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

EL DORADO
CHEMICAL COMPANY

July 24, 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 June 30, 2013.

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

Sincerely,

Greg Withrow

Greg Withrow
General Manager

Enclosures

NON-COMPLIANCE REPORT

Facility Name: El Dorado Chemical Company

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

Month / Year: Jun-13

Type of Violation	Permit Limit	Date of Violation	Cause of Violation	Corrective Action or Other Narrative
Outfall 001 / Temperature maximum (88.7°F)	86°F Temperature Maximum	6/25/13,6/26/13, 6/27/13, 6/28/13, 6/29/13, 6/30/13	Warm temperatures, mid-day temperature spikes, temperature excursions due to ambient temperature	Daily maximum temperature readings calculated from hourly measurements are utilized as a representative daily maximum temperature for DMR preparation.
Outfall 002 / NH3-N/ Monthly Average (14.9 mg/L)	12.0 mg/L Monthly Average	6/1/2013	Heavy rainfall in a short period of time caused Outfall 002 to discharge.	Discharges from Outfall 002 consist of controlled discharge from the stabilization/pretreatment basin within the wastewater treatment process during periods of excessive rainfall. The sample was taken downstream of the overflow at the outfall. The background concentrations from the creek upstream of Outfall 002 could have influenced the results.
Outfall 002 / Lead / Monthly Average and Daily Max (44.4 ug/L)	3.8 ug/L Monthly Average/ 7.62 ug/L Daily Max	6/1/2013	Heavy rainfall in a short period of time caused Outfall 002 to discharge.	Discharges from Outfall 002 consist of controlled discharge from the stabilization/pretreatment basin within the wastewater treatment process during periods of excessive rainfall. The sample was taken downstream of the overflow at the outfall. The background concentrations from the creek upstream of Outfall 002 could have influenced the results.
Outfall 002 / Copper / Monthly Average (16.3 ug/L)	12.2 ug/L Monthly Average	6/1/2013	Heavy rainfall in a short period of time caused Outfall 002 to discharge.	Discharges from Outfall 002 consist of controlled discharge from the stabilization/pretreatment basin within the wastewater treatment process during periods of excessive rainfall. The sample was taken downstream of the overflow at the outfall. The background concentrations from the creek upstream of Outfall 002 could have influenced the results.
Sampling at Outfall 002		6/1/2013	Failed to composite samples at Outfall 002 on 6/1/13.	Grab samples were collected at Outfall 002 on 6/1/13, but compositing of the samples was not done.
Outfall 006 / TDS Monthly Average and Daily Max (480.0 mg/L)	291 mg/L Monthly Average/ 436.5 mg/L Daily Max	6/6/2013	Unknown	EDCC has land applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006 / Zinc Monthly Average (156.0 ug/L)	115.62 ug/L Monthly Average	6/6/2013	Unknown	EDCC continues to monitor and evaluate potential sources of the Zinc excursion.
Outfall 006 / Lead Monthly Average (6.1 ug/L)	3.8 ug/L Monthly Average	6/6/2013	Unknown	EDCC continues to monitor and evaluate potential sources of the Lead excursion.
Outfall 007 / Zinc Monthly Average (154.0 ug/L)	115.62 ug/L Monthly Average	6/6/2013	Unknown	EDCC continues to monitor and evaluate potential sources of the Zinc excursion.

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

Signature / Date 7/24/13

Bio-Analytical Laboratories (BAL)
ADEQ Certificate #88-0630
Project X5144

Bio-Analytical Laboratories' Executive Summary

Permittee: El Dorado Chemical Company
4500 Northwest Avenue
El Dorado, AR 71731
Project #: X5144
Outfall: 001 (treated process and contaminated storm water)
Permit #: AR0000752/ AFIN #70-00040
Contact: Larken Pennington
Test Dates: June 18 - 25, 2013
Test Type: Chronic Static Renewal Survival and Reproduction Test using *Ceriodaphnia dubia* (EPA Method 1002.0).
Chronic Static Renewal Survival and Growth Test using *Pimephales promelas* (EPA Method 1000.0).

