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

EL DORADO
CHEMICAL COMPANY

May 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 April 30, 2013.

Enclosed you will find the Discharge Monitoring Report ending April 30, 2013.
If you have any questions regarding this report, please contact Larken Pennington at (870) 863-1125.

Sincerely,

Greg Withrow
General Manager

Enclosures

NON-COMPLIANCE REPORT

Facility Name: El Dorado Chemical Company

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

Month / Year: Apr-13

Type of Violation	Permit Limit	Date of Violation	Cause of Violation	Corrective Action or Other Narrative
Outfall 001 / TDS Monthly Average (270.0 mg/L)	237.0 mg/L - Monthly Average	4/1/2013	Unknown	
Outfall 006 / TDS Monthly Average (350.0 ug/L)	291.0 mg/L Monthly Average	4/5/2013	Unknown	EDCC has land applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 007 / Zinc Monthly Average (241.0 ug/L)	115.62 ug/L Monthly Average	4/5/2013	Unknown	EDCC continues to monitor and evaluate potential sources of the Zinc exceedance.
Outfall 007 / Zinc Daily Max (241.0 ug/L)	231.99 ug/L Daily Max	4/5/2013	Unknown	EDCC continues to monitor and evaluate potential sources of the Zinc exceedance.
Outfall 007 / TDS Monthly Average (420.0 mg/L)	291.0 mg/L Monthly Average	4/5/2013	Unknown	EDCC has land applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.

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 5/23/13

Signature / Date

Bio-Analytical Laboratories (BAL)
ADEQ Certificate #88-0630
Project X5077

Bio-Analytical Laboratories' Executive Summary

Permittee: El Dorado Chemical Company
4500 Northwest Avenue
El Dorado, AR 71731
Project #: X5077
Outfall: 001 (treated process and contaminated storm water)
Permit #: AR0000752/ AFIN #70-00040
Contact: Larken Pennington
Test Dates: April 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%), enter a "1"; otherwise, enter a "0" for Parameter TLP3B - 0.
2. If the NOEC for reproduction is less than the critical dilution, enter a "1"; otherwise, enter a "0" for Parameter TGP3B - 0.
3. Report the NOEC value for survival, Parameter TOP3B - 100%.
4. Report the NOEC value for reproduction, Parameter TPP3B - 100%.
5. Report the largest % coefficient of variation between the control and the critical dilution, Parameter TQP3B - 37.34%.

For *Pimephales promelas:*

1. If the NOEC for survival is less than the critical dilution (100%), enter a "1";otherwise, enter a "0" for Parameter TLP6C - 0.
2. If the NOEC for growth is less than the critical dilution, enter a "1";otherwise, enter a "0" for Parameter TGP6C- 0.
3. Report the NOEC value for survival, Parameter TOP6C - 100%
4. Report the NOEC value for growth, Parameter TPP6C - 100%
5. Report the largest % coefficient of variation between the control and the critical dilution, Parameter TQP6C - 15.88%.

This report contains a total of 49 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
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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 X5077

Test Dates: April 16 - 23, 2013

Report Date: May 16, 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 X5077

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BAL
ADEQ #88-0630
Project X5077

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 also raised in-house and were less than 24 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, using sodium chloride (NaCl) 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.

2.4 Test Concentrations

The test concentrations used in the chronic toxicity tests were 100, 75, 56, 42 and 32 percent effluent, and a reconstituted water control. The critical dilution was 100 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 April 15, 17 and 19, 2013. Upon collection and completion of each composite, the samples were chilled to 4^0 Celsius. The samples were delivered to the laboratory by BAL personnel.

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 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 Steel's Many-One Rank Test, a nonparametric test comparing concentration data to control data. Fathead minnow survival data was analyzed using Steel's Many-One Rank Test, while the growth data was analyzed using Dunnett' Test, a parametric 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 percent survival occurred in the control and in the critical dilution. The average number of neonates per female after three broods in the control was 22.8, while the average number of neonates in the 100 percent critical dilution was 22.3. The No-Observed-Effect-Concentration (NOEC) for survival and reproduction in this test was 100 percent effluent (p=.05). Toxic effects were not noted in the UV-treated critical dilution.

The fathead minnow test results can be found in Table 2. Ninety-seven-point-five percent survival occurred in the control and in the 100 percent critical dilution after seven days of exposure. The average weight gained per minnow in the control was 0.335 milligram (mg) and the average weight gained in the critical dilution was 0.380 mg. A non-monotonic response occurred in both the survival and the growth data. This may be due to the random mortality noted in the past and attributed to pathogen interference. Lethal and sub-lethal effects were not noted in the non-UV and UV treated critical dilutions. After further investigation, it was determined that the NOEC for survival and growth in this test was 100 percent effluent (p=.05).

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ADEQ #88-0630
Project X5077

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

Percent Effluent	Percent Survival	Sig.*	Mean # Neonates-Surviving	Mean # Neonates -Total	Sig.*
Control	90.0		25.3	22.8	
32.0	100.0		26.2	26.2	
42.0	100.0		24.4	24.4	
56.0	90.0		24.2	22.2	
75.0	100.0		23.3	23.3	
100.0	100.0		22.3	22.3	
100.0 UV	100.0		24.6	24.6	

*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	97.5		0.335/0.345+	
32.0	95.0		0.318	
42.0	72.5	*	0.255	
56.0	67.5	*	0.223	*
75.0	65.0	*	0.225	*
100.0	97.5		0.380	
100.0 UV	87.5		0.285	

*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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ADEQ #88-0630
Project X5077

4.0 Conclusions

The three composite samples of Outfall 001 collected from El Dorado Chemical Company, El Dorado, Arkansas, on April 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 percent critical dilution after seven days of exposure (p=.05). Sub-lethal effects (i.e., lack reproduction or growth) were not noted in the critical dilution in either test (p=.05).

BAL
ADEQ #88-0630
Project X5077

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.

APPENDIX A
CHAIN-OF-CUSTODY DOCUMENTS

Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023

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

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

Laboratory Use Only:

Company: El Dorado Chemical Company
Phone: (870) 863-1484

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

Analysis: Chronic Ceriodaphnia; Chronic minnow; Acute minnow(fresh/marine); Acute Daphnia species; Acute Mysid; Acute Ceriodaphnia; Fecal Coliform

Project Number: X5077

Temp. upon arrival: Temperature upon arrival: 2.7°
Thermometer #: 29
Tech: [signature]
Date: 4/15/13

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)
4-14-13 / 4-15-13	830 / 8:30	x		8 half gallons	001	X	X						C7233	ICE

Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Larken Pennington / EDCC	4/15/13	1015	[signature]	4/15/13	1015
[signature]	4/15/13	1320	L Meagler	4/15/13	1320

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

Comments:

Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
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1-800-259-1240
Fax: (318) 746-2778

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

Laboratory Use Only:

Company: El Dorado Chemical Company	**Phone:** (870) 863-1484
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: KarlenPennington/KarlenPennington/EDCC	

Analysis:

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	Project Number / Temp. upon arrival: / Preservative: (below)
4/17/13	0830	x		8 half gallons	001	X	X						C7247	X5077 / ice

Temperature upon arrival: 5-6 °C
Thermometer #: 39
Tech: RH
Date: 4/17/13

Relinquished by/Affiliation: KarlenPennington/EDCC	**Date:** 4/17/13	**Time:** 0950	**Received by/Affiliation:**	**Date:** 4-17-13 / **Time:** 0950
Relinquished by/Affiliation:	**Date:**	**Time:**	**Received by/Affiliation:**	**Date:** / **Time:**
Relinquished by/Affiliation:	**Date:** 4/17/13	**Time:** 1240	**Received by/Affiliation:** Renee Houghton	**Date:** 4/17/13 / **Time:** 1240

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

Comments:
Ⓐ Date and time noted on jugs AH 4/17/13

Bio-Analytical Laboratories

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Fax: (318) 745-2773

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

Laboratory Use Only:

Company: El Dorado Chemical Company	**Phone:** (870) 863-1484
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: Darken Pennington / Darken 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	Lab Control Number:	Project Number: X5077 / Temp. upon arrival: / Preservative: (below)
4-18-13 / 4-19-13	8:30 / 8:30	x		8 half gallons	001	X	X						C7269	ICE

Temperature upon arrival: 1.8°C
Thermometer #: 29
Tech: ERS
Date: 4/19/13

	Date:	Time:		Date:	Time:
Relinquished by/Affiliation: Darken Pennington / EDCC	4/19/13	0945	**Received by/Affiliation:**	4/19/13	0945
Relinquished by/Affiliation:			**Received by/Affiliation:**		
Relinquished by/Affiliation:	4/19/13	1235	**Received by/Affiliation:** Daniel Houghton	4/19/13	1235

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

Comments:

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST

Project# X5077 Date start: 4/16/13 Date end: 4/23/13

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° Technicians: EGB/AH/LGZ/RC

Adults isolated: Date 4/15/13 Time: 2245

Neonates collected: Date 4/16/13 Time: 0645 Board: W11/W115
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. 10.2/120.1%/AH	0. Y/20/8.6/98.6%/AH	NA	0. NA
1. 10.6/122.9%/RC	1. Y/20/8.6/99.9%/RC	1.	1.
2. 10.0/118.3%/RC	2. Y/20/8.4/96.7%/RC	2.	2.
3. 10.6/124.5%/RC	3. Y/20/8.5/97.5%/RC	3.	3.
4. 9.6/111.5%/AH	4. Y/20/8.6/98.1%/AH	4.	4.
5. 11.1/135.7%/AH	5. Y/20/8.3/97.2%/AH	5.	5.
6. 9.4/112.2%/AH	6. Y/20/8.2/95.5%/AH	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. 1.0/AH	1. C7233 4/16/13
2. <0.01/RC	2. No/RC	2. 1.0/RC	2. C7247 4/18/13
3. <0.01/AH	3. NO/AH	3. 0.5/AH	3. C7269 4/20/13

Comments:

Filtered effluent thru 60 µm plankton net to remove live organisms 4/17/13 AH

BIO-ANALYTICAL LABORATORIES
NUMBER NEONATES PER BROOD CERIODAPHNIA

Project # X5077 Test Dates 4/16/13 - 4/23/13

Client EDCC

Replicate	% Concentration						
	0	32	42	56	75	100	100uv
A	23	25	28	X[4]	18	28	26
B	22	30	29	30	25	11	18
C	24	20	23	14	14	8	30
D	28	27	24	31	29	29	30
E	X	28	27	25	22	27	29
F	21	26	25	26	30	22	28
G	30	23	10	23	24	19	28
H	31	24	24	23	28	32	10
I	21	29	24	21	19	17	22
J	28	30	30	25	24	30	25
Surviving Mean	25.3	26.2	24.4	24.2	23.3	22.3	24.6
Total Mean	22.8	26.2	24.4	22.2	23.3	22.3	24.6
CV%*	15.54	12.44	22.96	20.72	22.08	37.34	25.94

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

Key: M=male; X=dead adult

Calculated by: [signature] 4/24/13

Calculations checked by: [signature] 5/1/13

BIO-ANALYTICAL LABORATORIES

CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST-LIVE NEONATE PRODUCTION

Project# X5077 Test started: Date 4/16/13 Time 1700
Client EDCC Test ended: Date 4/23/13 Time 1635
Technician: Day0 AH 1 AH 2 RC 3 RC 4 AH 5 AH 6 [illegible] 7 [illegible] 8
Time: Day0 1700 1 1440 2 1455 3 1430 4 1715 5 1610 6 1445 7 1635 8
Temp.(°C): Day0 24.1 1 20.16 2 24.2 3 24.4 4 24.2 5 24.5 6 24.2 7 24.3 8

Conc %	Day	A	B	C	D	E	F	G	H	I	J	Number of Live Adults
0	1	0				X						9 ECC 5/14/13
	2	0					0					9
	3	0					0					9
	4	4	4	6	4		2	3	4	4	4	9
	5	7	0				3					9
	6	0	5	8	11		7	11	10	4	9	9
	7	12	13	11	13		12	16	17	13	15	9
	8											
32	1	0										10
	2	0										10
	3	0										10
	4	4	4	0	4	5	3	3	5	4	7	10
	5	7	10	5	4	5	8	0				10
	6	1	0	0	9	10	0	8	5	8	12	10
	7	13	16	15	14	13	15	12	14	17	11	10
	8											
42	1	0										10
	2	0										10
	3	0										10
	4	4	4	4	4	1	4	3	4	4	7	10
	5	6	0	8	0							10
	6	3	9	0	8	11	6	7	10	8	12	10
	7	15	16	11	12	15	15	0	16	16	11	10
	8											
56	1	0										10
	2	0										10
	3	0										10
	4	X	4	4	4	4	0	3	0	3	3	9
	5		0			10	3	0		7	0	9
	6		12	4	12	0	10	8	10	0	8	9
	7		14	6	15	11	13	12	11	11	14	9
	8											
75	1	0										10
	2	0										10
	3	0										10
	4	1	5	2	3	4	3	4	4	4	4	10
	5	9	5									10
	6	0	7	3	11	12	11	5	10	8	10	10
	7	8	13	9	15	6	16	15	14	7	10	10
	8											
100	1	0										10
	2	0										10
	3	0										10
	4	3	3	0	1	4	4	3	4	4	5	10
	5	10	0	4	3							10
	6	0	0	0	15	9	7	6	11	4	11	10
	7	15	8	4	13	14	11	10	17	9	14	10
	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# X5077 Test started: Date 4/16/13 Time 1700
Client EDCC Test ended: Date 4/23/13 Time 1035

	Day0	1	2	3	4	5	6	7	8
Technician:	AH	AH	RC	RC	AH	AH	[illegible]	[illegible]	
Time:	1700	1440	1425	1436	1715	1610	1415	1035	
Temp. (°C):	24.4	24.6	24.2	24.4	24.2	24.5	24.2	24.3	

Conc %	Day	A	B	C	D	E	F	G	H	I	J	Number of Live Adults
100 UV trtd	1	0										10
	2	0										10
	3	0										10
	4	2	0	4	3	1	4	2	3	3	4	10
	5	7	8	8	0							10
	6	2	2	0	10	11	9	11	7	5	10	10
	7	15	10	18	17	17	15	15	0	14	11	10
	8											
	1											
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	2											
	3											
	4											
	5											
	6											
	7											
	8											

[illegible] AH 4/16/13

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# X5077 Test started: Date 9/6/13 Time 1700
Client EDSC Test ended: Date 9/10 Time 1635
Organism C. dubia

