



P.O. Box 1807 • Phone (479) 754-3148 • Clarksville, Arkansas 72830

Michelle Bolenbaugh
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118-5317

RE: Permit # AR0022187

Dear Ms. Bolenbaugh:

Attached are the results of the retests of bio-monitoring. If you have any further questions or concerns please feel free to contact me at (479)754-7929.

Sincerely:

A handwritten signature in cursive script that reads "Gregg Rainey".

Gregg Rainey,
Wastewater Superintendent



**ENVIRONMENTAL ENTERPRISE GROUP
CITY OF CLARKSVILLE WWTP – OUTFALL 001
NPDES PERMIT NO. AR0022187
AFIN NO. 36-00038
BIOMONITORING REPORTING
TEST DATE: 08/20/13**

II. *Ceriodaphnia dubia*

	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. TLP3B.	<u>0</u>
B. If the No Observed Effect Concentration (NOEC) for reproduction is less than the critical dilution, enter a "1"; otherwise, enter a "0". Parameter No. TGP3B.	<u>0</u>
C. Report the NOEC value for survival, Parameter No. TOP3B.	<u>100%</u>
D. Report the NOEC value for reproduction, Parameter No. TPP3B.	<u>100%</u>
E. Report the highest (critical dilution or control) Coefficient of Variation, Parameter No. TQP3B.	<u>11.13%</u>

ENVIRONMENTAL ENTERPRISE GROUP
CITY OF CLARKSVILLE WWTP
OUTFALL 001

Chronic Biomonitoring Report
Permit Number NPDES AR0022187

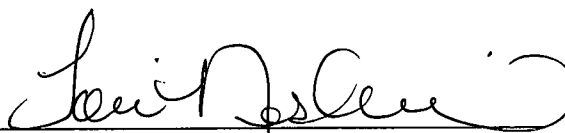
AFIN 36-00038

Ceriodaphnia dubia

Retest Two

August 20, 2013

Reviewed by: _____



Toni Nesbitt QA/QC Officer
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(940) 387-1025, Fax: (940) 387-1036

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TOXICITY TEST REPORT - CHRONIC

ClientEnvironmental Enterprise Group SampleOutfall 001
FacilityCity of Clarksville WWTP Laboratory I.D.21442
Permit No. NPDES AR0022187 Begin Date August 20, 2013

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

SAMPLE COLLECTION

Composite effluent samples from Environmental Enterprise Group, City of Clarksville WWTP were delivered by UPS courier to Huthur & Associates on August 20, August 22, and August 24, 2013. Effluent samples were collected and composited from Outfall 001 using an automatic sampler by facility personnel. One toxicity test was requested: a seven-day *Ceriodaphnia dubia* survival and reproduction test (EPA Method 1002.0). 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 and receiving water 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 receiving 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 1500 hours, August 20, 2013. Five concentrations were prepared (32%, 42%, 56%, 75%, and 100% effluent) utilizing receiving water (Lake Dardanelle) as dilution water. The test was conducted in 25 mL distilled water rinsed plastic beakers containing 15 mL of solution (one neonate 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 true control of ten replicate chambers containing one neonate each in receiving water was conducted concurrently with the test. There was 100% survival in the true control. In addition, a performance control of ten replicate chambers containing one neonate each in synthetic laboratory water was conducted concurrently with the test. The purpose of the performance control was to assess the health of the test organisms and to identify receiving water toxicity. The performance control data was not used in the statistical analysis of the test data. There was 100% survival in the performance control. The test ended at 1500 hours, August 27, 2013. 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: 100% 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 **PMSD: 8.5%**
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 AR0022187 for Environmental Enterprise Group, City of Clarksville WWTP, Outfall 001 **passed** for this testing period.

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

CLIENT EEG, City of Clarksville WWTP	SAMPLE TYPE 24 Hour Composite
NPDES # AR0022187	DATE COLLECTED 08/19/13 08/21/13 08/23/13
LAB ID # 21442	DATE RECEIVED 08/20/13 08/22/13 08/24/13
TEST TYPE 7 Day Chronic	BEGIN DATE/TIME 08/20/13 1500
TEST ORGANISM <i>Ceriodaphnia dubia</i>	END DATE/TIME 08/27/13 1500
ORGANISM AGE < 24 Hours	TEST TEMPERATURE (°C) 25 ± 1
ORGANISM SOURCE In House	PHOTO PERIOD 16-hr. Light 8-hr. Dark
RECEIVING WATER Lake Dardanelle	LIGHT INTENSITY 50-100 ft. cndl.
DILUTION WATER Lake Dardanelle	TECHNICIAN Z. Geiger

SURVIVAL & REPRODUCTION SUMMARY

Performance Control										
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
08/21/13	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/22/13	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/23/13	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/24/13	4	2	A	3	4	A	4	2	2	A
	4	2	0	3	4	0	4	2	2	0
08/25/13	A	A	5	A	A	3	A	A	A	2
	4	2	5	3	4	3	4	2	2	2
08/26/13	6	9	6	6	7	8	6	6	6	7
	10	11	11	9	11	11	10	8	8	9
08/27/13	11	13	12	13	11	13	12	12	11	13
	21	24	23	22	22	24	22	20	19	22
x # Young 21.9 C.V. 7.28% x% Survival 100% C.V. 0.00%										

True Control										
Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
08/21/13	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/22/13	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/23/13	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/24/13	4	4	5	2	4	3	2	4	2	5
	4	4	5	2	4	3	2	4	2	5
08/25/13	A	A	A	A	A	A	A	A	A	A
	4	4	5	2	4	3	2	4	2	5
08/26/13	6	8	6	6	8	11	7	7	8	10
	10	12	11	8	12	14	9	11	10	15
08/27/13	13	12	13	14	13	12	12	13	12	14
	23	24	24	22	25	26	21	24	22	29
x # Young 24.0 C.V. 9.62% 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
08/21/13	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/22/13	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/23/13	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/24/13	3	4	4	A	2	2	A	A	A	3
	3	4	4	0	2	2	0	0	0	3
08/25/13	A	A	A	3	A	9	3	2	5	A
	3	4	4	3	2	11	3	2	5	3
08/26/13	7	6	9	9	8	A	11	7	6	8
	10	10	13	12	10	11	14	9	11	11
08/27/13	14	13	12	12	11	14	12	13	12	14
	24	23	25	24	21	25	26	22	23	25
x # Young 23.8 C.V. 6.51% 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
08/21/13	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/22/13	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/23/13	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/24/13	5	2	3	A	0	5	A	5	5	5
	5	2	3	0	0	5	0	5	5	5
08/25/13	A	A	A	4	2	A	3	A	A	A
	5	2	3	4	2	5	3	5	5	5
08/26/13	10	11	8	8	7	11	9	8	6	8
	15	13	11	12	9	16	12	13	11	13
08/27/13	13	12	13	13	14	12	13	12	14	13
	28	25	24	25	23	28	25	25	25	26
x # Young 25.4 C.V. 6.21% x% Survival 100% C.V. 0.00%										

where: A = Alive ex 1:

A
4

 alive today total young to date

 5 = Alive, 5 young ex 2:

5
12

 alive, 5 young today total young to date

 D = Dead

 D5 = 5 Young, Female died

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

EEG, City of Clarksville WWTP

Lab ID# 21442

Test Date: August 20, 2013

56% Effluent

Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
08/21/13	A	A	A	A	A	A	A	A	A	A
08/22/13	A	A	A	A	A	A	A	A	A	A
08/23/13	0	0	0	0	0	0	0	0	0	0
08/24/13	5	3	5	0	0	0	0	0	5	3
08/25/13	5	3	5	5	5	3	4	3	5	3
08/26/13	7	6	8	11	9	8	6	8	8	9
08/27/13	14	13	11	13	12	14	13	15	12	13
<p>x# Young 25.1 C.V. 7.62%</p> <p>x% Survival 100% C.V. 0.00%</p>										

75% Effluent

Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
08/21/13	A	A	A	A	A	A	A	A	A	A
08/22/13	A	A	A	A	A	A	A	A	A	A
08/23/13	0	0	0	0	0	0	0	0	0	0
08/24/13	2	2	A	A	A	2	A	A	3	3
08/25/13	2	2	4	4	3	A	5	2	A	A
08/26/13	8	8	6	7	8	8	6	6	6	6
08/27/13	13	12	13	14	12	14	13	12	13	15
<p>x# Young 23.0 C.V. 6.15%</p> <p>x% Survival 100% C.V. 0.00%</p>										

100% Effluent

Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
08/21/13	A	A	A	A	A	A	A	A	A	A
08/22/13	A	A	A	A	A	A	A	A	A	A
08/23/13	0	0	0	0	0	0	0	0	0	0
08/24/13	2	4	5	5	2	A	4	A	3	3
08/25/13	2	4	5	5	2	4	4	3	3	3
08/26/13	6	7	7	10	6	6	9	9	7	10
08/27/13	14	12	13	15	14	12	14	13	12	13
<p>x# Young 24.4 C.V. 11.13%</p> <p>x% Survival 100% C.V. 0.00%</p>										

