4500 NORTH WEST AVE. • P. O. BOX 231 • EL DORADO, AR 71731 • (870) 863-1400

EL DORADO
CHEMICAL COMPANY

August 23, 2013

Arkansas Department of Environmental Quality
Water Enforcement Branch
5301 Northshore Drive
North Little Rock, AR 72118-5317

RE: NPDES Permit AR0000752 Discharge Monitoring Report for period ending July 31, 2013.

Enclosed you will find the Discharge Monitoring Report ending July 31, 2013.
If you have any questions regarding this report, please contact Larken Pennington at (870) 863-1125.

Sincerely,

Greg Withrow

Greg Withrow
General Manager

Enclosures

NON-COMPLIANCE REPORT

Facility Name: ***El Dorado Chemical Company***

Permit Number: ***AR0000752*** ***AFIN:*** ***70-00040***

Month / Year: ***Jul-13***

Type of Violation	*Permit Limit*	*Date of Violation*	*Cause of Violation*	*Corrective Action or Other Narrative*
Outfall 001 / Temperature maximum (88.6°F)	86°F Temperature Maximum	7/1/13, 7/8/13-7/13/13, 7/16/13-7/18/13, 7/20/13-7/22/13	Warm temperatures, mid-day temperature spikes, temperature excursions due to ambient temperature	Daily maximum temperature readings calculated from hourly measurements are utilized as a representative daily maximum temperature for DMR preparation.
Outfall 001 / pH Maximum (9.27 s.u.)	pH Maximum 9.0 s.u.	7/22/2013	Due to warmer temperatures, an algal growth in EDCC's final lake that discharges to Outfall 001 led to a high pH.	EDCC stopped discharge from this outfall until the pH was back within permit limits.
Outfall 001 / TDS Monthly Average (260.0 mg/L)	237.0 mg/L Monthly Average	7/1/2013	Unknown	
Outfall 006 / TDS Monthly Average (415.0 mg/L)	291 mg/L Monthly Average	7/18/2013	Unknown	EDCC has land applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006 / TDS Daily Max (540.0 mg/L)	436.5 mg/L Daily Max	7/18/2013	Unknown	EDCC has land applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006 / Zinc Monthly Average (277.0 ug/L)	115.62 ug/L Monthly Average	7/18/13, 7/26/13	Unknown	EDCC continues to monitor and evaluate potential sources of the Zinc excursion.
Outfall 006 / Zinc Daily Max (285.0 ug/L)	231.99 ug/L Daily Max	7/18/13, 7/26/13	Unknown	EDCC continues to monitor and evaluate potential sources of the Zinc excursion.
Outfall 006 / Lead Monthly Average (24.8 ug/L)	3.8 ug/L Monthly Average	7/18/13, 7/26/13	Unknown	EDCC continues to monitor and evaluate potential sources of the Lead excursion.
Outfall 006 / Lead Daily Max (32.8 ug/L)	7.62 ug/L Daily Max	7/18/13, 7/26/13	Unknown	EDCC continues to monitor and evaluate potential sources of the Lead excursion.
Outfall 007 / TDS Monthly Average (445.0 mg/L)	291 mg/L Monthly Average	7/18/13, 7/26/13	Unknown	EDCC has land applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.
Outfall 007 / TDS Daily Max (580.0 mg/L)	436.5 mg/L Daily Max	7/18/2013	Unknown	EDCC has land applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.
Outfall 007 / Zinc Monthly Average (227.05 ug/L)	115.62 ug/L Monthly Average	7/18/2013	Unknown	EDCC continues to monitor and evaluate potential sources of the Zinc excursion.
Outfall 007 / Zinc Daily Max (369.0 ug/L)	231.99 ug/L Daily Max	7/18/2013	Unknown	EDCC continues to monitor and evaluate potential sources of the Zinc excursion.
Outfall 007 / Lead Monthly Average (13.99 ug/L)	3.8 ug/L Monthly Average	7/18/13, 7/26/13	Unknown	EDCC continues to monitor and evaluate potential sources of the Lead excursion.
Outfall 007 / Lead Daily Max (19.50 ug/L)	7.62 ug/L Daily Max	7/18/13, 7/26/13	Unknown	EDCC continues to monitor and evaluate potential sources of the Lead excursion.

I CERTIFY THAT UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM WITH THE INFORMATION SUBMITTED HEREIN; AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 U.S.C 1001 AND 33 U.S.C. 1319. (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years.)

Greg Withrow

Signature / Date 8/23/13

Bio-Analytical Laboratories (BAL)
ADEQ Certificate #88-0630
Project X5164

Bio-Analytical Laboratories' Executive Summary

Permittee: El Dorado Chemical Company
4500 Northwest Avenue
El Dorado, AR 71731
Project #: X5164
Outfall: 001 (treated process and contaminated storm water)
Permit #: AR0000752/ AFIN #70-00040
Contact: Larken Pennington
Test Dates: July 16 - 23, 2013
Test Type: Chronic Static Renewal Survival and Reproduction Test using *Ceriodaphnia dubia* (EPA Method 1002.0).
Chronic Static Renewal Survival and Growth Test using *Pimephales promelas* (EPA Method 1000.0).

Results:

For *Ceriodaphnia dubia:*

1. If the NOEC for survival is less than the critical dilution (100.0%), enter a "1"; otherwise, enter a "0" for Parameter TLP3B - 0 **(Pass)**.
2. If the NOEC for reproduction is less than the critical dilution, enter a "1"; otherwise, enter a "0" for Parameter TGP3B - 1 **(Fail)**.
3. Report the NOEC value for survival, Parameter TOP3B - 100.0%.
4. Report the NOEC value for reproduction, Parameter TPP3B - 0.0%.
5. Report the largest % coefficient of variation between the control and the critical dilution, Parameter TQP3B - 67.61%.

For *Pimephales promelas:*

1. If the NOEC for survival is less than the critical dilution (100.0%), enter a "1";otherwise, enter a "0" for Parameter TLP6C - 0 **(Pass)**.
2. If the NOEC for growth is less than the critical dilution, enter a "1";otherwise, enter a "0" for Parameter TGP6C- 1 **(Fail)**.
3. Report the NOEC value for survival, Parameter TOP6C - 100.0%
4. Report the NOEC value for growth, Parameter TPP6C - 32.0%
5. Report the largest % coefficient of variation between the control and the critical dilution, Parameter TQP6C - 15.93%.

This report contains a total of 48 pages, including this page. The results in the report pertain only to the samples documented in the enclosed chain of custody documents, and meet the standards set forth by TNI and ADEQ. The chemical data in this report is for monitoring purposes only and should not be reported on discharge monitoring reports.

Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023

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

THE RESULTS OF TWO CHRONIC DEFINITIVE TOXICITY TESTS FOR OUTFALL 001

AT

EL DORADO CHEMICAL COMPANY
El Dorado, Arkansas

NPDES #AR0000752
AFIN #70-00040

EPA Methods 1000.0 and 1002.0

Project X5164

Test Dates: July 16 - 23, 2013

Report Date: August 8, 2013

Prepared for:
Larken Pennington
El Dorado Chemical Company
4500 Northwest Avenue
El Dorado, AR 71731

Prepared by:
Ginger Briggs
Bio-Analytical Laboratories
P.O. Box 527
Doyline, LA 71023
ADEQ #88-0630

BAL
ADEQ #88-0630
Project X5164

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BAL
ADEQ #88-0630
Project X5164

1.0 Introduction

Bio-Analytical Laboratories (BAL), Doyline, Louisiana conducted two chronic definitive toxicity tests for Outfall 001 at El Dorado Chemical Company, El Dorado, Arkansas. The test organisms used were the cladoceran, *Ceriodaphnia dubia*, and the fathead minnow, *Pimephales promelas*. The purpose of this study is to determine if appropriately dilute effluent samples adversely affect the survival, reproduction and/or growth of the test organisms. Toxicity is defined as a statistically significant difference at the 95 percent confidence level between the survival, reproduction and/or growth of the test organism 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, reproduction and/or growth of the test organism in the control. The test endpoint is the No-Observed-Effect-Concentration (NOEC), the highest effluent concentration that is not significantly different from the control.

2.0 Methods and Materials

2.1 Test Methods

All methods followed were according to the latest edition of "Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms" (EPA-821-R-02-013) and BAL's standard operating procedure.

2.2 Test Organisms

The *Ceriodaphnia dubia* test organisms were cultured in-house at test temperature and dilution water hardness and were less than 24 hours old at test initiation. The neonates were released within the same 8-hour period. The fathead minnow test organisms were obtained from Aquatic Biosystems, Fort Collins, Colorado (ABS) and were less than 48 hours old at test initiation. The minnows were acclimated to test temperature and dilution water hardness prior to test initiation. Monthly chronic reference toxicant tests were conducted in order to document organism sensitivity and demonstration of capability.

2.3 Dilution Water

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

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ADEQ #88-0630
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2.4 Test Concentrations

The test concentrations used in the chronic toxicity tests were 100.0, 75.0, 56.0, 42.0 and 32.0 percent effluent, and a reconstituted water control. The critical dilution was 100.0 percent effluent. The *Ceriodaphnia* test was conducted using 10 replicates of one animal each for a total of 10 animals per concentration. The fathead minnow test was conducted using five replicates of eight animals each for a total of 40 animals per concentration.

2.5 Sample Collection

Three 24-hour composite samples of Outfall 001 were collected by El Dorado Chemical personnel on July 15, 17 and 19, 2013. Upon collection and completion of each composite, the samples were chilled to $\leq 6.0^0$ Celsius. The samples were delivered the day of collection to the laboratory by BAL personnel. Sample temperature upon arrival ranged from 1.9 - 3.0^0 Celsius between the three samples.

2.6 Sample Preparation

Upon arrival, the samples were logged in, given an identification number and refrigerated unless needed. Prior to use, the samples were warmed to 25 ± 1^0 Celsius. Total residual chlorine levels were measured with a Capital Controls^R amperometric titrator and recorded if present. Total ammonia levels were measured using a HACH^R test strip. Portions of the effluent were treated with an 18 watt ultraviolet light (UV) at a rate of 113 ml per minute. An extra 100.0 percent concentration was run in the tests to determine if any toxicity was due to pathogen interference. Dissolved oxygen and pH measurements were measured on the control and each concentration at test initiation, at test renewal and at test termination. Conductivity measurements were also taken at test initiation and at each renewal. Alkalinity and hardness levels were measured on the control and the undiluted effluent samples.

2.7 Monitoring of the Tests

The cladoceran test was run in a Precision^R dual-programmable, illuminated incubator at a temperature of 25 ± 1^0 Celsius. The fathead minnow test was run in a circulating waterbath, using a Remcor^R heated liquid circulator to keep a constant temperature of 25 ± 1^0 Celsius. AEMC^R data-loggers were used to monitor diurnal test temperature. Test temperatures were recorded at the beginning of the day, after test renewal and at the end of the day. Light cycles and intensities were recorded twice a month.

2.8 Data Analysis

Ceriodaphnia dubia survival data was analyzed using Fisher's Exact Test, an equality test comparing concentration data to control data. Reproduction data was analyzed using Dunnett's Test, a parametric test comparing concentration data to control data. Fathead minnow survival data was analyzed using Steel's Many-One Rank Test, a nonparametric test comparing concentration data to control data, and growth data was analyzed using Dunnett's Test. The test endpoints in the reference toxicant tests and any other quality control test endpoints were obtained by approved EPA methods of analysis.

3.0 Results and Discussion

The results of the *Ceriodaphnia dubia* test can be found in Table 1. After seven days of exposure, 100.0 percent survival occurred in the control and 80.0 percent survival occurred in the 100.0 percent critical dilution. The average number of neonates per female after three broods in the control was 23.1, while the average number of neonates in the 100 percent critical dilution was 2.0. The No-Observed-Effect-Concentration (NOEC) for survival and reproduction in this test was 100.0 and zero percent effluent, respectively (p=.05). Treating the effluent with UV-light did not reduce the sublethal effects in the critical dilution.

The fathead minnow test results can be found in Table 2. Ninety percent survival occurred in the control and in the 100.0 percent critical dilution after seven days of exposure. The average weight gained per minnow in the control was 0.493 milligram (mg) and the average weight gained in the critical dilution was 0.395 mg. A non-monotonic response occurred in the growth data. After further investigation it was determined that the NOEC for survival and growth in this test was 100.0 and 32.0 percent effluent, respectively (p=.05). Treating the effluent with UV-light did not reduce the sublethal effects in the critical dilution.

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ADEQ #88-0630
Project X5164

Table 1: Results of the Chronic Definitive *Ceriodaphnia dubia* Test

Percent Effluent	Percent Survival	Sig.*	Mean # Neonates-Surviving	Mean # Neonates -Total	Sig.*
Control	100.0		23.1	23.1	
32.0	100.0		15.0	15.0	*
42.0	100.0		11.7	11.7	*
56.0	80.0		9.0	8.2	*
75.0	100.0		5.4	5.4	*
100.0	80.0		2.5	2.0	*
100.0 UV	100.0		8.9	8.9	*

*significant when compared to the control (p=.05). Test validity based on mean number of neonates per surviving female. NOEC value based on total mean number of neonates. +accidental death.

Table 2: Results of the Chronic Definitive Fathead Minnow Test

Percent Effluent	Percent Survival	Sig.*	Mean Dry Weight (mg)	Sig.*
Control	90.0		0.493/0.551+	
32.0	95.0		0.418	
42.0	95.0		0.385	*
56.0	97.5		0.393	*
75.0	100.0		0.425	
100.0	97.5		0.395	*
100.0 UV	97.5		0.390	*

*significant when compared to the control (p=.05). +Test validity based on mean dry weight per surviving larvae in the control. NOEC value based on mean dry weight per the number of larvae at the start of the test.

The monthly chronic reference toxicant tests showed those test organisms to be within the respective sensitivity range. The graphs of the results of the chronic reference toxicant tests can be found in Appendix D- Quality Assurance Charts.

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Project X5164

4.0 Conclusions

The three composite samples of Outfall 001 collected from El Dorado Chemical Company, El Dorado, Arkansas, on July 15, 17 and 19, 2013, were not found to be lethally toxic to the *Ceriodaphnia dubia* test organisms nor the fathead minnow test organisms in the 100.0 percent critical dilution after seven days of exposure (p=.05). Sub-lethal effects (i.e., lack reproduction and growth) were noted in the critical dilution in both tests (p=.05). Treating the samples with UV-light did not reduce the toxic effects.

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Project X5164

5.0 References

EPA, 2002. Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. EPA-821-R-02-013, 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
3340 Sturgis Road
Post Office Box 927
Daphne, LA 71023
(318) 746-8772
1-800-288-1946
Fax: (318) 746-8773

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

Laboratory Use Only:

Company: El Dorado Chemical Company	Phone: (870) 863-1484	Analysis:								
Address: 4500 Norwest Ave., El Dorado, AR 71731	Fax: (870) 863-7499									
Permit #: AR0000752/AFIN 70-00040	Purchase Order:									
Sampler's Signature/Printed Name/Affiliation: Larken Pennington / Larken Pennington / EDCC										

Date Start / Date End	Time Start / Time End	C	G	# and type of container	Sample Identification	Chronic Ceriodaphnia	Chronic minnow	Acute minnow (fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	Fecal Coliform		
7-14-13 / 7-15-13	8:30 / 8:30	x		8 half gallons	001	X	X						C7689	ICE

Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Larken Pennington / EDCC	7/15/13	1040		7/15/13	1040
Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Relinquished by/Affiliation:	Date: 7-15-13	Time: 1305	Received by/Affiliation:	Date: 7/15/13	Time: 1305

Method of Shipment: ✓ Lab ____ Bus ____ Fed Ex ____ DHL ____ UPS ____ Client ____ Other Tracking #____

Comments:

Bio-Analytical Laboratories
3340 Spurgin Road
Post Office Box 627
Daphne, LA 71029
(318) 746-8772
1-800-256-1946
Fax: (318) 746-8778

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

Laboratory Use Only:

Company: El Dorado Chemical Company				**Phone:** (870) 863-1484		**Analysis:**									
Address: 4500 Norwest Ave., El Dorado, AR 71731				**Fax:** (870) 863-7499											
Permit #: AR0000752/AFIN 70-00040				**Purchase Order:**											
Sampler's Signature/Printed Name/Affiliation: Larken Pennington/Larken Pennington/EDC															
Date Start / **Date End**	**Time Start** / **Time End**	**C**	**G**	**# and type of container**	**Sample Identification**	Chronic Ceriodaphnia	Chronic minnow	Acute minnow (fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	Fecal Coliform			
7/16/13-7/17/13	8:30-8:30	x		8 half gallons	001	X	X						C7704	ICE	

Relinquished by/Affiliation: Larken Pennington/EDC	**Date:** 7/17/13	**Time:** 1035	**Received by/Affiliation:**	**Date:** 7/17/13	**Time:** 1035
Relinquished by/Affiliation:	**Date:**	**Time:**	**Received by/Affiliation:**	**Date:**	**Time:**
Relinquished by/Affiliation:	**Date:** 7/17/13	**Time:** 1310	**Received by/Affiliation:**	**Date:** 7/17/13	**Time:** 1310

Method of Shipment: ___ Lab ___ Bus ___ Fed Ex ___ DHL ___ UPS ___ Client ___ Other **Tracking #**_____
Comments:

ival: 2.8°C

Bio-Analytical Laboratories
3340 Spurgin Road
Post Office Box 927
Doyline, LA 71023
(318) 745-3772
1-800-388-1946
Fax: (318) 745-2773

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

Laboratory Use Only:

Company: El Dorado Chemical Company	Phone: (870) 863-1484	Analysis:								
Address: 4500 Norwest Ave., El Dorado, AR 71731	Fax: (870) 863-7499									
Permit #: AR0000752/AFIN 70-00040	Purchase Order:									
Sampler's Signature/Printed Name/Affiliation: Larken Pennington/Larken Pennington/EDCC										

Date Start / Date End	Time Start / Time End	C	G	# and type of container	Sample Identification	Chronic Ceriodaphnia	Chronic minnow	Acute minnow(fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	Fecal Coliform		
7/18/13-7/19/13	8:30-8:30	x		8 half gallons	001	X	X						C-7723	ICE

Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Larken Pennington/EDCC	7/19/13	1015	[signature]	7/19/13	1015
Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Relinquished by/Affiliation: [signature]	Date: 7/19/13	Time: 1240	Received by/Affiliation: [signature]	Date: 7/19/13	Time: 1240

Method of Shipment: ✓ Lab ___ Bus ___ Fed Ex ___ DHL ___ UPS ___ Client ___ Other Tracking #_____

Comments:

Arrival: 3.0°C

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST

Project# X5164 Date start: 7/16/13 Date end: 7/22/13

Client/Contact: EDCC/El Dorado Chemical
Address: 4500 Northwest Avenue El Dorado AR 71731
NPDES#: AR0000752 AFIN70-00040
Sample Description: 001 Dilution Water: Soft Reconstituted
Test Temperature(°C) 25+1° Technicians: EGB/AH/LC/GW

Adults isolated: Date 7/15/13 Time: 2300

Neonates collected: Date 7/16/13 Time: 0545 Board: W24S
Dissolved Oxygen Meter: Model YSI55D Serial #06E2089 AU
pH Meter: Model Orion 230A+ Serial #105253
Conductivity Meter: Model Control Company Serial# 80277924
Amperometric Titrator: Model Fischer-Porter Serial # 92W445766

Effluent Initial D.O. (mg/L & %)/Tech	Aerate?/Minutes /Final D.O. (mg/L & %)/Tech	Receiving Water Initial D.O. (mg/L & %)/Tech	Aerate?/Minutes /Final D.O. (mg/L & %)/Tech
0. 9.0/107.8/AH	0. Y/20/7.8/92.6%/LC	0. NA	0. NA
1. 9.1/110.0%/LC	1. Y/20/7.9/94.7%/SW	1.	1.
2. 8.7/104.1%/LC	2. Y/20/7.9/95.3%/LC	2.	2.
3. 8.5/99.7%/SW	3. No/SW	3.	3.
4. 7.3/91.7%/SW	4. No/SW	4.	4.
5. 8.5/104.9%/EGB	5. Y/20/7.9/93.1%/EGB	5.	5.
6. 8.7/104.1%/SW	6. Y/20/8.0/94.6%/SW	6.	6.
7.	7.	7.	7.

