



July 30, 2014
Control No. 180852-1
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July 30, 2014

Test Results of
Third Quarter
Chronic 7-Day Renewal
Biomonitoring Testing
for
Outfall 001
Huntsville, AR

Control No. 180852-1

Prepared for:

Mr. Bill Eoff
Huntsville Water Utilities
Post Office Box 430
Huntsville, AR 72740

Prepared by:

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



Huntsville Water Utilities
ATTN: Mr. Bill Eoff
Post Office Box 430
Huntsville, AR 72740

Re: Chronic 7-Day Renewal utilizing *Pimephales promelas* (Fathead minnow) and *Ceriodaphnia dubia*
Outfall 001 - Huntsville, AR
NPDES Permit No. AR0022004 AFIN# 44-00018

Dear Mr. Bill Eoff:

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 100 % effluent, which is equal to the critical dilution of 100 %. Any statistical difference with sublethal effects cannot be considered toxic due to the minimum significant difference (PMSD) calculated result being below the lower PMSD bounds. **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 100 % effluent, which is equal to the critical dilution of 100 %. Any statistical difference with sublethal effects cannot be considered toxic due to the minimum significant difference (PMSD) calculated result being below the lower PMSD bounds. **The sample, therefore PASSED both lethal and sub-lethal effects for the *Ceriodaphnia dubia* test.**

AMERICAN INTERPLEX CORPORATION

A handwritten signature in black ink, appearing to read 'John Overbey', is written over a horizontal line.

John Overbey
Laboratory Director

PDF cc: Huntsville Water Utilities
ATTN: Mr. Bill Eoff
bill9eoff@hotmail.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	0.371	PASS
Control Growth CV < or = 40%	3.90	PASS
Growth Minimum Significant Difference 12 to 30%	11.2	BELOW
Critical Dilution CV < or = 40%	9.75	PASS

Ceriodaphnia dubia Method 1002.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	100	PASS
Control Reproduction > or = 15 per Surviving Female	29.5	PASS
Control CV < or = 40% per Surviving Female	6.24	PASS
Reproduction Minimum Significant Difference 13 to 47%	10.7	BELOW
Critical Dilution CV < or = 40%	8.49	PASS

II. Outlined Report

A. Introduction

1. Permit Number: AR0022004 AFIN# 44-00018
2. Test Requirements: Chronic Biomonitoring, Quarterly
Test Methods 1000.0 and 1002.0
3. Receiving Stream: White River Basin

B. Source of Effluent/Dilution Water

1. Effluent Samples:

- a. Sampling Point: Outfall 001
- b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	7.6	7.3	7.5
pH (standard units)	8.0	7.8	7.6
Alkalinity (mg/l as CaCO ₃)	140	150	140
Hardness (mg/l as CaCO ₃)	190	200	200
Conductivity (umhos/cm)	1000	1000	990
Residual Chlorine (mg/l)	<0.05	<0.05	<0.05
Ammonia as N (mg/l)	0.44	2.1	1.1

2. Dilution Water Samples: Synthetic Moderately Hard Water #4117

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

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	8.2	7.6	7.0
pH (standard units)	7.7	7.7	7.8
Alkalinity (mg/l as CaCO ₃)	60	60	60
Hardness (mg/l as CaCO ₃)	81	82	81
Conductivity (umhos/cm)	310	300	290
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: July 22, 2014 at 1110
Date & Time Test Terminated: July 29, 2014 at 0930
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: July 22, 2014 at 1120
Date & Time Test Terminated: July 28, 2014 at 1045
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.

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 July 8, 2014 at 1615 to July 15, 2014 at 1500

The results were as follows: (Control No. 180430-1.)

Survival LC-50: 4632 mg/l

Growth IC-25: 2837 mg/l

Growth PMSD: 9.25

Ceriodaphnia dubia

Chronic reference tests are performed monthly.

A chronic reference test was performed on July 8, 2014 at 1620 to July 14, 2014 at 1420

The results were as follows: (Control No. 180430-2.)

Survival LC-50: 2019 mg/l

Growth IC-25: 842.6 mg/l

Growth PMSD: 15.9

V. Chemical Analysis/Quality Control

Parameter	Method	% Recovery	Relative % Difference
Alkalinity	SM 2320 B	NA	0.00
Hardness	EPA 200.7	98.3	4.20
pH	SM 4500-H+ B	102	1.61
Conductivity	EPA 120.1	91.0	10.0

VI. Organism History

Pimephales promelas (Fathead minnow)

Date: July 22, 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: July 22, 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

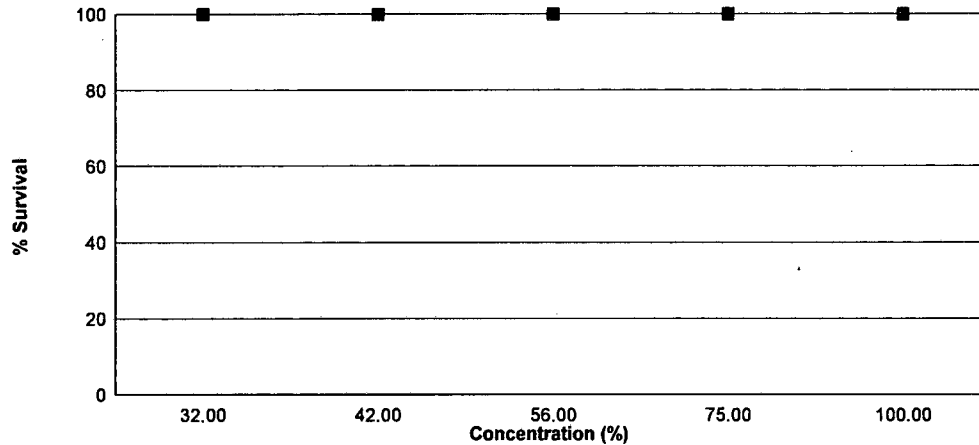
Larvae are exposed in a static renewal system for seven days to different concentrations of effluent with dilution water. Test results are based on the survival and growth (increase in weight) of the larvae.

Effluent dilutions for this test were 32 %, 42 %, 56 %, 75 %, 100 % in accordance with the NPDES permit.

The low flow or 'critical' dilution is specified in the NPDES permit as 100 % effluent.

