

Sanitary Sewer Overflow (SSO) Monthly Report

Facility Name: CAMDEN WATER UTILITIES NPDES Permit No.: AR0022365 Monitoring Period (Month/Year): 06/2014

No Sanitary Sewer Overflows This Monitoring Period

Summary Report Code Descriptions			
Cause(s) of SSO	SSO Impact	Action(s) Taken	Ultimate Discharge Location
CO-Construction	D-Debris	NEAH-No Evidence Adverse Health/ Environmental Impact	CR-Creek/Stream/River (specify)
E-Equipment Failure	G-Grease	OEHC-Observed or Evidence of Human Contact	DI-Ditch
HC-Hydro Clean	LF-Line Failure	EFK-Evidence of Fish Kill	DR-Drop Inlet
R-Rainfall	RG-Roots / Grease	HR-Hand Rodded	GR-Ground Surface
RO-Roots	V-Vandalism	EN-Referred to Engineering	PA-Paved Area
		FN-Public Notification	CB-Contained in Building

Location	Manhole #	Start Date of SSO	End Date of SSO	Estimated Volume (in gallons)	Cause of SSO	Environmental Impact	Action (s) Taken to Address SSO	Discharge Location
1344 Harper Street		06/09/2014	06/09/2014	150 gallons	RG	HR NEAH	HR	GR
Mary and Cash Rd		06/09/2014	06/09/2014	500 gallons	B	NEAH	HC	CR
Korns Street		06/16/2014	06/14/2014	4000 gallons	LF	NEAH	replaced line	GR

Thomas K. Bellard
Signature of Cognizant or Ranking Official

07/11/2014
Date

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Environmental Services Company, Inc.

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 13715 West Markham
 Little Rock, AR 72211
 Tel. (501)221-2565 Fax (501)221-1341

Northwest Arkansas Branch
 1107 Century Avenue
 Springdale, AR 72762
 Tel. (479)750-1170 Fax (479)750-1172


Control Number: 1406010421	Composite Date: 06/17/14 - 06/17/14	Collected By: ANNETTE STRICKL
Customer Name : CAMDEN WATER & WASTEWATER UTILITY	Sample Time : 1000	Delivery By : TMO
Customer Number : 1550	Sample Type : COMPOSITE WATER	Work Order :
Report Date : 06/24/14	Sample From : FINAL EFFLUENT	Purchase Order :

Laboratory Analysis

Analysis						Quality Assurance			
Date	Time	By	Parameter	Result	Notes	Quantity	Method	Precision % RPD	Accuracy % Recovery
06/24	0830	NTR	Phosphorous, Total (as P)	0.21 mg/L			EPA 365.3	0.00	104.3 *
06/19	0630	NTR	Nitrate + Nitrite	10.81 mg/L			SM 2000 4500-NO3 E	1.44	97.6 *

* QA data shown is from a different sample or standard on the same date.

All equipment used is checked and/or calibrated daily. All NPDES testing is conducted in accordance with 40 CFR Part 136. A minimum of 10% spiked and duplicate samples is run on each parameter where applicable for Quality Assurance purposes. Quality Assurance Plan on file with Arkansas Department of Environmental Quality. Analysis time indicates the time of the start of the analytical batch in which the specific sample was included.

Signature 
 Environmental Services Co., Inc.

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X5461

Bio-Analytical Laboratories' Executive Summary

Permittee: Camden Water Utilities
P.O. Drawer J
Camden, AR 71711

Project #: X5461

Outfall: Outfall 002 (treated municipal wastewater)

Permit #: AR0022365/ AFIN 52-00073

Contact: David Richardson

Test Dates: June 18 - 20, 2014

Test Type: 48-hour acute definitive toxicity test using *Daphnia pulex* (EPA 2021.0)
48-hour acute definitive toxicity test using *Pimephales promelas* (EPA 2000.0)

Results:

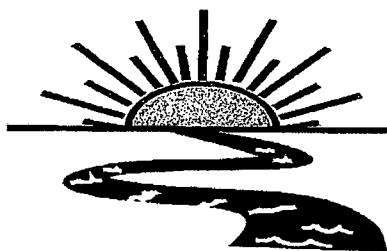
For *Daphnia pulex*:

1. If the NOEC for survival is less than the critical dilution (28.0%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D- 0 (Pass)
2. Report the NOEC for survival, Parameter TOM3D - 37.0%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 6.06%.

For *Pimephales promelas* (Fathead Minnow):

1. If the NOEC for survival is less than the critical dilution (28.0%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM6C- 0 (Pass).
2. Report the NOEC for survival, Parameter TOM6C - 37.0%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM6C - 6.06%.

This report contains a total of 32 pages, including this page. The results pertain only to the samples listed in the chain of custody documents in Appendix A. The information contained within meets the requirements set forth by ADEQ. The chemical results in this report are for monitoring purposes only and should not be included on discharge monitoring reports.