Total Residual Chlorine(mg/L)/ Tech	Dechlorinated? Amount?/Tech	Ammonia (NH3) (mg/L)/Tech	BAL Sample # Date in Use
1. <0.01/AH	1. No/AH	1. 0.5/AH	1. C7689 7/16/13
2. <0.01/LC	2. No/LC	2. 0.5/LC	2. C7704 7/18/13
3. <0.01/SW	3. No/SW	3. 0.5/SW	3. C7723 7/20/13

Comments:

BIO-ANALYTICAL LABORATORIES
NUMBER NEONATES PER BROOD CERIODAPHNIA

Project # X5164 Test Dates 7/16/13-7/23/13

Client EDCC-001

Replicate	% Concentration								
	0	32	42	56	75	100	100aw		
A	24	15	13	8	6	1	5		
B	23	17	11	X5	10	X	7		
C	17	15	17	10	7	1	9		
D	28	15	13	10	7	2	14		
E	21	16	11	5	6	6	4		
F	21	16	13	11	5	X	12		
G	17	15	11	14	5	3	10		
H	25	12	13	X5	1	3	10		
I	30	14	7	6	3	3	8		
J	25	15	8	8	4	1	10		
Surviving Mean	23.1	15.0	11.7	9.0	5.4	2.5	8.9		
Total Mean	23.1	15.0	11.7	8.2	5.4	2.0	8.9		
CV%*	18.42	8.89	24.19	31.98	45.53	67.61	34.10		

*coefficient of variation = standard deviation x 100/mean (calculation based on young of the surviving adults)

Key: M=male; X=dead adult

Calculated by: AH 7/29/13

Calculations checked by: EGB 7/31/13

BIO-ANALYTICAL LABORATORIES

CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST-LIVE NEONATE PRODUCTION

Project# X5164 Test started: Date 7/16 Time 1510
Client El Dorado Chemical Test ended: Date 7/23 Time 1350

	Day0	1	2	3	4	5	6	7	8
Technician:	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Time:	1510	1310	1425	1310	1115	1236	1350	1350	
Temp. (°C):	24.8	24.7	24.7	24.6	24.0	25.0	24.4	25.3	

Conc %	Day	A ✓	B ✓	C ✓	D ✓	E ✓	F ✓	G ✓	H	I ✓	J ✓	Number of Live Adults
0	1	0										10
	2	0										10
	3	0										10
	4	2	2	7	3	2	3	2	3	4	4	10
	5	0	0	1	0	0	0	0	1	0	0	10
	6	8	8	4	12	8	8	6	5	11	8	10
	7	14	13	10	13	11	10	9	16	15	13	10
	8											
32	1	0										10
	2	0										10
	3	0										10
	4	0	0	1	1	1	3	3	2	2	0	10
	5	1	0	5	0	0	5	0	0	2	0	10
	6	6	6	0	8	5	0	6	5	0	6	10
	7	8	11	9	6	10	8	6	5	10	9	10
	8											
42	1	0										10
	2	0										10
	3	0										10
	4	1	1	3	1	2	3	2	2	0	0	10
	5	0	0	8	6	0	4	3	0	0	0	10
	6	6	3	0	0	4	0	0	2	2	3	10
	7	6	7	6	6	5	6	4	8	5	5	10
	8											
56	1	0										10
	2	0										10
	3	0										10
	4	1	0	2	1	0	1	1	1	0	0	10
	5	0	1	5	1	0	0	3	0	0	0	10
	6	4	X4	3	4	4	4	6	3	1	3	9
	7	3		0	4	1	6	4	X1	5	5	8
	8											
75	1	0										10
	2	0										10
	3	0										10
	4	1	1	1	1	0	1	2	0	1	2	10
	5	0	0	1	0	0	0	0	0	0	0	10
	6	3	4	0	3	1	0	2	1	1	0	10
	7	2	5	5	4	5	4	1	0	1	2	10
	8											
100	1	0										10
	2	0										10
	3	0										10
	4	0	0	1	0	1	0	0	0	1	1	10
	5	0	0	0	0	0	X	0	0	6	0	9
	6	0	X0	0	0	2		2	2	0	0	8
	7	1		0	2	3		1	1	2	0	8
	8											

Key: X=dead adult, X^n=adult had n neonates before death, M=male CERIO2 Rev.2.0

BIO-ANALYTICAL LABORATORIES

CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST-LIVE NEONATE PRODUCTION

Project# X5164 Test started: Date 7/4/03 Time 1510

Client El Dorado Chemical Test ended: Date 7/10/03 Time 1350

Technician: Day0 SC 1 SW 2 AH 3 AH 4 SW 5 CCD 6 SW 7 SW 8 ____

Time: Day0 1510 1 1130 2 1425 3 1310 4 1145 5 1256 6 1350 7 1250 8 ____

Temp. (°C): Day0 24.4 1 24.2 2 24.7 3 24.6 4 24.0 5 25.0 6 24.9 7 25.2 8 ____

Conc %	Day	A	B	C	D	E	F	G	H	I	J	Number of Live Adults
100 ww. Ttd	1	0										10
	2	0										10
	3	0										10
	4	0	0	2	3	0	2	2	0	0	1	10
	5	0	0	0	0	0	2	0	1	0	0	10
	6	1	3	0	3	0	0	2	4	3	3	10
	7	4	4	7	8	4	8	6	5	5	6	10
	8											
	1											
	2											
	3											
	4											
	5											
	6											
	7											
	8											
	1											
	2											
	3											
	4											
	5											
	6											
	7											
	8											
	1											
	2											
	3											
	4											
	5											
	6											
	7											
	8											
	1											
	2											
	3											
	4											
	5											
	6											
	7											
	8											
	1											
	2											
	3											
	4											
	5											
	6											
	7											
	8											

Omit AH 7/16/03

Key: X=dead adult, X^n=adult had n neonates before death, M=male CERIO2 Rev.2.0

BIO-ANALYTICAL LABORATORIES CHRONIC WATER QUALITY DATA

Project# X5164 Test started: Date 7/16/2 Time 1510
Client El Dorado Chemicals Test ended: Date 7/23/2 Time 1350
Organism C. dubia

Day/# water used	0 3513	1 3516	2	3	4	5	6	7	8
Concentration: Control 50%									
pH	7.6	7.4/7.3	7.3/7.4	7.4/7.6	7.6/7.3	7.5/7.5	7.6/7.4	7.4	
DO (mg/l)	8.3	8.2/8.3	8.0/8.3	8.1/8.3	8.2/8.4	8.0/8.2	8.1/8.3	8.0	
Cond (umhos/cm)	168.2	168.4	167.7	168.0	168.4	167.6	700		
Alkalinity (mg/L)	36.0	36.0							
Hardness (mg/L)	44.0	44.0							
Concentration: 32%									
pH	7.8	7.5/7.5	7.4/7.6	7.5/7.6	7.6/7.5	7.5/7.4	7.5/7.6	7.4	
DO (mg/l)	8.2	8.1/8.2	8.0/8.2	8.0/8.5	8.1/8.0	7.7/8.1	8.0/8.2	8.0	
Cond (umhos/cm)	229	229	226	225	226	225.0	227		
Concentration: 42%									
pH	7.8	7.4/7.5	7.4/7.7	7.5/7.7	7.7/7.6	7.5/7.5	7.6/7.7	7.6	
DO (mg/l)	8.1	8.1/8.2	8.0/8.2	8.0/8.6	8.1/7.9	7.7/8.0	8.0/8.2	8.0	
Cond (umhos/cm)	245	247	242	241	240	238.0	244		
Concentration: 56%									
pH	7.8	7.7/7.6	7.5/7.7	7.6/7.8	7.7/7.8	7.5/7.6	7.6/7.8	7.7	
DO (mg/l)	8.1	8.1/8.1	8.0/8.1	8.0/8.7	8.2/7.8	7.7/8.0	7.9/8.2	8.0	
Cond (umhos/cm)	270	272	271	264	260	259.0	266		
Concentration: 75%						pH adj			
pH	7.9	7.8/7.6	7.5/7.8	7.6/7.9	7.8/7.8	7.6/7.7	7.7/7.8	7.9	
DO (mg/l)	8.0	8.0/8.1	7.9/8.0	8.0/8.7	8.1/7.6	7.7/7.9	7.9/8.1	8.0	
Cond (umhos/cm)	307	308	302	306	295	293.0	299		
Concentration: 100%									
pH	8.0	7.9/7.7	7.6/7.9	7.7/8.0	7.8/8.1	7.6/7.7	7.7/7.9	7.9	
DO (mg/l)	7.7	8.0/8.0	7.9/7.9	8.0/8.5	8.0/7.5	7.7/7.8	7.9/8.0	8.0	
Cond (umhos/cm)	354	354	347	344	340	337.0	344		
Tech-prerenewal		SW	AH	AH	SW	EGB	SW	SW	
Tech-postrenewal	JC	JC	JC	SW	SW	EGB	SW		
Alkalinity (mg/l)	68.0		72.0		76.0				
Hardness (mg/l)	24.0		44.0		44.0				

Key: prerenewal/postrenewal

BIO-ANALYTICAL LABORATORIES CHRONIC WATER QUALITY DATA

Project# X5164 Test started: Date 1/6/12 Time 1510
Client El Dorado Chemical Test ended: Date 1/13/12 Time 1350
Organism Cerio

Day/# water used	0	1	2	3	4	5	6	7	8
Concentration: ~~Control~~ 100% WW tested									
pH	7.9	7.7 / 7.8	7.7 / 7.8	7.7 / 7.8	7.9 / 8.0	7.7 / 7.8	7.7 / 7.8	8.0	
DO (mg/l)	7.7	7.7 / 7.7	7.9 / 7.6	7.9 / 8.7	8.0 / 7.5	7.5 / 7.8	7.8 / 7.7	7.7	
Cond (umhos/cm)	881	355	352	344	323	326.0	339		
Alkalinity (mg/L)									
Hardness (mg/L)									
Concentration:									
pH									
DO (mg/l)									
Cond (umhos/cm)									
Concentration:									
pH									
DO (mg/l)		DH							
Cond (umhos/cm)									
Concentration:									
pH									
DO (mg/l)									
Cond (umhos/cm)									
Concentration:									
pH									
DO (mg/l)									
Cond (umhos/cm)									
Concentration:									
pH									
DO (mg/l)									
Cond (umhos/cm)									
Tech-prerenewal		GW	AH	DH	GW	EGB	GW	GW	
Tech-postrenewal	LC	LC	LC	GW	GW	EGB	GW		
Alkalinity (mg/l)									
Hardness (mg/l)									

Key: prerenewal/postrenewal

BIO-ANALYTICAL LABORATORIES
PIMEPHALES PROMELAS SURVIVAL AND GROWTH DATA SHEET

Project# X5164 Date started: 7/16/13 Date ended 7/23/13

Client/Contact_ EDCC/El Dorado Chemical
Address 4500 Northwest Avenue El Dorado AR 71731
NPDES# AR0000752 AFIN70-00040
Sample Description 001 Dilution Water Soft Reconstituted
Test Temperature(°C) 25+1° Celsius Technicians EGB/AH/LC/GW
Test organism age 24hr Vendor/ID# ABS/750

Feeding Times

Day	Technician/Time/Amount (per replicate) AM	NOON	PM
0			SW 7/16/13 SW/0920/0.20ml HS/1017/10
1	SW/0845/0.10ml	LC/1050/0.10ml	LC/1525/0.10ml
2	AH/0905/0.10ml	LC/1100/0.10ml	AH/1510/0.10ml
3	SW/0850/0.10ml	SW/1100/0.10ml	SW/1540/0.10ml
4	SW/0925/0.20ml		SW/1510/0.20ml
5	EGB/1030/0.20ml		EGB/1045/0.20ml
6	SW/0840/0.10ml	SW/1055/0.10ml	SW/1605/0.10ml

Dissolved Oxygen Meter: Model YSI55D Serial #06E2089 AU
pH Meter: Model Orion 230A+ Serial #105253
Conductivity Meter: Model Control Company Serial #80277924
Amperometric Titrator: Model Fischer-Porter Serial #92W445766

Effluent Initial DO(mg/L&%)/Tech	Aerate?/Minutes /Final DO (mg/L & %)/Tech	Receiving Water Initial DO (mg/L & %)/Tech	Aerate?/Minutes /Final DO (mg/L & %)/Tech
0. 9.0/107.8%/LC	0. Y/20/7.8/92.6%/LC	0. N/A	0. N/A
1. 9.1/110.9%/LC	1. Y/20/7.9/94.7%/LC	1.	1.
2. 8.7/106.1%/LC	2. Y/20/7.9/95.3%/LC	2.	2.
3. 8.5/99.7%/SW	3. NO/SW	3.	3.
4. 7.3/91.7%/SW	4. NO/SW	4.	4.
5. 8.5/104.9%/EGB	5. Y/20/7.9/93.1%/EGB	5.	5.
6. 8.7/104.1%/SW	6. Y/20/8.0/94.6%/SW	6.	6.

Total Residual Chlorine(mg/L)/ Tech	Dechlorinated? Amount?/Tech	Ammonia(NH3) (mg/L)/Tech	BAL Sample # Date in use
1. <0.01/LC	1. NO/LC	1. 0.5/LC	1 C7689 7/16/13
2. <0.01/LC	2. NO/LC	2. 0.5/LC	2 C7704 7/18/13
3. <0.01/SW	3. NO/SW	3. 0.5/SW	3 C7723 7/20/13

Comments:

BIO-ANALYTICAL LABORATORIES 7-DAY CHRONIC MINNOW SURVIVAL DATA

Project# X5164
Client El Dorado Chemical

Test started: Date 11/6/13 Time 1520
Test ended: Date 11/13/13 Time 1105

Technician:	Day0		1		2		3		4		5		6	7
Time:	Day0	1530	1	1005	2	1340	3	1150	4	1345	5	1008	6	1105	7	1105
Temperature	Day0		1		2		3		4		5		6		7	

Conc.%	Rep.	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
0	A	8	8	8	8	8	8	8	7
	B	8	8	8	7	6	6	6	6
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	7	7	7	7
32	A	8	8	8	8	8	8	8	8
	B	8	8	7	7	7	7	7	7
	C	8	8	8	8	8	8	8	8
	D	8	8	7	7	7	7	7	7
	E	8	8	8	8	8	8	8	8
42	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8	7
	C	8	7	7	7	7	7	7	7
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8	8
56	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	7	7	7	7
75	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8	8
100	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8	8
	D	8	8	8	7	7	7	7	7
	E	8	8	8	8	8	8	8	8

11/12/13

File: Minnow2

BIO-ANALYTICAL LABORATORIES 7-DAY CHRONIC MINNOW SURVIVAL DATA

Project# X5164 Test started: Date 7/16/13 Time 1530
Client El Dorado Chemical Test ended: Date 7/23/13 Time [illegible]

	Day0	1	2	3	4	5	6	7
Technician:	AH	KC	KC	KC	JW	BGB	KC	[illegible]
Time:	1530	1045	1340	1050	0815	1000	1205	1105
Temperature	24	24.5	24.9	25.6	25.0	24.9	25.5	24.0

Conc. %	Rep.	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
100 UV-trt'd	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	7	7	7	7
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	7	7	7	7
	E	8	8	8	8	8	8	8	8
	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								

Void AH 7/16/13

File: Minnow2

BIO-ANALYTICAL LABORATORIES MINNOW LARVAL GROWTH DATA SHEET

Project#/Client X5164/EDCC Test Dates 7/16/13 - 7/23/13

Oven Temperature (° Celsius) 99°C ±2° 7/24/13

Conc. %	Replicate/ Pan number	Wt. of pan(g)/ Date weighed: 7/18/13 Tech: SW	Wt. of pan + larvae(g)/ Date weighed: 7/25/13 Tech: SW	Total wt. of larvae (g)	Original # of larvae at test initiation	Mean Dry wt. of larvae (mg)	Mean Dry wt. - surviving larvae (mg) Control Only*
0	A 71	0.9488	0.9528	0.0040	8	0.500	[7] 0.571
	B 72	0.9504	0.9542	0.0038	8	0.475	[6] 0.633
	C 73	0.9524	0.9570	0.0046	8	0.575	
	D 74	0.9508	0.9546	0.0038	8	0.475	
	E 75	0.9478	0.9513	0.0035	8	0.438	[7] 0.500
32	A 76	0.9464	0.9496	0.0032	8	0.400	
	B 77	0.9459	0.9498	0.0039	8	0.488	
	C 78	0.9471	0.9502	0.0031	8	0.388	
	D 79	0.9483	0.9514	0.0031	8	0.388	
	E 80	0.9451	0.9485	0.0034	8	0.425	
42	A 81	0.9495	0.9527	0.0032	8	0.400	
	B 82	0.9517	0.9543	0.0026	8	0.325	
	C 83	0.9496	0.9526	0.0030	8	0.375	
	D 84	0.9508	0.9544	0.0036	8	0.450	
	E 85	0.9519	0.9549	0.0030	8	0.375	
56	A 86	0.9494	0.9524	0.0030	8	0.375	
	B 87	0.9503	0.9529	0.0026	8	0.325	
	C 88	0.9502	0.9540	0.0038	8	0.475	
	D 89	0.9462	0.9494	0.0032	8	0.400	
	E 90	0.9483	0.9514	0.0031	8	0.388	
75	A 91	0.9232	0.9267	0.0035	8	0.438	
	B 92	0.9447	0.9481	0.0034	8	0.426	
	C 93	0.9502	0.9532	0.0030	8	0375	
	D 94	0.9513	0.9552	0.0039	8	0.488	
	E 95	0.9513	0.9545	0.0032	8	0.400	
100	A 96	0.9501	0.9531	0.0030	8	0.375	
	B 97	0.9487	0.9513	0.0026	8	0.325	
	C 98	0.9507	0.9540	0.0033	8	0.413	
	D 99	0.9493	0.9527	0.0034	8	0.425	
	E 100	0.9458	0.9493	0.0035	8	0.438	

* Test acceptance of control weight based on surviving larvae at end of test.

Calculated by: AH 7/29/13 Calculations checked by: EBB 7/31/13

BIO-ANALYTICAL LABORATORIES MINNOW LARVAL GROWTH DATA SHEET

Project#/Client X5164 / EDCC Test Dates 7/16/13 - 7/23/13
Oven Temperature (° Celsius) 99°C 7/24/13

Conc. %	Replicate/ Pan number	Wt. of pan(g)/ Date weighed: 7/18/13 Tech: SW	Wt. of pan + larvae(g)/ Date weighed: 7/24/13 Tech: SW	Total wt. of larvae (g)	Original # of larvae at test initiation	Mean Dry wt. of larvae (mg)	Mean Dry wt. - surviving larvae (mg) Control Only*
100 UV trt'd	A 101	0.9500	0.9538	0.0038	8	0.475	
	B 102	0.9180	0.9209	0.0029	8	0.363	
	C 103	0.9493	0.9527	0.0034	8	0.425	
	D 104	0.9485	0.9510	0.0025	8	0.313	
	E 105	0.9465	0.9495	0.0030	8	0.375	
	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						

* Test acceptance of control weight based on surviving larvae at end of test.

Calculated by: AH 7/29/13 Calculations checked by: EGB 7/31/13

BIO-ANALYTICAL LABORATORIES CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST

Project# X5164 Date start: 7/16/13 Date end: 7/22/13

Client/Contact: EDCC/El Dorado Chemical
Address: 4500 Northwest Avenue El Dorado AR 71731
NPDES#: AR0000752 AFIN70-00040
Sample Description: 001 Dilution Water: Soft Reconstituted
Test Temperature(°C) 25+1° Technicians: EGB/AH/LC/GW

Adults isolated: Date 7/15/13 Time: 2300

Neonates collected: Date 7/16/13 Time: 0545 Board: W94S
Dissolved Oxygen Meter: Model YSI55D Serial #06E2089 AU
pH Meter: Model Orion 230A+ Serial #105253
Conductivity Meter: Model Control Company Serial# 80277924
Amperometric Titrator: Model Fischer-Porter Serial # 92W445766

	Effluent Initial D.O. (mg/L & %)/Tech	Aerate?/Minutes /Final D.O. (mg/L & %)/Tech	Receiving Water Initial D.O. (mg/L & %)/Tech	Aerate?/Minutes /Final D.O. (mg/L & %)/Tech
0.	9.0/107.8/AH	y/20/7.8/92.6%/LC	N/A	
1.	9.1/110.0%/LC	y/20/7.9/94.7%/SW		
2.	8.7/102.1%/LC	y/20/7.9/95.3%/LC		
3.	8.5/99.7%/SW	no/SW		
4.	7.3/91.7%/SW	NO/SW		
5.	8.5/104.9%/EGB	y/20/7.9/93.1%/EGB		
6.	8.7/104.1%/SW	y/20/8.0/94.6%/SW		
7.				