Day/# water used	0 3483	1	2	3 3485	4 3480	5	6	7	8
Concentration: Control SOB									
pH	7.6	7.9 / 7.7	8.0 / 8.0	8.0 / 7.7	7.7 / 7.6	7.7 / 7.7	7.7 / 7.7	7.6	
DO (mg/l)	8.3	8.3 / 8.3	8.1 / 8.2	8.3 / 8.5	8.4 / 8.4	8.6 / 8.3	8.3 / 8.3	8.3	
Cond (umhos/cm)	181.5	180.5	180.5	178.8	182.1	180.1	178.8		
Alkalinity (mg/L)	32.0			40.0	44.0				
Hardness (mg/L)	52.0			40.0	48.0				
Concentration: 32									
pH	7.7	7.9 / 7.7	8.0 / 8.1	7.8 / 7.7	7.7 / 7.7	7.7 / 7.7	7.7 / 7.7	7.5	
DO (mg/l)	8.3	8.3 / 8.3	8.1 / 8.2	8.4 / 8.5	8.3 / 8.4	8.5 / 8.3	8.3 / 8.2	8.8	
Cond (umhos/cm)	277	278	280	279	280	280	278		
Concentration: 42									
pH	7.8	7.9 / 7.7	8.1 / 8.1	7.7 / 7.7	7.7 / 7.7	7.7 / 7.8	7.7 / 7.7	7.6	
DO (mg/l)	8.4	8.2 / 8.4	8.1 / 8.2	8.3 / 8.5	8.2 / 8.4	8.5 / 8.3	8.3 / 8.2	8.0	
Cond (umhos/cm)	306	308	277	298	308	309	309		
Concentration: 56									
pH	7.8	8.0 / 7.7	8.1 / 8.1	7.7 / 7.7	7.6 / 7.8	7.7 / 7.9	7.8 / 7.8	7.6	
DO (mg/l)	8.4	8.2 / 8.4	8.1 / 8.3	8.3 / 8.5	8.3 / 8.4	8.4 / 8.3	8.2 / 8.3	8.1	
Cond (umhos/cm)	345	346	349	344	347	352	354		
Concentration: 75									
pH	7.9	8.0 / 7.8	8.1 / 8.1	7.7 / 7.7	7.6 / 7.8	7.7 / 7.9	7.7 / 7.8	7.6	
DO (mg/l)	8.4	8.2 / 8.4	8.0 / 8.3	8.3 / 8.4	8.3 / 8.5	8.4 / 8.3	8.2 / 8.2	8.1	
Cond (umhos/cm)	401	401	408	401	405	409	413		
Concentration: 100									
pH	7.9	8.0 / 7.7	8.1 / 8.1	7.7 / 7.7	7.6 / 7.9	7.7 / 8.0	7.7 / 7.8	7.6	
DO (mg/l)	8.5	8.2 / 8.6	8.0 / 8.3	8.2 / 8.4	8.3 / 8.5	8.4 / 8.2	8.2 / 8.3	8.0	
Cond (umhos/cm)	472	475	479	475	478	483	485		
Tech-prerenewal		AH	RC	RC	AH	AH	AH	YM	
Tech-postrenewal	AH	YM	RC	RC	AH	AH	AH		
Alkalinity (mg/l)	52.0		48.0		60.0				
Hardness (mg/l)	52.0		52.0		48.0				

Key: prerenewal/postrenewal

BIO-ANALYTICAL LABORATORIES CHRONIC WATER QUALITY DATA

Project# X5077 Test started: Date 4/16/13 Time 1700
Client EOCC Test ended: Date 4/23/13 Time 11:35
Organism C. dubia

Day/# water used	0	1	2	3	4	5	6	7	8
Concentration: ~~Control~~ AH 4/15/13 100 UV trt'd									
pH	7.7	8.0/7.6	8.1/8.0	7.7/7.6	7.7/7.8	7.7/7.7	7.7/7.7	7.6/	
DO(mg/l)	8.2	8.1/8.3	7.9/7.9	8.1/8.9	8.2/8.4	8.3/7.9	8.0/7.9	8.0/	
Cond(umhos/cm)	480	489	482	476	482	496	507		
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		AH	RC	RC	AH	AH	AH	[illegible]	
Tech-postrenewal	AH	[illegible]	RC	RC	AH	AH	AH		
Alkalinity(mg/l)									
Hardness(mg/l)									

(Unused blocks crossed out: "Void AH 4/15/13")

Key: prerenewal/postrenewal

BIO-ANALYTICAL LABORATORIES
PIMEPHALES PROMELAS SURVIVAL AND GROWTH DATA SHEET

Project# X5077 Date started: 4/16/13 Date ended 4/23/13

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/LGZ/RC
Test organism age 24h Vendor/ID# BAL 41513

Feeding Times

Day	Technician/Time/Amount (per replicate) AM	NOON	PM
0			LDM/1500/0.20ml
1	RC/0845/0.10ml	LDM/1100/0.10ml	LDM/1510/0.10ml
2	RC/0850/0.10ml	RC/1100/0.10ml	LDM/1535/0.10ml
3	RC/0845/0.10ml	RC/1080/0.10ml	LDM/1600/0.10ml
4	AH/1050/0.20ml		AH/1530/0.20ml
5	AH/1140/0.20ml		AH/1645/0.20ml
6	LDM/0845/0.10ml	AH/1100/0.10ml	LDM/1625/0.10ml

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. 10.2/120.2%/AH	0. 4/20/8.6/98.6%/AH	NA	NA 0.
1. 10.6/122.9%/LDM	1. 4/20/8.6/99.9%/AH	1.	1.
2. 10.0/118.3%/LDM	2. 4/20/8.4/96.7%/RC	2.	2.
3. 10.6/121.5%/LDM	3. 4/20/8.5/97.5%/RC	3.	3.
4. 9.6/111.5%/AH	4. 4/20/8.6/98.1%/AH	4.	4.
5. 11.1/135.7%/AH	5. 4/20/8.3/97.2%/AH	5.	5.
6. 9.4/112.2%/LDM	6. 4/20/8.2/95.5%/AH	6.	6.

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. 1.0/AH	1 C7233 4/10/13
2. <0.01/LDM	2. NO/LDM	2. 1.0/LDM	2 C7247 4/18/13
3. <0.01/AH	3. NO/AH	3. 0.5/AH	3 C7269 4/20/13

Comments:

BIO-ANALYTICAL LABORATORIES 7-DAY CHRONIC MINNOW SURVIVAL DATA

Project# X5077 Test started: Date 4/10/13 Time 1450
Client EDCC Test ended: Date 4/23/13 Time 1115

Technician:	Day 0 AH	1 AH	2 RC	3 [illegible]	4 AH	5 AH	6 AH	7 [illegible]
Time:	Day 0 1450	1 1040	2 1315	3 1345	4 1340	5 1435	6 1100	7 1115
Temperature	Day 0 25.3	1 25.5	2 25.3	3 24.8	4 24.6	5 25.5	6 25.0	7 24.8

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	8
	B	8	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8	7
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8	8
32	A	8	8	8	8	8	8	8	7
	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	7	7
	E	8	8	8	8	8	8	AH 4/23/13 8	8
42	A	8	8	8	8	8	8	8	7
	B	8	8	8	8	6	6	6	6
	C	8	8	8	8	6	6	6	6
	D	8	8	8	8	8	8	8	6
	E	8	8	8	8	5	5	4	4
56	A	8	8	8	8	7	7	7	7
	B	8	8	8	8	7	7	6	6
	C	8	8	8	8	8	8	7	6
	D	8	8	7	7	7	7	7	5
	E	8	8	8	8	7	7	4	3
75	A	8	8	8	8	7	7	6	5
	B	8	8	7	7	5	5	3	3
	C	8	8	8	8	6	6	6	6
	D	8	8	8	8	7	7	6	6
	E	8	8	8	7	7	7	7	6
100	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8	8
	C	8	8	8	7	7	7	7	7
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8	8

File: Minnow2

BIO-ANALYTICAL LABORATORIES 7-DAY CHRONIC MINNOW SURVIVAL DATA

Project# X5077　　　　Test started: Date 4/16/13 Time 1450
Client FDCC　　　　Test ended: Date 4/23/13 Time 1115

Technician: Day0 AH 1 AH 2 RC 3 [illegible] 4 AH 5 AH 6 AH 7 [illegible]
Time: Day0 1450 1 1040 2 1315 3 1345 4 1340 5 1435 6 1100 7 1115
Temperature Day0 25.3 1 25.5 2 25.5 3 24.8 4 24.6 5 25.5 6 25.0 7 24.8

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	8	8	8	7
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8	5
	E	8	8	8	8	7	7	7	7
	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								

omit AH 4/16/13

File: Minnow2

BIO-ANALYTICAL LABORATORIES MINNOW LARVAL GROWTH DATA SHEET

Project#/Client X5077/EDCC-001 Test Dates 4/16/13 - 4/23/13

Oven Temperature (Celsius) 100°C

Conc.	Replicate/ Pan number	Wt. of pan(g)/ Date weighed: 4/22/13 Tech: BW	Wt. of pan + larvae(g)/ Date weighed: 4/24/13 Tech: BW	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 35	0.9342	0.9372	0.0030	8	0.375	
	B 36	0.9336	0.9366	0.0030	8	0.375	
	C 37	0.9355	0.9382	0.0027	8	0.338	7/0.3860
	D 38	0.9340	0.9365	0.0025	8	0.313	
	E 39	0.9329	0.9351	0.0022	8	0.275	
32	A 40	0.9294	0.9318	0.0024	8	0.300	
	B 41	0.9298	0.9325	0.0027	8	0.338	
	C 42	0.9321	0.9347	0.0026	8	0.325	
	D 43	0.9350	0.9373	0.0023	8	0.288	
	E 44	0.9362	0.9389	0.0027	8	0.338	
42	A 45	0.9381	0.9408	0.0027	8	0.338	
	B 46	0.9384	0.9408	0.0024	8	0.300	
	C 47	0.9374	0.9395	0.0021	8	0.263	
	D 48	0.9382	0.9401	0.0019	8	0.238	
	E 49	0.9363	0.9374	0.0011	8	0.138	
56	A 50	0.9318	0.9342	0.0024	8	0.300	
	B 51	0.9358	0.9377	0.0019	8	0.238	
	C 52	0.9312	0.9336	0.0024	8	0.300	
	D 53	0.9300	0.9315	0.0015	8	0.188	
	E 54	0.9288	0.9295	0.0007	8	0.088	
75	A 55	0.9279	0.9299	0.0020	8	0.250	
	B 56	0.9268	0.9278	0.0010	8	0.125	
	C 57	0.9345	0.9366	0.0021	8	0.263	
	D 58	0.9351	0.9371	0.0020	8	0.250	
	E 59	0.9339	0.9358	0.0019	8	0.238	
100	60 - Discarded	0.9295	0.9323	0.0028	8	0.350	
	B 61	0.9548	0.9574	0.0026	8	0.325	
	C 62	0.9508	0.9535	0.0027	8	0.338	
	D 63	0.9465	0.9499	0.0034	8	0.425	
	E 64	0.9324	0.9361	0.0037	8	0.463	

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

Calculated by: EBB 5/2/13 Calculations checked by: AH 5/3/13

BIO-ANALYTICAL LABORATORIES MINNOW LARVAL GROWTH DATA SHEET

Project#/Client X5077 / EDCC-001 Test Dates 4/16/13 - 4/23/13

Oven Temperature (° Celsius) 100°C

Conc.	Replicate/ Pan number	Wt. of pan(g)/ Date weighed: 4/22/13 Tech: SW	Wt. of pan + larvae(g)/ Date weighed: 4/24/13 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	A 65	0.9293	0.9318	0.0025	8	0.313	
	B 66	0.9282	0.9300	0.0018	8	0.225	
	C 67	0.9293	0.9321	0.0028	8	0.350	
	D 68	0.9280	0.9297	0.0017	8	0.213	
	E 69	0.9308	0.9334	0.0026	8	0.325	
	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						

OMC 4/17/13 RC

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

Calculated by: EDD 5/2/13 Calculations checked by: AH 5/3/13

BIO-ANALYTICAL LABORATORIES CHRONIC WATER QUALITY DATA

Project# X5077 Test started: Date 4/16/13 Time 1450
Client EDCC Test ended: Date 4/23/13 Time 1115
Organism P. promelas

Day/# water used	0 3483	1	2	3485	3486	5	6	7	8
Concentration: Control soft									
pH	7.6	7.7 / 7.7	8.0 / 8.0	7.7 / 7.7	8.0 / 8.0	7.7 / 7.7	7.7 / 7.7	7.7 / 7.7	7.4
DO(mg/l)	8.3	8.3 / 8.3	8.2 / 8.2	8.5 / 8.5	8.4 / 8.4	8.3 / 8.3	8.3 / 8.3	8.3 / 8.3	7.5
Cond(umhos/cm)	181.5	180.5	180.5	178.8	182.1	180.1	178.8		
Alkalinity(mg/L)	52.0			40.0	44.0				
Hardness (mg/L)	52.0			40.0	48.0				
Concentration: 32									
pH	7.7	7.7 / 7.7	8.1 / 8.1	7.7 / 7.7	7.7 / 7.7	7.7 / 7.7	7.7 / 7.7	7.7 / 7.7	7.3
DO(mg/l)	8.3	8.3 / 8.3	8.2 / 8.2	8.5 / 8.5	8.4 / 8.4	8.3 / 8.3	8.2 / 8.2	8.2 / 8.2	7.6
Cond(umhos/cm)	277	278	280	279	280	280	278		
Concentration: 42									
pH	7.8	7.7 / 7.7	8.1 / 8.1	7.7 / 7.7	7.7 / 7.7	7.8 / 7.8	7.7 / 7.7	7.7 / 7.7	7.3
DO(mg/l)	8.4	8.4 / 8.4	8.2 / 8.2	8.6 / 8.6	8.4 / 8.4	8.3 / 8.3	8.2 / 8.2	8.2 / 8.2	7.6
Cond(umhos/cm)	306	308	277	298	308	309	309		
Concentration: 56									
pH	7.8	7.7 / 7.7	8.1 / 8.1	7.7 / 7.7	7.8 / 7.8	7.9 / 7.9	7.8 / 7.8	7.8 / 7.8	7.4
DO(mg/l)	8.4	8.4 / 8.4	8.3 / 8.3	8.5 / 8.5	8.4 / 8.4	8.3 / 8.3	8.3 / 8.3	8.3 / 8.3	7.4
Cond(umhos/cm)	345	346	349	344	347	352	354		
Concentration: 75									
pH	7.9	7.8 / 7.8	8.1 / 8.1	7.7 / 7.7	7.8 / 7.8	7.9 / 7.9	7.8 / 7.8	7.8 / 7.8	7.3
DO(mg/l)	8.4	8.4 / 8.4	8.3 / 8.3	8.4 / 8.4	8.5 / 8.5	8.3 / 8.3	8.2 / 8.2	8.3 / 8.3	7.1
Cond(umhos/cm)	401	401	408	401	405	409	413		
Concentration: 100									
pH	7.9	7.7 / 7.7	8.1 / 8.1	7.7 / 7.7	7.9 / 7.9	8.0 / 8.0	7.8 / 7.8	7.8 / 7.8	7.3
DO(mg/l)	8.5	8.6 / 8.6	8.3 / 8.3	8.4 / 8.4	8.5 / 8.5	8.2 / 8.2	8.3 / 8.3	8.3 / 8.3	7.2
Cond(umhos/cm)	472	475	479	475	478	483	486		
Tech-prerenewal		AH	RC	RC	AH	AH	AH	AH	SMM
Tech-postrenewal	SMM	SMM	RC	RC	AH	AH	AH		
Alkalinity(mg/l) vol to	52.0		64.0		60.0				
Hardness(mg/l) vol to	52.0		60.0		48.0				

