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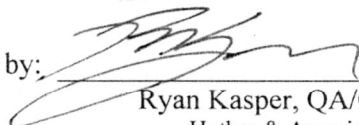
**NORTH LITTLE ROCK WASTEWATER UTILITY
FAULKNER LAKE PLANT
OUTFALL 001**

Chronic Biomonitoring Report
Permit Number NPDES AR0020303
AFIN 60-00274

Ceriodaphnia dubia
Pimephales promelas

August 8, 2017

Reviewed by:



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TABLE OF CONTENTS

TOXICITY TEST REPORT	1
SUMMARY	3
<i>CERIODAPHNIA DUBIA</i> SURVIVAL AND REPRODUCTION SUMMARY	4
<i>CERIODAPHNIA DUBIA</i> STATISTICAL ANALYSES	8
<i>PIMEPHALES PROMELAS</i> SURVIVAL AND GROWTH SUMMARY	9
<i>PIMEPHALES PROMELAS</i> STATISTICAL ANALYSES	12
APPENDIX A: RAW DATA	13
APPENDIX B: REFERENCE TOXICANTS	14
APPENDIX C: CHAIN OF CUSTODY SHEETS	15

TOXICITY TEST REPORT - CHRONIC

ClientNorth Little Rock Wastewater Utility
Facility Faulkner Lake Plant
Permit No. NPDES AR0020303

Sample Outfall 001
Laboratory I.D. 27256
Begin Date August 8, 2017

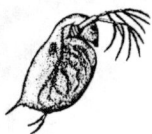
Results: **Pass** *Ceriodaphnia dubia* survival and reproduction and *Pimephales promelas* survival and growth at the critical low flow concentration (8% effluent).

SAMPLE COLLECTION

Composite effluent samples from North Little Rock Wastewater Utility, Faulkner Lake Plant were delivered by Greyhound Package Express courier to Huther & Associates on August 8, August 10, and August 12, 2017. Effluent samples were collected and composited from Outfall 001 using an automatic sampler by facility personnel. Two toxicity tests were requested: a seven-day *Ceriodaphnia dubia* survival and reproduction test (EPA Method 1002.0), and a seven-day *Pimephales promelas* larval survival and growth test (EPA Method 1000.0). Test organisms, procedures and quality assurance requirements were in accordance with the EPA manual, "Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition" (EPA-821-R-02-013).

The effluent samples were analyzed for total residual chlorine (Standard Methods, 22nd Edition, 4500-Cl D) and contained <0.01 mg/L, <0.01 mg/L, and <0.01 mg/L, respectively. Effluent and laboratory dilution water hardness, alkalinity, conductivity, pH, and dissolved oxygen data were collected and recorded.

TEST SETUP
Ceriodaphnia dubia



The seven-day *Ceriodaphnia dubia* survival and reproduction test was initiated at 1600 hours, August 8, 2017. Five concentrations were prepared (3%, 5%, 6%, 8%, and 11% effluent) utilizing distilled, deionized laboratory water reconstituted to match the hardness, alkalinity and pH of the receiving stream (Arkansas River). The test was conducted in 25 mL distilled water rinsed plastic beakers containing 15 mL of solution (one organism per beaker, ten beakers per concentration). *C. dubia* neonates were less than 24-hours-old and within eight hours of the same age at test initiation. Neonates were placed in beakers following a randomized block test design. Fresh solutions were prepared and renewed daily. Daily feeding consisted of 0.5 mL *Selenastrum capricornutum* and cerophyll per test chamber. The test proceeded for seven days during which survival, reproduction and water quality data were collected daily.

A control of ten replicate beakers containing one neonate each in distilled, deionized, reconstituted water (same as diluent) was conducted concurrently with the test. There was 100% survival in the control. The test ended at 1600 hours, August 15, 2017. Survival and reproduction data were statistically analyzed ($p = 0.05$) according to EPA procedures to determine the Lowest Observable Effect Concentration (LOEC) and the No Observable Effect Concentration (NOEC).

SURVIVAL
Ceriodaphnia dubia

There was 100% survival to *C. dubia* in all of the effluent concentrations tested. Therefore, statistical analyses were not required to determine a no effect concentration.

LOEC: Not Applicable
NOEC: 11% Effluent

REPRODUCTION
Ceriodaphnia dubia

C. dubia reproduction data were normally distributed at the 0.01 alpha level (13.277) using Chi-Square test for normality. Reproduction data were homogeneous using Bartlett's test at the 0.01 alpha level (15.09) without data transformations. Therefore, a parametric test was performed on the homogeneous data. Dunnett's test on *C. dubia* reproduction data demonstrated that there were no statistically significant differences between the control and any of the effluent concentrations.

LOEC: Not Applicable
NOEC: 11% Effluent

PMSD: 9.3%

TEST SETUP
Pimephales promelas



The seven-day *Pimephales promelas* larval survival and growth test was initiated at 1540 hours, August 8, 2017. Five concentrations were prepared (3%, 5%, 6%, 8%, and 11% effluent) utilizing distilled, deionized laboratory water reconstituted to match the hardness, alkalinity and pH of the receiving stream (Arkansas River). The test was conducted in 300 mL distilled water rinsed plastic beakers containing 250 mL of solution (eight larvae per beaker, five beakers per concentration). *P. promelas* larvae were less than 24-hours-old at test initiation and originated from a minimum of three in-house spawnings. Fresh solutions were prepared and renewed daily. Larvae in each test chamber were fed <24-hour-old *Artemia* (brine shrimp) three times per day. The test proceeded for seven days during which survival and water quality data were collected daily.

A control of five replicate chambers containing eight larvae each in distilled, deionized, reconstituted water (same as diluent) was conducted concurrently with the test. There was 100% survival in the control. The test ended at 1540 hours, August 15, 2017. At test termination, all larvae were sacrificed, dried for 24-hours, and weighed. Survival and growth (weight) data were statistically analyzed ($p = 0.05$) according to EPA procedures to determine the Lowest Observable Effect Concentration (LOEC) and the No Observable Effect Concentration (NOEC).

SURVIVAL
Pimephales promelas

There was 100% survival to *P. promelas* in all of the effluent concentrations tested. Therefore, statistical analyses were not required to determine a no effect concentration.

LOEC: Not Applicable

NOEC: 11% Effluent

GROWTH
Pimephales promelas

P. promelas growth data were normally distributed at the 0.01 alpha level (0.900) using Shapiro Wilk's test for normality. Growth data were homogeneous using Bartlett's test at the 0.01 alpha level (15.09) without data transformations. Therefore, a parametric test was performed on the homogeneous data. Dunnett's test on *P. promelas* growth data demonstrated that there were no statistically significant differences between the control and any of the effluent concentrations.

LOEC: Not Applicable

NOEC: 11% Effluent

PMSD: 8.1%

SUMMARY

There were no statistically significant differences between the control and the critical low flow concentration (8% effluent) for *C. dubia* survival and reproduction and *P. promelas* survival and growth. Based on biomonitoring requirements for Outfall 001 contained in Permit Number NPDES AR0020303 for North Little Rock Wastewater Utility, Faulkner Lake Plant, Outfall 001 **passed** for this testing period.

