



November 25, 2015

Test Results of
Fourth Quarter
Chronic 7-Day Renewal
Biomonitoring Testing
for
Cabot, AR

Control No. 196094-1

Prepared for:

Mr. Matt Bienvenu
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Prepared by:

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McClelland Consulting Engineers, Inc.
ATTN: Mr. Matt Bienvenu
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Re: Chronic 7-Day Renewal utilizing *Pimephales promelas* (Fathead minnow) and *Ceriodaphnia dubia*
- Cabot, AR
NPDES Permit No. AR0021661 AFIN:43-00059

Dear Mr. Matt Bienvenu:

This report is the analytical results and supporting information for the samples submitted to American Interplex Corporation (AIC). The following results are applicable only to the sample identified by the control number referenced above. Accurate assessment of the data requires access to the entire document. Each section of the report has been reviewed and approved by the Chief Operating Officer 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 %. The NOEC for growth occurred at 100 % effluent, which is equal to the critical dilution of 100 %. **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 42 % effluent, which is below the critical dilution of 100 %. The NOEC for reproduction occurred at 0 % effluent, which is below the critical dilution of 100 %. **The sample, therefore, FAILED 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
Chief Operating Officer

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Table of Contents

- I. Control Acceptance Criteria
- II. Outlined Report
- III. Data Analysis
- IV. Standard Reference Toxicants
- V. Chemical Analysis/Quality Control
- VI. Organism History
- VII. Results Summary
 - Pimephales promelas* (Fathead minnow)
 - Ceriodaphnia dubia*
- Appendix A: Raw Data
 - A1: Test 1000.0
 - Pimephales promelas* (Fathead minnow) Survival and Growth
 - Test 1002.0
 - Ceriodaphnia dubia* Survival and Reproduction
 - A2: Statistics
 - A3: Water Chemistry
 - A4: Reference Toxicant
- Appendix B: Chains of Custody

I. Control Acceptance Criteria

Pimephales promelas (Fathead minnow) Method 1000.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	97.5	PASS
Control Growth > or = 0.25 mg per Surviving minnow	0.276	PASS
Control Growth CV < or = 40%	9.86	PASS
Growth Minimum Significant Difference 12 to 30%	21.2	PASS
Critical Dilution CV < or = 40%	11.7	PASS

Ceriodaphnia dubia Method 1002.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	100	PASS
Control Reproduction > or = 15 per Surviving Female	21.6	PASS
Control CV < or = 40% per Surviving Female	14.8	PASS
Reproduction Minimum Significant Difference 13 to 47%	16.9	PASS
Critical Dilution CV < or = 40%	32.7	PASS

II. Outlined Report

A. Introduction

1. Permit Number: AR0021661 AFIN:43-00059
2. Test Requirements: Test Methods 1000.0 and 1002.0
3. Receiving Stream:

B. Source of Effluent/Dilution Water

1. Effluent Samples:

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

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	6.8	7.7	8.0
pH (standard units)	7.2	7.5	7.3
Alkalinity (mg/l as CaCO ₃)	88	110	89
Hardness (mg/l as CaCO ₃)	90	90	78
Conductivity (umhos/cm)	420	440	360
Residual Chlorine (mg/l)	<0.05	<0.05	<0.05
Ammonia as N (mg/l)	0.49	0.38	3.2

2. Dilution Water Samples: Synthetic Moderately Hard Water #4268

- a. Dates Prepared: October 31 through November 14, 2015
- b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	7.7	7.1	8.6
pH (standard units)	7.7	7.9	7.6
Alkalinity (mg/l as CaCO ₃)	60	60	60
Hardness (mg/l as CaCO ₃)	87	87	87
Conductivity (umhos/cm)	320	320	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: November 10, 2015 at 1745
Date & Time Test Terminated: November 17, 2015 at 1615
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: November 10, 2015 at 1900
Date & Time Test Terminated: November 17, 2015 at 1715
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 and Bartlett's test. 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 Shapiro-Wilk's 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 October 21, 2015 at 1600 to October 28, 2015 at 1530

The results were as follows: (Control No. 195350-1.)

Survival LC-50: 4872 mg/l
Growth IC-25: 3595 mg/l
Growth PMSD: 13

Ceriodaphnia dubia

Chronic reference tests are performed monthly.

A chronic reference test was performed on October 21, 2015 at 1400 to October 27, 2015 at 1550

The results were as follows: (Control No. 195350-2.)

Survival LC-50: 1732 mg/l
Growth IC-25: 879.2 mg/l
Growth PMSD: 20.2

V. Chemical Analysis/Quality Control

Parameter	Method	% Recovery	Relative % Difference
Alkalinity	SM 2320 B	NA	0.854
Hardness	EPA 200.7	100	2.28
pH	SM 4500-H+ B	100	0.672
Conductivity	EPA 120.1	96.6	1.40

VI. Organism History

Pimephales promelas (Fathead minnow)

Date: November 10, 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: November 10, 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

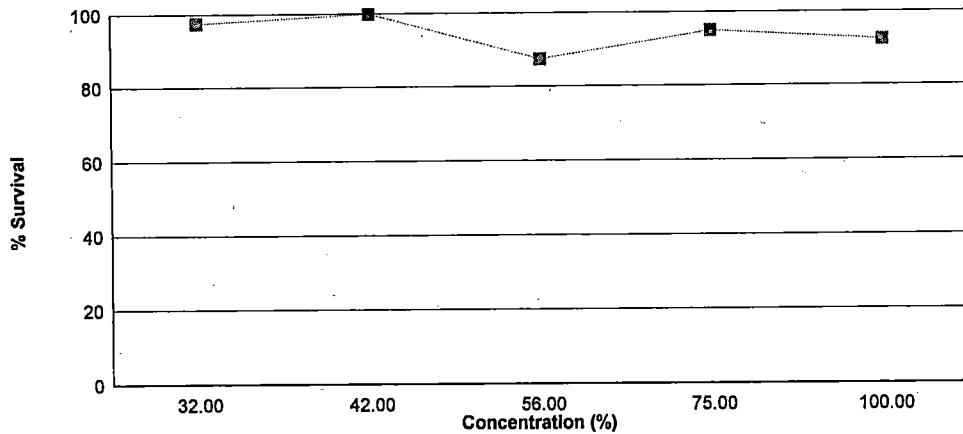
Larvae are exposed in a static renewal system for seven days to different concentrations of effluent with dilution water. Test results are based on the survival and growth (increase in weight) of the larvae.

