



Forrest City Water Utility  
303 N. Rosser St  
Forrest City, AR 72335

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10/15/2015

Transmittal Letter

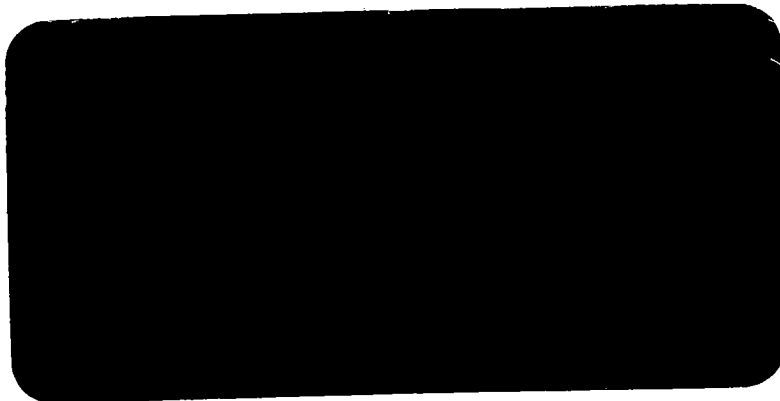
Arkansas Department of Environmental Quality  
5301 North Shore Dr.  
North Little Rock, AR 72118-5317  
ATTN: Michael Greenway-District 3 Field Inspector-Water Division

Please find Enclosed for your distribution the following:

September – 2<sup>nd</sup> Bio Monitoring Report

Sincerely,

Forrest City Water Utility  
W.H. Calvin Murdock, Manager  
(870)633-2921 – Office  
(870)261-2849 Cell



2<sup>nd</sup>

Huther and Associates, Inc.

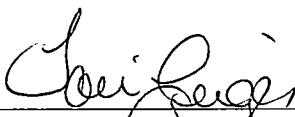
**CITY OF FORREST CITY WWTP  
OUTFALL 001**

Chronic Biomonitoring Report  
Permit Number NPDES AR0020087  
AFIN Number 62-00070

*Ceriodaphnia dubia*  
*Pimephales promelas*

September 29, 2015

Reviewed by: \_\_\_\_\_

  
Toni Geiger, QA/QC Officer  
Huther & Associates, Inc.  
1156 North Bonnie Brae  
Denton, Texas 76201  
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TOXICITY TEST REPORT - CHRONIC

Client ..... City of Forrest City WWTP                      Laboratory I.D. .... 24700  
Permit No. .... NPDES AR0020087                      Begin Date ..... September 29, 2015  
Sample..... 001

Results: **Pass** *Ceriodaphnia dubia* survival and reproduction and *Pimephales promelas* survival and growth at the critical low flow concentration (100% effluent).

**SAMPLE COLLECTION**

Composite effluent samples from City of Forrest City WWTP were delivered by Greyhound Package Express courier to Huther & Associates on September 29, October 1, and October 3, 2015. 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, 22<sup>nd</sup> 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 1520 hours, September 29, 2015. Five concentrations were prepared (32%, 42%, 56%, 75%, 100% effluent) utilizing distilled, deionized laboratory water reconstituted to match the hardness, alkalinity and pH of the receiving stream (unnamed tributary of L'Anguille 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.



**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: 100% 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: 10.7%**  
**NOEC: 100% Effluent**

**SUMMARY**

There were no statistically significant differences between the control and the critical low flow concentration (100% effluent) for *C. dubia* survival and reproduction and *P. promelas* survival and growth. Based on biomonitoring requirements for Outfall 001 contained in NPDES Permit Number NPDES AR0020087 for City of Forrest City WWTP, 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 Forrest City WWTP	SAMPLE TYPE	24 Hour Composite
NPDES #	AR0020087	DATE COLLECTED	09/28/15 09/30/15 10/02/15
LAB ID #	24700	DATE RECEIVED	09/29/15 10/01/15 10/03/15
TEST TYPE	7 Day Chronic	BEGIN DATE/TIME	09/29/15 1520
TEST ORGANISM	<i>Ceriodaphnia dubia</i>	END DATE/TIME	10/06/15 1520
ORGANISM AGE	< 24 Hours	TEST TEMPERATURE (°C)	25 ± 1
ORGANISM SOURCE	In House	PHOTO PERIOD	16-hr. Light 8-hr. Dark
RECEIVING WATER	unnamed tributary of L'Anguille River	LIGHT INTENSITY	50-100 ft. candl.
DILUTION WATER	Laboratory	TECHNICIAN	R. Kasper

**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
09/30/15	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/01/15	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/02/15	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/03/15	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/04/15	3	3	3	4	2	4	5	4	4	4
	3	3	3	4	2	4	5	4	4	4
10/05/15	6	11	9	7	10	7	6	7	6	8
	9	14	12	11	12	11	11	11	10	12
10/06/15	12	12	13	14	14	13	14	11	15	13
	21	26	25	25	26	24	25	22	25	25
x # Young 24.4                      C.V. 6.75% x% Survival 100%                      C.V. 0.00%										

32% Effluent										
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
09/30/15	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/01/15	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/02/15	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/03/15	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/04/15	4	4	5	3	2	4	5	4	3	2
	4	4	5	3	2	4	5	4	3	2
10/05/15	8	9	11	6	6	9	8	7	7	10
	12	13	16	9	8	13	13	11	10	12
10/06/15	15	13	13	13	14	15	13	14	15	11
	27	26	29	22	22	28	26	25	25	23
x # Young 25.3                      C.V. 9.51% x% Survival 100%                      C.V. 0.00%										

42% Effluent										
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
09/30/15	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/01/15	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/02/15	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/03/15	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/04/15	4	2	3	3	4	4	3	2	3	4
	4	2	3	3	4	4	3	2	3	4
10/05/15	8	6	9	6	9	9	11	6	11	8
	12	8	12	9	13	13	14	8	14	12
10/06/15	14	14	14	11	14	14	13	15	14	13
	26	22	26	20	27	27	27	23	28	25
x # Young 25.1                      C.V. 10.36% x% Survival 100%                      C.V. 0.00%										