Results:

For *Ceriodaphnia dubia:*

1. If the NOEC for survival is less than the critical dilution (100.0%), enter a "1"; otherwise, enter a "0" for Parameter TLP3B - 0 **(Pass)**.
2. If the NOEC for reproduction is less than the critical dilution, enter a "1"; otherwise, enter a "0" for Parameter TGP3B - 1 **(Fail)**.
3. Report the NOEC value for survival, Parameter TOP3B - 100.0%.
4. Report the NOEC value for reproduction, Parameter TPP3B - 42.0%.
5. Report the largest % coefficient of variation between the control and the critical dilution, Parameter TQP3B - 35.18%.

For *Pimephales promelas:*

1. If the NOEC for survival is less than the critical dilution (100.0%), enter a "1";otherwise, enter a "0" for Parameter TLP6C - 1 **(Fail)**.
2. If the NOEC for growth is less than the critical dilution, enter a "1";otherwise, enter a "0" for Parameter TGP6C- 1 **(Fail)**.
3. Report the NOEC value for survival, Parameter TOP6C - 75.0%
4. Report the NOEC value for growth, Parameter TPP6C - 0.0%
5. Report the largest % coefficient of variation between the control and the critical dilution, Parameter TQP6C - 54.94%.

This report contains a total of 50 pages, including this page. The results in the report pertain only to the samples documented in the enclosed chain of custody documents, and meet the standards set forth by TNI and ADEQ. The chemical data in this report is for monitoring purposes only and should not be reported on discharge monitoring reports.

Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023

(318) 746-2772
1-800-259-1246
Fax: (318) 746-2773

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 X5144

Test Dates: June 18 - 25, 2013

Report Date: July 17, 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 X5144

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BAL
ADEQ #88-0630
Project X5144

1.0 Introduction

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

2.0 Methods and Materials

2.1 Test Methods

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

2.2 Test Organisms

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

2.3 Dilution Water

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

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ADEQ #88-0630
Project X5144

2.4 Test Concentrations

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

2.5 Sample Collection

Three 24-hour composite samples of Outfall 001 were collected by El Dorado Chemical personnel on June 17, 19 and 21, 2013. Upon collection and completion of each composite, the samples were chilled to approximately 6.0^0 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 100.0 percent concentration was run in the tests to determine if any toxicity was due to pathogen interference. Dissolved oxygen and pH measurements were measured on the control and each concentration at test initiation, at test renewal and at test termination. Conductivity measurements were also taken at test initiation and at each renewal. Alkalinity and hardness levels were measured on the control and the undiluted effluent samples.

2.7 Monitoring of the Tests

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

2.8 Data Analysis

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

3.0 Results and Discussion

The results of the *Ceriodaphnia dubia* test can be found in Table 1. After seven days of exposure, 100.0 percent survival occurred in the control and in the critical dilution. The average number of neonates per female after three broods in the control was 16.4, while the average number of neonates in the 100 percent critical dilution was 9.4. The No-Observed-Effect-Concentration (NOEC) for survival and reproduction in this test was 100.0 and 42.0 percent effluent, respectively (p=.05). Treating the effluent with UV-light did not reduce the sublethal effects in the critical dilution.

The fathead minnow test results can be found in Table 2. One hundred percent survival occurred in the control and 52.5 percent survival occurred in the 100.0 percent critical dilution after seven days of exposure. The average weight gained per minnow in the control was 0.635 milligram (mg). A non-monotonic response occurred in both the survival and the growth data. After further investigation it was determined that the NOEC for survival and growth in this test was 75.0 and zero percent effluent, respectively (p=.05). Toxic effects were noted in the UV-treated critical dilution. The minnows starting to die after being introduced into the third sample.