Bio-Analytical Laboratories

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**THE RESULTS OF TWO 48-HOUR ACUTE
DEFINITIVE TOXICITY TESTS
FOR OUTFALL 002
AT**

**CAMDEN WATER UTILITIES
Camden, Arkansas**

NPDES #AR0022365

EPA Methods 2000.0 and 2021.0

Project X5461

Test Dates: June 18 - 20, 2014

Report Date: July 15, 2014

Prepared for:

Mr. David Richardson
Camden Water Utilities
P.O. Drawer J
Camden, AR 71711

Prepared by:

Ginger Briggs
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BAL
ADEQ #88-0630
Project X5461

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Project X5461

1.0 Introduction

Bio-Analytical Laboratories (BAL), Doyline, Louisiana conducted two 48-hour acute definitive toxicity tests for Outfall 002 at Camden Water Utilities, Camden, Arkansas. The test organisms used were the cladoceran, *Daphnia pulex*, and the fathead minnow, *Pimephales promelas*. The purpose of this study is to determine if an appropriately dilute effluent sample adversely affects the survival of the test organism. Toxicity is defined as a statistically significant difference at the 95 percent confidence level between the survival of the test organisms in the critical dilution (the effluent concentration representative of the proportion of effluent in the receiving water during critical low flow or critical mixing conditions) compared to the survival of the test organisms in the control. The test endpoints are the No-Observed-Effect-Concentration (NOEC), which is defined as the highest effluent concentration that is not statistically different from the control, and the 48-hour LC₅₀, the concentration in which 50 percent of the test organisms died.

2.0 Methods and Materials

2.1 Test Methods

All methods followed were according to the latest edition of "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms" (EPA-821-R-02-012), "Standard Methods for The Examination of Water and Wastewater, 20th Edition" (APHA 1998. Chemical results using this edition are listed in the report as SM 1997), and BAL's standard operating procedure.

2.2 Test Organisms

The *Daphnia pulex* test organisms were raised in-house at test temperature and were less than 24 hours old at test initiation. The fathead minnow test organisms were also raised in-house at test temperature and were approximately one day old at test initiation. Forty-eight hour reference toxicant tests were conducted monthly in order to document organism sensitivity and demonstration of capability.

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2.3 Dilution Water

Soft reconstituted water made per EPA guidelines was used as the dilution water and the control for the tests.

2.4 Test Concentrations

The test concentrations used in the acute toxicity tests were 37.0, 28.0, 21.0, 16.0 and 12.0 percent effluent and a control. The critical dilution was defined as 28.0 percent effluent. The tests were conducted using five replicates of eight animals each for a total of 40 animals per concentration.

2.5 Sample Collection

Two 24-hour composite samples of Outfall 002 were collected by Camden Water Utilities personnel on June 17 and 18, 2014. Upon completion of collection, the samples were chilled then packed in ice and delivered to Bio-Analytical Laboratories by BAL personnel. Sample temperature upon arrival was 0.3^o Celsius.

2.6 Sample Preparation

Upon arrival, the samples were logged in, given an identification number and refrigerated unless needed. Prior to use, each sample was warmed to 25±1^o Celsius. The total residual chlorine level was measured with a Capital Controls^R amperometric titrator (SM 4500-C1 D 1997) and recorded if present. The total ammonia level was measured using a HACH^R test strip. Dissolved oxygen (SM 4500-0 G 1997) and pH (SM 4500-H+ B 1997) measurements were measured on the control and each concentration at test initiation, at test renewal and at test termination. Conductivity (SM 2510 B 1997) measurements were also taken at test initiation and at each renewal. Alkalinity (SM 2320 B 1997) and hardness (SM 2340 C 1997) levels were measured on the control and the highest effluent concentration.

2.7 Monitoring of the Tests

The tests were run in a Precision^R dual controlled illuminated incubator at a temperature of 25±1^o Celsius. An AEMC^R data logger was used to monitor diurnal temperature throughout the testing period. Light cycle and intensity were recorded twice a month.

2.8 Data Analysis

The NOEC and LC₅₀ values were obtained by approved EPA methods of analysis, using the ToxCalc statistical program.

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3.0 Results and Discussion

The results of the tests can be found in Table 1. Significant differences in survival were not noted in either test. The NOEC value for both tests was 37.0 percent effluent (p=.05). The 48-hour LC₅₀ value for both tests was >37.0 percent effluent (p=.05).

Table 1: Results of the 48-hour Acute Definitive Toxicity Tests

Percent Effluent	Percent Survival	
	<i>Daphnia pulex</i>	Fathead minnow
Test Organism	<i>Daphnia pulex</i>	Fathead minnow
Control	97.5	97.5
12.0	95.0	95.0
16.0	92.5	97.5
21.0	97.5	100.0
28.0	97.5	97.5
37.0	77.5	100.0

The 48-hour reference toxicant test results indicate that the fathead minnow test organisms were within the respective sensitivity range. June's *Daphnia pulex* test was invalid.. The graphs of the acute reference toxicant tests can be found in Appendix D- Quality Assurance Charts.

