



Springdale Water Utilities

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Enforcement Branch
Arkansas Dept. of Environmental Quality
5301 Northshore Dr.
North Little Rock, AR 72118-5317

**RE: NPDES Permit No. AR0022063
AFIN #72-00003
Springdale, AR**

December 15, 2014

Dear Sir or Madame:

Enclosed please find the results of fourth quarter Ceriodaphnia dubia and Pimephales promelas analyses, and fourth quarter Table III analyses conducted on Springdale Water Utilities' wastewater treatment facility influent, effluent, and sludge (belt press influent) for 2014. These analyses are required by our NPDES Permit.

Please feel free to call Ms. Jennifer Enos at (479)756-3657 if you have any questions concerning these analyses.

Sincerely yours,

Heath A. Ward
Executive Director

JEE/jee
Enclosures

Cc: Jennifer Enos, SWU
Mary Barnett, ADEQ
File

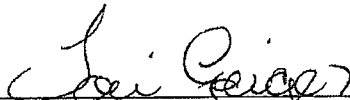
**CITY OF SPRINGDALE WWTF
OUTFALL 001**

**Chronic Biomonitoring Report
Permit Number NPDES AR0022063
AFIN Number 72-00003**

Ceriodaphnia dubia
Pimephales promelas

November 18, 2014

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

Client City of Springdale WWTF Laboratory I.D. 23123
Permit No. NPDES AR0022063 Begin Date November 18, 2014
Sample Outfall 001

Results: Pass *Ceriodaphnia dubia* survival and reproduction and *Pimephales promelas* survival and growth at the critical low flow concentration (97% effluent).

SAMPLE COLLECTION

Composite effluent samples from City of Springdale WWTF were delivered by Greyhound Package Express courier to Huthur & Associates on November 18, November 20, and November 24, 2014. 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. Note: The third sample was not used until November 24, due to shipping issues.

TEST SETUP
Ceriodaphnia dubia



The seven-day *Ceriodaphnia dubia* survival and reproduction test was initiated at 1500 hours, November 18, 2014. Five concentrations were prepared (31%, 41%, 55%, 73%, and 97% effluent) utilizing distilled, deionized laboratory water reconstituted to match the hardness, alkalinity and pH of the receiving stream (Spring Creek). 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.

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: 97% 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 **PMSD: 10.3%**
NOEC: 97% Effluent

SUMMARY

There were no statistically significant differences between the control and the critical low flow concentration (97% 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 AR0022063 for City of Springdale WWTF, Outfall 001 passed for this testing period.

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

CLIENT	City of Springdale WWTF	SAMPLE TYPE	24 Hour Composite
NPDES #	AR0022063	DATE COLLECTED	11/17/14 11/19/14 11/21/14
LAB ID #	23123	DATE RECEIVED	11/18/14 11/20/14 11/24/14
TEST TYPE	7 Day Chronic	BEGIN DATE/TIME	11/18/14 1500
TEST ORGANISM	<i>Ceriodaphnia dubia</i>	END DATE/TIME	11/25/14 1500
ORGANISM AGE	< 24 Hours	TEST TEMPERATURE (°C)	25 ± 1
ORGANISM SOURCE	In House	PHOTO PERIOD	16-hr. Light 8-hr. Dark
RECEIVING WATER	Spring Creek	LIGHT INTENSITY	50-100 ft. candl.
DILUTION WATER	Laboratory	TECHNICIAN	Z. Geiger

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
11/19/14	A	A	A	A	A	A	A	A	A	A
11/20/14	0	0	0	0	0	0	0	0	0	0
11/21/14	A	A	A	A	A	A	A	A	A	A
11/22/14	2	4	3	2	3	2	2	3	4	4
11/23/14	2	4	3	2	3	2	2	3	4	4
11/24/14	6	8	7	6	7	7	6	6	8	6
11/25/14	13	12	13	12	12	12	12	14	12	13
x # Young		22.1				C.V. 6.90%				
x% Survival		100%				C.V. 0.00%				

31% Effluent										
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
11/19/14	A	A	A	A	A	A	A	A	A	A
11/20/14	0	0	0	0	0	0	0	0	0	0
11/21/14	A	A	A	A	A	A	A	A	A	A
11/22/14	2	5	3	4	2	3	3	4	5	3
11/23/14	2	5	3	4	2	3	3	4	5	3
11/24/14	8	6	9	8	6	6	7	6	6	6
11/25/14	14	12	13	12	12	11	13	12	13	14
x # Young		22.8				C.V. 7.40%				
x% Survival		100%				C.V. 0.00%				

41% Effluent										
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
11/19/14	A	A	A	A	A	A	A	A	A	A
11/20/14	0	0	0	0	0	0	0	0	0	0
11/21/14	A	A	A	A	A	A	A	A	A	A
11/22/14	2	2	4	2	3	2	5	4	2	3
11/23/14	2	2	4	2	3	2	5	4	2	3
11/24/14	6	8	7	6	8	6	7	6	9	6
11/25/14	13	14	12	13	12	13	12	12	14	12
x # Young		22.5				C.V. 6.71%				
x% Survival		100%				C.V. 0.00%				