Effluent dilutions for this test were 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 November 10, 2015 at 1745 and continued through November 17, 2015 at 1615. 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	97.5	0.269
32 %	97.5	0.319
42 %	100	0.295
56 %	87.5	0.278
75 %	95.0	0.295
100 %	92.5	0.287

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

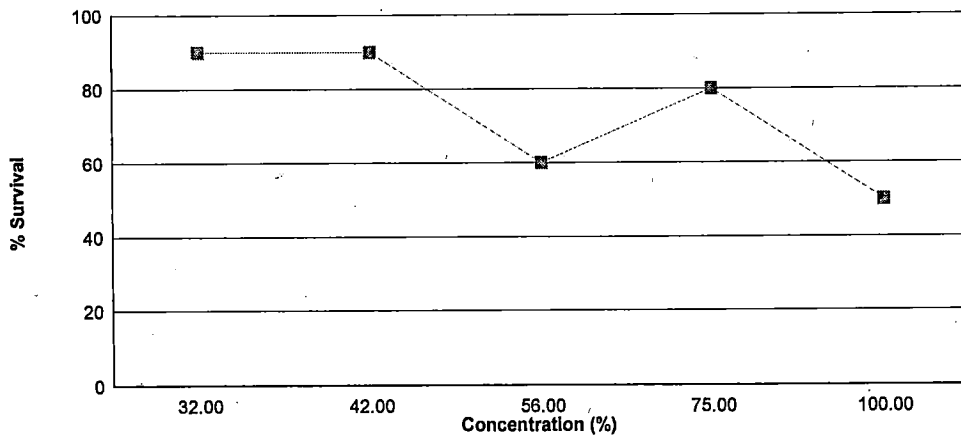
Neonates are exposed in a static renewal system to different concentrations of effluent with dilution water until 60% of surviving control organisms have three broods of offspring with an average of at least 15 young per female.

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 November 10, 2015 at 1900 and continued through November 17, 2015 at 1715. Statistical analyses were performed on the observed data and the no observable effects concentrations (NOECs) were as follows:

- a.) NOEC survival = 42 % effluent
- b.) NOEC reproduction = 0 % effluent



Concentration	Percent Survival	Mean Reproduction
Control	100	21.6
32 %	90.0	16.3 *
42 %	90.0	16.6
56 %	60.0 *	--
75 %	80.0	--
100 %	50.0 *	--

*Significant difference when compared to the control (p=0.05)

Appendix A1: Test 1000.0

Pimephales promelas (Fathead Minnow) 7-Day Survival

Date and Time Test Initiated: November 10, 2015 at 1745
Date and Time Test Terminated: November 17, 2015 at 1615

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	7
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	7
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	5
	B	8	8	8	8	8	8	7
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	7
	E	8	8	8	8	8	8	8
75 %	A	8	8	8	8	8	8	7
	B	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	7
	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	7
	D	8	8	8	8	8	8	6
	E	8	8	8	8	8	8	8

Appendix A1: Test 1000.0

Pimephales promelas (Fathead Minnow) 7-Day Growth

Test Initiated: November 10, 2015 at 1745
Test Terminated: November 17, 2015 at 1615

Drying Started: November 17, 2015 at 1025
Drying Ended: November 18, 2015 at 1114

Concentration	Replicate	Weight of pan	Weight of pan + fish	Total weight of fish (g)	Original # of fish	Mean dry weight (mg)
Control	A	.94283	.94526	0.00243	8	0.304
	B	.94073	.94283	0.00210	8	0.262
	C	.94880	.95089	0.00209	8	0.261
	D	.94487	.94674	0.00187	8	0.234
	E	.94725	.94953	0.00228	8	0.285
32 %	A	.94356	.94609	0.00253	8	0.316
	B	.94606	.94877	0.00271	8	0.339
	C	.94120	.94339	0.00219	8	0.274
	D	.94830	.95118	0.00288	8	0.360
	E	.94464	.94707	0.00243	8	0.304
42 %	A	.94881	.95106	0.00225	8	0.281
	B	.94462	.94698	0.00236	8	0.295
	C	.94824	.95039	0.00215	8	0.269
	D	.93957	.94190	0.00233	8	0.291
	E	.94015	.94286	0.00271	8	0.339
56 %	A	.94631	.94798	0.00167	8	0.209
	B	.94419	.94656	0.00237	8	0.296
	C	.94951	.95148	0.00197	8	0.246
	D	.94649	.94908	0.00259	8	0.324
	E	.94987	.95239	0.00252	8	0.315
75 %	A	.94246	.94506	0.00260	8	0.325
	B	.94444	.94717	0.00273	8	0.341
	C	.94689	.94955	0.00266	8	0.332
	D	.94608	.94787	0.00179	8	0.224
	E	.94552	.94755	0.00203	8	0.254
100 %	A	.94354	.94564	0.00210	8	0.262
	B	.94572	.94844	0.00272	8	0.340
	C	.94491	.94701	0.00210	8	0.262
	D	.93907	.94124	0.00217	8	0.271
	E	.94493	.94735	0.00242	8	0.302

Appendix A1: Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

Date and Time Test Initiated: November 10, 2015 at 1900
Date and Time Test Terminated: November 17, 2015 at 1715