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4.0 Conclusions

The two composite samples of Outfall 002 collected from Camden Water Utilities, Camden, Arkansas, on June 17 and 18, 2014, were not found to be lethally toxic to the fathead minnow test organisms nor the *Daphnia pulex* test organisms in the 28.0 percent critical dilution after 48 hours of exposure ($p=.05$).

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Project X5461

5.0 References

EPA, 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. EPA-821-R-02-012, Office of Water.

EPA, 2000. Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the National Pollutant Discharge Elimination System. EPA-833-R-00-003, Office of Wastewater Management.

EPA, 2000. Method Guidance and Recommendations for Whole Effluent (WET) Testing. EPA-821-B-00-04, Office of Water

APHA, 1998. Standard Methods for The Examination of Water and Wastewater. 20th Edition.

APPENDIX A
CHAIN-OF-CUSTODY DOCUMENTS



Bio-Analytical Laboratories

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NELAP/LELAP 01975, ADEQ 88-0630, TCEQ T104704278

Laboratory Use Only:

Company: Camden Water Utilities		Phone: (870) 836-4329		Analysis:						Project Number: X5461				
Address: P.O. Box J, Camden, AR 71711		Fax: (870) 836-5190		Chronic Ceriodaphnia	Chronic minnow	Acute minnow (fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia		Fecal Coliform	Temp. upon arrival: 0.30C		
Permit #: AR0022365/ AFIN 52-00073		Purchase Order:											Lab Control Number: 09210	Preservative: (below) ice
Sampler's Signature/Printed Name/Affiliation: <i>Annette Strickland</i> Annette Strickland														
Date Start Date End	Time Start Time End	C	G							# and type of container				
6-16 6-17	8:00 Am 8:00 Am	X		2 half gallons	002									
Relinquished by/Affiliation: <i>Annette Strickland</i>				Date: 6-18-14	Time: 9:25 Am	Received by/Affiliation: <i>Ceri S. Buagg</i>		Date: 6/18/14	Time: 0925					
Relinquished by/Affiliation: <i>Ceri S. Buagg</i>				Date: 6/18/14	Time: 1210	Received by/Affiliation: <i>Annette Strickland</i>		Date: 6/18/14	Time: 1210					
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:		Date:	Time:					
Method of Shipment: <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Bus <input type="checkbox"/> Fed Ex <input type="checkbox"/> DHL <input type="checkbox"/> UPS <input type="checkbox"/> Client <input type="checkbox"/> Other Tracking # _____														
Comments:														
COC Rev. 3.0														



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NELAP/LELAP 01975, ADEQ 88-0630, TCEQ T104704278

Laboratory Use Only:

Company: Camden Water Utilities		Phone: (870) 836-4329		Analysis:					Project Number: 15461										
Address: P.O. Box J, Camden, AR 71711		Fax: (870) 836-5190		Chronic Ceriodaphnia	Chronic minnow	Acute minnow (fresh/marine)	Acute Daphnia species	Acute Mysid		Acute Ceriodaphnia									
Permit #: AR0022365/ AFIN 52-00073		Purchase Order:									Fecal Coliform	Lab Control Number:	Temp. upon arrival: 0.3°C	Therm #29	Preservative: (below)				
Sampler's Signature/Printed Name/Affiliation: <i>Annette Strickland</i> ANNETTE STRICKLAND		Date Start Date End	Time Start Time End													C	G	# and type of container	Sample Identification
									6-17										
				6-18	8:00 AM														
Relinquished by/Affiliation: <i>Annette Strickland</i>		Date:	Time:						Received by/Affiliation: <i>BAL</i> <i>Chris Baupp</i>			Date:	Time:						
Relinquished by/Affiliation: <i>Chris Baupp</i> <i>BAL</i>		Date:	Time:	Received by/Affiliation: <i>Annette Strickland</i>		Date:	Time:												
Relinquished by/Affiliation:		Date:	Time:	Received by/Affiliation:		Date:	Time:												
Method of Shipment: <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Bus <input type="checkbox"/> Fed Ex <input type="checkbox"/> DHL <input type="checkbox"/> UPS <input type="checkbox"/> Client <input type="checkbox"/> Other Tracking # _____																			
Comments:																			
COC Rev. 3.0																			

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X5461

Client: CMDN/Camden Water Utilities

Address: P.O. Box J, Camden, AR 71711

NPDES# AR0022365 Outfall 002

Technicians: EGB/AH/RC

Test initiated: Date 6/18/14 Time 1625

Test terminated: Date 6/20/14 Time 1515

Dissolved Oxygen Meter: Model # YSI 55D Serial #06E2089 AU

pH Meter: Model #Orion 230A+ Serial #015253

Conductivity Meter: Model # Control Co. Serial #80277924

Amperometric Titrator: Model #Fischer-Porter Serial #92W445766

Sample Information

Sample ID#	Initial D.O. (mg/L and %)	Aerate? Minutes/Final D.O. (mg/L & %)	Total Residual Chlorine (mg/L)	Dechlorinated? Amount?	Ammonia (NH3) mg/L	Salinity	Hardness	Alkalinity	Tech
C9210	9.2 / 108.0%	1/25/8.6 93.1%	40.01	NO	0.25	N/A	37% 48.0	37% 20.0	AH
C9211	6.6 / 74.2%	1/15/8.2 94.9%	<0.01	↓	0.5	↓	4.0	16.0	RC

