relinquished By: <u>[Signature]</u>		Date/Time <u>6-5-15</u> <u>9:16 AM</u>		Received in Lab By: <u>DANNY BROWN</u>		Date/Time <u>6-5-15</u> <u>0416</u>							
Who should AIC contact with questions: Phone: _____ Fax: _____					Comments:													
Report Attention to: <u>Searcy Water Utilities</u>																		
Report Address to: <u>PO BOX 1319</u>																		
Email Address: <u>Searcy AR 72185</u>																		



CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: <u>Searcy</u>			PO No.		NO OF BOTTLES	ANALYSES REQUESTED										AIC CONTROL NO: <u>191061</u>		
Project Reference:			MATRIX			BOTTLES											AIC PROPOSAL NO:	
Project Manager: <u>Paul Abarca</u>			W	S			2											Carrier:
Sampled By: <u>Tom Hale</u>			A	O											Received Temperature C <u>3.4</u>			
AIC No.	Sample Identification	Date/Time Collected	R	I											Remarks			
<u>3</u>	<u>EFF</u>	<u>6-6-15/11:45am</u> <u>6-7-15/11:45am</u>		<input checked="" type="checkbox"/>														
Container Type			Preservative												Field pH calibration			
G = Glass			P = Plastic												on _____ @ _____			
NO = none			S = Sulfuric acid pH2												Buffer:			
V = VOA vials			N = Nitric acid pH2															
H = HCl to pH2																		
T = Sodium Thiosulfate																		
Z = Zinc acetate																		
A = (NH ₄) ₂ SO ₄ , NH ₄ OH																		
Turnaround Time Requested: (Please circle) NORMAL or EXPEDITED IN _____ DAYS					Relinquished By: <u>Daryl</u>		Date/Time <u>6-8-15</u> <u>6:00am</u>		Received By: <u>Ray Dye</u>		Date/Time <u>6-8-15</u> <u>6:00am</u>							
Expedited results requested by: _____					Relinquished By: <u>Ray Dye</u>		Date/Time <u>6-8-15</u> <u>9:15am</u>		Received in Lab By: <u>Danny Brown</u>		Date/Time <u>6-8-15</u> <u>9:15</u>							
Who should AIC contact with questions:					Comments:													
Phone: _____ Fax: _____																		
Report Attention to: <u>Searcy Water Utilities</u>																		
Report Address to: <u>P.O. Box 1319</u>																		
Email Address: <u>Searcy.WA 72445</u>																		

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SEARCY, ARKANSAS 72145-1319

NPDES Enforcement Division
A.D.E.Q.
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North Little Rock, AR 72118-5317