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

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

EEG, City of Clarksville WWTP

Lab ID# 21442

Test Date: August 20, 2013

WET CHEMISTRY MEASUREMENTS

Date	Time	Temp	Samp. No.	pH of Solution						Analyst
				CON	5%	6%	8%	11%	25%	
08/20/13	Start	25.0	1	8.17	8.05	7.92	7.85	7.75	7.60	7.37
08/21/13	24 Hr.	24.9	1	8.14	8.00	7.89	7.85	7.82	7.73	7.60
08/21/13	Renew	24.8	1	8.17	8.05	7.93	7.81	7.70	7.62	7.37
08/22/13	48 Hr.	25.4	1	8.14	7.97	7.88	7.83	7.78	7.72	7.62
08/22/13	Renew	25.0	2	8.12	8.05	7.58	7.55	7.48	7.40	7.33
08/23/13	72 Hr.	25.7	2	8.10	7.96	7.94	7.91	7.89	7.87	7.83
08/23/13	Renew	25.7	2	8.16	7.60	7.56	7.49	7.43	7.40	7.37
08/24/13	96 Hr.	25.7	2	8.26	8.00	7.94	7.92	7.91	7.86	7.85
08/24/13	Renew	25.7	3	8.90	7.36	7.35	7.34	7.28	7.26	7.40
08/25/13	120 Hr.	25.7	3	8.46	8.25	8.15	8.12	8.10	8.03	7.93
08/25/13	Renew	25.4	3	8.12	7.57	7.51	7.48	7.43	7.41	7.35
08/26/13	144 Hr.	25.8	3	8.42	8.21	8.16	8.11	8.09	8.02	8.07
08/26/13	Renew	25.7	3	8.12	7.74	7.64	7.61	7.55	7.54	7.46
08/27/13	168 Hr.	25.6	3	8.34	8.15	8.10	8.06	8.02	7.97	7.89

Date	Time	Temp	Samp. No.	DO (mg/L) of Solution						Analyst
				CON	5%	6%	8%	11%	25%	
08/20/13	Start	25.0	1	7.86	8.68	8.36	8.32	8.81	8.52	8.65
08/21/13	24 Hr.	24.9	1	7.81	7.80	7.80	7.88	7.86	8.03	7.86
08/21/13	Renew	24.8	1	7.86	8.68	8.46	8.34	8.20	8.25	8.65
08/22/13	48 Hr.	25.4	1	8.05	8.08	8.22	8.25	8.29	8.28	7.92
08/22/13	Renew	25.0	2	7.85	8.73	8.64	8.71	8.97	8.65	8.59
08/23/13	72 Hr.	25.7	2	8.69	8.35	8.17	8.10	8.16	8.13	8.09
08/23/13	Renew	25.7	2	8.12	8.17	8.20	8.09	8.27	8.29	8.65
08/24/13	96 Hr.	25.7	2	7.56	7.71	7.73	7.62	7.66	8.03	7.64
08/24/13	Renew	25.7	3	7.65	10.95	10.83	10.78	10.89	11.03	8.62
08/25/13	120 Hr.	25.7	3	7.87	8.26	7.83	7.68	8.01	7.84	7.75
08/25/13	Renew	25.4	3	7.85	8.37	7.94	7.86	7.95	8.07	8.03
08/26/13	144 Hr.	25.8	3	8.34	8.32	8.75	8.41	8.00	7.96	8.01
08/26/13	Renew	25.7	3	7.85	8.09	8.05	8.32	8.17	8.26	8.22
08/27/13	168 Hr.	25.6	3	8.45	8.03	7.78	7.79	8.66	7.86	7.90

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

EEG, City of Clarksville WWTP

Lab ID# 21442

Test Date: August 20, 2013

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
08/20/13	1	7.37	8.65	72	40	366	<0.01	N/A	TN
08/22/13	2	7.33	8.59	80	40	367	<0.01	N/A	TN
08/24/13	3	7.40	8.62	80	40	359	<0.01	N/A	TN

¹ Measurements taken in 100% solution.

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
08/20/13	RS1	8.05	8.68	152	94	609	<0.01	N/A	TN
08/22/13	RS2	8.05	8.73	148	100	601	<0.01	N/A	TN
08/24/13	RS3	8.00	8.63	140	100	589	<0.01	N/A	TN

Huther and Associates, Inc.
 Begin Date: August 20, 2013
 Lab I.D.# 21442

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	24.000
2	32% Effluent	10	21.000	26.000	23.800
3	42% Effluent	10	23.000	28.000	25.400
4	56% Effluent	10	22.000	29.000	25.100
5	75% Effluent	10	20.000	25.000	23.000
6	100% Effluent	10	22.000	30.000	24.400

Summary Statistics on Transformed Data Table 2 of 2

Grp	Identification	Variance	Sd	Sem	C.V.%
1	Control	5.333	2.309	0.730	9.62
2	32% Effluent	2.400	1.549	0.490	6.51
3	42% Effluent	2.489	1.578	0.499	6.21
4	56% Effluent	3.656	1.912	0.605	7.62
5	75% Effluent	2.000	1.414	0.447	6.15
6	100% Effluent	7.378	2.716	0.859	11.13

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	5	13	26	12	4

Calculated Chi-Square goodness of fit test statistic = 1.2494
 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 = 5.86

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	38.883	7.777	2.006
Within (Error)	54	209.300	3.876	
Total	59	248.183		

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	24.000	24.000		
2	32% Effluent	23.800	23.800	0.227	
3	42% Effluent	25.400	25.400	-1.590	
4	56% Effluent	25.100	25.100	-1.249	
5	75% Effluent	23.000	23.000	1.136	
6	100% Effluent	24.400	24.400	-0.454	

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)	Difference	
				% of Control	from Control
1	Control	10			
2	32% Effluent	10	2.034	8.5	0.200
3	42% Effluent	10	2.034	8.5	-1.400
4	56% Effluent	10	2.034	8.5	-1.100
5	75% Effluent	10	2.034	8.5	1.000
6	100% Effluent	10	2.034	8.5	-0.400

**APPENDIX A
RAW DATA**

7-DAY CERIODAPHNIA DUBIA SURVIVAL & REPRODUCTION

DAILY RAW DATA TABLE

PAGE 1 OF 2

CLIENT

EEG Clarksville

START DATE/TIME

8-20-13 26 1500

OUTFALL

001

END DATE/TIME

8-27-13 NL 1500

LAB ID #

2442

Acn

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
8/21	A	A	A	A	A	A	A	A	A	A	ZG	1500
8/22	A	A	A	A	A	A	A	A	A	A	NL	1145
8/23	A	A	A	A	A	A	A	A	A	A	MH	1310
8/24	4	2	A	3	4	A	4	2	2	A	Jh	1310
8/25	A	A	5	A	A	3	A	A	A	2	Jh	1015
8/26	6	9	6	6	7	8	6	6	6	7	MH	1030
8/27	11	13	12	13	11	13	12	12	11	13	NL	1500
	21	24	23	22	22	24	22	20	19	22		

\bar{x} # Young w/o Dead = 21.9 CV% = 7.28

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

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

Tcon

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
8/21	A	A	A	A	A	A	A	A	A	A	ZG	1500
8/22	A	A	A	A	A	A	A	A	A	A	NL	1145
8/23	A	A	A	A	A	A	A	A	A	A	MH	1310
8/24	4	4	5	2	4	3	2	4	2	5	Jh	1310
8/25	A	A	A	A	A	A	A	A	A	A	Jh	1015
8/26	6	8	6	6	8	11	7	7	8	10	MH	1030
8/27	13	12	13	14	13	12	12	13	12	14	NL	1500
	23	24	24	22	25	26	21	24	22	29		

\bar{x} # Young w/o Dead = 24.0 CV% = 9.62

\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
8/21	A	A	A	A	A	A	A	A	A	A	ZG	1500
8/22	A	A	A	A	A	A	A	A	A	A	NL	1145
8/23	A	A	A	A	A	A	A	A	A	A	MH	1310
8/24	3	4	4	A	2	2	A	A	A	3	Jh	1310
8/25	A	A	A	3	A	9	3	2	5	A	Jh	1015
8/26	7	6	9	9	8	A	11	7	6	8	MH	1030
8/27	14	13	12	12	11	14	12	13	12	14	NL	1500
	24	23	25	24	21	25	26	22	23	25		

\bar{x} # Young w/o Dead = 23.8 CV% = 6.51

\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
8/21	A	A	A	A	A	A	A	A	A	A	ZG	1500
8/22	A	A	A	A	A	A	A	A	A	A	NL	1145
8/23	A	A	A	A	A	A	A	A	A	A	MH	1310
8/24	5	2	3	A	A	5	A	5	5	5	Jh	1310
8/25	A	A	A	4	2	A	3	A	A	A	Jh	1015
8/26	10	11	8	8	7	11	9	8	6	8	MH	1030
8/27	13	12	13	13	14	12	13	12	14	13	NL	1500
	28	25	24	25	23	28	25	25	25	26		

\bar{x} # Young w/o Dead = 25.4 CV% = 6.21

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

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

7-DAY CERIODAPHNIA DUBIA SURVIVAL & REPRODUCTION

DAILY RAW DATA TABLE

PAGE 2 OF 2

CLIENT EEG Clarksville

START DATE/TIME 8-20-13 2C 1500

TREATMENT 001

END DATE/TIME 8-27-13 NL 1500

LAB ID # 2142

56

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
8/21	A	A	A	A	A	A	A	A	A	A	ZG	1500
8/22	A	A	A	A	A	A	A	A	A	A	NL	1145
8/23	A	A	A	A	A	A	A	A	A	A	MH	1310
8/24	5	3	5	A	A	A	A	A	5	3	Jh	1310
8/25	A	A	A	5	5	3	4	3	A	A	Jh	1015
8/26	7	6	8	11	9	8	6	8	8	9	MH	1030
8/27	14	13	11	13	12	14	13	15	12	13	NL	1500
	26	22	24	29	26	25	23	26	25	25		