Dilution Water Information

Dilution Water	ID#	Initial D.O. (mg/L & %)	Aerate? Minutes/D.O. (mg/L & %)	Total Residual Chlorine (mg/L)	Ammonia (NH3) mg/L	pH	Hardness	Alkalinity	Tech
Soft H ₂ O	3625	8.1	1.1	0.1	0.1	7.6	530	28.0	AH

Test Species Information

Test Species Info.	Species ID#	Species ID#	Species ID#:	Species ID#:
Age	24hr	1 day 24 hrs		
Test Container Size	30ml	250ml		
Test volume	25ml	200ml		
Feeding: Type	YCT: Algae	Artemia		
Amount	Feed 2hrs prior to test initiation			
Aeration? Amount	1hr	1hr		
Condition of survivors	Good RC 6/20/14	Good RC 6/20/14		

Comments:

BIO-ANALYTICAL LABORATORIES ACUTE TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Project# X5461

Test started: Date 6/18/14

Time 1625

Client Camden

Test ended: Date 6/20/14

Time 1505

Sample Description 002

Test Species D. Dux

ID# BAL/HO-14

Technician: 0hour AH 24hour AC 48hour PC 72hour PC 96hour PC

Time: 0hour 1625 24hour 1630 48hour 1505 72hour PC 96hour PC

Temperature (°C): 0hour 21.7 24hour 24.7 48hour 24.7 72hour PC 96hour PC

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity					
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	
28	A	Na	8	8	8			8.0	7.7	8.1	7.8			6.9	7.2	6.8			218	219	220	221	
	B		8	7	7																		
	C		8	8	8																		
	D		8	8	8																		
	E		8	8	8																		
37	A		8	8	7			8.0	7.6	8.1	7.9			6.8	7.3	6.7			220	225	214	237	
	B		8	8	8																		
	C		8	8	4																		
	D		8	5	5																		
	E		8	8	7																		
Chemistry Tech prerenewal/postrenewal							AH	PC	PC	PC			AH	PC	PC	PC			AH	PC	PC	PC	

BIO-ANALYTICAL LABORATORIES ACUTE TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Project# X5461

Test started: Date 6/18/14 Time 1205

Client Camden

Test ended: Date 6/20/14 Time 1515

Sample Description 002

Test Species P. promelas ID# BA1161714

Technician: Ohour RC 24hour RC 48hour RC 72hour 96hour

Time: Ohour 1705 24hour 1640 48hour 1515 72hour 96hour

Temperature (°C): Ohour 24.9 24hour 24.8 48hour 24.7 72hour 96hour

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0	A	Na	8	8	7			8.0	7.8	7.8			7.2	7.0	6.8			170.2	176.1	179.8		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
12	A		8	8	8			8.0	7.1	7.6			7.2	6.9	6.7			RC	188.5	187.7	196	
	B		8	8	8																	
	C		8	8	7																	
	D		8	8	8																	
	E		8	8	7																	
Chemistry Tech prerenewal/postrenewal								RC	RC	RC			RC	RC	RC			RC	RC	RC		

BIO-ANALYTICAL LABORATORIES ACUTE TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Project# X5461

Test started: Date 6/18/14 Time 1705

Client Camden

Test ended: Date 6/20/14 Time 1515

Sample Description 002

Test Species P. promelas ID# BA161914

Technician: 0hour RC 24hour RC 48hour RC 72hour RC 96hour RC

Time: 0hour 1705 24hour 1640 48hour 1515 72hour RC 96hour RC

Temperature (°C): 0hour 24.9 24hour 24.8 48hour 24.7 72hour RC 96hour RC

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity							
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96			
16	A	NA	8	8	8			8.0	7.7	8.2	7.6			7.1	6.8	6.9	6.6			1005	1810	1854	198		
	B		8	8	8																				
	C		8	7	7																				
	D		8	8	8																				
	E		8	8	8																				
21	A		8	8	8			8.0	7.7	8.2	7.6			7.1	6.8	6.9	6.6			201	200	197	207		
	B		8	8	8																				
	C		8	8	8																				
	D		8	8	8																				
	E		8	8	8																				
Chemistry Tech prerenewal/postrenewal								RC	RC	RC	RC			RC	RC	RC	RC			RC	RC	RC	RC		