Huther and Associates

7-Day/3 Brood *Ceriodaphnia dubia* Survival and Reproduction Chronic Toxicity Test

CLIENT North Little Rock, Faulkner Lake Plant
 NPDES # AR0020303
 LAB ID # 27256
 TEST TYPE 7 Day Chronic
 TEST ORGANISM *Ceriodaphnia dubia*
 ORGANISM AGE < 24-hours
 ORGANISM SOURCE In House
 RECEIVING WATER Arkansas River
 DILUTION WATER Laboratory

SAMPLE TYPE 24 Hour Composite
 DATE COLLECTED 08/07/17 08/09/17 08/11/17
 DATE RECEIVED 08/08/17 08/10/17 08/12/17
 BEGIN DATE/TIME 08/08/17 1600
 END DATE/TIME 08/15/17 1600
 TEST TEMPERATURE (°C) 25 ± 1
 PHOTO PERIOD 16-hr. Light 8-hr. Dark
 LIGHT INTENSITY 50-100 ft. cndl.
 TECHNICIAN M. Horner

SURVIVAL & REPRODUCTION SUMMARY

Control										
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
08/09/17	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/10/17	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/11/17	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/12/17	3	5	2	5	5	4	2	5	2	3
	A	A	A	A	A	A	A	A	A	A
08/13/17	3	5	2	5	5	4	2	5	2	3
	6	9	8	7	10	7	6	9	10	8
08/14/17	9	14	10	12	15	11	8	14	12	11
	12	15	12	13	13	12	14	13	12	12
08/15/17	21	29	22	25	28	23	22	27	24	23
	x # Young 24.4		C.V. 11.30%		x% Survival 100%		C.V. 0.00%			

3% Effluent										
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
08/09/17	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/10/17	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/11/17	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/12/17	5	5	2	3	5	2	2	5	3	2
	A	A	A	A	A	A	A	A	A	A
08/13/17	5	5	2	3	5	2	2	5	3	2
	11	8	7	6	9	10	9	6	7	8
08/14/17	16	13	9	9	14	12	11	11	10	10
	12	12	14	13	13	12	13	13	12	12
08/15/17	28	25	23	22	27	24	24	24	22	22
	x # Young 24.1		C.V. 8.63%		x% Survival 100%		C.V. 0.00%			

5% Effluent										
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
08/09/17	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/10/17	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/11/17	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/12/17	4	2	2	5	3	4	3	2	4	4
	A	A	A	A	A	A	A	A	A	A
08/13/17	4	2	2	5	3	4	3	2	4	4
	9	8	6	7	6	9	10	11	7	8
08/14/17	13	10	8	12	9	13	13	13	11	12
	13	12	14	14	12	13	13	12	13	14
08/15/17	26	22	22	26	21	26	26	25	24	26
	x # Young 24.4		C.V. 8.24%		x% Survival 100%		C.V. 0.00%			

6% Effluent										
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
08/09/17	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/10/17	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/11/17	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/12/17	2	2	5	2	4	3	5	3	2	2
	A	A	A	A	A	A	A	A	A	A
08/13/17	2	2	5	2	4	3	5	3	2	2
	9	8	7	7	6	9	10	7	7	8
08/14/17	11	10	12	9	10	12	15	10	9	10
	13	13	12	12	13	14	12	12	12	14
08/15/17	24	23	24	21	23	26	27	22	21	24
	x # Young 23.5		C.V. 8.33%		x% Survival 100%		C.V. 0.00%			

where: A = Alive
 5 = Alive, 5 young
 D = Dead
 D5 = 5 Young, Female died

ex 1:

A	alive today
4	total young to date

ex 2:

5	alive, 5 young today
12	total young to date

Huther and Associates
7-Day/3 Brood *Ceriodaphnia dubia* Survival and Reproduction Chronic Toxicity Test

NRL, Faulkner

Lab ID# 27256

Test Date: August 8, 2017

8% Effluent																		
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10								
	A	A	A	A	A	A	A	A	A	A								
08/09/17	0	0	0	0	0	0	0	0	0	0								
	A	A	A	A	A	A	A	A	A	A								
08/10/17	0	0	0	0	0	0	0	0	0	0								
	A	A	A	A	A	A	A	A	A	A								
08/11/17	0	0	0	0	0	0	0	0	0	0								
	3	2	5	3	2	5	3	3	3	5								
08/12/17	3	2	5	3	2	5	3	3	3	5								
	A	A	A	A	A	A	A	A	A	A								
08/13/17	3	2	5	3	2	5	3	3	3	5								
	9	6	9	7	10	10	11	7	8	6								
08/14/17	12	8	14	10	12	15	14	10	11	11								
	12	12	14	13	12	13	13	14	12	13								
08/15/17	24	20	28	23	24	28	27	24	23	24								
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">x # Young</td> <td style="width: 50%;">24.5</td> <td style="width: 50%;">C.V.</td> <td style="width: 50%;">10.23%</td> </tr> <tr> <td>x% Survival</td> <td>100%</td> <td>C.V.</td> <td>0.00%</td> </tr> </table>											x # Young	24.5	C.V.	10.23%	x% Survival	100%	C.V.	0.00%
x # Young	24.5	C.V.	10.23%															
x% Survival	100%	C.V.	0.00%															

11% Effluent																		
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10								
	A	A	A	A	A	A	A	A	A	A								
08/09/17	0	0	0	0	0	0	0	0	0	0								
	A	A	A	A	A	A	A	A	A	A								
08/10/17	0	0	0	0	0	0	0	0	0	0								
	A	A	A	A	A	A	A	A	A	A								
08/11/17	0	0	0	0	0	0	0	0	0	0								
	2	3	5	3	4	3	5	3	5	2								
08/12/17	2	3	5	3	4	3	5	3	5	2								
	A	A	A	A	A	A	A	A	A	A								
08/13/17	2	3	5	3	4	3	5	3	5	2								
	10	7	8	6	6	7	8	9	10	7								
08/14/17	12	10	13	9	10	10	13	12	15	9								
	12	13	13	14	14	12	13	13	12	13								
08/15/17	24	23	26	23	24	22	26	25	27	22								
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">x # Young</td> <td style="width: 50%;">24.2</td> <td style="width: 50%;">C.V.</td> <td style="width: 50%;">7.24%</td> </tr> <tr> <td>x% Survival</td> <td>100%</td> <td>C.V.</td> <td>0.00%</td> </tr> </table>											x # Young	24.2	C.V.	7.24%	x% Survival	100%	C.V.	0.00%
x # Young	24.2	C.V.	7.24%															
x% Survival	100%	C.V.	0.00%															

where: A = Alive
5 = Alive, 5 young
D = Dead
D5 = 5 Young, Female died

ex 1:

A
4

 alive today
total young to date

ex 2:

5
12

 alive, 5 young today
total young to date

Huther and Associates
7-Day/3 Brood *Ceriodaphnia dubia* Survival and Reproduction Chronic Toxicity Test

NLR, Faulkner

Lab ID# 27256

Test Date: August 8, 2017

WET CHEMISTRY MEASUREMENTS

Date	Time	Temp	Samp. No.	pH of Solution						Analyst
				CON	3%	5%	6%	8%	11%	
08/08/17	Start	25.0	1	7.84	7.92	7.83	8.02	8.07	8.06	TB
08/09/17	24 Hr.	25.6	1	8.00	8.03	7.89	7.90	7.86	7.85	TB
08/09/17	Renew	25.3	1	7.96	7.99	7.92	7.97	8.03	8.05	TB
08/10/17	48 Hr.	25.7	1	8.26	8.01	8.05	8.08	8.13	7.98	JS
08/10/17	Renew	25.0	2	8.15	8.02	7.97	7.95	7.92	7.87	JS
08/11/17	72 Hr.	25.8	2	7.47	7.56	7.92	7.94	7.97	7.89	JS
08/11/17	Renew	25.3	2	8.15	8.13	8.08	8.06	8.00	7.91	JS
08/12/17	96 Hr.	25.7	2	7.88	8.05	8.08	8.10	7.99	7.88	JS
08/12/17	Renew	25.0	3	8.19	8.13	8.13	8.11	8.03	7.92	JS
08/13/17	120 Hr.	25.5	3	8.10	8.19	8.20	8.16	8.10	8.05	TB
08/13/17	Renew	25.6	3	8.08	8.10	8.07	8.06	8.10	8.00	TB
08/14/17	144 Hr.	25.8	3	8.34	8.28	8.24	8.27	8.26	8.09	JS
08/14/17	Renew	25.8	3	8.22	8.32	8.31	8.35	8.16	8.05	JS
08/15/17	168 Hr.	25.7	3	7.76	7.67	8.10	8.16	8.17	8.21	JS