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	0	2	3	2	5	0	0	4	4	3	23	10	2.30	
5	3	8	10	7	10	6	0	9	8	9	70	10	7.00	
6	7	9	7	0	11	10	7	0	0	0	51	10	5.10	
7	9	0	0	9	0	10	11	11	10	12	72	10	7.20	
8														
TOTAL	19	19	20	18	26	26	18	24	22	24	216	10	21.6	

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	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
4	3	2	3	0	3	0	0	0	2	X	13	9	1.44	
5	4	5	4	4	8	1	4	5	7	X	42	9	4.67	
6	0	0	0	9	0	4	0	6	0	X	19	9	2.11	
7	9	10	9	12	11	9	10	10	9	X	89	9	9.89	
8														
TOTAL	16	17	16	25	22	14	14	21	18	0	163	10	16.3	

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	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
4	4	X	2	0	0	0	0	0	0	3	9	9	1.00	
5	6	X	0	6	6	3	6	4	6	4	41	9	4.56	
6	0	X	5	8	7	0	9	0	6	0	35	9	3.89	
7	9	X	10	9	10	7	8	9	10	9	81	9	9.00	
8														
TOTAL	19	0	17	23	23	10	23	13	22	16	166	10	16.6	

Appendix A1: Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

Date and Time Test Initiated: November 10, 2015 at 1900

Date and Time Test Terminated: November 17, 2015 at 1715

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	X	0	0	0	0	0	0	0	0	0	9	0.00
3	0	X	X	0	0	0	0	0	0	0	0	0	8	0.00
4	0	X	X	0	0	3	X	X	0	0	3	6	0.500	
5	6	X	X	3	5	5	X	X	4	7	30	6	5.00	
6	6	X	X	0	6	0	X	X	5	7	24	6	4.00	
7	9	X	X	8	7	8	X	X	9	8	49	6	8.17	
8														
TOTAL	21	0	0	11	18	16	0	0	18	22	106	10	10.6	

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	0	0	0	0	X	0	0	0	0	0	0	9	0.00	
4	1	X	3	0	X	0	0	0	3	0	7	8	0.875	
5	0	X	5	6	X	0	5	0	5	0	21	8	2.62	
6	3	X	0	8	X	4	10	0	0	4	29	8	3.62	
7	2	X	6	0	X	6	6	0	9	8	37	8	4.62	
8														
TOTAL	6	0	14	14	0	10	21	0	17	12	94	10	9.40	

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	X	0	9	0.00	
3	0	0	0	0	0	X	0	0	0	X	0	8	0.00	
4	X	0	0	0	X	X	4	0	X	X	4	5	0.800	
5	X	2	4	6	X	X	7	4	X	X	23	5	4.60	
6	X	5	6	4	X	X	0	3	X	X	18	5	3.60	
7	X	7	7	9	X	X	2	0	X	X	25	5	5.00	
8														
TOTAL	0	14	17	19	0	0	13	7	0	0	70	10	7.00	

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	0.87500	1.20940
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	0.87500	1.20940
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	0.62500	0.91174
4	56 %	2	0.87500	1.20940
4	56 %	3	1.00000	1.39310
4	56 %	4	0.87500	1.20940
4	56 %	5	1.00000	1.39310
5	75 %	1	0.87500	1.20940
5	75 %	2	1.00000	1.39310
5	75 %	3	1.00000	1.39310
5	75 %	4	0.87500	1.20940
5	75 %	5	1.00000	1.39310
6	100 %	1	1.00000	1.39310
6	100 %	2	1.00000	1.39310
6	100 %	3	0.87500	1.20940
6	100 %	4	0.75000	1.04720
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 = 0.3469 W = 0.9047 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		Transform: Arc Sin(Square Root(Y))
<p>Test can not be performed because at least one group has zero variance. Data FAIL to meet homogeneity of variance assumption.</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 %	30.00	16.00	5.00	
4	56 %	22.00	16.00	5.00	
5	75 %	25.00	16.00	5.00	
6	100 %	24.50	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 = 0.03522 W = 0.9498 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 = 3.266 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	0.007257	0.001451	0.9884	
Within (Error)	24	0.03522	0.001468		
Total	29	0.04248			
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	0.2692	0.2692			
2	32 %	0.3186	0.3186	-2.039		
3	42 %	0.295	0.295	-1.065		
4	56 %	0.278	0.278	-0.3632		
5	75 %	0.2952	0.2952	-1.073		
6	100 %	0.2874	0.2874	-0.7511		
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	0.05719	21.2	-0.0494	
3	42 %	5	0.05719	21.2	-0.0258	
4	56 %	5	0.05719	21.2	-0.0088	
5	75 %	5	0.05719	21.2	-0.026	
6	100 %	5	0.05719	21.2	-0.0182	

Appendix A2: Statistics

Ceriodaphnia dubia Survival

Fisher's Exact Test			
Identification	Alive	Dead	Total Animals
Control	10	0	10
32 %	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
42 %	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
56 %	6	4	10
Total	16	4	20

Critical Fisher's value (10,10,10) (alpha=0.05) is 6. b value is 6. Since b is less than or equal to 6 there is A 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 %	8	2	10
Total	18	2	20

Critical Fisher's value (10,10,10) (alpha=0.05) is 6. b value is 8. 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 %	5	5	10
Total	15	5	20

Critical Fisher's value (10,10,10) ($\alpha=0.05$) is 6. b value is 5. Since b is less than or equal to 6 there is A 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	1	
2	42 %	10	1	
3	56 %	10	4	*
4	75 %	10	2	
5	100 %	10	5	*

Appendix A2: Statistics

Ceriodaphnia dubia Reproduction

Shapiro - Wilk's Test for Normality	No Transformation
D = 992.9 W = 0.8799 Critical W = 0.9 (alpha = 0.01, N = 30) Critical W = 0.927 (alpha = 0.05, N = 30)	
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	32 %	74.50	79.00	10.00	*
3	42 %	81.50	79.00	10.00	