BIO-ANALYTICAL LABORATORIES ACUTE TOXICITY TEST SURVIVAL AND WATER QUALITY DATA

Project# X5461

Test started: Date 6/18/14 Time 1705

Client Camden

Test ended: Date 6/20/14 Time 1515

Sample Description 002

Test Species P. promelas ID# BAL 61714

Technician: Ohour RC 24hour RC 48hour RC 72hour RC 96hour RC

Time: Ohour 1705 24hour 1640 48hour 1515 72hour 1515 96hour 1515

Temperature (°C): Ohour 24.9 24hour 24.8 48hour 24.7 72hour 24.7 96hour 24.7

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
1/0		NA																				
28	A		8	8	8			8.0 ^{1.6}	8.1	7.6			6.9 ^{6.7}	6.8	6.5			218 ²¹⁹	208	220		
	B		8	8	8																	
	C		8	8	7																	
	D		8	8	8																	
	E		8	8	8																	
37	A		8	8	8			8.0 ^{1.7}	8.1	7.5			6.8 ^{6.7}	6.7	6.5			220 ²²²	214	231		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								RC	RC	RC			RC	RC	RC			RC	RC	RC		

APPENDIX C
STATISTICAL ANALYSIS

Daphnid Acute Test-48 Hr Survival

X5461

Start Date: 6/18/2014	Test ID: X5461DP	Sample ID: AR0022365	Page 21 of 32
End Date: 6/20/2014	Lab ID: ADEQ880630	Sample Type: EFF1-POTW	
Sample Date: 6/17/2014	Protocol: EPAAW02-EPA/821/R-02-01	Test Species: DP-Daphnia pulex	

Comments:

Conc-%	1	2	3	4	5
D-Control	0.8750	1.0000	1.0000	1.0000	1.0000
12	0.8750	1.0000	1.0000	1.0000	0.8750
16	0.8750	1.0000	1.0000	1.0000	0.7500
21	1.0000	1.0000	1.0000	0.8750	1.0000
28	1.0000	0.8750	1.0000	1.0000	1.0000
37	0.8750	1.0000	0.5000	0.6250	0.8750

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root				N	Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%			
D-Control	0.9750	1.0000	1.3564	1.2094	1.3931	6.055	5		
12	0.9500	0.9744	1.3196	1.2094	1.3931	7.623	5	25.00	16.00
16	0.9250	0.9487	1.2872	1.0472	1.3931	12.116	5	24.50	16.00
21	0.9750	1.0000	1.3564	1.2094	1.3931	6.055	5	27.50	16.00
28	0.9750	1.0000	1.3564	1.2094	1.3931	6.055	5	27.50	16.00
37	0.7750	0.7949	1.1018	0.7854	1.3931	22.427	5	19.00	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.8895	0.927	-0.5949	0.71194
Bartlett's Test indicates equal variances (p = 0.12)	8.79697	15.0863		
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	37	>37		2.7027
Treatments vs D-Control				

Acute Fish Test-48 Hr Survival

X5461

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Start Date: 6/18/2014	Test ID: X5461PP	Sample ID: AR0022365
End Date: 6/20/2014	Lab ID: ADEQ880630	Sample Type: EFF1-POTW
Sample Date: 6/17/2014	Protocol: EPAAW02-EPA/821/R-02-01	Test Species: PP-Pimephales promelas

Comments:

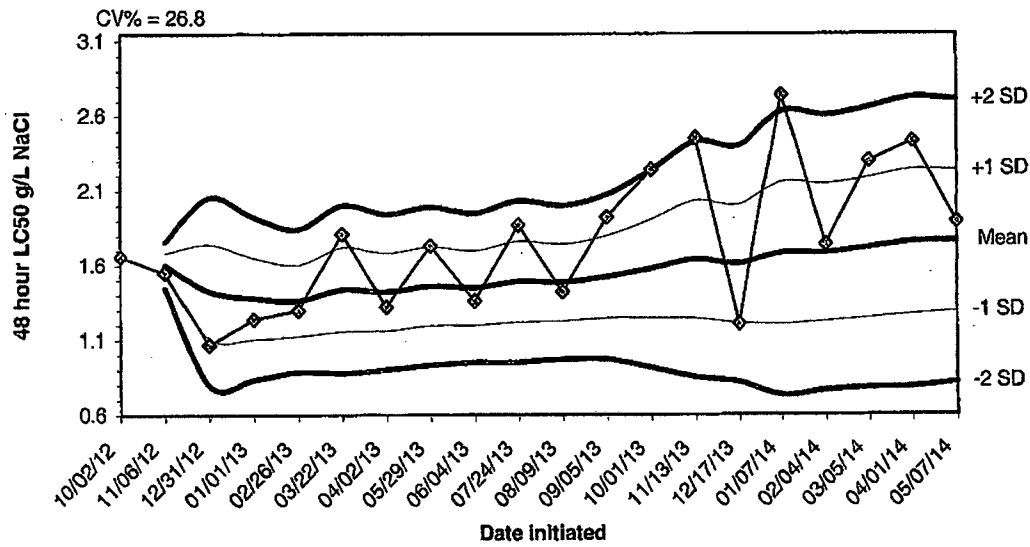
Conc-%	1	2	3	4	5
D-Control	0.8750	1.0000	1.0000	1.0000	1.0000
12	1.0000	1.0000	0.8750	1.0000	0.8750
16	1.0000	1.0000	0.8750	1.0000	1.0000
21	1.0000	1.0000	1.0000	1.0000	1.0000
28	1.0000	1.0000	0.8750	1.0000	1.0000
37	1.0000	1.0000	1.0000	1.0000	1.0000