\bar{x} # Young w/o Dead = 25.1 CV% = 7.62

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

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

75

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
8/21	A	A	A	A	A	A	A	A	A	A	ZG	1500
8/22	A	A	A	A	A	A	A	A	A	A	NL	1145
8/23	A	A	A	A	A	A	A	A	A	A	MH	1310
8/24	2	2	A	A	A	2	A	A	3	3	Jh	1310
8/25	A	A	4	4	3	A	5	2	A	A	Jh	1015
8/26	8	8	6	7	8	8	6	6	6	6	MH	1030
8/27	13	12	13	14	12	14	13	12	13	15	NL	1500
	23	22	23	25	23	24	24	22	24	24		

\bar{x} # Young w/o Dead = 23.0 CV% = 6.15

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

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

100

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
8/21	A	A	A	A	A	A	A	A	A	A	ZG	1500
8/22	A	A	A	A	A	A	A	A	A	A	NL	1145
8/23	A	A	A	A	A	A	A	A	A	A	MH	1310
8/24	2	4	5	5	2	A	4	A	3	3	Jh	1310
8/25	A	A	A	A	A	4	A	3	A	A	Jh	1015
8/26	6	7	7	10	6	6	9	9	7	10	MH	1030
8/27	14	12	13	15	14	12	14	13	12	13	NL	1500
	22	23	25	30	22	27	25	22	26	26		

\bar{x} # Young w/o Dead = 24.4 CV% = 11.13

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

\bar{x} % Survival = 100.0 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% =

Client / Facility EEG Clarksville
 Lab ID Number 21442
 Outfall Number 001
 Test Date 8-20-13

INITIAL CHEMISTRY MEASUREMENTS @ 100% EFFLUENT

Date	Samp. No.	pH	DO	Hardness mg/L CaCO ₃	Alkalinity mg/L CaCO ₃	Conduct. umhos/cm	Resid. Cl ₂ mg/L	Dechlor(mL) Na ₂ S ₂ O ₃ mg/L	Analyst
8/20	1	7.37	8.65	72	40	366	20.01	Na	TJ
8/22	2	7.33	8.59	80	40	367	§	§	§
8/24	3	7.40	8.62	80	40	359	§	§	§

INITIAL CHEMISTRY MEASUREMENTS @ RECEIVING WATER

Date	Samp. No.	pH	DO	Hardness mg/L CaCO ₃	Alkalinity mg/L CaCO ₃	Conduct. umhos/cm	Resid. Cl ₂ mg/L	Dechlor(mL) Na ₂ S ₂ O ₃ mg/L	Analyst
8/20	RS1	8.05	8.68	152	94	609	20.01	Na	TJ
8/22	RS2	8.05	8.73	148	100	601	§	§	§
8/24	RS3	8.00	8.63	140	100	589	§	§	§

Notes:

APPENDIX B
REFERENCE TOXICANTS

CHRONIC REFERENCE TOXICANT TEST RESULTS

SPECIES: *Ceriodaphnia dubia*

CHEMICAL: Sodium Chloride

DURATION: 7-Days

TEST NUMBER: 8

TEST DATE/TIME: 08/08/13 - 08/15/13
1430 Hrs - 1430 Hrs

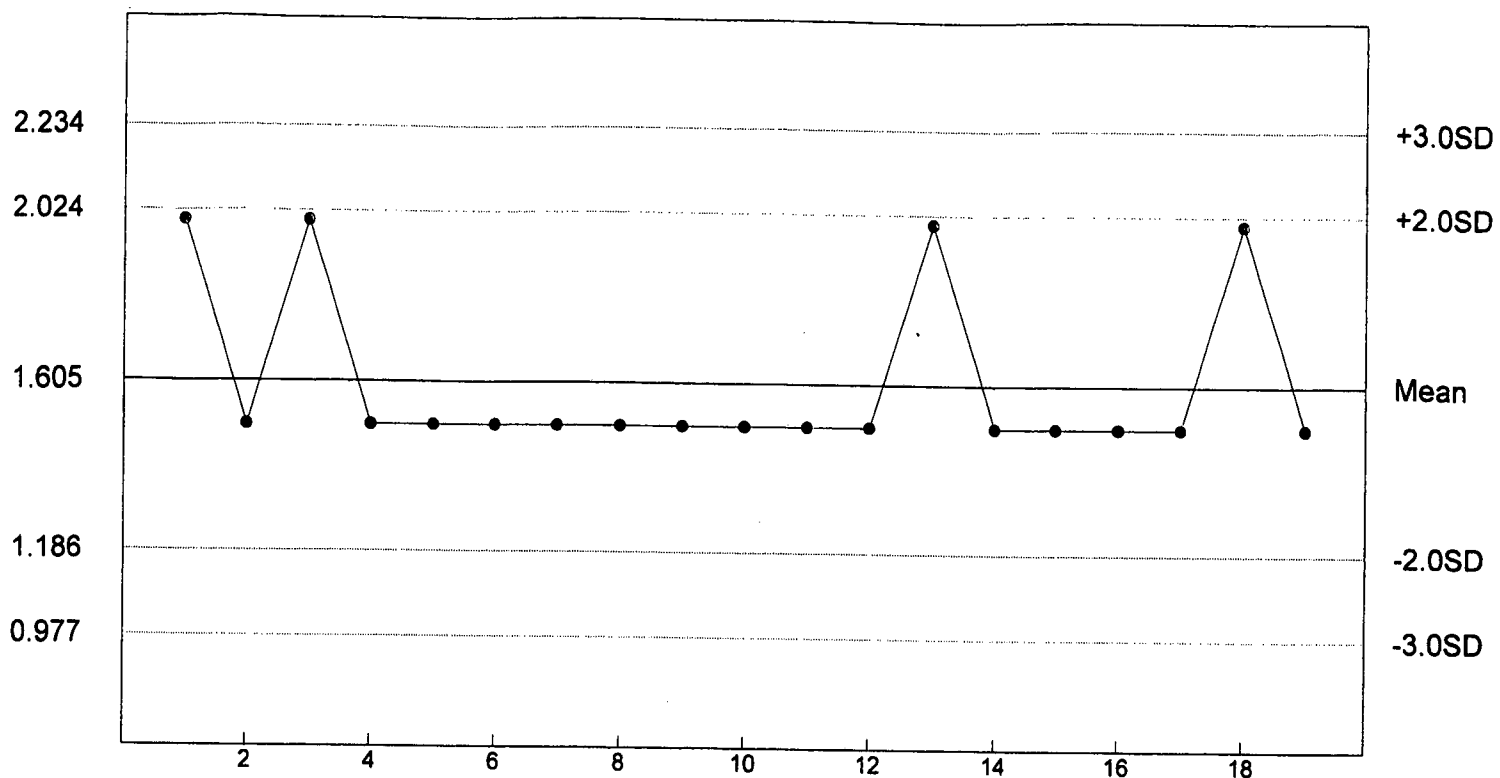
STATISTICAL METHOD: Fishers, Dunnetts/Steels

CONCENTRATION (g/L)	NUMBER EXPOSED	NUMBER DEAD
0.5	10	1
1.0	10	0
1.5	10	1
2.0	10	8
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

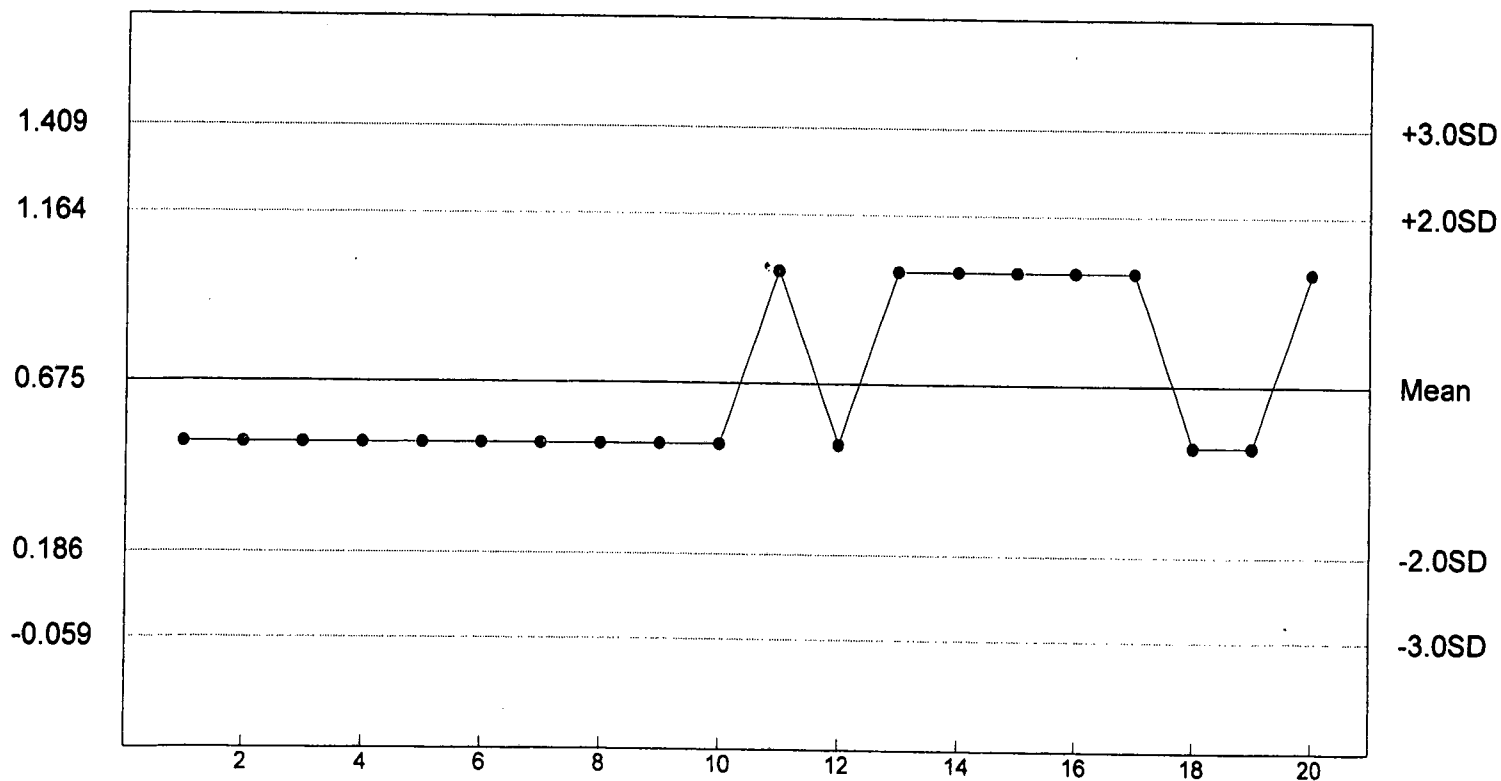
C. dubia Survival - NOEC



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= 0.675 SD= 0.245 CV= 36.25% Min= 0.500 Max= 1.000