Critical values are 1 tailed (k=2)

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	2	71.45	35.72	2.281	
Within (Error)	25	391.6	15.66		
Total	27	463			
Critical F = 5.57 (alpha = 0.01, df = 2,25)					
3.38 (alpha = 0.05, df = 2,25)					
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	21.6	21.6			
2	32 %	18.111	18.111	1.919		
3	42 %	18.444	18.444	1.736		
Dunnett's critical value = 2.01 (1 Tailed, alpha = 0.05, df [used] = 2,24) (Actual df = 2,25)						
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	32 %	9	3.655	16.9	3.489		
3	42 %	9	3.655	16.9	3.156		

Appendix A3: Water Chemistry

Routine Chemical and Physical Data

Date and Time Test Initiated: November 10, 2015 at 1526

Date and Time Test Terminated: November 17, 2015 at 1715

Effluent Conc.: Control	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	
DO, mg/l	Initial	7.7	7.9	7.1	7.7	8.6	8.3	8.0
	Final *1	7.5	7.0	7.4	7.4	7.9	8.5	6.4
	Final *2	7.4	7.7	7.8	8.6	8.0	7.4	6.4
pH, units	Initial	7.7	7.8	7.9	7.6	7.6	7.7	7.9
	Final *1	7.7	7.5	7.4	7.8	7.7	7.5	7.6
	Final *2	8.2	8.0	8.2	8.0	8.0	8.2	8.4
Alkalinity, mg CaCO ₃ /l	60	NA	60	NA	60	NA	NA	
Hardness, mg CaCO ₃ /l	87	NA	87	NA	87	NA	NA	
Conductivity, umhos/cm	320	280	320	320	290	290	330	
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	7.6	7.7	7.6	7.8	8.4	8.0	7.9
	Final *1	6.6	6.8	7.4	7.6	8.0	8.5	6.4
	Final *2	7.3	7.8	8.1	8.4	8.3	7.6	6.2
pH, units	Initial	7.5	7.7	7.7	7.7	7.5	7.8	7.7
	Final *1	7.6	7.6	7.5	7.9	7.8	7.6	7.6
	Final *2	8.1	8.1	8.2	8.0	8.0	8.2	8.3

Effluent Conc.: 42 %	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	
DO, mg/l	Initial	7.7	7.6	7.6	7.9	8.3	7.9	7.6
	Final *1	6.6	6.7	7.5	7.6	8.0	8.5	6.2
	Final *2	7.0	7.6	7.6	8.5	8.2	7.7	6.1
pH, units	Initial	7.4	7.7	7.7	7.7	7.5	7.8	7.7
	Final *1	7.6	7.5	7.5	7.9	7.8	7.6	7.7
	Final *2	8.1	8.1	8.2	8.0	8.0	8.2	8.4

Appendix A3: Water Chemistry

Routine Chemical and Physical Data

Date and Time Test Initiated: November 10, 2015 at 1526
Date and Time Test Terminated: November 17, 2015 at 1715

Effluent Conc.: 56 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	6.7	7.8	7.7	7.7	8.3	8.0	7.9
	Final *1	6.9	7.0	7.6	7.7	7.8	8.4	6.5
	Final *2	7.2	7.7	7.9	8.6	8.1	7.8	6.4
pH, units	Initial	7.6	7.7	7.6	7.7	7.4	7.8	7.7
	Final *1	7.7	7.7	7.6	8.0	7.8	7.6	7.7
	Final *2	8.2	8.2	8.2	8.1	8.0	8.3	8.4

Effluent Conc.: 75 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.2	7.8	7.7	7.9	8.4	8.0	7.8
	Final *1	6.8	7.0	7.4	7.5	7.8	8.6	6.5
	Final *2	7.3	7.8	7.9	8.6	8.1	7.6	6.5
pH, units	Initial	7.3	7.6	7.5	7.6	7.3	7.8	7.6
	Final *1	7.8	7.6	7.6	8.0	7.9	7.6	7.7
	Final *2	8.2	8.2	8.2	8.1	8.0	8.2	8.4