56% Effluent										
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
09/30/15	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/01/15	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/02/15	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/03/15	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
10/04/15	3	2	3	3	4	2	2	4	5	5
	3	2	3	3	4	2	2	4	5	5
10/05/15	8	8	10	6	8	11	9	8	8	6
	11	10	13	9	12	13	11	12	13	11
10/06/15	13	11	15	12	14	12	14	11	12	15
	24	21	28	21	26	25	25	23	25	26
x # Young 24.4                      C.V. 9.10% x% Survival 100%                      C.V. 0.00%										

where: A = Alive                      ex 1: 

A
---

 alive today                      ex 2: 

5
---

 alive, 5 young today

5 = Alive, 5 young                      

4
---

 total young to date                      

12
----

 total young to date

D = Dead

D5 = 5 Young, Female died



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

City of Forrest City WWTP

Lab ID# 24700

Test Date: September 29, 2015

75% Effluent																						
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10												
09/30/15	A	A	A	A	A	A	A	A	A	A												
	0	0	0	0	0	0	0	0	0	0												
10/01/15	A	A	A	A	A	A	A	A	A	A												
	0	0	0	0	0	0	0	0	0	0												
10/02/15	A	A	A	A	A	A	A	A	A	A												
	0	0	0	0	0	0	0	0	0	0												
10/03/15	A	A	A	A	A	A	A	A	A	A												
	0	0	0	0	0	0	0	0	0	0												
10/04/15	5	4	5	4	5	3	5	2	4	5												
	5	4	5	4	5	3	5	2	4	5												
10/05/15	6	8	6	11	9	9	9	7	10	8												
	11	12	11	15	14	12	14	9	14	13												
10/06/15	14	15	14	14	14	13	12	14	11	13												
	25	27	25	29	28	25	26	23	25	26												
<table style="width: 100%; border: none;"> <tr> <td style="width: 15%;"></td> <td style="width: 15%;">x # Young</td> <td style="width: 15%;">25.9</td> <td style="width: 15%;"></td> <td style="width: 15%;">C.V.</td> <td style="width: 15%;">6.68%</td> </tr> <tr> <td></td> <td>x% Survival</td> <td>100%</td> <td></td> <td>C.V.</td> <td>0.00%</td> </tr> </table>												x # Young	25.9		C.V.	6.68%		x% Survival	100%		C.V.	0.00%
	x # Young	25.9		C.V.	6.68%																	
	x% Survival	100%		C.V.	0.00%																	

100% Effluent																						
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10												
09/30/15	A	A	A	A	A	A	A	A	A	A												
	0	0	0	0	0	0	0	0	0	0												
10/01/15	A	A	A	A	A	A	A	A	A	A												
	0	0	0	0	0	0	0	0	0	0												
10/02/15	A	A	A	A	A	A	A	A	A	A												
	0	0	0	0	0	0	0	0	0	0												
10/03/15	A	A	A	A	A	A	A	A	A	A												
	0	0	0	0	0	0	0	0	0	0												
10/04/15	3	4	5	5	5	3	2	2	3	2												
	3	4	5	5	5	3	2	2	3	2												
10/05/15	9	6	8	6	7	8	7	7	9	6												
	12	10	13	11	12	11	9	9	12	8												
10/06/15	15	14	14	14	14	15	12	14	15	13												
	27	24	27	25	26	26	21	23	27	21												
<table style="width: 100%; border: none;"> <tr> <td style="width: 15%;"></td> <td style="width: 15%;">x # Young</td> <td style="width: 15%;">24.7</td> <td style="width: 15%;"></td> <td style="width: 15%;">C.V.</td> <td style="width: 15%;">9.55%</td> </tr> <tr> <td></td> <td>x% Survival</td> <td>100%</td> <td></td> <td>C.V.</td> <td>0.00%</td> </tr> </table>												x # Young	24.7		C.V.	9.55%		x% Survival	100%		C.V.	0.00%
	x # Young	24.7		C.V.	9.55%																	
	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

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

City of Forrest City WWTP

Lab ID# 24700

Test Date: September 29, 2015

**WET CHEMISTRY MEASUREMENTS**

Date	Time	Temp	Samp. No.	pH of Solution						Analyst
				CON	32%	42%	56%	75%	100%	
09/29/15	Start	25.0	1	7.45	7.52	7.55	7.57	7.56	7.57	GP
09/30/15	24 Hr.	25.0	1	7.43	7.58	7.66	7.73	7.81	7.89	TB
09/30/15	Renew	25.0	1	7.70	7.75	7.74	7.74	7.74	7.77	TB
10/01/15	48 Hr.	24.8	1	7.94	7.88	7.84	7.82	7.79	7.80	GP
10/01/15	Renew	25.0	2	7.71	7.66	7.66	7.65	7.65	7.67	GP
10/02/15	72 Hr.	24.5	2	7.76	7.76	7.75	7.75	7.77	7.80	GP
10/02/15	Renew	25.0	2	7.69	7.74	7.72	7.75	7.77	7.80	GP
10/03/15	96 Hr.	25.1	2	7.65	7.74	7.51	7.88	7.49	7.38	CA
10/03/15	Renew	25.0	3	7.53	7.48	7.83	7.77	7.57	7.47	CA
10/04/15	120 Hr.	25.1	3	7.66	7.54	7.66	7.97	7.67	7.49	CA
10/04/15	Renew	25.0	3	7.80	7.16	7.30	7.91	7.39	7.90	CA
10/05/15	144 Hr.	24.7	3	7.48	7.64	7.75	7.79	7.88	7.96	RK
10/05/15	Renew	24.8	3	8.12	8.15	8.13	8.16	8.08	8.05	RK
10/06/15	168 Hr.	24.4	3	7.67	7.76	7.84	7.89	7.97	8.07	GP