Date	Time	Temp	Samp. No.	DO (mg/L) of Solution						Analyst
				CON	3%	5%	6%	8%	11%	
08/08/17	Start	25.0	1	8.11	7.71	7.62	7.68	7.79	7.61	TB
08/09/17	24 Hr.	25.6	1	7.88	7.68	7.59	7.50	7.76	7.65	TB
08/09/17	Renew	25.3	1	7.89	7.88	7.69	7.78	7.72	7.80	TB
08/10/17	48 Hr.	25.7	1	7.92	8.28	8.01	8.19	8.05	7.81	JS
08/10/17	Renew	25.0	2	8.01	8.48	8.10	8.44	8.51	8.25	JS
08/11/17	72 Hr.	25.8	2	8.65	7.36	6.97	7.43	7.68	7.36	JS
08/11/17	Renew	25.3	2	7.83	7.51	8.06	7.94	8.45	8.75	JS
08/12/17	96 Hr.	25.7	2	8.54	8.50	8.19	8.32	8.28	8.32	JS
08/12/17	Renew	25.0	3	7.91	8.36	8.09	8.45	7.93	8.11	JS
08/13/17	120 Hr.	25.5	3	7.88	7.69	7.81	7.89	7.92	7.68	TB
08/13/17	Renew	25.6	3	7.88	8.01	7.98	8.10	8.09	8.03	TB
08/14/17	144 Hr.	25.8	3	8.05	8.27	7.66	7.77	7.90	7.81	JS
08/14/17	Renew	25.8	3	8.26	7.79	7.54	7.84	7.67	7.65	JS
08/15/17	168 Hr.	25.7	3	7.57	7.46	7.45	7.51	7.59	7.63	JS

Huther and Associates
7-Day/3 Brood *Ceriodaphnia dubia* Survival and Reproduction Chronic Toxicity Test

NLR, Faulkner

Lab ID# 27256

Test Date: August 8, 2017

INITIAL CHEMISTRY MEASUREMENTS @ 100% EFFLUENT

Date	Samp. No.	pH ¹	DO ¹	Hardness mg/L CaCO ₃ ¹	Alkalinity mg/L CaCO ₃ ¹	Conduct. μS/cm ¹	Resid.Cl ₂ mg/L ¹	Dechlor(mL) Na ₂ S ₂ O ₃ mg/L ¹	Analyst
08/08/17	1	7.85	7.56	52	82	479	<0.01	N/A	RK
08/10/17	2	7.78	7.28	56	72	453	<0.01	N/A	RK
08/12/17	3	7.62	7.37	48	72	465	<0.01	N/A	RK
08/08/17	Con	7.84	8.11	108	62	353	-	-	RK

¹ Measurements taken in 100% solution.

CERIODAPHNIA DUBIA STATISTICAL ANALYSES
 Reproduction

Summary Statistics on Transformed Data Table 1 of 2

Grp	Identification	N	Min	Max	Mean
1	Control	10	21.000	29.000	24.400
2	3% Effluent	10	22.000	28.000	24.100
3	5% Effluent	10	21.000	26.000	24.400
4	6% Effluent	10	21.000	27.000	23.500
5	8% Effluent	10	20.000	28.000	24.500
6	11% Effluent	10	22.000	27.000	24.200

Summary Statistics on Transformed Data Table 2 of 2

Grp	Identification	Variance	Sd	Sem	C.V.%
1	Control	7.600	2.757	0.872	11.30
2	3% Effluent	4.322	2.079	0.657	8.63
3	5% Effluent	4.044	2.011	0.636	8.24
4	6% Effluent	3.833	1.958	0.619	8.33
5	8% Effluent	6.278	2.506	0.792	10.23
6	11% Effluent	3.067	1.751	0.554	7.24

Chi-Square Test For Normality: Actual And Expected Frequencies

Interval	< -1.5	-1.5 to -0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
Expected	4.020	14.520	22.920	14.520	4.020
Observed	2	20	20	14	4

Calculated Chi-Square goodness of fit test statistic = 3.4740

Table Chi-Square value (alpha = 0.01) = 13.277

Data **Pass** normality test. Continue analysis.

Bartlett's Test For Homogeneity of Variance

Calculated B1 statistic = 2.52

Table Chi-square value = 15.09 (alpha = 0.01, DF = 5)

Table Chi-square value = 11.07 (alpha = 0.05, DF = 5)

Data **Pass** B1 homogeneity test at 0.01 level. Continue analysis.

ANOVA Table

SOURCE	DF	SS	MS	F
Between	5	6.683	1.337	0.275
Within (Error)	54	262.300	4.857	
Total	59	268.983		

Critical F value = 2.45 (0.05,5,40)

Since F < Critical F Fail to Reject Ho: All equal

Dunnett's Test - Table 1 of 2 Ho:Control<Treatment

Grp	Identification	Transformed Mean	Mean	T Stat	Sig
			Calculated In Original Units		
1	Control	24.400	24.400		
2	3% Effluent	24.100	24.100	0.304	
3	5% Effluent	24.400	24.400	0.000	
4	6% Effluent	23.500	23.500	0.913	
5	8% Effluent	24.500	24.500	-0.101	
6	11% Effluent	24.200	24.200	0.203	

Dunnett table value = 2.31 (1 Tailed Value, P=0.05, DF=40,5)

No statistically significant difference

Dunnett's Test - Table 2 of 2 Ho:Control<Treatment

Grp	Identification	Num of Reps	Minimum Sig	% of Control	Difference
			Diff (In Orig. Units)		from Control
1	Control	10			
2	3% Effluent	10	2.277	9.3	0.300
3	5% Effluent	10	2.277	9.3	0.000
4	6% Effluent	10	2.277	9.3	0.900
5	8% Effluent	10	2.277	9.3	-0.100
6	11% Effluent	10	2.277	9.3	0.200

Huthur and Associates
7-Day *Pimephales promelas* Survival and Growth Chronic Toxicity Test

CLIENT	North Little Rock, Faulkner Lake Plant	SAMPLE TYPE	24 Hour Composite
NPDES #	AR0020303	DATE COLLECTED	08/07/17 08/09/17 08/11/17
LAB ID #	27256	DATE RECEIVED	08/08/17 08/10/17 08/12/17
TEST TYPE	7 Day Chronic	BEGIN DATE/TIME	08/08/17 1540
TEST ORGANISM	<i>Pimephales promelas</i>	END DATE/TIME	08/15/17 1540
ORGANISM AGE	< 24-hours	TEST TEMPERATURE (°C)	25 ± 1
ORGANISM SOURCE	In House	PHOTO PERIOD	16-hr. Light 8-hr. Dark
RECEIVING WATER	Arkansas River	LIGHT INTENSITY	50-100 ft. cndl.
DILUTION WATER	Laboratory	TECHNICIAN	B. Bacon

SURVIVAL SUMMARY

Conc.	08/09/17					08/10/17					08/11/17					08/12/17					08/13/17				
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
CON	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
3%	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
5%	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
6%	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
8%	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
11%	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8

Conc.	08/14/17					08/15/17					x % Survival	C.V. %
	A	B	C	D	E	A	B	C	D	E		
CON	8	8	8	8	8	8	8	8	8	8	100.0	0.00
3%	8	8	8	8	8	8	8	8	8	8	100.0	0.00
5%	8	8	8	8	8	8	8	8	8	8	100.0	0.00
6%	8	8	8	8	8	8	8	8	8	8	100.0	0.00
8%	8	8	8	8	8	8	8	8	8	8	100.0	0.00
11%	8	8	8	8	8	8	8	8	8	8	100.0	0.00

MEAN DRY WEIGHT PER REP

% Effluent	Rep A	Rep B	Rep C	Rep D	Rep E	x	C.V.%
CON	0.4420	0.4650	0.4290	0.4560	0.4240	0.4432	3.93
3%	0.4350	0.4290	0.4550	0.4390	0.4650	0.4446	3.36
5%	0.4710	0.4350	0.4650	0.4450	0.4610	0.4554	3.28
6%	0.4260	0.4850	0.4950	0.4850	0.4440	0.4670	6.46
8%	0.4670	0.4120	0.5010	0.4290	0.4860	0.4590	8.20
11%	0.4950	0.4470	0.4860	0.4720	0.4890	0.4778	4.01

Huther and Associates
7-Day *Pimephales promelas* Survival and Growth Chronic Toxicity Test

