

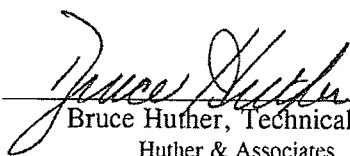
ENVIRONMENTAL ENTERPRISE GROUP
CITY OF CLARKSVILLE WWTP
OUTFALL 001

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

Ceriodaphnia dubia
Pimephales promelas

August 26, 2014

Reviewed by:



Bruce Huther, Technical Director

Huther & Associates, Inc.
1156 North Bonnie Brae
Denton, Texas 76201
(940) 387-1025, Fax: (940) 387-1036

TABLE OF CONTENTS

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

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

Form Approved
OMB No. 2040-0004

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if Different)

NAME: CLARKSVILLE, CITY OF
ADDRESS: P.O. BOX 1807
CLARKSVILLE, AR 72830
FACILITY: CLARKSVILLE CITY OF
LOCATION: 1305 S. CRAWFORD ST
CLARKSVILLE, AR 72830
ATTN: GREG RAINEY/MIKE HUGHES

AR0022187	TX1-Q
PERMIT NUMBER	DISCHARGE NUMBER
MONITORING PERIOD	
MM/DD/YYYY	MM/DD/YYYY
07/01/2014	09/30/2014

DMR Mailing ZIP CODE: 72830
MAJOR
001-QUARTERLY CHRONIC TOXICITY
External Outfall

No Discharge

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
Pass/Fail Static Renewal 7 Day Chronic Ceriodaphnia	SAMPLE MEASUREMENT	*****	*****	*****	*****	0	*****	*****	0	1/90	24Hr
TGP3B 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	pass=0/fail=1		Quarterly	COMP24
Pass/Fail Statre 7Day Chronic Pimephales Promelas	SAMPLE MEASUREMENT	*****	*****	*****	*****	0	*****	*****	0	1/60	24Hr
TGP6C 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	pass=0/fail=1		Quarterly	COMP24
Low Flow Pass/Fail Survival Test Static Renewal 7 Day Chronic	SAMPLE MEASUREMENT	*****	*****	*****	*****	0	*****	*****	0	1/60	24Hr
TLP3B 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	pass=0/fail=1		Quarterly	COMP24
Low Flow Pass/Fail Survival Test Static Renewal 7 Day Chronic	SAMPLE MEASUREMENT	*****	*****	*****	*****	0	*****	*****	0	1/90	24Hr
TLP6C 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	pass=0/fail=1		Quarterly	COMP24
NOEC Lethal Static Renewal 7 Day Chronic Ceriodaphnia dubia	SAMPLE MEASUREMENT	*****	*****	*****	*****	100%	*****	*****	0	1/90	24Hr
TOP3B 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24
NOEC Lethal Static Renewal 7 Day Chronic Pimephales promelas	SAMPLE MEASUREMENT	*****	*****	*****	*****	100%	*****	*****	0	1/90	24Hr
TOP6C 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24
NOEC Sub-Lethal Static Renewal 7 Day Chronic Ceriodaphnia dubia	SAMPLE MEASUREMENT	*****	*****	*****	*****	100%	*****	*****	0	1/90	24Hr
TPP3B 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER Gregg Rainey Supt. TYPED OR PRINTED	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.	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT <i>Gregg Rainey</i>	TELEPHONE	DATE
			479-754-7929 AREA Code NUMBER	09/19/2014 MM/DD/YYYY

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)
SEE PART II, #11. WET TESTING REDUCED TO SEMI-ANNUAL 04/13/10 - 03/31/14 PER MARY BARNETT'S LETTER. 38-00038

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

Form Approved
OMB No. 2040-0004

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if Different)

NAME: CLARKSVILLE, CITY OF
ADDRESS: P.O. BOX 1807
CLARKSVILLE, AR 72830
FACILITY: CLARKSVILLE CITY OF
LOCATION: 1305 S. CRAWFORD ST
CLARKSVILLE, AR 72830
ATTN: GREG RAINEY/MIKE HUGHES

AR0022187	TX1-Q
PERMIT NUMBER	DISCHARGE NUMBER
MONITORING PERIOD	
MM/DD/YYYY	MM/DD/YYYY
07/01/2014	09/30/2014

DMR Mailing ZIP CODE: 72830
MAJOR

001-QUARTERLY CHRONIC TOXICITY
External Outfall

No Discharge

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
Pass/Fail Static Renewal 7 Day Chronic Ceriodaphnia	SAMPLE MEASUREMENT	*****	*****	*****	*****	0	*****	*****	0	1/90	24HL
TGP3B 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG.	*****	pass=0/fail=1		Quarterly	COMP24
Pass/Fail Statre 7Day Chronic Pimephales Promelas	SAMPLE MEASUREMENT	*****	*****	*****	*****	0	*****	*****	0	1/90	24HL
TGP6C 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	pass=0/fail=1		Quarterly	COMP24
Low Flow Pass/Fail Survival Test Static Renewal 7 Day Chronic	SAMPLE MEASUREMENT	*****	*****	*****	*****	0	*****	*****	0	1/90	24HL
TLP3B 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	pass=0/fail=1		Quarterly	COMP24
Low Flow Pass/Fail Survival Test Static Renewal 7 Day Chronic	SAMPLE MEASUREMENT	*****	*****	*****	*****	0	*****	*****	0	1/90	24HL
TLP6C 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	pass=0/fail=1		Quarterly	COMP24
NOEC Lethal Static Renewal 7 Day Chronic Ceriodaphnia dubia	SAMPLE MEASUREMENT	*****	*****	*****	*****	100%	*****	*****	0	1/90	24HL
TOP3B 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24
NOEC Lethal Static Renewal 7 Day Chronic Pimephales promelas	SAMPLE MEASUREMENT	*****	*****	*****	*****	100%	*****	*****	0	1/90	24HL
TOP6C 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24
NOEC Sub-Lethal Static Renewal 7 Day Chronic Ceriodaphnia dubia	SAMPLE MEASUREMENT	*****	*****	*****	*****	100%	*****	*****	0	1/90	24HL
TPP3B 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER Gregg Rainey Supt. TYPED OR PRINTED	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.	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT <i>Gregg Rainey</i>	TELEPHONE		DATE
			AREA Code	NUMBER	MM/DD/YYYY
			479-754-7929	09/19/2018	

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

SEE PART II, #11. WET TESTING REDUCED TO SEMI-ANNUAL 04/13/10 - 03/31/14 PER MARY BARNETT'S LETTER. 38-00038

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

Form Approved
OMB No. 2040-0004

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if Different)

NAME: CLARKSVILLE, CITY OF
ADDRESS: P.O. BOX 1807
CLARKSVILLE, AR 72830
FACILITY: CLARKSVILLE CITY OF
LOCATION: 1305 S. CRAWFORD ST
CLARKSVILLE, AR 72830
ATTN: GREG RAINEY/MIKE HUGHES

AR0022187	TX1-Q
PERMIT NUMBER	DISCHARGE NUMBER
MONITORING PERIOD	
MM/DD/YYYY	MM/DD/YYYY
07/01/2014	09/30/2014

DMR Mailing ZIP CODE: 72830
MAJOR

001-QUARTERLY CHRONIC TOXICITY
External Outfall

No Discharge

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
NOEC Sub-Lethal Static Renewal 7 Day Chronic Pimephales promelas	SAMPLE MEASUREMENT	*****	*****	*****	*****	100%	*****		0	1/90	24HC
TPP6C 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24
Coef Of Var Statre 7Day Chronic Ceriodaphnia	SAMPLE MEASUREMENT	*****	*****	*****	*****	6.98%	*****		0	1/90	24HC
TQP3B 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24
Coef Of Var Statre 7Day Chronic Pimephales	SAMPLE MEASUREMENT	*****	*****	*****	*****	6.31%	*****		0	1/90	24HC
TQP6C 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER Gregg Rainey Supt. TYPED OR PRINTED	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.	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT <i>Gregg Rainey</i>	TELEPHONE	DATE
			479-754-7929 AREA Code NUMBER	09/19/2014 MM/DD/YYYY

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)
SEE PART II, #11. WET TESTING REDUCED TO SEMI-ANNUAL 04/13/10 - 03/31/14 PER MARY BARNETT'S LETTER. 38-00038