The test was initiated on July 22, 2014 at 1110 and continued through July 29, 2014 at 0930. Statistical analyses were performed on the observed data and the no observable effects concentrations (NOECs) were as follows:

- a.) NOEC survival = 100 % effluent
- b.) NOEC growth = 100 % effluent



Summary of the 7-day Fathead Minnow Survival and Growth		
Concentration	Percent Survival	Mean Growth (mg)
Control	100	0.371
32 %	100	0.387
42 %	100	0.379
56 %	100	0.373
75 %	100	0.408
100 %	100	0.391

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

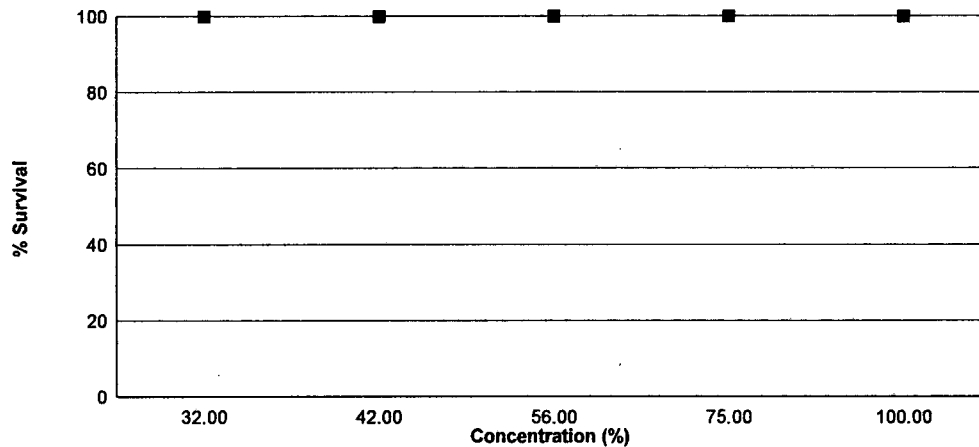
Neonates are exposed in a static renewal system to different concentrations of effluent with dilution water until 60% of surviving control organisms have three broods of offspring with an average of at least 15 young per female.

Effluent dilutions for this test were 32 %, 42 %, 56 %, 75 %, 100 % in accordance with the NPDES permit.

The low flow or 'critical' dilution is specified in the NPDES permit as 100 % effluent.

The test was initiated on July 22, 2014 at 1120 and continued through July 28, 2014 at 1045. Statistical analyses were performed on the observed data and the no observable effects concentrations (NOECs) were as follows:

- a.) NOEC survival = 100 % effluent
- b.) NOEC reproduction = 100 % effluent



Summary of the 6-day <i>Ceriodaphnia dubia</i> Survival and Reproduction Data		
Concentration	Percent Survival	Mean Reproduction
Control	100	29.5
32 %	100	29.6
42 %	100	30.8
56 %	100	30.1
75 %	100	32.7
100 %	100	32.1

Appendix A1: Test 1000.0

Pimephales promelas (Fathead Minnow) 7-Day Survival

Date and Time Test Initiated: July 22, 2014 at 1110

Date and Time Test Terminated: July 29, 2014 at 0930

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
32 %	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
42 %	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
56 %	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
75 %	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
100 %	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: July 22, 2014 at 1110
Test Terminated: July 29, 2014 at 0930

Drying Started: July 23, 2014 at 1540
Drying Ended: July 30, 2014 at 1005

Concentration	Replicate	Weight of pan	Weight of pan + fish	Total weight of fish (g)	Original # of fish	Mean dry weight (mg)
Control	A	.94870	.95164	0.00294	8	0.368
	B	.94874	.95168	0.00294	8	0.368
	C	.95244	.95527	0.00283	8	0.354
	D	.95008	.95304	0.00296	8	0.370
	E	.95044	.95359	0.00315	8	0.394
32 %	A	.95253	.95529	0.00276	8	0.345
	B	.94960	.95265	0.00305	8	0.381
	C	.95169	.95476	0.00307	8	0.384
	D	.95338	.95640	0.00302	8	0.378
	E	.95054	.95410	0.00356	8	0.445
42 %	A	.95702	.95982	0.00280	8	0.350
	B	.95674	.95964	0.00290	8	0.362
	C	.95343	.95657	0.00314	8	0.392
	D	.94817	.95128	0.00311	8	0.389
	E	.95258	.95579	0.00321	8	0.401
56 %	A	.95001	.95286	0.00285	8	0.356
	B	.95291	.95583	0.00292	8	0.365
	C	.95021	.95331	0.00310	8	0.388
	D	.95170	.95458	0.00288	8	0.360
	E	.95823	.96140	0.00317	8	0.396
75 %	A	.95432	.95727	0.00295	8	0.369
	B	.95106	.95447	0.00341	8	0.426
	C	.95120	.95455	0.00335	8	0.419
	D	.94887	.95195	0.00308	8	0.385
	E	.95224	.95578	0.00354	8	0.442
100 %	A	.95351	.95666	0.00315	8	0.394
	B	.95286	.95606	0.00320	8	0.400
	C	.95536	.95883	0.00347	8	0.434
	D	.95531	.95848	0.00317	8	0.396
	E	.95116	.95379	0.00263	8	0.329

Appendix A1: Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

Date and Time Test Initiated: July 22, 2014 at 1120

Date and Time Test Terminated: July 28, 2014 at 1045

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	5	5	5	4	6	6	4	5	6	5	51	10	5.10	
4	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
5	12	11	12	10	13	11	12	11	10	12	114	10	11.4	
6	12	12	13	13	14	15	13	14	12	12	130	10	13.0	
7														
8														
TOTAL	29	28	30	27	33	32	29	30	28	29	295	10	29.5	

Concentration: 32 %													
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	4	6	5	6	0	5	5	5	6	5	47	10	4.70
4	0	0	0	0	0	0	0	0	0	0	0	10	0.00
5	13	13	12	10	13	8	8	11	12	12	112	10	11.2
6	14	13	13	15	15	13	15	14	12	13	137	10	13.7
7													
8													
TOTAL	31	32	30	31	28	26	28	30	30	30	296	10	29.6