55% Effluent										
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
11/19/14	A	A	A	A	A	A	A	A	A	A
11/20/14	0	0	0	0	0	0	0	0	0	0
11/21/14	A	A	A	A	A	A	A	A	A	A
11/22/14	2	4	2	2	3	2	3	2	2	3
11/23/14	2	4	2	2	3	2	3	2	2	3
11/24/14	6	6	7	10	9	6	7	8	6	7
11/25/14	12	13	12	12	14	12	13	11	12	12
x # Young		22.0				C.V. 9.09%				
x% Survival		100%				C.V. 0.00%				

where: A = Alive
 5 = Alive, 5 young
 D = Dead

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

City of Springdale WWTF

Lab ID# 23123

Test Date: November 18, 2014

73% Effluent										
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
11/19/14	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
11/20/14	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
11/21/14	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
	4	2	4	3	3	2	2	3	5	2
11/22/14	4	2	4	3	3	2	2	3	5	2
	A	A	A	A	A	A	A	A	A	A
11/23/14	4	2	4	3	3	2	2	3	5	2
	7	6	6	6	8	6	6	10	6	8
11/24/14	11	8	10	9	11	8	8	13	11	10
	14	12	12	15	13	12	12	13	12	14
11/25/14	25	20	22	24	24	20	20	26	23	24
		x# Young 22.8				C.V. 9.65%				
		x% Survival 100%				C.V. 0.00%				

97% Effluent										
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
11/19/14	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
11/20/14	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
11/21/14	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
	4	3	3	2	2	4	2	3	2	3
11/22/14	4	3	3	2	2	4	2	3	2	3
	A	A	A	A	A	A	A	A	A	A
11/23/14	4	3	3	2	2	4	2	3	2	3
	8	6	8	7	9	6	9	8	7	6
11/24/14	12	9	11	9	11	10	11	11	9	9
	12	12	13	12	13	12	12	14	13	12
11/25/14	24	21	24	21	24	22	23	25	22	21
		x# Young 22.7				C.V. 6.58%				
		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

City of Springdale WWTF

Lab ID# 23123

Test Date: November 18, 2014

WET CHEMISTRY MEASUREMENTS

Date	Time	Temp	Samp. No.	pH of Solution						Analyst
				CON	31%	41%	55%	73%	97%	
11/18/14	Start	25.0	1	8.75	8.23	8.01	7.96	7.82	7.75	WLB
11/19/14	24 Hr.	24.3	1	8.09	8.01	7.98	7.94	7.90	7.86	WLB
11/19/14	Renew	24.7	1	8.02	7.95	7.89	7.86	7.80	7.72	WLB
11/20/14	48 Hr.	24.6	1	8.05	8.01	7.99	7.98	7.94	7.89	WLB
11/20/14	Renew	25.0	2	8.43	8.18	8.04	7.97	7.89	7.78	WLB
11/21/14	72 Hr.	24.8	2	7.90	7.86	7.85	7.82	7.78	7.73	EMS
11/21/14	Renew	24.8	2	8.21	8.18	8.08	8.04	8.01	7.82	EMS
11/22/14	96 Hr.	24.8	2	8.03	7.96	7.95	7.88	7.83	7.76	CS
11/22/14	Renew	24.8	2	8.28	8.18	8.09	8.00	7.91	7.71	CS
11/23/14	120 Hr.	24.8	2	8.29	8.20	8.22	8.24	8.15	8.08	EMS
11/23/14	Renew	24.8	2	8.34	8.24	8.19	8.16	8.10	8.05	EMS
11/24/14	144 Hr.	25.5	2	8.28	8.14	8.02	7.95	7.88	7.72	EMS
11/24/14	Renew	25.5	3	8.39	8.22	8.06	7.97	7.83	7.68	EMS
11/25/14	168 Hr.	24.7	3	8.01	7.98	7.92	7.86	7.81	7.8	CS

Date	Time	Temp	Samp. No.	DO (mg/L) of Solution						Analyst
				CON	31%	41%	55%	73%	97%	
11/18/14	Start	25.0	1	8.16	8.20	8.92	8.84	8.07	7.92	WLB
11/19/14	24 Hr.	24.3	1	8.64	8.67	7.72	8.48	7.53	8.18	WLB
11/19/14	Renew	24.7	1	8.71	7.97	8.01	8.57	8.35	8.21	WLB
11/20/14	48 Hr.	24.6	1	8.73	8.56	8.27	8.09	8.67	7.92	WLB
11/20/14	Renew	25.0	2	7.74	7.83	8.44	8.47	7.78	8.83	WLB
11/21/14	72 Hr.	24.8	2	8.08	7.84	8.02	8.30	8.14	7.56	EMS
11/21/14	Renew	24.8	2	8.48	8.44	8.52	8.62	7.99	8.46	EMS
11/22/14	96 Hr.	24.8	2	8.68	8.43	8.56	8.67	8.78	8.54	CS
11/22/14	Renew	24.8	2	8.37	8.29	8.65	8.53	8.59	8.59	CS
11/23/14	120 Hr.	24.8	2	7.61	8.36	8.13	7.96	7.72	7.53	EMS
11/23/14	Renew	24.8	2	8.28	8.25	7.75	7.89	8.00	8.12	EMS
11/24/14	144 Hr.	25.5	2	8.04	8.27	7.59	7.93	7.95	8.41	EMS
11/24/14	Renew	25.5	3	8.32	8.19	7.88	7.73	7.79	8.20	EMS
11/25/14	168 Hr.	24.7	3	8.33	8.27	7.71	7.86	8.26	8.14	CS

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

City of Springdale WWTF

Lab ID# 23123

Test Date: November 18, 2014

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
11/18/14	1	7.52	8.78	92	176	679	<0.01	N/A	TN
11/20/14	2	7.63	8.61	100	184	822	<0.01	N/A	TN
11/24/14	3	7.67	8.68	104	178	819	<0.01	N/A	TN
11/18/14	Con	8.75	8.16	160	124	573	--	--	TN

¹ Measurements taken in 100% solution.