NLR, Faulkner

Lab ID# 27256

Test Date: August 8, 2017

WET CHEMISTRY MEASUREMENTS

Date	Time	Temp	Samp. No.	pH of Solution						Analyst
				CON	3%	5%	6%	8%	11%	
08/08/17	Start	25.0	1	7.84	7.92	7.83	8.02	8.07	8.06	TB
08/09/17	24 Hr.	25.6	1	8.01	8.06	7.98	7.95	7.89	7.89	TB
08/09/17	Renew	25.3	1	7.96	7.99	7.92	7.97	8.03	8.05	TB
08/10/17	48 Hr.	25.7	1	7.59	6.55	7.50	7.57	7.56	7.57	JS
08/10/17	Renew	25.0	2	8.15	8.02	7.97	7.95	7.92	7.87	JS
08/11/17	72 Hr.	25.8	2	7.11	6.81	7.54	7.69	7.58	7.68	JS
08/11/17	Renew	25.3	2	8.15	8.13	8.08	8.06	8.00	7.91	JS
08/12/17	96 Hr.	25.7	2	6.93	6.86	7.47	7.62	7.71	7.73	JS
08/12/17	Renew	25.0	3	8.19	8.13	8.13	8.11	8.03	7.92	JS
08/13/17	120 Hr.	25.6	3	8.06	8.10	8.08	8.10	8.09	8.02	TB
08/13/17	Renew	25.6	3	8.08	8.10	8.07	8.06	8.10	8.00	TB
08/14/17	144 Hr.	25.8	3	6.80	7.18	7.61	7.63	7.62	7.68	JS
08/14/17	Renew	25.8	3	8.22	8.32	8.31	8.35	8.16	8.05	JS
08/15/17	168 Hr.	25.7	3	7.26	7.32	7.88	7.94	7.90	7.91	JS

Date	Time	Temp	Samp. No.	DO (mg/L) of Solution						Analyst
				CON	3%	5%	6%	8%	11%	
08/08/17	Start	25.0	1	8.11	7.71	7.62	7.68	7.79	7.61	TB
08/09/17	24 Hr.	25.6	1	7.88	7.69	7.70	7.59	7.50	7.53	TB
08/09/17	Renew	25.3	1	7.89	7.88	7.69	7.78	7.72	7.80	TB
08/10/17	48 Hr.	25.7	1	7.26	8.39	8.02	7.98	7.95	8.21	JS
08/10/17	Renew	25.0	2	8.01	8.48	8.10	8.44	8.21	8.25	JS
08/11/17	72 Hr.	25.8	2	7.16	7.16	7.57	7.61	8.23	7.75	JS
08/11/17	Renew	25.3	2	7.83	7.51	8.06	7.94	8.45	8.15	JS
08/12/17	96 Hr.	25.7	2	8.25	8.34	7.55	7.48	7.62	7.47	JS
08/12/17	Renew	25.0	3	7.91	8.36	8.09	8.45	7.93	8.11	JS
08/13/17	120 Hr.	25.6	3	8.00	8.03	7.98	7.92	7.89	7.83	TB
08/13/17	Renew	25.6	3	7.88	8.01	7.98	8.10	8.09	8.03	TB
08/14/17	144 Hr.	25.8	3	7.97	7.80	7.65	8.09	7.77	8.12	JS
08/14/17	Renew	25.8	3	8.26	7.79	7.54	7.84	7.67	7.65	JS
08/15/17	168 Hr.	25.7	3	7.76	8.18	7.95	8.06	7.96	7.87	JS

Huther and Associates
 7-Day *Pimephales promelas* Survival and Growth Chronic Toxicity Test

NLR, Faulkner

Lab ID# 27256

Test Date: August 8, 2017

INITIAL CHEMISTRY MEASUREMENTS @ 100% EFFLUENT

Date	Samp. No.	pH ¹	DO ¹	Hardness mg/L CaCO ₃ ¹	Alkalinity mg/L CaCO ₃ ¹	Conduct. μS/cm ¹	Resid.Cl ₂ mg/L ¹	Dechlor(mL) Na ₂ S ₂ O ₃ mg/L ¹	Analyst
08/08/17	1	7.85	7.56	52	82	479	<0.01	N/A	RK
08/10/17	2	7.78	7.28	56	72	453	<0.01	N/A	RK
08/12/17	3	7.62	7.37	48	72	465	<0.01	N/A	RK
08/08/17	Con	7.84	8.11	108	62	353	-	-	RK

¹ Measurements taken in 100% solution.

PIMEPHALES PROMELAS STATISTICAL ANALYSES
 Growth

Summary Statistics on Transformed Data Table 1 of 2

Grp	Identification	N	Min	Max	Mean
1	Control	5	0.424	0.465	0.443
2	3% Effluent	5	0.429	0.465	0.445
3	5% Effluent	5	0.435	0.471	0.455
4	6% Effluent	5	0.426	0.495	0.467
5	8% Effluent	5	0.412	0.501	0.459
6	11% Effluent	5	0.447	0.495	0.478

Summary Statistics on Transformed Data Table 2 of 2

Grp	Identification	Variance	Sd	Sem	C.V.%
1	Control	0.000	0.017	0.008	3.93
2	3% Effluent	0.000	0.015	0.007	3.36
3	5% Effluent	0.000	0.015	0.007	3.28
4	6% Effluent	0.001	0.030	0.013	6.46
5	8% Effluent	0.001	0.038	0.017	8.20
6	11% Effluent	0.000	0.019	0.009	4.01

Shapiro - Wilk's Test For Normality

D = 0.014

W = 0.969

Critical W (P = 0.05) (n = 30) = 0.927

Critical W (P = 0.01) (n = 30) = 0.900

Data **Pass** normality test at P=0.01 level. Continue analysis.

Bartlett's Test For Homogeneity of Variance

Calculated B1 statistic = 5.87

Table Chi-square value = 15.09 (alpha = 0.01, DF = 5)

Table Chi-square value = 11.07 (alpha = 0.05, DF = 5)

Data **Pass** B1 homogeneity test at 0.01 level. Continue analysis.

ANOVA Table

SOURCE	DF	SS	MS	F
Between	5	0.004	0.001	1.532
Within (Error)	24	0.014	0.001	
Total	29	0.018		

Critical F value = 2.62 (0.05,5,24)

Since F < Critical F Fail to Reject Ho: All equal

Dunnett's Test - Table 1 of 2 Ho:Control<Treatment

Grp	Identification	Mean		T Stat	Sig
		Transformed Mean	Calculated In Original Units		
1	Control	0.443	0.443		
2	3% Effluent	0.445	0.445	-0.092	
3	5% Effluent	0.455	0.455	-0.805	
4	6% Effluent	0.467	0.467	-1.571	
5	8% Effluent	0.459	0.459	-1.043	
6	11% Effluent	0.478	0.478	-2.284	

Dunnett table value = 2.36 (1 Tailed Value, P=0.05, DF=24,5)

No statistically significant difference

Dunnett's Test - Table 2 of 2 Ho:Control<Treatment

Grp	Identification	Num of Repts	Minimum Sig	% of	Difference
			Diff (In Orig. Units)	Control	from Control
1	Control	5			
2	3% Effluent	5	0.036	8.1	-0.001
3	5% Effluent	5	0.036	8.1	-0.012
4	6% Effluent	5	0.036	8.1	-0.024
5	8% Effluent	5	0.036	8.1	-0.016
6	11% Effluent	5	0.036	8.1	-0.035

**APPENDIX A
RAW DATA**

7-DAY CERIODAPHNA DUBIA SURVIVAL & REPRODUCTION

DAILY RAW DATA TABLE

PAGE 1 OF 2

CLIENT NLR- Faulkner

START DATE/TIME 8-8-17 MH 1600

OUTFALL 001

END DATE/TIME 8-15-17 TB 1600

LAB ID # 27256

Con

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
8/9	A	A	A	A	A	A	A	A	A	A	MH	1600
8/10	A	A	A	A	A	A	A	A	A	A	MH	1430
8/11	A	A	A	A	A	A	A	A	A	A	BB	1330
8/12	3	5	2	5	5	4	2	5	2	3	MH	1415
8/13	A	A	A	A	A	A	A	A	A	A	MH	1200
8/14	6	9	8	7	10	7	6	9	10	8	RP	1130
8/15	12	12	12	13	13	12	14	13	12	12	TB	1600