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

Form Approved
OMB No. 2040-0004

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if Different)

NAME: CLARKSVILLE, CITY OF
ADDRESS: P.O. BOX 1807
CLARKSVILLE, AR 72830
FACILITY: CLARKSVILLE CITY OF
LOCATION: 1305 S. CRAWFORD ST
CLARKSVILLE, AR 72830
ATTN: GREG RAINEY/MIKE HUGHES

AR0022187	TX1-Q
PERMIT NUMBER	DISCHARGE NUMBER
MONITORING PERIOD	
MM/DD/YYYY	MM/DD/YYYY
07/01/2014	09/30/2014

DMR Mailing ZIP CODE: 72830
MAJOR

001-QUARTERLY CHRONIC TOXICITY
External Outfall

No Discharge

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
NOEC Sub-Lethal Static Renewal 7 Day Chronic Pimephales promelas	SAMPLE MEASUREMENT	*****	*****	*****	*****	100%	*****	*****	0	1/90	24HC
	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24
Coef Of Var Statre 7Day Chronic Ceriodaphnia	SAMPLE MEASUREMENT	*****	*****	*****	*****	6.98%	*****	*****	0	1/90	24HC
	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24
Coef Of Var Statre 7Day Chronic Pimephales	SAMPLE MEASUREMENT	*****	*****	*****	*****	6.31%	*****	*****	0	1/90	24HC
	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER	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.	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	TELEPHONE	DATE
Gregg Rainey Supt. TYPED OR PRINTED		<i>Gregg Rainey</i>	479-754-7929 AREA Code NUMBER	09/19/2014 MM/DD/YYYY

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)
SEE PART II, #11. WET TESTING REDUCED TO SEMI-ANNUAL 04/13/10 - 03/31/14 PER MARY BARNETT'S LETTER. 38-00038

**ENVIRONMENTAL ENTERPRISE GROUP
 CITY OF CLARKSVILLE WWTP – OUTFALL 001
 NPDES PERMIT NO. AR0022187
 AFIN NO. 36-00038
 BIOMONITORING REPORTING
 TEST DATE: 08/26/14**

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.	6.98%

I. *Pimephales promelas*

	Response
A. If the No Observed Effect Concentration (NOEC) for survival is less than the critical dilution, enter a "1"; otherwise, enter a "0". Parameter No. TLP6C.	0
B. If the No Observed Effect Concentration (NOEC) for growth is less than the critical dilution, enter a "1"; otherwise, enter a "0". Parameter No. TGP6C.	0
C. Report the NOEC value for survival, Parameter No. TQP6C.	100%
D. Report the NOEC value for growth, Parameter No. TPP6C.	100%
E. Report the highest (critical dilution or control) Coefficient of Variation, Parameter No. TQP6C.	6.31%

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

Form Approved
OMB No. 2040-0004

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if Different)

NAME: CLARKSVILLE, CITY OF
ADDRESS: P.O. BOX 1807
CLARKSVILLE, AR 72830
FACILITY: CLARKSVILLE CITY OF
LOCATION: 1305 S. CRAWFORD ST
CLARKSVILLE, AR 72830
ATTN: GREG RAINEY/MIKE HUGHES

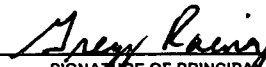
AR0022187	TX2-Q
PERMIT NUMBER	DISCHARGE NUMBER
MONITORING PERIOD	
MM/DD/YYYY	MM/DD/YYYY
07/01/2014	09/30/2014

DMR Mailing ZIP CODE: 72830
MAJOR

002-QUARTERLY-CHRONIC TOXICITY
External Outfall

No Discharge

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
NOEC Sub-Lethal Static Renewal 7 Day Chronic Pimephales promelas	SAMPLE MEASUREMENT	*****	*****	*****	*****		*****				
TPP6C 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24
Coef Of Var Statre 7Day Chronic Ceriodaphnia	SAMPLE MEASUREMENT	*****	*****	*****	*****		*****				
TQP3B 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24
Coef Of Var Statre 7Day Chronic Pimephales	SAMPLE MEASUREMENT	*****	*****	*****	*****		*****				
TQP6C 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER	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.	 SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	TELEPHONE	DATE
Greg Rainey Supt. TYPED OR PRINTED			479-254-7929 AREA Code NUMBER	09/19/2014 MM/DD/YYYY

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

(PASS=0/FAIL=1) IF THE NOEC VALUE IS LESS THAN THE CRITICAL DILUTION, REPORT "1"; OTHERWISE, REPORT "0". SEE PART II, CONDITION NO. 11. Toxicity Testing for outfall 002 reduced to semi-annual via Mary Barnett's 05/16/2012 letter. 36-00038

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

Form Approved
OMB No. 2040-0004

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if Different)

NAME: CLARKSVILLE, CITY OF
ADDRESS: P.O. BOX 1807
CLARKSVILLE, AR 72830
FACILITY: CLARKSVILLE CITY OF
LOCATION: 1305 S. CRAWFORD ST
CLARKSVILLE, AR 72830
ATTN: GREG RAINEY/MIKE HUGHES


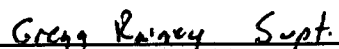
AR0022187	TX2-Q
PERMIT NUMBER	DISCHARGE NUMBER
MONITORING PERIOD	
MM/DD/YYYY	MM/DD/YYYY
07/01/2014	09/30/2014

DMR Mailing ZIP CODE: 72830
MAJOR

002-QUARTERLY-CHRONIC TOXICITY
External Outfall

No Discharge

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
NOEC Sub-Lethal Static Renewal 7 Day Chronic Pimephales promelas	SAMPLE MEASUREMENT	*****	*****	*****	*****		*****				
TPP6C 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24
Coef Of Var Statre 7Day Chronic Ceriodaphnia	SAMPLE MEASUREMENT	*****	*****	*****	*****		*****				
TQP3B 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24
Coef Of Var Statre 7Day Chronic Pimephales	SAMPLE MEASUREMENT	*****	*****	*****	*****		*****				
TQP6C 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER	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.	 SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	TELEPHONE	DATE
 TYPED OR PRINTED			479-254-7929 AREA Code NUMBER	09/19/2014 MM/DD/YYYY

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

(PASS=0/FAIL=1) IF THE NOEC VALUE IS LESS THAN THE CRITICAL DILUTION, REPORT "1"; OTHERWISE, REPORT "0". SEE PART II, CONDITION NO. 11. Toxicity Testing for outfall 002 reduced to semi-annual via Mary Barnett's 05/16/2012 letter. 36-00038

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

Form Approved
OMB No. 2040-0004

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if Different)

NAME: CLARKSVILLE, CITY OF
ADDRESS: P.O. BOX 1807
CLARKSVILLE, AR 72830
FACILITY: CLARKSVILLE CITY OF
LOCATION: 1305 S. CRAWFORD ST
CLARKSVILLE, AR 72830
ATTN: GREG RAINEY/MIKE HUGHES

AR0022187	TX2-Q
PERMIT NUMBER	DISCHARGE NUMBER
MONITORING PERIOD	
MM/DD/YYYY	MM/DD/YYYY
07/01/2014	09/30/2014

DMR Mailing ZIP CODE: 72830
MAJOR

002-QUARTERLY-CHRONIC TOXICITY
External Outfall

No Discharge

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
Pass/Fail Static Renewal 7 Day Chronic Ceriodaphnia	SAMPLE MEASUREMENT	*****	*****	*****	*****						
TGP3B 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	pass=0/fail=1		Quarterly	COMP24
Pass/Fail Statre 7Day Chronic Pimephales Promelas	SAMPLE MEASUREMENT	*****	*****	*****	*****						
TGP6C 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	pass=0/fail=1		Quarterly	COMP24
Low Flow Pass/Fail Survival Test Static Renewal 7 Day Chronic	SAMPLE MEASUREMENT	*****	*****	*****	*****						
TLP3B 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	pass=0/fail=1		Quarterly	COMP24
Low Flow Pass/Fail Survival Test Static Renewal 7 Day Chronic	SAMPLE MEASUREMENT	*****	*****	*****	*****						
TLP6C 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	pass=0/fail=1		Quarterly	COMP24
NOEC Lethal Static Renewal 7 Day Chronic Ceriodaphnia dubia	SAMPLE MEASUREMENT	*****	*****	*****	*****						
TOP3B 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24
NOEC Lethal Static Renewal 7 Day Chronic Pimephales promelas	SAMPLE MEASUREMENT	*****	*****	*****	*****						
TOP6C 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24
NOEC Sub-Lethal Static Renewal 7 Day Chronic Ceriodaphnia dubia	SAMPLE MEASUREMENT	*****	*****	*****	*****						
TPP3B 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER <i>Gregg Rainey Supt</i> TYPED OR PRINTED	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.	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT <i>Gregg Rainey</i>	TELEPHONE		DATE
			AREA Code	NUMBER	MM/DD/YYYY
			479-254-7929	09/19/2014	