Key: prerenewal/postrenewal

52.0 SMM 4/24/13

BIO-ANALYTICAL LABORATORIES CHRONIC WATER QUALITY DATA

Project# X5077 Test started: Date 4/16/13 Time 1450
Client EDCC. Test ended: Date 4/23/13 Time 1115
Organism P. promelas

Day/# water used	0	1	2	3	4	5	6	7	8
Concentration: ~~Control~~ AH 4/16/13 100uv trt'd									
pH	7.7	7.5/7.6	7.7/8.0	7.9/7.6	7.4/7.8	7.3/7.7	7.3/7.7	7.5/	
DO(mg/l)	8.2	7.8/8.3	6.9/7.9	7.8/8.1	7.7/8.4	7.3/7.9	7.2/7.9	7.5/	
Cond(umhos/cm)	480	489	482	476	482	496	507		
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		AH	RC	RC	AH	AH	AH	[illegible]	
Tech-postrenewal	[illegible]	[illegible]	RC	RC	AH	AH	AH		
Alkalinity(mg/l)									
Hardness(mg/l)									

Omit AH 4/16/13

Key: prerenewal/postrenewal

APPENDIX C
STATISTICAL ANALYSIS

Ceriodaphnia Survival and Reproduction Test-7 Day Survival

Start Date:	4/16/2013	Test ID:	X5077CD	Sample ID:	1
End Date:	4/23/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	4/16/2013	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	0.0000	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	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	1.0000	1.0000	1.0000	1.0000	1.0000	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	0.9000	1.0000	1	9	10	10		
32	1.0000	1.1111	0	10	10	10	0.5000	0.0500
42	1.0000	1.1111	0	10	10	10	0.5000	0.0500
56	0.9000	1.0000	1	9	10	10	0.7632	0.0500
75	1.0000	1.1111	0	10	10	10	0.5000	0.0500
100	1.0000	1.1111	0	10	10	10	0.5000	0.0500
100UV	1.0000	1.1111	0	10	10	10	0.5000	0.0500

Hypothesis Test (1-tail, 0.05)

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

Reviewed by: EQB 5/16/13

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	4/16/2013	Test ID:	X5077CD	Sample ID:	1
End Date:	4/23/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	4/16/2013	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	23.000	22.000	24.000	28.000	21.000	30.000	31.000	21.000	28.000	
32	25.000	30.000	20.000	27.000	28.000	26.000	23.000	24.000	29.000	30.000
42	28.000	29.000	23.000	24.000	27.000	25.000	10.000	24.000	24.000	30.000
56	30.000	14.000	31.000	25.000	26.000	23.000	23.000	21.000	25.000	
75	18.000	25.000	14.000	29.000	22.000	30.000	24.000	28.000	19.000	24.000
100	28.000	11.000	8.000	29.000	27.000	22.000	19.000	32.000	17.000	30.000
100UV	26.000	18.000	30.000	30.000	29.000	28.000	28.000	10.000	22.000	25.000

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	25.333	1.0000	25.333	21.000	31.000	15.541	9			
32	26.200	1.0342	26.200	20.000	30.000	12.440	10	-0.335	2.462	6.366
42	24.400	0.9632	24.400	10.000	30.000	22.957	10	0.361	2.462	6.366
56	24.222	0.9561	24.222	14.000	31.000	20.722	9	0.419	2.462	6.531
75	23.300	0.9197	23.300	14.000	30.000	22.075	10	0.786	2.462	6.366
100	22.300	0.8803	22.300	8.000	32.000	37.342	10	1.173	2.462	6.366
100UV	24.600	0.9711	24.600	10.000	30.000	25.937	10	0.284	2.462	6.366

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.05)	0.85931	0.895	-0.9188	0.79332
Bartlett's Test indicates equal variances (p = 0.15)	9.36536	16.8119		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Bonferroni t Test indicates no significant differences Treatments vs D-Control	6.36595	0.25129	16.1211	31.6747	0.79924	6, 61

Reviewed by: EKB 5/16/13

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	4/16/2013	Test ID:	X5077CD	Sample ID:	1
End Date:	4/23/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	4/16/2013	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	23.000	22.000	24.000	28.000	0.000	21.000	30.000	31.000	21.000	28.000
32	25.000	30.000	20.000	27.000	28.000	26.000	23.000	24.000	29.000	30.000
42	28.000	29.000	23.000	24.000	27.000	25.000	10.000	24.000	24.000	30.000
56	4.000	30.000	14.000	31.000	25.000	26.000	23.000	23.000	21.000	25.000
75	18.000	25.000	14.000	29.000	22.000	30.000	24.000	28.000	19.000	24.000
100	28.000	11.000	8.000	29.000	27.000	22.000	19.000	32.000	17.000	30.000
100UV	26.000	18.000	30.000	30.000	29.000	28.000	28.000	10.000	22.000	25.000

			Transform: Untransformed					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	22.800	1.0000	22.800	0.000	31.000	38.725	10		
32	26.200	1.1491	26.200	20.000	30.000	12.440	10	116.00	74.00
42	24.400	1.0702	24.400	10.000	30.000	22.957	10	112.50	74.00
56	22.200	0.9737	22.200	4.000	31.000	35.835	10	104.00	74.00
75	23.300	1.0219	23.300	14.000	30.000	22.075	10	102.00	74.00
100	22.300	0.9781	22.300	8.000	32.000	37.342	10	102.00	74.00
100UV	24.600	1.0789	24.600	10.000	30.000	25.937	10	111.50	74.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.05)	1.24651	0.895	-1.3708	2.19834
Bartlett's Test indicates equal variances (p = 0.10)	10.5132	16.8119		

Hypothesis Test (1-tail, 0.05)

Steel's Many-One Rank Test indicates no significant differences
Treatments vs D-Control

 Reviewed by: EAB 5/6/13

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	4/16/2013	Test ID:	X5077CD	Sample ID:	1
End Date:	4/23/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	4/16/2013	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	23.000	22.000	24.000	28.000	0.000	21.000	30.000	31.000	21.000	28.000
32	25.000	30.000	20.000	27.000	28.000	26.000	23.000	24.000	29.000	30.000
42	28.000	29.000	23.000	24.000	27.000	25.000	10.000	24.000	24.000	30.000
56	4.000	30.000	14.000	31.000	25.000	26.000	23.000	23.000	21.000	25.000
75	18.000	25.000	14.000	29.000	22.000	30.000	24.000	28.000	19.000	24.000
100	28.000	11.000	8.000	29.000	27.000	22.000	19.000	32.000	17.000	30.000
100UV	26.000	18.000	30.000	30.000	29.000	28.000	28.000	10.000	22.000	25.000

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	22.800	1.0000	22.800	0.000	31.000	38.725	10			
32	26.200	1.1491	26.200	20.000	30.000	12.440	10	-1.125	2.347	7.094
42	24.400	1.0702	24.400	10.000	30.000	22.957	10	-0.529	2.347	7.094
56	22.200	0.9737	22.200	4.000	31.000	35.835	10	0.199	2.347	7.094
75	23.300	1.0219	23.300	14.000	30.000	22.075	10	-0.165	2.347	7.094
100	22.300	0.9781	22.300	8.000	32.000	37.342	10	0.165	2.347	7.094
100UV	24.600	1.0789	24.600	10.000	30.000	25.937	10	-0.596	2.347	7.094

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.05)	1.24651	0.895	-1.3708	2.19834
Bartlett's Test indicates equal variances (p = 0.10)	10.5132	16.8119		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test indicates no significant differences Treatments vs D-Control	7.09438	0.31116	21.2143	45.6794	0.83205	6, 63

EB 5/6/13

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:	4/16/2013	Test ID:	X5077PP	Sample ID:	1
End Date:	4/23/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	4/16/2013	Protocol:	EPAFW02-EPA/821/R-02-01	Test Species:	PP-Pimephales promelas

Comments:

Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	0.8750	1.0000	1.0000
32	0.8750	1.0000	1.0000	0.8750	1.0000
42	0.8750	0.7500	0.7500	0.7500	0.5000
56	0.8750	0.7500	0.7500	0.6250	0.3750
75	0.6250	0.3750	0.7500	0.7500	0.7500
100	1.0000	1.0000	0.8750	1.0000	1.0000
100UV	1.0000	0.8750	1.0000	0.6250	0.8750

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	0.9750	1.0000	1.3564	1.2094	1.3931	6.055	5		
32	0.9500	0.9744	1.3196	1.2094	1.3931	7.623	5	25.00	16.00
*42	0.7250	0.7436	1.0273	0.7854	1.2094	14.833	5	15.50	16.00
*56	0.6750	0.6923	0.9749	0.6591	1.2094	21.096	5	15.50	16.00
*75	0.6500	0.6667	0.9425	0.6591	1.0472	17.926	5	15.00	16.00
100	0.9750	1.0000	1.3564	1.2094	1.3931	6.055	5	27.50	16.00
100UV	0.8750	0.8974	1.2234	0.9117	1.3931	16.097	5	22.00	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.9019	0.934	-0.9178	0.52854
Bartlett's Test indicates equal variances (p = 0.39)	6.269	16.8119		

Hypothesis Test (1-tail, 0.05)

Steel's Many-One Rank Test indicates significant differences
Treatments vs D-Control

 Reviewed by: EBB 5/6/13

Larval Fish Growth and Survival Test-7 Day Growth

Start Date:	4/16/2013	Test ID:	X5077PP	Sample ID:	1
End Date:	4/23/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	4/16/2013	Protocol:	EPAFW02-EPA/821/R-02-01	Test Species:	PP-Pimephales promelas

Comments:

Conc-%	1	2	3	4	5
D-Control	0.3750	0.3750	0.3375	0.3125	0.2750
32	0.3000	0.3375	0.3250	0.2875	0.3375
42	0.3375	0.3000	0.2625	0.2375	0.1375
56	0.3000	0.2375	0.3000	0.1875	0.0875
75	0.2500	0.1250	0.2625	0.2500	0.2375
100	0.3500	0.3250	0.3375	0.4250	0.4625
100UV	0.3125	0.2250	0.3500	0.2125	0.3250
0-SN	0.3750	0.3750	0.3857	0.3125	0.2750

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.3350	1.0000	0.3350	0.2750	0.3750	12.763	5			
32	0.3175	0.9478	0.3175	0.2875	0.3375	7.152	5	0.459	2.443	0.0931
42	0.2550	0.7612	0.2550	0.1375	0.3375	29.737	5	2.098	2.443	0.0931
*56	0.2225	0.6642	0.2225	0.0875	0.3000	40.002	5	2.951	2.443	0.0931
*75	0.2250	0.6716	0.2250	0.1250	0.2625	25.154	5	2.885	2.443	0.0931
100	0.3800	1.1343	0.3800	0.3250	0.4625	15.878	5	-1.180	2.443	0.0931
100UV	0.2850	0.8507	0.2850	0.2125	0.3500	21.798	5	1.311	2.443	0.0931
0-SN	0.3446	1.0288	0.3446	0.2750	0.3857	14.076	5	-0.253	2.443	0.0931

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.94717	0.94	-0.609	-0.1381
Bartlett's Test indicates equal variances (p = 0.43)	6.94979	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	0.09312	0.27798	0.01689	0.00363	0.00111	7, 32

ToxCalc v5.0.23

Reviewed by: EOB 5/16/13

Larval Fish Growth and Survival Test-7 Day Growth

Start Date:	4/16/2013	Test ID:	X5077PP	Sample ID:	1
End Date:	4/23/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	4/16/2013	Protocol:	EPAFW02-EPA/821/R-02-01	Test Species:	PP-Pimephales promelas

Comments:

Conc-%	1	2	3	4	5
D-Control	0.3750	0.3750	0.3375	0.3125	0.2750
32	0.3000	0.3375	0.3250	0.2875	0.3375
42	0.3375	0.3000	0.2625	0.2375	0.1375
56	0.3000	0.2375	0.3000	0.1875	0.0875
75	0.2500	0.1250	0.2625	0.2500	0.2375
100	0.3500	0.3250	0.3375	0.4250	0.4625
100UV	0.3125	0.2250	0.3500	0.2125	0.3250
0-SN	0.3750	0.3750	0.3857	0.3125	0.2750

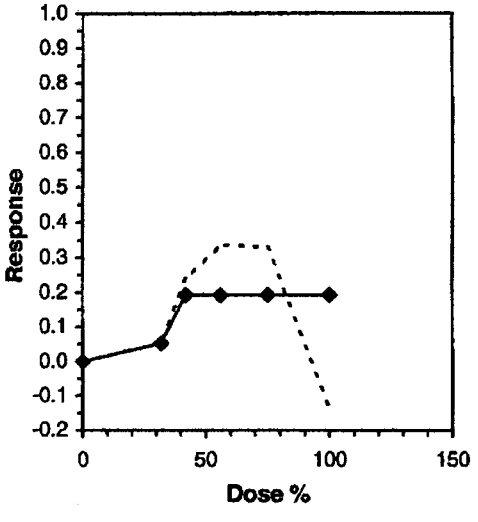
			Transform: Untransformed					Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	0.3350	1.0000	0.3350	0.2750	0.3750	12.763	5	0.3350	1.0000
32	0.3175	0.9478	0.3175	0.2875	0.3375	7.152	5	0.3175	0.9478
42	0.2550	0.7612	0.2550	0.1375	0.3375	29.737	5	0.2706	0.8078
56	0.2225	0.6642	0.2225	0.0875	0.3000	40.002	5	0.2706	0.8078
75	0.2250	0.6716	0.2250	0.1250	0.2625	25.154	5	0.2706	0.8078
100	0.3800	1.1343	0.3800	0.3250	0.4625	15.878	5	0.2706	0.8078
100UV	0.2850	0.8507	0.2850	0.2125	0.3500	21.798	5		
0-SN	0.3446	1.0288	0.3446	0.2750	0.3857	14.076	5		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.94717	0.94	-0.609	-0.1381
Bartlett's Test indicates equal variances (p = 0.43)	6.94979	18.4753		

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)	Skew
IC05*	30.629			
IC10	35.413			
IC15	38.987			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