Huther and Associates, Inc.
 Begin Date: November 18, 2014
 Lab I.D.# 23123

CERIODAPHNIA DUBIA STATISTICAL ANALYSES
 Reproduction

Summary Statistics on Transformed Data Table 1 of 2

Grp	Identification	N	Min	Max	Mean
1	Control	10	20.000	24.000	22.100
2	31% Effluent	10	20.000	25.000	22.800
3	41% Effluent	10	21.000	25.000	22.500
4	55% Effluent	10	20.000	26.000	22.000
5	73% Effluent	10	20.000	26.000	22.800
6	97% Effluent	10	21.000	25.000	22.700

Summary Statistics on Transformed Data Table 2 of 2

Grp	Identification	Variance	Sd	Sem	C.V.%
1	Control	2.322	1.524	0.482	6.90
2	31% Effluent	2.844	1.687	0.533	7.40
3	41% Effluent	2.278	1.509	0.477	6.71
4	55% Effluent	4.000	2.000	0.632	9.09
5	73% Effluent	4.844	2.201	0.696	9.65
6	97% Effluent	2.233	1.494	0.473	6.58

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	17	18	20	3

Calculated Chi-Square goodness of fit test statistic = 4.8217
 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 = 2.45

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	6.283	1.257	0.407
Within (Error)	54	166.700	3.087	
Total	59	172.983		

Critical F value = 2.45 (0.05,5,40)
 Since F < Critical F Fail to Reject Ho: All equal

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

Grp	Identification	Transformed	Mean	T Stat	Sig
		Mean	Calculated In Original Units		
1	Control	22.100	22.100		
2	31% Effluent	22.800	22.800	-0.891	
3	41% Effluent	22.500	22.500	-0.509	
4	55% Effluent	22.000	22.000	0.127	
5	73% Effluent	22.800	22.800	-0.891	
6	97% Effluent	22.700	22.700	-0.764	

Dunnnett table value = 2.31 (1 Tailed Value, P=0.05, DF=40,5)
 No statistically significant difference

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

Grp	Identification	Num of Reps	Minimum Sig Diff (In Orig. Units)	% of Control	Difference
					from Control
1	Control	10			
2	31% Effluent	10	1.815	8.2	-0.700
3	41% Effluent	10	1.815	8.2	-0.400
4	55% Effluent	10	1.815	8.2	0.100
5	73% Effluent	10	1.815	8.2	-0.700
6	97% Effluent	10	1.815	8.2	-0.600

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

CLIENT	City of Springdale WWTF	SAMPLE TYPE	24 Hour Composite
NPDES #	AR0022063	DATE COLLECTED	11/17/14 11/19/14 11/21/14
LAB ID #	23123	DATE RECEIVED	11/18/14 11/20/14 11/24/14
TEST TYPE	7 Day Chronic	BEGIN DATE/TIME	11/18/14 1610
TEST ORGANISM	<i>Pimephales promelas</i>	END DATE/TIME	11/25/14 1610
ORGANISM AGE	< 24 Hours	TEST TEMPERATURE (°C)	25 ± 1
ORGANISM SOURCE	In House	PHOTO PERIOD	16-hr. Light 8-hr. Dark
RECEIVING WATER	Spring Creek	LIGHT INTENSITY	50-100 ft. candl.
DILUTION WATER	Laboratory	TECHNICIAN	Z. Geiger

SURVIVAL SUMMARY

Conc.	11/19/14					11/20/14					11/21/14					11/22/14					11/23/14				
	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
31%	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
41%	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
55%	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
73%	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
97%	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.	11/24/14					11/25/14					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
31%	8	8	8	8	8	8	8	8	8	8	100.0	0.00
41%	8	8	8	8	8	8	8	8	8	8	100.0	0.00
55%	8	8	8	8	8	8	8	8	8	8	100.0	0.00
73%	8	8	8	8	8	8	8	8	8	8	100.0	0.00
97%	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	0.4450	0.4950	0.4360	0.4990	0.4170	0.4584	8.00
31%	0.4650	0.4720	0.4910	0.4250	0.4560	0.4618	5.25
41%	0.4820	0.4510	0.5030	0.4450	0.4610	0.4684	5.11
55%	0.5020	0.4650	0.4200	0.5030	0.4810	0.4742	7.21
73%	0.4450	0.4710	0.5060	0.4290	0.5050	0.4712	7.37
97%	0.4960	0.5060	0.4270	0.4450	0.4710	0.4690	7.11