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%	N		
D-Control	0.9750	1.0000	1.3564	1.2094	1.3931	6.055	5		
12	0.9500	0.9744	1.3196	1.2094	1.3931	7.623	5	25.00	16.00
16	0.9750	1.0000	1.3564	1.2094	1.3931	6.055	5	27.50	16.00
21	1.0000	1.0256	1.3931	1.3931	1.3931	0.000	5	30.00	16.00
28	0.9750	1.0000	1.3564	1.2094	1.3931	6.055	5	27.50	16.00
37	1.0000	1.0256	1.3931	1.3931	1.3931	0.000	5	30.00	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.75189	0.927	-1.4191	1.02293
Equality of variance cannot be confirmed				
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	37	>37		2.7027
Treatments vs D-Control				

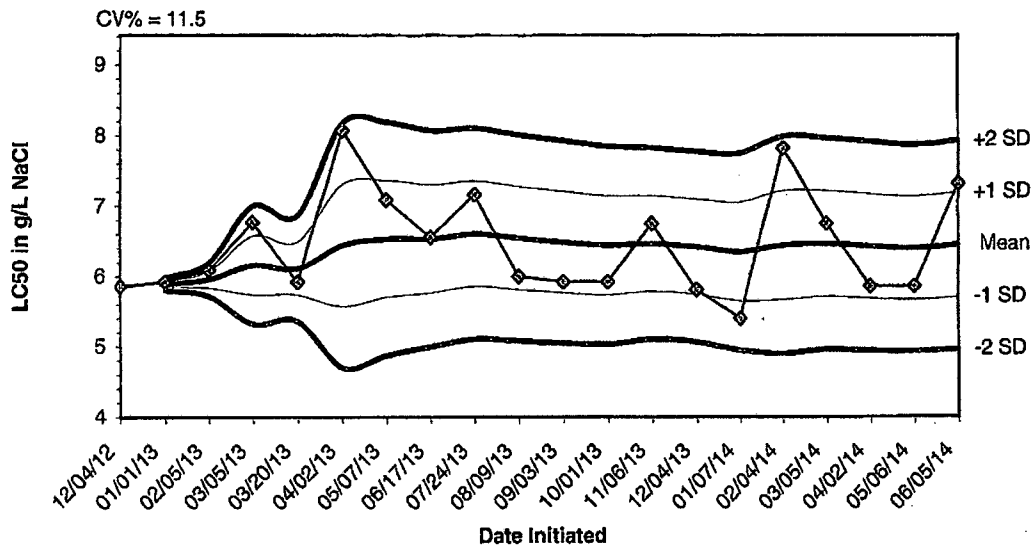
APPENDIX D
QUALITY ASSURANCE CHARTS

2014 48 hour Reference Toxicant Test Results using *Daphnia pulex*



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
10/02/12	1.6600					
11/06/12	1.5500	1.6050	1.5272	1.4494	1.6828	1.7606
12/31/12	1.0700	1.4267	1.1129	0.7992	1.7404	2.0541
01/01/13	1.2400	1.3800	1.1074	0.8347	1.6526	1.9253
02/26/13	1.3000	1.3640	1.1252	0.8864	1.6028	1.8416
03/22/13	1.8100	1.4383	1.1577	0.8770	1.7190	1.9997
04/02/13	1.3200	1.4214	1.1613	0.9012	1.6815	1.9416
05/29/13	1.7300	1.4600	1.1956	0.9313	1.7244	1.9887
06/04/13	1.3600	1.4489	1.1994	0.9498	1.6984	1.9479
07/24/13	1.8700	1.4910	1.2207	0.9503	1.7613	2.0317
08/09/13	1.4200	1.4845	1.2272	0.9699	1.7419	1.9992
09/05/13	1.9200	1.5208	1.2451	0.9694	1.7965	2.0722
10/01/13	2.2400	1.5762	1.2453	0.9145	1.9070	2.2378
11/13/13	2.4500	1.6386	1.2441	0.8497	2.0330	2.4275
12/17/13	1.2100	1.6100	1.2141	0.8183	2.0059	2.4017
01/07/14	2.7400	1.6806	1.2052	0.7297	2.1561	2.6316
02/04/14	1.7400	1.6841	1.2235	0.7629	2.1447	2.6053
03/05/14	2.3000	1.7183	1.2485	0.7787	2.1882	2.6580
04/01/14	2.4300	1.7558	1.2709	0.7860	2.2407	2.7256
05/07/14	1.8900	1.7625	1.2896	0.8166	2.2354	2.7084