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

(PASS=0/FAIL=1) IF THE NOEC VALUE IS LESS THAN THE CRITICAL DILUTION, REPORT "1"; OTHERWISE, REPORT "0". SEE PART II, CONDITION NO. 11. Toxicity Testing for outfall 002 reduced to semi-annual via Mary Barnett's 05/16/2012 letter. 36-00038

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

Form Approved
OMB No. 2040-0004

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if Different)

NAME: CLARKSVILLE, CITY OF
ADDRESS: P.O. BOX 1807
CLARKSVILLE, AR 72830
FACILITY: CLARKSVILLE CITY OF
LOCATION: 1305 S. CRAWFORD ST
CLARKSVILLE, AR 72830
ATTN: GREG RAINEY/MIKE HUGHES

AR0022187	TX2-Q
PERMIT NUMBER	DISCHARGE NUMBER
MONITORING PERIOD	
MM/DD/YYYY	MM/DD/YYYY
07/01/2014	09/30/2014

DMR Mailing ZIP CODE: 72830
MAJOR

002-QUARTERLY-CHRONIC TOXICITY
External Outfall

No Discharge

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
Pass/Fail Static Renewal 7 Day Chronic Ceriodaphnia	SAMPLE MEASUREMENT	*****	*****	*****	*****						
TGP3B 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	pass=0/fail=1		Quarterly	COMP24
Pass/Fail Statre 7Day Chronic Pimephales Promelas	SAMPLE MEASUREMENT	*****	*****	*****	*****						
TGP6C 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	pass=0/fail=1		Quarterly	COMP24
Low Flow Pass/Fail Survival Test Static Renewal 7 Day Chronic	SAMPLE MEASUREMENT	*****	*****	*****	*****						
TLP3B 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	pass=0/fail=1		Quarterly	COMP24
Low Flow Pass/Fail Survival Test Static Renewal 7 Day Chronic	SAMPLE MEASUREMENT	*****	*****	*****	*****						
TLP6C 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	pass=0/fail=1		Quarterly	COMP24
NOEC Lethal Static Renewal 7 Day Chronic Ceriodaphnia dubia	SAMPLE MEASUREMENT	*****	*****	*****	*****						
TOP3B 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24
NOEC Lethal Static Renewal 7 Day Chronic Pimephales promelas	SAMPLE MEASUREMENT	*****	*****	*****	*****						
TOP6C 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24
NOEC Sub-Lethal Static Renewal 7 Day Chronic Ceriodaphnia dubia	SAMPLE MEASUREMENT	*****	*****	*****	*****						
TPP3B 10 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	Req. Mon. 7 DA AVG	*****	%		Quarterly	COMP24

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER	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.	TELEPHONE	DATE
<i>Gregg Rainey Supt</i> TYPED OR PRINTED		<i>Gregg Rainey</i> SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	479-254-7929 AREA Code NUMBER

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

(PASS=0/FAIL=1) IF THE NOEC VALUE IS LESS THAN THE CRITICAL DILUTION, REPORT "1"; OTHERWISE, REPORT "0". SEE PART II, CONDITION NO. 11. Toxicity Testing for outfall 002 reduced to semi-annual via Mary Barnett's 05/16/2012 letter. 36-00038



TOXICITY TEST REPORT - CHRONIC

Client	Environmental Enterprise Group	Sample.....	Outfall 001
Facility	City of Clarksville WWTP	Laboratory I.D.	22781
Permit No.	NPDES AR0022187	Begin Date	August 26, 2014

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 Environmental Enterprise Group, City of Clarksville WWTP were delivered by United Parcel Service courier to Huthier & Associates on August 26, August 28, and August 30, 2014. Effluent samples were collected from Outfall 001 using an automatic sampler and were manually composited 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 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 1315 hours, August 26, 2014. 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 survival in the performance control. The test ended at 1315 hours, September 2, 2014. 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: 6.7%**
NOEC: 100% Effluent

TEST SETUP
Pimephales promelas



The seven-day *Pimephales promelas* larval survival and growth test was initiated at 1500 hours, August 26, 2014. Five concentrations were prepared (32%, 42%, 56%, 75%, and 100% effluent) utilizing receiving water (Lake Dardanelle) as dilution water. The test was conducted in 300 mL distilled water rinsed plastic beakers containing 250 mL of solution (eight larvae per beaker, five beakers per concentration). *P. promelas* larvae were less than 24-hours old at test initiation and originated from a minimum of three in-house spawnings. Fresh solutions were prepared and renewed daily. Larvae in each test chamber were fed <24-hour-old *Artemia* (brine shrimp) three times per day. The test proceeded for seven days during which survival and water quality data were collected daily.

A true control of five replicate chambers of eight larvae each in receiving water was conducted concurrently with the test. There was 100% survival in the true control. In addition, a performance control of five replicate chambers of eight larvae 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 larvae 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. At the end of the test, all larvae were sacrificed, dried, and weighed. The test ended at 1500 hours, September 2, 2014. Survival and growth (weight) data were statistically analyzed ($p = 0.05$) according to EPA procedures to determine the Lowest Observable Effect Concentration (LOEC) and the No Observable Effect Concentration (NOEC).

SURVIVAL
Pimephales promelas

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

LOEC: Not Applicable
NOEC: 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: 9.4%**
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 Permit Number NPDES AR0022187 for Environmental Enterprise Group, City of Clarksville WWTP, Outfall 001 passed for this testing period.

Huther 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 08/25/14 08/27/14 08/29/14
 LAB ID # 22781 DATE RECEIVED 08/26/14 08/28/14 08/30/14
 TEST TYPE 7 Day Chronic BEGIN DATE/TIME 08/26/14 1315
 TEST ORGANISM *Ceriodaphnia dubia* END DATE/TIME 09/02/14 1315
 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 N. Lehr

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
08/27/14	A	A	A	A	A	A	A	A	A	A
08/28/14	0	0	0	0	0	0	0	0	0	0
08/29/14	A	A	A	A	A	A	A	A	A	A
08/30/14	4	3	4	3	2	2	2	2	4	3
08/31/14	A	A	A	A	A	A	A	A	A	A
09/01/14	10	11	13	9	8	8	9	10	10	9
09/02/14	14	12	12	13	14	13	12	13	14	12
	24	23	25	22	22	21	21	23	24	21
x# Young 22.6 C.V. 6.33% 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
08/27/14	A	A	A	A	A	A	A	A	A	A
08/28/14	0	0	0	0	0	0	0	0	0	0
08/29/14	A	A	A	A	A	A	A	A	A	A
08/30/14	2	4	4	3	2	5	3	2	2	3
08/31/14	A	A	A	A	A	A	A	A	A	A
09/01/14	6	7	8	10	8	9	7	7	8	9
09/02/14	14	12	13	12	12	13	13	14	12	12
	22	23	25	25	22	27	23	23	22	24
x# Young 23.6 C.V. 6.98% 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
08/27/14	A	A	A	A	A	A	A	A	A	A
08/28/14	0	0	0	0	0	0	0	0	0	0
08/29/14	A	A	A	A	A	A	A	A	A	A
08/30/14	2	4	2	3	2	2	4	3	2	3
08/31/14	A	A	A	A	A	A	A	A	A	A
09/01/14	6	10	9	8	7	9	8	9	9	7
09/02/14	14	12	13	13	12	13	14	12	12	14
	22	26	24	24	21	24	26	24	23	24
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
08/27/14	A	A	A	A	A	A	A	A	A	A
08/28/14	0	0	0	0	0	0	0	0	0	0
08/29/14	A	A	A	A	A	A	A	A	A	A
08/30/14	3	2	4	4	3	2	4	2	2	2
08/31/14	A	A	A	A	A	A	A	A	A	A
09/01/14	9	8	6	8	8	9	9	6	8	7
09/02/14	13	13	15	12	13	12	13	14	12	13
	25	23	25	24	24	23	26	22	22	22
x# Young 23.6 C.V. 6.06% 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