Concentration: 42 %													
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	6	6	6	6	6	4	5	4	5	5	53	10	5.30
4	0	0	0	0	0	0	0	0	0	0	0	10	0.00
5	14	14	12	14	13	12	12	12	6	12	121	10	12.1
6	13	12	13	14	14	14	12	14	14	14	134	10	13.4
7													
8													
TOTAL	33	32	31	34	33	30	29	30	25	31	308	10	30.8

Appendix A1: Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

Date and Time Test Initiated: July 22, 2014 at 1120

Date and Time Test Terminated: July 28, 2014 at 1045

Concentration: 56 %														
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	6	6	5	5	5	5	6	6	5	5	54	10	5.40	
4	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
5	13	14	8	4	14	10	15	11	1	12	102	10	10.2	
6	14	14	14	15	14	14	16	14	14	16	145	10	14.5	
7														
8														
TOTAL	33	34	27	24	33	29	37	31	20	33	301	10	30.1	

Concentration: 75 %													
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	6	4	4	6	5	5	6	5	6	4	51	10	5.10
4	0	0	1	0	0	0	0	0	0	0	1	10	0.100
5	10	15	14	12	16	10	16	10	13	10	126	10	12.6
6	15	14	13	15	16	13	16	16	15	16	149	10	14.9
7													
8													
TOTAL	31	33	32	33	37	28	38	31	34	30	327	10	32.7

Concentration: 100 %													
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	6	4	5	6	6	5	5	4	5	5	51	10	5.10
4	0	0	0	0	0	0	0	0	0	0	0	10	0.00
5	12	13	15	13	10	14	10	8	10	13	118	10	11.8
6	14	17	15	14	14	17	15	16	14	16	152	10	15.2
7													
8													
TOTAL	32	34	35	33	30	36	30	28	29	34	321	10	32.1

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	32 %	1	1.00000	1.39310
2	32 %	2	1.00000	1.39310
2	32 %	3	1.00000	1.39310
2	32 %	4	1.00000	1.39310
2	32 %	5	1.00000	1.39310
3	42 %	1	1.00000	1.39310
3	42 %	2	1.00000	1.39310
3	42 %	3	1.00000	1.39310
3	42 %	4	1.00000	1.39310
3	42 %	5	1.00000	1.39310
4	56 %	1	1.00000	1.39310
4	56 %	2	1.00000	1.39310
4	56 %	3	1.00000	1.39310
4	56 %	4	1.00000	1.39310
4	56 %	5	1.00000	1.39310
5	75 %	1	1.00000	1.39310
5	75 %	2	1.00000	1.39310
5	75 %	3	1.00000	1.39310
5	75 %	4	1.00000	1.39310
5	75 %	5	1.00000	1.39310
6	100 %	1	1.00000	1.39310
6	100 %	2	1.00000	1.39310
6	100 %	3	1.00000	1.39310
6	100 %	4	1.00000	1.39310
6	100 %	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 W = 0 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	32 %	27.50	16.00	5.00	
3	42 %	27.50	16.00	5.00	
4	56 %	27.50	16.00	5.00	
5	75 %	27.50	16.00	5.00	
6	100 %	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 = 0.01871 W = 0.9906 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 = 5.146 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	0.004778	0.0009556	1.226	
Within (Error)	24	0.0187	0.0007792		
Total	29	0.02348			
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	0.3708	0.3708		
2	32 %	0.3866	0.3866	-0.895	
3	42 %	0.3788	0.3788	-0.4531	
4	56 %	0.373	0.373	-0.1246	
5	75 %	0.4082	0.4082	-2.118	
6	100 %	0.3906	0.3906	-1.122	
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	32 %	5	0.04166	11.2	-0.0158
3	42 %	5	0.04166	11.2	-0.008
4	56 %	5	0.04166	11.2	-0.0022
5	75 %	5	0.04166	11.2	-0.0374
6	100 %	5	0.04166	11.2	-0.0198

Appendix A2: Statistics

Ceriodaphnia dubia Survival

Fisher's Exact Test			
Identification	Alive	Dead	Total Animals
Control	10	0	10
32 %	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
42 %	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
56 %	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
75 %	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
100 %	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	32 %	10	0	
2	42 %	10	0	
3	56 %	10	0	
4	75 %	10	0	
5	100 %	10	0	

Appendix A2: Statistics

Ceriodaphnia dubia Reproduction

Kolmogorov Test for Normality	No Transformation
<p>D = 0.0779 D* = 0.6112 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 = 14.44 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	89.2	17.84	1.895	
Within (Error)	54	508.4	9.415		
Total	59	597.6			
Critical F = 3.38 (alpha = 0.01, df = 5,54)					
2.38 (alpha = 0.05, df = 5,54)					
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	29.5	29.5			
2	32 %	29.6	29.6	-0.07287		
3	42 %	30.8	30.8	-0.9474		
4	56 %	30.1	30.1	-0.4372		
5	75 %	32.7	32.7	-2.332		
6	100 %	32.1	32.1	-1.895		
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	32 %	10	3.17	10.7	-0.1	
3	42 %	10	3.17	10.7	-1.3	
4	56 %	10	3.17	10.7	-0.6	
5	75 %	10	3.17	10.7	-3.2	
6	100 %	10	3.17	10.7	-2.6	

Appendix A3: Water Chemistry

Routine Chemical and Physical Data

Date and Time Test Initiated: July 22, 2014 at 1000

Date and Time Test Terminated: July 29, 2014 at 0930

Effluent Conc.: Control	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	
DO, mg/l	Initial	8.2	7.6	7.6	7.7	7.0	7.4	8.1
	Final *1	6.7	7.0	7.0	6.6	6.9	6.8	6.8
	Final *2	7.6	7.6	7.8	7.7	7.5	7.7	NA
pH, units	Initial	7.7	7.7	7.7	7.7	7.8	7.8	7.7
	Final *1	7.6	7.6	7.7	7.7	7.8	7.8	7.6
	Final *2	7.7	8.0	7.8	7.9	8.0	7.7	NA
Alkalinity, mg CaCO ₃ /l	60	NA	60	NA	60	NA	NA	
Hardness, mg CaCO ₃ /l	81	NA	82	NA	81	NA	NA	
Conductivity, umhos/cm	310	310	300	300	290	300	290	
Res. Chlorine, mg/l	<0.05	NA	<0.05	NA	<0.05	NA	NA	