Date	Time	Temp	Samp. No.	DO (mg/L) of Solution						Analyst
				CON	32%	42%	56%	75%	100%	
09/29/15	Start	25.0	1	7.85	8.12	8.62	8.10	8.58	8.61	GP
09/30/15	24 Hr.	25.0	1	7.52	7.91	7.65	7.44	8.01	7.96	TB
09/30/15	Renew	25.0	1	8.08	8.16	8.37	8.25	8.22	8.47	TB
10/01/15	48 Hr.	24.8	1	8.96	9.11	8.40	8.79	9.12	9.24	GP
10/01/15	Renew	25.0	2	7.98	8.27	8.92	8.75	9.05	9.22	GP
10/02/15	72 Hr.	24.5	2	8.35	8.66	8.70	8.67	8.65	8.43	GP
10/02/15	Renew	25.0	2	8.21	8.24	8.00	8.40	8.63	8.52	GP
10/03/15	96 Hr.	25.1	2	7.93	7.89	7.62	8.01	8.28	8.19	CA
10/03/15	Renew	25.0	3	8.20	8.76	7.74	8.32	8.47	7.78	CA
10/04/15	120 Hr.	25.1	3	8.18	7.64	8.51	7.69	7.80	8.11	CA
10/04/15	Renew	25.0	3	8.38	7.67	8.16	8.67	7.58	8.43	CA
10/05/15	144 Hr.	24.7	3	8.83	8.97	7.66	8.25	8.74	8.04	RK
10/05/15	Renew	24.8	3	8.40	8.45	8.38	8.58	8.54	8.54	RK
10/06/15	168 Hr.	24.4	3	7.50	7.61	7.44	8.51	8.01	7.33	GP

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

City of Forrest City WWTP

Lab ID# 24700

Test Date: September 29, 2015

**INITIAL CHEMISTRY MEASUREMENTS @ 100% EFFLUENT**

Date	Samp. No.	pH	DO	Hardness mg/L CaCO <sub>3</sub> <sup>1</sup>	Alkalinity mg/L CaCO <sub>3</sub> <sup>1</sup>	Conduct. umhos/cm <sup>1</sup>	Resid. Cl <sub>2</sub> mg/L <sup>1</sup>	Dechlor(mL) Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> mg/L <sup>1</sup>	Analyst
09/29/15	1	7.57	8.61	224	148	878	<0.01	N/A	TG
10/01/15	2	7.67	9.22	228	144	844	<0.01	N/A	TG
10/03/15	3	7.47	7.78	232	156	924	<0.01	N/A	TG
09/29/15	Con	7.45	7.85	78	68	292	-	-	TG

<sup>1</sup> Measurements taken in 100% solution.

Huther and Associates, Inc.  
 Begin Date: September 29, 2015  
 Lab I.D.# 24700

**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	26.000	24.400
2	32% Effluent	10	22.000	29.000	25.300
3	42% Effluent	10	20.000	28.000	25.100
4	56% Effluent	10	21.000	28.000	24.400
5	75% Effluent	10	23.000	29.000	25.900
6	100% Effluent	10	21.000	27.000	24.700

Summary Statistics on Transformed Data Table 2 of 2

Grp	Identification	Variance	Sd	Sem	C.V. %
1	Control	2.711	1.647	0.521	6.75
2	32% Effluent	5.789	2.406	0.761	9.51
3	42% Effluent	6.767	2.601	0.823	10.36
4	56% Effluent	4.933	2.221	0.702	9.10
5	75% Effluent	2.989	1.729	0.547	6.68
6	100% Effluent	5.567	2.359	0.746	9.55

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	7	12	21	17	3

Calculated Chi-Square goodness of fit test statistic = 3.4896  
 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 = 2.84

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	17.133	3.427	0.715
Within (Error)	54	258.800	4.793	
Total	59	275.933		

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
			Original Units	Calculated In		
1	Control	24.400	24.400			
2	32% Effluent	25.300	25.300		-0.919	
3	42% Effluent	25.100	25.100		-0.715	
4	56% Effluent	24.400	24.400		0.000	
5	75% Effluent	25.900	25.900		-1.532	
6	100% Effluent	24.700	24.700		-0.306	

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

Dunnett'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	32% Effluent	10	2.262	9.3	-0.900
3	42% Effluent	10	2.262	9.3	-0.700
4	56% Effluent	10	2.262	9.3	0.000
5	75% Effluent	10	2.262	9.3	-1.500
6	100% Effluent	10	2.262	9.3	-0.300

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

CLIENT	City of Forrest City WWTP	SAMPLE TYPE	24 Hour Composite
NPDES #	AR0020087	DATE COLLECTED	09/28/15 09/30/15 10/02/15
LAB ID #	24700	DATE RECEIVED	09/29/15 10/01/15 10/03/15
TEST TYPE	7 Day Chronic	BEGIN DATE/TIME	09/29/15 1520
TEST ORGANISM	<i>Pimephales promelas</i>	END DATE/TIME	10/06/15 1520
ORGANISM AGE	< 24 Hours	TEST TEMPERATURE (°C)	25 ± 1
ORGANISM SOURCE	In House	PHOTO PERIOD	16-hr. Light 8-hr. Dark
RECEIVING WATER	unnamed tributary of the L'Anguille River	LIGHT INTENSITY	50-100 ft. candl.
DILUTION WATER	Laboratory	TECHNICIAN	M. Horner

**SURVIVAL SUMMARY**

Conc.	09/30/15					10/01/15					10/02/15					10/03/15					10/04/15									
	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
32%	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
42%	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
56%	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
75%	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
100%	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

Conc.	10/05/15					10/06/15					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
32%	8	8	8	8	8	8	8	8	8	8	100.0	0.00
42%	8	8	8	8	8	8	8	8	8	8	100.0	0.00
56%	8	8	8	8	8	8	8	8	8	8	100.0	0.00
75%	8	8	8	8	8	8	8	8	8	8	100.0	0.00
100%	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	0.4800	0.4190	0.4200	0.4360	0.4540	0.4418	5.81
32%	0.4520	0.4960	0.4450	0.4620	0.4810	0.4672	4.50
42%	0.4950	0.4160	0.4800	0.4390	0.5020	0.4664	7.99
56%	0.4450	0.4820	0.4260	0.4910	0.5040	0.4696	6.98
75%	0.4760	0.5060	0.4250	0.4710	0.4960	0.4748	6.59
100%	0.4260	0.5010	0.4930	0.4200	0.4730	0.4626	8.13