\bar{x} # Young w/o Dead = 24.4 CV% = 11.30

\bar{x} # Young w/Dead = CV% =

\bar{x} % Survival = 100 CV% = 0.00

3

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
8/9	A	A	A	A	A	A	A	A	A	A	MH	1600
8/10	A	A	A	A	A	A	A	A	A	A	MH	1430
8/11	A	A	A	A	A	A	A	A	A	A	BB	1330
8/12	5	5	2	3	5	2	2	5	3	2	MH	1415
8/13	A	A	A	A	A	A	A	A	A	A	MH	1200
8/14	11	8	7	6	9	10	9	6	7	8	RP	1130
8/15	12	12	14	13	13	12	13	13	12	12	TB	1600

\bar{x} # Young w/o Dead = 24.1 CV% = 8.63

\bar{x} # Young w/Dead = CV% =

\bar{x} % Survival = 100 CV% = 0.00

5

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
8/9	A	A	A	A	A	A	A	A	A	A	MH	1600
8/10	A	A	A	A	A	A	A	A	A	A	MH	1430
8/11	A	A	A	A	A	A	A	A	A	A	BB	1330
8/12	4	2	2	5	3	4	3	2	4	4	MH	1415
8/13	A	A	A	A	A	A	A	A	A	A	MH	1200
8/14	9	8	6	7	6	9	10	11	7	8	RP	1130
8/15	13	12	14	14	12	13	13	12	13	14	TB	1600

\bar{x} # Young w/o Dead = 24.4 CV% = 8.24

\bar{x} # Young w/Dead = CV% =

\bar{x} % Survival = 100 CV% = 0.00

6

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
8/9	A	A	A	A	A	A	A	A	A	A	MH	1600
8/10	A	A	A	A	A	A	A	A	A	A	MH	1430
8/11	A	A	A	A	A	A	A	A	A	A	BB	1330
8/12	2	2	5	2	4	3	5	3	2	2	MH	1415
8/13	A	A	A	A	A	A	A	A	A	A	MH	1200
8/14	9	8	7	7	6	9	10	7	7	8	RP	1130
8/15	13	13	12	12	13	14	12	12	12	14	TB	1600

\bar{x} # Young w/o Dead = 23.5 CV% = 8.33

\bar{x} # Young w/Dead = CV% =

\bar{x} % Survival = 100 CV% = 0.00

0 TB 8/15/17

7-DAY CERIODAPHNA DUBIA SURVIVAL & REPRODUCTION

DAILY RAW DATA TABLE

PAGE 2 OF 2

CLIENT NLR- Faulkner

OUTFALL 001

LAB ID # 27256

8

START DATE/TIME 8-8-17 MH 1600

END DATE/TIME 8-15-17 TB 1600

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
8/9	A	A	A	A	A	A	A	A	A	A	MH	1600
8/10	A	A	A	A	A	A	A	A	A	A	MH	1430
8/11	A	A	A	A	A	A	A	A	A	A	BB	1330
8/12	3	2	5	3	2	5	3	3	3	5	MH	1415
8/13	A	A	A	A	A	A	A	A	A	A	MH	1200
8/14	9	6	9	7	10	10	11	7	8	6	RP	1130
8/15	12	12	14	13	12	13	13	14	12	13	TB	1600
	24	20	28	23	24	28	27	24	23	24		

\bar{x} # Young w/o Dead = 24.5 CV% = 10.23
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100 CV% = 0.00

11

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
8/9	A	A	A	A	A	A	A	A	A	A	MH	1600
8/10	A	A	A	A	A	A	A	A	A	A	MH	1430
8/11	A	A	A	A	A	A	A	A	A	A	BB	1330
8/12	2	3	5	3	4	3	5	3	5	2	MH	1415
8/13	A	A	A	A	A	A	A	A	A	A	MH	1200
8/14	10	7	8	6	6	7	8	9	10	7	RP	1130
8/15	12	13	13	14	14	12	13	13	12	13	TB	1600
	24	23	26	23	24	22	26	25	27	22		

\bar{x} # Young w/o Dead = 24.2 CV% = 7.24
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100 CV% = 0.00

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time

\bar{x} # Young w/o Dead = CV% =
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = CV% =

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time

\bar{x} # Young w/o Dead = CV% =
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = CV% =

**7-DAY CHRONIC TOXICITY TEST
PIMEPHALES PROMELAS (fathead minnow) SURVIVAL**

CLIENT/FACILITY NLR-FAULKNER
 OUTFALL # 001 PROJECT # 27256
 ORGANISM ID# FP0-17-219

DATE/TIME STARTED 8-8-17 BB 1540
 DATE/TIME ENDED 8-15-17 BB 1540

Conc.	A					B					C					D					E									
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E					
CON	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
3	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
5	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
6	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
11	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Initials Date/Time	8-9-17 BB 1540					8-10-17 RP 0840					8-11-17 BB 0835					8-12-17 TB 0905					8-13-17 MH 0910									

Conc.	A	B	C	D	E	A	B	C	D	E	Mean Survival	C.V. %
CON	8	8	8	8	8	8	8	8	8	8	100.0	0.00
3	8	8	8	8	8	8	8	8	8	8	100.0	0.00
5	8	8	8	8	8	8	8	8	8	8	100.0	0.00
6	8	8	8	8	8	8	8	8	8	8	100.0	0.00
8	8	8	8	8	8	8	8	8	8	8	100.0	0.00
11	8	8	8	8	8	8	8	8	8	8	100.0	0.00
Initials Date/Time	8-14-17 BB 0830					8-15-17 BB 1540						

Client / Facility NLR-Faulkner
 Lab ID Number 27256
 Outfall Number 001
 Test Date 8-8-17

INITIAL CHEMISTRY MEASUREMENTS @ 100% EFFLUENT

Date	Samp. No.	pH	DO	Hardness mg/L CaCO ₃ ¹	Alkalinity mg/L CaCO ₃ ¹	Conduct. umhos/cm ¹	Resid. Cl ₂ mg/L ¹	Dechlor(mL) Na ₂ S ₂ O ₃ mg/L ¹	Analyst
8-8	1	7.85	7.56	52	82	479	<0.01	NIA	RK
8-10	2	7.78	7.28	56	72	453	↓	↓	↓
8-12	3	7.62	7.37	48	72	465	↓	↓	↓
8-8	Con	7.84	8.11	108	62	353	—	—	↓

INITIAL CHEMISTRY MEASUREMENTS @ RECEIVING WATER

Date	Samp. No.	pH	DO	Hardness mg/L CaCO ₃ ¹	Alkalinity mg/L CaCO ₃ ¹	Conduct. umhos/cm ¹	Resid. Cl ₂ mg/L ¹	Dechlor(mL) Na ₂ S ₂ O ₃ mg/L ¹	Analyst

Notes:

APPENDIX B
REFERENCE TOXICANTS

CHRONIC REFERENCE TOXICANT TEST RESULTS

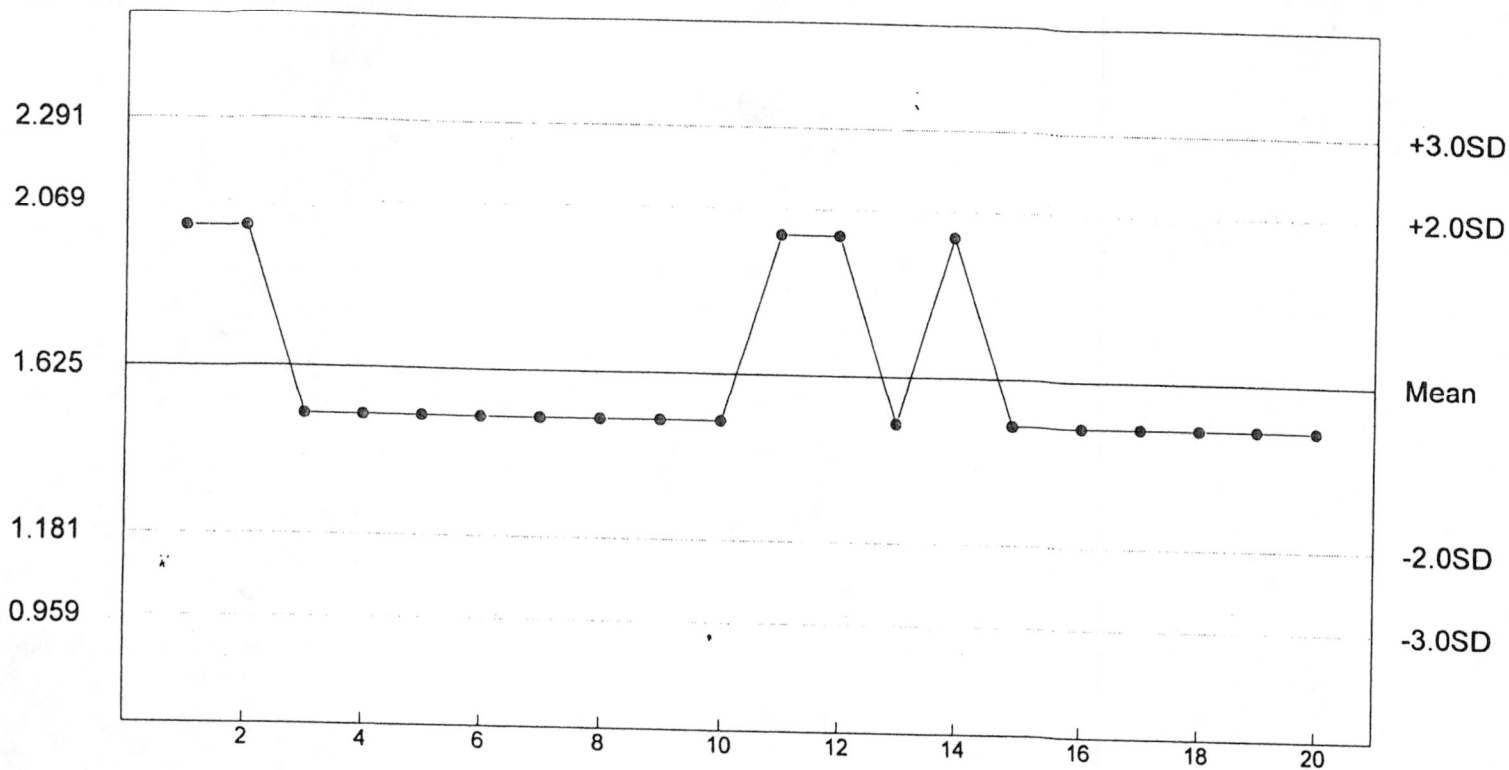
SPECIES: *Ceriodaphnia dubia*
 CHEMICAL: Sodium Chloride
 DURATION: 7-Days
 TEST NUMBER: 08
 TEST DATE: 08/02/17 - 08/09/17
 1635 Hrs - 1635 Hrs
 STATISTICAL METHOD: Dunnetts/Steels