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

EEG, City of Clarksville WWTP

Lab ID# 22781

Test Date: August 26, 2014

56% Effluent

Date	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
08/27/14	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/28/14	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/29/14	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/30/14	2	3	3	4	2	3	4	3	2	2
	2	3	3	4	2	3	4	3	2	2
08/31/14	A	A	A	A	A	A	A	A	A	A
	2	3	3	4	2	3	4	3	2	2
	8	11	6	8	7	9	10	9	6	8
09/01/14	10	14	9	12	9	12	14	12	8	10
	13	12	15	12	13	13	12	14	14	12
09/02/14	23	26	24	24	22	25	26	26	22	22
<p>x# Young 24.0 C.V. 7.08%</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
08/27/14	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/28/14	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/29/14	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/30/14	2	3	5	3	2	2	4	2	2	3
	2	3	5	3	2	2	4	2	2	3
08/31/14	A	A	A	A	A	A	A	A	A	A
	2	3	5	3	2	2	4	2	2	3
	7	9	9	8	9	8	11	10	8	6
09/01/14	9	12	14	11	11	10	15	12	10	9
	13	12	12	14	12	13	12	12	13	14
09/02/14	22	24	26	25	23	23	27	24	23	23
<p>x# Young 24.0 C.V. 6.51%</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
08/27/14	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/28/14	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/29/14	A	A	A	A	A	A	A	A	A	A
	0	0	0	0	0	0	0	0	0	0
08/30/14	2	4	2	3	3	2	4	2	3	2
	2	4	2	3	3	2	4	2	3	2
08/31/14	A	A	A	A	A	A	A	A	A	A
	2	4	2	3	3	2	4	2	3	2
	7	9	10	8	9	6	7	8	9	7
09/01/14	9	13	12	11	12	8	11	10	12	9
	13	12	12	13	12	14	13	12	13	14
09/02/14	22	25	24	24	24	22	24	22	25	23
<p>x# Young 23.5 C.V. 5.01%</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	alive today
4	total young to date

ex 2:

5	alive, 5 young today
12	total young to date

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

EEG, City of Clarksville WWTP

Lab ID# 22781

Test Date: August 26, 2014

WET CHEMISTRY MEASUREMENTS

Date	Time	Temp	Samp. No.	pH of Solution						Analyst	
				PCON	TCON	32%	42%	56%	75%		100%
08/26/14	Start	25.0	1	7.54	7.58	7.43	7.36	7.27	7.11	6.67	JHS
08/27/14	24 Hr.	25.2	1	7.97	7.88	7.85	7.73	7.70	7.42	7.49	EMS
08/27/14	Renew	25.2	1	7.59	7.60	7.53	7.44	7.36	7.11	7.59	EMS
08/28/14	48 Hr.	25.4	1	8.27	8.16	8.11	8.00	7.92	7.79	7.50	EMS
08/28/14	Renew	25.4	2	7.67	8.19	8.03	7.89	7.83	7.57	7.29	WLB
08/29/14	72 Hr.	25.2	2	8.24	8.23	8.07	8.00	7.93	7.82	7.63	EMS
08/29/14	Renew	25.2	2	8.14	7.93	7.83	7.66	7.60	7.44	7.09	EMS
08/30/14	96 Hr.	25.2	2	8.22	8.12	7.98	7.88	7.63	7.55	7.43	BH
08/30/14	Renew	25.3	3	8.24	8.24	8.22	8.16	8.10	8.09	7.88	BH
08/31/14	120 Hr.	25.3	3	8.14	7.97	7.96	7.89	7.85	7.78	7.76	EMS
08/31/14	Renew	25.3	3	8.32	8.14	7.91	7.78	7.66	7.50	7.27	EMS
09/01/14	144 Hr.	25.3	3	8.11	8.10	7.86	7.84	7.80	7.65	7.63	EMS
09/01/14	Renew	25.3	3	8.33	8.02	8.03	7.72	7.76	7.47	7.27	EMS
09/02/14	168 Hr.	25.2	3	8.56	7.87	7.79	7.75	7.71	7.64	7.55	WLB

Date	Time	Temp	Samp. No.	DO (mg/L) of Solution						Analyst	
				PCON	TCON	32%	42%	56%	75%		100%
08/26/14	Start	25.0	1	7.68	8.63	8.64	8.37	8.88	8.41	8.89	JHS
08/27/14	24 Hr.	25.2	1	8.26	8.02	7.99	8.48	7.56	7.95	8.16	EMS
08/27/14	Renew	25.2	1	8.03	8.06	7.93	7.75	8.08	7.59	7.54	EMS
08/28/14	48 Hr.	25.4	1	7.45	7.68	7.67	8.40	8.60	8.12	7.74	EMS
08/28/14	Renew	25.4	2	7.90	8.16	8.53	7.79	7.94	8.19	7.69	WLB
08/29/14	72 Hr.	25.2	2	7.45	7.50	7.55	8.31	8.33	7.69	7.91	EMS
08/29/14	Renew	25.2	2	8.27	8.17	8.23	7.94	8.57	8.55	8.17	EMS
08/30/14	96 Hr.	25.2	2	7.88	7.86	7.77	7.62	7.56	7.44	7.38	BH
08/30/14	Renew	25.3	3	8.37	7.55	7.46	7.42	7.33	7.21	7.19	BH
08/31/14	120 Hr.	25.3	3	8.07	8.12	8.18	8.14	8.30	8.27	8.26	EMS
08/31/14	Renew	25.3	3	8.75	8.33	7.80	8.20	8.12	8.06	8.34	EMS
09/01/14	144 Hr.	25.3	3	8.08	8.08	8.16	8.03	8.16	8.06	8.10	EMS
09/01/14	Renew	25.3	3	8.29	7.67	7.62	7.79	7.90	7.87	7.90	EMS
09/02/14	168 Hr.	25.2	3	7.52	7.62	7.79	7.68	7.78	7.88	7.94	WLB

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

EEG, City of Clarksville WWTP

Lab ID# 22781

Test Date: August 26, 2014

INITIAL CHEMISTRY MEASUREMENTS @ 100% EFFLUENT

Date	Samp. No.	pH	DO	Hardness mg/L CaCO ₃ ¹	Alkalinity mg/L CaCO ₃ ¹	Conduct. umhos/cm ¹	Resid. Cl ₂ mg/L ¹	Dechlor(mL) Na ₂ S ₂ O ₃ mg/L ¹	Analyst
08/26/14	1	6.67	8.89	96	20	787	<0.01	N/A	TN
08/28/14	2	7.67	7.98	100	36	714	<0.01	N/A	TN
08/30/14	3	7.88	7.19	96	32	728	<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
08/26/14	RS1	7.58	8.63	268	150	1437	<0.01	N/A	TN
08/28/14	RS2	8.09	8.02	268	128	1587	<0.01	N/A	TN
08/30/14	RS3	8.24	8.17	264	130	1265	<0.01	N/A	TN

Huther and Associates, Inc.
 Begin Date: August 26, 2014
 Lab I.D.# 22781

CERIODAPHNIA DUBIA STATISTICAL ANALYSES
 Reproduction

Summary Statistics on Transformed Data Table 1 of 2

Grp	Identification	N	Min	Max	Mean
1	Control	10	22.000	27.000	23.600
2	32% Effluent	10	21.000	26.000	23.800
3	42% Effluent	10	22.000	26.000	23.600
4	56% Effluent	10	22.000	26.000	24.000
5	75% Effluent	10	22.000	27.000	24.000
6	100% Effluent	10	22.000	25.000	23.500

Summary Statistics on Transformed Data Table 2 of 2

Grp	Identification	Variance	Sd	Sem	C.V.%
1	Control	2.711	1.647	0.521	6.98
2	32% Effluent	2.400	1.549	0.490	6.51
3	42% Effluent	2.044	1.430	0.452	6.06
4	56% Effluent	2.889	1.700	0.537	7.08
5	75% Effluent	2.444	1.563	0.494	6.51
6	100% Effluent	1.389	1.179	0.373	5.01