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

City of Forrest City WWTP

Lab ID# 24700

Test Date: September 29, 2015

**WET CHEMISTRY MEASUREMENTS**

Date	Time	Temp	Samp. No.	pH of Solution						Analyst
				CON	32%	42%	56%	75%	100%	
09/29/15	Start	25.0	1	7.45	7.52	7.55	7.57	7.56	7.57	GP
09/30/15	24 Hr.	25.0	1	7.51	7.28	7.49	7.55	7.61	7.77	TB
09/30/15	Renew	25.0	1	7.70	7.75	7.74	7.74	7.74	7.77	TB
10/01/15	48 Hr.	25.2	1	7.58	7.61	7.78	7.79	7.86	7.95	GP
10/01/15	Renew	25.0	2	7.71	7.66	7.66	7.65	7.65	7.67	GP
10/02/15	72 Hr.	24.6	2	7.68	7.74	7.88	7.89	7.94	8.04	GP
10/02/15	Renew	25.0	2	7.69	7.74	7.72	7.75	7.77	7.80	GP
10/03/15	96 Hr.	24.8	2	7.74	7.08	7.72	7.13	7.32	7.46	CA
10/03/15	Renew	25.0	3	7.53	7.48	7.83	7.77	7.57	7.47	CA
10/04/15	120 Hr.	24.7	3	7.71	7.10	7.13	7.00	7.57	7.20	CA
10/04/15	Renew	25.0	3	7.80	7.16	7.30	7.91	7.39	7.90	CA
10/05/15	144 Hr.	25.2	3	8.21	8.22	8.52	8.30	8.28	8.34	BB
10/05/15	Renew	24.8	3	8.12	8.15	8.13	8.16	8.08	8.05	RK
10/06/15	168 Hr.	24.4	3	7.61	7.67	7.85	7.88	7.94	8.01	GP

Date	Time	Temp	Samp. No.	DO (mg/L) of Solution						Analyst
				CON	32%	42%	56%	75%	100%	
09/29/15	Start	25.0	1	7.85	8.12	8.62	8.10	8.58	8.61	GP
09/30/15	24 Hr.	25.0	1	8.35	8.04	8.11	8.36	7.95	8.44	TB
09/30/15	Renew	25.0	1	8.08	8.16	8.37	8.25	8.22	8.47	TB
10/01/15	48 Hr.	25.2	1	8.03	8.77	8.60	8.41	8.63	7.77	GP
10/01/15	Renew	25.0	2	7.98	8.27	8.92	8.75	9.05	9.22	GP
10/02/15	72 Hr.	24.6	2	9.06	9.00	8.10	7.92	7.90	7.52	GP
10/02/15	Renew	25.0	2	8.21	8.24	8.00	8.40	8.63	8.52	GP
10/03/15	96 Hr.	24.8	2	7.76	8.45	8.12	8.98	7.68	8.95	CA
10/03/15	Renew	25.0	3	8.20	8.76	7.74	8.32	8.47	7.78	CA
10/04/15	120 Hr.	24.7	3	8.83	8.36	8.81	8.39	8.74	8.73	CA
10/04/15	Renew	25.0	3	8.38	7.67	8.16	8.67	7.58	8.43	CA
10/05/15	144 Hr.	25.2	3	7.56	7.42	8.42	7.64	7.99	7.24	BB
10/05/15	Renew	24.8	3	8.40	8.45	8.38	8.58	8.54	8.54	RK
10/06/15	168 Hr.	24.4	3	8.81	7.75	8.57	7.90	8.69	7.90	GP

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

City of Forrest City WWTP

Lab ID# 24700

Test Date: September 29, 2015

INITIAL CHEMISTRY MEASUREMENTS @ 100% EFFLUENT

Date	Samp. No.	pH	DO	Hardness mg/L CaCO <sub>3</sub> <sup>1</sup>	Alkalinity mg/L CaCO <sub>3</sub> <sup>1</sup>	Conduct. umhos/cm <sup>1</sup>	Resid. Cl <sub>2</sub> mg/L <sup>1</sup>	Dechlor(mL) Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> mg/L <sup>1</sup>	Analyst
09/29/15	1	7.57	8.61	224	148	878	<0.01	N/A	TG
10/01/15	2	7.67	9.22	228	144	844	<0.01	N/A	TG
10/03/15	3	7.47	7.78	232	156	924	<0.01	N/A	TG
09/29/15	Con	7.45	7.85	78	68	292	-	-	TG

<sup>1</sup> Measurements taken in 100% solution.

Huther and Associates, Inc.  
 Begin Date: September 29, 2015  
 Lab I.D.# 24700

**PIMEPHALES PROMELAS STATISTICAL ANALYSES**  
 Growth

Summary Statistics on Transformed Data Table 1 of 2

Grp	Identification	N	Min	Max	Mean
1	Control	5	0.419	0.480	0.442
2	32% Effluent	5	0.445	0.496	0.467
3	42% Effluent	5	0.416	0.502	0.466
4	56% Effluent	5	0.426	0.504	0.470
5	75% Effluent	5	0.425	0.506	0.475
6	100% Effluent	5	0.420	0.501	0.463

Summary Statistics on Transformed Data Table 2 of 2

Grp	Identification	Variance	Sd	Sem	C.V. %
1	Control	0.001	0.026	0.011	5.81
2	32% Effluent	0.000	0.021	0.009	4.50
3	42% Effluent	0.001	0.037	0.017	7.99
4	56% Effluent	0.001	0.033	0.015	6.98
5	75% Effluent	0.001	0.031	0.014	6.59
6	100% Effluent	0.001	0.038	0.017	8.13

Shapiro - Wilk's Test For Normality

D = 0.024

W = 0.921

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 = 1.70

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	0.003	0.001	0.663
Within (Error)	24	0.024	0.001	
Total	29	0.027		

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

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

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

Grp	Identification	Mean		T Stat	Sig
		Transformed Mean	Calculated In Original Units		
1	Control	0.442	0.442		
2	32% Effluent	0.467	0.467	-1.274	
3	42% Effluent	0.466	0.466	-1.234	
4	56% Effluent	0.470	0.470	-1.394	
5	75% Effluent	0.475	0.475	-1.655	
6	100% Effluent	0.463	0.463	-1.043	

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

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)	Difference	
				% of Control	from Control
1	Control	5			
2	32% Effluent	5	0.047	10.7	-0.025
3	42% Effluent	5	0.047	10.7	-0.025
4	56% Effluent	5	0.047	10.7	-0.028
5	75% Effluent	5	0.047	10.7	-0.033
6	100% Effluent	5	0.047	10.7	-0.021