* indicates IC estimate less than the lowest concentration

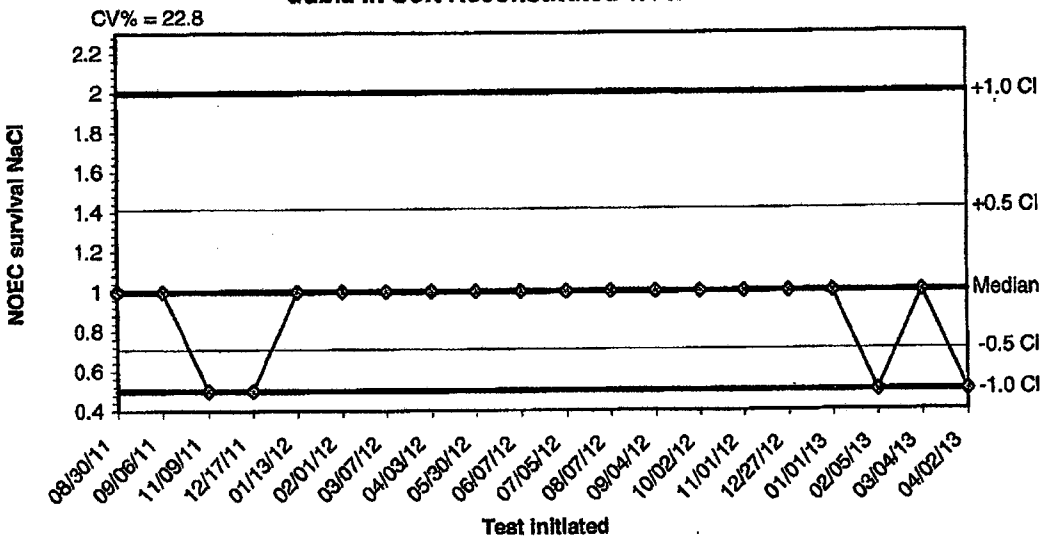


ToxCalc v5.0.23

Reviewed by: EGB 5/16/13

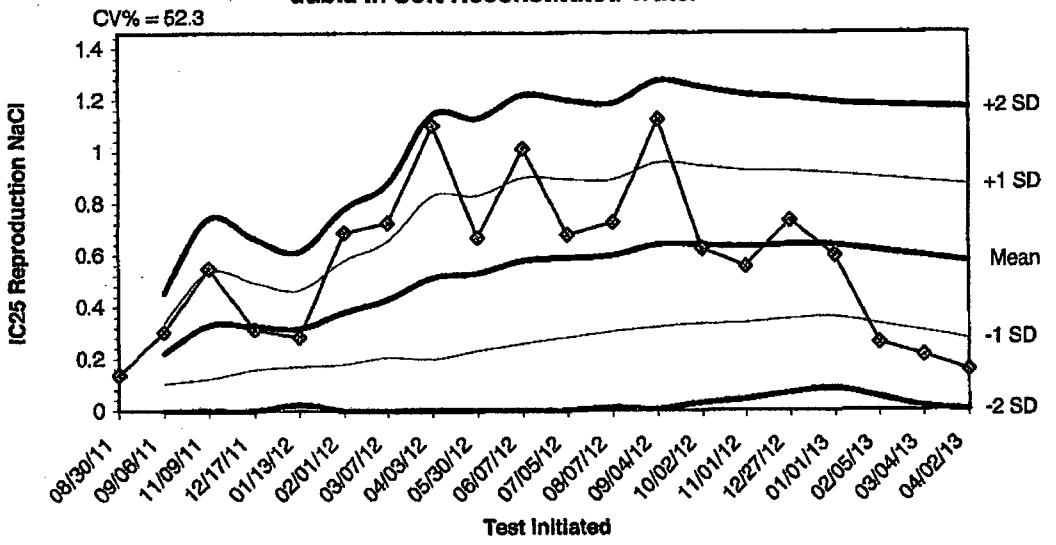
APPENDIX D
QUALITY ASSURANCE CHARTS

2013 Chronic Reference Toxicant Test Results using Ceriodaphnia dubia in Soft Reconstituted Water



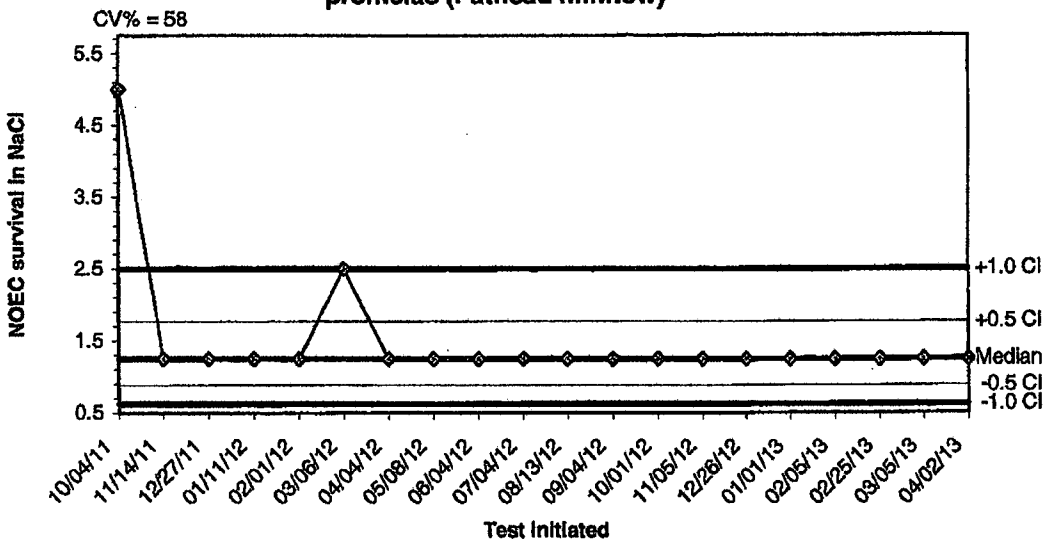
Dates	Values	Median	-0.5 CI	-1.0 CI	+0.5 CI	+1.0 CI
08/30/11	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
09/06/11	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
11/09/11	0.5000	1.0000	0.7071	0.5000	1.4142	2.0000
12/17/11	0.5000	1.0000	0.7071	0.5000	1.4142	2.0000
01/13/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
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

2013 Chronic Reference Toxicant Test Results using Ceriodaphnia dubia in Soft Reconstituted Water



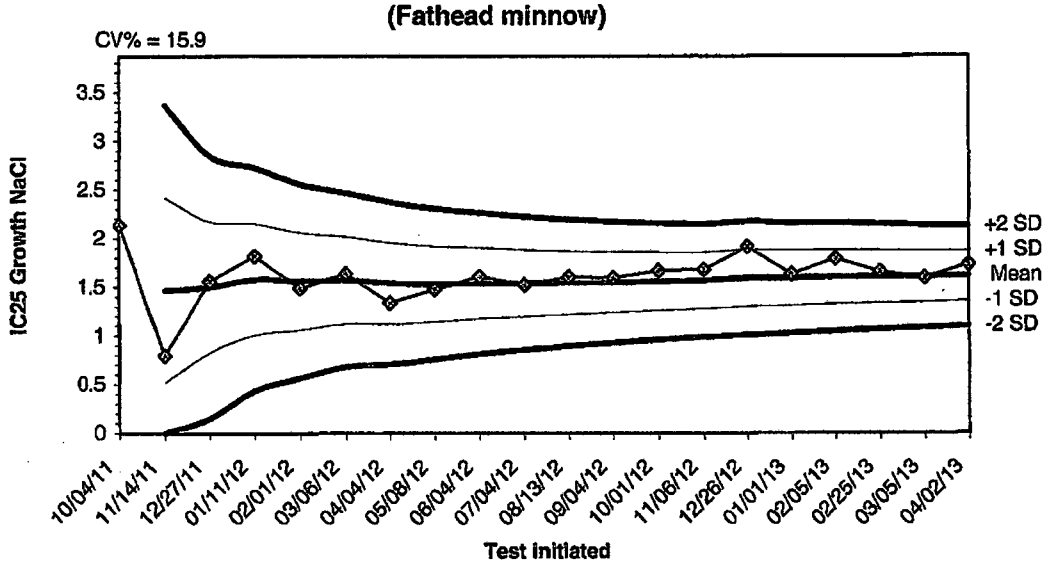
Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
08/30/11	0.1390					
09/06/11	0.3034	0.2212	0.1050	0.0000	0.3374	0.4537
11/09/11	0.5489	0.3304	0.1242	0.0000	0.5367	0.7430
12/17/11	0.3138	0.3263	0.1576	0.0000	0.4949	0.6635
01/13/12	0.2835	0.3177	0.1704	0.0231	0.4650	0.6123
02/01/12	0.6864	0.3792	0.1791	0.0000	0.5792	0.7792
03/07/12	0.7233	0.4283	0.2041	0.0000	0.6525	0.8767
04/03/12	1.1000	0.5123	0.1969	0.0000	0.8277	1.1431
05/30/12	0.6660	0.5294	0.2299	0.0000	0.8288	1.1282
06/07/12	1.0102	0.5775	0.2568	0.0000	0.8981	1.2188
07/05/12	0.6765	0.5865	0.2808	0.0000	0.8921	1.1978
08/07/12	0.7250	0.5980	0.3038	0.0097	0.8922	1.1863
09/04/12	1.1229	0.6384	0.3213	0.0043	0.9554	1.2725
10/02/12	0.6225	0.6372	0.3326	0.0280	0.9419	1.2465
11/01/12	0.5553	0.6318	0.3375	0.0431	0.9261	1.2204
12/27/12	0.7326	0.6381	0.3526	0.0672	0.9235	1.2090
01/01/13	0.5948	0.6355	0.3589	0.0824	0.9121	1.1887
02/05/13	0.2615	0.6148	0.3323	0.0499	0.8972	1.1796
03/04/13	0.2108	0.5935	0.3038	0.0141	0.8832	1.1729
04/02/13	0.1529	0.5715	0.2728	0.0000	0.8702	1.1689

2013 Chronic Reference Toxicant Test Results using Pimephales promelas (Fathead minnow)



Dates	Values	Median	-0.5 CI	-1.0 CI	+0.5 CI	+1.0 CI
10/04/11	5.0000	1.2500	0.8839	0.6250	1.7678	2.5000
11/14/11	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
12/27/11	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
01/11/12	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
02/01/12	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
03/06/12	2.5000	1.2500	0.8839	0.6250	1.7678	2.5000
04/04/12	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
05/08/12	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
06/04/12	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
07/04/12	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
08/13/12	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
09/04/12	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
10/01/12	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
11/05/12	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
12/26/12	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
01/01/13	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
02/05/13	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
02/25/13	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
03/05/13	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
04/02/13	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000

2013 Chronic Reference Toxicant Test Results for Pimephales promelas (Fathead minnow)



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
10/04/11	2.1400					
11/14/11	0.7959	1.4680	0.5175	0.0000	2.4184	3.3688
12/27/11	1.5600	1.4986	0.8245	0.1503	2.1728	2.8469
01/11/12	1.8182	1.5785	1.0054	0.4322	2.1517	2.7248
02/01/12	1.4900	1.5608	1.0629	0.5649	2.0588	2.5567
03/06/12	1.6400	1.5740	1.1275	0.6809	2.0206	2.4671
04/04/12	1.3400	1.5406	1.1235	0.7063	1.9577	2.3748
05/08/12	1.4800	1.5330	1.1462	0.7595	1.9198	2.3066
06/04/12	1.6119	1.5418	1.1790	0.8163	1.9045	2.2673
07/04/12	1.5255	1.5402	1.1981	0.8561	1.8822	2.2242
08/13/12	1.6031	1.5459	1.2208	0.8958	1.8709	2.1960
09/04/12	1.5956	1.5500	1.2398	0.9295	1.8603	2.1705
10/01/12	1.6692	1.5592	1.2603	0.9614	1.8581	2.1569
11/06/12	1.6773	1.5676	1.2787	0.9899	1.8565	2.1454
12/26/12	1.9167	1.5909	1.2983	1.0057	1.8835	2.1761
01/01/13	1.6322	1.5935	1.3106	1.0277	1.8763	2.1592
02/05/13	1.7919	1.6051	1.3271	1.0490	1.8832	2.1613
02/25/13	1.6572	1.6080	1.3380	1.0679	1.8781	2.1482
03/05/13	1.5937	1.6073	1.3448	1.0823	1.8698	2.1322
04/02/13	1.7306	1.6135	1.3565	1.0995	1.8704	2.1274

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**	**4/14/13 To**	**0830**	**4/15/13**
Composite 2 Collected From	**0830**	**4/16/13 To**	**0830**	**4/17/13**
Composite 3 Collected From	**0830**	**4/18/13 To**	**0830**	**4/19/13**
Test initiated:	1700 **am/pm**		4/16/13	**date**
Test terminated:	1635 **am/pm**		4/23/13	**date**
Dilution water used:	**Receiving**		**Reconstituted**	

PERCENT SURVIVAL

Time of Reading	Percent Effluent						
	0	32	42	56	75	100	100 UV
24h	90	100	100	100	100	100	100
48h	90	100	100	100	100	100	100
End of test	90	100	100	90	100	100	100

NUMBER OF YOUNG PRODUCED PER FEMALE @ END OF TEST

Rep	0	32	42	56	75	100	100 UV
A	23	25	28	D4	18	28	26
B	22	30	29	30	25	11	18
C	24	20	23	14	14	8	30
D	28	27	24	31	29	29	30
E	D	28	27	25	22	27	29
F	21	26	25	26	30	22	28
G	30	23	10	23	24	19	28
H	31	24	24	23	28	32	10
I	21	29	24	21	19	17	22
J	28	30	30	25	24	30	25
Surv. Mean	25.3	26.2	24.4	24.2	23.3	22.3	24.6
Total Mean	22.8	26.2	24.4	22.2	23.3	22.3	24.6
CV%*	15.54	12.44	22.96	20.72	22.08	37.34	25.94

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

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%):**	**YES**	**X**	**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): 0
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% effluent**
b) NOEC reproduction:	**100% effluent**
c) LOEC survival:	**N/A% effluent**
d) LOEC reproduction:	**N/A% 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: Haughton, Zeagler, Callahan

Sample No. 1 Collected: Date: 4/15/13 Time: 0830
Sample No. 2 Collected: Date: 4/17/13 Time: 0830
Sample No. 3 Collected: Date: 4/19/13 Time: 0830
Test Begin: Date: 4/16/13 Time: 1700
Test End: Date: 4/23/13 Time: 1635

Dilution: 0

Day:	1	2	3	4	5	6	7	Comments
Temp (C)	24.6	24.2	24.4	24.2	24.5	24.2	24.3	
DO Initial	8.3	8.1	8.3	8.4	8.6	8.3	8.3	
DO Final	8.3	8.2	8.5	8.4	8.3	8.3		
pH Initial	7.9	8.0	8.0	7.7	7.7	7.7	7.6	
pH Final	7.7	8.0	7.7	7.6	7.7	7.7		
Alkalinity	32.0		40.0	44.0				
Hardness	52.0		40.0	48.0				
Conductivity	180.5	180.5	178.8	182.1	180.1	178.8		
Chlorine	<.01		<.01	<.01				