Effluent Conc.: 32 %	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	
DO, mg/l	Initial	8.4	7.5	7.6	7.5	7.6	7.6	8.2
	Final *1	6.7	6.9	7.9	6.8	6.9	6.7	6.6
	Final *2	7.7	7.5	7.8	7.5	7.3	7.7	NA
pH, units	Initial	7.7	7.9	7.8	7.6	7.8	8.0	7.7
	Final *1	7.8	7.8	7.9	7.9	8.0	8.0	7.8
	Final *2	7.9	8.2	8.0	8.0	8.2	7.9	NA

Effluent Conc.: 42 %	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	
DO, mg/l	Initial	7.6	7.7	7.6	7.8	7.7	7.6	8.1
	Final *1	6.7	6.8	7.8	6.6	6.6	6.6	6.5
	Final *2	7.6	7.5	8.0	7.7	7.3	7.8	NA
pH, units	Initial	7.8	7.9	7.9	7.6	7.7	8.1	7.7
	Final *1	7.9	7.9	7.9	7.9	8.0	8.0	7.8
	Final *2	8.0	8.2	8.0	8.1	8.2	8.0	NA

Appendix A3: Water Chemistry

Routine Chemical and Physical Data

Date and Time Test Initiated: July 22, 2014 at 1000

Date and Time Test Terminated: July 29, 2014 at 0930

Effluent Conc.: 56 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.7	7.6	7.6	7.8	7.5	7.7	8.2
	Final *1	6.5	6.7	7.7	6.6	6.7	7.0	6.7
	Final *2	7.7	7.4	7.9	7.6	7.2	7.9	NA
pH, units	Initial	7.8	7.9	7.9	7.7	7.6	8.2	7.7
	Final *1	8.0	8.0	8.0	8.0	8.1	8.2	7.9
	Final *2	8.1	8.3	8.1	8.1	8.2	8.0	NA

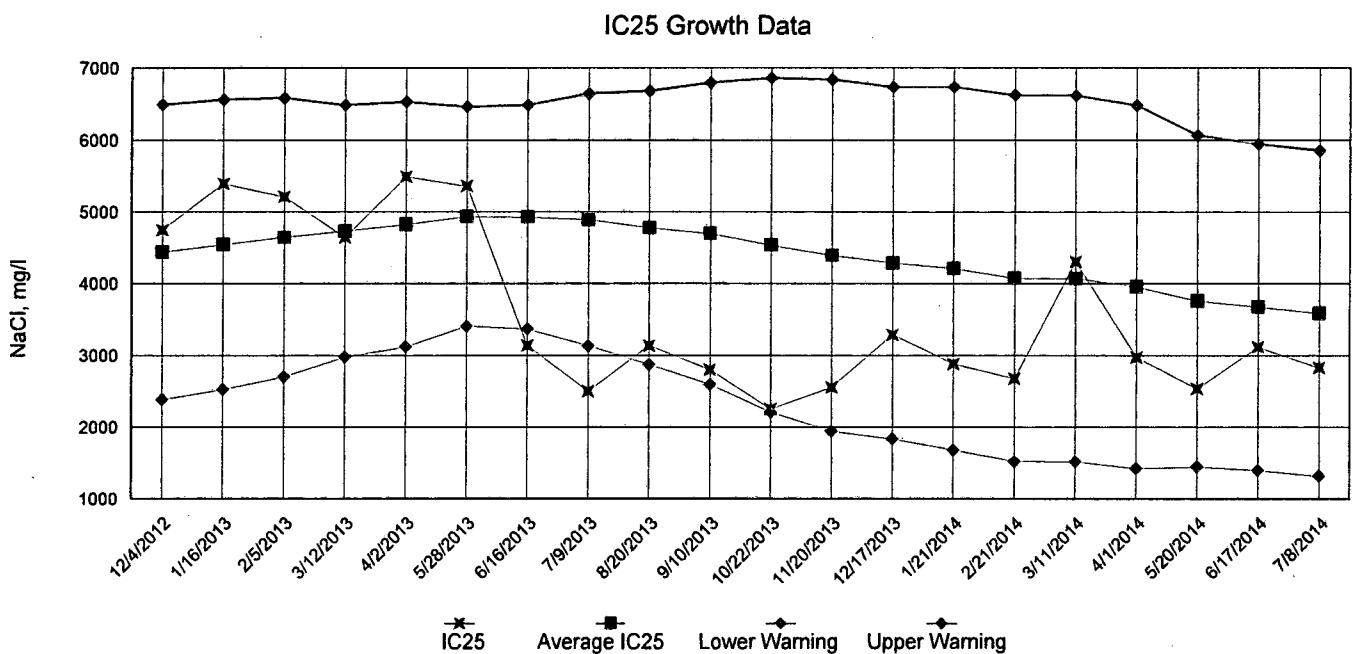
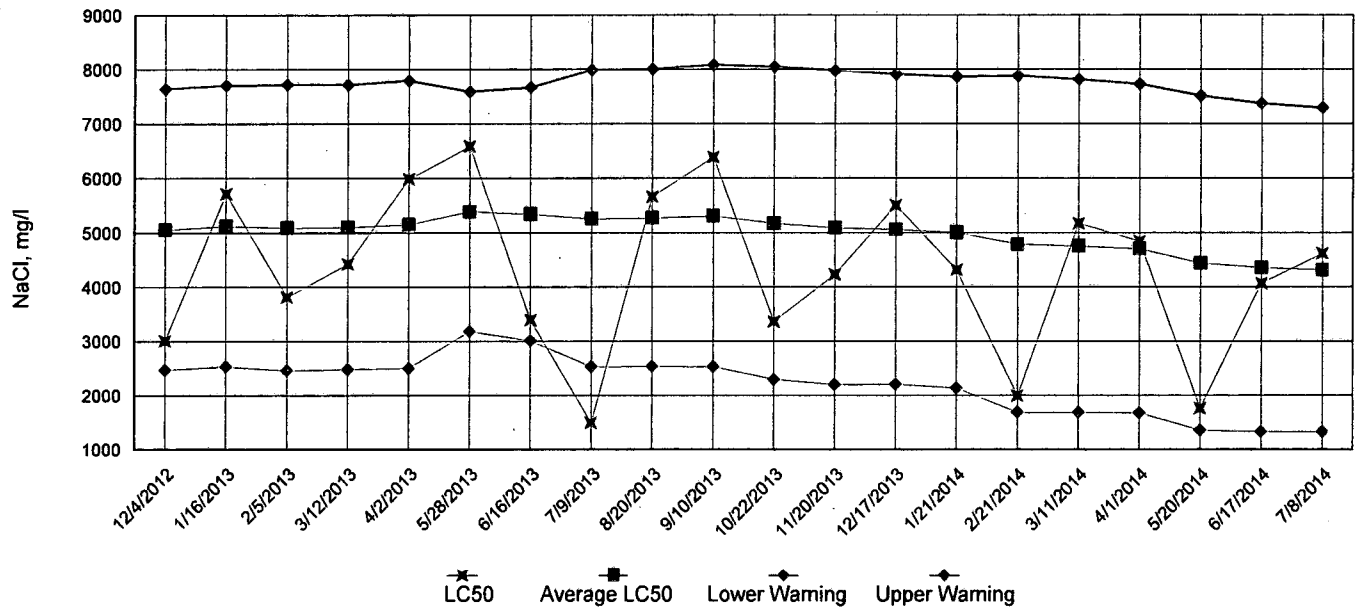
Effluent Conc.: 75 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.6	7.7	7.6	7.6	7.5	7.6	8.1
	Final *1	6.6	6.7	6.8	6.6	6.6	6.8	6.5
	Final *2	7.6	7.5	7.6	7.6	7.3	7.8	NA
pH, units	Initial	7.8	7.9	7.9	7.6	7.6	8.2	7.7
	Final *1	8.0	8.0	8.1	8.1	8.1	8.2	7.9
	Final *2	8.2	8.4	8.2	8.2	8.3	8.1	NA