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 # 21442 PROJECT NAME EEG Clarksville PERMIT# NPOES ARO022187

OUTFALL SAMPLES Project # L444-047412

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	W. Palmer	0701 8-18-13	0710 8-19-13	24	✓	-	-	1
Lab Control # 0813159								

RECEIVING WATER SAMPLES

SAMPLE IDENTIFICATION (FOR REC'G) H ₂ O GRABS, GIVE NAME OF STREAM AND LOCATION	PERSON TAKING SAMPLE	DATE	TIME	# OF CONTAINERS TO BE SHIPPED
Lake Dardanelle	William Palmer	8-19-13	07:15	1
Lab Control # 0813160				

TYPE OF TEST 7 day Lead RT#2
 NAME OF RECEIVING WATER Lake Dardanelle
 DILUTION WATER USED FOR THIS TEST R.S.

RELINQUISHED BY: William Palmer DATE: 8-19-13 TIME: 0918 RECEIVED BY AT THIS DATE/TIME: Stacyner 8-19-13 @0918

RELINQUISHED BY: Stacyner DATE: 8-19-13 TIME: 1400 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 UPS

RECEIVED: Matt Houser DATE: 8-20-13 TIME: 1115 SAMPLE TEMP. @ RECEIPT. 1.1



Environmental Enterprise Group, Inc.
PROVIDING CUSTOMIZED SERVICES NATIONWIDE

L444-047412

Environmental Enterprise Group, Inc.
220 North Knoxville, Suite 200
Russellville, Arkansas 72801
(479) 968-6767 Fax (479) 968-1956

Company Name:		Phone #:		Requested Analysis														Laboratory Control Number	Remarks (Please note special detection limits below.)		
Clarksville Light and Water		(479) 754-7929		7-Day Chronic Bio-Monitoring																	
Address:		Fax #:																			
P.O. Box 1807 Clarksville, AR 72830		(479) 754-8181																			
Project Name or Number:		Purchase Order #:																			
Bio-Monitoring		Sampling Personnel Signature(s):		Printed:																	
Porsha Russell		Porsha Russell																			
Sample I.D.	Date	Time	Comp.	Grab	Cont. Type		# of Containers	Method Preserved						Sample Matrix						7-Day Chronic Bio-Monitoring	
					Plast.	Glass		H2SO4	HNO3	NAOH	HCL	Ice	None	Water	Soil	Air	Sludge	Other			
Outfall 001	8-20-13	0705	X		X		1						X	X					X	0813159	
	8-21-13	0715																			
Relinquished by:		Date:		Time:		Received By:		Date:		Time:		Relinquished By:		Date:		Time:					
Porsha Russell		8-21-13		0730		Staunin		8/21/13		0925		Staunin		8/21/13		1000					
Received by:		Date:		Time:		Relinquished By:		Date:		Time:		Received by Laboratory:		Date:		Time:					
Willie Palmr		8-21-13		0730		Staunin		8/21/13		1000		Matt Horner		8-22-13		1015					
Relinquished by:		Date:		Time:		Received by Laboratory:		Date:		Time:		Received by Laboratory:		Date:		Time:					
Willie Palmr		8-21-13		0925		Matt Horner		8-22-13		1015		Matt Horner		8-22-13		1015					
Comments:		Re-test number 2 1,40C																			



Environmental Enterprise Group, Inc.
 PROVIDING CUSTOMIZED SERVICES NATIONWIDE

L444-047412

Company Name:								Phone #:								Requested Analysis							Laboratory Control Number	Remarks (Please note special detection limits below.)					
Clarksville Light and Water								(479) 754-7929								7-Day Chronic Bio-Monitoring													
Address:								Fax #:																					
P.O. Box 1807 Clarksville, AR 72830								(479) 754-8181																					
Project Name or Number:								Purchase Order #:																					
Bio-Monitoring								Printed:																					
Sampling Personnel Signature(s):								Printed:																					
<i>Willie Palmer</i>								<i>Willie Palmer</i>																					
Sample I.D.	Date	Time	Comp.	Grab	Cont. Type		# of Containers	Method Preserved						Sample Matrix					7-Day Chronic Bio-Monitoring										
					Plast.	Glass		H2SO4	HNO3	NAOH	HCL	Ice	None	Water	Soil	Air	Sludge	Other											
Receiving Water	8-21-13	0730		X	X		1					X	X																
Relinquished by:								Date:	Time:	Received By:							Date:	Time:											
<i>Willie Palmer</i>								8-21-13	0925																				
Received by:								Date:	Time:	Relinquished By:							Date:	Time:											
<i>Stacynew</i>								8/21/13	0925																				
Relinquished by:								Date:	Time:	Received by Laboratory:							Date:	Time:											
<i>Stacynew</i>								8/21/13	1600																				
Comments:																													
Re-test number 2																													



Environmental Enterprise Group, Inc.

PROVIDING CUSTOMIZED SERVICES NATIONWIDE

L444-047412

Environmental Enterprise Group, Inc.
220 North Knoxville, Suite 200
Russellville, Arkansas 72801
(479) 968-6767 Fax (479) 968-1956

Company Name:			Phone #:			Requested Analysis											Laboratory Control Number	Remarks (Please note special detection limits below.)				
Clarksville Light and Water			(479) 754-7929			7-Day Chronic Bio-Monitoring																
Address:			Fax #:																			
P.O. Box 1807 Clarksville, AR 72830			(479) 754-8181																			
Project Name or Number:			Purchase Order #:																			
Bio-Monitoring																						
Sampling Personnel Signature(s): <i>Porsha Russell</i>							Printed: <i>Porsha Russell</i>															
Sample I.D.	Date	Time	Comp.	Grab	Cont. Type		# of Containers	Method Preserved					Sample Matrix					7-Day Chronic Bio-Monitoring				
					Plast.	Glass		H2SO4	HNO3	NaOH	HCL	Ice	None	Water	Soil	Air	Sludge			Other		
Outfall 001	8-22-13 8-23-13	0732 0725	X		X		1						X	X						X		
Relinquished by: <i>Porsha Russell</i>							Date: 8/23/13		Time: 1201		Received By: <i>Wah Cuh</i>							Date: 8/23/13		Time: 1201		
Received by: <i>Wah Cuh</i>							Date: 8/23/13		Time: 1600		Relinquished By:							Date:		Time:		
Relinquished by:							Date:		Time:		Received by Laboratory: <i>Spencer Ann</i>							Date: 8-24-13		Time: 0930		
Comments: Re-test number 2							4.0°C															

**ENVIRONMENTAL ENTERPRISE GROUP
CITY OF CLARKSVILLE WWTP – OUTFALL 001
NPDES PERMIT NO. AR0022187
AFIN NO. 36-00038
BIOMONITORING REPORTING
TEST DATE: 07/16/13**

II. *Ceriodaphnia dubia*

	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. TLP3B.	0
B. If the No Observed Effect Concentration (NOEC) for reproduction is less than the critical dilution, enter a "1"; otherwise, enter a "0". Parameter No. TGP3B.	0
C. Report the NOEC value for survival, Parameter No. TOP3B.	100%
D. Report the NOEC value for reproduction, Parameter No. TPP3B.	100%
E. Report the highest (critical dilution or control) Coefficient of Variation, Parameter No. TQP3B.	13.21%

**ENVIRONMENTAL ENTERPRISE GROUP
CITY OF CLARKSVILLE WWTP
OUTFALL 001**

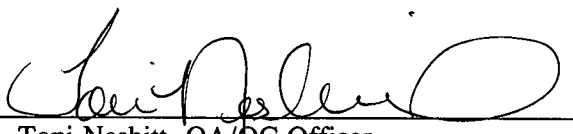
Chronic Biomonitoring Report
Permit Number NPDES AR0022187
AFIN Number 36-00038

Ceriodaphnia dubia

Retest Number One

July 16, 2013

Reviewed by: _____



Toni Nesbitt, QA/QC Officer
Huther & Associates, Inc.
1156 North Bonnie Brae
Denton, Texas 76201
(940) 387-1025, Fax: (940) 387-1036

TABLE OF CONTENTS

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TOXICITY TEST REPORT - CHRONIC

Client Environmental Enterprise Group
Facility City of Clarksville WWTP
Permit No. NPDES AR0022187