**APPENDIX A  
RAW DATA**

7-DAY CERIODAPHnia DUBIA SURVIVAL & REPRODUCTION

DAILY RAW DATA TABLE

PAGE 1 OF 2

CLIENT Forrest City

START DATE/TIME 9-29-15 Rk 1520

OUTFALL 001

END DATE/TIME 10-6-15 Rk 1520

LAB ID # 24700

CON

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
9/30	A	A	A	A	A	A	A	A	A	A	RK	1520
10/1	A	A	A	A	A	A	A	A	A	A	ZG	1320
10/2	A	A	A	A	A	A	A	A	A	A	ZG	1020
10/3	A	A	A	A	A	A	A	A	A	A	ZG	1420
10/4	3	3	3	4	2	4	5	4	4	4	RK	1125
10/5	6	11	9	7	10	7	6	7	6	8	MH	1155
10/6	12	12	13	14	14	13	14	11	15	13	RK	1520
	21	26	25	25	26	24	25	22	26	23		

$\bar{x}$  # Young w/o Dead = 24.4 CV% = 6.75

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

$\bar{x}$  % Survival = 100.0 CV% = 0.00

32

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
9/30	A	A	A	A	A	A	A	A	A	A	RK	1520
10/1	A	A	A	A	A	A	A	A	A	A	ZG	1320
10/2	A	A	A	A	A	A	A	A	A	A	ZG	1020
10/3	A	A	A	A	A	A	A	A	A	A	ZG	1420
10/4	4	4	5	3	2	4	5	4	3	2	RK	1125
10/5	8	9	11	6	6	9	8	7	7	10	MH	1155
10/6	15	13	13	13	14	15	13	14	15	11	RK	1520
	27	26	27	22	22	28	26	25	25	23		

$\bar{x}$  # Young w/o Dead = 25.3 CV% = 9.51

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

$\bar{x}$  % Survival = 100.0 CV% = 0.00

42

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
9/30	A	A	A	A	A	A	A	A	A	A	RK	1520
10/1	A	A	A	A	A	A	A	A	A	A	ZG	1320
10/2	A	A	A	A	A	A	A	A	A	A	ZG	1020
10/3	A	A	A	A	A	A	A	A	A	A	ZG	1420
10/4	4	2	3	3	4	4	3	2	3	4	RK	1125
10/5	8	6	9	6	9	9	11	6	11	8	MH	1155
10/6	14	14	14	11	14	14	13	15	14	13	RK	1520
	26	22	26	20	27	27	27	23	28	23		

$\bar{x}$  # Young w/o Dead = 25.1 CV% = 10.36

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

$\bar{x}$  % Survival = 100.0 CV% = 0.00

56

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
9/30	A	A	A	A	A	A	A	A	A	A	RK	1520
10/1	A	A	A	A	A	A	A	A	A	A	ZG	1320
10/2	A	A	A	A	A	A	A	A	A	A	ZG	1020
10/3	A	A	A	A	A	A	A	A	A	A	ZG	1420
10/4	3	2	3	3	4	2	2	4	5	5	RK	1125
10/5	8	8	10	6	8	11	9	8	8	6	MH	1155
10/6	13	11	15	12	14	12	14	11	12	15	RK	1520
	24	21	28	21	26	25	25	23	25	26		

$\bar{x}$  # Young w/o Dead = 24.4 CV% = 9.10

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

$\bar{x}$  % Survival = 100.0 CV% = 0.00



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

CLIENT/FACILITY Forrest City  
 OUTFALL # 001 PROJECT # 24700  
 ORGANISM ID# PP0-15-271

DATE/TIME STARTED 9-29-15 MH 1520  
 DATE/TIME ENDED 10-6-15 TB 1520

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
32	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
42	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
56	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
75	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
100	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	9-30-15 MH 1520					10-1-15 MH 0835					10-2-15 MH 0810					10-3-15 TB 0855					10-4-15 TB 0835									

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
32	8	8	8	8	8	8	8	8	8	8	100.0	0.00
42	8	8	8	8	8	8	8	8	8	8	100.0	0.00
56	8	8	8	8	8	8	8	8	8	8	100.0	0.00
75	8	8	8	8	8	8	8	8	8	8	100.0	0.00
100	8	8	8	8	8	8	8	8	8	8	100.0	0.00
Initials Date/Time	10-5-15 SB 0910					10-6-15 TB 1520						



Client / Facility Forrest City  
 Lab ID Number 24700  
 Outfall Number 001  
 Test Date 9-29-15

INITIAL CHEMISTRY MEASUREMENTS @ 100% EFFLUENT

Date	Samp. No.	pH	DO	Hardness mg/L CaCO <sub>3</sub> <sup>1</sup>	Alkalinity mg/L CaCO <sub>3</sub> <sup>1</sup>	Conduct. umhos/cm <sup>1</sup>	Resid. Cl <sub>2</sub> mg/L <sup>1</sup>	Dechlor(mL) Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> mg/L <sup>1</sup>	Analyst
9/29	1	7.57	8.61	224	148	878	6.01	Na	TG
10/1	2	7.67	9.22	228	144	844	<	<	<
10/3	3	7.47	7.78	232	156	924	<	<	<
9/29	CON	7.45	7.85	78	68	292	—	—	<

INITIAL CHEMISTRY MEASUREMENTS @ RECEIVING WATER

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

Notes:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**APPENDIX B  
REFERENCE TOXICANTS**

**CHRONIC REFERENCE TOXICANT TEST RESULTS**

SPECIES: *Ceriodaphnia dubia*  
 CHEMICAL: Sodium Chloride  
 DURATION: 7-Days  
 TEST NUMBER: 9  
 TEST DATE: 09/02/15 - 09/09/15  
 1610 Hrs - 1610 Hrs  
 STATISTICAL METHOD: Dunnetts/Steels