	Total Residual Chlorine(mg/L)/ Tech	Dechlorinated? Amount?/Tech	Ammonia (NH3) (mg/L)/Tech	BAL Sample # Date in Use
1.	<0.01/AH	NO/AH	0.5/AH	C7689 7/16/13
2.	<0.01/LC	NO/LC	0.5/LC	C7704 7/18/13
3.	<0.01/SW	NO/SW	0.5/SW	C7723 7/20/13

Comments:

BIO-ANALYTICAL LABORATORIES
NUMBER NEONATES PER BROOD CERIODAPHNIA

Project # X5164 Test Dates 7/16/13-7/23/13

Client EDCC-001

Replicate	% Concentration								
	0	32	42	56	75	100	100w		
A	24	15	13	8	6	1	5		
B	23	17	11	X5	10	X	7		
C	17	15	17	10	7	1	9		
D	28	15	13	10	7	2	14		
E	21	16	11	5	6	6	4		
F	21	16	13	11	5	X	12		
G	17	15	11	14	5	3	10		
H	25	12	13	X5	1	3	10		
I	30	14	7	6	3	3	8		
J	25	15	8	8	4	1	10		
Surviving Mean	23.1	15.0	11.7	9.0	5.4	2.5	8.9		
Total Mean	23.1	15.0	11.7	8.2	5.4	2.0	8.9		
CV%*	18.42	8.89	24.19	31.98	45.53	67.61	34.10		

*coefficient of variation = standard deviation x 100/mean (calculation based on young of the surviving adults)

Key: M=male; X=dead adult

Calculated by: AH 7/29/13

Calculations checked by: EGB 7/31/13

BIO-ANALYTICAL LABORATORIES

CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST-LIVE NEONATE PRODUCTION

Project# X5164 Test started: Date 7/6/15 Time 1510

Client El Dorado Chemical Test ended: Date 7/13/15 Time 1350

Technician: Day0 [illegible] 1 [illegible] 2 [illegible] 3 [illegible] 4 [illegible] 5 [illegible] 6 [illegible] 7 [illegible] 8

Time: Day0 1510 1 1310 2 1425 3 1310 4 1135 5 1236 6 1350 7 1355 8

Temp.(°C): Day0 24.8 1 24.7 2 24.7 3 24.6 4 24.9 5 25.0 6 24.9 7 25.3 8

Conc %	Day	A ✓	B ✓	C ✓	D ✓	E ✓	F ✓	G ✓	H ✓	I ✓	J ✓	Number of Live Adults
0	1	0										10
	2	0										10
	3	0										10
	4	2	2	2	3	2	3	2	3	4	4	10
	5	0	0	1	0	0	0	0	1	0	0	10
	6	8	8	4	12	8	8	6	5	11	8	10
	7	14	13	10	13	11	10	9	16	15	13	10
	8											
32	1	0										10
	2	0										10
	3	0										10
	4	0	0	1	1	1	3	3	2	2	0	10
	5	1	0	5	0	0	5	0	0	2	0	10
	6	6	6	0	8	5	0	6	5	0	6	10
	7	8	11	9	6	10	8	6	5	10	9	10
	8											
42	1	0										10
	2	0										10
	3	0										10
	4	1	1	3	1	2	3	2	2	0	0	10
	5	0	0	3	0	0	4	5	0	0	0	10
	6	6	3	0	0	4	0	0	3	2	3	10
	7	6	7	6	6	5	6	4	8	5	5	10
	8											
56	1	0										10
	2	0										10
	3	0										10
	4	1	0	2	1	0	1	1	1	0	0	10
	5	0	1	5	1	0	0	3	0	0	0	10
	6	4	X4	3	4	4	4	6	3	1	3	9
	7	3	1	0	4	1	6	4	X1	5	5	8
	8											
75	1	0										10
	2	0										10
	3	0										10
	4	0	1	1	1	0	1	2	0	1	2	10
	5	0	0	1	0	0	0	0	0	0	0	10
	6	3	4	0	2	1	0	2	1	1	0	10
	7	2	5	5	4	5	4	1	0	1	2	10
	8											
100	1	0										10
	2	0										10
	3	0										10
	4	0	0	1	0	1	0	0	0	1	1	10
	5	0	0	0	0	0	X	0	0	0	0	9
	6	0	X0	0	0	2	1	2	2	0	0	8
	7	1	1	0	2	3	1	1	1	2	0	8
	8											

Key: X=dead adult, X^n=adult had n neonates before death, M=male CERIO2 Rev.2.0

BIO-ANALYTICAL LABORATORIES

CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST-LIVE NEONATE PRODUCTION

Project# X5164 Test started: Date 7/16/13 Time 1510
Client El Dorado Chemical Test ended: Date 7/23/13 Time 1350

	Day0	1	2	3	4	5	6	7	8
Technician:	SC	SW	AH	AH	SW	CB	SW	SW	
Time:	1510	1310	1425	1310	1145	1256	1350	1350	
Temp. (°C):	24.8	24.7	24.7	24.6	24.1	25.0	24.9	25.3	

Conc %	Day	A	B	C	D	E	F	G	H	I	J	Number of Live Adults
100 w. trtd	1	0										10
	2	0										10
	3	0										10
	4	0	0	2	3	0	2	2	0	0	1	10
	5	0	0	0	0	0	2	0	1	0	0	10
	6	1	3	0	3	0	0	2	4	3	3	10
	7	4	4	7	8	4	8	6	5	5	6	10
	8											
	1											
	2											
	3											
	4											
	5											
	6											
	7											
	8											
	1											
	2											
	3											
	4											
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	6											
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	7											
	8											
	1											
	2											
	3											
	4											
	5											
	6											
	7											
	8											

Only 1 [illegible] 7/15/13

Key: X=dead adult, X^n=adult had n neonates before death; M=male CERIO2 Rev.2.0

BIO-ANALYTICAL LABORATORIES CHRONIC WATER QUALITY DATA

Project# X5164 Test started: Date 1/16/2 Time 1510
Client El Dorado Chemicals Test ended: Date 1/22/3 Time 1350
Organism C. dubia

Day/# water used	0 3513	1 3516	2	3	4	5	6	7	8
Concentration: Control 50%									
pH	7.6	7.4/7.3	7.3/7.4	7.4/7.6	7.6/7.3	7.5/7.5	7.6/7.4	7.4	
DO (mg/l)	8.3	8.2/8.3	8.0/8.3	8.1/8.3	8.3/8.4	8.0/8.2	8.1/8.3	8.0	
Cond (umhos/cm)	168.2	168.4	167.7	168.0	168.4	167.6	170.0		
Alkalinity (mg/L)	36.0	36.0							
Hardness (mg/L)	44.0	44.0							
Concentration: 32%									
pH	7.8	7.5/7.5	7.4/7.6	7.5/7.6	7.6/7.5	7.5/7.4	7.5/7.6	7.4	
DO (mg/l)	8.2	8.1/8.2	8.0/8.2	8.0/8.5	8.1/8.0	7.7/8.1	8.0/8.2	8.0	
Cond (umhos/cm)	229	229	226	225	226	225.0	227		
Concentration: 42%									
pH	7.8	7.6/7.5	7.4/7.7	7.5/7.7	7.7/7.6	7.5/7.5	7.6/7.7	7.6	
DO (mg/l)	8.1	8.1/8.2	8.0/8.2	8.0/8.6	8.1/7.9	7.7/8.0	8.0/8.2	8.0	
Cond (umhos/cm)	245	247	242	241	240	238.0	244		
Concentration: 56%									
pH	7.8	7.6/7.6	7.5/7.7	7.6/7.8	7.7/7.8	7.5/7.6	7.6/7.8	7.7	
DO (mg/l)	8.1	8.1/8.1	8.0/8.1	8.0/8.7	8.2/7.8	7.7/8.0	7.9/8.2	8.0	
Cond (umhos/cm)	270	272	271	264	260	259.0	266		
Concentration: 75%						pH 11 mOS			
pH	7.9	7.8/7.6	7.5/7.8	7.6/7.9	7.8/7.8	7.6/7.7	7.7/7.8	7.9	
DO (mg/l)	8.0	8.0/8.1	7.9/8.0	8.0/8.7	8.1/7.6	7.7/7.9	7.9/8.1	8.0	
Cond (umhos/cm)	307	308	302	306	295	293.0	299		
Concentration: 100%									
pH	8.0	7.9/7.7	7.6/7.9	7.7/8.0	7.8/8.1	7.6/7.7	7.7/7.9	7.9	
DO (mg/l)	7.7	8.0/8.0	7.9/7.9	8.0/8.5	8.0/7.5	7.7/7.8	7.9/8.0	8.0	
Cond (umhos/cm)	354	354	347	344	340	337.0	344		
Tech-prerenewal		SW	AH	DH	SW	EGB	SW	SW	
Tech-postrenewal	JC	JC	JC	SW	SW	EGB	SW		
Alkalinity (mg/l)	68.0		72.0		76.0				
Hardness (mg/l)	24.0		44.0		44.0				

Key: prerenewal/postrenewal

BIO-ANALYTICAL LABORATORIES CHRONIC WATER QUALITY DATA

Project# X5164
Client El Dorado Chemical
Organism C.dubia

Test started: Date [illegible] Time 1510
Test ended: Date [illegible] Time 1350

Day/# water used	0	1	2	3	4	5	6	7	8
Concentration: ~~Control~~ AH 7/15/13 100% UV trt'd									
pH	7.9	7.9/7.7	7.7/7.8	7.7/7.8	7.9/8.0	7.7/7.8	7.7/7.8	8.0	
DO (mg/1)	7.7	7.9/7.7	7.9/7.6	7.9/8.7	8.0/7.5	7.5/7.8	7.8/7.7	7.9	
Cond (umhos/cm)	351	355	352	344	323	326.0	339		
Alkalinity (mg/L)									
Hardness (mg/L)									
Concentration:									
pH									
DO (mg/1)									
Cond (umhos/cm)									
Concentration:									
pH									
DO (mg/1)									
Cond (umhos/cm)									
Concentration:									
pH									
DO (mg/1)									
Cond (umhos/cm)									
Concentration:									
pH									
DO (mg/1)									
Cond (umhos/cm)									
Concentration:									
pH									
DO (mg/1)									
Cond (umhos/cm)									
Tech-prerenewal		SW	AH	DH	SW	EGB	SW	SW	
Tech-postrenewal	LC	LC	LC	SW	SW	EGB	SW		
Alkalinity (mg/1)									
Hardness (mg/1)									

Key: prerenewal/postrenewal

(Unused sections struck through diagonally, annotated "Drill AH 7/15/13")

BIO-ANALYTICAL LABORATORIES
PIMEPHALES PROMELAS SURVIVAL AND GROWTH DATA SHEET

Project# X5164 Date started: 7/16/13 Date ended 7/23/13

Client/Contact_ EDCC/El Dorado Chemical
Address 4500 Northwest Avenue El Dorado AR 71731
NPDES# AR0000752 AFIN70-00040
Sample Description 001 Dilution Water Soft Reconstituted
Test Temperature(^{0}C) 25+1^0 Celsius Technicians EGB/AH/LC/GW
Test organism age <48h Vendor/ID# ABS/750

Feeding Times
Technician/Time/Amount (per replicate)

Day	AM	NOON	PM
0			GW/1020/0.20ml ~~HS/1017/0~~ GW 7/16/13
1	GW/0845/0.10ml	LC/1050/0.10ml	LC/1525/0.10ml
2	AH/0905/0.10ml	LC/1100/0.10ml	AH/1510/0.10ml
3	GW/0850/0.10ml	GW/1100/0.10ml	GW/1540/0.10ml
4	GW/0725/0.20ml	—	GW/1510/0.20ml
5	EGB/1030/0.20ml	—	EGB/1045/0.20ml
6	GW/0840/0.10ml	GW/1055/0.10ml	GW/1605/0.10ml

Dissolved Oxygen Meter: Model YSI55D Serial #06E2089 AU
pH Meter: Model Orion 230A+ Serial #105253
Conductivity Meter: Model Control Company Serial #80277924
Amperometric Titrator: Model Fischer-Porter Serial #92W445766

Day	Effluent Initial DO(mg/L&%)/Tech	Aerate?/Minutes /Final DO (mg/L & %)/Tech	Receiving Water Initial DO (mg/L & %)/Tech	Aerate?/Minutes /Final DO (mg/L & %)/Tech
0.	9.0/107.8%/LC	Y/20/7.8/92.0%/LC	N/A	N/A
1.	9.1/110.0%/LC	Y/20/7.9/94.7%/LC		
2.	8.7/106.1%/LC	Y/20/7.9/95.3%/LC		
3.	8.5/99.7%/GW	NO/GW		
4.	7.3/91.7%/GW	NO/GW		
5.	8.5/104.9%/EGB	Y/20/7.9/93.1%/EGB		
6.	8.7/104.1%/GW	Y/20/8.0/94.6%/GW		

	Total Residual Chlorine(mg/L)/ Tech	Dechlorinated? Amount?/Tech	Ammonia(NH3) (mg/L)/Tech	BAL Sample # Date in use
1.	<0.01/LC	NO/LC	0.5/LC	C7689 7/16/13
2.	<0.01/LC	NO/LC	0.5/LC	C7704 7/18/13
3.	<0.01/GW	NO/GW	0.5/GW	C7723 7/20/13

Comments:

BIO-ANALYTICAL LABORATORIES 7-DAY CHRONIC MINNOW SURVIVAL DATA

Project# X5164
Client El Dorado Chemical

Test started: Date 7/26/13 Time 1530
Test ended: Date 8/2/13 Time 1105

Technician:	Day0	AW	1	JC	2	JC	3	JC	4	AW	5	EGB	6	JC	7	AW
Time:	Day0	1530	1	1045	2	1340	3	1050	4	0945	5	1008	6	1005	7	1105
Temperature	Day0	AW	1	24.5	2	24.9	3	25.6	4	25.2	5	24.9	6	25.2	7	24.6

Conc.%	Rep.	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
0	A	8	8	8	8	8	8	8	7
	B	8	8	8	7	6	6	6	6
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	7	7	7	7
32	A	8	8	8	8	8	8	8	8
	B	8	8	7	7	7	7	7	7
	C	8	8	8	8	8	8	8	8
	D	8	8	7	7	7	7	7	7
	E	8	8	8	8	8	8	8	8
42	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8	7
	C	8	7	7	7	7	7	7	7
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8	8
56	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	7	7	7	7
75	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8	8
100	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8	8
	D	8	8	8	7	7	7	7	7
	E	8	8	8	8	8	8	8	8

File: Minnow2

BIO-ANALYTICAL LABORATORIES 7-DAY CHRONIC MINNOW SURVIVAL DATA

Project# X5164
Client El Dorado Chemical
Test started: Date 7/10/13 Time 1530
Test ended: Date [illegible] Time 1105

	Day0	1	2	3	4	5	6	7
Technician:	OH	JC	JC	JC	JW	SGB	JC	[illegible]
Time:	1530	1045	1340	1050	0915	1000	1205	1105
Temperature	24	24.5	24.9	23.6	25.0	24.9	25.5	24.0

Conc. %	Rep.	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
100 UV-trt'd	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	7	7	7	7
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	7	7	7	7
	E	8	8	8	8	8	8	8	8
	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								

DNU OH 7/15/13

File: Minnow2

BIO-ANALYTICAL LABORATORIES MINNOW LARVAL GROWTH DATA SHEET

Project#/Client X5164/EDCC Test Dates 7/16/13 - 7/23/13

Oven Temperature (° Celsius) 99°C at 7/24/13

Conc. %	Replicate/ Pan number	Wt. of pan(g)/ Date weighed: 7/18/13 Tech: SW	Wt. of pan + larvae(g)/ Date weighed: 7/25/13 Tech: SW	Total wt. of larvae (g)	Original # of larvae at test initiation	Mean Dry wt. of larvae (mg)	Mean Dry wt. - surviving larvae (mg) Control Only*
0	A 71	0.9488	0.9528	0.0040	8	0.500	[1] 0.571
	B 72	0.9504	0.9542	0.0038	8	0.475	[2] 0.633
	C 73	0.9524	0.9570	0.0046	8	0.575	
	D 74	0.9508	0.9546	0.0038	8	0.475	
	E 75	0.9478	0.9513	0.0035	8	0.438	[3] 0.500
32	A 76	0.9464	0.9496	0.0032	8	0.400	
	B 77	0.9459	0.9498	0.0039	8	0.488	
	C 78	0.9471	0.9502	0.0031	8	0.388	
	D 79	0.9483	0.9514	0.0031	8	0.388	
	E 80	0.9451	0.9485	0.0034	8	0.425	
42	A 81	0.9495	0.9527	0.0032	8	0.400	
	B 82	0.9517	0.9543	0.00216	8	0.325	
	C 83	0.9496	0.9526	0.0030	8	0.375	
	D 84	0.9508	0.9544	0.0036	8	0.450	
	E 85	0.9519	0.9549	0.0030	8	0.375	
56	A 86	0.9494	0.9524	0.0030	8	0.375	
	B 87	0.9503	0.9529	0.0026	8	0.325	
	C 88	0.9502	0.9540	0.0038	8	0.475	
	D 89	0.9462	0.9494	0.0032	8	0.400	
	E 90	0.9483	0.9514	0.0031	8	0.388	
75	A 91	0.9232	0.9267	0.0035	8	0.438	
	B 92	0.9447	0.9481	0.0034	8	0.425	
	C 93	0.9502	0.9532	0.0030	8	0375	
	D 94	0.9513	0.9552	0.0039	8	0.488	
	E 95	0.9513	0.9545	0.0032	8	0.400	
100	A 96	0.9501	0.9531	0.0030	8	0.375	
	B 97	0.9487	0.9513	0.0026	8	0.325	
	C 98	0.9507	0.9540	0.0033	8	0.413	
	D 99	0.9493	0.9527	0.0034	8	0.425	
	E 100	0.9458	0.9493	0.0035	8	0.438	

* Test acceptance of control weight based on surviving larvae at end of test.

Calculated by: AH 7/29/13 Calculations checked by: EDB 7/31/13

BIO-ANALYTICAL LABORATORIES CHRONIC WATER QUALITY DATA

Project# X5164 Test started: Date 7/16/13 Time 1530
Client El Dorado Chemical Test ended: Date 7/23 Time 1105
Organism P. promelas

Day/# water used	3513 0	3516 1	2	3	4	5	6	7	8
Concentration: Control Soft									
pH	7.6	7.3/7.3	7.2/7.4	7.2/7.6	7.1/7.3	7.4/7.5	7.2/7.4	7.2	
DO (mg/l)	8.3	7.8/8.3	7.0/8.3	7.2/8.3	7.4/8.4	7.4/8.2	5.9/8.3	6.4	
Cond (umhos/cm)	168.2	168.4	167.7	168.0	168.4	167.6	170.0		
Alkalinity (mg/L)	36.0	36.0							
Hardness (mg/L)	44.0	44.0							
Concentration: 32%									
pH	7.8	7.3/7.5	7.2/7.6	7.2/7.6	7.0/7.5	7.3/7.4	7.2/7.6	7.2	
DO (mg/l)	8.2	7.8/8.2	7.3/8.2	7.1/8.5	7.3/8.0	7.3/8.1	6.0/8.2	6.4	
Cond (umhos/cm)	229	229	226	225	226	225.0	227		
Concentration: 42%									
pH	7.8	7.3/7.5	7.3/7.7	7.2/7.7	7.1/7.6	7.2/7.5	7.2/7.7	7.2	
DO (mg/l)	8.1	7.7/8.2	7.4/8.2	7.0/8.6	7.0/7.9	7.1/8.0	5.7/8.2	6.3	
Cond (umhos/cm)	245	247	242	241	240	238.0	244		
Concentration: 56%									
pH	7.8	7.4/7.6	7.3/7.7	7.2/7.8	7.1/7.8	7.2/7.6	7.2/7.8	7.2	
DO (mg/l)	8.1	7.7/8.1	7.2/8.1	7.0/8.7	7.0/7.8	7.1/8.0	5.8/8.2	6.4	
Cond (umhos/cm)	270	272	271	264	260	259.0	266		
Concentration: 75%									
pH	7.9	7.4/7.6	7.4/7.8	7.2/7.9	7.1/8.1	7.2/7.7	7.2/7.8	7.3	
DO (mg/l)	8.0	7.7/8.1	7.2/8.0	6.9/8.7	7.2/7.6	7.0/7.9	5.6/8.1	5.9	
Cond (umhos/cm)	307	308	302	300	295	293.0	299		
Concentration: 100%									
pH	8.0	7.5/7.7	7.4/7.9	7.4/8.0	7.3/8.1	7.3/7.7	7.2/7.9	7.4	
DO (mg/l)	7.7	7.7/8.0	7.2/7.9	6.9/8.5	6.8/7.5	7.1/7.8	5.2/8.0	6.3	
Cond (umhos/cm)	354	354	347	344	340	337.0	344		
Tech-prerenewal		LC	LC	LC	SW	EDB	LC	SW	
Tech-postrenewal	LC	LC	LC	SW	SW	EDB	SW		
Alkalinity (mg/l)	108.0		72.0		76.0				
Hardness (mg/l)	24.0		44.0		44.0				

Key: prerenewal/postrenewal

BIO-ANALYTICAL LABORATORIES CHRONIC WATER QUALITY DATA

Project# X5164
Client El Dorado Chemical
Organism P. promelas
Test started: Date 7/16/13 Time 1530
Test ended: Date 7/23/13 Time 1105

Day/# water used	0	1	2	3	4	5	6	7	8
Concentration: ~~Control~~ AH 7/18/13 100% UV trtd									
pH	7.9	7.6/7.7	7.5/7.8	7.3/7.8	7.4/8.0	7.4/7.8	7.3/7.8	7.4	
DO (mg/l)	7.7	7.5/7.7	7.2/7.6	6.7/8.7	6.8/7.5	6.8/7.8	5.2/7.7	6.2	
Cond (umhos/cm)	351	355	352	344	323	326.0	339		
Alkalinity (mg/L)									
Hardness (mg/L)									
Concentration:									
pH									
DO (mg/l)									
Cond (umhos/cm)									
Concentration:									
pH									
DO (mg/l)									
Cond (umhos/cm)									
Concentration:									
pH									
DO (mg/l)									
Cond (umhos/cm)									
Concentration:									
pH									
DO (mg/l)									
Cond (umhos/cm)									
Concentration:									
pH									
DO (mg/l)									
Cond (umhos/cm)									
Tech-prerenewal		LC	LC	LC	SW	EGB	LC	SW	
Tech-postrenewal	LC	LC	LC	SW	SW	EGB	SW		
Alkalinity (mg/l)									
Hardness (mg/l)									

OK AH 7/15/13

Key: prerenewal/postrenewal

APPENDIX C
STATISTICAL ANALYSIS

Ceriodaphnia Survival and Reproduction Test-7 Day Survival

Start Date:	7/16/2013	Test ID:	X5164CD	Sample ID:	1
End Date:	7/23/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	7/16/2013	Protocol:	EPAFW02-EPA/821/R-02-01	Test Species:	CD-Ceriodaphnia dubia
Comments:					

Conc-%	1	2	3	4	5	6	7	8	9	10
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
42	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
75	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	0.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000
100UV	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Conc-%	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical
D-Control	1.0000	1.0000	0	10	10	10		
32	1.0000	1.0000	0	10	10	10	1.0000	0.0500
42	1.0000	1.0000	0	10	10	10	1.0000	0.0500
56	0.8000	0.8000	2	8	10	10	0.2368	0.0500
75	1.0000	1.0000	0	10	10	10	1.0000	0.0500
100	0.8000	0.8000	2	8	10	10	0.2368	0.0500
100UV	1.0000	1.0000	0	10	10	10	1.0000	0.0500

Hypothesis Test (1-tail, 0.05)