CONCENTRATION (g/L)	NUMBER EXPOSED	NUMBER DEAD
0.5	10	0
1.0	10	0
1.5	10	3
2.0	10	10
2.5	10	10
3.0	10	10

LOEC FOR SURVIVAL	NOEC FOR SURVIVAL	LOEC FOR REPRODUCTION	NOEC FOR REPRODUCTION
2.0 g/L	1.5 g/L	1.0 g/L	0.5 g/L

Reference Tox Sodium Chloride g/L

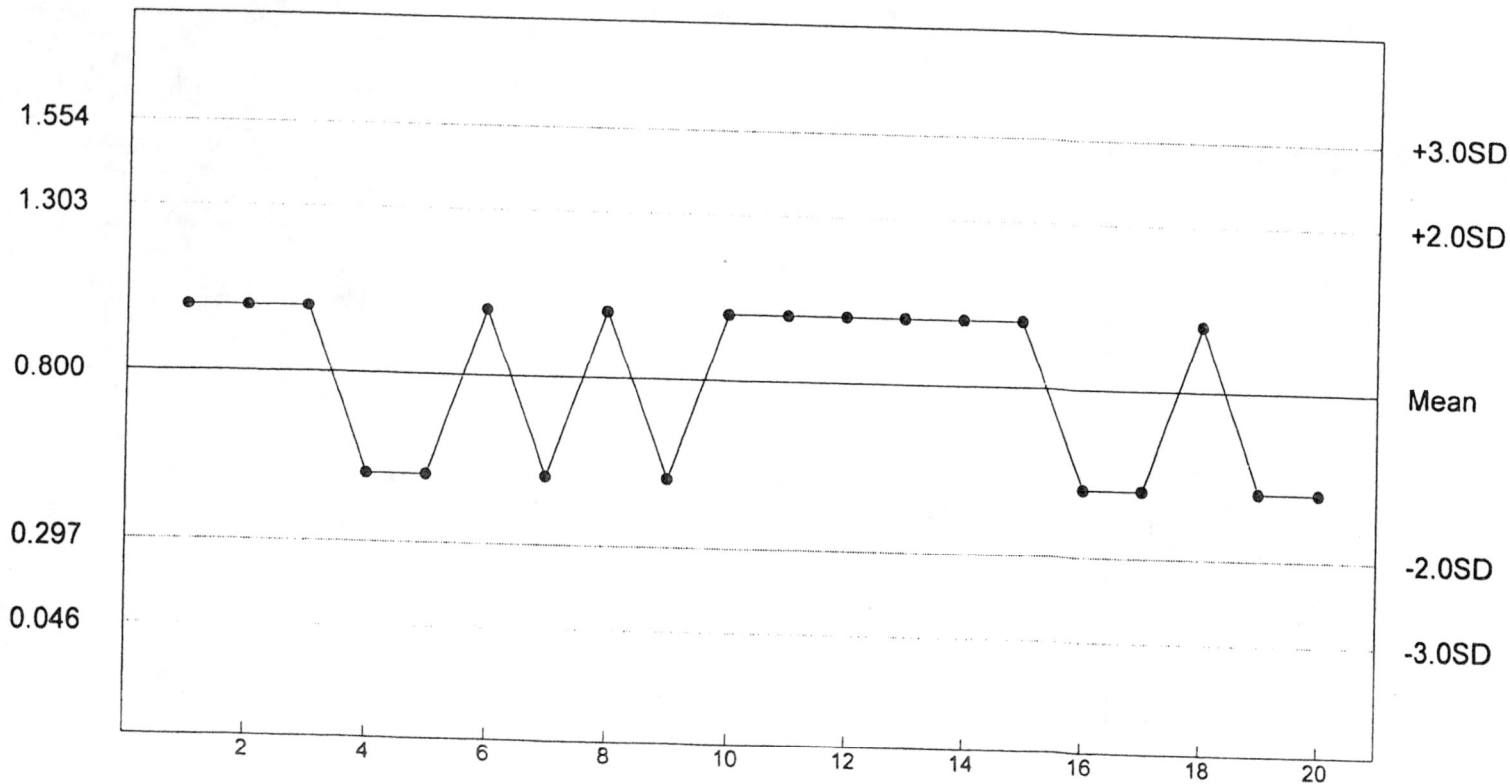
C. dubia Survival - NOEC



n= 20 Mean= 1.625 SD= 0.222 CV= 13.67% Min= 1.500 Max= 2.000

Reference Tox Sodium Chloride g/L

C. dubia Reproduction - NOEC



n= 20 Mean= 0.800 SD= 0.251 CV= 31.41% Min= 0.500 Max= 1.000

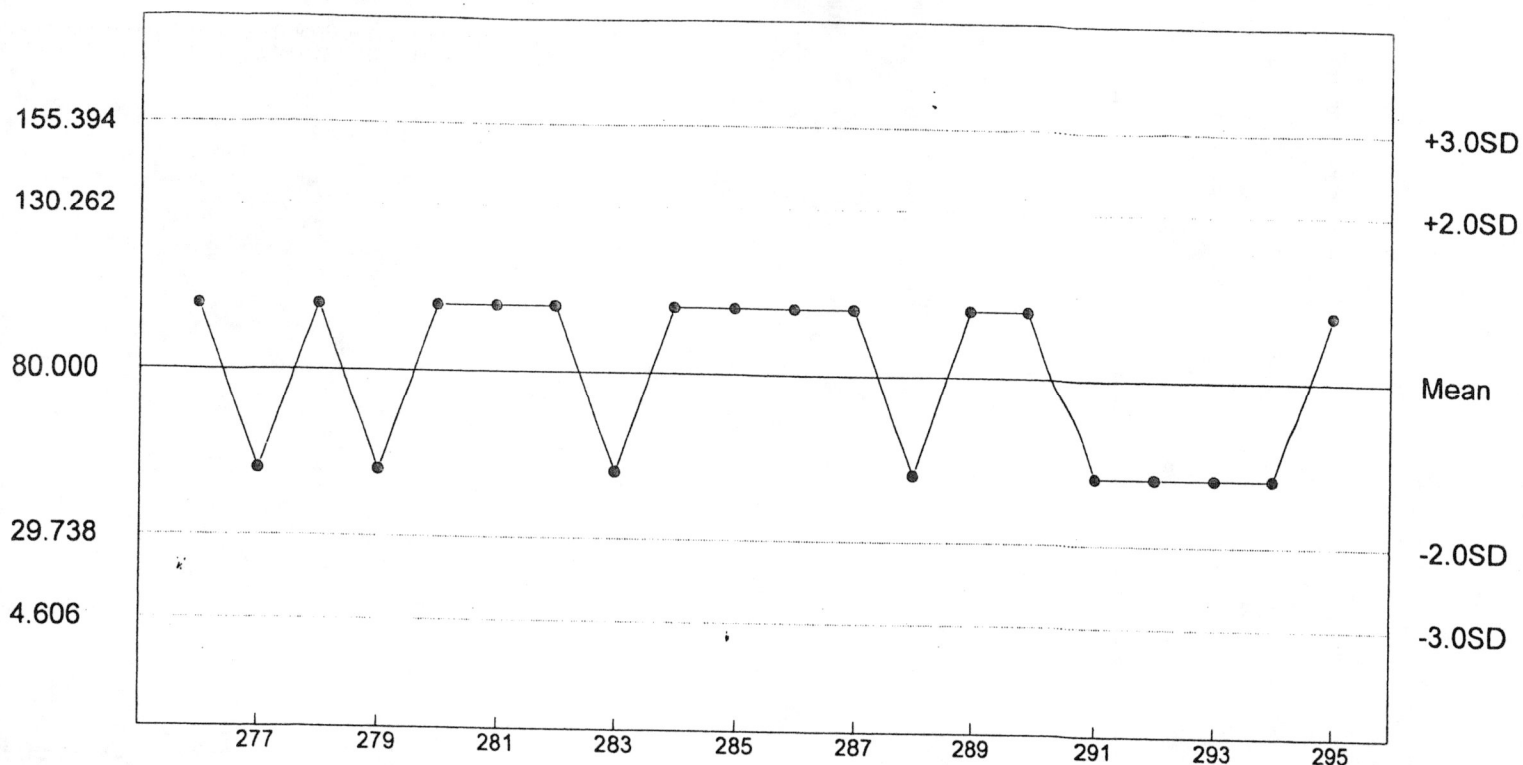
CHRONIC REFERENCE TOXICANT TEST RESULTS

SPECIES: *Pimephales promelas*
 CHEMICAL: Copper Nitrate
 DURATION: 7-Days
 TEST NUMBER: 08
 TEST DATE: 08/02/17 - 08/09/17
 1600 Hrs - 1600 Hrs
 STATISTICAL METHOD: Dunnetts/Steels

CONCENTRATION (ug/L)	NUMBER EXPOSED	NUMBER DEAD
12.5	40	0
25	40	0
50	40	0
100	40	2
200	40	10
400	40	33

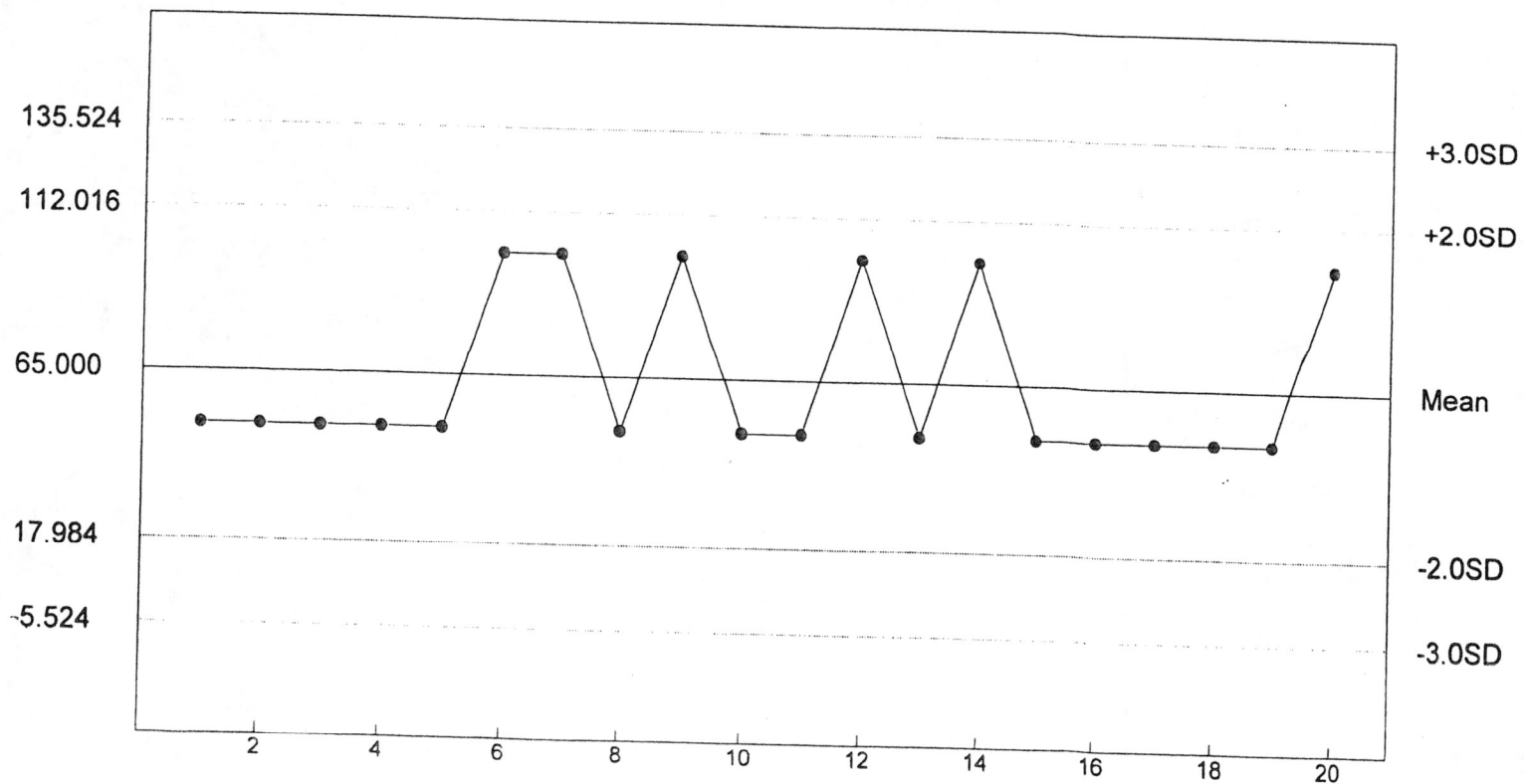
LOEC FOR SURVIVAL	NOEC FOR SURVIVAL	LOEC FOR GROWTH	NOEC FOR GROWTH
200 ug/L	100 ug/L	200 ug/L	100 ug/L