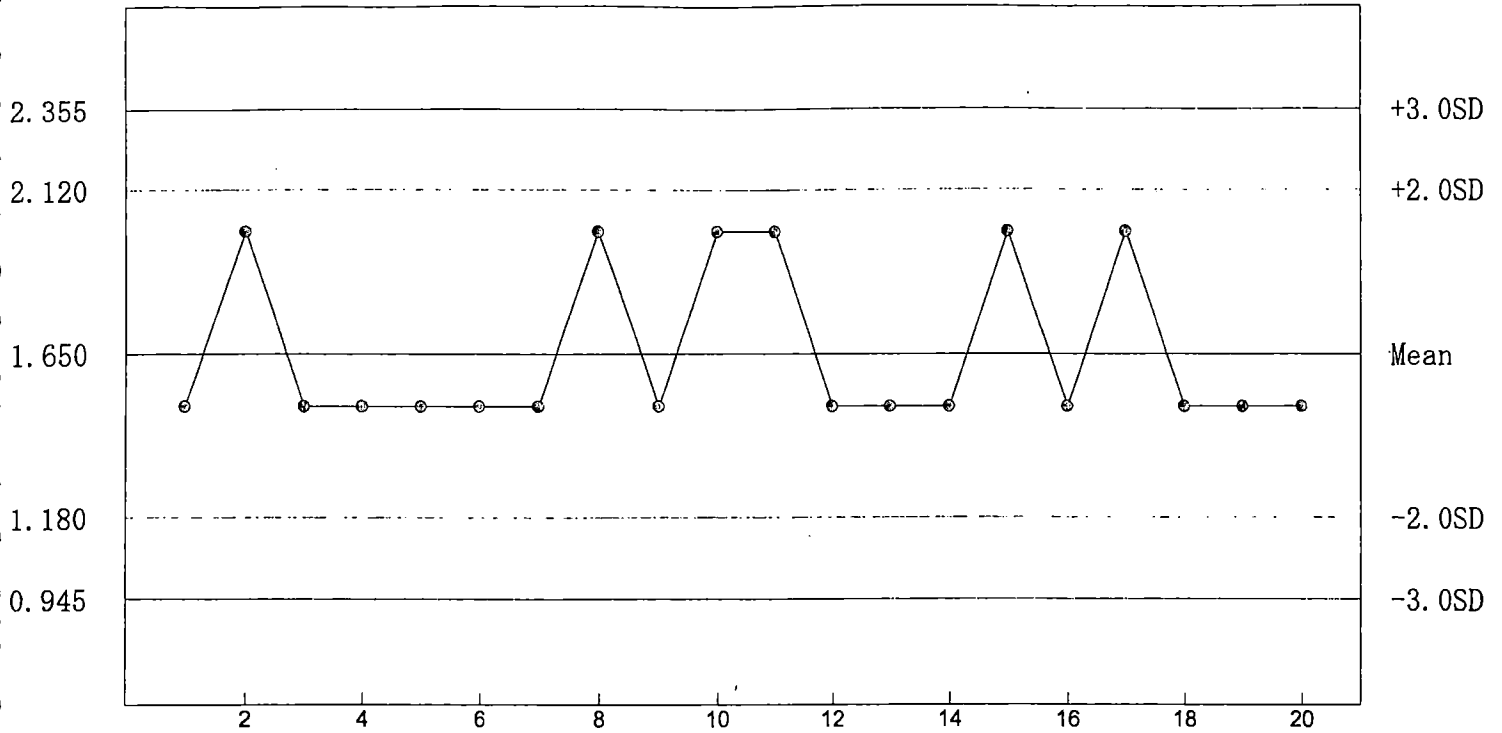
CONCENTRATION (g/L)	NUMBER EXPOSED	NUMBER DEAD
0.5	10	0
1.0	10	0
1.5	10	0
2.0	10	6
2.5	10	10
3.0	10	10

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



Reference Tox Sodium Chloride g/L

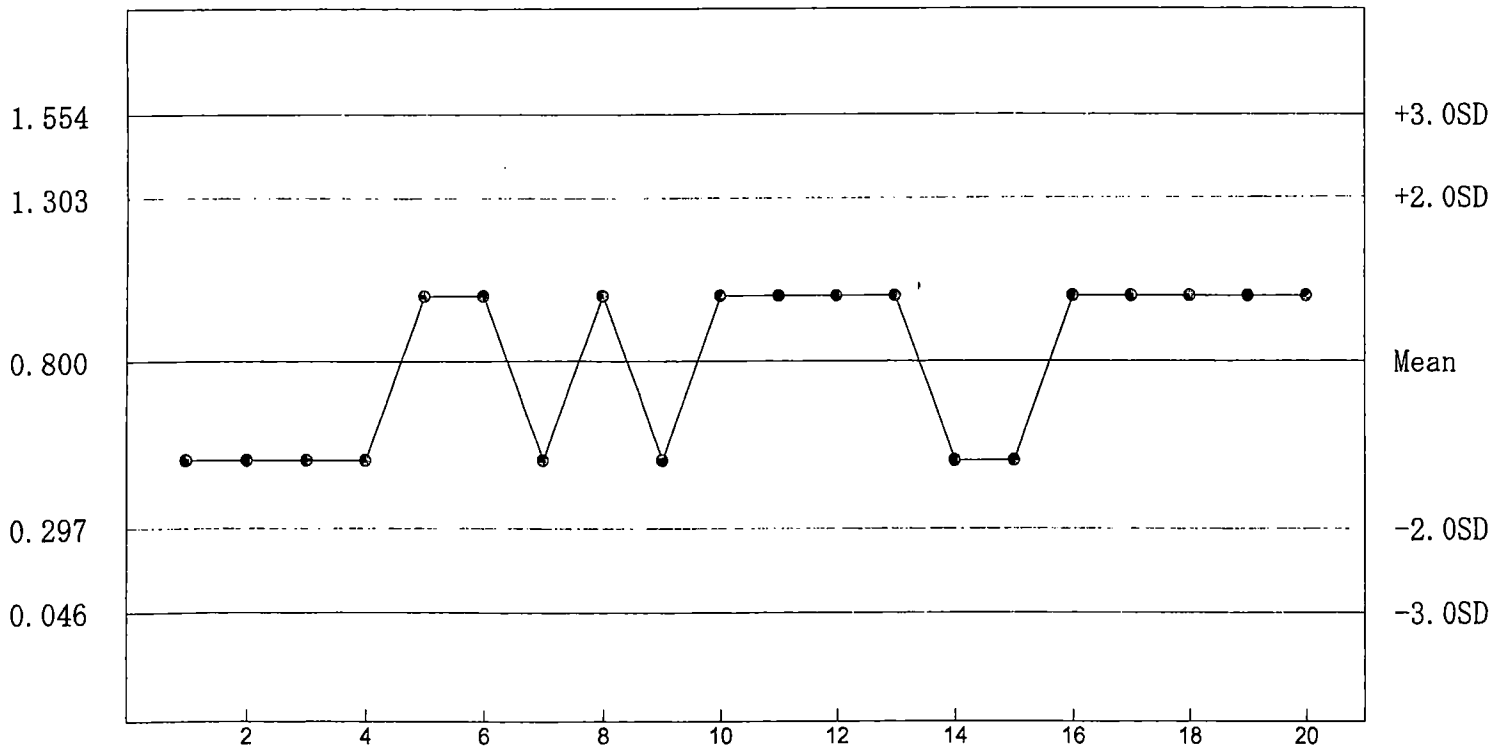
*C. dubia* Survival - NOEC



n= 20 Mean= 1.650 SD= 0.235 CV= 14.25% 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