BAL
ADEQ #88-0630
Project X5144

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

Percent Effluent	Percent Survival	Sig.*	Mean # Neonates-Surviving	Mean # Neonates -Total	Sig.*
Control	100.0		16.4	16.4	
32.0	100.0		17.9	17.9	
42.0	100.0		15.7	14.8	
56.0	90.0		11.8	10.6	*
75.0	80.0		11.8	9.4	*
100.0	100.0		9.4	9.4	*
100.0 UV	100.0		11.0	11.0	*

*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	100.0		0.635	
32.0	77.5	*	0.363	*
42.0	82.5		0.348	*
56.0	82.5		0.380	*
75.0	62.5		0.225	*
100.0	57.5	*	-----	
100.0 UV	52.5	*	-----	

*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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4.0 Conclusions

The three composite samples of Outfall 001 collected from El Dorado Chemical Company, El Dorado, Arkansas, on June 17, 19 and 21, 2013, were not found to be lethally toxic to the *Ceriodaphnia dubia* test organisms in the 100.0 percent critical dilution after seven days of exposure (p=.05). Sub-lethal effects (i.e., lack reproduction) were noted in the critical dilution in the daphnid test (p=.05). Outfall 001 was found to be lethally toxic to the fathead minnow test organisms in the 100.0 percent critical dilution after seven days of exposure (p=.05). Treating the samples with UV-light did not reduce the toxic effects.

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Project X5144

5.0 References

EPA, 2002. Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. EPA-821-R-02-013, Office of Water.

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

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

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

APPENDIX A
CHAIN-OF-CUSTODY DOCUMENTS

Bio-Analytical Laboratories
3240 Shargin Road
Post Office Box 527
Doyline, LA 71023
(318) 745-8772
1-800-259-1845
Fax: (318) 746-2778

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	Chronic Ceriodaphnia	Chronic minnow	Acute minnow(fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	Fecal Coliform	[redacted]	[redacted]
Permit #: AR0000752/AFIN 70-00040	Purchase Order:									
Sampler's Signature/Printed Name/Affiliation: Karen Pennington Karen Pennington/EDCC										

Date Start / Date End	Time Start / Time End	C	G	# and type of container	Sample Identification									
6-16-13 / 6-17-13	8:30 / 8:30	x		8 half gallons	001	X	X						C 5.6	ICE

Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Karen Pennington EDCC	6/17/13	1010		6/17/13	1010
Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Relinquished by/Affiliation:	Date: 6/17/13	Time: 1215	Received by/Affiliation:	Date: 6/17/13	Time: 1215

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

Comments:

Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023

(318) 745-2772
1-800-259-1346
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

Temp. on arrival: 2.1°C
6/19/13

Date Start / Date End	Time Start / Time End	C	G	# and type of container	Sample Identification	Chronic Ceriodaphnia	Chronic minnow	Acute minnow (fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	Fecal Coliform	Lab use	Lab use
6-18-13 - 6-19-13	8:30 - 8:30	x		8 half gallons	001	X	X						C7584	ICE

Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Larken Pennington / EDCC	6/19/13	1100	[signature]	6/19/13	1100
[signature]	6/19/13	1310	[signature]	6/19/13	1310

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

Comments:

Bio-Analytical Laboratories
3240 Spurgin Road
Post Office Box 627
Doyline, LA 71023
(318) 746-8772
1-800-256-1246
Fax: (318) 746-8778

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

Laboratory Use Only:

Company: El Dorado Chemical Company	Phone: (870) 863-1484	Analysis:								
Address: 4500 Norwest Ave., El Dorado, AR 71731	Fax: (870) 863-7499	Chronic Ceriodaphnia	Chronic minnow	Acute minnow(fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	Fecal Coliform		
Permit #: AR0000752/AFIN 70-00040	Purchase Order:									
Sampler's Signature/Printed Name/Affiliation: KarlenPennington/KarlenPennington/EDCC										