Dilution: 32

Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.6	24.2	24.2	24.2	24.5	24.2	24.3	
DO Initial	8.3	8.1	8.4	8.3	8.5	8.3	8.2	
DO Final	8.3	8.2	8.5	8.4	8.3	8.2		
pH Initial	7.9	8.0	7.8	7.7	7.7	7.7	7.5	
pH Final	7.7	8.1	7.7	7.7	7.7	7.7		
Alkalinity								
Hardness								
Conductivity	278	280	279	280	280	278		
Chlorine								

Dilution: 42

Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.6	24.2	24.2	24.2	24.5	24.2	24.3	
DO Initial	8.2	8.1	8.3	8.3	8.5	8.3	8.0	
DO Final	8.4	8.2	8.5	8.4	8.3	8.2		
pH Initial	7.9	8.1	7.7	7.7	7.7	7.7	7.6	
pH Final	7.7	8.1	7.7	7.7	7.8	7.7		
Alkalinity								
Hardness								
Conductivity	308	277	298	308	309	309		
Chlorine								

Dilution: 100 UV

Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.6	24.2	24.2	24.2	24.5	24.2	24.3	
DO Initial	8.1	7.9	8.1	8.2	8.3	8.0	8.0	
DO Final	8.3	7.9	8.3	8.4	7.9	7.9		
pH Initial	8.0	8.1	7.7	7.7	7.7	7.7	7.6	
pH Final	7.6	8.0	7.6	7.8	7.7	7.7		
Alkalinity								
Hardness								
Conductivity	489	482	476	482	496	507		
Chlorine								

Dilution: 56

Day:	1	2	3	4	5	6	7	Comments
Temp (C)	24.6	24.2	24.4	24.2	24.5	24.2	24.3	
DO Initial	8.2	8.1	8.3	8.3	8.4	8.2	8.1	
DO Final	8.4	8.3	8.5	8.4	8.3	8.3		
pH Initial	8.0	8.1	7.7	7.6	7.7	7.8	7.6	
pH Final	7.7	8.1	7.7	7.8	7.9	7.8		
Alkalinity								
Hardness								
Conductivity	346	349	344	347	352	354		
Chlorine								

Dilution: 75

Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.6	24.2	24.4	24.2	24.5	24.2	24.3	
DO Initial	8.2	8.0	8.3	8.3	8.4	8.2	8.1	
DO Final	8.4	8.3	8.4	8.5	8.3	8.2		
pH Initial	8.0	8.1	7.7	7.6	7.7	7.7	7.6	
pH Final	7.8	8.1	7.7	7.8	7.9	7.8		
Alkalinity								
Hardness								
Conductivity	401	408	401	405	409	413		
Chlorine								

Dilution: 100

Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.6	24.2	24.2	24.2	24.5	24.2	24.3	
DO Initial	8.2	8.0	8.2	8.3	8.4	8.2	8.0	
DO Final	8.6	8.3	8.4	8.5	8.2	8.3		
pH Initial	8.0	8.1	7.7	7.6	7.7	7.7	7.6	
pH Final	7.7	8.1	7.7	7.9	8.0	7.8		
Alkalinity	52.0	64.0		60.0				
Hardness	52.0	52.0		48.0				
Conductivity	475	479	475	478	483	485		
Chlorine	<.01	<.01		<.01				

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**	**4/14/13 To**	**0830**	**4/15/13**
Composite 2 Collected from:	**0830**	**4/16/13 To**	**0830**	**4/17/13**
Composite 3 Collected from:	**0830**	**4/18/13 To**	**0830**	**4/19/13**

Test initiated: 1450 **am/pm** 4/16/13 **date**
Test terminated: 1115 **am/pm** 4/23/13 **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	100	100	87.5	100	100	100	100	97.5	6.06
32	87.5	100	100	87.5	100	100	100	95.0	7.62
42	87.5	75.0	75.0	75.0	50.0	100	100	72.5	14.83
56	87.5	75.0	75.0	62.5	37.5	100	100	67.5	21.10
75	62.5	37.5	75.0	75.0	75.0	100	97.5	65.0	17.93
100	100	100	87.5	100	100	100	100	97.5	6.06
100 UV	100	87.5	100	62.5	87.5	100	100	87.5	16.10

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	0.375	0.375	0.338	0.313	0.275	0.335	12.76
32	0.300	0.338	0.325	0.288	0.338	0.318	7.15
42	0.338	0.300	0.263	0.238	0.138	0.255	29.74
56	0.300	0.238	0.300	0.188	0.088	0.223	10.00
75	0.250	0.125	0.263	0.250	0.238	0.225	25.15
100	0.350	0.325	0.338	0.425	0.463	0.380	15.88
100 UV	0.313	0.225	0.350	0.213	0.325	0.285	21.80
0-SN	0.375	0.375	0.386	0.313	0.275	0.345	14.08

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

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%)**	**YES**	**X**	**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): 0
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% effluent**
b.) NOEC growth	**100% effluent**
c.) LOEC survival	**N/A% effluent**
d.) LOEC growth	**N/A% 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: Haughton, Zeagler, Callahan

Sample No. 1 Collected: Date: 4/15/13 Time: 0830
Sample No. 2 Collected: Date: 4/17/13 Time: 0830
Sample No. 3 Collected: Date: 4/19/13 Time: 0830
Test Begin: Date: 4/16/13 Time: 1450
Test End: Date: 4/23/13 Time: 1115

Dilution: 0 Day:

	1	2	3	4	5	6	7	Comments
Temp (C)	25.5	25.3	24.8	24.6	25.5	25.0	24.8	
DO Initial	8.2	7.4	7.3	7.9	7.7	7.4	7.5	
DO Final	8.3	8.2	8.5	8.4	8.3	8.3		
pH Initial	7.4	7.6	7.3	7.4	7.5	7.2	7.4	
pH Final	7.7	8.0	7.7	7.6	7.7	7.7		
Alkalinity	32.0		40.0	44.0				
Hardness	52.0		40.0	48.0				
Conductivity	180.5	180.5	178.8	182.1	180.1	178.8		
Chlorine	<.01		<.01	<.01				

Dilution: 56 Day:

	1	2	3	4	5	6	7	Comments
Temp (C)	25.5	25.3	24.8	24.6	25.5	25.0	24.8	
DO Initial	8.1	7.0	7.4	7.9	7.5	7.2	7.4	
DO Final	8.4	8.3	8.5	8.4	8.3	8.3		
pH Initial	7.4	7.7	7.2	7.3	7.4	7.3	7.4	
pH Final	7.7	8.1	7.7	7.8	7.9	7.8		
Alkalinity								
Hardness								
Conductivity	346	349	344	347	352	354		
Chlorine								

Dilution: 32 Day

	1	2	3	4	5	6	7	Comments
Temp (C)	25.5	25.3	24.8	24.6	25.5	25.0	24.8	
DO Initial	8.2	7.3	7.3	7.9	7.6	7.4	7.6	
DO Final	8.3	8.2	8.5	8.4	8.3	8.2		
pH Initial	7.4	7.6	7.2	7.3	7.4	7.2	7.3	
pH Final	7.7	8.1	7.7	7.7	7.7	7.7		
Alkalinity								
Hardness								
Conductivity	278	280	279	280	280	278		
Chlorine								

Dilution: 75 Day

	1	2	3	4	5	6	7	Comments
Temp (C)	25.5	25.3	24.8	24.6	25.5	25.0	24.8	
DO Initial	8.1	7.0	7.4	7.9	7.5	7.0	7.1	
DO Final	8.4	8.3	8.4	8.5	8.3	8.2		
pH Initial	7.4	7.7	7.3	7.3	7.4	7.2	7.3	
pH Final	7.8	8.1	7.7	7.8	7.9	7.8		
Alkalinity								
Hardness								
Conductivity	401	408	401	405	409	413		
Chlorine								

Dilution: 42 Day

	1	2	3	4	5	6	7	Comments
Temp (C)	25.5	25.3	24.8	24.6	25.5	25.0	24.8	
DO Initial	8.1	7.2	7.5	7.9	7.6	7.3	7.6	
DO Final	8.4	8.2	8.5	8.4	8.3	8.2		
pH Initial	7.4	7.6	7.2	7.3	7.4	7.2	7.3	
pH Final	7.7	8.1	7.7	7.7	7.8	7.7		
Alkalinity								
Hardness								
Conductivity	308	277	298	308	309	309		
Chlorine								

Dilution: 100 Day

	1	2	3	4	5	6	7	Comments
Temp (C)	25.5	25.3	24.8	24.6	25.5	25.0	24.8	
DO Initial	8.1	6.8	7.2	7.7	7.4	7.1	7.2	
DO Final	8.6	8.3	8.4	8.5	8.2	8.3		
pH Initial	7.5	7.7	7.3	7.3	7.3	7.2	7.3	
pH Final	7.7	8.1	7.7	7.9	8.0	7.8		
Alkalinity	52.0	64.0		60.0				
Hardness	52.0	52.0		48.0				
Conductivity	475	479	475	478	483	485		
Chlorine	<.01	<.01		<.01				

Dilution: 100 UV Day

	1	2	3	4	5	6	7	Comments
Temp (C)	25.5	25.3	24.8	24.6	25.5	25.0	24.8	
DO Initial	7.8	6.9	7.4	7.7	7.3	7.2	7.5	
DO Final	8.3	7.9	8.3	8.4	7.9	7.9		
pH Initial	7.5	7.7	7.3	7.4	7.3	7.3	7.5	
pH Final	7.6	8.0	7.6	7.8	7.7	7.7		
Alkalinity								
Hardness								
Conductivity	489	482	476	482	496	507		
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 (v. 31612)

Client: El Dorado Chemical

Project#: X5077

Chain of Custody Documents Checked by: AH 5/7/13
Technician/Date

Raw Data Documents Checked by: AH 5/7/13
Technician/Date

Statistical Analysis Package Checked by: EGB 5/6/13
Quality Manager/Date

Quality Control Data Checked by: EGB 4/18/13
Quality Manager/Date

Report Checked by: EGB 5/10/13
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.

Eric G. Boggs, BS
Quality Manager

5/10/13
Date

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X5068

Bio-Analytical Laboratories' Executive Summary

Permittee: El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731
Project #: X5068
Outfall: Outfall 006 (contaminated storm water)
Permit #: AR0000752/ AFIN #70-00040
Contact: Ms. Larken Pennington
Test Dates: April 5 - 7, 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%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM6C- 0.
2. Report the NOEC for survival, Parameter TOM6C - 100%.
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%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D- 0.
2. Report the NOEC for survival, Parameter TOM3D -100%.
3.Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 7.84%.

-Note: Due to lack of available test organisms the proper age, only the 0 and 100% test dilutions were used in the daphnid test.

This report contains a total of 30 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

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Doyline, LA 71023

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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 X5068

Test Dates: April 5 - 7, 2013
Report Date: April 24, 2013

Prepared for:
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ADEQ #88-0630

BAL
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Project X5068

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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 raised in-house and were approximately two 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, using sodium chloride (NaCl), 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 fathead minnow test were 100, 75.0, 56.0, 42.0, 32.0 and 22.0 percent effluent and a reconstituted water control. Due to the lack of available daphnids the correct age, the only concentrations used in the *Daphnia pulex* test were 100 percent effluent and a reconstituted water control. The critical dilution was defined as 100 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 April 5, 2013. Upon completion of collection, the sample was chilled to 4^0 Celsius and delivered to Bio-Analytical Laboratories by BAL personnel.

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 total ammonia level was measured using a HACH^R test strip. 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.

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3.0 Results and Discussion

The results of the tests can be found in Table 1. Significant differences in survival were not noted in the 100 percent critical dilution after 48 hours of exposure (p=.05). The NOEC value for both tests was 100 percent effluent (p=.05).

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	92.5
22.0	100.0	-----
32.0	100.0	-----
42.0	100.0	-----
56.0	100.0	-----
75.0	100.0	-----
100.0	100.0	92.5

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.

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4.0 Conclusions

The sample of Outfall 006 collected from El Dorado Chemical Company, El Dorado, Arkansas, on April 5, 2013, was not found to be lethally toxic to the *Daphnia pulex* test organisms nor the fathead minnow test organisms in the 100 percent critical dilution after 48 hours of exposure (p=.05).

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5.0 Reference

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.

APPENDIX A
CHAIN-OF-CUSTODY DOCUMENTS

Bio-Analytical Laboratories
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Doyline, LA 71023
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1-800-259-1248
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: David Artus / DAVID SARTAIN / 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	Lab Control Number:	Preservative: (below)
4.4.13 – 4.5.13	0620 – 0620	✓		6 half gallon	OUTFALL 006			X	X				C7209	ICE

Temperature upon arrival: 0.2°C
Thermometer #: 09
Tech: LMG
Date: 4/5/13
Project Number: X5068
Temp. upon arrival:

Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
David Artus	4.5.13	0910	[signature]	4-5-13	0910
Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Relinquished by/Affiliation: [signature]	Date: 4-5-13	Time: 1120	Received by/Affiliation: Gylleigler	Date: 4/5/13	Time: 1120

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# X5068

Client: EDCC/El Dorado Chemical Company

Address: 4500 Northwest Ave El Dorado AR 71731

NPDES#AR0000752 Outfall 006

Technicians: EGB/AH/LGZ/RC

Test initiated: Date 4/5/13 Time 1510

Test terminated: Date 4/7/13 Time 1310

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 & %)	Total Residual Chlorine (mg/L)	Dechlorinated? Amount?	Ammonia (NH3) mg/L	Salinity	Hardness 100%	Alkalinity 100%	Tech
C7209	11.4/138.0%	4120 8.3/96%	40.01	NO	1.0	N/A	3960	44.0	AH
↓	11.9/137.2%	YDS 8.8/94.0%	↓	↓	↓	↓			

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
		NA	NA	NA	NA				
Soft H2O	3476						44.0	32.0	RC
↓	↓								

Test Species Information

Test Species Info.	Species: D.pulex ID#: BAU05-F6	Species: P.promelas ID#: BAU4313	Species: ID#:	Species: ID#:
Age	<24h	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			

Comments:

4/7/13

ACUTE1 020809 Rev.

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

Project# X5068

Client El Dorado Chemical

Test started: Date 4/5/13 Time 1510

Test ended: Date 4/7/13 Time 1310

Sample Description 006

Test Species D. pulex ID# BA4DS-F6

Technician: Ohour AH 24hour [illegible] 48hour [illegible] 72hour ____ 96hour ____

Time: Ohour 1510 24hour 1118 48hour 1310 72hour ____ 96hour ____

Temperature (°C): Ohour 24 24hour 24.1 48hour 24.2 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			8.3	8.7/8.5	8.3			7.9	7.7/7.6	8.0			178.5	182/179	258		
	B		8	7	7																	
	C		8	7	7																	
	D		8	7	7																	
	E		8	8	8																	
100	A		8	8	7			8.2	8.7/8.7	8.3			7.7	7.6/7.7	7.4			123	144/137	132		
	B		8	8	8																	
	C		8	7	7																	
	D		8	8	8																	
	E		8	8	7																	
Chemistry Tech prerenewal/postrenewal								RC	[illegible]	[illegible]			RC	[illegible]	[illegible]			RC	[illegible]	[illegible]		

ACUTE2 020809 Rev.