2014 48-hour Reference Toxicant Test Results for *Pimephales promelas*



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
12/04/12	5.8600					
01/01/13	5.9200	5.8900	5.8476	5.8051	5.9324	5.9749
02/05/13	6.0900	5.9567	5.8374	5.7181	6.0760	6.1953
03/05/13	6.7700	6.1600	5.7418	5.3237	6.5782	6.9963
03/20/13	5.9200	6.1120	5.7343	5.3566	6.4897	6.8674
04/02/13	8.0700	6.4383	5.5705	4.7027	7.3061	8.1740
05/07/13	7.0900	6.5314	5.7018	4.8722	7.3610	8.1906
06/17/13	6.5600	6.5350	5.7669	4.9987	7.3031	8.0713
07/24/13	7.1600	6.6044	5.8563	5.1082	7.3526	8.1007
08/09/13	6.0000	6.5440	5.8132	5.0825	7.2748	8.0055
09/03/13	5.9200	6.4873	5.7689	5.0506	7.2056	7.9240
10/01/13	5.9200	6.4400	5.7358	5.0316	7.1442	7.8484
11/06/13	6.7500	6.4638	5.7841	5.1044	7.1435	7.8232
12/04/13	5.8100	6.4171	5.7411	5.0651	7.0932	7.7692
01/07/14	5.4000	6.3493	5.6470	4.9446	7.0517	7.7541
02/04/14	7.8200	6.4413	5.6695	4.8977	7.2130	7.9848
03/05/14	6.7500	6.4594	5.7084	4.9574	7.2104	7.9614
04/02/14	5.8600	6.4261	5.6840	4.9418	7.1683	7.9104
05/06/14	5.8600	6.3963	5.6635	4.9306	7.1292	7.8620
06/05/14	7.3100	6.4420	5.7000	4.9581	7.1840	7.9259

APPENDIX E
AGENCY FORMS

**Acute Forms
Daphnia pulex Survival**

Permittee: Camden Water Utilities
NPDES Permit Number: AR0022365/ AFIN 52-00073

Composite Collected From: 6/16/14 To: 6/17/14
 From: 6/17/14 To: 6/18/14

Test Initiated: 6/18/14

Dilution Water Used: Receiving Water Reconstituted Water

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	12.0	16.0	21.0	28.0	37.0
24-hour	A	87.5	87.5	100.0	100.0	100.0	100.0
	B	100.0	100.0	100.0	100.0	87.5	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0
	D	100.0	100.0	100.0	100.0	100.0	62.5
	E	100.0	100.0	100.0	100.0	100.0	100.0
48-hour	A	87.5	87.5	87.5	100.0	100.0	87.5
	B	100.0	100.0	100.0	100.0	87.5	100.0
	C	100.0	100.0	100.0	100.0	100.0	50.0
	D	100.0	100.0	100.0	87.5	100.0	62.5
	E	100.0	87.5	75.0	100.0	100.0	87.5
	Mean	97.5	95.0	92.5	97.5	97.5	77.5

1. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate: Is the mean survival at 48 hours significantly different (p=.05) than the control survival for the % effluent corresponding to:

- a.) LOW FLOW OR CRITICAL DILUTION (28.0%) YES X NO
b.) 1/2 LOW FLOW OR 2X CRITICAL DILUTION (N/A%) YES NO

2. Enter percent effluent corresponding to the LC₅₀ below:

LC₅₀ = >37.0% effluent

95 % confidence limits: N/A

Method of LC₅₀ calculation: N/A

3. If you answered NO to 1.a) enter (P) otherwise enter (F): P

4. Enter response to item 3 on DMR Form, parameter TEM3D

5. If you answered NO to 1.b) enter (P) otherwise enter (F): N/A

6. Enter response to item 5 on DMR Form, parameter TFM3D

**Biomonitoring
Daphnia 48 hour Acute Static Renewal
Chemical Parameters Chart***

**Permittee: Camden Water Utilities
NPDES Number: AR0022365/ AFIN 52-00073**

**Contact: David Richardson
Analyst: Haughton, Callahan, Callaban**

Sample Collected	From:	Date 6/16/14	Time 0800
	To:	Date 6/17/14	Time 0800
Test Begin		Date 6/18/14	Time 1625
Test End		Date 6/20/14	Time 1505

Parameter	D.O.			Temperature			Alkalinity			Hardness			pH			
	Dilut./Time	0hrs.	24hrs	48hrs	0hrs.	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs
0		8.0	8.2	7.9	24.7	24.7	24.7	28.0			52.0			7.2	7.1	7.0
12.0		8.0	8.2	7.9	24.7	24.7	24.7							7.2	6.9	6.9
16.0		8.0	8.2	7.8	24.7	24.7	24.7							7.1	6.9	6.9
21.0		8.0	8.2	7.9	24.7	24.7	24.7							7.1	6.9	6.9
28.0		8.0	8.1	7.8	24.7	24.7	24.7							6.9	6.8	6.8
37.0		8.0	8.1	7.9	24.7	24.7	24.7	20.0	16.0		48.0	64.0		6.8	6.7	6.7