Effluent Conc.: 100 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.6	7.6	7.3	7.2	7.5	8.3	7.7
	Final *1	6.7	6.8	6.6	6.4	6.6	6.5	6.3
	Final *2	7.7	7.4	7.6	7.6	7.4	7.9	NA
pH, units	Initial	8.0	7.8	7.8	7.5	7.6	8.3	7.6
	Final *1	8.1	8.1	8.1	8.0	8.1	8.2	8.0
	Final *2	8.3	8.4	8.2	8.2	8.4	8.2	NA
Alkalinity, mg CaCO ₃ /l	140	NA	150	NA	140	NA	NA	
Hardness, mg CaCO ₃ /l	190	NA	200	NA	200	NA	NA	
Conductivity, umhos/cm	1000	1000	1000	1000	990	990	1000	
Res. Chlorine, mg/l	<0.05	NA	<0.05	NA	<0.05	NA	NA	

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

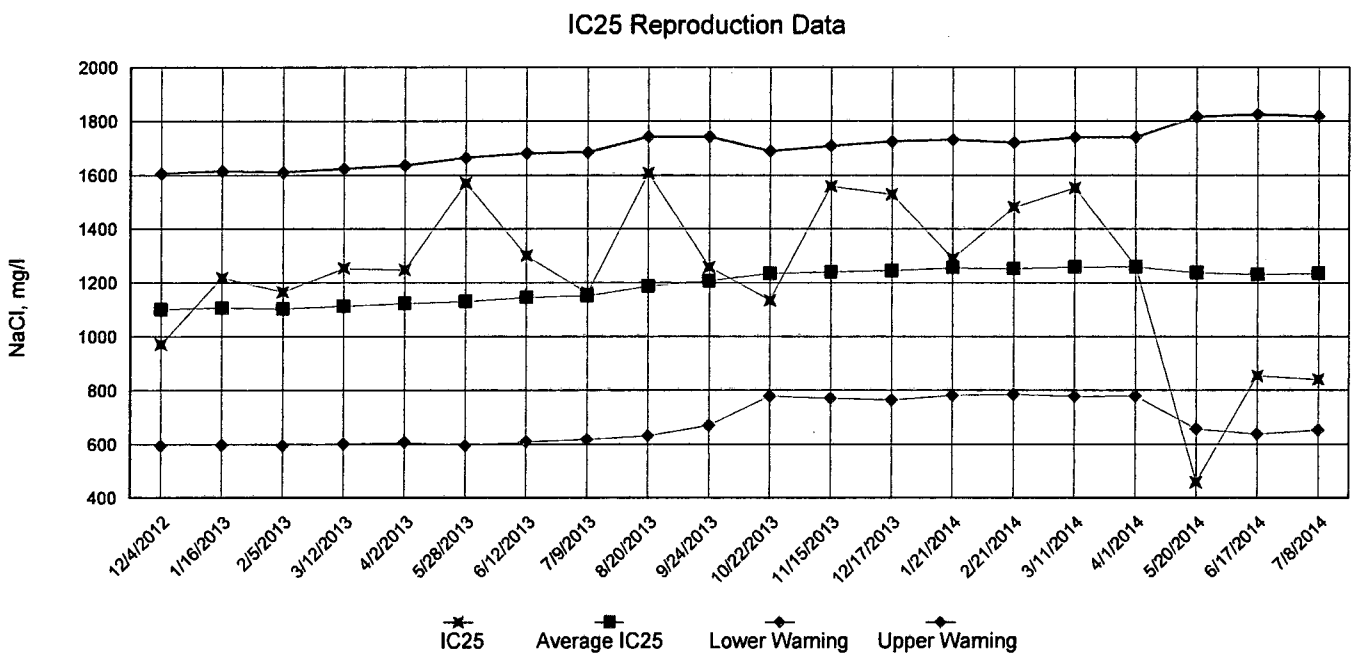
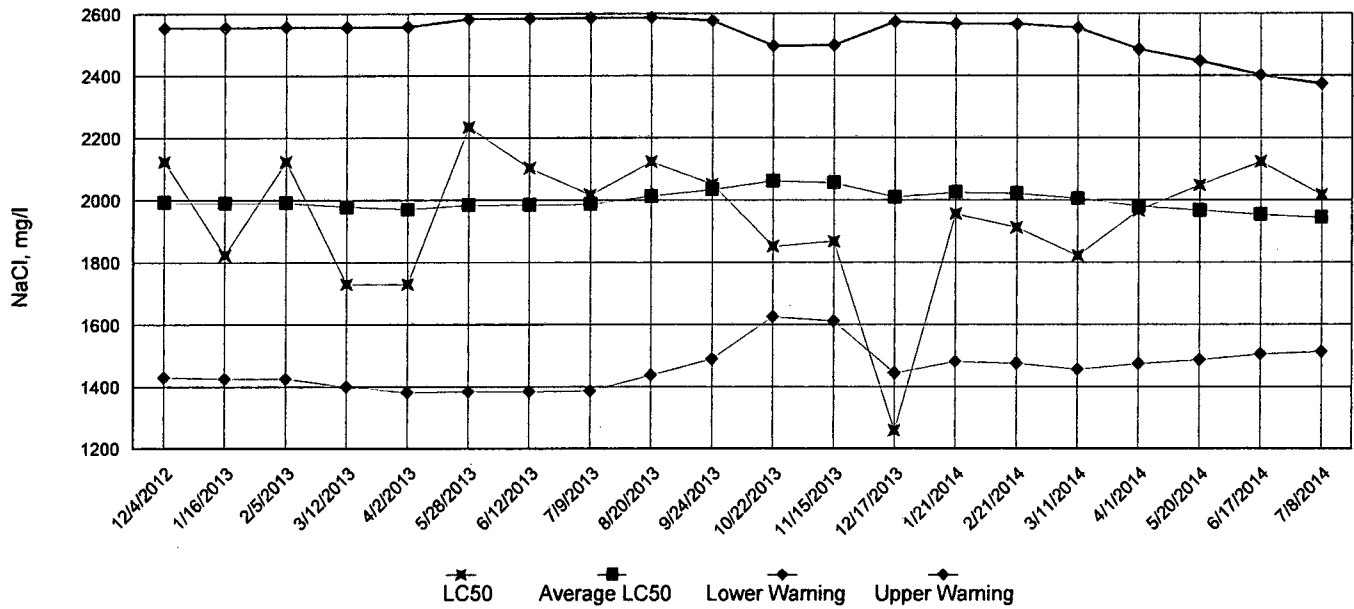
Appendix A4: Test 1000.0
Chronic Reference Toxicant, *Pimephales promelas* (Fathead Minnow)