Date Start / Date End	Time Start / Time End	C	G	# and type of container	Sample Identification									
6-20-13 / 6-21-13	8:32 / 8:30	x		8 half gallons	001	X	X						C7602	NE

Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
KarlenPennington/EDCC	6/21/13	0945		6/21/13	0945
Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Relinquished by/Affiliation:	Date: 6/21/13	Time: 1200	Received by/Affiliation:	Date: 6/21/13	Time: 1200

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

Comments:

Arrival: 3.1°C

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APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST

Project# X5144 Date start: 6/18/13 Date end: 6/25/13

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

Adults isolated: Date 6/17/13 Time: 2300

Neonates collected: Date 6/18/13 Time: 0630 Board: W20S
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.	8.5/99.2%/AH	0. No/AH	0. N/A	0. N/A
1.	9.1/113.9%/AH	1. Y/20/7.8/94.7%/LC	1.	1.
2.	8.7/103.0%/LC	2. Y/20/8.1/95.5%/LC	2.	2.
3.	9.1/114.3%/GW	3. Y/20/7.8/92.3%/GW	3.	3.
4.	7.5/89.9%/EGB	4. No/EGB	4.	4.
5.	9.3/113.8%/EGB	5. Y/20/8.0/94.9%/EGB	5.	5.
6.	9.5/110.2%/GW	6. Y/20/8.2/96.0%/LC	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. C7560 6/18/13
2.	<0.01/LC	2. No/LC	2. 0.28/LC	2. C7584 6/20/13
3.	<0.01/EGB	3. No/EGB	3. 0.25/EGB	3. C7602 6/22/13

Comments:

BIO-ANALYTICAL LABORATORIES
NUMBER NEONATES PER BROOD CERIODAPHNIA

Project # X5144 Test Dates 6/18-25/13

Client El Dorado Chemical

Replicate	% Concentration						
	0	32	42	56	75	100	100UV
A	18	17	15	14	13	5	9
B	19	14	14	13	8	8	10
C	18	18	11	7	11	4	10
D	14	14	10	8	X	7	16
E	10	23	19	X	13	9	11
F	18	22	X7	11	12	11	12
G	19	21	18	13	16	13	10
H	19	17	18	15	X	12	13
I	15	10	18	13	11	12	11
J	14	23	18	12	10	13	8
Surviving Mean	16.4	17.9	15.7	11.8	11.8	9.4	11.0
Total Mean	16.4	17.9	14.8	10.6	9.4	9.4	11.0
CV%*	18.45	24.49	21.41	22.77	20.22	35.18	20.55

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

Key: M=male; X=dead adult

Calculated by: PH 6/25/13

Calculations checked by: JC 6/26/13

BIO-ANALYTICAL LABORATORIES

CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST-LIVE NEONATE PRODUCTION

Project# X5144 Test started: Date [illegible] Time 1725
Client El Dorado Chemical Test ended: Date [illegible] Time 1315
Technician: Day0 [illegible] 1 [illegible] 2 [illegible] 3 [illegible] 4 EB 5 EB 6 [illegible] 7 [illegible] 8
Time: Day0 1725 1 1330 2 1400 3 1300 4 1050 5 1219 6 1425 7 1315 8
Temp. (°C): Day0 24.9 1 24.1 2 24.8 3 24.3 4 24.5 5 24.5 6 24.3 7 24.2 8