*This Form is to be submitted with each DMR.
Alkalinity and hardness to be reported as mg/l CaCO₃

Acute Forms
Pimephales promelas (Fathead Minnow) Survival

Permittee: Camden Water Utilities

NPDES Permit Number: AR0022365/ AFIN 52-00073

Composite Collected

From: 6/16/14

To: 6/17/14

From: 6/17/14

To: 6/18/14

Test Initiated: 6/18/14

Dilution Water Used:

Receiving Water

Reconstituted Water

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	12.0	16.0	21.0	28.0	37.0
24-hour	A	100.0	100.0	100.0	100.0	100.0	100.0
	B	100.0	100.0	100.0	100.0	100.0	100.0
	C	100.0	100.0	87.5	100.0	100.0	100.0
	D	100.0	100.0	100.0	100.0	100.0	100.0
	E	100.0	100.0	100.0	100.0	100.0	100.0
48-hour	A	87.5	100.0	100.0	100.0	100.0	100.0
	B	100.0	100.0	100.0	100.0	100.0	100.0
	C	100.0	87.5	87.5	100.0	87.5	100.0
	D	100.0	100.0	100.0	100.0	100.0	100.0
	E	100.0	87.5	100.0	100.0	100.0	100.0
	Mean	97.5	95.0	97.5	100.0	97.5	100.0

1. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate: Is the mean survival at 48 hours significantly different ($p=.05$) than the control survival for the % effluent corresponding to:

- a.) LOW FLOW OR CRITICAL DILUTION (28.0%) YES X NO
 b.) 1/2 LOW FLOW OR 2X CRITICAL DILUTION (N/A%) YES NO

2. Enter percent effluent corresponding to the LC_{50} below:

LC_{50} = >37.0% effluent

95 % confidence limits: N/A

Method of LC_{50} calculation: N/A

3. If you answered NO to 1.a) enter (P) otherwise enter (F): P

4. Enter response to item 3 on DMR Form, parameter TEM3D

5. If you answered NO to 1.b) enter (P) otherwise enter (F): N/A

6. Enter response to item 5 on DMR Form, parameter TFM3D

**Biomonitoring
 Fathead Minnow 48 hour Acute Static Renewal
 Chemical Parameters Chart***

**Permittee: Camden Water Utilities
 NPDES Number: AR0022365/ AFIN 52-00073**

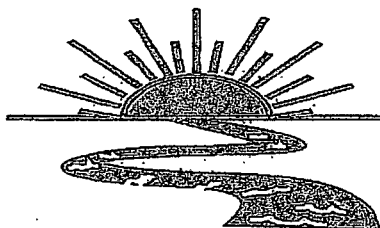
**Contact: David Richardson
 Analyst: Callahan**

Sample Collected **From:** **Date 6/16/14** **Time 0800**
To: **Date 6/17/14** **Time 0800**
Test Begin **Date 6/18/14** **Time 1705**
Test End **Date 6/20/14** **Time 1515**

Parameter	D.O.			Temperature			Alkalinity			Hardness			pH			
	Dilut./Time	0hrs.	24hrs	48hrs	0hrs.	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs
0	8.0	8.2	7.8	24.9	24.8	24.7	28.0				52.0			7.2	7.1	6.8
12.0	8.0	8.2	7.6	24.9	24.8	24.7								7.2	6.9	6.7
16.0	8.0	8.2	7.6	24.9	24.8	24.7								7.1	6.9	6.6
21.0	8.0	8.2	7.6	24.9	24.8	24.7								7.1	6.9	6.6
28.0	8.0	8.1	7.6	24.9	24.8	24.7								6.9	6.8	6.5
37.0	8.0	8.1	7.5	24.9	24.8	24.7	20.0	16.0			48.0	64.0		6.8	6.7	6.5

*This Form is to be submitted with each DMR.
 Alkalinity and hardness to be reported as mg/l CaCO₃

APPENDIX F
REPORT QUALITY ASSURANCE FORM



Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023

(318) 745-2772
1-800-259-1246
Fax: (318) 745-2773

REPORT QUALITY ASSURANCE FORM

Client: Camden Water

Project#: X5461

Chain of Custody Documents Checked by: AH 7/3/14
Technician/Date

Raw Data Documents Checked by: AH 7/3/14
Technician/Date

Statistical Analysis Package Checked by: EGB 6/30/14
Quality Manager/Date

Quality Control Data Checked by: EGB 6/30/14
Quality Manager/Date

Report Checked by: EGB 7/15/14
Quality Manager/Date

I certify that this document was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. The information contained in this document, to the best of my knowledge, is true, accurate and complete.

Erin H. Bragg, BS
Quality Manager

7/15/14
Date

No part of this work may be altered in any form or by any means without written permission from Bio-Analytical Laboratories.

Camden Water Utilities
P.O. Box J
Camden, AR 71711



A.D.E.Q.
Water Division-
Enforcement Branch
5301 Northshore Drive
North Little Rock, AR 72118-5317