Fisher's Exact Test indicates no significant differences
Treatments vs D-Control

ToxCalc v5.0.23

Reviewed by: EGB 7/31/13

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	7/16/2013	Test ID:	X5164CD	Sample ID:	1
End Date:	7/23/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	7/16/2013	Protocol:	EPAFW02-EPA/821/R-02-01	Test Species:	CD-Ceriodaphnia dubia
Comments:					

Conc-%	1	2	3	4	5	6	7	8	9	10
D-Control	24.000	23.000	17.000	28.000	21.000	21.000	17.000	25.000	30.000	25.000
32	15.000	17.000	15.000	15.000	16.000	16.000	15.000	12.000	14.000	15.000
42	13.000	11.000	17.000	13.000	11.000	13.000	11.000	13.000	7.000	8.000
56	8.000	10.000	10.000	5.000	11.000	14.000	6.000	8.000		
75	6.000	10.000	7.000	7.000	6.000	5.000	5.000	1.000	3.000	4.000
100	1.000	1.000	2.000	6.000	3.000	3.000	3.000	1.000		
100UV	5.000	7.000	9.000	14.000	4.000	12.000	10.000	10.000	8.000	10.000

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	23.100	1.0000	23.100	17.000	30.000	18.417	10			
*32	15.000	0.6494	15.000	12.000	17.000	8.889	10	6.443	2.464	3.098
*42	11.700	0.5065	11.700	7.000	17.000	24.191	10	9.067	2.464	3.098
*56	9.000	0.3896	9.000	5.000	14.000	31.983	8	10.574	2.464	3.286
*75	5.400	0.2338	5.400	1.000	10.000	45.529	10	14.078	2.464	3.098
*100	2.500	0.1082	2.500	1.000	6.000	67.612	8	15.448	2.464	3.286
*100UV	8.900	0.3853	8.900	4.000	14.000	34.101	10	11.294	2.464	3.098

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.05)	0.87452		0.895		0.02745	0.42012
Bartlett's Test indicates equal variances (p = 0.04)	13.076		16.8119			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Bonferroni t Test indicates significant differences Treatments vs D-Control	3.09806	0.13412	432.66	7.90339	2.7E-22	6, 59

ToxCalc v5.0.23

Reviewed by: ECB 7/31/13

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	7/16/2013	Test ID: X5164CD	Sample ID: 1
End Date:	7/23/2013	Lab ID: ADEQ880630	Sample Type: EFF2-Industrial
Sample Date:	7/16/2013	Protocol: EPAFW02-EPA/821/R-02-01	Test Species: CD-Ceriodaphnia dubia
Comments:			

Conc-%	1	2	3	4	5	6	7	8	9	10
D-Control	24.000	23.000	17.000	28.000	21.000	21.000	17.000	25.000	30.000	25.000
32	15.000	17.000	15.000	15.000	16.000	16.000	15.000	12.000	14.000	15.000
42	13.000	11.000	17.000	13.000	11.000	13.000	11.000	13.000	7.000	8.000
56	8.000	5.000	10.000	10.000	5.000	11.000	14.000	5.000	6.000	8.000
75	6.000	10.000	7.000	7.000	6.000	5.000	5.000	1.000	3.000	4.000
100	1.000	0.000	1.000	2.000	6.000	0.000	3.000	3.000	3.000	1.000
100UV	5.000	7.000	9.000	14.000	4.000	12.000	10.000	10.000	8.000	10.000

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	23.100	1.0000	23.100	17.000	30.000	18.417	10			
*32	15.000	0.6494	15.000	12.000	17.000	8.889	10	6.417	2.347	2.963
*42	11.700	0.5065	11.700	7.000	17.000	24.191	10	9.031	2.347	2.963
*56	8.200	0.3550	8.200	5.000	14.000	37.168	10	11.804	2.347	2.963
*75	5.400	0.2338	5.400	1.000	10.000	45.529	10	14.022	2.347	2.963
*100	2.000	0.0866	2.000	0.000	6.000	91.287	10	16.716	2.347	2.963
*100UV	8.900	0.3853	8.900	4.000	14.000	34.101	10	11.250	2.347	2.963

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.05)	0.85094		0.895		0.09582	0.32172
Bartlett's Test indicates equal variances (p = 0.04)	13.1453		16.8119			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Dunnett's Test indicates significant differences Treatments vs D-Control	2.96274	0.12826	477.448	7.96667	3.7E-24	6, 63

Reviewed by: EAB 7/31/13

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	7/16/2013	Test ID:	X5164CD	Sample ID:	1
End Date:	7/23/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	7/16/2013	Protocol:	EPAFW02-EPA/821/R-02-01	Test Species:	CD-Ceriodaphnia dubia

Comments:

Conc-%	1	2	3	4	5	6	7	8	9	10
D-Control	24.000	23.000	17.000	28.000	21.000	21.000	17.000	25.000	30.000	25.000
32	15.000	17.000	15.000	15.000	16.000	16.000	15.000	12.000	14.000	15.000
42	13.000	11.000	17.000	13.000	11.000	13.000	11.000	13.000	7.000	8.000
56	8.000	5.000	10.000	10.000	5.000	11.000	14.000	5.000	6.000	8.000
75	6.000	10.000	7.000	7.000	6.000	5.000	5.000	1.000	3.000	4.000
100	1.000	0.000	1.000	2.000	6.000	0.000	3.000	3.000	3.000	1.000
100UV	5.000	7.000	9.000	14.000	4.000	12.000	10.000	10.000	8.000	10.000

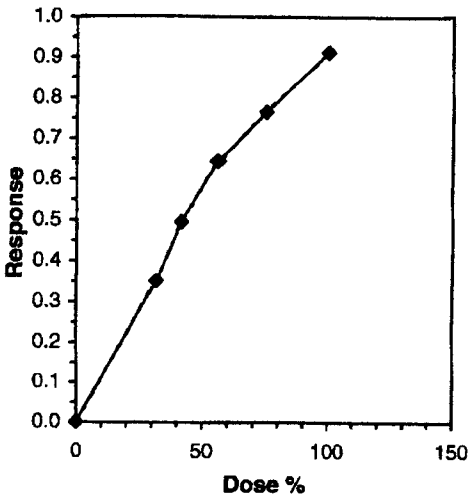
			Transform: Untransformed					Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	23.100	1.0000	23.100	17.000	30.000	18.417	10	23.100	1.0000
32	15.000	0.6494	15.000	12.000	17.000	8.889	10	15.000	0.6494
42	11.700	0.5065	11.700	7.000	17.000	24.191	10	11.700	0.5065
56	8.200	0.3550	8.200	5.000	14.000	37.168	10	8.200	0.3550
75	5.400	0.2338	5.400	1.000	10.000	45.529	10	5.400	0.2338
100	2.000	0.0866	2.000	0.000	6.000	91.287	10	2.000	0.0866
100UV	8.900	0.3853	8.900	4.000	14.000	34.101	10		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test Indicates normal distribution (p > 0.05)	0.85094	0.895	0.09582	0.32172
Bartlett's Test Indicates equal variances (p = 0.04)	13.1453	16.8119		

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05*	4.563	0.534	3.779	5.909	0.8249
IC10*	9.126	1.068	7.558	11.818	0.8249
IC15*	13.689	1.602	11.337	17.727	0.8249
IC20*	18.252	2.135	15.116	23.636	0.8249
IC25*	22.815	2.669	18.894	29.545	0.8249
IC40	35.455	2.773	30.231	41.218	0.3378
IC50	42.600	3.170	37.565	49.467	0.4079

* indicates IC estimate less than the lowest concentration



ToxCalc v5.0.23

Reviewed by: EAB 7/31/13

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:	7/16/2013	Test ID:	X5164PP	Sample ID:	1
End Date:	7/23/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	7/16/2013	Protocol:	EPAFW02-EPA/821/R-02-01	Test Species:	PP-Pimephales promelas
Comments:					

Conc-%	1	2	3	4	5
D-Control	0.8750	0.7500	1.0000	1.0000	0.8750
32	1.0000	0.8750	1.0000	0.8750	1.0000
42	1.0000	0.8750	0.8750	1.0000	1.0000
56	1.0000	1.0000	1.0000	1.0000	0.8750
75	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	0.8750	1.0000
100UV	1.0000	0.8750	1.0000	0.8750	1.0000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	0.9000	1.0000	1.2504	1.0472	1.3931	11.683	5		
32	0.9500	1.0556	1.3196	1.2094	1.3931	7.623	5	31.00	16.00
42	0.9500	1.0556	1.3196	1.2094	1.3931	7.623	5	31.00	16.00
56	0.9750	1.0833	1.3564	1.2094	1.3931	6.055	5	33.00	16.00
75	1.0000	1.1111	1.3931	1.3931	1.3931	0.000	5	35.00	16.00
100	0.9750	1.0833	1.3564	1.2094	1.3931	6.055	5	33.00	16.00
100UV	0.9500	1.0556	1.3196	1.2094	1.3931	7.623	5	31.00	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.9018	0.934	-0.6101	-0.5197
Equality of variance cannot be confirmed				
Hypothesis Test (1-tail, 0.05)				
Steel's Many-One Rank Test indicates no significant differences				
Treatments vs D-Control				

ToxCalc v5.0.23

Reviewed by: EAB 7/31/13

Larval Fish Growth and Survival Test-7 Day Growth

Start Date:	7/16/2013	Test ID:	X5164PP	Sample ID:	1
End Date:	7/23/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	7/16/2013	Protocol:	EPAFW02-EPA/821/R-02-01	Test Species:	PP-Pimephales promelas
Comments:					

Conc-%	1	2	3	4	5
D-Control	0.5000	0.4750	0.5750	0.4750	0.4375
32	0.4000	0.4875	0.3875	0.3875	0.4250
42	0.4000	0.3250	0.3750	0.4500	0.3750
56	0.3750	0.3250	0.4750	0.4000	0.3875
75	0.4375	0.4250	0.3750	0.4875	0.4000
100	0.3750	0.3250	0.4125	0.4250	0.4375
100UV	0.4750	0.3625	0.4250	0.3125	0.3750
0-SN	0.5714	0.6333	0.5750	0.4750	0.5000

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.4925	1.0000	0.4925	0.4375	0.5750	10.403	5			
32	0.4175	0.8477	0.4175	0.3875	0.4875	10.065	5	2.306	2.443	0.0795
*42	0.3850	0.7817	0.3850	0.3250	0.4500	11.796	5	3.305	2.443	0.0795
*56	0.3925	0.7970	0.3925	0.3250	0.4750	13.809	5	3.074	2.443	0.0795
75	0.4250	0.8629	0.4250	0.3750	0.4875	9.974	5	2.075	2.443	0.0795
*100	0.3950	0.8020	0.3950	0.3250	0.4375	11.541	5	2.997	2.443	0.0795
*100UV	0.3900	0.7919	0.3900	0.3125	0.4750	15.929	5	3.151	2.443	0.0795
0-SN	0.5510	1.1187	0.5510	0.4750	0.6333	11.533	5	-1.797	2.443	0.0795

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.94681	0.94	0.27223	-0.6634
Bartlett's Test indicates equal variances (p = 0.99)	1.40279	18.4753		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df.
Dunnett's Test indicates significant differences Treatments vs D-Control	0.07945	0.16132	0.01783	0.00265	6.1E-05	7, 32

ToxCalc v5.0.23

Reviewed by: EJB 7/31/13

Larval Fish Growth and Survival Test-7 Day Growth

Start Date:	7/16/2013	Test ID:	X5164PP	Sample ID:	1
End Date:	7/23/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	7/16/2013	Protocol:	EPAFW02-EPA/821/R-02-01	Test Species:	PP-Pimephales promelas

Comments:

Conc-%	1	2	3	4	5
D-Control	0.5000	0.4750	0.5750	0.4750	0.4375
32	0.4000	0.4875	0.3875	0.3875	0.4250
42	0.4000	0.3250	0.3750	0.4500	0.3750
56	0.3750	0.3250	0.4750	0.4000	0.3875
75	0.4375	0.4250	0.3750	0.4875	0.4000
100	0.3750	0.3250	0.4125	0.4250	0.4375
100UV	0.4750	0.3625	0.4250	0.3125	0.3750
0-SN	0.5714	0.6333	0.5750	0.4750	0.5000

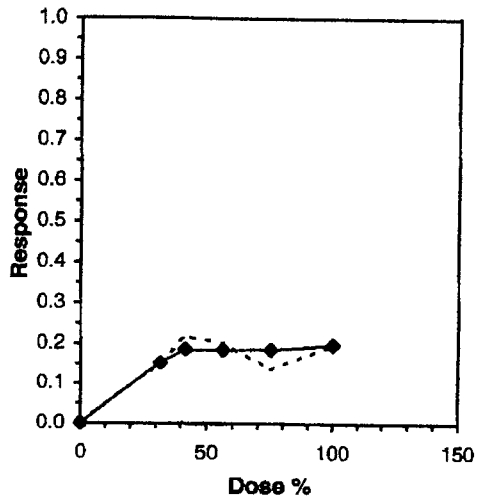
			Transform: Untransformed					Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	0.4925	1.0000	0.4925	0.4375	0.5750	10.403	5	0.4925	1.0000
32	0.4175	0.8477	0.4175	0.3875	0.4875	10.065	5	0.4175	0.8477
42	0.3850	0.7817	0.3850	0.3250	0.4500	11.796	5	0.4008	0.8139
56	0.3925	0.7970	0.3925	0.3250	0.4750	13.809	5	0.4008	0.8139
75	0.4250	0.8629	0.4250	0.3750	0.4875	9.974	5	0.4008	0.8139
100	0.3950	0.8020	0.3950	0.3250	0.4375	11.541	5	0.3950	0.8020
100UV	0.3900	0.7919	0.3900	0.3125	0.4750	15.929	5		
0-SN	0.5510	1.1187	0.5510	0.4750	0.6333	11.533	5		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.94681	0.94	0.27223	-0.6634
Bartlett's Test indicates equal variances (p = 0.99)	1.40279	18.4753		

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)		Skew
IC05*	10.507	6.211	5.473	43.183	2.0916
IC10*	21.013				
IC15*	31.520				
IC20	>100				
IC25	>100				
IC40	>100				
IC50	>100				

* indicates IC estimate less than the lowest concentration



ToxCalc v5.0.23

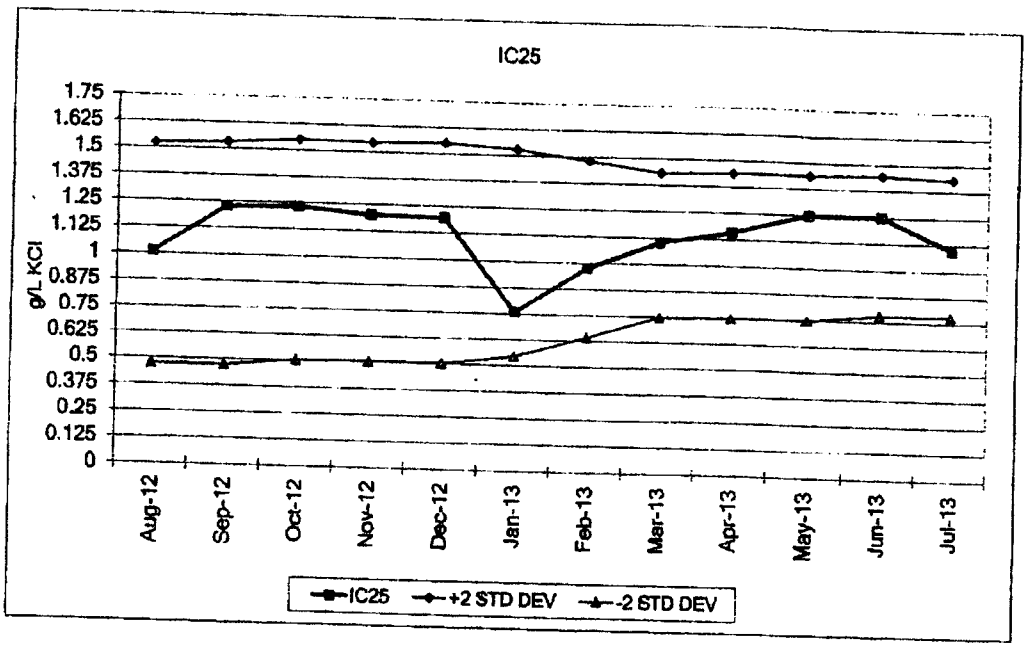
Reviewed by: EGB 7/31/13

APPENDIX D
QUALITY ASSURANCE CHARTS

1300 Blue Spruce Drive, Suite C
Fort Collins, Colorado 80524

Toll Free: 800/331-5916
Tel:970/484-5091 Fax:970/484-2514

Pimephales promelas



Chronic 7 Day Survival Test Data

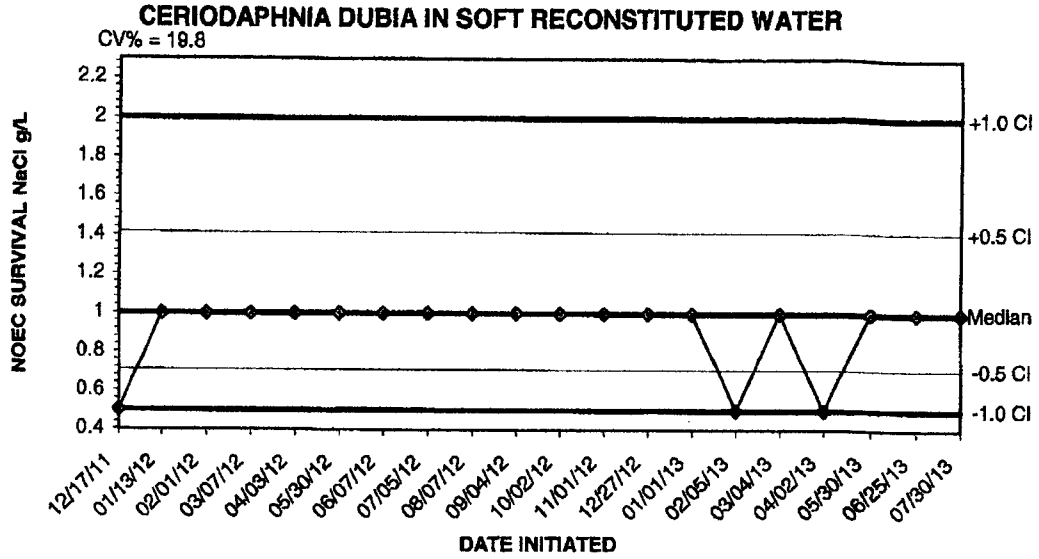
Date	NOEC (g/L KCl)	LOEC (g/L KCl)
Feb-13	0.50	1.0
Mar-13	0.50	1.0
Apr-13	0.50	1.0
May-13	0.50	1.0
Jun-13	0.50	1.0
Jul-13	0.50	1.0

IC 25 for Growth Test

Date	IC25 g/L KCl	95% Confidence (upper)	95% Confidence (lower)	Avg. IC25 g/L KCl	+2 STD DEV	-2 STD DEV
Feb-13	0.977	1.414	0.439	1.062	1.482	0.643
Mar-13	1.103	1.288	0.885	1.090	1.433	0.746
Apr-13	1.158	1.283	0.930	1.095	1.439	0.751
May-13	1.250	1.250	1.152	1.095	1.439	0.751
Jun-13	1.250	1.250	1.162	1.114	1.446	0.782
Jul-13	1.099	1.148	0.964	1.107	1.433	0.781

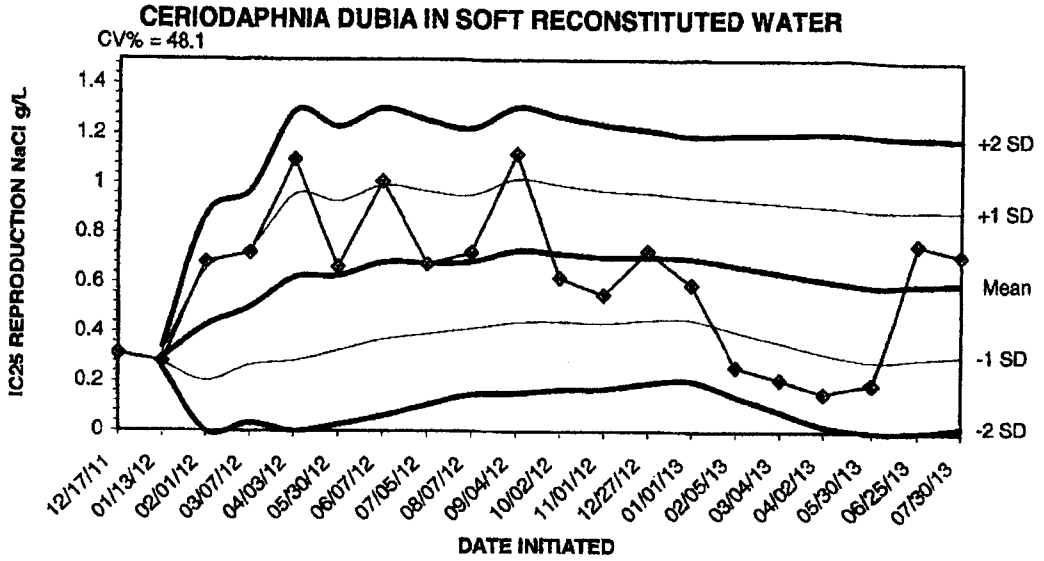
**Current Test Dates: 07/10-17/2013

CHRONIC REFERENCE TOXICANT TEST RESULTS FOR CERIODAPHNIA DUBIA IN SOFT RECONSTITUTED WATER



Dates	Values	Median	-0.5 CI	-1.0 CI	+0.5 CI	+1.0 CI
12/17/11	0.5000	1.0000	0.7071	0.5000	1.4142	2.0000
01/13/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
02/01/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
03/07/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
04/03/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
05/30/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
06/07/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
07/05/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
08/07/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
09/04/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
10/02/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
11/01/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
12/27/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
01/01/13	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
02/05/13	0.5000	1.0000	0.7071	0.5000	1.4142	2.0000
03/04/13	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
04/02/13	0.5000	1.0000	0.7071	0.5000	1.4142	2.0000
05/30/13	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
06/25/13	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
07/30/13	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000