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

City of Springdale WWTF

Lab ID# 23123

Test Date: November 18, 2014

WET CHEMISTRY MEASUREMENTS

Date	Time	Temp	Samp. No.	pH of Solution						Analyst
				CON	31%	41%	55%	73%	97%	
11/18/14	Start	25.0	1	8.75	8.23	8.01	7.96	7.82	7.75	WLB
11/19/14	24 Hr.	25.0	1	8.01	7.75	7.79	7.79	7.78	7.69	WLB
11/19/14	Renew	24.7	1	8.02	7.95	7.89	7.86	7.80	7.72	WLB
11/20/14	48 Hr.	24.8	1	8.21	7.79	8.02	8.11	8.05	8.01	WLB
11/20/14	Renew	25.0	2	8.43	8.18	8.04	7.97	7.89	7.78	WLB
11/21/14	72 Hr.	24.6	2	8.23	8.10	8.04	8.05	8.04	7.99	EMS
11/21/14	Renew	24.6	2	8.21	8.18	8.08	8.04	8.01	7.82	EMS
11/22/14	96 Hr.	24.8	2	8.26	8.20	8.15	8.04	8.00	7.86	CS
11/22/14	Renew	24.8	2	8.28	8.18	8.09	8.00	7.91	7.71	CS
11/23/14	120 Hr.	25.0	2	8.48	8.29	8.26	8.29	8.27	8.27	EMS
11/23/14	Renew	25.0	2	8.34	8.24	8.19	8.16	8.10	8.05	EMS
11/24/14	144 Hr.	25.3	2	8.01	7.92	7.90	7.93	7.94	7.82	EMS
11/24/14	Renew	25.3	3	8.39	8.22	8.06	7.97	7.83	7.68	EMS
11/25/14	168 Hr.	24.4	3	8.22	8.15	8.10	8.07	8.03	7.98	CS

Date	Time	Temp	Samp. No.	DO (mg/L) of Solution						Analyst
				CON	31%	41%	55%	73%	97%	
11/18/14	Start	25.0	1	8.16	8.20	8.92	8.84	8.07	7.92	WLB
11/19/14	24 Hr.	25.0	1	8.74	8.95	8.71	8.76	8.60	8.63	WLB
11/19/14	Renew	24.7	1	8.71	7.97	8.01	8.57	8.35	8.21	WLB
11/20/14	48 Hr.	24.8	1	8.76	8.54	8.42	8.34	8.41	8.38	WLB
11/20/14	Renew	25.0	2	7.74	7.83	8.44	8.47	7.78	8.83	WLB
11/21/14	72 Hr.	24.6	2	8.26	8.69	8.59	8.52	8.55	8.65	EMS
11/21/14	Renew	24.6	2	8.48	8.44	8.52	8.62	7.99	8.46	EMS
11/22/14	96 Hr.	24.8	2	8.59	8.65	8.68	8.48	8.79	8.44	CS
11/22/14	Renew	24.8	2	8.37	8.29	8.65	8.53	8.59	8.59	CS
11/23/14	120 Hr.	25.0	2	8.40	7.73	8.03	7.93	7.93	7.93	EMS
11/23/14	Renew	25.0	2	8.28	8.25	7.75	7.89	8.00	8.12	EMS
11/24/14	144 Hr.	25.3	2	8.70	8.36	8.23	8.04	8.05	7.69	EMS
11/24/14	Renew	25.3	3	8.32	8.19	7.88	7.73	7.79	8.20	EMS
11/25/14	168 Hr.	24.4	3	8.16	8.33	8.42	8.75	8.48	8.62	CS

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

City of Springdale WWTF

Lab ID# 23123

Test Date: November 18, 2014

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
11/18/14	1	7.52	8.78	92	176	679	<0.01	N/A	TN
11/20/14	2	7.63	8.61	100	184	822	<0.01	N/A	TN
11/24/14	3	7.67	8.68	104	178	819	<0.01	N/A	TN
11/18/14	Con	8.75	8.16	160	124	573	--	--	TN

¹ Measurements taken in 100% solution.

**APPENDIX A
RAW DATA**

7-DAY CERIODAPHNA DUBIA SURVIVAL & REPRODUCTION
DAILY RAW DATA TABLE
PAGE 1 OF 2

CLIENT Springdale
OUTFALL 001
LAB ID # 23123

START DATE/TIME 11-18-14 26 1500
END DATE/TIME 11-25-14 NL 1500

Con

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
11/19	A	A	A	A	A	A	A	A	A	A	ZG	1500
11/20	A	A	A	A	A	A	A	A	A	A	NL	1530
11/21	A	A	A	A	A	A	A	A	A	A	BH	1200
11/22	2	4	3	2	3	2	2	3	4	4	wcB	1330
11/23	A	A	A	A	A	A	A	A	A	A	NL	1130
11/24	6	8	7	6	7	7	6	6	8	6	MH	1145
11/25	13	12	13	12	12	12	14	12	13		NL	1500
	21	24	23	20	22	21	20	23	24	23		

\bar{x} # Young w/o Dead = 22.1 CV% = 6.90
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100 CV% = 0.00

31

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
11/19	A	A	A	A	A	A	A	A	A	A	ZG	1500
11/20	A	A	A	A	A	A	A	A	A	A	NL	1530
11/21	A	A	A	A	A	A	A	A	A	A	BH	1200
11/22	2	5	3	4	2	3	3	4	5	3	wcB	1330
11/23	A	A	A	A	A	A	A	A	A	A	NL	1130
11/24	8	6	9	8	6	7	6	6	6	6	MH	1145
11/25	14	12	13	12	12	11	13	12	13	14	NL	1500
	24	23	25	24	20	20	23	22	24	23		

\bar{x} # Young w/o Dead = 22.8 CV% = 7.40
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100 CV% = 0.00