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

Project# X5068
Test started: Date 4/5/13 Time 1510
Client El Dorado Chemical
Test ended: Date 4/7/13 Time 1310
Sample Description 006
Test Species P. promelas ID# BAY4313

Technician: 0hour RC 24hour [illegible] 48hour [illegible] 72hour 96hour
Time: 0hour 1510 24hour 1100 48hour 1310 72hour 96hour
Temperature (°C): 0hour 25.0 24hour 24.3 48hour 24.8 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			8.3	8.6/8.5	8.3			7.9	7.8/7.6	7.9			178.5	180.1/179.3	211		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
22	A		8	8	8			8.3	8.6/8.5	8.4			7.8	7.7/7.4	7.6			419	420/416	447		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								RC	[illegible]/[illegible]	[illegible]			RC	[illegible]/[illegible]	[illegible]			RC	[illegible]/[illegible]	[illegible]		

ACUTE2 020809 Rev.

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

Project# X5068 — Test started: Date 4/5/13 Time 1510

Client El Dorado Chemical — Test ended: Date 4/7/13 Time 1310

Sample Description DOC — Test Species P. promelas ID# BAL 4313

Technician: Ohour RC 24hour [illegible] 48hour [illegible] 72hour ____ 96hour ____

Time: Ohour 1510 24hour 1100 48hour 1310 72hour ____ 96hour ____

Temperature (°C): Ohour 25.0 24hour 24.3 48hour 24.8 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
32	A		8	8	8			8.3	8.3/8.5	8.4			7.8	7.7/7.6	7.6			524	527/519	557		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
42	A		8	8	8			8.3	8.5/8.6	8.4			7.8	7.7/7.6	7.6			632	643/635	660		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								RC	[illegible]	[illegible]			RC	[illegible]	[illegible]			RC	[illegible]	[illegible]		

ACUTE2 020809 Rev.

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

Project# X5068

Client El Dorado Chemical

Sample Description 006

Test started: Date 4/5/13 Time 1510

Test ended: Date 4/7/13 Time 1310

Test Species P. promelas ID# BAH 4313

Technician: 0hour RC 24hour [illegible] 48hour [illegible] 72hour — 96hour —

Time: 0hour 1510 24hour 1100 48hour 1310 72hour — 96hour —

Temperature (°C): 0hour 25.0 24hour 24.3 48hour 24.8 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																				
56	A		8	8	8			8.2	8.6/8.6	8.4			7.8	7.8/7.6	7.6			784	781/783	818		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
75	A		8	8	8			8.2	8.5/8.6	8.4			7.7	7.7/7.5	7.5			971	975/971	993		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								RC	[illegible]/[illegible]	[illegible]			RC	[illegible]/[illegible]	[illegible]			RC	[illegible]/[illegible]	[illegible]		

ACUTE2 020809 Rev.

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

Project# X5068

Client El Dorado Chemical

Test started: Date 4/5/13 Time 1510

Test ended: Date 4/7/13 Time 1310

Sample Description DDD

Test Species P. promelas ID# BPA 4313

Technician: Ohour RC 24hour [illegible] 48hour [illegible] 72hour ____ 96hour ____

Time: Ohour 1510 24hour 1100 48hour 1310 72hour ____ 96hour ____

Temperature (°C): Ohour 25.0 24hour 24.3 48hour 24.8 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																				
100	A		8	8	8			8.2	8.5/8.7	8.4			7.7	7.8/7.7	7.5			1239	1245/1297	1012		
	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								RC					RC					RC				

4/4/13

ACUTE2 020809 Rev.

APPENDIX C
STATISTICAL ANALYSIS

Daphnid Acute Test-48 Hr Survival

Start Date:	4/5/2013	Test ID:	X5068DP	Sample ID:	6
End Date:	4/7/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	4/5/2013	Protocol:	EPAAW02-EPA/821/R-02-01	Test Species:	DP-Daphnia pulex
Comments:					

Conc-%	1	2	3	4	5
D-Control	1.0000	0.8750	0.8750	0.8750	1.0000
100	0.8750	1.0000	0.8750	1.0000	0.8750

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	0.9250	1.0000	1.2829	1.2094	1.3931	7.841	5		
100	0.9250	1.0000	1.2829	1.2094	1.3931	7.841	5	27.50	19.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.64015	0.842	0.48412	-2.2768
F-Test indicates equal variances (p = 1.00)	1	23.1545		
Hypothesis Test (1-tail, 0.05)				
Wilcoxon Two-Sample Test indicates no significant differences Treatments vs D-Control				

ToxCalc v5.0.23

Reviewed by: 4/18/13

Acute Fish Test-48 Hr Survival

Start Date:	4/5/2013	Test ID:	X5068PP	Sample ID:	6
End Date:	4/7/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	4/5/2013	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				

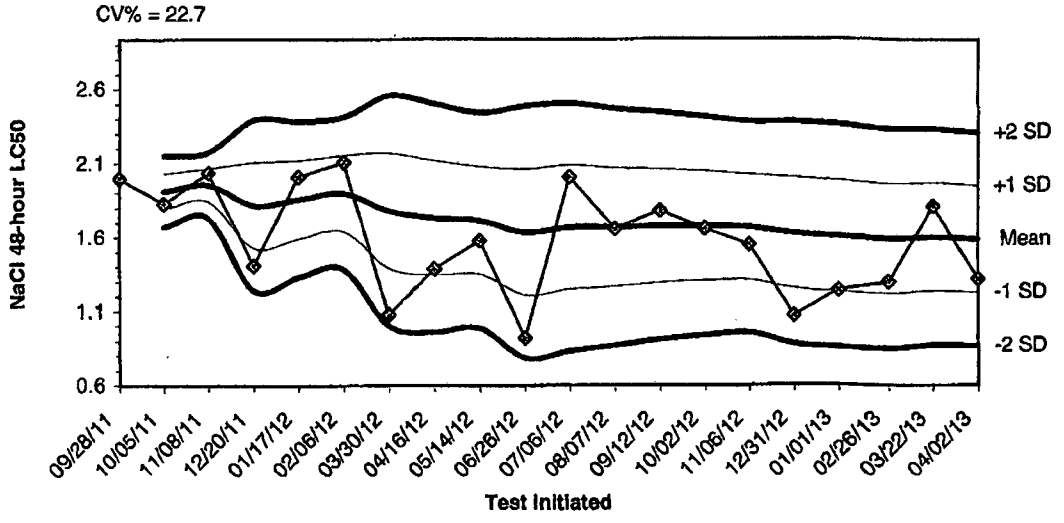
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs D-Control				

ToxCalc v5.0.23

Reviewed by: EGB 4/18/13

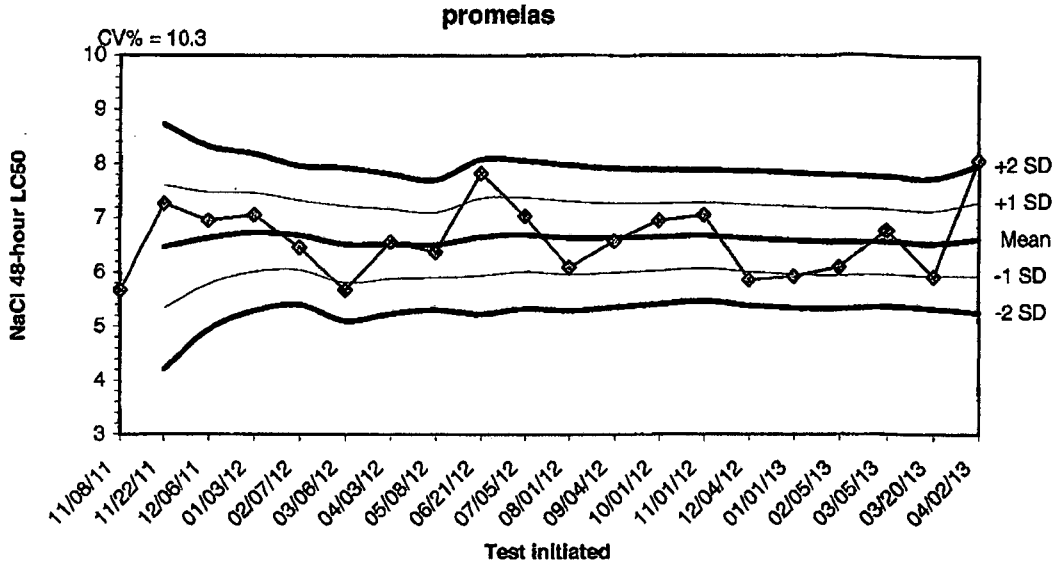
APPENDIX D
QUALITY ASSURANCE CHARTS

2013 48-hour Acute Reference Toxicant Test Results using Daphnia pulex



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
09/28/11	2.0000					
10/05/11	1.8300	1.9150	1.7948	1.6746	2.0352	2.1554
11/08/11	2.0400	1.9567	1.8452	1.7337	2.0682	2.1797
12/20/11	1.4100	1.8200	1.5319	1.2438	2.1081	2.3962
01/17/12	2.0100	1.8580	1.5944	1.3309	2.1216	2.3851
02/06/12	2.1100	1.9000	1.6428	1.3856	2.1572	2.4144
03/30/12	1.0800	1.7829	1.3940	1.0052	2.1717	2.5605
04/16/12	1.3900	1.7338	1.3479	0.9620	2.1196	2.5055
05/14/12	1.5800	1.7167	1.3521	0.9876	2.0812	2.4458
06/26/12	0.9200	1.6370	1.2109	0.7847	2.0631	2.4893
07/06/12	2.0100	1.6709	1.2513	0.8316	2.0905	2.5102
08/07/12	1.6600	1.6700	1.2699	0.8698	2.0701	2.4702
09/12/12	1.7800	1.6785	1.2942	0.9099	2.0628	2.4470
10/02/12	1.6600	1.6771	1.3079	0.9386	2.0464	2.4156
11/06/12	1.5500	1.6687	1.3113	0.9540	2.0260	2.3833
12/31/12	1.0700	1.6313	1.2550	0.8787	2.0075	2.3838
01/01/13	1.2400	1.6082	1.2318	0.8553	1.9847	2.3612
02/26/13	1.3000	1.5911	1.2187	0.8463	1.9635	2.3359
03/22/13	1.8100	1.6026	1.2373	0.8719	1.9680	2.3333
04/02/13	1.3200	1.5885	1.2273	0.8661	1.9497	2.3109

2013 48-hour Acute Reference Toxicant Test Results using Pimephales promelas



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
11/08/11	5.6700					
11/22/11	7.2700	6.4700	5.3386	4.2073	7.6014	8.7327
12/06/11	6.9500	6.6300	5.7834	4.9367	7.4766	8.3233
01/03/12	7.0600	6.7375	6.0136	5.2896	7.4614	8.1854
02/07/12	6.4600	6.6820	6.0429	5.4038	7.3211	7.9602
03/06/12	5.6700	6.5133	5.8080	5.1027	7.2186	7.9240
04/03/12	6.5600	6.5200	5.8759	5.2318	7.1641	7.8082
05/08/12	6.3700	6.5013	5.9026	5.3039	7.0999	7.6986
06/21/12	7.8200	6.6478	5.9358	5.2239	7.3597	8.0716
07/05/12	7.0300	6.6860	6.0040	5.3220	7.3680	8.0500
08/01/12	6.0900	6.6318	5.9603	5.2888	7.3033	7.9748
09/04/12	6.5700	6.6267	5.9862	5.3457	7.2672	7.9077
10/01/12	6.9500	6.6515	6.0318	5.4120	7.2713	7.8911
11/01/12	7.0600	6.6807	6.0753	5.4700	7.2861	7.8914
12/04/12	5.8600	6.6260	6.0054	5.3847	7.2466	7.8673
01/01/13	5.9200	6.5819	5.9568	5.3318	7.2069	7.8319
02/05/13	6.0900	6.5529	5.9361	5.3193	7.1698	7.7866
03/05/13	6.7700	6.5650	5.9644	5.3638	7.1656	7.7662
03/20/13	5.9200	6.5311	5.9289	5.3268	7.1332	7.7353
04/02/13	8.0700	6.6080	5.9284	5.2487	7.2876	7.9673

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: 4/4/13** **To: 4/5/13**
From: **To:**
Test Initiated: 4/5/13
Dilution Water Used: **Receiving Water** **Reconstituted Water**

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	100					
24-hour	A	100	100					
	B	87.5	100					
	C	87.5	87.5					
	D	87.5	100					
	E	100	100					
48-hour	A	100	87.5					
	B	87.5	100					
	C	87.5	87.5					
	D	87.5	100					
	E	100	87.5					
	Mean	92.5	92.5					

1. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate: Is the mean survival at 48 hours significantly different (p=.05) than the control survival for the % effluent corresponding to:
a.) LOW FLOW OR CRITICAL DILUTION (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
Sample Collected **From:** **Date 4/4/13** **Time 0620**
To: **Date 4/5/13** **Time 0620**
Test Begin **Date 4/5/13** **Time 1510**
Test End **Date 4/7/13** **Time 1310**

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	8.3	8.5	8.3	24.0	24.1	24.2	32.0			44.0			7.9	7.6	8.0
100	8.2	8.7	8.3	24.0	24.1	24.2	44.0			396.0			7.7	7.7	7.4

*This Form is to be submitted with each DMR.
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: 4/4/13** **To: 4/5/13**
From: **To:**
Test Initiated: 4/5/13
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	100	100	100	100	100	100
	B	100	100	100	100	100	100	100
	C	100	100	100	100	100	100	100
	D	100	100	100	100	100	100	100
	E	100	100	100	100	100	100	100
48-hour	A	100	100	100	100	100	100	100
	B	100	100	100	100	100	100	100
	C	100	100	100	100	100	100	100
	D	100	100	100	100	100	100	100
	E	100	100	100	100	100	100	100
	Mean	100	100	100	100	100	100	100

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

Sample Collected	**From:**	**Date 4/4/13**	**Time 0620**
	To:	**Date 4/5/13**	**Time 0620**
Test Begin		**Date 4/5/13**	**Time 1510**
Test End		**Date 4/7/13**	**Time 1310**

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	8.3	8.5	8.3	25.0	24.3	24.8	32.0			44.0			7.9	7.6	7.9
22	8.3	8.5	8.4	25.0	24.3	24.8							7.8	7.4	7.6
32	8.3	8.5	8.4	25.0	24.3	24.8							7.8	7.6	7.6
42	8.3	8.6	8.4	25.0	24.3	24.8							7.8	7.6	7.6
56	8.2	8.6	8.4	25.0	24.3	24.8							7.8	7.6	7.6
75	8.2	8.6	8.4	25.0	24.3	24.8							7.7	7.5	7.5
100	8.2	8.7	8.4	25.0	24.3	24.8	44.0			396.0			7.7	7.7	7.5

*This Form is to be submitted with each DMR.
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 (v. 31612)

Client: El Dorado Chemical

Project#: X5068

Chain of Custody Documents Checked by: AH 4/9/13
Technician/Date

Raw Data Documents Checked by: AH 4/9/13
Technician/Date

Statistical Analysis Package Checked by: EGB 4/18/13
Quality Manager/Date

Quality Control Data Checked by: EGB 4/18/13
Quality Manager/Date

Report Checked by: EGB 4/24/13
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.