Conc %	Day	A ✓	B ✓	C ✓	D ✓	E	F ✓	G ✓	H ✓	I ✓	J ✓	Number of Live Adults
0	1	0										
	2	0										10
	3	0										10
	4	3	3	3	2	2	3	4	3	2	3	10
	5	0	5	3	5	3	2	0	0	3	3	10
	6	4	0	0	0	5	0	6	4	0	0	10
	7	11	11	12	7	8	13	9	12	10	8	10
	8											
32	1	0										10
	2	0										10
	3	0										10
	4	3	3	3	2	4	5	3	1	1	2	10
	5	0	1	6	3	4	0	0	0	5	6	10
	6	3	0	0	0	0	7	7	6	4	0	10
	7	11	10	9	9	10	10	11	10	0	10	10
	8											
42	1	0										10
	2	0										10
	3	0										10
	4	2	2	3	2	3	1	0	1	2	3	10
	5	1	1	2	2	6	5	3	2	5	6	10
	6	0	0	0	0	0	1	6	8	0	0	10
	7	12	11	6	6	10	X	9	7	11	9	10
	8											
56	1	0										10
	2	0				X	0					9
	3	0					0					9
	4	1	0	0	0		0	2	1	2	2	9
	5	0	3	0	0		0	3	0	4	1	9
	6	4	0	0	4		6	0	8	0	0	9
	7	9	10	7	4		5	8	8	7	9	9
	8											
75	1	0							X	0		9
	2	0								0		9
	3	0			X	0				0		8
	4	2	2	0		0	0	2		3	2	8
	5	0	0	3		3	0	3		2	0	8
	6	3	0	0		1	5	5		0	0	8
	7	7	6	8		9	7	6		6	8	8
	8											
100	1	0										10
	2	0										10
	3	0										10
	4	2	0	0	0	0	0	0	2	2	0	10
	5	0	2	2	2	2	0	1	3	3	5	10
	6	3	3	2	0	0	2	6	3	0	0	10
	7	0	6	0	5	7	9	6	7	7	8	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# X5144 Test started: Date [illegible] Time [illegible]
Client El Dorado Chemical Test ended: Date [illegible] Time 1315
Technician: Day0 [illegible] 1 AH 2 JC 3 JC 4 EB 5 EB 6 GW 7 JC 8
Time: Day0 [illegible] 1 1330 2 1430 3 1330 4 1250 5 1219 6 [illegible] 7 1315 8
Temp. (°C): Day0 24.4 1 24.4 2 24.8 3 24.3 4 24.5 5 24.5 6 24.3 7 24.2 8

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

Onue [illegible] 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# X5144 Test started: Date 6/13 Time 1725
Client: El Dorado Chemical Test ended: Date 6/23 Time 1315
Organism C. dubia

Day/# water used	0 3507	1	2	3	4 3511	5	6	7	8
Concentration: Control Soft									
pH	7.4	7.5 / 7.5	7.5 / 7.5	7.6 / 7.5	8.4 / 7.2	7.6 / 7.4	7.5 / 7.5	7.5	
DO (mg/l)	8.3	8.0 / 8.3	8.0 / 8.2	7.8 / 7.9	7.8 / 7.8	8.1 / 8.1	8.1 / 8.2	7.9	
Cond (umhos/cm)	169.1	167.1	169.3	169.6	172.5	171.2	172.9		
Alkalinity (mg/L)	32.0				28.0				
Hardness (mg/L)	48.0				48.0				
Concentration: 32									
pH	7.4	7.4 / 7.4	7.4 / 7.6	7.5 / 7.4	8.0 / 7.2	7.5 / 7.4	7.5 / 7.6	7.4	
DO (mg/l)	8.3	7.9 / 8.2	7.9 / 8.2	7.8 / 7.9	7.6 / 7.5	8.1 / 8.1	8.0 / 8.2	8.1	
Cond (umhos/cm)	246	242	242	243	251	246	249		
Concentration: 42									
pH	7.3	7.4 / 7.4	7.3 / 7.7	7.5 / 7.5	7.8 / 7.3	7.5 / 7.5	7.6 / 7.6	7.4	
DO (mg/l)	8.2	7.9 / 8.2	7.9 / 8.1	7.7 / 7.9	7.6 / 7.5	8.0 / 8.1	8.8 / 8.1	8.1	
Cond (umhos/cm)	265	262	263	264	273	269	271		
Concentration: 56									
pH	7.3	7.3 / 7.4	7.3 / 7.6	7.5 / 7.5	7.7 / 7.4	7.5 / 7.6	7.6 / 7.7	7.4	
DO (mg/l)	8.2	7.9 / 8.2	7.8 / 8.1	7.7 / 7.8	7.6 / 7.4	7.8 / 8.1	7.9 / 8.1	8.1	
Cond (umhos/cm)	298	297	292	297	300	302	304		
Concentration: 75									
pH	7.2	7.3 / 7.4	7.4 / 7.6	7.5 / 7.5	7.7 / 7.4	7.5 / 7.6	7.6 / 7.7	7.4	
DO (mg/l)	8.0	7.9 / 8.2	7.7 / 8.1	7.6 / 7.8	7.6 / 7.4	7.8 / 8.1	7.9 / 8.1	8.1	
Cond (umhos/cm)	344	338	333	340	342	345	351		
Concentration: 100									
pH	7.1	7.3 / 7.5	7.3 / 8.0	7.5 / 7.5	7.6 / 7.4	7.5 / 7.6	7.6 / 7.7	7.5	→7.9 EOB 7/17/13
DO (mg/l)	7.7	7.9 / 8.0	7.7 / 8.0	7.6 / 7.7	7.5 / 7.5	7.8 / 8.1	7.9 / 8.1	8.0	
Cond (umhos/cm)	401	398	389	403	404	407	410		
Tech-prerenewal	—	AH	JC	JC	EOB	EOB	AH	JC	
Tech-postrenewal	AH	AH	AH	JC	EOB	EOB	AH		
Alkalinity (mg/L) 100 pt	40.0		36.0		36.0				
Hardness (mg/l) 100 pt	52.0		52.0		52.0				