41

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
11/19	A	A	A	A	A	A	A	A	A	A	ZG	1500
11/20	A	A	A	A	A	A	A	A	A	A	NL	1530
11/21	A	A	A	A	A	A	A	A	A	A	BH	1200
11/22	2	3	4	2	3	2	5	4	2	3	wcB	1330
11/23	A	A	A	A	A	A	A	A	A	A	NL	1130
11/24	6	8	7	6	8	6	7	6	9	6	MH	1145
11/25	13	14	12	13	12	13	12	12	14	12	NL	1500
	21	24	23	21	23	21	24	22	25	21		

\bar{x} # Young w/o Dead = 22.5 CV% = 6.71
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100 CV% = 0.00

55

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
11/19	A	A	A	A	A	A	A	A	A	A	ZG	1500
11/20	A	A	A	A	A	A	A	A	A	A	NL	1530
11/21	A	A	A	A	A	A	A	A	A	A	BH	1200
11/22	2	4	2	2	3	2	3	2	2	3	wcB	1330
11/23	A	A	A	A	A	A	A	A	A	A	NL	1130
11/24	6	6	7	10	9	6	7	8	6	7	MH	1145
11/25	12	13	12	12	14	12	13	11	12	12	NL	1500
	20	23	21	24	26	20	23	21	20	22		

\bar{x} # Young w/o Dead = 22.0 CV% = 9.09
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100 CV% = 0.00

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

CLIENT/FACILITY Springdale
 OUTFALL # 001 PROJECT # 23123
 ORGANISM ID# PP0-14-321

DATE/TIME STARTED 11-18-14 2G 1610
 DATE/TIME ENDED 11-25-14 2G 1610

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
31	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
41	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
55	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
73	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
97	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	11-19-14 MH 1610					11-20-14 MH 0925					11-21-14 MH 0810					11-22-14 WLB 0925					11-23-14 WLB 0855									

Conc.	A					B					Mean 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
31	8	8	8	8	8	8	8	8	8	8	100.0	0.00
41	8	8	8	8	8	8	8	8	8	8	100.0	0.00
55	8	8	8	8	8	8	8	8	8	8	100.0	0.00
73	8	8	8	8	8	8	8	8	8	8	100.0	0.00
97	8	8	8	8	8	8	8	8	8	8	100.0	0.00
Initials Date/Time	11-24-14 MH 0820					11-25-14 2G 1610						



Huther and Associates, Inc.

environmental toxicologists, biologists, and consultants

Client / Facility Springdale

Lab ID Number 23123

Outfall Number 001

Test Date 11-18-14

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
11/18	1	7.52	8.78	92	176	679	6.01	Na	TKI
11/20	2	7.63	8.61	100	184	822	5	5	5
11/24	3	7.67	8.68	104	178	819	5	5	5
11/18	CON	8.75	8.16	160	124	573	—	—	5

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

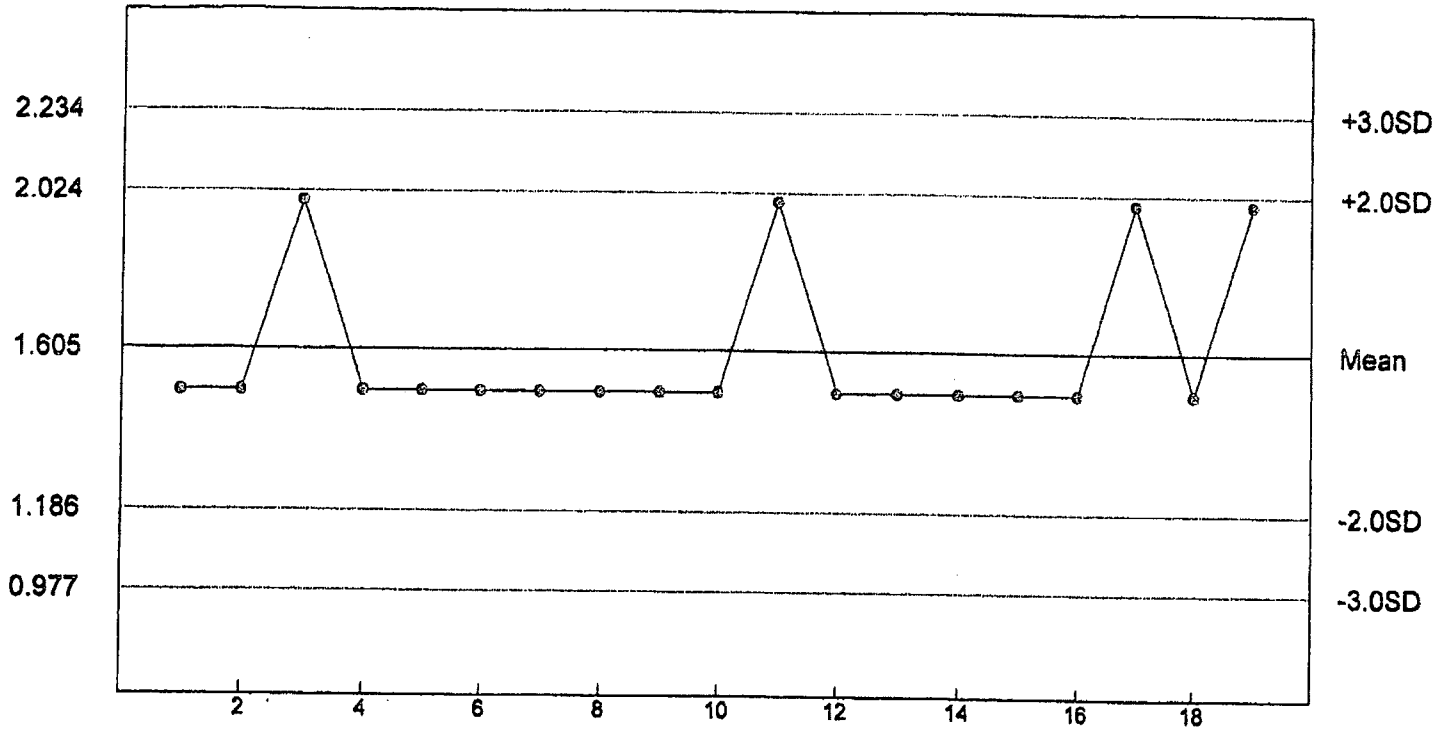
SPECIES: *Ceriodaphnia dubia*
 CHEMICAL: Sodium Chloride
 DURATION: 7-Days
 TEST NUMBER: 11
 TEST DATE/TIME: 11/05/14 - 11/12/14
 1600 Hrs - 1600 Hrs
 STATISTICAL METHOD: Fishers, Dunnetts/Steels