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	1	20	22	14	3

Calculated Chi-Square goodness of fit test statistic = 4.6513
 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 = 1.38

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	2.350	0.470	0.203
Within (Error)	54	124.900	2.313	
Total	59	127.250		

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	23.600	23.600			
2	32% Effluent	23.800	23.800		-0.294	
3	42% Effluent	23.600	23.600		0.000	
4	56% Effluent	24.000	24.000		-0.588	
5	75% Effluent	24.000	24.000		-0.588	
6	100% Effluent	23.500	23.500		0.147	

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	1.571	6.7	-0.200
3	42% Effluent	10	1.571	6.7	0.000
4	56% Effluent	10	1.571	6.7	-0.400
5	75% Effluent	10	1.571	6.7	-0.400
6	100% Effluent	10	1.571	6.7	0.100

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

CLIENT	EEG, City of Clarksville WWTP	SAMPLE TYPE	24 Hour Composite
NPDES #	AR0022187	DATE COLLECTED	08/25/14 08/27/14 08/29/14
LAB ID #	22781	DATE RECEIVED	08/26/14 08/28/14 08/30/14
TEST TYPE	7 Day Chronic	BEGIN DATE/TIME	08/26/14 1500
TEST ORGANISM	<i>Pimephales promelas</i>	END DATE/TIME	09/02/14 1500
ORGANISM AGE	< 24 Hours	TEST TEMPERATURE (°C)	25 ± 1
ORGANISM SOURCE	In House	PHOTO PERIOD	16-hr. Light 8-hr. Dark
RECEIVING WATER	Lake Dardanelle	LIGHT INTENSITY	50-100 ft. cndl.
DILUTION WATER	Lake Dardanelle	TECHNICIAN	M. Horner

SURVIVAL SUMMARY

Conc.	08/27/14					08/28/14					08/29/14					08/30/14					08/31/14				
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
Pcon	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
Tcon	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
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
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
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
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

Conc.	09/01/14					09/02/14					x % Survival	C.V. %
	A	B	C	D	E	A	B	C	D	E		
Pcon	8	8	8	8	8	8	8	8	8	8	100.0	0.00
Tcon	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. %
Pcon	0.4950	0.5060	0.4470	0.4820	0.4690	0.4798	4.79
Tcon	0.4260	0.4750	0.4200	0.4670	0.4810	0.4538	6.31
32%	0.4450	0.5020	0.4710	0.5030	0.4260	0.4694	7.28
42%	0.4950	0.5040	0.4500	0.4690	0.5030	0.4842	4.91
56%	0.4270	0.4810	0.5040	0.4500	0.4750	0.4674	6.34
75%	0.4960	0.5040	0.4270	0.4690	0.4800	0.4752	6.35
100%	0.4750	0.5040	0.4460	0.4820	0.5010	0.4816	4.86

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

EEG, City of Clarksville WWTP

Lab ID# 22781

Test Date: August 26, 2014

WET CHEMISTRY MEASUREMENTS

Date	Time	Temp	Samp. No.	pH of Solution						Analyst	
				PCON	TCON	32%	42%	56%	75%		100%
08/26/14	Start	25.0	1	7.95	7.83	7.80	7.70	7.60	7.35	7.66	EMS
08/27/14	24 Hr.	25.9	1	8.02	7.99	7.92	7.96	7.88	7.66	7.62	EMS
08/27/14	Renew	25.9	1	7.59	7.60	7.53	7.44	7.36	7.11	7.59	EMS
08/28/14	48 Hr.	25.7	1	7.83	8.01	7.91	7.84	7.74	7.50	6.78	WLB
08/28/14	Renew	25.7	2	7.67	8.19	8.03	7.89	7.83	7.57	7.29	WLB
08/29/14	72 Hr.	25.8	2	8.22	8.24	8.27	8.19	8.09	7.99	7.82	EMS
08/29/14	Renew	25.5	2	7.84	7.93	7.83	7.66	7.60	7.44	7.39	EMS
08/30/14	96 Hr.	25.2	2	7.82	7.88	7.86	7.82	7.77	7.71	7.45	BH
08/30/14	Renew	25.3	3	8.33	8.24	8.22	8.16	8.10	8.09	7.88	BH
08/31/14	120 Hr.	25.7	3	7.97	7.92	7.87	7.81	7.73	7.50	8.06	EMS
08/31/14	Renew	25.7	3	8.32	8.14	7.91	7.78	7.66	7.50	7.27	EMS
09/01/14	144 Hr.	25.6	3	8.05	8.03	8.03	7.91	7.77	7.76	7.99	EMS
09/01/14	Renew	25.6	3	8.33	8.02	8.03	7.72	7.76	7.47	7.27	EMS
09/02/14	168 Hr.	25.6	3	8.08	7.97	7.89	7.81	7.71	7.52	6.97	WLB

Date	Time	Temp	Samp. No.	DO (mg/L) of Solution						Analyst	
				PCON	TCON	32%	42%	56%	75%		100%
08/26/14	Start	25.0	1	8.77	8.01	7.98	8.24	8.37	7.65	7.63	EMS
08/27/14	24 Hr.	25.9	1	8.45	8.00	7.99	7.93	7.92	7.55	7.41	EMS
08/27/14	Renew	25.9	1	8.03	8.06	7.93	7.75	8.08	7.59	7.54	EMS
08/28/14	48 Hr.	25.7	1	7.95	8.16	8.22	7.24	8.21	8.28	8.18	WLB
08/28/14	Renew	25.7	2	7.90	8.16	8.53	7.79	7.94	8.19	7.69	WLB
08/29/14	72 Hr.	25.8	2	8.57	8.31	7.79	7.76	8.13	8.28	7.90	EMS
08/29/14	Renew	25.2	2	8.27	8.17	8.23	7.94	8.57	8.55	8.17	EMS
08/30/14	96 Hr.	25.3	2	8.26	8.22	8.18	8.17	8.12	8.09	8.06	BH
08/30/14	Renew	25.3	3	7.62	7.55	7.46	7.42	7.33	7.21	7.19	BH
08/31/14	120 Hr.	25.7	3	8.42	8.42	8.40	8.41	8.41	8.37	8.37	EMS
08/31/14	Renew	25.7	3	8.75	8.33	7.80	8.20	8.12	8.06	8.34	EMS
09/01/14	144 Hr.	25.6	3	8.25	8.47	8.44	8.39	8.36	8.36	8.19	EMS
09/01/14	Renew	25.6	3	8.29	7.67	7.62	7.79	7.90	7.87	7.90	EMS
09/02/14	168 Hr.	25.6	3	8.38	8.50	8.35	8.39	8.14	8.42	8.49	WLB

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

BEG, City of Clarksville WWTP

Lab ID# 22781

Test Date: August 26, 2014

INITIAL CHEMISTRY MEASUREMENTS @ 100% EFFLUENT

Date	Samp. No.	pH	DO	Hardness mg/L CaCO ₃ ¹	Alkalinity mg/L CaCO ₃ ¹	Conduct. umhos/cm ¹	Resid. Cl ₂ mg/L ¹	Dechlor(mL) Na ₂ S ₂ O ₃ mg/L ¹	Analyst
08/26/14	1	6.67	8.89	96	20	787	<0.01	N/A	TN
08/28/14	2	7.67	7.98	100	36	714	<0.01	N/A	TN
08/30/14	3	7.88	7.19	96	32	728	<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
08/26/14	RS1	7.58	8.63	268	150	1437	<0.01	N/A	TN
08/28/14	RS2	8.09	8.02	268	128	1587	<0.01	N/A	TN
08/30/14	RS3	8.24	8.17	264	130	1265	<0.01	N/A	TN

¹ Measurements taken in 100% solution.