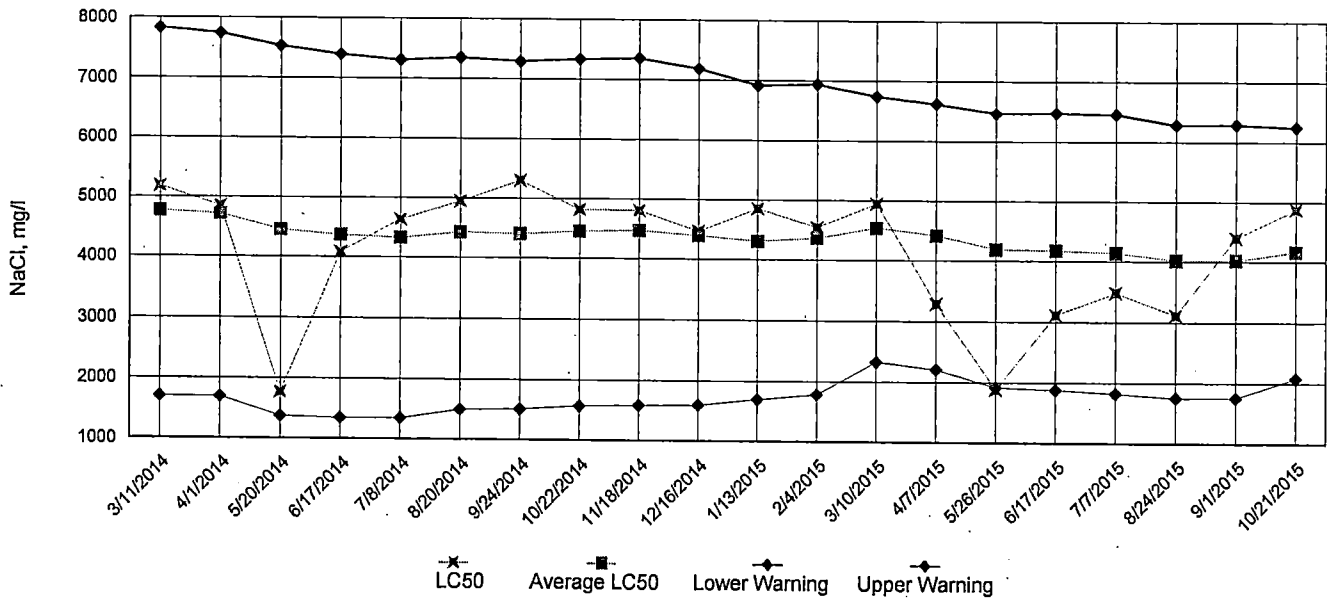
Effluent Conc.: 100 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	6.8	7.5	7.7	7.2	8.0	7.7	7.7
	Final *1	5.9	6.9	7.3	7.7	7.8	8.5	6.3
	Final *2	6.7	7.7	7.8	8.3	8.3	7.6	6.2
pH, units	Initial	7.2	7.5	7.5	7.6	7.3	7.8	7.6
	Final *1	7.7	7.7	7.6	8.0	7.9	7.7	7.7
	Final *2	8.2	8.3	8.2	8.1	8.1	8.3	8.5
Alkalinity, mg CaCO ₃ /l	88	NA	110	NA	89	NA	NA	NA
Hardness, mg CaCO ₃ /l	90	NA	90	NA	78	NA	NA	NA
Conductivity, umhos/cm	420	390	440	440	360	360	400	
Res. Chlorine, mg/l	<0.05	NA	<0.05	NA	<0.05	NA	NA	NA