Sample Outfall 001
Laboratory I.D. 21233
Begin Date July 16, 2013

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

SAMPLE COLLECTION

Composite effluent samples from Environmental Enterprise Group, City of Clarksville WWTP were delivered by United Parcel Service courier to Huther & Associates on July 16, July 18, and July 20, 2013. Effluent samples were collected and composited from Outfall 001 using an automatic sampler. One toxicity test was requested: a seven-day *Ceriodaphnia dubia* survival and reproduction test (EPA Method 1002.0). 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 and receiving water 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 receiving 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 1440 hours, July 16, 2013. Five concentrations were prepared (32%, 42%, 56%, 75%, and 100% effluent) utilizing receiving water (Lake Dardanelle) as dilution water. The test was conducted in 25 mL distilled water rinsed plastic beakers containing 15 mL of solution (one neonate 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 true control of ten replicate chambers containing one neonate each in receiving water was conducted concurrently with the test. There was 100% survival in the true control. In addition, a performance control of ten replicate chambers containing one neonate each in synthetic laboratory water was conducted concurrently with the test. The purpose of the performance control was to assess the health of the test organisms and to identify receiving water toxicity. The performance control data was not used in the statistical analysis of the test data. There was 100% survival in the performance control. The test ended at 1440 hours, July 23, 2013. 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: 100% 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: 100% Effluent****PMSD: 9.1%****SUMMARY**

There were no statistically significant differences between the control and the critical low flow concentration (100% effluent) for *C. dubia* survival and reproduction. Based on biomonitoring requirements for Outfall 001 contained in Permit Number NPDES AR0022187 for Environmental Enterprise Group, City of Clarksville WWTP, Outfall 001 **passed** for this testing period.

Huth and Associates

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

CLIENT EEG, City of Clarksville WWTP
 NPDES # AR0022187
 LAB ID # 21233
 TEST TYPE 7 Day Chronic
 TEST ORGANISM *Ceriodaphnia dubia*
 ORGANISM AGE < 24 Hours
 ORGANISM SOURCE In House
 RECEIVING WATER Lake Dardonnelle
 DILUTION WATER Lake Dardonnelle

SAMPLE TYPE 24 Hour Composite
 DATE COLLECTED 07/15/13 07/17/13 07/19/13
 DATE RECEIVED 07/16/13 07/18/13 07/20/13
 BEGIN DATE/TIME 07/16/13 1440
 END DATE/TIME 07/23/13 1440
 TEST TEMPERATURE (°C) 25 ± 1
 PHOTO PERIOD 16-hr. Light 8-hr. Dark
 LIGHT INTENSITY 50-100 ft. candl.
 TECHNICIAN T. Nesbitt

SURVIVAL & REPRODUCTION SUMMARY

Performance Control

Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
07/17/13	A	A	A	A	A	A	A	A	A	A
07/18/13	0	0	0	0	0	0	0	0	0	0
07/19/13	A	A	A	A	A	A	A	A	A	A
07/20/13	2	2	2	4	3	2	2	2	2	0
07/21/13	2	2	2	4	9	2	2	2	2	8
07/22/13	6	6	6	7	A	7	6	8	7	6
07/23/13	12	12	11	13	12	14	12	13	13	11
	20	20	19	24	21	23	20	23	22	25
x # Young 21.7 C.V. 9.23% x% Survival 100% C.V. 0.00%										

True Control

Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
07/17/13	A	A	A	A	A	A	A	A	A	A
07/18/13	0	0	0	0	0	0	0	0	0	0
07/19/13	0	0	0	0	0	0	0	0	0	0
07/20/13	6	2	5	3	4	2	4	2	4	6
07/21/13	6	9	12	11	12	8	4	9	4	6
07/22/13	9	A	A	A	A	A	9	A	10	8
07/23/13	13	12	14	12	14	12	15	13	14	15
	28	21	26	23	26	20	28	22	28	29
x # Young 25.1 C.V. 13.21% 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
07/17/13	A	A	A	A	A	A	A	A	A	A
07/18/13	0	0	0	0	0	0	0	0	0	0
07/19/13	0	0	0	0	0	0	0	0	0	0
07/20/13	3	4	5	4	4	2	5	4	2	4
07/21/13	9	13	13	4	12	2	5	14	11	13
07/22/13	9	13	13	11	12	11	12	14	11	13
07/23/13	22	27	25	24	26	23	27	28	24	27
x # Young 25.3 C.V. 7.92% 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
07/17/13	A	A	A	A	A	A	A	A	A	A
07/18/13	0	0	0	0	0	0	0	0	0	0
07/19/13	0	0	0	0	0	0	0	0	0	0
07/20/13	6	2	5	5	2	2	5	3	2	3
07/21/13	7	8	7	A	9	8	A	9	7	8
07/22/13	13	10	12	5	11	10	5	12	9	11
07/23/13	27	22	27	23	25	22	27	25	21	25
x # Young 24.4 C.V. 9.31% 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

EEG, City of Clarksville WWTP

Lab ID# 21233

Test Date: July 16, 2013

56% Effluent

Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
07/17/13	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
07/18/13	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
07/19/13	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
07/20/13	4	2	3	3	2	3	4	4	4	6
	4	2	3	3	2	3	4	4	4	6
07/21/13	A	8	A	A	6	7	A	A	A	8
	4	10	3	3	8	10	4	4	4	14
07/22/13	7	A	8	7	A	A	9	8	7	A
	11	10	11	10	8	10	13	12	11	14
07/23/13	12	13	14	13	14	13	15	14	12	12
	23	23	25	23	22	23	28	26	23	26
x# Young 24.2 C.V. 7.98% x% Survival 100% C.V. 0.00%										

75% Effluent

Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
07/17/13	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
07/18/13	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
07/19/13	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
07/20/13	3	2	3	2	2	3	4	4	2	4
	3	2	3	2	2	3	4	4	2	4
07/21/13	8	9	A	7	8	7	8	8	9	7
	11	11	3	9	10	10	12	12	11	11
07/22/13	A	A	6	A	A	A	A	A	A	A
	11	11	9	9	10	10	12	12	11	11
07/23/13	13	13	15	14	12	13	14	15	13	12
	24	24	24	23	22	23	26	27	24	23
x# Young 24.0 C.V. 6.21% 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
07/17/13	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
07/18/13	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
07/19/13	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
07/20/13	2	3	4	2	2	3	2	2	3	2
	2	3	4	2	2	3	2	2	3	2
07/21/13	7	7	7	8	6	7	6	6	9	7
	9	10	11	10	8	10	8	8	12	9
07/22/13	A	A	A	A	A	A	A	A	A	A
	9	10	11	10	8	10	8	8	12	9
07/23/13	13	14	14	12	12	15	13	14	12	13
	22	24	25	22	20	25	21	22	24	22
x# Young 22.7 C.V. 7.50% 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

EEG, City of Clarksville WWTP

Lab ID# 21233

Test Date: July 16, 2013

WET CHEMISTRY MEASUREMENTS

Date	Time	Temp	Samp. No.	pH of Solution						Analyst	
				PCON	TCON	32%	42%	56%	75%		100%
07/16/13	Start	25.0	1	8.68	8.02	8.51	8.45	8.36	8.09	7.25	STC
07/17/13	24 Hr.	26.0	1	8.20	8.05	7.97	7.94	7.90	7.85	7.82	GZK
07/17/13	Renew	26.0	1	8.68	8.02	8.35	8.29	8.15	7.86	7.25	GZK
07/18/13	48 Hr.	26.0	1	8.09	7.88	7.82	7.80	7.79	7.75	7.72	GZK
07/18/13	Renew	25.0	2	8.15	8.02	8.28	8.12	7.92	7.59	7.25	GZK
07/19/13	72 Hr.	25.9	2	8.21	7.99	7.92	7.92	7.92	7.86	7.82	MJK
07/19/13	Renew	26.0	2	8.15	8.50	8.23	8.08	7.86	7.62	7.39	MJK
07/20/13	96 Hr.	26.0	2	8.31	8.10	8.04	8.00	7.98	7.93	7.87	MJK
07/20/13	Renew	26.0	3	8.15	8.04	8.17	8.10	7.97	7.76	7.21	MJK
07/21/13	120 Hr.	25.4	3	8.27	8.09	8.07	8.03	8.01	7.97	7.86	STC
07/21/13	Renew	25.1	3	8.15	8.59	8.50	8.40	8.25	8.09	7.94	STC
07/22/13	144 Hr.	25.5	3	8.19	8.07	8.03	8.00	7.97	7.91	7.89	STC
07/22/13	Renew	25.3	3	8.27	8.47	8.35	8.28	8.14	8.03	7.89	STC
07/23/13	168 Hr.	25.4	3	8.28	8.13	8.11	8.11	8.02	8.01	7.96	STC