Huther and Associates, Inc.
 Begin Date: August 26, 2014
 Lab I.D.# 22781

PIMEPHALES PROMELAS STATISTICAL ANALYSES
 Growth

Summary Statistics on Transformed Data Table 1 of 2

Grp	Identification	N	Min	Max	Mean
1	Control	5	0.420	0.481	0.454
2	32% Effluent	5	0.426	0.503	0.469
3	42% Effluent	5	0.450	0.504	0.484
4	56% Effluent	5	0.427	0.504	0.467
5	75% Effluent	5	0.427	0.504	0.475
6	100% Effluent	5	0.446	0.504	0.482

Summary Statistics on Transformed Data Table 2 of 2

Grp	Identification	Variance	Sd	Sem	C.V.%
1	Control	0.001	0.029	0.013	6.31
2	32% Effluent	0.001	0.034	0.015	7.28
3	42% Effluent	0.001	0.024	0.011	4.91
4	56% Effluent	0.001	0.030	0.013	6.34
5	75% Effluent	0.001	0.030	0.014	6.35
6	100% Effluent	0.001	0.023	0.010	4.86

Shapiro - Wilk's Test For Normality

D = 0.020

W = 0.920

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 = 0.77

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	0.749
Within (Error)	24	0.020	0.001	
Total	29	0.023		

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

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

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

Grp	Identification	Transformed Mean	Mean		T Stat	Sig
			Original Units	Calculated In		
1	Control	0.454	0.454			
2	32% Effluent	0.469	0.469		-0.864	
3	42% Effluent	0.484	0.484		-1.683	
4	56% Effluent	0.467	0.467		-0.753	
5	75% Effluent	0.475	0.475		-1.185	
6	100% Effluent	0.482	0.482		-1.539	

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

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	5			
2	32% Effluent	5	0.043	9.4	-0.016
3	42% Effluent	5	0.043	9.4	-0.030
4	56% Effluent	5	0.043	9.4	-0.014
5	75% Effluent	5	0.043	9.4	-0.021
6	100% Effluent	5	0.043	9.4	-0.028

**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 # 22781

START DATE/TIME 8-26-14 NL 1315
END DATE/TIME 9-2-14 ZC 1315

pcon

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
8/27	A	A	A	A	A	A	A	A	A	A	NL	1315
8/28	A	A	A	A	A	A	A	A	A	A	ZC	1500
8/29	A	A	A	A	A	A	A	A	A	A	ZC	1420
8/30	7	3	4	3	2	2	2	2	4	3	NL	1030
8/31	A	A	A	A	A	A	A	A	A	A	NL	0930
9/1	6	8	9	6	6	6	7	8	6	6	NL	0900
9/2	14	12	12	13	14	13	12	13	14	12	ZC	1315

\bar{x} # Young w/o Dead = 22.6 CV% = 6.33
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100 CV% = 0.00

Tcon

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
8/27	A	A	A	A	A	A	A	A	A	A	NL	1315
8/28	A	A	A	A	A	A	A	A	A	A	ZC	1500
8/29	A	A	A	A	A	A	A	A	A	A	ZC	1420
8/30	2	4	4	3	2	5	3	2	2	3	NL	1030
8/31	A	A	A	A	A	A	A	A	A	A	NL	0930
9/1	6	7	8	10	8	9	7	7	8	9	NL	0900
9/2	14	12	13	12	12	13	13	14	12	12	ZC	1315

\bar{x} # Young w/o Dead = 23.6 CV% = 6.98
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100 CV% = 0.00

32

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
8/27	A	A	A	A	A	A	A	A	A	A	NL	1315
8/28	A	A	A	A	A	A	A	A	A	A	ZC	1500
8/29	A	A	A	A	A	A	A	A	A	A	ZC	1420
8/30	2	4	2	3	2	2	4	3	2	3	NL	1030
8/31	A	A	A	A	A	A	A	A	A	A	NL	0930
9/1	6	10	9	8	7	9	8	9	9	7	NL	0900
9/2	14	12	13	13	12	13	14	12	12	14	ZC	1315

\bar{x} # Young w/o Dead = 23.8 CV% = 6.51
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100 CV% = 0.00

42

Date	Rep1	Rep2	Rep3	Rep4	Rep5	Rep6	Rep7	Rep8	Rep9	Rep10	Analyst	Time
8/27	A	A	A	A	A	A	A	A	A	A	NL	1315
8/28	A	A	A	A	A	A	A	A	A	A	ZC	1500
8/29	A	A	A	A	A	A	A	A	A	A	ZC	1420
8/30	3	2	4	4	3	2	4	2	2	2	NL	1030
8/31	A	A	A	A	A	A	A	A	A	A	NL	0930
9/1	9	8	6	8	8	9	9	6	8	7	NL	0900
9/2	13	13	15	12	13	12	13	14	12	13	ZC	1315

\bar{x} # Young w/o Dead = 23.6 CV% = 6.06
 \bar{x} # Young w/Dead = CV% =
 \bar{x} % Survival = 100 CV% = 0.00

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

CLIENT/FACILITY EEG Clarksville
 OUTFALL # 001 PROJECT # 22781
 ORGANISM ID# PPO-14-237

DATE/TIME STARTED 8-26-14 MH 1500
 DATE/TIME ENDED 9-2-14 NL 1500

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
Pcon	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
Tcon	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
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
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
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
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
Initials Date/Time	8-27-14 MH 1500					8-28-14 MH 0855					8-29-14 26 0830					8-30-14 MH 0820					8-31-14 MH 0830				

Conc.	A					B					Mean Survival	C.V. %
	A	B	C	D	E	A	B	C	D	E		
Pcon	8	8	8	8	8	8	8	8	8	8	100	0.00
Tcon	8	8	8	8	8	8	8	8	8	8	100	0.00
32	8	8	8	8	8	8	8	8	8	8	100	0.00
42	8	8	8	8	8	8	8	8	8	8	100	0.00
56	8	8	8	8	8	8	8	8	8	8	100	0.00
75	8	8	8	8	8	8	8	8	8	8	100	0.00
100	8	8	8	8	8	8	8	8	8	8	100	0.00
Initials Date/Time	9-1-14 26 0905					9-2-14 NL 1500						

Client / Facility EEG Clarksville
 Lab ID Number 22781
 Outfall Number 001
 Test Date 8-26-14

INITIAL CHEMISTRY MEASUREMENTS @ 100% EFFLUENT

Date	Samp. No.	pH	DO	Hardness mg/L CaCO3	Alkalinity mg/L CaCO3	Conduct. umhos/cm	Resid. Cl2 mg/L	Dechlor(mL) Na2S2O3 mg/L	Analyst
8/26	1	6.67	8.89	96	20	787	20.01	Na	TN
8/28	2	7.67	7.90	100	36	714	∞	∞	∞
8/30	3	7.88	7.19	96	32	728	∞	∞	∞

INITIAL CHEMISTRY MEASUREMENTS @ RECEIVING WATER

Date	Samp. No.	pH	DO	Hardness mg/L CaCO3	Alkalinity mg/L CaCO3	Conduct. umhos/cm	Resid. Cl2 mg/L	Dechlor(mL) Na2S2O3 mg/L	Analyst
8/26	RS1	7.58	8.63	268	150	1437	20.01	Na	TN
8/28	RS2	8.09	8.02	268	128	1587	∞	∞	∞
8/30	RS3	8.24	8.17	264	130	1265	∞	∞	∞

Notes:

APPENDIX B
REFERENCE TOXICANTS

CHRONIC REFERENCE TOXICANT TEST RESULTS

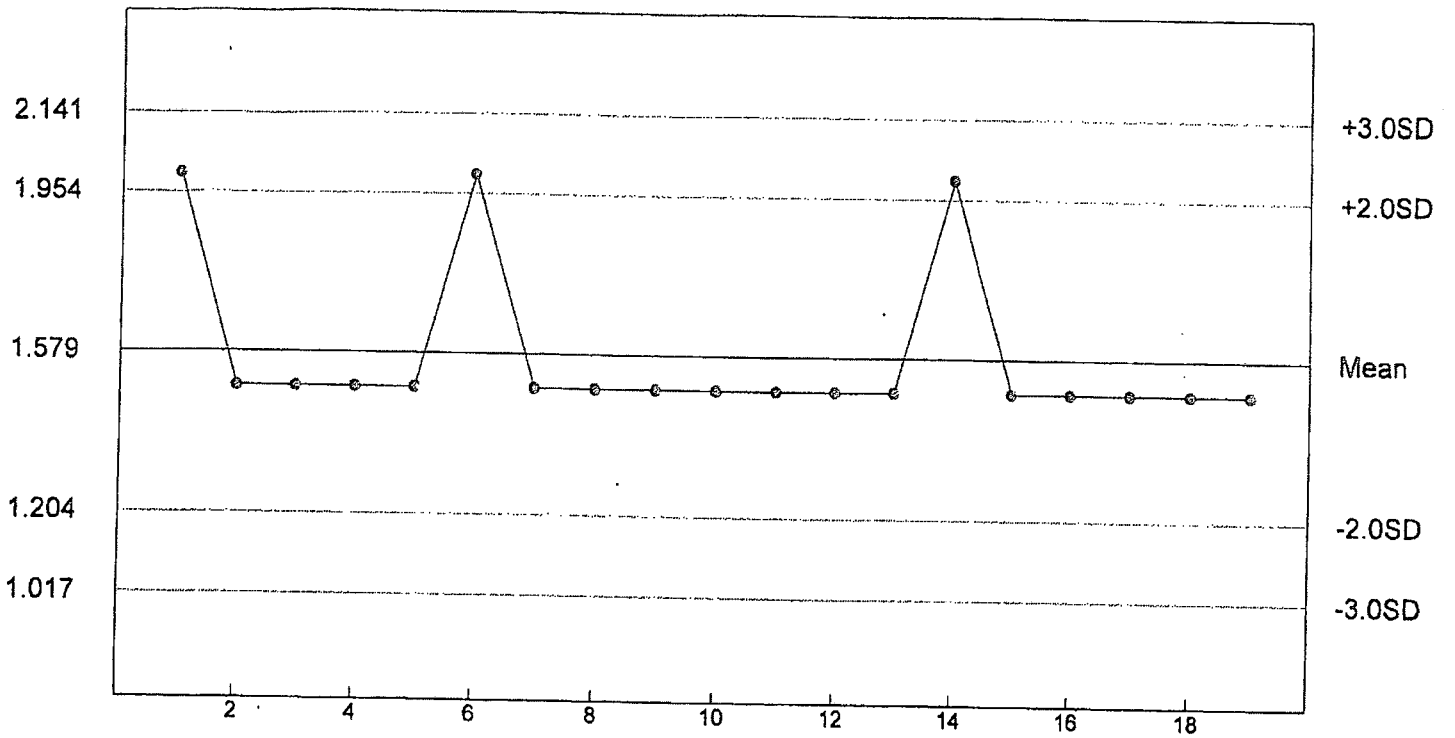
SPECIES: *Ceriodaphnia dubia*
 CHEMICAL: Sodium Chloride
 DURATION: 7-Days
 TEST NUMBER: 08
 TEST DATE/TIME: 08/05/14 - 08/12/14
 1500 Hrs - 1500 Hrs
 STATISTICAL METHOD: Fishers, Dunnetts/Steels