CHRONIC REFERENCE TOXICANT TEST RESULTS FOR CERIODAPHNIA DUBIA IN SOFT RECONSTITUTED WATER



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
12/17/11	0.3138					
01/13/12	0.2835	0.2987	0.2772	0.2558	0.3201	0.3415
02/01/12	0.6864	0.4279	0.2035	0.0000	0.6523	0.8767
03/07/12	0.7233	0.5018	0.2664	0.0311	0.7371	0.9724
04/03/12	1.1000	0.6214	0.2851	0.0000	0.9577	1.2941
05/30/12	0.6660	0.6288	0.3275	0.0261	0.9302	1.2316
06/07/12	1.0102	0.6833	0.3727	0.0621	0.9939	1.3045
07/05/12	0.6765	0.6825	0.3949	0.1073	0.9700	1.2576
08/07/12	0.7250	0.6872	0.4178	0.1485	0.9565	1.2259
09/04/12	1.1229	0.7308	0.4418	0.1529	1.0197	1.3086
10/02/12	0.6225	0.7209	0.4449	0.1689	0.9970	1.2730
11/01/12	0.5553	0.7071	0.4396	0.1721	0.9746	1.2421
12/27/12	0.7326	0.7091	0.4529	0.1967	0.9653	1.2215
01/01/13	0.5948	0.7009	0.4529	0.2048	0.9490	1.1970
02/05/13	0.2615	0.6716	0.4070	0.1425	0.9362	1.2008
03/04/13	0.2108	0.6428	0.3624	0.0821	0.9232	1.2036
04/02/13	0.1529	0.6140	0.3177	0.0213	0.9103	1.2067
05/30/13	0.1943	0.5907	0.2867	0.0000	0.8947	1.1987
06/25/13	0.7643	0.5998	0.3017	0.0035	0.8980	1.1961
07/30/13	0.7212	0.6059	0.3144	0.0230	0.8973	1.1888

APPENDIX E
AGENCY FORMS

SUMMARY REPORTING FORMS
CHRONIC BIOMONITORING

Ceriodaphnia dubia Survival and Reproduction

Permittee: El Dorado Chemical **NPDES No.: AR0000752**
Outfall 001 **AFIN: 70-00040**

	Time	Date		Time	Date
Composite 1 Collected From	**0830**	**7/14/13**	**To**	**0830**	**7/15/13**
Composite 2 Collected From	**0830**	**7/16/13**	**To**	**0830**	**7/17/13**
Composite 3 Collected From	**0830**	**7/18/13**	**To**	**0830**	**7/19/13**

Test initiated: 1510 **am/pm** 7/16/13 **date**
Test terminated: 1350 **am/pm** 7/23/13 **date**
Dilution water used: **Receiving** X **Reconstituted**

PERCENT SURVIVAL

Time of Reading	Percent Effluent						
	0	32	42	56	75	100	100UV
24h	100	100	100	100	100	100	100
48h	100	100	100	100	100	100	100
End of test	100	100	100	80	100	80	100

NUMBER OF YOUNG PRODUCED PER FEMALE @ END OF TEST

Rep	0	32	42	56	75	100	100UV
A	24	15	13	8	6	1	5
B	23	17	11	D5	10	D	7
C	17	15	17	10	7	1	9
D	28	15	13	10	7	2	14
E	21	16	11	5	6	6	4
F	21	16	13	11	5	D	12
G	17	15	11	14	5	3	10
H	25	12	13	D5	1	3	10
I	30	14	7	6	3	3	8
J	25	15	8	8	4	1	10
Surv. Mean	23.1	15.0	11.7	9.0	5.4	2.5	8.9
Total Mean	23.1	15.0	11.7	8.2	5.4	2.0	8.9
CV%*	18.42	8.89	24.19	31.98	45.53	67.61	34.10

*coefficient of variation = standard deviation x 100/mean. D=dead adult

PMSD = 12.8%

Ceriodaphnia dubia
Survival and Reproduction (cont)

1. Fisher's Exact Test:

Is the mean survival at the end of the test significantly different (p=.05) than the control survival for the % effluent corresponding to (lethality):

a) LOW FLOW OR CRITICAL DILUTION	**(100%):**	**YES**	**X**	**NO**
b) ½ LOW FLOW DILUTION	**(N/A%):**	**YES**		**NO**

2. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate:

Is the mean number of young produced per female significantly different (p=.05) than the control's number of young per female for the % effluent corresponding to (significant non-lethal effects):

a) LOW FLOW OR CRITICAL DILUTION	**(100%):**	**X**	**YES**	**NO**
b)½ LOW FLOW DILUTION	**(N/A%):**		**YES**	**NO**

3. If you answered NO to 1. a) and 2. a) enter (0) otherwise enter (1): 1
4. If you answered NO to 1. b) and 2. b) enter (0) otherwise enter (1): N/A
5. Enter response to item 3 on DMR Form, parameter #TEP3B.
6. Enter response to item 4 on DMR Form, parameter #TFP3B.
7. Enter percent effluent corresponding to each NOEC below and circle lowest number:

a) NOEC survival:	**100.0% effluent**
b) NOEC reproduction:	**0.0% effluent**
c) LOEC survival:	**N/A% effluent**
d) LOEC reproduction:	**32.0% effluent**

Biomonitoring Form
Chronic Toxicity Summary Form
Ceriodaphnia dubia
Chemical Parameters Chart

Permittee: El Dorado Chemical
NPDES No.: AR0000752/ AFIN 70-00040
Contact: Larken Pennington
Analyst: Briggs, Haughton, Cotty, Williams

Sample No. 1 Collected: Date: 7/15/13 Time: 0830
Sample No. 2 Collected: Date: 7/17/13 Time: 0830
Sample No. 3 Collected: Date: 7/19/13 Time: 0830
Test Begin: Date: 7/16/13 Time: 1510
Test End: Date: 7/23/13 Time: 1350

Dilution: 0

Day:	1	2	3	4	5	6	7	Comments
Temp (C)	24.7	24.7	24.6	24.7	25.0	24.9	25.3	
DO Initial	8.2	8.0	8.1	8.2	8.0	8.1	8.0	
DO Final	8.3	8.3	8.3	8.4	8.2	8.3		
pH Initial	7.4	7.3	7.4	7.6	7.5	7.6	7.4	
pH Final	7.3	7.4	7.6	7.3	7.5	7.4		
Alkalinity	36.0							
Hardness	44.0							
Conductivity	168.4	167.7	168.0	168.4	167.6	170.0		
Chlorine	<.01							

Dilution: 56.0

Day:	1	2	3	4	5	6	7	Comments
Temp (C)	24.7	24.7	24.6	24.7	25.0	24.9	25.3	
DO Initial	8.1	8.0	8.0	8.2	7.7	7.9	8.0	
DO Final	8.1	8.1	8.7	7.8	8.0	8.2		
pH Initial	7.7	7.5	7.6	7.7	7.5	7.6	7.7	
pH Final	7.6	7.7	7.8	7.8	7.6	7.8		
Alkalinity								
Hardness								
Conductivity	272	271	264	260	259	266		
Chlorine								

Dilution: 32.0

Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.7	24.7	24.6	24.7	25.0	24.9	25.3	
DO Initial	8.1	8.0	8.0	8.1	7.7	8.0	8.0	
DO Final	8.2	8.3	8.5	8.0	8.1	8.2		
pH Initial	7.5	7.4	7.5	7.6	7.5	7.5	7.4	
pH Final	7.5	7.6	7.6	7.5	7.4	7.6		
Alkalinity								
Hardness								
Conductivity	229	226	225	226	225	227		
Chlorine								

Dilution: 75.0

Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.7	24.7	24.6	24.7	25.0	24.9	25.3	
DO Initial	8.0	7.9	8.0	8.1	7.7	7.9	8.0	
DO Final	8.1	8.0	8.7	7.6	7.9	8.1		
pH Initial	7.8	7.5	7.6	7.8	7.6	7.7	7.9	
pH Final	7.6	7.8	7.9	8.1	7.7	7.8		
Alkalinity								
Hardness								
Conductivity	308	302	309	295	293	299		
Chlorine								

Dilution: 42.0

Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.7	24.7	24.6	24.7	25.0	24.9	25.3	
DO Initial	8.1	8.0	8.0	8.1	7.7	8.0	8.0	
DO Final	8.2	8.2	8.6	7.9	8.0	8.2		
pH Initial	7.6	7.4	7.5	7.7	7.5	7.6	7.6	
pH Final	7.5	7.7	7.7	7.6	7.5	7.7		
Alkalinity								
Hardness								
Conductivity	247	242	241	240	238	244		
Chlorine								

Dilution: 100.0

Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.7	24.7	24.6	24.7	25.0	24.9	25.3	
DO Initial	8.0	7.9	8.0	8.0	7.7	7.9	8.0	
DO Final	8.0	7.9	8.5	7.5	7.8	8.0		
pH Initial	7.9	7.6	7.7	7.8	7.6	7.7	7.9	
pH Final	7.7	7.9	8.0	8.1	7.7	7.9		
Alkalinity	68.0	72.0		76.0				
Hardness	24.0	44.0		44.0				
Conductivity	354	347	344	340	337	344		
Chlorine	<.01	<.01		<.01				

Dilution: 100.0 UV

Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.7	24.7	24.6	24.7	25.0	24.9	25.3	
DO Initial	7.9	7.9	7.9	8.0	7.5	7.8	7.8	
DO Final	7.7	7.6	8.7	7.5	7.8	7.7		
pH Initial	7.9	7.7	7.7	7.9	7.7	7.7	8.0	
pH Final	7.7	7.8	7.8	8.0	7.8	7.8		
Alkalinity								
Hardness								
Conductivity	355	352	344	323	326	339		
Chlorine								

SUMMARY REPORTING FORMS CHRONIC BIOMONITORING FATHEAD MINNOW LARVAE GROWTH AND SURVIVAL
(Pimephales promelas)

Permittee: El Dorado Chemical **NPDES No.: AR0000752**
Outfall 001 **AFIN: 70-00040**

	Time	Date	Time	Date
Composite 1 Collected from:	**0830**	**7/14/13 To**	**0830**	**7/15/13**
Composite 2 Collected from:	**0830**	**7/16/13 To**	**0830**	**7/17/13**
Composite 3 Collected from:	**0830**	**7/18/13 To**	**0830**	**7/19/13**
Test initiated:	1530 **am/pm**		7/16/13	**date**
Test terminated:	1105 **am/pm**		7/23/13	**date**
Dilution water used:		**Receiving**	**Reconstituted**	

DATA TABLE FOR SURVIVAL

Effluent Conc. %	Percent Survival in Replicate Chambers					Mean Percent Survival			CV%*
	A	B	C	D	E	24h	48h	7 days	
0	87.5	75.0	100	100	87.5	100	100	90.0	11.68
32	100	87.5	100	87.5	100	100	95.0	95.0	7.62
42	100	87.5	87.5	100	100	97.5	97.5	95.0	7.62
56	100	100	100	100	87.5	100	100	97.5	6.06
75	100	100	100	100	100	100	100	100	0.00
100	100	100	100	87.5	100	100	100	97.5	6.06
100 UV	100	87.5	100	87.5	100	100	100	97.5	7.62

DATA TABLE FOR GROWTH

Effluent Conc. %	Average Dry Weight in milligrams in replicate chambers					Mean Dry Weight mg	CV*
	A	B	C	D	E		
0	0.500	0.475	0.575	0.475	0.438	0.493	10.40
32	0.400	0.488	0.388	0.388	0.425	0.418	10.07
42	0.400	0.325	0.375	0.450	0.375	0.385	11.80
56	0.375	0.325	0.475	0.400	0.388	0.393	13.81
75	0.438	0.425	0.375	0.488	0.400	0.425	9.97
100	0.375	0.325	0.413	0.425	0.438	0.395	11.54
100 UV	0.475	0.363	0.425	0.313	0.375	0.390	15.93
0-SN	0.571	0.633	0.575	0.475	0.500	0.551	11.53

*coefficient of variation = standard deviation x 100/mean.

PMSD = 16.1%

FATHEAD MINNOW LARVAE GROWTH AND SURVIVAL (cont)
(Pimephales promelas)

1. Dunnett's Procedure or Steels Many-One Rank Test as appropriate:

Is the mean survival at 7 days significantly different (p=.05) than the control survival for the % effluent corresponding to:

a) LOW FLOW OR CRITICAL DILUTION	**(100%)**	**YES**	**X**	**NO**
b) ½ LOW FLOW DILUTION	**(N/A%)**	**YES**		**NO**

2. Dunnett's Procedure (or appropriate test):

Is the mean dry weight (growth) at 7 days significantly different (p=.05) than the control's dry weight for the % effluent corresponding to (significant non-lethal effects):

a) LOW FLOW OR CRITICAL DILUTION	**(100%)**	**X**	**YES**	**NO**
b) ½ LOW FLOW DILUTION	**(N/A%)**		**YES**	**NO**

3. If you answered NO to 1. a) and 2. a) enter (0) otherwise enter (1): 1
4. If you answered NO to 1. b) and 2. b) enter (0) otherwise enter (1): N/A
5. Enter response to item 3 on DMR Form, parameter #TEP6C.
6. Enter response to item 4 on DMR Form, parameter #TFP6C.
7. Enter percent effluent corresponding to each NOEC below and circle lowest number:

a.) NOEC survival	**100.0% effluent.**
b.) NOEC growth	**32.0% effluent.**
c.) LOEC survival	**N/A% effluent**
d.) LOEC growth	**42.0% effluent**

Biomonitoring Form
Chronic Toxicity Summary Form
Pimephales promelas
Chemical Parameters Chart

Permittee: El Dorado Chemical
NPDES No.: AR0000752/ AFIN 70-00040
Contact: Larken Pennington
Analyst: Briggs, Heaglsten, Cotty, Williams

Sample No. 1 Collected: Date: 7/15/13 Time: 0830
Sample No. 2 Collected: Date: 7/17/13 Time: 0830
Sample No. 3 Collected: Date: 7/19/13 Time: 0830
Test Begin: Date: 7/16/13 Time: 1530
Test End: Date: 7/23/13 Time: 1105

Dilution: 0

Day:	1	2	3	4	5	6	7	Comments
Temp (C)	24.5	24.9	25.6	25.0	24.9	25.2	24.6	
DO Initial	7.8	7.0	7.2	7.4	7.4	5.9	6.4	
DO Final	8.3	8.3	8.3	8.4	8.2	8.3		
pH Initial	7.3	7.2	7.2	7.1	7.4	7.2	7.2	
pH Final	7.3	7.4	7.6	7.3	7.5	7.4		
Alkalinity	36.0							
Hardness	44.0							
Conductivity	168.4	167.7	168.0	168.4	167.6	170.0		
Chlorine	<.01							

Dilution: 56

Day:	1	2	3	4	5	6	7	Comments
Temp (C)	24.5	24.9	25.6	25.0	24.9	25.2	24.6	
DO Initial	7.7	7.2	7.0	7.0	7.1	5.8	6.4	
DO Final	8.1	8.1	8.7	7.8	8.0	8.2		
pH Initial	7.4	7.3	7.2	7.1	7.2	7.2	7.2	
pH Final	7.6	7.7	7.8	7.8	7.6	7.8		
Alkalinity								
Hardness								
Conductivity	272	271	264	260	259	266		
Chlorine								

Dilution: 32

Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.5	24.9	25.6	25.0	24.9	25.2	24.6	
DO Initial	7.8	7.3	7.1	7.3	7.3	6.0	6.4	
DO Final	8.2	8.2	8.5	8.0	8.1	8.2		
pH Initial	7.3	7.3	7.2	7.0	7.3	7.2	7.2	
pH Final	7.5	7.6	7.6	7.5	7.4	7.6		
Alkalinity								
Hardness								
Conductivity	229	226	225	226	225	227		
Chlorine								

Dilution: 75

Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.5	24.9	25.6	25.0	24.9	25.2	24.6	
DO Initial	7.7	7.2	6.9	7.0	7.0	5.6	5.9	
DO Final	8.1	8.0	8.7	7.6	7.9	8.1		
pH Initial	7.4	7.4	7.2	7.1	7.2	7.2	7.3	
pH Final	7.6	7.8	7.9	8.1	7.7	7.8		
Alkalinity								
Hardness								
Conductivity	308	302	300	295	293	299		
Chlorine								

Dilution: 42

Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.5	24.9	25.6	25.0	24.9	25.2	24.6	
DO Initial	7.7	7.4	7.0	7.0	7.1	5.7	6.3	
DO Final	8.2	8.2	8.6	7.9	8.0	8.2		
pH Initial	7.3	7.3	7.2	7.1	7.2	7.2	7.2	
pH Final	7.5	7.7	7.7	7.6	7.5	7.7		
Alkalinity								
Hardness								
Conductivity	247	242	241	240	238	244		
Chlorine								

Dilution: 100

Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.5	24.9	25.6	25.0	24.9	25.2	24.6	
DO Initial	7.7	7.2	6.9	6.8	7.1	5.2	6.3	
DO Final	8.0	7.9	8.5	7.5	7.8	8.0		
pH Initial	7.5	7.4	7.4	7.3	7.3	7.2	7.4	
pH Final	7.7	7.9	8.0	8.1	7.7	7.9		
Alkalinity	68.0	72.0		76.0				
Hardness	24.0	44.0		44.0				
Conductivity	354	347	344	340	337	344		
Chlorine	<.01	<.01		<.01				

Dilution:

Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.5	24.9	25.6	25.0	24.9	25.2	24.6	
DO Initial	7.5	7.2	6.7	6.8	6.8	5.2	6.2	
DO Final	7.7	7.6	8.7	7.5	7.8	7.7		
pH Initial	7.6	7.5	7.3	7.4	7.4	7.3	7.4	
pH Final	7.7	7.8	7.8	8.0	7.8	7.8		
Alkalinity								
Hardness								
Conductivity	355	352	344	323	326	339		
Chlorine								

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: El Dorado Chemical

Project#: X5164

Chain of Custody Documents Checked by: AH 8/1/13
Technician/Date

Raw Data Documents Checked by: AH 8/1/13
Technician/Date

Statistical Analysis Package Checked by: EGB 7/31/13
Quality Manager/Date

Quality Control Data Checked by: EGB 8/9/13
Quality Manager/Date

Report Checked by: EGB 8/8/13
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.

[signature], BS
Quality Manager

8/9/13
Date

Report Rev. 3.0

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X5168

Bio-Analytical Laboratories' Executive Summary

Permittee: El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731
Project #: X5168
Outfall: Outfall 006 (contaminated storm water)
Permit #: AR0000752/ AFIN #70-00040
Contact: Ms. Larken Pennington
Test Dates: July 19 - 21, 2013
Test Type: 48-hour acute toxicity test using *Pimephales promelas* (EPA 2000.0).
48-hour acute toxicity test using *Daphnia pulex* (EPA 2021.0)
Results:

For *Pimephales promelas:*
1. If the NOEC for survival is less than the critical dilution (100.0%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM6C- 0 **(Pass).**
2. Report the NOEC for survival, Parameter TOM6C - 100.0%.
3.Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM6C - 0.00%.

For *Daphnia pulex:*
1. If the NOEC for survival is less than the critical dilution (100.0%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D- 0 **(Pass).**
2. Report the NOEC for survival, Parameter TOM3D -100.0%.
3.Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 11.68%.

This report contains a total of 33 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 data in this report is for monitoring purposes only and should not be reported on discharge monitoring reports.

Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023

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

THE RESULTS OF TWO 48-HOUR ACUTE TOXICITY TESTS FOR OUTFALL 006 AT

EL DORADO CHEMICAL COMPANY
El Dorado, Arkansas

NPDES #AR0000752
AFIN #70-00040

EPA Methods 2000.0 and 2021.0

Project X5168

Test Dates: July 19 - 21, 2013
Report Date: July 26, 2013

Prepared for:
Ms. Larken Pennington
El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731

Prepared by:
Ginger Briggs
Bio-Analytical Laboratories
P.O. Box 527
Doyline, LA 71023
ADEQ #88-0630

BAL
ADEQ #88-0630
Project X5168

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BAL
ADEQ #88-0630
Project X5168

1.0 Introduction

Bio-Analytical Laboratories (BAL), Doyline, Louisiana conducted two 48-hour acute toxicity tests for Outfall 006 at El Dorado Chemical Company, El Dorado, Arkansas. The test organisms used were the fathead minnow, *Pimephales promelas* and the cladoceran, *Daphnia pulex*. 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 LC_{50}, 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).

2.2 Test Organisms

The fathead minnows were obtained from Aquatic Biosystems, Fort Collins, Colorado (ABS) and were approximately 12 days old at test initiation. The *Daphnia pulex* test organisms were raised in-house and were less than 24 hours old at test initiation. Forty-eight hour reference toxicant tests were conducted monthly in order to document organism sensitivity and demonstration of capability.

2.3 Dilution Water

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

2.4 Test Concentrations

The test concentrations used in the tests were 100.0, 75.0, 56.0, 42.0, 32.0 and 22.0 percent effluent and a reconstituted water control. The critical dilution was defined as 100.0 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

One sample of Outfall 006 was collected by El Dorado Chemical personnel on July 19, 2013. Upon completion of collection, the sample was chilled and delivered to Bio-Analytical Laboratories by BAL personnel. The sample temperature upon arrival was 2.2^0 Celsius.