LC50 Survival Data



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

LC50 Survival Data



Appendix B: Test 1000.0

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

Permittee: Huntsville Water Utilities

NPDES No.: AR0022004 AFIN# 44-00018

Date and Time Test Initiated: July 22, 2014 at 1110

Date and Time Test Terminated: July 29, 2014 at 0930

Dilution water used: Synthetic Moderately Hard Water #4117

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
32 %	100	100	100	100	100	100	100	100	0.00
42 %	100	100	100	100	100	100	100	100	0.00
56 %	100	100	100	100	100	100	100	100	0.00
75 %	100	100	100	100	100	100	100	100	0.00
100 %	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	0.368	0.368	0.354	0.370	0.394	0.371	3.90
32 %	0.345	0.381	0.384	0.378	0.445	0.387	9.37
42 %	0.350	0.362	0.392	0.389	0.401	0.379	5.73
56 %	0.356	0.365	0.388	0.360	0.396	0.373	4.79
75 %	0.369	0.426	0.419	0.385	0.442	0.408	7.40
100 %	0.394	0.400	0.434	0.396	0.329	0.391	9.75

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	(100 %)	_____ YES	<u> X </u> NO
b.) 1/2 LOW FLOW DILUTION	(NA)	_____ YES	_____ 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	(100 %)	_____ 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 (TLP6C)

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

5. NOEC Pimephales Lethality: 100 % (TOP6C)

6. LOEC Pimephales Lethality: 100 % (TXP6C)

7. NOEC Pimephales Sublethality: 100 % (TPP6C)

8. LOEC Pimephales Sublethality: 100 % (TYP6C)

9. Coefficient of variation for Pimephales growth: 9.75 (TQP6C)

Appendix B: Test 1000.0

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

PERMITTEE: <u>Huntsville Water Utilities</u>	SAMPLE No. 1 COLLECTED ending: <u>DATE: July 21, 2014</u>	TIME: <u>0500</u>
NPDES NO.: <u>AR0022004 AFIN# 44-00018</u>	SAMPLE No. 2 COLLECTED ending: <u>DATE: July 23, 2014</u>	TIME: <u>0500</u>
CONTACT: <u>Mr. Bill Eoff</u>	SAMPLE No. 3 COLLECTED ending: <u>DATE: July 25, 2014</u>	TIME: <u>0500</u>
ANALYST: <u>280, 304, 307, 310</u>	Test Initiated: <u>DATE: July 22, 2014</u>	TIME: <u>1110</u>
	Test Terminated: <u>DATE: July 29, 2014</u>	TIME: <u>0930</u>

DILUTION Control	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.2	7.6	7.6	7.7	7.0	7.4	8.1
Final	6.7	7.0	7.0	6.6	6.9	6.8	6.8
pH Initial	7.7	7.7	7.7	7.7	7.8	7.8	7.7
Final	7.6	7.6	7.7	7.7	7.8	7.8	7.6
Alkalinity	60	NA	60	NA	60	NA	NA
Hardness	81	NA	82	NA	81	NA	NA
Conductivity	310	310	300	300	290	300	290
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 32 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.4	7.5	7.6	7.5	7.6	7.6	8.2
Final	6.7	6.9	7.9	6.8	6.9	6.7	6.6
pH Initial	7.7	7.9	7.8	7.6	7.8	8.0	7.7
Final	7.8	7.8	7.9	7.9	8.0	8.0	7.8
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	530	540	530	530	510	520	520
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 42 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.6	7.7	7.6	7.8	7.7	7.6	8.1
Final	6.7	6.8	7.8	6.6	6.6	6.6	6.5
pH Initial	7.8	7.9	7.9	7.6	7.7	8.1	7.7
Final	7.9	7.9	7.9	7.9	8.0	8.0	7.8
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	600	600	600	610	570	580	570
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 56 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	7.6	7.6	7.8	7.5	7.7	8.2
Final	6.5	6.7	7.7	6.6	6.7	7.0	6.7
pH Initial	7.8	7.9	7.9	7.7	7.6	8.2	7.7
Final	8.0	8.0	8.0	8.0	8.1	8.2	7.9
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	710	710	710	700	680	680	680
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 75 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.6	7.7	7.6	7.6	7.5	7.6	8.1
Final	6.6	6.7	6.8	6.6	6.6	6.8	6.5
pH Initial	7.8	7.9	7.9	7.6	7.6	8.2	7.7
Final	8.0	8.0	8.1	8.1	8.1	8.2	7.9
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	850	850	850	850	800	800	800
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 100 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.6	7.6	7.3	7.2	7.5	8.3	7.7
Final	6.7	6.8	6.6	6.4	6.6	6.5	6.3
pH Initial	8.0	7.8	7.8	7.5	7.6	8.3	7.6
Final	8.1	8.1	8.1	8.0	8.1	8.2	8.0
Alkalinity	140	NA	150	NA	140	NA	NA
Hardness	190	NA	200	NA	200	NA	NA
Conductivity	1000	1000	1000	1000	990	990	1000
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