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

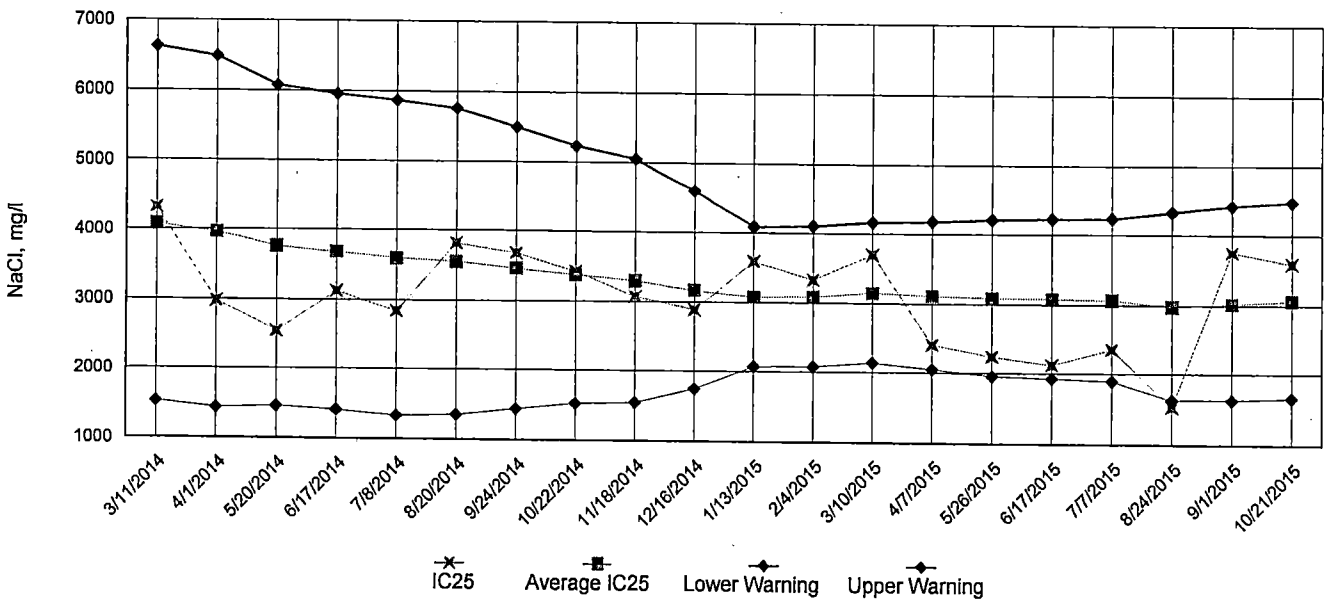
Appendix A4: Test 1000.0

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

LC50 Survival Data



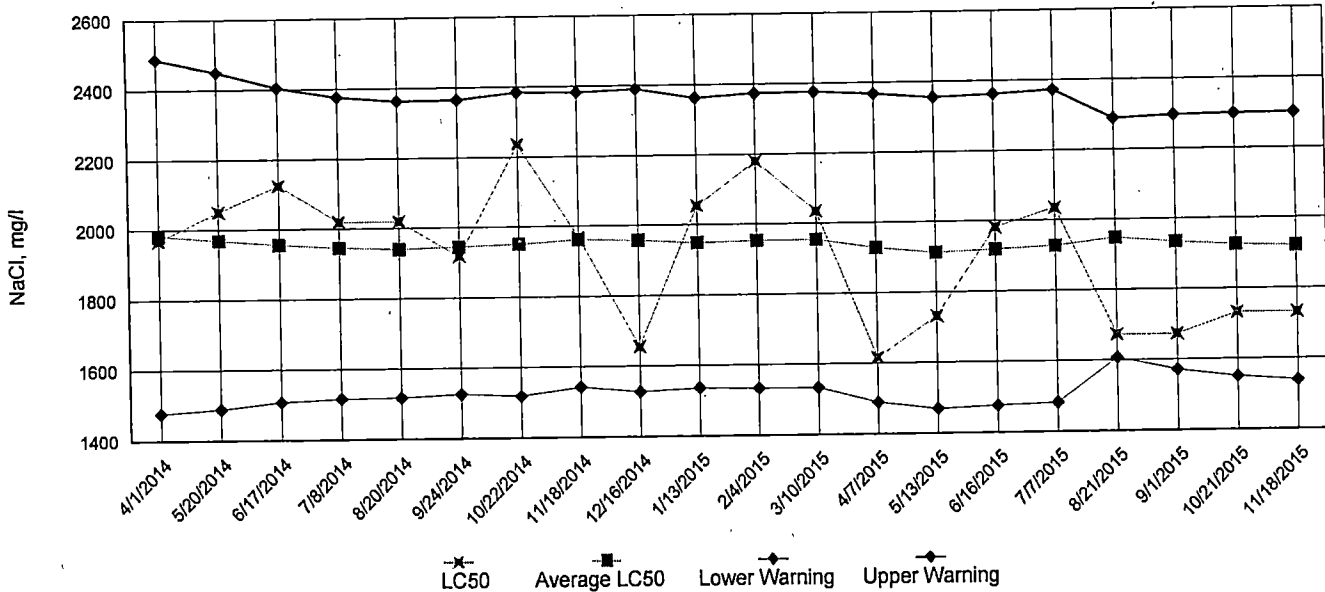
IC25 Growth Data



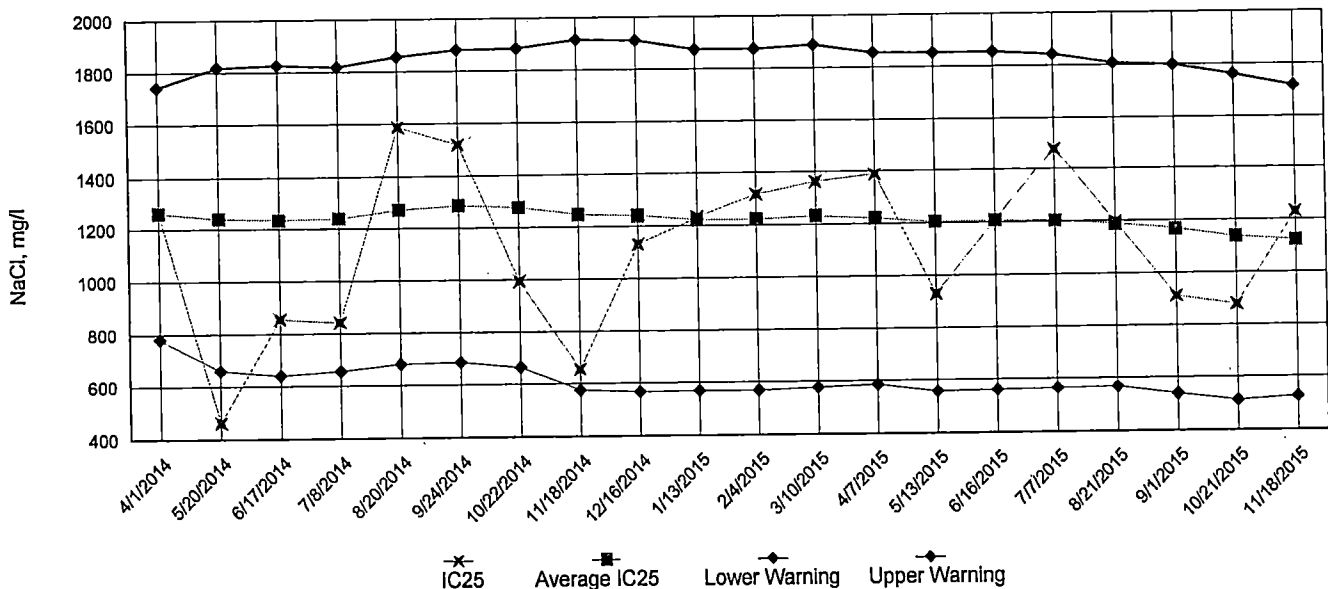
Appendix A4: Test 1002.0

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: McClelland Consulting Engineers, Inc.

NPDES No.: AR0021661 AFIN:43-00059

Date and Time Test Initiated: November 10, 2015 at 1745

Date and Time Test Terminated: November 17, 2015 at 1615

Dilution water used: Synthetic Moderately Hard Water #4268

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	87.5	100	100	97.5	5.73
32 %	100	100	100	100	87.5	100	100	97.5	5.73
42 %	100	100	100	100	100	100	100	100	0.00
56 %	62.5	87.5	100	87.5	100	100	100	87.5	17.5
75 %	87.5	100	100	87.5	100	100	100	95.0	7.21
100 %	100	100	87.5	75.0	100	100	100	92.5	12.1

DATA TABLE FOR GROWTH

Effluent Conc. %	Average dry weight, mg replicate chambers					Mean dry weight, mg	CV%
	A	B	C	D	E		
Control	0.304	0.262	0.261	0.234	0.285	0.269	9.86
32 %	0.316	0.339	0.274	0.360	0.304	0.319	10.3
42 %	0.281	0.295	0.269	0.291	0.339	0.295	9.01
56 %	0.209	0.296	0.246	0.324	0.315	0.278	17.6
75 %	0.325	0.341	0.332	0.224	0.254	0.295	17.9
100 %	0.262	0.340	0.262	0.271	0.302	0.287	11.7

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 %)	<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	(100 %)	<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: 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: 11.7 (TQP6C)