2.6 Sample Preparation

Upon arrival, the sample was logged in, given an identification number and refrigerated unless needed. Prior to use, the sample was warmed to 25 ± 1^0 Celsius. The total residual chlorine level was measured with a Capital Controls^R amperometric titrator and recorded if present. Dissolved oxygen, pH and conductivity measurements were taken on the control and each test concentration at test initiation, at each renewal and at test termination. Alkalinity and hardness 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 ± 1^0 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.

BAL
ADEQ #88-0630
Project X5168

2.8 Data Analysis

The NOEC and LC_{50} values values were obtained by approved EPA methods of analysis, using the ToxCalc statistical program.

3.0 Results and Discussion

The results of the tests can be found in Table 1. Significant differences in survival were not noted in the 100 percent critical dilution after 48 hours of exposure (p=.05). The NOEC value for both tests was 100.0 percent effluent (p=.05). The 48-hour LC_{50} values could not be determined because greater than 50.0 percent survival occurred in the 100.0 percent dilution.

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

Percent Effluent	Percent Survival	
Test Organism	*Pimephales promelas* (Fathead Minnow)	*Daphnia pulex*
Control	100.0	95.0
22.0	100.0	82.5
32.0	100.0	85.0
42.0	100.0	92.5
56.0	100.0	92.5
75.0	100.0	90.0
100.0	100.0	90.0

The 48-hour reference toxicant test results indicate that the test organisms were within the respective sensitivity range. The graphs of the acute reference toxicant tests can be found in Appendix D.

BAL
ADEQ #88-0630
Project X5168

4.0 Conclusions

The sample of Outfall 006 collected from El Dorado Chemical Company, El Dorado, Arkansas, on July 18, 2013, was not found to be lethally toxic to the *Daphnia pulex* test organisms nor the fathead minnow test organisms in the 100.0 percent critical dilution after 48 hours of exposure (p=.05).

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

3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023

(318) 745-2772
1-800-256-1246
Fax: (318) 745-2773

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

Laboratory Use Only:

Company: El Dorado Chemical Company				**Phone:** (870) 863-1484	**Analysis:**							Project Number: X5168		
Address: 4500 Norwest Ave., El Dorado, AR 71731				**Fax:** (870) 863-7499								Temperature upon arrival: 2.2°C		
Permit #: AR0000752/AFIN 70-00040				**Purchase Order:**								Thermometer #: 29		
Sampler's Signature/Printed Name/Affiliation: Karen Pennington / Karen Pennington / EDCC												Tech: LC		
												Date: 7/19/13		
Date Start / **Date End**	**Time Start** / **Time End**	**C**	**G**	**# and type of container**	**Sample Identification**	Chronic Ceriodaphnia	Chronic minnow	Acute minnow(fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	Fecal Coliform	**Lab Control Number:**	**Preservative: (below)**
7/18/13	1800-2200	X		6 half gallon	006			X	X				C7726	ICE
													TB 7-19-13	
Relinquished by/Affiliation: Karen Pennington / EDCC					**Date:** 7/18/13	**Time:** 1015	**Received by/Affiliation:**						**Date:** 7/19/13	**Time:** 1015
Relinquished by/Affiliation:					**Date:**	**Time:**	**Received by/Affiliation:**						**Date:**	**Time:**
Relinquished by/Affiliation:					**Date:** 7-19-13	**Time:** 1240	**Received by/Affiliation:**						**Date:** 7/19/13	**Time:** 1240

Method of Shipment: ___X___ Lab _____ Bus _____ Fed Ex _____ DHL _____ UPS _____ Client _____ Other **Tracking #** _____

Comments:

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X5168

Client: EDCC/El Dorado Chemical Company

Address: 4500 Northwest Ave El Dorado AR 71731

NPDES#AR0000752 Outfall 006

Technicians: EGB/AH/LC/GW

Test initiated: Date 7/19/13 Time 1505

Test terminated: Date 7/21/13 Time 1630

Dissolved Oxygen Meter: Model # YSI 55D Serial #06E2089 AU
pH Meter: Model #Orion 230A+ Serial #105253
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 & %) @1520	Total Residual Chlorine (mg/L)	Dechlorinated? Amount?	Ammonia (NH3) mg/L	Salinity	Hardness 1003	Alkalinity 1003	Tech
C7726	9.1/111.8%	7.8/94.2%	<0.01	NO	6.0	N/A	384.0	4.0	LC
↓	9.2/105.1	Y120/ 8.11 94.5% @1340	↓	↓	↓	↓	↓	↓	

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 H2O	3516	NA	NA	NA	NA	7.5	44.0	36.0	AH
↓		↓	↓	↓	↓				

Test Species Information

Test Species Info.	Species: Daphnia ID#: Batch L1	Species: Ceriodaphnia ID#: Batch A351748	Species: ID#:	Species: ID#:
Age	<24h	1-2 days		
Test Container Size	30ml	250ml		
Test volume	25ml	200ml		
Feeding: Type	YCT: Algae	Artemia		
Amount	Fed 2hrs prior to test initiation			
Aeration?	NA	NA		
Amount				
Condition of survivors	good	good		

Comments:

EGB 7/21/13

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

Project# X5168

Client El Dorado Chemical

Test started: Date 7/19/13 Time 1505

Test ended: Date 7/21/13 Time 1545

Sample Description 006

Test Species D. pulex ID# BAL/L1

Technician: 0hour AH 24hour SW 48hour EGB 72hour — 96hour —

Time: 0hour 1505 24hour 1430 48hour 1545 72hour — 96hour —

Temperature (°C): 0hour 25.3 24hour 25.1 48hour 24.5 72hour — 96hour —

Test Dilution %	Replicate	Test Salinity	# Live Organisms 0 hr	24	48	72	96	Dissolved Oxygen 0	24	48	72	96	pH 0	24	48	72	96	Conductivity 0	24	48	72	96
		NA																				
0	A		8	8	7			8.2	8.2/8.4	7.7			7.5	7.6/7.4	7.8			167.4	197.2/162.1	209.0		
	B		8	8	8																	
	C		8	8	7																	
	D		8	8	8																	
	E		8	8	8																	
22	A		8	8	6			8.0	7.9/8.3	7.8			7.1	7.0/7.0	7.4			382	390/367	477.0		
	B		8	8	6																	
	C		8	8	7																	
	D		8	8	7																	
	E		8	8	7																	
Chemistry Tech prerenewal/postrenewal								SW	SW/SW	EGB			SW	SW/SW	EGB			SW	SW/SW	EGB		

ACUTE2 020809 Rev.

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

Project# X5168

Client El Dorado Chemical

Sample Description ODo

Test started: Date 7/19/13 Time 1505

Test ended: Date 7/21/13 Time 1545

Test Species D. pulex ID# BAL1

Technician:	Ohour AH	24hour SW	48hour EGB	72hour	96hour
Time:	Ohour 1505	24hour 1430	48hour 1545	72hour	96hour
Temperature (°C):	Ohour 25.3	24hour 25.1	48hour 24.5	72hour	96hour

Test Dilution %	Replicate	Test Salinity NA	# 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
32	A		8	8	6			8.0	7.9/8.2	8.0			7.0	7.2/7.0	7.4			472	491/458	511.0		
	B		8	8	6																	
	C		8	8	7																	
	D		8	8	7																	
	E		8	8	8																	
42	A		8	8	7			7.9	7.9/8.3	8.0			6.9	7.2/6.9	7.3			571	574/542	605.0		
	B		8	7	7																	
	C		8	8	7																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								SW	SW	EGB			SW	SW	EGB			SW	SW	EGB		

ACUTE2 020809 Rev.

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

Project# X5168

Client El Dorado Chemical

Sample Description OOL

Test started: Date 7/19/13 Time 1505

Test ended: Date 7/21/13 Time 1545

Test Species D. pulex ID# BAL L1

Technician: Ohour AH 24hour JW 48hour EDB 72hour ____ 96hour ____

Time: Ohour 1505 24hour 1530 48hour 1545 72hour ____ 96hour ____

Temperature (°C): Ohour 25.3 24hour 25.1 48hour 24.5 72hour ____ 96hour ____

Test Dilution %	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
		NA	0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
56	A		8	8	8			7.8	8.1	8.0			6.8	6.8	7.2			697	672	750		
	B		8	7	7																	
	C		8	8	8																	
	D		8	8	7																	
	E		8	7	7																	
75	A		8	8	8			7.7	8.2	8.1			6.6	6.5	7.0			870	836	959		
	B		8	6	6																	
	C		8	6	6																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								JW	JW	EDB			JW	JW	EDB			JW	JW	EDB		

ACUTE2 020809 Rev.

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

Project# X5168

Client El Dorado Chemical

Sample Description OOL

Test started: Date 7/19/13 Time 1505

Test ended: Date 7/21/13 Time 1545

Test Species D. pulex ID# BAL L1

Technician: Ohour BH 24hour BW 48hour EGB 72hour ____ 96hour ____

Time: Ohour 1505 24hour 1430 48hour 1545 72hour ____ 96hour ____

Temperature (°C): Ohour 25.3 24hour 25.1 48hour 24.5 72hour ____ 96hour ____

Test Dilution %	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
		NA	0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
100	A		8	8	8			7.7	7.7/8.1	8.0			6.0	6.7/6.0	6.6			1098	1109/1051	1262	1.0	
	B		8	8	8																	
	C		8	8	6																	
	D		8	7	7																	
	E		8	7	7																	
	A		8																			
	B		8																			
	C		8																			
	D		8																			
	E		8																			
Chemistry Tech prerenewal/postrenewal								BW	BW	EGB			BW	BW	EGB			BW	BW	EGB		

BH 7/19/13

ACUTE2 020809 Rev.

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

Project# X5168 | Test started: Date 7/19/13 | Time 1505
Client El Dorado Chemical | Test ended: Date 7/21/13 | Time 1630
Sample Description 006 | Test Species P. promelas | ID# ~~BPL~~ ABS/748 LC 7/19/13

Technician: 0hour LC 24hour SW 48hour EB 72hour | 96hour |
Time: 0hour 1505 24hour 1330 48hour 1630 72hour | 96hour |
Temperature (^0C): 0hour 28.9 24hour 24.8 48hour 25.5 72hour | 96hour |

Test Dilution %	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
		NA	0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0	A		8	8	8			8.2	7.1/7.4	7.3			7.5	7.3/7.4	7.2			167.4	180.1/162.1	194.0		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
22	A		8	8	8			8.0	7.5/8.3	9.1			7.1	7.2/7.0	7.0			382	396/367	417.0		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								LC	SW/SW	EB			LC	SW/SW	EB			LC	SW/SW	EB		

ACUTE2 020809 Rev.

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

Project# X5168

Client El Dorado Chemical

Sample Description OOL

Test started: Date 7/19/13 Time 1505

Test ended: Date 7/21/13 Time 1630

Test Species P. promelas ID# ABS1748

Technician: Ohour LC 24hour SW 48hour EGB 72hour ____ 96hour ____

Time: Ohour 1505 24hour 1320 48hour 1630 72hour ____ 96hour ____

Temperature (°C): Ohour 25.1 24hour 24.8 48hour 25.5 72hour ____ 96hour ____

LC 7/19/13

Test Dilution %	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
		NA	0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
32	A		8	8	8			8.0	7.5/8.2	6.9			7.0	7.2/7.0	7.1			472	484/458	519.0		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
42	A		8	8	8			7.9	7.4/8.3	6.9			6.9	7.1/6.9	7.0			571	580/564	620.0		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8/8	8																	
				SW 7/20/13																		
Chemistry Tech prerenewal/postrenewal								LC	SW/SW	EGB			LC	SW/SW	EGB			LC	SW/SW	EGB		

ACUTE2 020809 Rev.

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

Project# X5168

Client El Dorado Chemical

Sample Description 006

Test started: Date 7/19/13 Time 1505

Test ended: Date 7/21/13 Time 1630

Test Species P. promelas ID# ~~[illegible]~~ A05/748 LC 7/19/13

Technician: 0hour LC 24hour SW 48hour EGB 72hour — 96hour —

Time: 0hour 1505 24hour 1330 48hour 1630 72hour — 96hour —

Temperature (°C): 0hour 25.9 24hour 24.8 48hour 25.5 72hour — 96hour —

Test Dilution %	Replicate	Test Salinity	# Live Organisms 0 hr	24	48	72	96	Dissolved Oxygen 0	24	48	72	96	pH 0	24	48	72	96	Conductivity 0	24	48	72	96
		NA																				
56	A		8	8	8			7.8	7.3/8.1	6.8			6.8	7.0/6.8	7.0			697	714/670	757.0		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
75	A		8	8	8			7.7	7.3/8.2	6.8			6.6	6.8/6.5	6.8			810	882/836	943.0		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								LC	SW/[illegible]	EGB			LC	SW/[illegible]	EGB			LC	SW/[illegible]	EGB		

ACUTE2 020809 Rev.

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

Project# X5168 | Test started: Date 7/19/13 | Time 1505

Client El Dorado Chemical | Test ended: Date 7/21/13 | Time 1630

Sample Description 006 | Test Species P. promelas | ID# ~~BPL~~ ABS/148 LC 7/19/13

Technician: 0hour LC 24hour SW 48hour EGB 72hour — 96hour —

Time: 0hour 1505 24hour 1330 48hour 1630 72hour — 96hour —

Temperature (^{o}C): 0hour 25.9 24hour 24.8 48hour 25.5 72hour — 96hour —

Test Dilution %	Replicate	Test Salinity	# Live Organisms 0 hr	24	48	72	96	Dissolved Oxygen 0	24	48	72	96	pH 0	24	48	72	96	Conductivity 0	24	48	72	96
100	A	NA	8	8	8			7.7	7.3/8.1	6.6			6.0	6.4/6.0	6.4			1098	1113/1054	1201.0		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
	A		8						/					/					/			
	B		8																			
	C		8																			
	D		8																			
	E		8																			
Chemistry Tech prerenewal/postrenewal								LC	SW/SW	EGB			LC	SW/SW	EGB			LC	SW/SW	EGB		

(Second replicate group lined through diagonally: "Only A&C 7/19/13")

ACUTE2 020809 Rev.

APPENDIX C
STATISTICAL ANALYSIS

Daphnid Acute Test-48 Hr Survival

Start Date:	7/19/2013	Test ID:	X5168DP	Sample ID:	6
End Date:	7/21/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	7/19/2013	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	0.8750	1.0000	1.0000
22	0.7500	0.7500	0.8750	0.8750	0.8750
32	0.7500	0.7500	0.8750	0.8750	1.0000
42	0.8750	0.8750	0.8750	1.0000	1.0000
56	1.0000	0.8750	1.0000	0.8750	0.8750
75	1.0000	0.7500	0.7500	1.0000	1.0000
100	1.0000	1.0000	0.7500	0.8750	0.8750

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	0.9500	1.0000	1.3196	1.2094	1.3931	7.623	5		
22	0.8250	0.8684	1.1445	1.0472	1.2094	7.764	5	18.00	16.00
32	0.8500	0.8947	1.1813	1.0472	1.3931	12.150	5	20.50	16.00
42	0.9250	0.9737	1.2829	1.2094	1.3931	7.841	5	25.00	16.00
56	0.9250	0.9737	1.2829	1.2094	1.3931	7.841	5	25.00	16.00
75	0.9000	0.9474	1.2547	1.0472	1.3931	15.099	5	25.50	16.00
100	0.9000	0.9474	1.2504	1.0472	1.3931	11.683	5	24.00	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test Indicates non-normal distribution (p <= 0.05)	0.92747	0.934	-0.146	-1.1412
Bartlett's Test Indicates equal variances (p = 0.73)	3.58988	16.8119		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test Treatments vs D-Control	100	>100		1

ToxCalc v5.0.23

Reviewed by: EQB 7/23/13

Acute Fish Test-48 Hr Survival

Start Date:	7/19/2013	Test ID:	X5168PP	Sample ID:	6
End Date:	7/21/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	7/19/2013	Protocol:	EPAAW02-EPA/821/R-02-01	Test Species:	PP-Pimephales promelas
Comments:					

Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000
22	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
42	1.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	1.0000	1.0000	1.0000
75	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000	1.0000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5		
22	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
32	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
42	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
56	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
75	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
100	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00

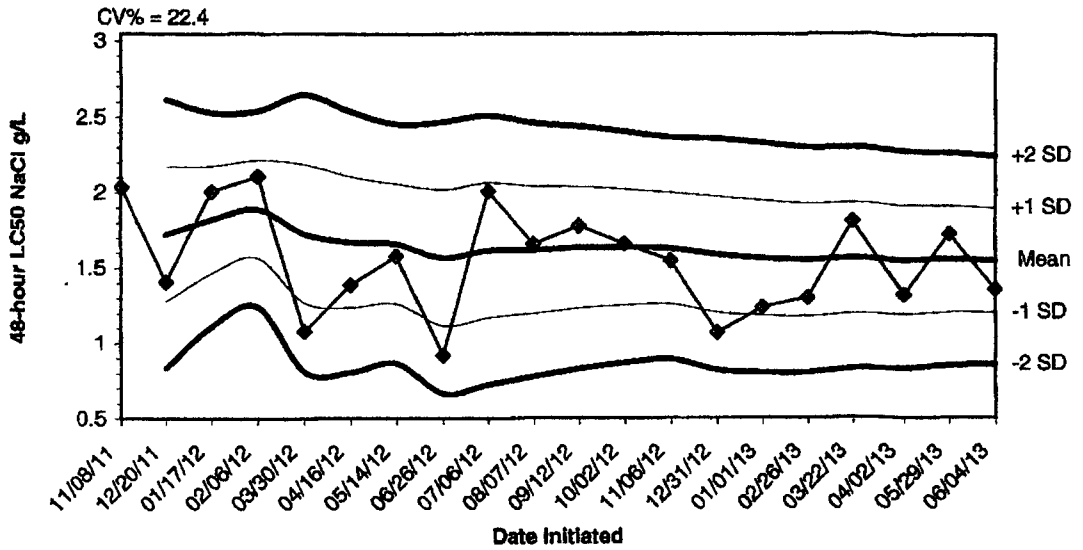
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	1	0.934		
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs D-Control				

Reviewed by: EOB 7/23/13

APPENDIX D
QUALITY ASSURANCE CHARTS

2013 48-hour Reference Toxicant Test Results Using Daphnia pulex



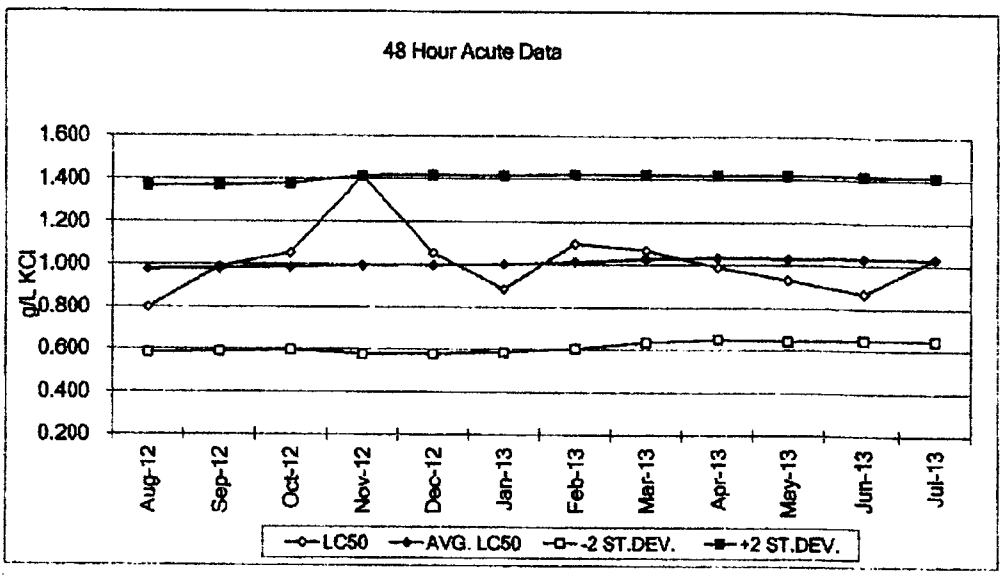
Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
11/08/11	2.0400					
12/20/11	1.4100	1.7250	1.2795	0.8340	2.1705	2.6160
01/17/12	2.0100	1.8200	1.4646	1.1092	2.1754	2.5308
02/06/12	2.1100	1.8925	1.5681	1.2437	2.2169	2.5413
03/30/12	1.0800	1.7300	1.2707	0.8114	2.1893	2.6486
04/16/12	1.3900	1.6733	1.2397	0.8061	2.1070	2.5406
05/14/12	1.5800	1.6600	1.2626	0.8652	2.0574	2.4548
06/26/12	0.9200	1.5675	1.1160	0.6646	2.0190	2.4704
07/06/12	2.0100	1.6167	1.1693	0.7220	2.0640	2.5113
08/07/12	1.6600	1.6210	1.1990	0.7771	2.0430	2.4649
09/12/12	1.7800	1.6355	1.2323	0.8291	2.0386	2.4418
10/02/12	1.6600	1.6375	1.2530	0.8686	2.0220	2.4064
11/06/12	1.5500	1.6308	1.2619	0.8930	1.9997	2.3686
12/31/12	1.0700	1.5907	1.2059	0.8211	1.9755	2.3603
01/01/13	1.2400	1.5673	1.1856	0.8039	1.9490	2.3308
02/26/13	1.3000	1.5506	1.1758	0.8011	1.9254	2.3002
03/22/13	1.8100	1.5659	1.1976	0.8293	1.9342	2.3025
04/02/13	1.3200	1.5522	1.1903	0.8283	1.9142	2.2762
05/29/13	1.7300	1.5616	1.2075	0.8533	1.9157	2.2698
06/04/13	1.3600	1.5515	1.2039	0.8563	1.8991	2.2467