Cindy L. Beggs, BS
Quality Manager

4/24/13
Date

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X5069

Bio-Analytical Laboratories' Executive Summary

Permittee: El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731
Project #: X5069
Outfall: Outfall 007 (contaminated storm water)
Permit #: AR0000752/ AFIN #70-00040
Contact: Ms. Larken Pennington
Test Dates: April 5 - 7, 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%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM6C- 1.
2. Report the NOEC for survival, Parameter TOM6C - 32%.
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%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D- 1.
2. Report the NOEC for survival, Parameter TOM3D -0%.
3.Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 7.62%.

Note: Due to lack of available test organisms the proper age, only the 0 and 100% test dilutions were used in the daphnid test. The initial pH of the sample was less than 6.0; therefore, an extra 100 % dilution was adjusted to a pH range of 6.0-9.0. The pH adjusted 100% dilution showed no toxicity as compared to the control in the minnow test, but significant differences were still noted in the *Daphnia pulex* test.

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
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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 X5069

Test Dates: April 5 - 7, 2013
Report Date: April 24, 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 X5069

TABLE OF CONTENTS

BAL
ADEQ #88-0630
Project X5069

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 two 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, using sodium chloride (NaCl), 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 fathead minnow test were 100, 75.0, 56.0, 50.0, 42.0 and 32.0 percent effluent and a reconstituted water control. Due to the lack of available daphnids the correct age, the only concentrations used in the *Daphnia pulex* test were 100 percent effluent and a reconstituted water control. The critical dilution was defined as 100 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 April 5, 2013. Upon completion of collection, the sample was chilled to 4^0 Celsius and delivered to Bio-Analytical Laboratories by BAL personnel.

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 total ammonia level was measured using a HACH^R test strip. The initial pH of the sample was 4.4. An aliquot of the sample was adjusted to a pH of 6.0-9.0 (the required permitted range) using 1.0 Normal Sodium Hydroxide (1.0 N NaOH). One hundred percent of the pH adjusted sample was added to each test. 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 X5069

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 24 hours of exposure (p=.05). The NOEC value for the fathead minnow test and the *Daphnia pulex* test was 32.0 and zero percent effluent, respectively (p=.05). The 48-hour LC_{50} value for the minnow and daphnid test was 36.7 and 50.0 percent effluent, respectively. Adjusting the pH in the sample reduced the lethality in both tests; however, significant differences in survival were still noted in the daphnid test (p=.05).

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
32.0	100.0	-----
42.0	0.0	-----
50.0	0.0	-----
56.0	0.0	-----
75.0	0.0	-----
100.0	0.0	0.0
100.0 pH adjusted	100.0	82.5

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 X5069

4.0 Conclusions

The sample of Outfall 007 collected from El Dorado Chemical Company, El Dorado, Arkansas, on April 5, 2013, was found to be lethally toxic to the *Daphnia pulex* test organisms and the fathead minnow test organisms in the 100 percent critical dilution after 24 hours of exposure (p=.05). Adjusting the pH of the sample from the initial pH of 4.4 to a range of 6.0-9.0 reduced the toxicity to both test organisms.

BAL
ADEQ #88-0630
Project X5069

5.0 Reference

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.

APPENDIX A
CHAIN-OF-CUSTODY DOCUMENTS

Bio-Analytical Laboratories
3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023
(318) 746-2772
1-800-256-1346
Fax: (318) 746-2773

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

Laboratory Use Only:

Company: El Dorado Chemical Company				**Phone:** (870) 863-1484		**Analysis:**								**Project Number:** X5069	
Address: 4500 Norwest Ave., El Dorado, AR 71731				**Fax:** (870) 863-7499											
Permit #: AR0000752/AFIN 70-00040				**Purchase Order:**										Temp. upon arrival: Temperature upon arrival: 1.7°C	
Sampler's Signature/Printed Name/Affiliation: David Sartain / DAVID SARTAIN / EDCC														Thermometer #: 29	
														Tech: Dom 4/5/13	
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		Date: Lab Control Number: C7210	**Preservative: (below)** ICE
4.4.13 – 4.5.13	0630 – 0630	✓		6 half gallon	OUTFALL 007			X	X						
Relinquished by/Affiliation: David Sartain / EDCC					**Date:** 4/5/13	**Time:** 0910	**Received by/Affiliation:**							**Date:** 4/5/13	**Time:** 0910
Relinquished by/Affiliation:					**Date:**	**Time:**	**Received by/Affiliation:**							**Date:**	**Time:**
Relinquished by/Affiliation:					**Date:** 4/5/13	**Time:** 1120	**Received by/Affiliation:**							**Date:** 4/5/13	**Time:** 1120

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# X5069

Client: EDCC/El Dorado Chemical Company

Address: 4500 Northwest Ave El Dorado AR 71731

NPDES#AR0000752 Outfall 007

Technicians: EGB/AH/LGZ/RC

Test initiated: Date 4/5/13 Time 1535

Test terminated: Date 4/7/13 Time 1335

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 & %)	Total Residual Chlorine (mg/L)	Dechlorinated? Amount?	Ammonia (NH3) mg/L	Salinity	Hardness 100%	Alkalinity 100%	Tech
C7210	12.2/147.0%	4/20 8.3/98.8%	<0.01	NO	0.5	N/A	456.0	0.0	AH
↓	13.6/147.4%	4/20 8.7/98.8%	↓	↓	↓	↓			

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
		N/A	N/A	N/A	N/A				
Soft H2O	34716						44.0	32.0	RC
↓	↓								

Test Species Information

Test Species Info.	Species: ID#: D.pulex BAJDS-F16	Species: ID#: P.promelas BAJ4313	Species: ID#:	Species: ID#:
Age	<24h	2days		
Test Container Size	30ml	250ml		
Test volume	25ml	200ml		
Feeding: Type	YCT; Algae	Artemia		
Amount	Fed 1hrs prior to test initiation			
Aeration?	N/A	N/A		
Amount				
Condition of survivors	Good			

Comments:

LGZ 4/7/13

ACUTE1 020809 Rev.

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

Project# X50169

Client El Dorado Chemical

Sample Description 007

Test started: Date 4/5/13 Time 1520

Test ended: Date 4/7/13 Time 1320

Test Species D. pulex ID# BAL D5-F6

Technician:	Ohour AH	24hour [illegible]	48hour [illegible]	72hour	96hour
Time:	Ohour 1520	24hour 1115	48hour 1320	72hour	96hour
Temperature (°C):	Ohour 24	24hour 24.1	48hour 24.2	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			8.3	8.7/8.5	8.1			7.8	7.7/7.6	7.8			1828	1857/1803	280		
	B		8	8	8																	
	C		8	8	8																	
	D		8	7	7																	
	E		8	7/6	7 4/6/13																	
100	A		8	0				8.4	8.7				4.4	4.6				1566	1508			
	B		8	0																		
	C		8	0																		
	D		8	0																		
	E		8	0																		
Chemistry Tech prerenewal/postrenewal								[illegible]	[illegible]				[illegible]	[illegible]				[illegible]	[illegible]			

ACUTE2 020809 Rev.

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

Project# X5069

Client El Dorado Chemical

Test started: Date 4/5/13 Time 1530

Test ended: Date 4/7/13 Time 1330

Sample Description 007

Test Species D. pulex ID# BAL D5-F6

Technician: Ohour RH 24hour [illegible] 48hour [illegible] 72hour ___ 96hour ___

Time: Ohour 1520 24hour 1115 48hour 1300 72hour ___ 96hour ___

Temperature (°C): Ohour 21 24hour 24.1 48hour 24.2 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	7			8.4	8.7/8.0	8.6			7.2	7.6/7.8	7.1			1602	1615/1574	1716		
pH Adj	B		8	8	6																	
	C		8	7	7																	
	D		8	6	6																	
	E		8	7	7																	
	A		8						/					/					/			
	B		8																			
	C		8																			
	D		8																			
	E		8																			
Chemistry Tech prerenewal/postrenewal								[illegible]					[illegible]					[illegible]				

ACUTE2 020809 Rev.

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

Project# X5069

Client El Dorado Chemical

Sample Description 007

Test started: Date 4/5/13 Time 1535

Test ended: Date 4/7/13 Time 1335

Test Species P. promelas ID# BAL 4313

Technician:	Ohour [illegible]	24hour [illegible]	48hour [illegible]	72hour	96hour
Time:	Ohour 1535	24hour 1040	48hour 1335	72hour	96hour
Temperature (°C):	Ohour 25.1	24hour 24.3	48hour 24.8	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			8.3	8.2/8.5	8.4			7.8	7.7/7.6	8.1			182.8	176/180.3	206		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
32	A		8	8	8			8.3	8.2/8.6	8.6			5.6	6.5/6.9	7.0			614	611/620	631		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								RC	[illegible]	[illegible]			RC	[illegible]	[illegible]			RC	[illegible]	[illegible]		

ACUTE2 020809 Rev.

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

Project# X5069 | Test started: Date 4/5/13 | Time 1535

Client El Dorado Chemical | Test ended: Date 4/7/13 | Time 1335

Sample Description 007 | Test Species P. promelas | ID# BAL 4813

Technician: 0hour RC/[illegible] 24hour [illegible] 48hour [illegible] 72hour — 96hour —

Time: 0hour 1535 24hour 1040 48hour 1335 72hour — 96hour —

Temperature (°C): 0hour 25.1 24hour 24.7 48hour 24.8 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	NA	8	0				8.3	8.9				4.9	5.3				747	750			
	B		8	0																		
	C		8	0																		
	D		8	0																		
	E		8	0																		
50	A		8	0				8.3	8.9				4.8	4.7				868	878			
	B		8	0																		
	C		8	0																		
	D		8	0																		
	E		8	0																		
Chemistry Tech prerenewal/postrenewal								RC	[illegible]	[illegible]			RC	[illegible]	[illegible]			RC	[illegible]	[illegible]		

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

Project# X5069

Client El Dorado Chemical

Sample Description 007

Test started: Date 4/5/13 Time 1535

Test ended: Date 4/7/13 Time 1335

Test Species P. promelas ID# BAL 4313

Technician: Ohour RC/dbm 24hour dbm 48hour dbm 72hour ____ 96hour ____

Time: Ohour 1535 24hour 1040 48hour 1335 72hour ____ 96hour ____

Temperature (°C): Ohour 25.1 24hour 24.3 48hour 21.8 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	0				8.3	8.9				4.7	4.7				940	839			
	B		8	0																		
	C		8	0																		
	D		8	0																		
	E		8	0																		
75	A		8	0				8.2	8.9				4.6	4.5				1260	1198			
	B		8	0																		
	C		8	0																		
	D		8	0																		
	E		8	0																		
Chemistry Tech prerenewal/postrenewal								RC	dbm	dbm			RC	dbm	dbm			RC	dbm	dbm		

ACUTE2 020809 Rev.

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

Project# X5069

Client El Dorado Chemical

Sample Description 007

Test started: Date 4/5/13 Time 1535

Test ended: Date 4/7/13 Time 1335

Test Species P. promelas ID# BAL 4313

Technician: 0hour RC/LBW 24hour LBW 48hour LBW 72hour — 96hour —

Time: 0hour 1535 24hour 1040 48hour 1335 72hour — 96hour —

Temperature (°C): 0hour 25.1 24hour 24.3 48hour 24.8 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	0				8.4	8.9				4.4	4.4				1566	1509			
	B		8	0																		
	C		8	0																		
	D		8	0																		
	E		8	0																		
100 pH Adj.	A		8	8	8			7.3 / 8.4 LBW 4/5/13	7.1 / 8.0	8.5			8.4 / 7.3 LBW 4/5/13	7.1 / 7.8	7.0			1601	1580 / 1579	1646		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								LBW	LBW / LBW	LBW			LBW	LBW / LBW	LBW			LBW	LBW / LBW	LBW		

ACUTE2 020809 Rev.

APPENDIX C
STATISTICAL ANALYSIS

Daphnid Acute Test-48 Hr Survival

Start Date:	4/5/2013	Test ID:	x5069DP	Sample ID:	7
End Date:	4/7/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	4/5/2013	Protocol:	EPAAW02-EPA/821/R-02-01	Test Species:	DP-Daphnia pulex
Comments:					

Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	0.8750	0.8750
100	0.0000	0.0000	0.0000	0.0000	0.0000
100 pH adj	0.8750	0.7500	0.8750	0.7500	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		
100	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5		
*100 pH adj	0.8250	0.8684	1.1445	1.0472	1.2094	7.764	5	18.00	19.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.68559	0.842	-0.4869	-2.2454
F-Test indicates equal variances (p = 0.82)	1.28157	23.1545		
Hypothesis Test (1-tail, 0.05)				
Wilcoxon Two-Sample Test indicates significant differences				
Treatments vs D-Control				

ToxCalc v5.0.23

Reviewed by: EBB 4/18/13

Daphnid Acute Test-48 Hr Survival

Start Date:	4/5/2013	Test ID:	x5069DP	Sample ID:	7
End Date:	4/7/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	4/5/2013	Protocol:	EPAAW02-EPA/821/R-02-01	Test Species:	DP-Daphnia pulex
Comments:					

Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	0.8750	0.8750
100	0.0000	0.0000	0.0000	0.0000	0.0000
100 pH adj	0.8750	0.7500	0.8750	0.7500	0.8750

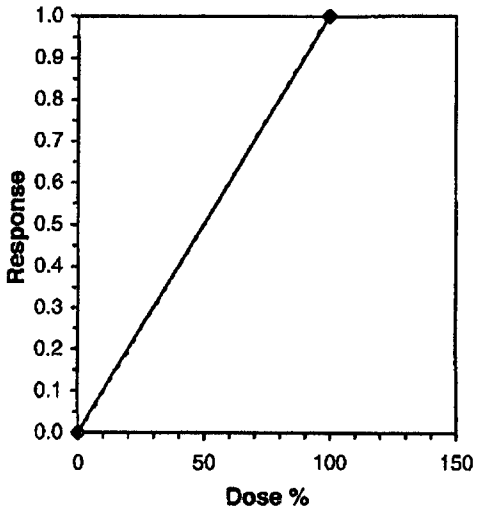
			Transform: Arcsin Square Root					Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	0.9500	1.0000	1.3196	1.2094	1.3931	7.623	5	0.9500	1.0000
100	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	0.0000	0.0000
100 pH adj	0.8250	0.8684	1.1445	1.0472	1.2094	7.764	5		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.68559	0.842	-0.4869	-2.2454
F-Test indicates equal variances (p = 0.82)	1.28157	23.1545		

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)		Skew
IC05*	5.000	0.000	5.000	5.000	1.4214
IC10*	10.000	0.000	10.000	10.000	0.1945
IC15*	15.000	0.000	15.000	15.000	-0.4278
IC20*	20.000	0.000	20.000	20.000	-1.8874
IC25*	25.000	0.000	25.000	25.000	0.4327
IC40*	40.000	0.000	40.000	40.000	#DIV/0!
IC50*	50.000	0.000	50.000	50.000	#DIV/0!