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

Permittee: Huntsville Water Utilities

NPDES No.: AR0022004 AFIN# 44-00018

Date and Time Test Initiated: July 22, 2014 at 1120

Date and Time Test Terminated: July 28, 2014 at 1045

Dilution water used: Synthetic Moderately Hard Water #4117

PERCENT SURVIVAL

Time of Reading	Control	Percent Effluent				
		32 %	42 %	56 %	75 %	100 %
24 hour	100	100	100	100	100	100
48 hour	100	100	100	100	100	100
6 day	100	100	100	100	100	100

NUMBER OF YOUNG PRODUCED PER FEMALE @ 6 DAYS

Replicates	Control	Percent Effluent				
		32 %	42 %	56 %	75 %	100 %
A	29	31	33	33	31	32
B	28	32	32	34	33	34
C	30	30	31	27	32	35
D	27	31	34	24	33	33
E	33	28	33	33	37	30
F	32	26	30	29	28	36
G	29	28	29	37	38	30
H	30	30	30	31	31	28
I	28	30	25	20	34	29
J	29	30	31	33	30	34
Mean per Adult	29.5	29.6	30.8	30.1	32.7	32.1
Mean per Surviving Adult	29.5	29.6	30.8	30.1	32.7	32.1
CV %	6.24	6.00	8.36	17.1	9.35	8.49

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	(100 %)	_____ YES	<u> X </u> NO
b.) 1/2 LOW FLOW DILUTION	(NA)	_____ YES	_____ 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	(100 %)	_____ 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: 100 % (TOP3B)
6. LOEC Ceriodaphnia Lethality: 100 % (TXP3B)
7. NOEC Ceriodaphnia Sublethality: 100 % (TPP3B)
8. LOEC Ceriodaphnia Sublethality: 100 % (TYP3B)
9. Coefficient of variation for Ceriodaphnia Reproduction: 8.49 (TQP3B)

Appendix B: Test 1002.0

CHRONIC TOXICITY SUMMARY FORM
Ceriodaphnia dubia
CHEMICAL PARAMETERS CHART

PERMITTEE: Huntsville Water Utilities SAMPLE No. 1 COLLECTED ending: DATE: July 21, 2014 TIME: 0500
 NPDES NO.: AR0022004 AFIN# 44-00018 SAMPLE No. 2 COLLECTED ending: DATE: July 23, 2014 TIME: 0500
 CONTACT: Mr. Bill Eoff SAMPLE No. 3 COLLECTED ending: DATE: July 25, 2014 TIME: 0500
 ANALYST: 280, 304, 307, 310 Test Initiated: DATE: July 22, 2014 TIME: 1120
 Test Terminated: DATE: July 28, 2014 TIME: 1045

DILUTION Control	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.2	7.6	7.6	7.7	7.0	7.4	8.1
Final	7.6	7.6	7.8	7.7	7.5	7.7	NA
pH Initial	7.7	7.7	7.7	7.7	7.8	7.8	7.7
Final	7.7	8.0	7.8	7.9	8.0	7.7	NA
Alkalinity	60	NA	60	NA	60	NA	NA
Hardness	81	NA	82	NA	81	NA	NA
Conductivity	310	310	300	300	290	300	290
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 32 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.4	7.5	7.6	7.5	7.6	7.6	8.2
Final	7.7	7.5	7.8	7.5	7.3	7.7	NA
pH Initial	7.7	7.9	7.8	7.6	7.8	8.0	7.7
Final	7.9	8.2	8.0	8.0	8.2	7.9	NA
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	530	540	530	530	510	520	520
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 42 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.6	7.7	7.6	7.8	7.7	7.6	8.1
Final	7.6	7.5	8.0	7.7	7.3	7.8	NA
pH Initial	7.8	7.9	7.9	7.6	7.7	8.1	7.7
Final	8.0	8.2	8.0	8.1	8.2	8.0	NA
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	600	600	600	610	570	580	570
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 56 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	7.6	7.6	7.8	7.5	7.7	8.2
Final	7.7	7.4	7.9	7.6	7.2	7.9	NA
pH Initial	7.8	7.9	7.9	7.7	7.6	8.2	7.7
Final	8.1	8.3	8.1	8.1	8.2	8.0	NA
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	710	710	710	700	680	680	680
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 75 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.6	7.7	7.6	7.6	7.5	7.6	8.1
Final	7.6	7.5	7.6	7.6	7.3	7.8	NA
pH Initial	7.8	7.9	7.9	7.6	7.6	8.2	7.7
Final	8.2	8.4	8.2	8.2	8.3	8.1	NA
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	850	850	850	850	800	800	800
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 100 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.6	7.6	7.3	7.2	7.5	8.3	7.7
Final	7.7	7.4	7.6	7.6	7.4	7.9	NA
pH Initial	8.0	7.8	7.8	7.5	7.6	8.3	7.6
Final	8.3	8.4	8.2	8.2	8.4	8.2	NA
Alkalinity	140	NA	150	NA	140	NA	NA
Hardness	190	NA	200	NA	200	NA	NA
Conductivity	1000	1000	1000	1000	990	990	1000
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA



8600 Kanis Road
 Little Rock, AR 72204-2322
 (501) 224-5060
 FAX (501) 224-5072

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

PAGE 1 OF 3

Client: <u>Huntsville Water Utilities</u>			PO No.		NO OF BOTTLES	Cd & Pb Chronic	ANALYSES REQUESTED										AIC CONTROL NO: <u>180852</u>					
Project Reference: <u>Bio Monitoring</u>			SAMPLE MATRIX				WATER	SOIL											AIC PROPOSAL NO:			
Project Manager: <u>Bill Eoff</u>			G R A B	C O M P	X	X			3	X											Carrier: <u>Fed Ex</u>	
Sampled By: <u>Bill Eoff</u>																	Received on Ice (AIC)? <u>(YES) 2.1 NO</u>					
AIC No.	Sample Identification	Date/Time Collected																				Remarks
①	<u>Huntsville #1</u>	<u>7/20/14 @ 7:00 - 7/21/14 @ 5:00</u>			X	X																
		Container Type <u>lp</u>											Field pH calibration on _____ @ _____									
		Preservative <u>4C</u>											Buffer: _____									
G = Glass P = Plastic V = VOA vials H = HCl to pH2 T = Sodium Thiosulfate																						
NO = none S = Sulfuric acid pH2 N = Nitric acid pH2 B = NaOH to pH12 Z = Zinc acetate																						
Turnaround Time Requested: (Please circle) <u>NORMAL</u> or EXPEDITED IN _____ DAYS					Relinquished By: <u>BM</u>					Date/Time: <u>7/21/14 @ 8:00 A.M.</u>					Received By: _____							
Expedited results requested by: _____					Relinquished By: _____					Date/Time: _____					Received in Lab. By: <u>Jimmy</u>							
Who should AIC contact with questions: <u>Bill Eoff</u>															Date/Time: <u>7/22/14 0935</u>							
Phone: <u>(479) - 738 - 208</u> Fax: <u>(479) - 738 - 1285</u>																						
Report Attention to: <u>Bill Eoff</u>																						
Report Address to: <u>Bill Eoff Huntsville Water Utilities P.O. Box 430</u>																						
															Comments: <u>Fed Ex 8019 4081 1944</u>							



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CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

PAGE OF

Client: Huntsville Water Utilities			PO No.:		ANALYSES REQUESTED												AIC CONTROL NO: 180852						
Project Reference: Bio Monitoring			SAMPLE MATRIX		NO OF BOTTLES	Cd & Pb Chronic											AIC PROPOSAL NO:						
Project Manager: Bill Eoff			W	S													Carrier:						
Sampled By: Bill Eoff			G	C	A	S	Received on Ice (4°C)? YES NO																
AIC No.	Sample Identification	Date/Time Collected	A	M	R	O	Remarks																
2	Huntsville #2	7/22/14 @ 7:00 7/23/14 @ 5:00	X	X			3	X															
Container Type: P			Field pH calibration																				
Preservative: 4C			on _____ @ _____																				
G = Glass P = Plastic V = VOA vials			Buffer:																				
NO = none S = Sulfuric acid pH2 N = Nitric acid pH2			T = Sodium Thiosulfate Z = Zinc acetate																				

Turnaround Time Requested: (Please circle)
 NORMAL or EXPEDITED IN _____ DAYS

Expedited results requested by: _____

Who should AIC contact with questions: Bill Eoff

Phone: (479) - 738 - 208 Fax: (479) - 738 - 1285

Report Attention to: Bill Eoff

Report Address to: Bill Eoff
 Huntsville Water Utilities
 P.O. Box 430

Relinquished By: <i>BM</i>	Date/Time: 7/23/14 @ 8:00 AM	Received By: <i>[Signature]</i>	Date/Time: 7-24-14
Relinquished By:	Date/Time:	Received in Lab By: <i>[Signature]</i>	Date/Time: 08-15
Comments: <i>Feltex 8019-4081-1933</i>			



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CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

PAGE _____ OF _____

Client: Huntsville Water Utilities			PO No.		NO OF BOTTLES	Cd & Pb Chronic	ANALYSES REQUESTED										AIC CONTROL NO: 180852					
Project Reference: Bio Monitoring			SAMPLE MATRIX				WATER	SOIL													AIC PROPOSAL NO:	
Project Manager: Bill Eoff			G R A B	C O M P	A T E R	S O I L															NO OF BOTTLES	Cd & Pb Chronic
Sampled By: Bill Eoff																						
AIC No.	Sample Identification	Date/Time Collected																				
③	Huntsville #3	7/24/14 @ 7:00 - 7/25/14 @ 5:00		X	X			3	X												Remarks	

AIC CONTROL NO:
180852
 AIC PROPOSAL NO:
 Carrier:
 Received on Ice (4°C)?
 YES 3.4 NO
 Remarks

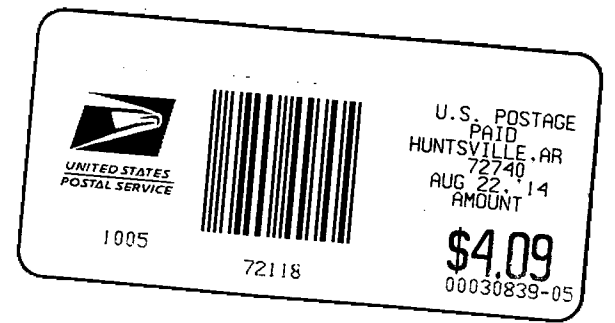
Field pH calibration on _____ @ _____ Buffer:

G = Glass P = Plastic V = VOA vials H = HCl to pH2 T = Sodium Thiosulfate
 NO = none S = Sulfuric acid pH2 N = Nitric acid pH2 B = NaOH to pH12 Z = Zinc acetate

Turnaround Time Requested: (Please circle) **NORMAL** or EXPEDITED IN _____ DAYS
 Expedited results requested by: _____
 Who should AIC contact with questions: Bill Eoff
 Phone: (479) - 738 - 208 Fax: (479) - 738 - 1285
 Report Attention to: Bill Eoff
 Report Address to: Bill Eoff
Huntsville Water Utilities
P.O. Box 430

Relinquished By: [Signature] Date/Time: 7/25/14 @ 8:00
 Received By: _____ Date/Time: _____
 Relinquished By: _____ Date/Time: _____
 Received in Lab By: [Signature] Date/Time: 7/26/14 0840
 Comments: FedEx 8019 4091 1922

Huntsville Water Utilities
P.O. Box 430
Huntsville, AR 72740



A.D.E.Q.
N.P.D.E.S. Enforcement Division
5301 Northshore Drive
North Little Rock, AR 72118-5317