Date	Time	Temp	Samp. No.	DO (mg/L) of Solution						Analyst	
				PCON	TCON	32%	42%	56%	75%		100%
07/16/13	Start	25.0	1	8.13	8.67	7.97	7.97	7.79	7.97	7.59	STC
07/17/13	24 Hr.	26.0	1	6.97	6.88	6.95	6.99	6.98	7.34	7.19	GZK
07/17/13	Renew	26.0	1	8.13	8.67	7.93	7.93	7.96	8.00	7.59	GZK
07/18/13	48 Hr.	26.0	1	8.26	8.31	8.29	8.23	8.14	8.35	8.38	GZK
07/18/13	Renew	25.0	2	8.40	8.67	8.36	8.40	7.91	8.63	7.59	GZK
07/19/13	72 Hr.	25.9	2	6.89	6.86	6.68	6.79	6.76	6.59	6.69	MJK
07/19/13	Renew	26.0	2	8.40	8.62	8.64	8.63	8.67	8.30	8.34	MJK
07/20/13	96 Hr.	26.0	2	7.05	7.05	7.00	7.05	7.06	6.86	6.77	MJK
07/20/13	Renew	26.0	3	8.40	8.62	7.17	6.95	6.74	6.89	7.66	MJK
07/21/13	120 Hr.	25.4	3	8.28	7.99	7.79	7.71	7.75	7.85	8.03	STC
07/21/13	Renew	25.1	3	8.40	8.82	8.81	8.57	8.56	8.53	8.22	STC
07/22/13	144 Hr.	25.5	3	8.54	7.98	8.38	8.09	8.48	7.82	8.25	STC
07/22/13	Renew	25.3	3	8.47	8.24	8.24	8.83	8.76	8.58	8.53	STC
07/23/13	168 Hr.	25.4	3	7.86	8.11	8.28	8.37	8.36	8.36	8.35	STC

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

EEG, City of Clarksville WWTP

Lab ID# 21233

Test Date: July 16, 2013

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
07/16/13	1	7.25	7.59	72	46	441	<0.01	N/A	TN
07/18/13	2	7.23	7.61	72	48	445	<0.01	N/A	TN
07/20/13	3	7.21	7.66	76	48	447	<0.01	N/A	TN

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
07/16/13	RS1	8.02	8.67	180	80	830	<0.01	N/A	TN
07/18/13	RS2	8.03	8.61	188	84	833	<0.01	N/A	TN
07/20/13	RS3	8.04	8.62	184	84	839	<0.01	N/A	TN

¹ Measurements taken in 100% solution.

Huther and Associates, Inc.
 Begin Date: July 16, 2013
 Lab I.D.# 21233

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	29.000	25.100
2	32% Effluent	10	22.000	28.000	25.300
3	42% Effluent	10	21.000	27.000	24.400
4	56% Effluent	10	22.000	28.000	24.200
5	75% Effluent	10	22.000	27.000	24.000
6	100% Effluent	10	20.000	25.000	22.700

Summary Statistics on Transformed Data Table 2 of 2

Grp	Identification	Variance	Sd	Sem	C.V.%
1	Control	10.989	3.315	1.048	13.21
2	32% Effluent	4.011	2.003	0.633	7.92
3	42% Effluent	5.156	2.271	0.718	9.31
4	56% Effluent	3.733	1.932	0.611	7.98
5	75% Effluent	2.222	1.491	0.471	6.21
6	100% Effluent	2.900	1.703	0.539	7.50

ANOVA Table

SOURCE	DF	SS	MS	F
Between	5	43.083	8.617	1.782
Within (Error)	54	261.100	4.835	
Total	59	304.183		

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	25.100	25.100		
2	32% Effluent	25.300	25.300	-0.203	
3	42% Effluent	24.400	24.400	0.712	
4	56% Effluent	24.200	24.200	0.915	
5	75% Effluent	24.000	24.000	1.119	
6	100% Effluent	22.700	22.700	2.441	

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

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	3	21	16	18	2

Calculated Chi-Square goodness of fit test statistic = 7.0891
 Table Chi-Square value (alpha = 0.01) = 13.277

Data Pass normality test. Continue analysis.

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

Grp	Identification	Num of Reps	Minimum Sig Diff (In Orig. Units)	% of	Difference
				Control	from Control
1	Control	10			
2	32% Effluent	10	2.272	9.1	-0.200
3	42% Effluent	10	2.272	9.1	0.700
4	56% Effluent	10	2.272	9.1	0.900
5	75% Effluent	10	2.272	9.1	1.100
6	100% Effluent	10	2.272	9.1	2.400

Bartlett's Test For Homogeneity of Variance

Calculated B1 statistic = 7.32

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.

**APPENDIX A
RAW DATA**

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

CLIENT EEG Clarksville
OUTFALL 001
LAB ID # 21233

START DATE/TIME 7-16-13 TR 1440
END DATE/TIME 7-23-13 NL 1440

Pcon

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
7/17	A	A	A	A	A	A	A	A	A	A	NL	1440
7/18	A	A	A	A	A	A	A	A	A	A	NL	1315
7/19	A	A	A	A	A	A	A	A	A	A	NL	1015
7/20	2	2	2	4	3	2	2	2	2	A	AL	1310
7/21	A	A	A	A	6	A	A	A	A	A	ZG	1315
7/22	6	6	6	7	A	7	6	8	7	6	NL	0900
7/23	12	12	11	13	12	14	12	13	13	11	NL	1440
	20	20	19	24	21	23	22	22	25			

\bar{x} # Young w/o Dead = 21.7 CV% = 9.23
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100.0 CV% = 0.00

Tcon

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
7/17	A	A	A	A	A	A	A	A	A	A	NL	1440
7/18	A	A	A	A	A	A	A	A	A	A	NL	1315
7/19	A	A	A	A	A	A	A	A	A	A	NL	1015
7/20	6	2	5	3	4	2	4	2	4	6	AL	1310
7/21	A	7	7	8	8	6	A	7	A	A	ZG	1315
7/22	9	A	A	A	A	9	A	10	8		NL	0900
7/23	13	12	14	12	14	12	15	13	14	15	NL	1440
	28	21	26	23	26	20	28	22	28	29		

\bar{x} # Young w/o Dead = 25.1 CV% = 13.21
 \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
7/17	A	A	A	A	A	A	A	A	A	A	NL	1440
7/18	A	A	A	A	A	A	A	A	A	A	NL	1315
7/19	A	A	A	A	A	A	A	A	A	A	NL	1015
7/20	3	4	5	4	4	2	5	7	2	4	AL	1310
7/21	6	9	8	A	8	A	A	10	9	9	ZG	1315
7/22	A	A	A	7	A	9	7	A	A	A	NL	0900
7/23	13	14	12	13	14	12	15	14	13	14	NL	1440
	22	27	25	24	26	27	27	28	24	27		

\bar{x} # Young w/o Dead = 25.7 CV% = 7.92
 \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
7/17	A	A	A	A	A	A	A	A	A	A	NL	1440
7/18	A	A	A	A	A	A	A	A	A	A	NL	1315
7/19	A	A	A	A	A	A	A	A	A	A	NL	1015
7/20	6	2	5	5	2	2	5	3	2	3	AL	1310
7/21	7	8	7	A	9	8	A	9	7	8	ZG	1315
7/22	A	A	A	6	A	A	7	A	A	A	NL	0900
7/23	14	12	15	12	14	12	15	13	12	14	NL	1440
	27	22	27	23	25	22	27	25	21	25		

\bar{x} # Young w/o Dead = 24.4 CV% = 9.31
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100.0 CV% = 0.00

7-DAY CERIODAPHNIA DUBIA SURVIVAL & REPRODUCTION
DAILY RAW DATA TABLE

CLIENT EEG Clarksville
OUTFALL 001
LAB ID # 21233

START DATE/TIME 7-16-13 TN 1440
END DATE/TIME 7-23-13 NL 1440

56

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
7/17	A	A	A	A	A	A	A	A	A	A	NL	1440
7/18	A	A	A	A	A	A	A	A	A	A	NL	1315
7/19	A	A	A	A	A	A	A	A	A	A	NL	615
7/20	4	2	3	3	2	3	4	4	4	6	9L	1310
7/21	A	8	A	A	6	7	A	A	A	8	ZG	1315
7/22	7	A	8	7	A	A	9	8	7	A	NL	0900
7/23	12	13	14	13	14	13	15	14	12	12	NL	1440
	23	23	25	22	22	23	28	26	23	26		

\bar{x} # Young w/o Dead = 24.2 CV% = 7.98

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

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

75

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
7/17	A	A	A	A	A	A	A	A	A	A	NL	1440
7/18	A	A	A	A	A	A	A	A	A	A	NL	1315
7/19	A	A	A	A	A	A	A	A	A	A	NL	1015
7/20	3	2	3	2	2	3	4	4	2	4	9L	1310
7/21	8	9	A	7	8	7	8	8	9	7	ZG	1315
7/22	A	A	6	A	A	A	A	A	A	A	NL	0900
7/23	13	13	15	14	12	13	14	15	13	12	NL	1440
	24	24	24	23	22	23	26	27	24	27		

\bar{x} # Young w/o Dead = 24.0 CV% = 6.21

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

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

100

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
7/17	A	A	A	A	A	A	A	A	A	A	NL	1440
7/18	A	A	A	A	A	A	A	A	A	A	NL	1315
7/19	A	A	A	A	A	A	A	A	A	A	NL	1015
7/20	2	3	4	2	2	3	2	2	3	2	9L	1310
7/21	7	7	7	8	6	7	6	6	9	7	ZG	1315
7/22	A	A	A	A	A	A	A	A	A	A	NL	0900
7/23	13	14	14	12	12	15	13	14	12	13	NL	1440
	22	24	25	22	20	25	21	27	24	22		

\bar{x} # Young w/o Dead = 22.7 CV% = 7.50

\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% =

Client / Facility EEG Clarksville
 Lab ID Number 21233
 Outfall Number 001
 Test Date 7-16-13

INITIAL CHEMISTRY MEASUREMENTS @ 100% EFFLUENT

Date	Samp. No.	pH	DO	Hardness mg/L CaCO ₃	Alkalinity mg/L CaCO ₃	Conduct. umhos/cm	Resid. Cl ₂ mg/L	Dechlor(mL) Na ₂ S ₂ O ₃ mg/L	Analyst
7/16	1	7.25	7.59	72	46	441	20.01	Na	TN
7/18	2	7.23	7.61	72	48	445	§	§	§
7/20	3	7.21	7.66	76	48	447	§	§	§