1300 Blue Spruce Drive, Suite
Fort Collins, Colorado 80524

Toll Free: 800/331-5916
Tel:970/484-5091 Fax:970/484-2514

REFERENCE TOXICANT LC50

Pimephales promelas



48 HOUR ACUTE TOXICITY DATA FOR

Pimephales promelas

DATE	LC50 (g/L KCl)	95% CONFIDENCE (upper)	(lower)	AVG.LC50 (g/L KCl)	METHOD	+2 STD	-2 STD
Feb 13	1.097	1.929	0.630	1.013	PROBIT	1.4227	0.6037
Mar 13	1.069	1.198	0.956	1.028	PROBIT	1.4222	0.6332
Apr 13	0.990	1.109	0.884	1.035	PROBIT	1.4209	0.6487
May 13	0.933	1.040	0.837	1.031	SPKR	1.4198	0.6431
Jun 13	0.871	0.964	0.786	1.033	SPKR	1.4185	0.6477
Jul 13	1.035	1.156	0.927	1.030	SPKR	1.4142	0.6458

**Current Test Dates: 07/10-12/2013

APPENDIX E
AGENCY FORMS

Acute Forms
Daphnia pulex Survival

Permittee: El Dorado Chemical - Outfall 006
NPDES Permit Number: AR0000752/ AFIN 70-00040
Composite Collected **From: 7/18/13** **To: 7/18/13**
From: **To:**
Test Initiated: 7/19/13
Dilution Water Used: **Receiving Water** **Reconstituted Water**

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	22	32	42	56	75	100
24-hour	A	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	B	100.0	100.0	100.0	87.5	87.5	75.0	100.0
	C	100.0	100.0	100.0	100.0	100.0	75.0	100.0
	D	100.0	100.0	100.0	100.0	100.0	100.0	87.5
	E	100.0	100.0	100.0	100.0	87.5	100.0	87.5
48-hour	A	87.5	75.0	75.0	87.5	100.0	100.0	100.0
	B	100.0	75.0	75.0	87.5	87.5	75.0	100.0
	C	87.5	87.5	87.5	87.5	100.0	75.0	75.0
	D	100.0	87.5	87.5	100.0	87.5	100.0	87.5
	E	100.0	87.5	100.0	100.0	87.5	100.0	87.5
	Mean	95.0	82.5	85.0	92.5	92.5	90.0	90.0

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 (100%) **YES** **X NO**
b.)½ LOW FLOW OR 2X CRITICAL DILUTION (N/A%) **YES** **NO**
2. Enter percent effluent corresponding to the LC_{50} below:
LC_{50} = N/A% 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
Daphnia 48 hour Acute Static Renewal
Chemical Parameters Chart*

Permittee: El Dorado Chemical - Outfall 006
NPDES Number: AR0000752/ AFIN 70-00040
Contact: Larken Pennington
Analyst: Haughton, Williams, Briggs
Sample Collected **From:** **Date 7/18/13** **Time 1800**
To: **Date 7/18/13** **Time 2200**
Test Begin **Date 7/19/13** **Time 1505**
Test End **Date 7/21/13** **Time 1545**

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	8.2	8.4	7.7	25.3	25.1	24.5	36.0			44.0			7.5	7.4	7.8
22	8.0	8.3	7.8	25.3	25.1	24.5							7.1	7.0	7.4
32	8.0	8.2	8.0	25.3	25.1	24.5							7.0	7.0	7.4
42	7.9	8.3	8.0	25.3	25.1	24.5							6.9	6.9	7.3
56	7.8	8.1	8.0	25.3	25.1	24.5							6.8	6.8	7.2
75	7.7	8.2	8.1	25.3	25.1	24.5							6.6	6.5	7.0
100	7.7	8.1	8.0	25.3	25.1	24.5	4.0			284.0			6.0	6.0	6.6

*This Form is to be submitted with each DMR.6.6
Alkalinity and hardness to be reported as mg/l $CaCO_3$

Acute Forms
Pimephales promelas (Fathead Minnow) Survival

Permittee: El Dorado Chemical - Outfall 006
NPDES Permit Number: AR0000752/ AFIN 70-00040
Composite Collected **From: 7/18/13** **To: 7/18/13**
From: **To:**
Test Initiated: 7/19/13
Dilution Water Used: **Receiving Water** **Reconstituted Water**

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	22	32	42	56	75	100
24-hour	A	100.0	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	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	D	100.0	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	100.0
48-hour	A	100.0	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	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	D	100.0	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	100.0
	Mean	100.0	100.0	100.0	100.0	100.0	100.0	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 (100%) **YES** **X NO**
b.)½ LOW FLOW OR 2X CRITICAL DILUTION (N/A%) **YES** **NO**
2. Enter percent effluent corresponding to the LC_{50} below:
LC_{50} = N/A% 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: El Dorado Chemical - Outfall 006
NPDES Number: AR0000752/ AFIN 70-00040
Contact: Larken Pennington
Analyst: Haughton, Williams, Briggs

Sample Collected	**From:**	**Date 7/18/13**	**Time 1800**
	To:	**Date 7/18/13**	**Time 2200**
Test Begin		**Date 7/19/13**	**Time 1505**
Test End		**Date 7/21/13**	**Time 1630**

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	8.2	8.4	7.3	25.9	24.8	25.5	36.0			44.0			7.5	7.4	7.2
22	8.0	8.3	7.1	25.9	24.8	25.5							7.1	7.0	7.0
32	8.0	8.2	6.9	25.9	24.8	25.5							7.0	7.0	7.1
42	7.9	8.3	6.9	25.9	24.8	25.5							6.9	6.9	7.0
56	7.8	8.1	6.8	25.9	24.8	25.5							6.8	6.8	7.0
75	7.7	8.2	6.8	25.9	24.8	25.5							6.6	6.5	6.8
100	7.7	8.1	6.6	25.9	24.8	25.5	4.0			284.0			6.0	6.0	6.4

*This Form is to be submitted with each DMR.6.6
Alkalinity and hardness to be reported as mg/l $CaCO_3$

APPENDIX F
REPORT QUALITY ASSURANCE FORM

Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 627
Doyline, LA 71023

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

REPORT QUALITY ASSURANCE FORM

Client: El Dorado Chemical - ODe

Project#: X5168

Chain of Custody Documents Checked by: AH 7/22/13
Technician/Date

Raw Data Documents Checked by: AH 7/22/13
Technician/Date

Statistical Analysis Package Checked by: EGB 7/23/13
Quality Manager/Date

Quality Control Data Checked by: EGB 7/10/13
Quality Manager/Date

Report Checked by: EGB 7/26/13
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 G. Braggio, BS — 7/26/13
Quality Manager — **Date**

Report Rev. 3.0

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X5169

Bio-Analytical Laboratories' Executive Summary

Permittee: El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731
Project #: X5169
Outfall: Outfall 007 (contaminated storm water)
Permit #: AR0000752/ AFIN #70-00040
Contact: Ms. Larken Pennington
Test Dates: July 19 - 21, 2013
Test Type: 48-hour acute toxicity test using *Pimephales promelas* (EPA 2000.0).
48-hour acute toxicity test using *Daphnia pulex* (EPA 2021.0)
Results:

For *Pimephales promelas:*
1. If the NOEC for survival is less than the critical dilution (100.0%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM6C- 1 **(Fail)**.
2. Report the NOEC for survival, Parameter TOM6C - 75.0%.
3.Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM6C - 0.00%.
Note: Toxicity was removed when the 100% effluent concentration's pH level was maintained at a range of 6.2-6.9.

For *Daphnia pulex:*
1. If the NOEC for survival is less than the critical dilution (100.0%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D- 1 **(Fail)**.
2. Report the NOEC for survival, Parameter TOM3D -42.0%.
3.Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 15.98%.
Note: Toxicity was removed when the 100% effluent concentration's pH level was maintained at a range of 6.2-6.9.

This report contains a total of 36 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 data in this report is for monitoring purposes only and should not be reported on discharge monitoring reports.

Bio-Analytical Laboratories

3240 Spurgin Road
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Fax: (318) 745-2773

THE RESULTS OF TWO 48-HOUR ACUTE TOXICITY TESTS FOR OUTFALL 007 AT

EL DORADO CHEMICAL COMPANY
El Dorado, Arkansas

NPDES #AR0000752
AFIN #70-00040

EPA Methods 2000.0 and 2021.0

Project X5169

Test Dates: July 19 - 21, 2013
Report Date: July 26, 2013

Prepared for:
Ms. Larken Pennington
El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731

Prepared by:
Ginger Briggs
Bio-Analytical Laboratories
P.O. Box 527
Doyline, LA 71023
ADEQ #88-0630

BAL
ADEQ #88-0630
Project X5169

TABLE OF CONTENTS

BAL
ADEQ #88-0630
Project X5169

1.0 Introduction

Bio-Analytical Laboratories (BAL), Doyline, Louisiana conducted two 48-hour acute toxicity tests for Outfall 007 at El Dorado Chemical Company, El Dorado, Arkansas. The test organisms used were the fathead minnow, *Pimephales promelas* and the cladoceran, *Daphnia pulex*. 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 LC_{50}, 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).

2.2 Test Organisms

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

2.3 Dilution Water

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

2.4 Test Concentrations

The test concentrations used in the tests were 100.0, 75.0, 56.0, 50.0, 42.0 and 32.0 percent effluent and a reconstituted water control. The critical dilution was defined as 100.0 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

One sample of Outfall 007 was collected by El Dorado Chemical personnel on July 19, 2013. Upon completion of collection, the sample was chilled and delivered to Bio-Analytical Laboratories by BAL personnel. The sample temperature upon arrival was 1.5^0 Celsius.

2.6 Sample Preparation

Upon arrival, the sample was logged in, given an identification number and refrigerated unless needed. Prior to use, the sample was warmed to 25 ± 1^0 Celsius. The total residual chlorine level was measured with a Capital Controls^R amperometric titrator and recorded if present. The initial pH of the sample was 5.0; therefore, an aliquot was adjusted to a range of 6.2-6.9 using 1.0 Normal Sodium Hydroxide solution. A pH-adjusted 100.0 percent effluent concentration was then run with the test in order to document toxicity due to low pH. Dissolved oxygen, pH and conductivity measurements were taken on the control and each test concentration at test initiation, at each renewal and at test termination. Alkalinity and hardness 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 ± 1^0 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 LC_{50} values values were obtained by approved EPA methods of analysis, using the ToxCalc statistical program.

3.0 Results and Discussion

The results of the tests can be found in Table 1. Significant differences in survival were noted in the 100 percent critical dilution after 48 hours of exposure (p=.05). The NOEC value for both the *Daphnia pulex* test and the fathead minnow test was 42.0 and 75.0 percent effluent, respectively (p=.05). The 48-hour LC_{50} value in the *Daphnia pulex* test could not be determined because greater than 50.0 percent survival occurred in the 100.0 percent dilution. The 48-hour LC_{50} value for the fathead minnow test was 86.6 percent effluent (p=.05).

Adjusting the pH of the sample removed the toxicity in both tests.

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

Percent Effluent	Percent Survival	
Test Organism	*Pimephales promelas* (Fathead Minnow)	*Daphnia pulex*
Control	100.0	97.5
32.0	100.0	90.0
42.0	100.0	95.0
50.0	100.0	80.0
56.0	100.0	92.5
75.0	100.0	82.5
100.0	0.0	85.0
100.0 pH	100.0	90.0

The 48-hour reference toxicant test results indicate that the test organisms were within the respective sensitivity range. The graphs of the acute reference toxicant tests can be found in Appendix D.

BAL
ADEQ #88-0630
Project X5169

4.0 Conclusions

The sample of Outfall 007 collected from El Dorado Chemical Company, El Dorado, Arkansas, on July 18, 2013, was found to be lethally toxic to the *Daphnia pulex* test organisms and the fathead minnow test organisms in the 100.0 percent critical dilution after 48 hours of exposure (p=.05). Adjusting the pH from 5.0, and maintaining it in a range of 6.2-6.9 reduced the toxicity at the 100.0 percent critical dilution.

BAL
ADEQ #88-0630
Project X5169

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
3340 Spurgin Road
Post Office Box 627
Doyline, LA 71023
(318) 745-2772
1-800-256-1246
Fax: (318) 745-2773

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

Laboratory Use Only:

Company: El Dorado Chemical Company	Phone: (870) 863-1484	Analysis:							Project Number: X5169
Address: 4500 Norwest Ave., El Dorado, AR 71731	Fax: (870) 863-7499								Temperature upon arrival: 1.5°C
Permit #: AR0000752/AFIN 70-00040	Purchase Order:								Thermometer #: 29
Sampler's Signature/Printed Name/Affiliation: Karken Pennington / Karken Pennington / EDCC									Tech: LC
									Date: 7/19/13

Date Start / Date End	Time Start / Time End	C	G	# and type of container	Sample Identification	Chronic Ceriodaphnia	Chronic minnow	Acute minnow(fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	Fecal Coliform	Lab Control Number	Preservative: (below)
7/18/13	1810-2210	X		6 half gallon	007			X	X				C7725	ICE
					TV3 7-19-13								TV3 7-19-13	

Relinquished by/Affiliation: Karken Pennington / EDCC	Date: 7/18/13	Time: 1015	Received by/Affiliation:	Date: 7/19/13	Time: 1015
Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Relinquished by/Affiliation:	Date: 7-9-13	Time: 1240	Received by/Affiliation:	Date: 7/19/13	Time: 1240

Method of Shipment: ____ Lab ____ Bus ____ Fed Ex ____ DHL ____ UPS ____ Client ____ Other Tracking #_____

Comments:

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X5169

Client: EDCC/El Dorado Chemical Company

Address: 4500 Northwest Ave El Dorado AR 71731

NPDES#AR0000752 Outfall 007

Technicians: EGB/AH/LC/GW

Test initiated: Date 7/19/13 Time 1525

Test terminated: Date 7/21/13 Time 1615

Dissolved Oxygen Meter: Model # YSI 55D Serial #06E2089 AU
pH Meter: Model #Orion 230A+ Serial #105253
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 & %) 7/20	Total Residual Chlorine (mg/L)	Dechlor inated? Amount?	Ammonia (NH3) mg/L	Salinity	Hard-ness 100%	Alkal-inity 100%	Tech
C7725	9.2/110.4%	7.9/94.8%	<0.01	NO	6.0	N/A	336.0	4.0	JC
↓	9.7/111.3%	7/20 8.0 93.9%	↓	↓	↓	↓	↓	↓	

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	Hard-ness	Alkal-inity	Tech
Soft H2O	3516	NA	NA	NA	NA	7.5	44.0	36.0	AH
↓		↓	↓	↓	↓				

Test Species Information

Test Species Info.	Species: D.pulex ID#: BAL L1	Species: P.promelas ID#: BAL 7/16/13	Species: ID#:	Species: ID#:
Age	<24h	3days		
Test Container Size	30ml	250ml		
Test volume	25ml	200ml		
Feeding: Type	YCT; Algae	Artemia		
Amount	Fed 2 hrs prior to test initiation			
Aeration? Amount	NA	NA		
Condition of survivors	good	good		

Comments:

EGB 7/21/13

ACUTE1 020809 Rev.

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

Project# X5169

Client El Dorado Chemical

Sample Description 007

Test started: Date 7/19/13 Time 1525

Test ended: Date 7/21/13 Time 1600

Test Species D. pulex ID# BPL4

Technician: Ohour AH 24hour AW 48hour EGB 72hour ____ 96hour ____

Time: Ohour 1525 24hour 1455 48hour 1600 72hour ____ 96hour ____

Temperature (°C): Ohour 25.3 24hour 25.2 48hour 24.5 72hour ____ 96hour ____

Test Dilution %	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
		NA	0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0	A		8	8	8			8.1	8.1/8.2	7.8			7.3	7.9/7.7	7.3			493	503/468	509		
	B		8	8	8																	
	C		8	7	7																	
	D		8	8	8																	
	E		8	8	8																	
32	A		8	7	7			8.0	7.9/8.2	7.9			6.8	7.9/6.9	7.1			511	540/514	566		
	B		8	7	7																	
	C		8	8	8																	
	D		8	6	6																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal																						

ACUTE2 020809 Rev.

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

Project# X5169

Client El Dorado Chemical

Sample Description 007

Test started: Date 7/19/13 Time 1525

Test ended: Date 7/21/13 Time 1600

Test Species D. pulex ID# BAL-1

Technician:	Ohour AH	24hour SW	48hour EGB	72hour	96hour
Time:	Ohour 1525	24hour 1455	48hour 1600	72hour	96hour
Temperature (°C):	Ohour 25.3	24hour 25.2	48hour 24.5	72hour	96hour

Test Dilution %	Replicate	Test Salinity NA	# 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
42	A		8	8	8			7.9	7.7/8.1	8.0			6.7	7.2/6.7	7.1			619	633/605	696		
	B		8	7	7																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	7	7																	
50	A		8	5	5			8.0	7.7/8.0	8.0			6.5	7.2/6.6	7.0			700	717/686	750		
	B		8	8	8																	
	C		8	6	6																	
	D		8	7	7																	
	E		8	6	6																	
Chemistry Tech prerenewal/postrenewal								SW	SW/SW	EGB			SW	SW/SW	EGB			SW	SW/SW	EGB		

ACUTE2 020809 Rev.

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

Project# XS1169

Client El Dorado Chemical

Sample Description 007

Test started: Date 7/19/13 Time 1535

Test ended: Date 7/21/13 Time 1600

Test Species D. pulex ID# BAL-1

Technician: Ohour AH 24hour SW 48hour EGB 72hour ____ 96hour ____

Time: Ohour 1523 24hour 1453 48hour 1600 72hour ____ 96hour ____

Temperature (°C): Ohour 25.3 24hour 25.2 48hour 24.5 72hour ____ 96hour ____

Test Dilution %	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
		NA	0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
56	A		8	7	7		SW 7/16	7.9 7.9	7.4 8.1	7.9			6.4	7.0 6.4	7.0		SW 7/22	753 753	754 739	811.0		
	B		8	8	8																	
	C		8	7	7																	
	D		8	7	7																	
	E		8	8	8																	
75	A		8	7	7			7.8	7.7 8.1	8.0			5.9	6.3 6.2	6.8			941	945 923	1075.0		
	B		8	6	6																	
	C		8	6	6																	
	D		8	7	7																	
	E		8	7	7																	
Chemistry Tech prerenewal/postrenewal								SW	SW SW	EGB			SW	SW SW	EGB			SW	SW SW	EGB		

ACUTE2 020809 Rev.

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

Project# X5169

Client El Dorado Chemical

Sample Description 007

Test started: Date 7/19/13 Time 1525

Test ended: Date 7/21/13 Time 1600

Test Species D. pulex ID# BPL 4

Technician: Ohour AH 24hour SW 48hour EOB 72hour ____ 96hour ____

Time: Ohour 1525 24hour 1455 48hour 1600 72hour ____ 96hour ____

Temperature (°C): Ohour 25.3 24hour 25.2 48hour 24.5 72hour ____ 96hour ____

Test Dilution %	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
		N/A	0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
100	A		8	8	8			7.8	7.6/7.9	7.9			5.0	6.5/5.0	6.2			1187	1184/1168	1351.0		
	B		8	6	6																	
	C		8	6	6																	
	D		8	8	8																	
	E		8	6	6																	
0	A		8						/					/					/			
	B		8																			
	C		8																			
	D		8																			
	E		8																			
Chemistry Tech prerenewal/postrenewal								SW	SW/EOB	EOB			SW	SW/EOB				SW	SW/EOB			

ACUTE2 020809 Rev.

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

Project# X5169

Client El Dorado Chemical

Sample Description 007

Test started: Date 7/19/13 Time 1525 EGB 7/21/13

Test ended: Date 7/21/13 Time ~~1545~~ 1600

Test Species D. Pulex ID# BAC/L1

Technician: Ohour AH 24hour SW 48hour EGB 72hour _____ 96hour _____

Time: Ohour 525 24hour 1455 48hour 1600 72hour _____ 96hour _____

Temperature (°C): Ohour 25.3 24hour 25.2 48hour 24.5 72hour _____ 96hour _____

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
%		NA	0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
pH Adj. 100	A		8	7	7			7.7	7.4/7.8	7.7			6.9	6.5/6.2	6.4			1268	1157/1187	1359.0		
	B		8	8	8																	
	C		8	6	6																	
	D		8	7	7																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								SW	SW/EGB	EGB			SW	SW/EGB	EGB			SW	SW/EGB	EGB		

ACUTE2 020809 Rev.

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

Project# X5169

Client El Dorado Chemical

Test started: Date 7/19/13 Time 1530

Test ended: Date 7/21/13 Time 1615

Sample Description 007

Test Species P. promelas ID# BAL 71613

Technician: Ohour JC 24hour SW 48hour EAB 72hour ____ 96hour ____

Time: Ohour 1530 24hour 1355 48hour 1615 72hour ____ 96hour ____

Temperature (°C): Ohour 25.0 24hour 26.0 48hour 26.0 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
		NA																				
0	A		8	8	8			8.1	7.5/7.2	7.0			7.3	7.3/7.7	7.6			169.3	1812/1648	1926		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
32	A		8	8	8			8.2	7.5/7.3	6.7			6.8	7.0/6.9	6.9			517	594/534	5760		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								SW	SW/EAB	EAB			SW	SW/EAB	EAB			SW	SW/EAB	EAB		

ACUTE2 020809 Rev.