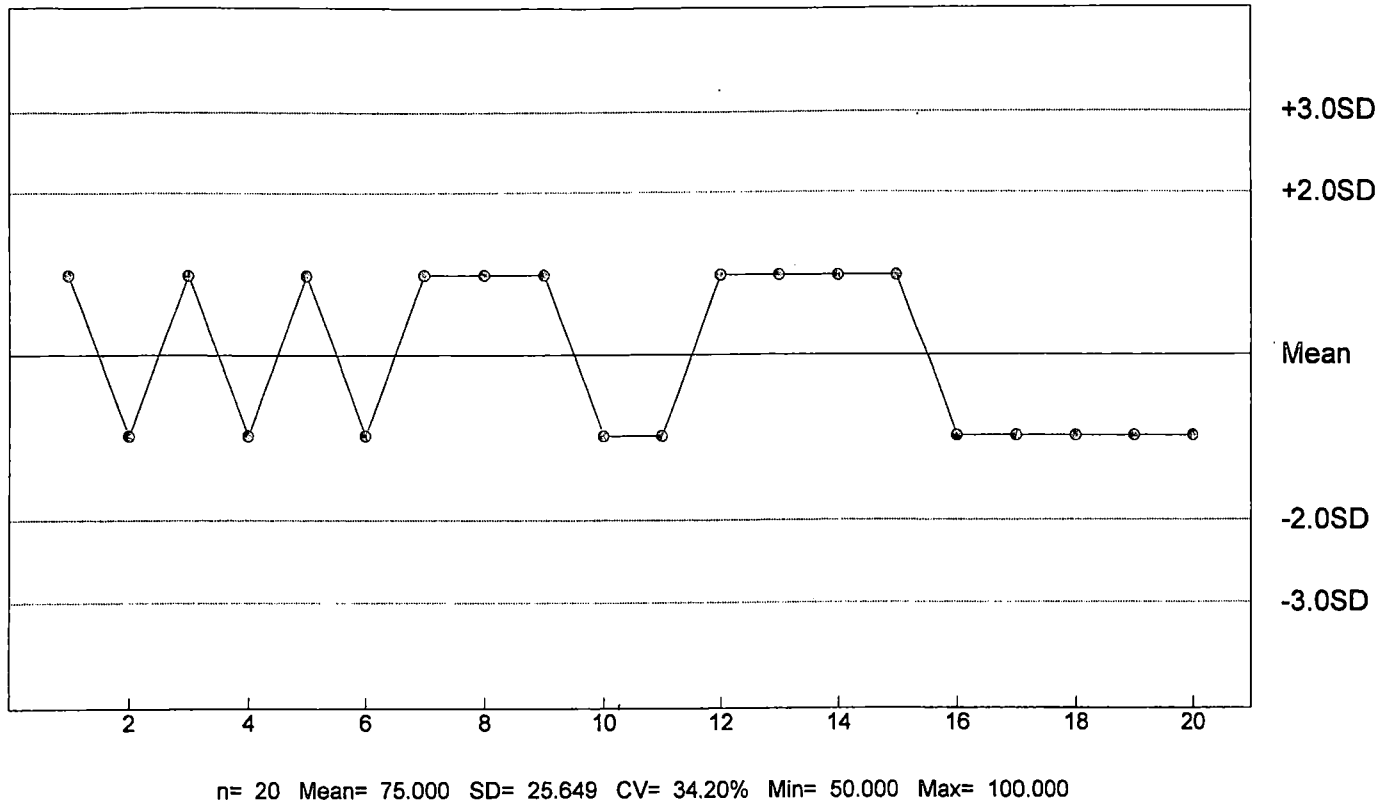
**CHRONIC REFERENCE TOXICANT TEST RESULTS**

SPECIES: *Pimephales promelas*  
 CHEMICAL: Copper Nitrate  
 DURATION: 7-Days  
 TEST NUMBER: 9  
 TEST DATE: 09/02/15 - 09/09/15  
 1530 Hrs - 1530 Hrs  
 STATISTICAL METHOD: Dunnetts/Steels