INITIAL CHEMISTRY MEASUREMENTS @ RECEIVING WATER

Date	Samp. No.	pH	DO	Hardness mg/L CaCO ₃	Alkalinity mg/L CaCO ₃	Conduct. umhos/cm	Resid. Cl ₂ mg/L	Dechlor(mL) Na ₂ S ₂ O ₃ mg/L	Analyst
7/16	RS1	8.02	8.67	180	80	830	20.01	Na	TN
7/18	RS2	8.03	8.61	188	84	833	§	§	§
7/20	RS3	8.04	8.62	184	84	839	§	§	§

Notes:

CHRONIC REFERENCE TOXICANT TEST RESULTS

SPECIES: *Ceriodaphnia dubia*

CHEMICAL: Sodium Chloride

DURATION: 7-Days

TEST NUMBER: 7

TEST DATE/TIME: 06/26/13 - 07/03/13
1100 Hrs - 1100 Hrs

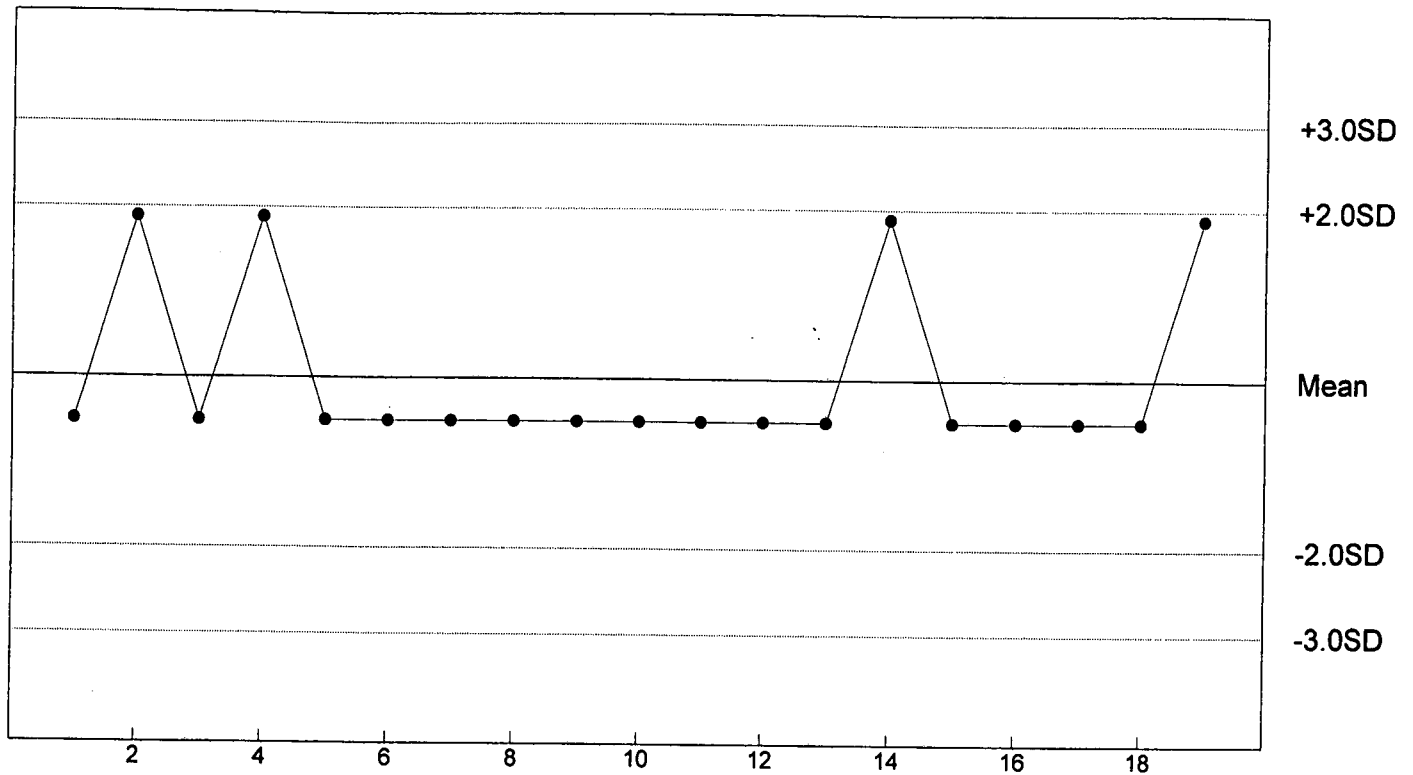
STATISTICAL METHOD: Fishers, Dunnetts/Steels

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

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

Reference Tox Sodium Chloride g/L

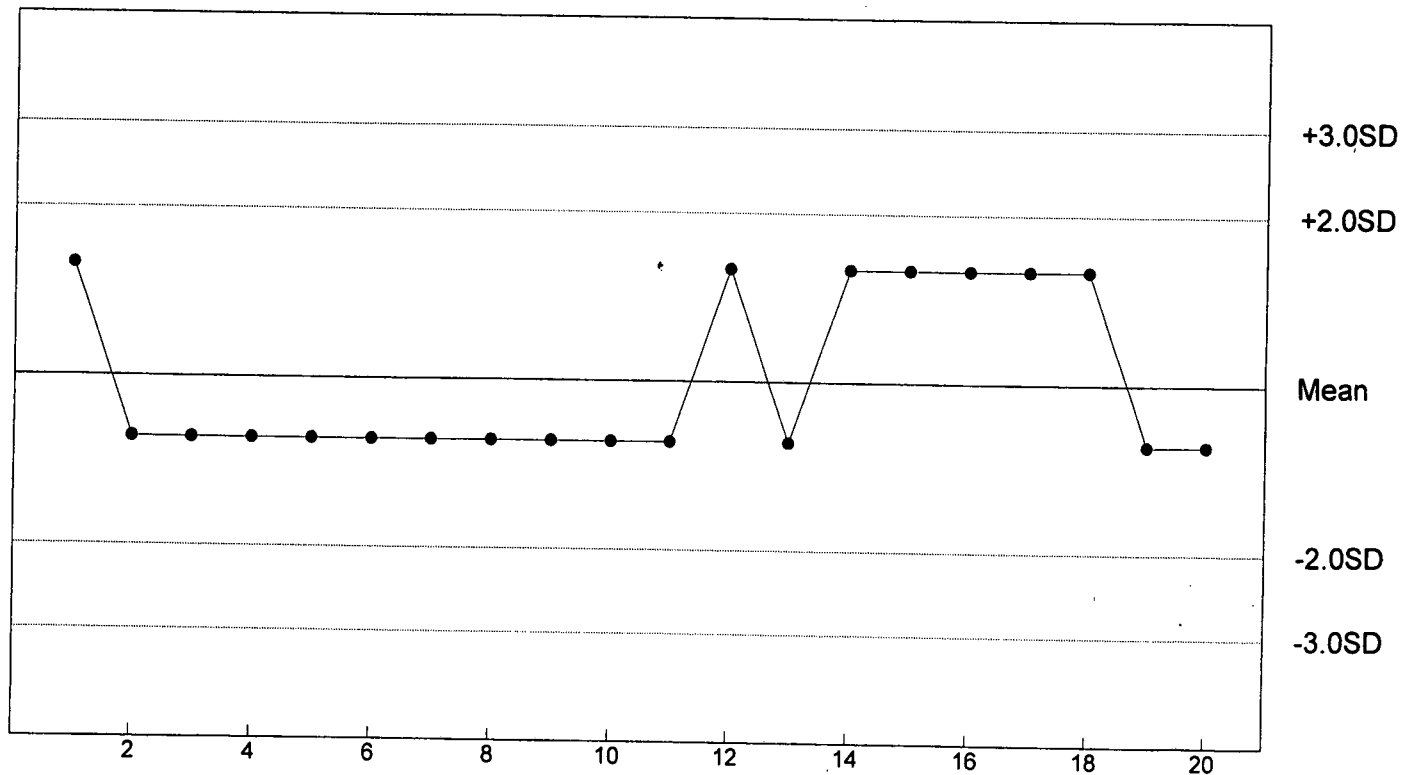
C. dubia Survival - NOEC



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= 0.675 SD= 0.245 CV= 36.25% Min= 0.500 Max= 1.000

APPENDIX C
CHAIN OF CUSTODY SHEETS



Environmental Enterprise Group, Inc.
PROVIDING CUSTOMIZED SERVICES NATIONWIDE

Environmental Enterprise Group, Inc.
220 North Knoxville, Suite 200
Russellville, Arkansas 72801
(479) 968-6767 Fax (479) 968-1956

L441-047283

Company Name: Clarksville Light and Water						Phone #: (479) 754-7929						Requested Analysis								Laboratory Control Number	Remarks (Please note special detection limits below.)								
Address: P.O. Box 1807 Clarksville, AR 72830						Fax #: (479) 754-8181						7-Day Chronic Bio-Monitoring																	
Project Name or Number:						Purchase Order #:																							Bio-Monitoring
Sampling Personnel Signature(s): <i>Megan Hatcher</i>						Printed: <i>Megan Hatcher</i>																							
Sample I.D.	Date	Time	Comp.	Grab	Cont. Type Plast. Glass	# of Containers	Method Preserved					Sample Matrix																	
							H2SO4	HNO3	NAOH	HCL	Ice	None	Water	Soil	Air	Sludge	Other												
Outfall 001	7-14-13 7-15-13	0700 0800	X		X	1					X	X						X										0713096	
Relinquished by: <i>Megan Hatcher</i>						Date: 7-15-13		Time: 1315		Received By:						Date:		Time:											
Received by: <i>Stacy New</i>						Date: 7/15/13		Time: 1315		Relinquished By:						Date:		Time:											
Relinquished by: <i>Stacy New</i>						Date: 7/15/13		Time: 1600		Received by Laboratory: <i>Matt Horner</i>						Date: 7-16-13		Time: 1100											
Comments: 4.1°C																													