Appendix B: Test 1000.0

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

PERMITTEE: McClelland Consulting Engineers, SAMPLE No. 1 COLLECTED ending: DATE: November 10, 2015 TIME: 0800
 NPDES NO.: AR0021661 AFIN:43-00059 SAMPLE No. 2 COLLECTED ending: DATE: November 11, 2015 TIME: 0800
 CONTACT: Mr. Matt Bienvenu SAMPLE No. 3 COLLECTED ending: DATE: November 13, 2015 TIME: 0800
 ANALYST: 280, 304, 310, 314 Test Initiated: DATE: November 10, 2015 TIME: 1745
 Test Terminated: DATE: November 17, 2015 TIME: 1615

DILUTION Control	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	7.9	7.1	7.7	8.6	8.3	8.0
Final	7.5	7.0	7.4	7.4	7.9	8.5	6.4
pH Initial	7.7	7.8	7.9	7.6	7.6	7.7	7.9
Final	7.7	7.5	7.4	7.8	7.7	7.5	7.6
Alkalinity	60	NA	60	NA	60	NA	NA
Hardness	87	NA	87	NA	87	NA	NA
Conductivity	320	280	320	320	290	290	330
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 32 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.6	7.7	7.6	7.8	8.4	8.0	7.9
Final	6.6	6.8	7.4	7.6	8.0	8.5	6.4
pH Initial	7.5	7.7	7.7	7.7	7.5	7.8	7.7
Final	7.6	7.6	7.5	7.9	7.8	7.6	7.6
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	340	310	360	360	310	310	350
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 42 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	7.6	7.6	7.9	8.3	7.9	7.6
Final	6.6	6.7	7.5	7.6	8.0	8.5	6.2
pH Initial	7.4	7.7	7.7	7.7	7.5	7.8	7.7
Final	7.6	7.5	7.5	7.9	7.8	7.6	7.7
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	360	330	370	370	320	320	360
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 56 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	6.7	7.8	7.7	7.7	8.3	8.0	7.9
Final	6.9	7.0	7.6	7.7	7.8	8.4	6.5
pH Initial	7.6	7.7	7.6	7.7	7.4	7.8	7.7
Final	7.7	7.7	7.6	8.0	7.8	7.6	7.7
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	380	340	390	390	330	330	370
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 75 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.2	7.8	7.7	7.9	8.4	8.0	7.8
Final	6.8	7.0	7.4	7.5	7.8	8.6	6.5
pH Initial	7.3	7.6	7.5	7.6	7.3	7.8	7.6
Final	7.8	7.6	7.6	8.0	7.9	7.6	7.7
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	390	360	410	410	340	340	380
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 100 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	6.8	7.5	7.7	7.2	8.0	7.7	7.7
Final	5.9	6.9	7.3	7.7	7.8	8.5	6.3
pH Initial	7.2	7.5	7.5	7.6	7.3	7.8	7.6
Final	7.7	7.7	7.6	8.0	7.9	7.7	7.7
Alkalinity	88	NA	110	NA	89	NA	NA
Hardness	90	NA	90	NA	78	NA	NA
Conductivity	420	390	440	440	360	360	400
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: McClelland Consulting Engineers, Inc.

NPDES No.: AR0021661 AFIN:43-00059

Date and Time Test Initiated: November 10, 2015 at 1900

Date and Time Test Terminated: November 17, 2015 at 1715

Dilution water used: Synthetic Moderately Hard Water #4268

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	90.0	100	90.0
7 day	100	90.0	90.0	60.0	80.0	50.0

NUMBER OF YOUNG PRODUCED PER FEMALE @ 7 DAYS

Replicates	Control	Percent Effluent				
		32 %	42 %	56 %	75 %	100 %
A	19	16	19	21	6	0
B	19	17	0	0	0	14
C	20	16	17	0	14	17
D	18	25	23	11	14	19
E	26	22	23	18	0	0
F	26	14	10	16	10	0
G	18	14	23	0	21	13
H	24	21	13	0	0	7
I	22	18	22	18	17	0
J	24	0	16	22	12	0
Mean per Adult	21.6	16.3	16.6	10.6	9.40	7.00
Mean per Surviving Adult	21.6	18.1	18.4	17.7	11.8	14.0
CV %	14.8	20.9	26.0	22.3	55.5	32.7

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 %)	<u> X </u>	YES	<u> </u>	NO
b.) 1/2 LOW FLOW DILUTION	(NA)	<u> </u>	YES	<u> </u>	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	(100 %)	<u> X </u>	YES	<u> </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]: 1 (TLP3B)
4. If you answered NO to 2.a) enter [0] otherwise enter [1]: 1 (TGP3B)
5. NOEC *Ceriodaphnia* Lethality: 42 % (TOP3B)
6. LOEC *Ceriodaphnia* Lethality: 56 % (TXP3B)
7. NOEC *Ceriodaphnia* Sublethality: 0 % (TPP3B)
8. LOEC *Ceriodaphnia* Sublethality: 0 % (TYP3B)
9. Coefficient of variation for *Ceriodaphnia* Reproduction: 32.7 (TQP3B)

Appendix B: Test 1002.0
CHRONIC TOXICITY SUMMARY FORM
Ceriodaphnia dubia
CHEMICAL PARAMETERS CHART

PERMITTEE: McClelland Consulting Engineers SAMPLE No. 1 COLLECTED ending: DATE: November 10, 2015 TIME: 0800
 NPDES NO.: AR0021661 AFIN:43-00059 SAMPLE No. 2 COLLECTED ending: DATE: November 11, 2015 TIME: 0800
 CONTACT: Mr. Matt Bienvenu SAMPLE No. 3 COLLECTED ending: DATE: November 13, 2015 TIME: 0800
 ANALYST: 280, 304, 310, 314 Test Initiated: DATE: November 10, 2015 TIME: 1900
 Test Terminated: DATE: November 17, 2015 TIME: 1715