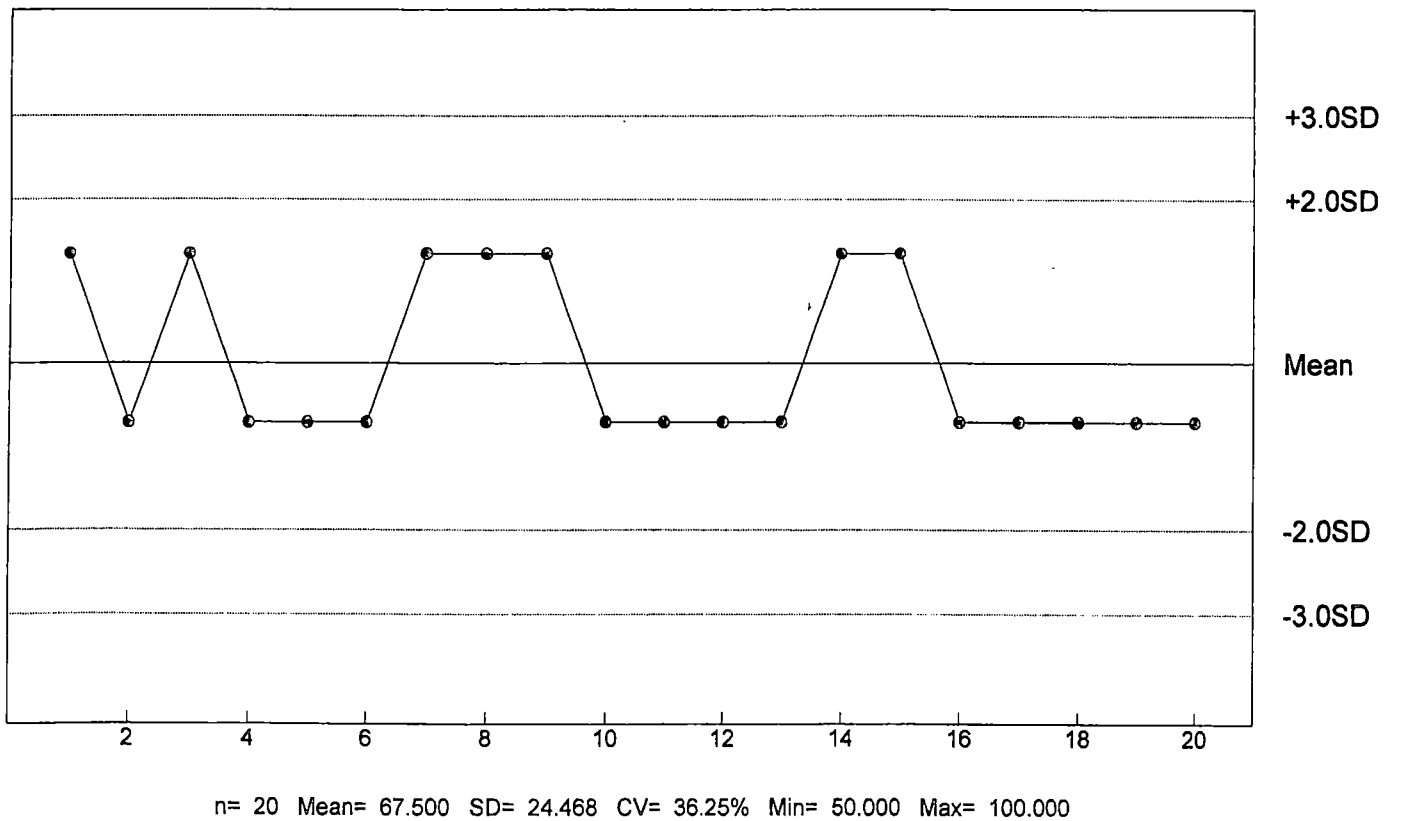
CONCENTRATION (ug/L)	NUMBER EXPOSED	NUMBER DEAD
25	40	0
50	40	0
100	40	10
200	40	28
400	40	39
800	40	40

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



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



**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 # 24700 PROJECT NAME Forest City PERMIT# NPDES A20020087

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.	
001	Joel R. Thetford	9-27-15 10:00AM	9-28-15 10:00AM	226	X			1

RECEIVING WATER SAMPLES

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

TYPE OF TEST 7day G/F  
 NAME OF RECEIVING WATER Unnamed trib.  
 DILUTION WATER USED FOR THIS TEST Lab

RELINQUISHED BY: Joel R. Thetford DATE: 9-28-15 TIME: 11:00AM 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 Danner DATE: 9-29-15 TIME: 1100 SAMPLE TEMP. @ RECEIPT. -0.2

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

### CHAIN OF CUSTODY RECORD

PROJECT # 24700 PROJECT NAME Forrest City PERMIT# NPDES ARO020087

#### 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.	
001	Joel R. Thetford	9-29-15 10:00 AM	9-30-15 10:00 AM	220	X			1

#### RECEIVING WATER SAMPLES

SAMPLE IDENTIFICATION (FOR REC'NG) H <sub>2</sub> 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 unnamed trib.

DILUTION WATER USED FOR THIS TEST lab

RELINQUISHED BY: Joel R. Thetford DATE: 9-30-15 TIME: 10:50AM 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: 10-1-15 TIME: 1030 SAMPLE TEMP. @ RECEIPT. 0.3

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

CHAIN OF CUSTODY RECORD

PROJECT # 24700 PROJECT NAME Forrest City PERMIT# NPDES AR0020087

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.	
001	Joel R. Theford	10-1-15 10:00 AM	10-2-15 10:00 AM	224	X			1

RECEIVING WATER SAMPLES

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

TYPE OF TEST 7day C/F

NAME OF RECEIVING WATER Unnamed trib.

DILUTION WATER USED FOR THIS TEST Lab

RELINQUISHED BY: Joel R. Theford DATE: 10-2-15 TIME: 11:40 AM 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: Rad [Signature] DATE: 10-3-15 TIME: 1000 SAMPLE TEMP. @ RECEIPT. 1.4

**CITY OF FORREST CITY WWTP  
NPDES PERMIT NO. AR0020087  
BIOMONITORING REPORTING  
TEST DATE: 09/29/15**

**I. *Ceriodaphnia dubia***

- a. If the NOEC for survival is less than the critical dilution, enter a "1"; otherwise, enter a "0". **Parameter No. TLP3B.**
- b. Report the NOEC value for survival, **Parameter No. TOP3B.**
- c. Report the NOEC value for reproduction, **Parameter No. TPP3B.**
- d. If the NOEC for reproduction is less than the critical dilution, enter a "1"; otherwise, enter a "0". **Parameter No. TGP3B.**
- e. Report the higher coefficient of variation (critical dilution or control), **Parameter No. TQP3B.**

**Response**

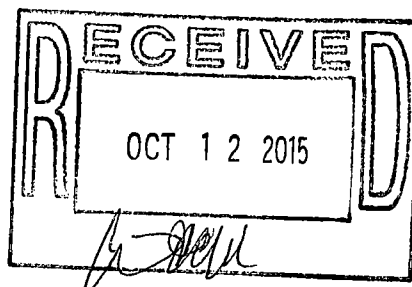
0
100%
100%
0
9.55%

**II. *Pimephales promelas***

- 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.**
- b. Report the NOEC value for survival, **Parameter No. TOP6C.**
- c. Report the NOEC value for growth, **Parameter No. TPP6C.**
- 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.**
- e. Report the highest coefficient of variation (critical dilution or control) **Parameter No. TQP6C.**

**Response**

0
100%
100%
0
8.13%







**Forrest City Water Utility**  
**303 N. Rosser Street**  
**Post Office Box 816**  
**Forrest City, AR 72335**



**Arkansas Department of  
Environmental Quality**  
**5301 North Shore Drive**  
**North Little Rock, AR 72118-5317**