CONCENTRATION (g/L)	NUMBER EXPOSED	NUMBER DEAD
0.5	10	0
1.0	10	0
1.5	10	0
2.0	10	3
2.5	10	10
3.0	10	10
4.0	10	10

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

Reference Tox Sodium Chloride g/L

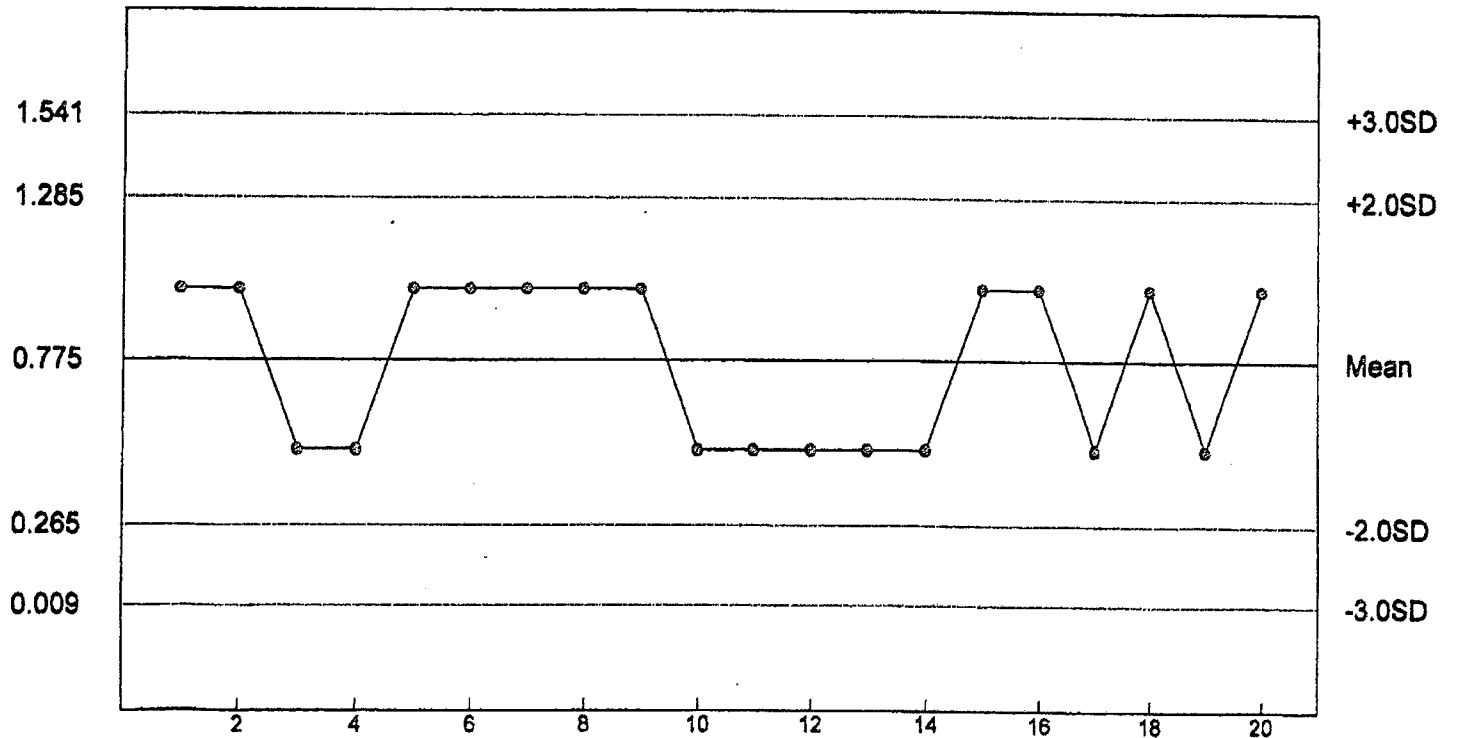
C. dubia Survival - NOEC



n= 19 Mean= 1.605 SD= 0.209 CV= 13.05% Min= 1.500 Max= 2.000

Reference Tox Sodium Chloride g/L