DILUTION Control	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	7.9	7.1	7.7	8.6	8.3	8.0
Final	7.4	7.7	7.8	8.6	8.0	7.4	6.4
pH Initial	7.7	7.8	7.9	7.6	7.6	7.7	7.9
Final	8.2	8.0	8.2	8.0	8.0	8.2	8.4
Alkalinity	60	NA	60	NA	60	NA	NA
Hardness	87	NA	87	NA	87	NA	NA
Conductivity	320	280	320	320	290	290	330
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 32 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.6	7.7	7.6	7.8	8.4	8.0	7.9
Final	7.3	7.8	8.1	8.4	8.3	7.6	6.2
pH Initial	7.5	7.7	7.7	7.7	7.5	7.8	7.7
Final	8.1	8.1	8.2	8.0	8.0	8.2	8.3
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	340	310	360	360	310	310	350
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 42 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	7.6	7.6	7.9	8.3	7.9	7.6
Final	7.0	7.6	7.6	8.5	8.2	7.7	6.1
pH Initial	7.4	7.7	7.7	7.7	7.5	7.8	7.7
Final	8.1	8.1	8.2	8.0	8.0	8.2	8.4
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	360	330	370	370	320	320	360
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 56 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	6.7	7.8	7.7	7.7	8.3	8.0	7.9
Final	7.2	7.7	7.9	8.6	8.1	7.8	6.4
pH Initial	7.6	7.7	7.6	7.7	7.4	7.8	7.7
Final	8.2	8.2	8.2	8.1	8.0	8.3	8.4
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	380	340	390	390	330	330	370
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 75 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.2	7.8	7.7	7.9	8.4	8.0	7.8
Final	7.3	7.8	7.9	8.6	8.1	7.6	6.5
pH Initial	7.3	7.6	7.5	7.6	7.3	7.8	7.6
Final	8.2	8.2	8.2	8.1	8.0	8.2	8.4
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	390	360	410	410	340	340	380
Chlorine	NA	NA	NA	NA	NA	NA	NA

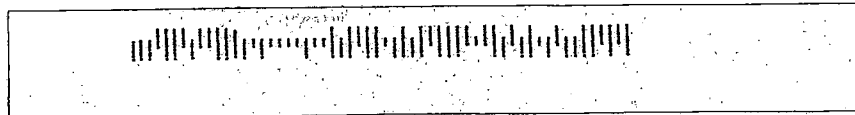
DILUTION 100 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	6.8	7.5	7.7	7.2	8.0	7.7	7.7
Final	6.7	7.7	7.8	8.3	8.3	7.6	6.2
pH Initial	7.2	7.5	7.5	7.6	7.3	7.8	7.6
Final	8.2	8.3	8.2	8.1	8.1	8.3	8.5
Alkalinity	88	NA	110	NA	89	NA	NA
Hardness	90	NA	90	NA	78	NA	NA
Conductivity	420	390	440	440	360	360	400
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: <u>Labot</u>			PO No.:		NO OF BOTTLES	ANALYSES REQUESTED										AIC CONTROL NO: <u>196094</u>	
Project Reference:			MATRIX			3	<div style="position: absolute; left: -50px; top: 50px; transform: rotate(-90deg); font-size: small;">1st Day Monitoring</div>										AIC PROPOSAL NO:
Project Manager: <u>MGE Matt B.</u>			WATER SOIL														Carrier:
Sampled By: <u>Jana Kohlmann</u>			GRA B	COMP													Received Temperature C <u>0.1</u>
AIC No.	Sample Identification	Date/Time Collected															Remarks
1	Bio Monitoring	11/9/15 8:00 AM 11/10/15 8:00 AM	X	X													
Container Type			Preservative														Field pH calibration on _____ @ _____
					P												Buffer:
					ICE												
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>Jana Kohlmann</u>		Date/Time: <u>11/10/15 8:30 AM</u>		Received By: <u>Jessie Brown</u>		Date/Time: <u>11-10-15 12:40</u>						
Expedited results requested by: _____					Relinquished By: <u>Jessie Brown</u>		Date/Time: <u>11/16/15 1440</u>		Received in Lab By: <u>Danny Brown</u>		Date/Time: <u>11-10-15 1440</u>						
Who should AIC contact with questions:					Comments:												
Phone: _____ Fax: _____																	
Report Attention to:																	
Report Address to:																	
Email Address:																	

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: <u>Cabot</u>			PO No.:		NO OF BOTTLES	ANALYSES REQUESTED										AIC CONTROL NO: <u>196094</u>			
																AIC PROPOSAL NO:			
Project Reference:			MATRIX		3rd Day Biomonitoring											Carrier:			
																Received Temperature C <u>0.6</u>			
Project Manager: Sampled By: <u>Jana Kohlmann</u>			G R A B	C O M P	W A T E R	S O I L	NO OF BOTTLES											Remarks	
AIC No.	Sample Identification	Date/Time Collected																	
<u>3</u>	<u>Bio Monitor</u>	<u>11/12/15 8:00A</u> <u>11/13/15 8:00A</u>		<u>X</u>	<u>X</u>		<u>3</u>												
Container Type Preservative							<u>P</u> <u>ICE</u>											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		A = (NH ₄) ₂ SO ₄ , NH ₄ OH								
Turnaround Time Requested: (Please circle) NORMAL or EXPEDITED IN: _____ DAYS							Relinquished By: <u>Jana Kohlmann</u>			Date/Time: <u>11/13/15 8:30 AM</u>			Received By: <u>Jessica Brown</u>			Date/Time: <u>11/13/15 1107</u>			
Expedited results requested by: _____							Relinquished By: <u>Jessica Brown</u>			Date/Time: <u>11/13/15 1224</u>			Received in Lab By: <u>D. Ben</u>			Date/Time: <u>11-13-15 1224</u>			
Who should AIC contact with questions: Phone: _____ Fax: _____							Comments:												
Report Attention to: Report Address to:																			
Email Address:																			



Michelle Bolenbaugh
ADEQ Enforcement Analyst
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