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

Reference Tox Sodium Chloride g/L

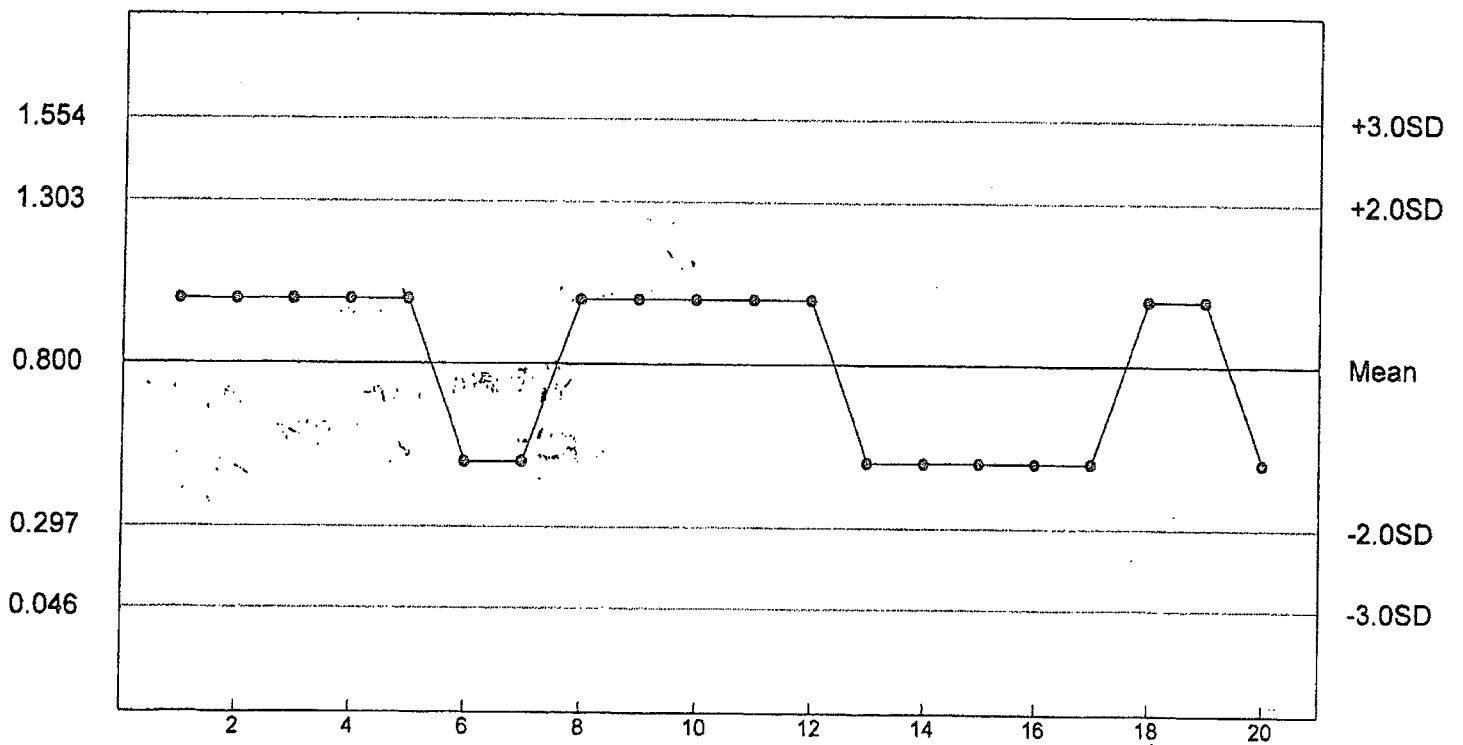
C. dubia Survival - NOEC



n= 19 Mean= 1.579 SD= 0.187 CV= 11.86% Min= 1.500 Max= 2.000

Reference Tox Sodium Chloride g/L

C. dubia Reproduction - NOEC



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

CHRONIC REFERENCE TOXICANT TEST RESULTS

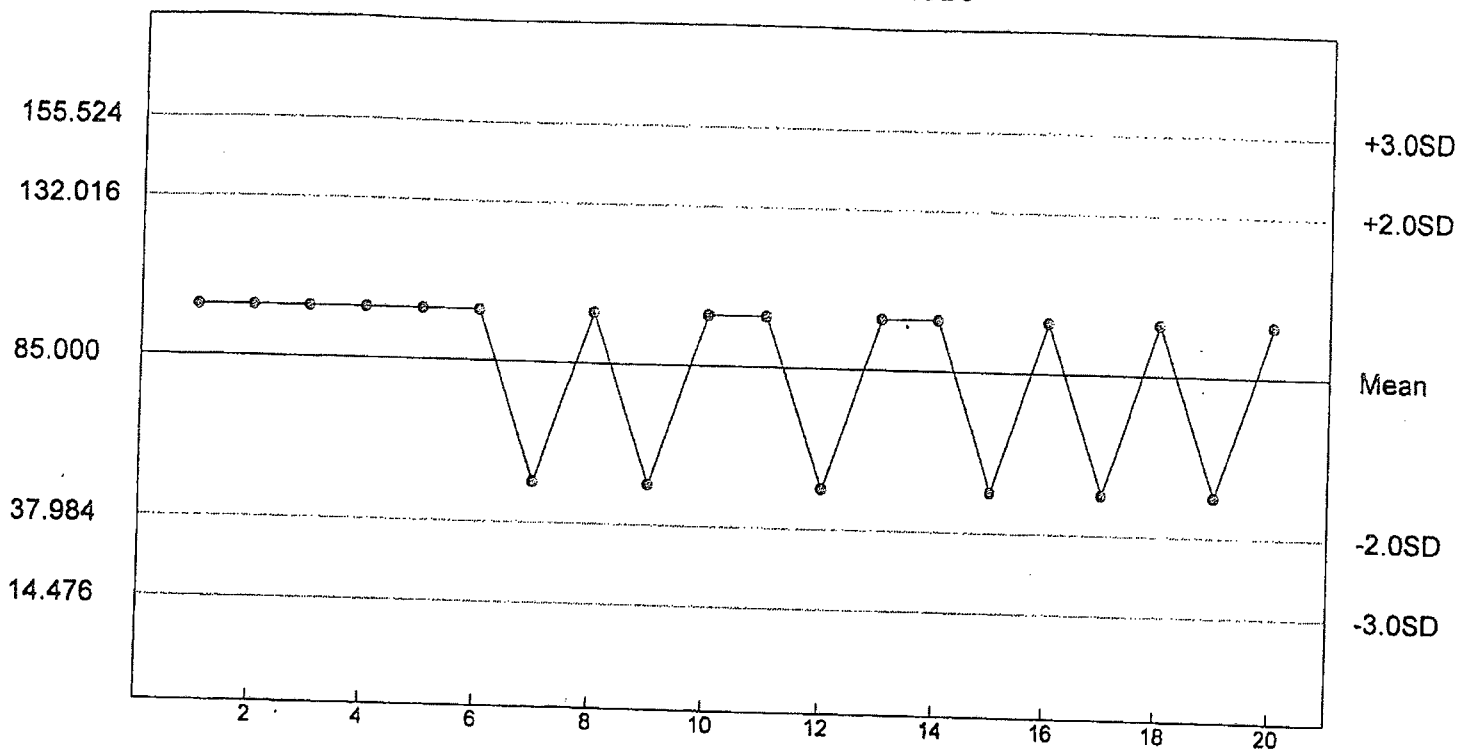
SPECIES: *Pimephales promelas*
 CHEMICAL: Copper Nitrate
 DURATION: 7-Days
 TEST NUMBER: 08
 TEST DATE/TIME: 08/05/14 - 08/12/14
 1600 Hrs - 1600 Hrs
 STATISTICAL METHOD: Dunnetts/Steels

CONCENTRATION (ug/L)	NUMBER EXPOSED	NUMBER DEAD
12.5	40	0
25	40	0
50	40	0
100	40	0
200	40	26
400	40	40
800	40	40

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

Reference Tox Copper Nitrate ug/L

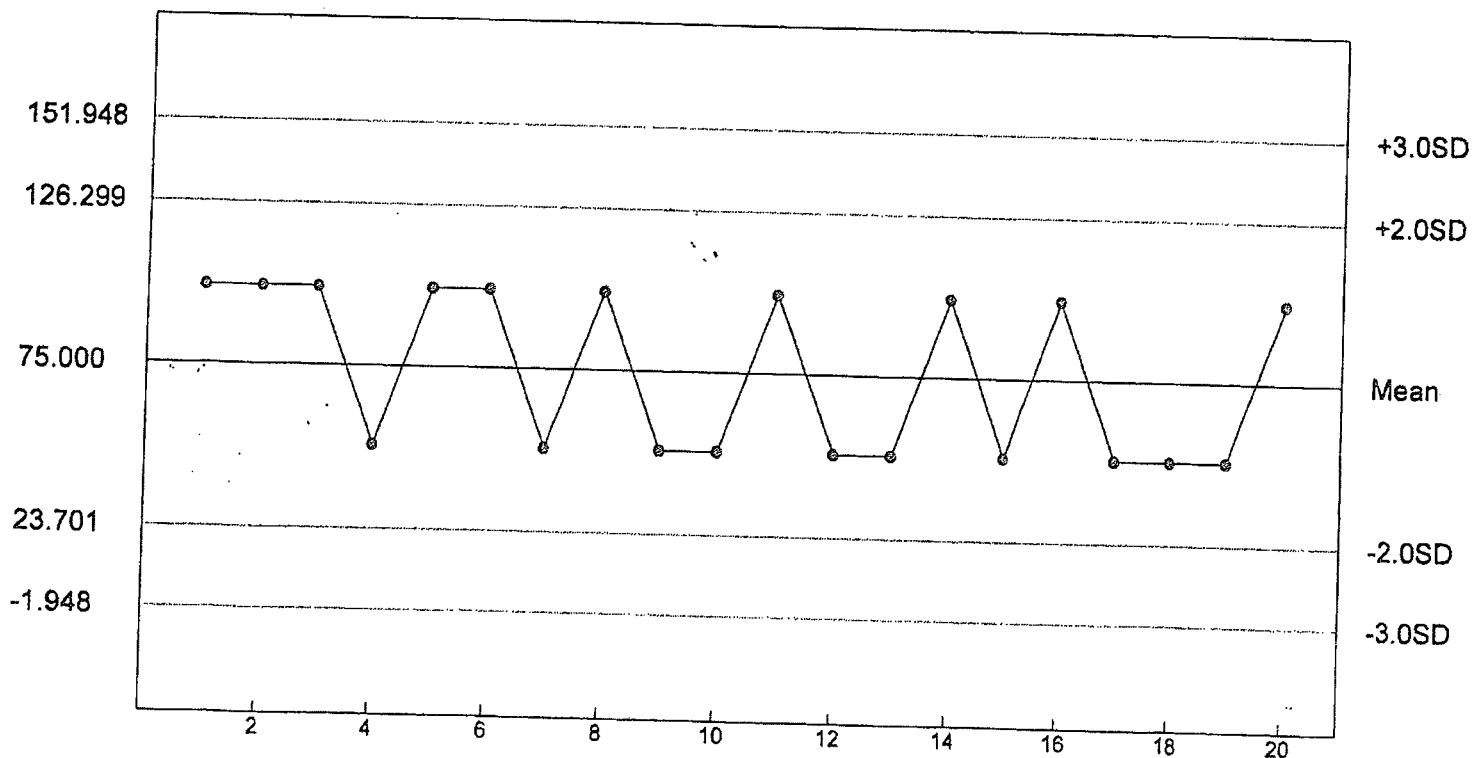
P. promelas Chronic Survival - NOEC



n= 20 Mean= 85.000 SD= 23.508 CV= 27.66% Min= 50.000 Max= 100.000

Reference Tox Copper Nitrate ug/L

P. promelas Growth - NOEC



n= 20 Mean= 75.000 SD= 25.649 CV= 34.20% Min= 50.000 Max= 100.000

**APPENDIX C
CHAIN OF CUSTODY SHEETS**

ENVIRONMENTAL ENTERPRISE GROUP
CITY OF CLARKSVILLE WWTP – OUTFALL 001
NPDES PERMIT NO. AR0022187
AFIN NO. 36-00038
BIOMONITORING REPORTING
TEST DATE: 08/26/14

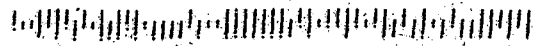
II. *Ceriodaphnia dubia*

	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.	6.98%

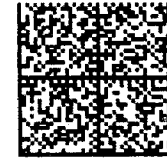
I. *Pimephales promelas*

	Response
A. If the No Observed Effect Concentration (NOEC) for survival is less than the critical dilution, enter a "1"; otherwise, enter a "0". Parameter No. TLP6C.	0
B. If the No Observed Effect Concentration (NOEC) for growth is less than the critical dilution, enter a "1"; otherwise, enter a "0". Parameter No. TGP6C.	0
C. Report the NOEC value for survival, Parameter No. TQP6C.	100%
D. Report the NOEC value for growth, Parameter No. TPP6C.	100%
E. Report the highest (critical dilution or control) Coefficient of Variation, Parameter No. TQP6C.	6.31%

CERTIFIED MAIL™



7013 2630 0000 6570 9261



U.S. POSTAGE >> PITNEY BOWES



ZIP 72830 \$ 008.66⁰
02 1W
0001370120 SEP. 19. 2014

CLARKSVILLE LIGHT & WATER CO.

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

To

ADEQ
5301 North Shore Dr.
North Little Rock, AR 72118