* indicates IC estimate less than the lowest concentration



Reviewed by: EOB 4/18/13

Acute Fish Test-48 Hr Survival

Start Date:	4/5/2013	Test ID:	X5069PP	Sample ID:	7
End Date:	4/7/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	4/5/2013	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	0.0000	0.0000	0.0000	0.0000	0.0000
50	0.0000	0.0000	0.0000	0.0000	0.0000
56	0.0000	0.0000	0.0000	0.0000	0.0000
75	0.0000	0.0000	0.0000	0.0000	0.0000
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	18.00
42	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5		
50	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5		
56	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5		
75	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5		
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	18.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test Indicates normal distribution (p > 0.05)	1	0.881		
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 4/18/18

Acute Fish Test-48 Hr Survival

Start Date:	4/5/2013	Test ID:	X5069PP	Sample ID:	7
End Date:	4/7/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	4/5/2013	Protocol:	EPAAW02-EPA/821/R-02-01	Test Species:	PP-Pimephales promelas

Comments:

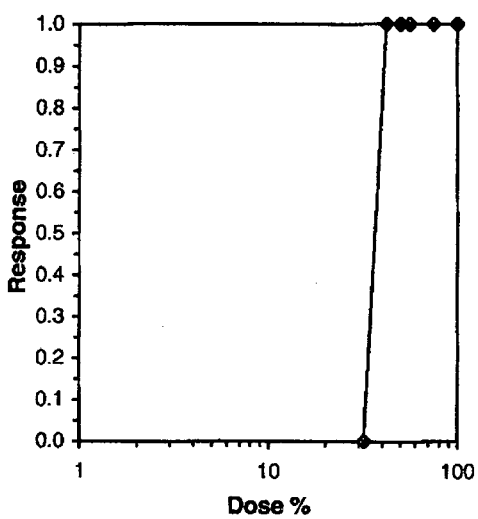
Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
42	0.0000	0.0000	0.0000	0.0000	0.0000
50	0.0000	0.0000	0.0000	0.0000	0.0000
56	0.0000	0.0000	0.0000	0.0000	0.0000
75	0.0000	0.0000	0.0000	0.0000	0.0000
100	0.0000	0.0000	0.0000	0.0000	0.0000
100PHADJ	1.0000	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	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	40	40
50	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	40	40
56	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	40	40
75	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	40	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	0.881		
Equality of variance cannot be confirmed				

Graphical Method

Trim Level	EC50
0.0%	36.661
	36.661

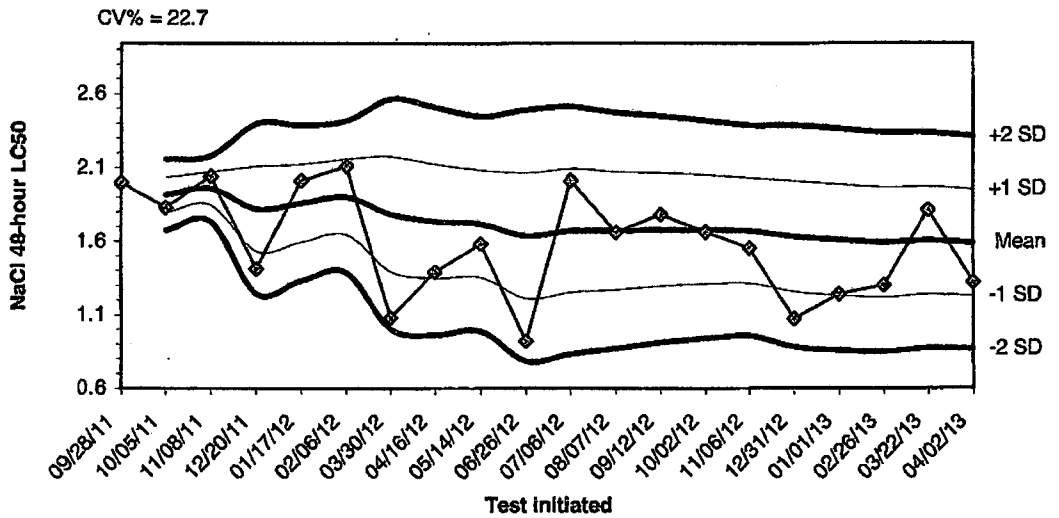


ToxCalc v5.0.23

Reviewed by: EJB 4/18/13

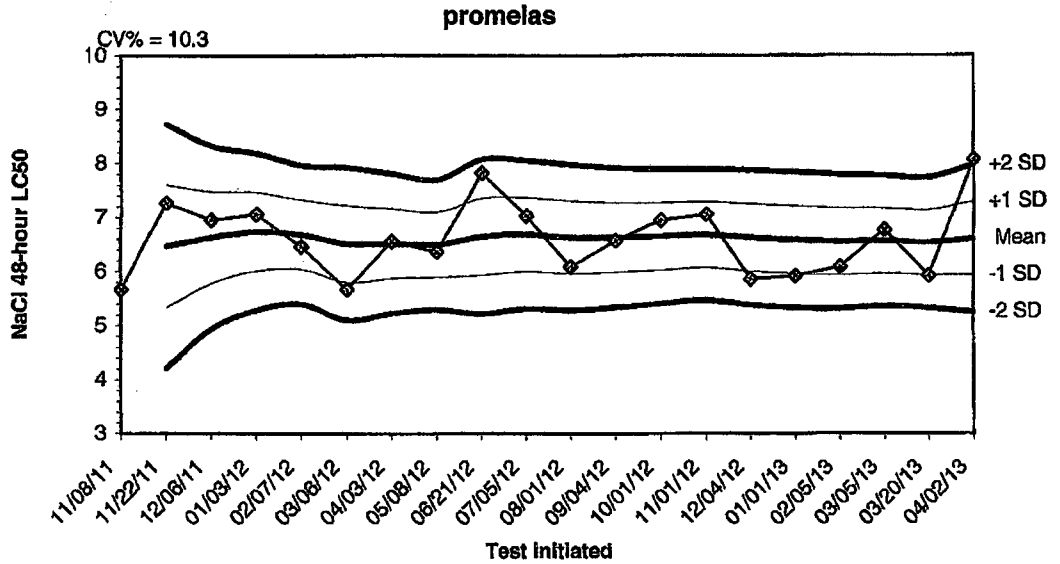
APPENDIX D
QUALITY ASSURANCE CHARTS

2013 48-hour Acute Reference Toxicant Test Results using Daphnia pulex



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
09/28/11	2.0000					
10/05/11	1.8300	1.9150	1.7948	1.6746	2.0352	2.1554
11/08/11	2.0400	1.9567	1.8452	1.7337	2.0682	2.1797
12/20/11	1.4100	1.8200	1.5319	1.2438	2.1081	2.3962
01/17/12	2.0100	1.8580	1.5944	1.3309	2.1216	2.3851
02/06/12	2.1100	1.9000	1.6428	1.3856	2.1572	2.4144
03/30/12	1.0800	1.7829	1.3940	1.0052	2.1717	2.5605
04/16/12	1.3900	1.7338	1.3479	0.9620	2.1196	2.5055
05/14/12	1.5800	1.7167	1.3521	0.9876	2.0812	2.4458
06/26/12	0.9200	1.6370	1.2109	0.7847	2.0631	2.4893
07/06/12	2.0100	1.6709	1.2513	0.8316	2.0905	2.5102
08/07/12	1.6600	1.6700	1.2699	0.8698	2.0701	2.4702
09/12/12	1.7800	1.6785	1.2942	0.9099	2.0628	2.4470
10/02/12	1.6600	1.6771	1.3079	0.9386	2.0464	2.4156
11/06/12	1.5500	1.6687	1.3113	0.9540	2.0260	2.3833
12/31/12	1.0700	1.6313	1.2550	0.8787	2.0075	2.3838
01/01/13	1.2400	1.6082	1.2318	0.8553	1.9847	2.3612
02/26/13	1.3000	1.5911	1.2187	0.8463	1.9635	2.3359
03/22/13	1.8100	1.6026	1.2373	0.8719	1.9680	2.3333
04/02/13	1.3200	1.5885	1.2273	0.8661	1.9497	2.3109

2013 48-hour Acute Reference Toxicant Test Results using Pimephales promelas



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
11/08/11	5.6700					
11/22/11	7.2700	6.4700	5.3386	4.2073	7.6014	8.7327
12/06/11	6.9500	6.6300	5.7834	4.9367	7.4766	8.3233
01/03/12	7.0600	6.7375	6.0136	5.2896	7.4614	8.1854
02/07/12	6.4600	6.6820	6.0429	5.4038	7.3211	7.9602
03/06/12	5.6700	6.5133	5.8080	5.1027	7.2186	7.9240
04/03/12	6.5600	6.5200	5.8759	5.2318	7.1641	7.8082
05/08/12	6.3700	6.5013	5.9026	5.3039	7.0999	7.6986
06/21/12	7.8200	6.6478	5.9358	5.2239	7.3597	8.0716
07/05/12	7.0300	6.6860	6.0040	5.3220	7.3680	8.0500
08/01/12	6.0900	6.6318	5.9603	5.2888	7.3033	7.9748
09/04/12	6.5700	6.6267	5.9862	5.3457	7.2672	7.9077
10/01/12	6.9500	6.6515	6.0318	5.4120	7.2713	7.8911
11/01/12	7.0600	6.6807	6.0753	5.4700	7.2861	7.8914
12/04/12	5.8600	6.6260	6.0054	5.3847	7.2466	7.8673
01/01/13	5.9200	6.5819	5.9568	5.3318	7.2069	7.8319
02/05/13	6.0900	6.5529	5.9361	5.3193	7.1698	7.7866
03/05/13	6.7700	6.5650	5.9644	5.3638	7.1656	7.7662
03/20/13	5.9200	6.5311	5.9289	5.3268	7.1332	7.7353
04/02/13	8.0700	6.6080	5.9284	5.2487	7.2876	7.9673

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: 4/4/13** **To: 4/5/13**
From: **To:**
Test Initiated: 4/5/13
Dilution Water Used: **Receiving Water** **Reconstituted Water**

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	100	100 ph adj					
24-hour	A	100	0	100					
	B	100	0	100					
	C	100	0	87.5					
	D	87.5	0	75.0					
	E	87.5	0	87.5					
48-hour	A	100	0	87.5					
	B	100	0	75.0					
	C	100	0	87.5					
	D	87.5	0	75.0					
	E	87.5	0	87.5					
	Mean	95.0	0	92.5					

1. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate: Is the mean survival at 48 hours significantly different (p=.05) than the control survival for the % effluent corresponding to:
a.) LOW FLOW OR CRITICAL DILUTION (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} = 50.0% effluent
95 % confidence limits: N/A
Method of LC_{50} calculation: Graphical
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 pulex 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, Zeagler

Sample Collected	**From:**	**Date 4/4/13**	**Time 0630**
	To:	**Date 4/5/13**	**Time 0630**
Test Begin		**Date 4/5/13**	**Time 1520**
Test End		**Date 4/7/13**	**Time 1320**

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	8.3	8.5	8.1	24.0	24.1	24.2	32.0			44.0			7.8	7.6	7.8
100	8.4	8.7		24.0	24.1		0.0			456.0			4.4	4.6	
100 pH	8.4	8.0		24.0	24.1								7.2	7.8	7.1

*This Form is to be submitted with each DMR.
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: 4/4/13** **To: 4/5/13**
From: **To:**
Test Initiated: 4/5/13
Dilution Water Used: **Receiving Water** **Reconstituted Water**

Dilution Series Results - Percent Survival

TIME OF READING	REP	100	32	42	50	56	75	100	100 pH adj
24-hour	A	100	100	0	0	0	0	0	100
	B	100	100	0	0	0	0	0	100
	C	100	100	0	0	0	0	0	100
	D	100	100	0	0	0	0	0	100
	E	100	100	0	0	0	0	0	100
48-hour	A	100	100	0	0	0	0	0	100
	B	100	100	0	0	0	0	0	100
	C	100	100	0	0	0	0	0	100
	D	100	100	0	0	0	0	0	100
	E	100	100	0	0	0	0	0	100
	Mean	100	100	0	0	0	0	0	100

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} = 36.7% effluent
95 % confidence limits: N/A
Method of LC_{50} calculation: Graphical
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: Zeagler, Callahan
Sample Collected **From:** **Date 4/4/13** **Time 0630**
To: **Date 4/5/13** **Time 0630**
Test Begin **Date 4/5/13** **Time 1535**
Test End **Date 4/7/13** **Time 1335**

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	8.3	8.5	8.4	25.1	24.3	24.8	32.0			44.0			7.8	7.6	8.1
32	8.3	8.6	8.6	25.1	24.3	24.8							5.6	6.4	7.0
42	8.3	8.9		25.1	24.3								4.9	5.3	
50	8.3	8.9		25.1	24.3								4.8	4.7	
56	8.3	8.9		25.1	24.3								4.7	4.7	
75	8.2	8.9		25.1	24.3								4.6	4.5	
100	8.4	8.9		25.1	24.3		0.0			456.0			4.4	4.4	
100 pH	8.4	8.0	8.5	25.1	24.3	24.8							7.2	7.8	7.0

*This Form is to be submitted with each DMR.
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 (v. 31612)

Client: El Dorado Chemical

Project#: X5069

Chain of Custody Documents Checked by: AH 4/9/13
Technician/Date

Raw Data Documents Checked by: AH 4/9/13
Technician/Date

Statistical Analysis Package Checked by: EGB 4/18/13
Quality Manager/Date

Quality Control Data Checked by: EGB 4/18/13
Quality Manager/Date

Report Checked by: EGB 4/24/13
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. Briggs, BS
Quality Manager

4/24/13
Date

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

El Dorado, AR 71730

FedEx Express

J13111302120326

Ship Date: 23MAY13
ActWgt: 2.0 LB
CAD: 5887030/INET3370

Delivery Address Bar Code

Ref #
Invoice #
PO #
Dept #

SHIP TO: (501) 682-0655 BILL SENDER
ADEQ - Water Division Enforcement
ADEQ - Water Division Enforcement
5301 NORTHSHORE DR

NORTH LITTLE ROCK, AR 72118

FRI - 24 MAY 10:30A
PRIORITY OVERNIGHT

TRK# 7998 3410 2938
0201

X2 LITA

72118
AR-US
LIT

518G1/9983/93AB

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