Environmental Enterprise Group, Inc.
PROVIDING CUSTOMIZED SERVICES NATIONWIDE

L444-047283

Company Name:		Phone #:		Requested Analysis										7-Day Chronic Bio-Monitoring	Laboratory Control Number	Remarks (Please note special detection limits below.)			
Clarksville Light and Water		(479) 754-7929																	
Address:		Fax #:																	
P.O. Box 1807 Clarksville, AR 72830		(479) 754-8181																	
Project Name or Number:		Purchase Order #:																	
Bio-Monitoring		Printed :																	
Sampling Personnel Signature(s):		Printed :																	
<i>Willie Palmer</i>		<i>Willie Palmer</i>																	
Sample I.D.	Date	Time	Cont. Type		# of Containers	Method Preserved					Sample Matrix					7-Day Chronic Bio-Monitoring	Laboratory Control Number	Remarks	
			Comp.	Grab		Plast.	Glass	H2SO4	HNO3	NAOH	HCL	Ice	None	Water	Soil				Air
Receiving Water	7-15-13	0720	X	X	1					X	X							0713097	
Relinquished by:		Date:	Time:	Received By:		Date:	Time:	Relinquished By:		Date:	Time:	Received by Laboratory:		Date:	Time:				
<i>Willie Palmer</i>		7-15-13	1225	<i>Staupren</i>		7-15-13	1225	<i>Staupren</i>		7-15-13	1600	<i>Matt Palmer</i>		7-16-13	1100				
Received by:		Date:	Time:	Relinquished By:		Date:	Time:	Received by Laboratory:		Date:	Time:								
<i>Megan Hatcher</i>		7-15-13	1225	<i>Staupren</i>		7-15-13	1315	<i>Matt Palmer</i>											
Relinquished by:		Date:	Time:	Received by Laboratory:		Date:	Time:												
<i>Megan Hatcher</i>		7-15-13	1315	<i>Matt Palmer</i>															
Comments:																			



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L444-047283

Environmental Enterprise Group, Inc.
 220 North Knoxville, Suite 200
 Russellville, Arkansas 72801
 (479) 968-6767 Fax (479) 968-1956

Company Name:													Phone #:			Requested Analysis													Laboratory Control Number	Remarks (Please note special detection limits below.)			
Clarksville Light and Water													(479) 754-7929																				
Address:													Fax #:																				
P.O. Box 1807 Clarksville, AR 72830													(479) 754-8181																				
Project Name or Number:													Purchase Order #:																				
Bio-Monitoring																																	
Sampling Personnel Signature(s): <i>Megan Hatcher</i>										Printed: <i>Megan Hatcher</i>																							
Sample I.D.	Date	Time	Comp.	Grab	Cont. Type		# of Containers	Method Preserved						Sample Matrix					7-Day Chronic Bio-Monitoring														
					Plast.	Glass		H2SO4	HNO3	NAOH	HCL	Ice	None	Water	Soil	Air	Sludge	Other															
Outfall 001	7-16-13 7-17-13	1120- 1020	X		X		1					X		X						X												0713096	
Relinquished by: <i>Megan Hatcher</i>										Date: 7-17-13			Time: 1600			Received By:					Date:			Time:									
Received by: <i>Stacyner</i>										Date: 7/17/13			Time: 1600			Relinquished By:					Date:			Time:									
Relinquished by: <i>Stacyner</i>										Date: 7/17/13			Time: 1615			Received by Laboratory: <i>Matt Horner</i>					Date: 7-18-13			Time: 0955									
Comments: 5.7°C																																	

L444-047283

EEG

Environmental Enterprise Group, Inc.
PROVIDING CUSTOMIZED SERVICES NATIONWIDE

Company Name:				Phone #:				Requested Analysis							Laboratory Control Number Remarks (Please note special detection limits below.)																
Clarksville Light and Water				(479) 754-7929				<div style="writing-mode: vertical-rl; transform: rotate(180deg); display: flex; align-items: center; justify-content: center; font-weight: bold;"> 7-Day Chronic Bio-Monitoring </div>																							
Address:				Fax #:																											
P.O. Box 1807 Clarksville, AR 72830				(479) 754-8181																											
Project Name or Number:				Purchase Order #:											Bio-Monitoring																
Sampling Personnel Signature(s): Dam Smith						Printed: Dam Smith																									
Sample I.D.	Date	Time	Comp.	Grab	Cont. Type		# of Containers	Method Preserved											Sample Matrix												
					Plast.	Glass		H2SO4	HNO3	NAOH	HCL	Ice	None	Water	Soil	Air	Sludge	Other													
Receiving Water	7-17-13	0835		X	X		1					X			X							X								0713097	
Relinquished by: Dam Smith				Date: 7-17-13	Time: 1307			Received By: Sawyer				Date: 7/17/13	Time: 1600																		
Received by: Megan Hatcher				Date: 7-17-13	Time: 1308			Relinquished By: Sawyer				Date: 7/17/13	Time: 1615																		
Relinquished by: Megan Hatcher				Date: 7-17-13	Time: 1600			Received by Laboratory: Parlett Inc				Date: 7-18-13	Time: 0955																		
Comments:																															



Environmental Enterprise Group, Inc.
PROVIDING CUSTOMIZED SERVICES NATIONWIDE

L444-047283

Environmental Enterprise Group, Inc.
220 North Knoxville, Suite 200
Russellville, Arkansas 72801
(479) 968-6767 Fax (479) 968-1956

Company Name:				Phone #:				Requested Analysis										Laboratory Control Number	Remarks (Please note special detection limits below.)						
Clarksville Light and Water				(479) 754-7929				7-Day Chronic Bio-Monitoring																	
Address:				Fax #:																					
P.O. Box 1807 Clarksville, AR 72830				(479) 754-8181																					
Project Name or Number:				Purchase Order #:																					
Bio-Monitoring				Printed :																					
Sampling Personnel Signature(s):				Megan Hatcher																					
Sample I.D.	Date	Time	Comp.	Grab	Cont. Type		# of Containers	Method Preserved						Sample Matrix											
					Plast.	Glass		H2SO4	HNO3	NAOH	HCL	Ice	None	Water	Soil	Air	Sludge	Other							
Outfall 001	7-18-13 7-19-13	1015- 0915	X		X		1				X		X											07130916	
Relinquished by:				Megan Hatcher				Date:	7-19-13	Time:	1135	Received By:						Date:		Time:					
Received by:				Stacymen				Date:	7/19/13	Time:	1135	Relinquished By:						Date:		Time:					
Relinquished by:				Stacymen				Date:	7/19/13	Time:	1600	Received by Laboratory:						Date:	7/25/13	Time:	1000				
Comments:																									

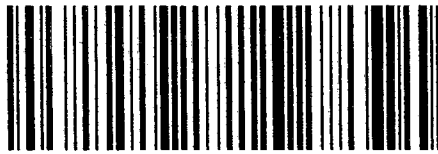
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Environmental Enterprise Group, Inc.
 PROVIDING CUSTOMIZED SERVICES NATIONWIDE

L444-04728 3

Company Name:			Phone #:					Requested Analysis								7-Day Chronic Bio-Monitoring	Laboratory Control Number	Remarks (Please note special detection limits below.)			
Clarksville Light and Water			(479) 754-7929																		
Address:			Fax #:																		
P.O. Box 1807 Clarksville, AR 72830			(479) 754-8181																		
Project Name or Number:			Purchase Order #:																		
Bio-Monitoring			Sampling Personnel Signature(s):			Printed :															
William Palmer			William Palmer																		
Sample I.D.	Date	Time	Comp.	Grab	Cont. Type		# of Containers	Method Preserved					Sample Matrix					7-Day Chronic Bio-Monitoring	Laboratory Control Number	Remarks	
					Plast.	Glass		H2SO4	HNO3	NAOH	HCL	Ice	None	Water	Soil	Air	Sludge				Other
Receiving Water	7-19-13	0716		X	X		1							X						0713097	
Relinquished by:			Date:	Time:	Received by:			Date:	Time:	Relinquished By:			Date:	Time:	Received by Laboratory:			Date:	Time:		
William Palmer			7-19-13	1050	Stacy New			7/19/13	1135	Stacy New			7/19/13	1600	Janey Taylor			7/20/13	1000		
Received by:			Date:	Time:	Relinquished By:			Date:	Time:	Received by Laboratory:			Date:	Time:							
Megan Hatcher			7-19-13	1050	Stacy New			7/19/13	1600	Janey Taylor											
Relinquished by:			Date:	Time:	Received by Laboratory:			Date:	Time:												
Megan Hatcher			7-19-13	1135	Janey Taylor																
Comments:																					
66°C																					

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CLARKSVILLE LIGHT & WATER CO.

400 WEST MAIN • P.O. BOX 1807
CLARKSVILLE, AR 72830
PHONE (479) 754-3148

To

ADEQ
Michelle Bolenbaugh
5301 Northshore Drive
North Little Rock, AR 72118