C. dubia Reproduction - NOEC



n= 20 Mean= 0.775 SD= 0.255 CV= 32.93% Min= 0.500 Max= 1.000

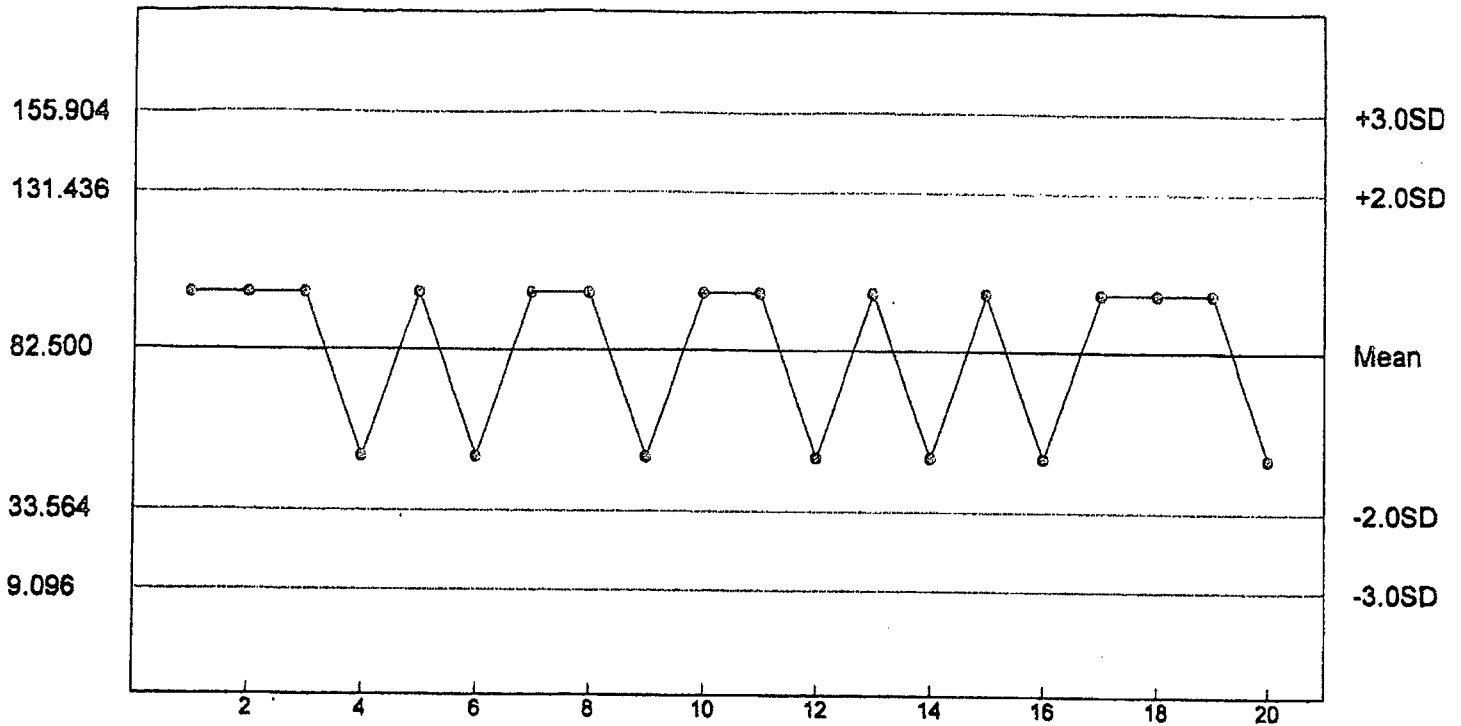
CHRONIC REFERENCE TOXICANT TEST RESULTS

SPECIES: *Pimephales promelas*
 CHEMICAL: Copper Nitrate
 DURATION: 7-Days
 TEST NUMBER: 11
 TEST DATE/TIME: 11/06/14 - 11/13/14
 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	10
200	40	19
400	40	40
800	40	40