Reference Tox Copper Nitrate ug/L
P. promelas Chronic Survival - NOEC



n= 20 Mean= 80.000 SD= 25.131 CV= 31.41% Min= 50.000 Max= 100.000

Reference Tox Copper Nitrate ug/L
P. promelas Growth - NOEC



n= 20 Mean= 65.000 SD= 23.508 CV= 36.17% Min= 50.000 Max= 100.000

APPENDIX C
CHAIN OF CUSTODY SHEETS

HUTHER & ASSOCIATES
 1156 NORTH BONNIE BRAE STREET
 DENTON, TX 76201
 (940) 387-1025 • FAX (940) 387-1036

CHAIN OF CUSTODY RECORD

PROJECT # 27256 PROJECT NAME NLR-Faulkner PERMIT# AR620303

OUTFALL SAMPLES

24-Hr Flow Weighted Composite Other _____

OUTFALL NUMBER	PERSON TAKING SAMPLE	START DATE/TIME	END DATE/TIME	# OF PORTIONS COMPOSITED	METHODS OF COLLECTION AND COMPOSITE			# OF CONTAINERS TO BE SHIPPED
					AUTO COLL. AUTO COMP.	MANUAL COLL. MANUAL COMP.	AUTO COLL. MANUAL COMP.	
	Phillip Spence	8-6-17 0820	8-7-17 0715	96	X			1

PO# 171647
 Cl₂ = <0.05

RECEIVING WATER SAMPLES

SAMPLE IDENTIFICATION (FOR REC'NG) H ₂ O GRABS, GIVE NAME OF STREAM AND LOCATION	PERSON TAKING SAMPLE	DATE	TIME	# OF CONTAINERS TO BE SHIPPED

TYPE OF TEST 7 day CF
 NAME OF RECEIVING WATER Arkansas River
 DILUTION WATER USED FOR THIS TEST Lab

RELINQUISHED BY: Phillip Spence DATE: 8-7-17 TIME: 1330 RECEIVED BY AT THIS DATE/TIME _____

RELINQUISHED BY: _____ DATE: _____ TIME: _____ RECEIVED BY AT THIS DATE/TIME _____

RELINQUISHED BY: _____ DATE: _____ TIME: _____ RECEIVED BY AT THIS DATE/TIME _____

METHOD OF SHIPMENT: Greyhound Pick Up _____ Client Delivered _____ Other _____

RECEIVED: Tom Burk DATE: 8-8-17 TIME: 1100 SAMPLE TEMP. @ RECEIPT. 4.19 CTR

HUTHER & ASSOCIATES
 1156 NORTH BONNIE BRAE STREET
 DENTON, TX 76201
 (940) 387-1025 • FAX (940) 387-1036

CHAIN OF CUSTODY RECORD

PROJECT # 27256 PROJECT NAME NLR-Faulkner PERMIT# AR020303

OUTFALL SAMPLES

24-Hr Flow Weighted Composite Other

OUTFALL NUMBER	PERSON TAKING SAMPLE	START DATE/TIME	END DATE/TIME	# OF PORTIONS COMPOSITED	METHODS OF COLLECTION AND COMPOSITE			# OF CONTAINERS TO BE SHIPPED
					AUTO COLL. AUTO COMP.	MANUAL COLL. MANUAL COMP.	AUTO COLL. MANUAL COMP.	
	<u>P. Spence</u>	<u>8-8-17</u> <u>6715</u>	<u>8-9-17</u> <u>0720</u>	<u>96</u>	<u>X</u>			<u>1</u>

PO#
CL2 - 0.08

RECEIVING WATER SAMPLES

SAMPLE IDENTIFICATION (FOR REC'NG) H ₂ O GRABS, GIVE NAME OF STREAM AND LOCATION	PERSON TAKING SAMPLE	DATE	TIME	# OF CONTAINERS TO BE SHIPPED

TYPE OF TEST 7day CF
 NAME OF RECEIVING WATER Arkansas River
 DILUTION WATER USED FOR THIS TEST Lab

RELINQUISHED BY: Phillip Spence DATE: 8-9-17 TIME: 1330 RECEIVED BY AT THIS DATE/TIME _____

RELINQUISHED BY: _____ DATE: _____ TIME: _____ RECEIVED BY AT THIS DATE/TIME _____

RELINQUISHED BY: _____ DATE: _____ TIME: _____ RECEIVED BY AT THIS DATE/TIME _____

METHOD OF SHIPMENT: Greyhound Pick Up _____ Client Delivered _____ Other _____

RECEIVED: Matt Horner DATE: 8-10-17 TIME: 1015 SAMPLE TEMP. @ RECEIPT. 0.9

IRI

HUTHER & ASSOCIATES
 1156 NORTH BONNIE BRAE STREET
 DENTON, TX 76201
 (940) 387-1025 • FAX (940) 387-1036

CHAIN OF CUSTODY RECORD

PROJECT # 27256 PROJECT NAME NLR - Faulkner PERMIT# AR020303

OUTFALL SAMPLES

24-Hr Flow Weighted Composite Other _____

OUTFALL NUMBER	PERSON TAKING SAMPLE	START DATE/TIME	END DATE/TIME	# OF PORTIONS COMPOSITED	METHODS OF COLLECTION AND COMPOSITE			# OF CONTAINERS TO BE SHIPPED
					AUTO COLL. AUTO COMP.	MANUAL COLL. MANUAL COMP.	AUTO COLL. MANUAL COMP.	
	<u>P. Spence</u>	<u>8-10-17 0125</u>	<u>8-11-17 0720</u>	<u>96</u>	<u>X</u>			<u>1</u>

PO# 5711047
C12 = 0.06

RECEIVING WATER SAMPLES

SAMPLE IDENTIFICATION (FOR REC'NG) H ₂ O GRABS, GIVE NAME OF STREAM AND LOCATION	PERSON TAKING SAMPLE	DATE	TIME	# OF CONTAINERS TO BE SHIPPED
 	 	 	 	
 	 	 	 	

TYPE OF TEST 7day 9/F
 NAME OF RECEIVING WATER Arkansas River
 DILUTION WATER USED FOR THIS TEST Lab

RELINQUISHED BY: Phillip Spence DATE: 8-11-17 TIME: 1330 RECEIVED BY AT THIS DATE/TIME _____

RELINQUISHED BY: _____ DATE: _____ TIME: _____ RECEIVED BY AT THIS DATE/TIME _____

RELINQUISHED BY: _____ DATE: _____ TIME: _____ RECEIVED BY AT THIS DATE/TIME _____

METHOD OF SHIPMENT: Greyhound Pick Up _____ Client Delivered _____ Other _____

RECEIVED: Tom RA DATE: 8-2-17 TIME: 1100 SAMPLE TEMP. @ RECEIPT. 3.4°C IR21

NORTH LITTLE ROCK WASTEWATER UTILITY
FAULKNER LAKE PLANT
NPDES PERMIT NO. AR0020303
AFIN NO. 60-00274
OUTFALL 001 DMR REPORTING
TEST DATE: 08/08/17

I. *Ceriodaphnia dubia*

	Response
(A) If the NOEC for survival is less than the critical dilution, enter a "1"; otherwise, enter a "0". Parameter No. TLP3B.	0
(B) Report the NOEC value for survival, Parameter No. TOP3B.	11%
(C) Report the NOEC value for reproduction, Parameter No. TPP3B.	11%
(D) If the NOEC for reproduction is less than the critical dilution, enter a "1"; otherwise, enter a "0". Parameter No. TGP3B.	0
(E) Report the higher (critical dilution or control) Coefficient of Variation, Parameter No. TQP3B.	11.30%

II. *Pimephales promelas* (fathead minnow)

	Response
(A) If the No Observed Effect Concentration (NOEC) for survival is less than the critical dilution, enter a "1"; otherwise, enter a "0". Parameter No. TLP6C.	0
(B) Report the NOEC value for survival, Parameter No. TOP6C.	11%
(C) Report the NOEC value for growth, Parameter No. TPP6C.	11%
(D) If the No Observed Effect Concentration (NOEC) for growth is less than the critical dilution, enter a "1"; otherwise, enter a "0". Parameter No. TGP6C.	0
(E) Report the highest (critical dilution or control) Coefficient of Variation, Parameter No. TQP6C.	8.20%