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

Project# X5169

Client El Dorado Chemical

Test started: Date 7/19/13 Time 1530

Test ended: Date 7/24/13 Time 1615

Sample Description 007

Test Species P. promelas ID# BAL 71613

Technician: Ohour LC 24hour SW 48hour EB 72hour ____ 96hour ____

Time: Ohour 1530 24hour 1355 48hour 1615 72hour ____ 96hour ____

Temperature (°C): Ohour 25.0 24hour 26.0 48hour 26.0 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
42	A		8	8	8			7.9	7.4/8.1	6.7			6.7	7.0/6.7	7.0			619	625/660	672	0	
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
50	A		8	8	8			8.0	7.5/8.0	7.1			6.5	6.9/6.6	6.9			700	703/684	768	0	
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								SW	SW/SW	EB			SW	SW/SW	EB			SW	SW/SW	EB		

ACUTE2 020809 Rev.

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

Project# X5169

Client El Dorado Chemical

Sample Description 007

Test started: Date 7/19/13 Time 1530

Test ended: Date 7/24/13 Time 1615

Test Species P. Promelas ID# BAL 71613

Technician: Ohour JC 24hour SW 48hour EOB 72hour ____ 96hour ____

Time: Ohour 1530 24hour 1355 48hour 1615 72hour ____ 96hour ____

Temperature (°C): Ohour 25.5 24hour 26.0 48hour 26.0 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
56	A		8	8	8			7.9	7.5/8.1	6.7			6.4	6.8/6.4	6.9			153	142/131	880		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
75	A		8	8	8			7.8	7.4/8.1	6.7			5.9	6.6/6.2	6.7			947	952/923	1015.0		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								SW	SW/SW	EOB			SW	SW/SW	EOB			SW	SW/SW	EOB		

ACUTE2 020809 Rev.

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

Project# X5169 Test started: Date 7/19/13 Time 1530

Client El Dorado Chemical Test ended: Date 7/24/13 Time 1615

Sample Description 007 Test Species P. promelas ID# BAL 71613

Technician: Ohour SC 24hour SW 48hour EDB 72hour ____ 96hour ____

Time: Ohour 1530 24hour 1555 48hour 1615 72hour ____ 96hour ____

Temperature (°C): Ohour 25.0 24hour 24.0 48hour 24.0 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
		n/a																				
100	A		8	0	—			7.8	6.8/7.9	—			5.0	5.6/5.0	—			1187	1279/1168	—		
	B		8	0	—																	
	C		8	0	—																	
	D		8	0	—																	
	E		8	0	—																	
	A		8						/					/					/			
	B		8																			
	C		8																			
	D		8																			
	E		8																			
Chemistry Tech prerenewal/postrenewal								SW	SW/SW	EDB			SW	SW/SW	EDB			SW	SW/SW	EDB		

SW BAL 7/19/13

ACUTE2 020809 Rev.

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

Project# X5169

Client El Dorado Chemical

Sample Description 007 SW 7/20/13

Technician: 0hour YC 24hour SW 48hour EGB 72hour ______ 96hour ______

Time: 0hour 1330 24hour 1355 48hour 1615 72hour ______ 96hour ______

Temperature (°C): 0hour 25.0 24hour 26.0 48hour 26.0 72hour ______ 96hour ______

Test started: Date 7/19/13 Time 1330

Test ended: Date 7/21/13 Time 1615

Test Species D. promelas ID# BA071613

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
%		NA	0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
pH Adj. 100	A		8	8	8			7.7	7.1/7.8	6.6			6.9	6.8/6.7	6.5			1203	1218/1151	1307.0		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								SW	SW/SW	EGB			SW	SW/SW	EGB			SW	SW/SW	EGB		

ACUTE2 020809 Rev.

APPENDIX C
STATISTICAL ANALYSIS

Daphnid Acute Test-48 Hr Survival

Start Date:	7/19/2013	Test ID:	X5169DP	Sample ID:	7
End Date:	7/21/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	7/19/2013	Protocol:	EPAAW02-EPA/821/R-02-01	Test Species:	CD-Ceriodaphnia dubia

Comments:

Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	0.8750	1.0000	1.0000
32	0.8750	0.8750	1.0000	0.7500	1.0000
42	1.0000	0.8750	1.0000	1.0000	0.8750
50	0.6250	1.0000	0.7500	0.8750	0.7500
56	0.8750	1.0000	0.8750	0.8750	1.0000
75	0.8750	0.7500	0.7500	0.8750	0.8750
100	1.0000	0.7500	0.7500	1.0000	0.7500
100PHADJ	0.8750	1.0000	0.7500	0.8750	1.0000

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.9750	1.0000	1.3564	1.2094	1.3931	6.055	5			
32	0.9000	0.9231	1.2504	1.0472	1.3931	11.683	5	1.233	2.443	0.2098
42	0.9500	0.9744	1.3196	1.2094	1.3931	7.623	5	0.428	2.443	0.2098
*50	0.8000	0.8205	1.1217	0.9117	1.3931	16.470	5	2.731	2.443	0.2098
56	0.9250	0.9487	1.2829	1.2094	1.3931	7.841	5	0.855	2.443	0.2098
*75	0.8250	0.8462	1.1445	1.0472	1.2094	7.764	5	2.466	2.443	0.2098
100	0.8500	0.8718	1.1856	1.0472	1.3931	15.980	5	1.988	2.443	0.2098
100PHADJ	0.9000	0.9231	1.2504	1.0472	1.3931	11.683	5	1.233	2.443	0.2098

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.95855	0.94	0.16002	-0.7853
Bartlett's Test indicates equal variances (p = 0.61)	5.42598	18.4753		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test indicates significant differences Treatments vs D-Control	0.12417	0.13006	0.03428	0.01845	0.10998	7, 32

Erratic dose response noted. EGB 7/23/13

Reviewed by: EGB 7/23/13

Acute Fish Test-48 Hr Survival

Start Date:	7/19/2013	Test ID:	X5169PP	Sample ID:	7
End Date:	7/21/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	7/19/2013	Protocol:	EPAAW02-EPA/821/R-02-01	Test Species:	PP-Pimephales promelas

Comments:

Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
42	1.0000	1.0000	1.0000	1.0000	1.0000
50	1.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	1.0000	1.0000	1.0000
75	1.0000	1.0000	1.0000	1.0000	1.0000
100	0.0000	0.0000	0.0000	0.0000	0.0000
100PHADJ	1.0000	1.0000	1.0000	1.0000	1.0000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5		
32	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
42	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
50	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
56	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
75	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
100	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5		
100PHADJ	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	1	0.934		
Equality of variance cannot be confirmed				
Hypothesis Test (1-tail, 0.05)				
Steel's Many-One Rank Test indicates no significant differences				
Treatments vs D-Control				

ToxCalc v5.0.23

Reviewed by: EGB 9/23/13

Acute Fish Test-48 Hr Survival

Start Date:	7/19/2013	Test ID:	X5169PP	Sample ID:	7
End Date:	7/21/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	7/19/2013	Protocol:	EPAAW02-EPA/821/R-02-01	Test Species:	PP-Pimephales promelas

Comments:

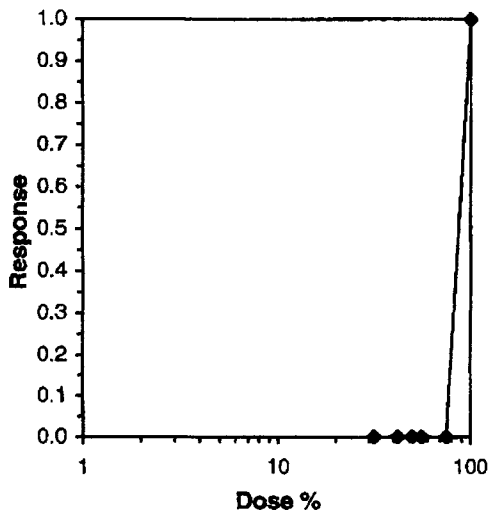
Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
42	1.0000	1.0000	1.0000	1.0000	1.0000
50	1.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	1.0000	1.0000	1.0000
75	1.0000	1.0000	1.0000	1.0000	1.0000
100	0.0000	0.0000	0.0000	0.0000	0.0000
100PHADJ	1.0000	1.0000	1.0000	1.0000	1.0000

			Transform: Arcsin Square Root					Number	Total
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Resp	Number
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	40
32	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	40
42	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	40
50	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	40
56	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	40
75	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	40
100	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	40	40
100PHADJ	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	1	0.934		
Equality of variance cannot be confirmed				

Graphical Method

Trim Level	EC50
0.0%	86.603
	86.603

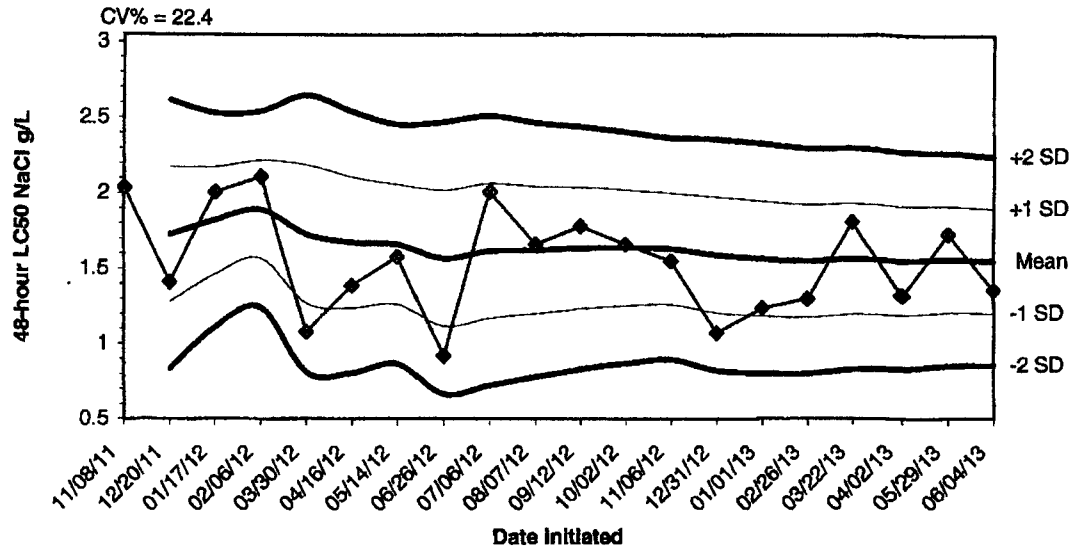


ToxCalc v5.0.23

Reviewed by: EGB 4/23/13

APPENDIX D
QUALITY ASSURANCE CHARTS

2013 48-hour Reference Toxicant Test Results Using Daphnia pulex



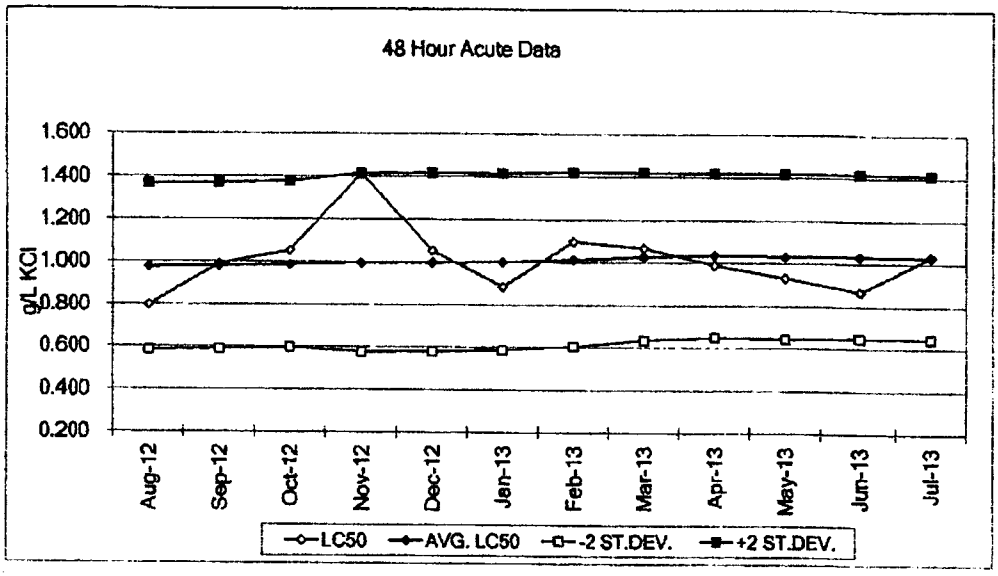
Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
11/08/11	2.0400					
12/20/11	1.4100	1.7250	1.2795	0.8340	2.1705	2.6160
01/17/12	2.0100	1.8200	1.4646	1.1092	2.1754	2.5308
02/06/12	2.1100	1.8925	1.5681	1.2437	2.2169	2.5413
03/30/12	1.0800	1.7300	1.2707	0.8114	2.1893	2.6486
04/16/12	1.3900	1.6733	1.2397	0.8061	2.1070	2.5406
05/14/12	1.5800	1.6600	1.2626	0.8652	2.0574	2.4548
06/26/12	0.9200	1.5675	1.1160	0.6646	2.0190	2.4704
07/06/12	2.0100	1.6167	1.1693	0.7220	2.0640	2.5113
08/07/12	1.6600	1.6210	1.1990	0.7771	2.0430	2.4649
09/12/12	1.7800	1.6355	1.2323	0.8291	2.0386	2.4418
10/02/12	1.6600	1.6375	1.2530	0.8686	2.0220	2.4064
11/06/12	1.5500	1.6308	1.2619	0.8930	1.9997	2.3686
12/31/12	1.0700	1.5907	1.2059	0.8211	1.9755	2.3603
01/01/13	1.2400	1.5673	1.1856	0.8039	1.9490	2.3308
02/26/13	1.3000	1.5506	1.1758	0.8011	1.9254	2.3002
03/22/13	1.8100	1.5659	1.1976	0.8293	1.9342	2.3025
04/02/13	1.3200	1.5522	1.1903	0.8283	1.9142	2.2762
05/29/13	1.7300	1.5616	1.2075	0.8533	1.9157	2.2698
06/04/13	1.3600	1.5515	1.2039	0.8563	1.8991	2.2467

1300 Blue Spruce Drive, Suite
Fort Collins, Colorado 80524

Toll Free: 800/331-5916
Tel:970/484-5091 Fax:970/484-2514

REFERENCE TOXICANT LC50

Pimephales promelas



48 HOUR ACUTE TOXICITY DATA FOR

Pimephales promelas

DATE	LC50 (g/L KCl)	95% CONFIDENCE (upper)	(lower)	AVG.LC50 (g/L KCl)	METHOD	+2 STD	-2 STD
Feb 13	1.097	1.929	0.630	1.013	PROBIT	1.4227	0.6037
Mar 13	1.069	1.198	0.956	1.028	PROBIT	1.4222	0.6332
Apr 13	0.990	1.109	0.884	1.035	PROBIT	1.4209	0.6487
May 13	0.933	1.040	0.837	1.031	SPKR	1.4198	0.6431
Jun 13	0.871	0.964	0.786	1.033	SPKR	1.4185	0.6477
Jul 13	1.035	1.156	0.927	1.030	SPKR	1.4142	0.6458

**Current Test Dates: 07/10-12/2013

APPENDIX E
AGENCY FORMS

Acute Forms
Daphnia pulex Survival

Permittee: El Dorado Chemical - Outfall 007
NPDES Permit Number: AR0000752/ AFIN 70-00040
Composite Collected **From: 7/18/13** **To: 7/18/13**
From: **To:**
Test Initiated: 7/19/13
Dilution Water Used: **Receiving Water** **Reconstituted Water**

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	32	42	50	56	75	100	100pH
24-hour	A	100.0	87.5	100.0	62.5	87.5	87.5	100.0	87.5
	B	100.0	87.5	87.5	100.0	100.0	75.0	75.0	100.0
	C	87.5	100.0	100.0	75.0	87.5	75.0	75.0	75.0
	D	100.0	75.0	100.0	87.5	87.5	87.5	100.0	87.5
	E	100.0	100.0	87.5	75.0	100.0	87.5	75.0	100.0
48-hour	A	100.0	87.5	100.0	62.5	87.5	87.5	100.0	87.5
	B	100.0	87.5	87.5	100.0	100.0	75.0	75.0	100.0
	C	87.5	100.0	100.0	75.0	87.5	75.0	75.0	75.0
	D	100.0	75.0	100.0	87.5	87.5	87.5	100.0	87.5
	E	100.0	100.0	87.5	75.0	100.0	87.5	75.0	100.0
	Mean	97.5	90.0	95.0	80.0	92.5	82.5	85.0	90.0

1. Dunnett's Procedure or Steel's Many-O95.0ne 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 (100%) **X YES** **NO**
b.)½ LOW FLOW OR 2X CRITICAL DILUTION (N/A%) **YES** **NO**
2. Enter percent effluent corresponding to the LC_{50} below:
LC_{50} = N/A% 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): F
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: El Dorado Chemical - Outfall 007
NPDES Number: AR0000752/ AFIN 70-00040
Contact: Larken Pennington
Analyst: Haughton, Williams, Briggs
Sample Collected **From:** **Date 7/18/13** **Time 1810**
To: **Date 7/18/13** **Time 2210**
Test Begin **Date 7/19/13** **Time 1525**
Test End **Date 7/21/13** **Time 1600**

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	8.1	8.2	7.8	25.3	25.2	24.5	36.0			44.0			7.3	7.7	7.3
32	8.0	8.2	7.9	25.3	25.2	24.5							6.8	6.9	7.1
42	7.9	8.1	8.0	25.3	25.2	24.5							6.7	6.7	7.1
50	8.0	8.0	8.0	25.3	25.2	24.5							6.5	6.6	7.0
56	7.9	8.1	7.9	25.3	25.2	24.5							6.4	6.4	7.0
75	7.8	8.1	8.0	25.3	25.2	24.5							5.9	6.2	6.8
100	7.8	7.9	7.9	25.3	25.2	24.5	4.0			336.0			5.0	5.0	6.2
100 pH	7.7	7.8	7.7	25.3	25.2	24.5							6.9	6.2	6.4

*This Form is to be submitted with each DMR.6.6
Alkalinity and hardness to be reported as mg/l $CaCO_3$

Acute Forms
Pimephales promelas (Fathead Minnow) Survival

Permittee: El Dorado Chemical - Outfall 007
NPDES Permit Number: AR0000752/ AFIN 70-00040
Composite Collected **From: 7/18/13** **To: 7/18/13**
From: **To:**
Test Initiated: 7/19/13
Dilution Water Used: **Receiving Water** **Reconstituted Water**

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	32	42	50	56	75	100	100pH
24-hour	A	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0
	B	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0
	D	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0
	E	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0
48-hour	A	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0
	B	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0
	D	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0
	E	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0
	Mean	100.0	100.0	100.0	100.0	100.0	100.0	0.0	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 (100%) **X YES** **NO**
b.)½ LOW FLOW OR 2X CRITICAL DILUTION (N/A%) **YES** **NO**
2. Enter percent effluent corresponding to the LC_{50} below:
LC_{50} = 86.6% effluent
95 % confidence limits: N/A
Method of LC_{50} calculation: Graphnical
3. If you answered NO to 1.a) enter (P) otherwise enter (F): F
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: El Dorado Chemical - Outfall 007
NPDES Number: AR0000752/ AFIN 70-00040
Contact: Larken Pennington
Analyst: Haughton, Williams, Briggs

Sample Collected	**From:**	**Date 7/18/13**	**Time 1810**
	To:	**Date 7/18/13**	**Time 2210**
Test Begin		**Date 7/19/13**	**Time 1530**
Test End		**Date 7/21/13**	**Time 1615**

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	8.1	8.2	7.0	25.0	26.0	26.0	36.0			44.0			7.3	7.7	7.0
32	8.0	8.2	6.7	25.0	26.0	26.0							6.8	6.9	6.9
42	7.9	8.1	6.7	25.0	26.0	26.0							6.7	6.7	7.0
50	8.0	8.0	7.1	25.0	26.0	26.0							6.5	6.6	6.9
56	7.9	8.1	6.7	25.0	26.0	26.0							6.4	6.4	6.9
75	7.8	8.1	6.7	25.0	26.0	26.0							5.9	6.2	6.7
100	7.8	6.8		25.0	26.0		4.0			336.0			5.0	5.6	
100 pH	7.7	7.8	6.6	25.0	26.0	26.0							6.9	6.2	6.5

*This Form is to be submitted with each DMR.6.6
Alkalinity and hardness to be reported as mg/l $CaCO_3$

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: El Dorado Chemical - 007

Project#: X5169

Chain of Custody Documents Checked by: AH 7/22/13
Technician/Date

Raw Data Documents Checked by: AH 7/22/13
Technician/Date

Statistical Analysis Package Checked by: EGB 7/23/13
Quality Manager/Date

Quality Control Data Checked by: EGB 7/10/13
Quality Manager/Date

Report Checked by: EGB 7/26/13
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 G. Braggs, BS — 7/26/13
Quality Manager — **Date**

Report Rev. 3.0

From: (870) 863-1125 Origin ID: ELDA
Larken Pennington
EL DORADO CHEMICAL COMPANY
4500 Northwest Ave.

El Dorado, AR 71730

FedEx Express

J132013006280326

Ship Date: 23AUG13
ActWgt: 3.0 LB
CAD: 5887030/INET3430

Delivery Address Bar Code

SHIP TO: (870) 863-1484 BILL SENDER
ADEQ - Water Division Enforcement
ADEQ - Water Division Enforcement
5301 NORTHSHORE DR

NORTH LITTLE ROCK, AR 72118

Ref #
Invoice #
PO #
Dept #

MON - 26 AUG 10:30A
PRIORITY OVERNIGHT

TRK# 7965 3053 6420
0201

72118
AR-US
LIT

X2 LITA

51AG1/09B9/1A9E

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1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

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