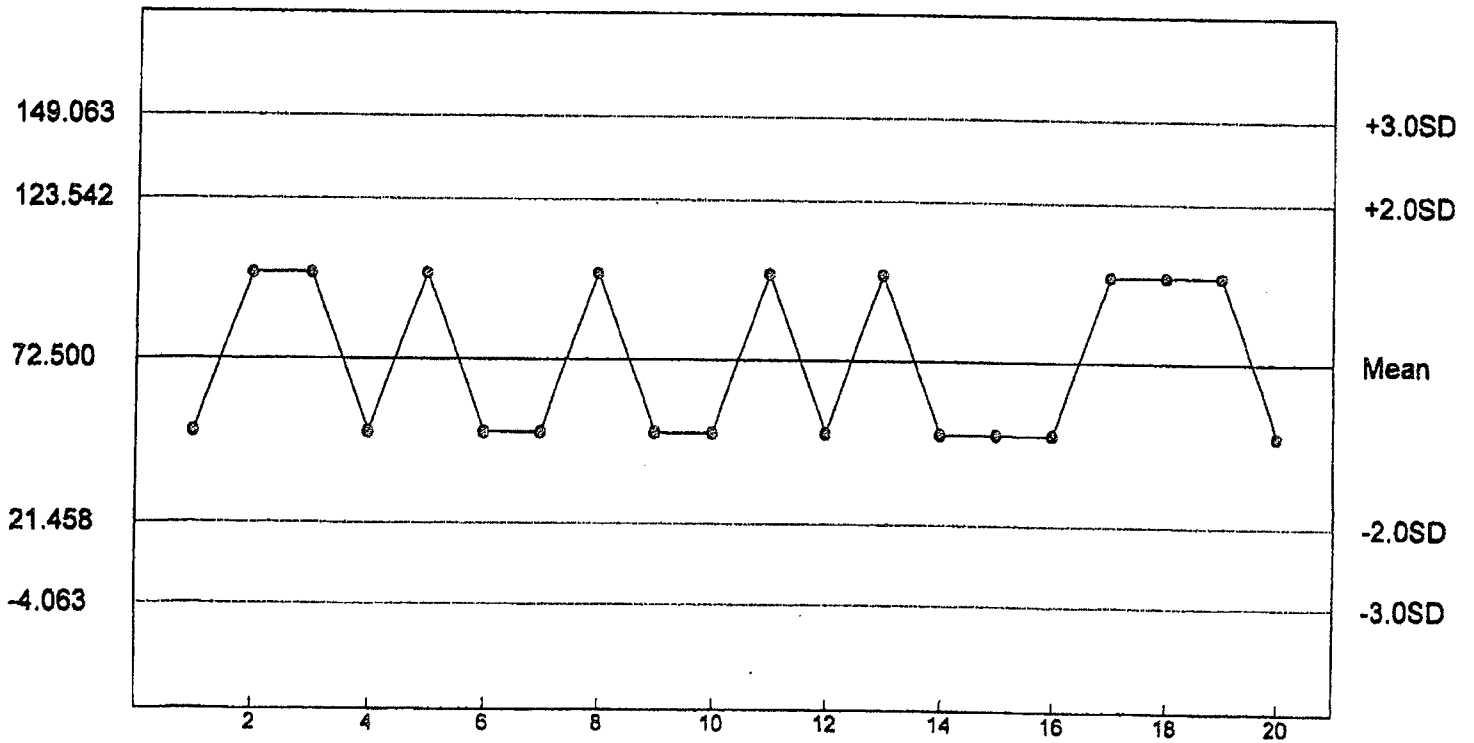
LOEC FOR SURVIVAL	NOEC FOR SURVIVAL	LOEC FOR GROWTH	NOEC FOR GROWTH
100 ug/L	50 ug/L	100 ug/L	50 ug/L

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



n= 20 Mean= 82.500 SD= 24.468 CV= 29.66% Min= 50.000 Max= 100.000

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



n= 20 Mean= 72.500 SD= 25.521 CV= 35.20% 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 # 23123 PROJECT NAME Springdale PERMIT# AR0022003

OUTFALL SAMPLES

24-Hr Flow Weighted Composite _____ Other 24HR. FLOW COMP.

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.	
001	OPERATIONS STAFF	11/18-19/14	0600-0600	88	✓			(1)

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 C/F
 NAME OF RECEIVING WATER Spring Creek
 DILUTION WATER USED FOR THIS TEST Lab

RELINQUISHED BY: M. L. Phillips DATE: 11/19/14 TIME: 0700 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: Antonia Lela DATE: 11-20-14 TIME: 1400 SAMPLE TEMP. @ RECEIPT. 1.4°

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

CHAIN OF CUSTODY RECORD

PROJECT # 23123 PROJECT NAME Springdale PERMIT# AR00220103

OUTFALL SAMPLES

24-Hr Flow Weighted Composite _____ Other 24HR. Flow Comp.

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.	
001	OPERATION'S STAFF	0600 11/20/14	0600 11/21/14	129	✓			(1)

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 Spring Creek
 DILUTION WATER USED FOR THIS TEST Lab

RELINQUISHED BY: Josh Weaver DATE: 11/21/14 TIME: 0700 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 X Pick Up _____ Client Delivered _____ Other _____

RECEIVED: Matt Horner DATE: 11-24-14 TIME: 0940 SAMPLE TEMP. @ RECEIPT. 1.9

**CITY OF SPRINGDALE WWTF
 NPDES PERMIT NO. AR0022063
 AFIN NO. 72-00003
 BIOMONITORING REPORTING
 TEST DATE: 11/18/14**

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.	97%
(C) Report the NOEC value for reproduction, Parameter No. TPP3B.	97%
(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.	6.90%

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.	97%
(C) Report the NOEC value for growth, Parameter No. TPP6C.	97%
(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.	8.00%

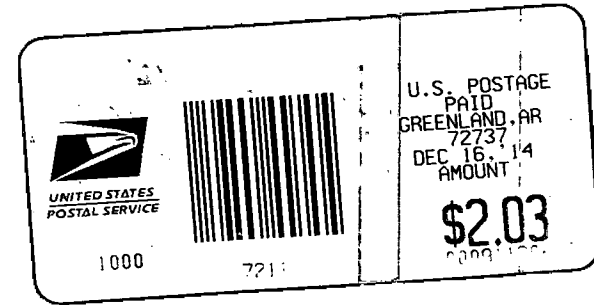
22415 Retest Number 1

Leave Blank

22416 Retest Number 2

Leave Blank

Springdale Water Utilities
P.O. Box 769
Springdale, AR 72765



Mary Barnett
Arkansas Dept. of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118-5317