Key: prerenewal/postrenewal

BIO-ANALYTICAL LABORATORIES CHRONIC WATER QUALITY DATA

Project# X5144 Test started: Date 6/18/13 Time 1725
Client El Dorado Chemical Test ended: Date [illegible] Time 1315
Organism C. dubia

Day/# water used	0	1	2	3	4	5	6	7	8
Concentration: ~~Control~~ AH 6/17/13 100% UN trt'd									
pH	7.2	7.3/7.4	7.3/7.4	7.5/7.4	7.6/7.3	7.6/7.6	7.6/7.4	7.5/	
DO(mg/l)	7.8	7.8/7.7	7.7/7.9	7.6/7.4	7.5/7.7	7.8/7.9	7.7/7.9	8.0/	
Cond(umhos/cm)	402	395	393	401	405	402	413		
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	LC	LC	EGB	EGB	SW	LC	
Tech-postrenewal	AH	SW	AH	LC	EGB	EGB	AH		
Alkalinity(mg/l)									
Hardness(mg/l)									

Key: prerenewal/postrenewal

BIO-ANALYTICAL LABORATORIES
PIMEPHALES PROMELAS SURVIVAL AND GROWTH DATA SHEET

Project# X5144 Date started: 6/18/13 Date ended 6/25/13

Client/Contact EDCC/El Dorado Chemical
Address 4500 Northwest Avenue El Dorado AR 71731
NPDES# AR0000752 AFIN70-00040
Sample Description 001 Dilution Water Soft Reconstituted
Test Temperature(°C) 25+1° Celsius Technicians EGB/AH/LC/GW
Test organism age <48 hr Vendor/ID# ABS/745

Feeding Times

Day	Technician/Time/Amount (per replicate) AM	NOON	PM
0			
1	GW/0840/0.10ml	AH/1020/0.10ml	GW/1320/0.20ml
2	AH/0825/0.10ml	AH/1050/0.10ml	LC/1540/0.10ml
3	GW/0830/0.10ml	LC/1035/0.10ml	GW/1555/0.10ml
4	EGB/1000/0.20ml	—	LC/1435/0.10ml
5	EGB/0950/0.20ml	—	EMP/1400/0.20ml
6	GW/0855/0.10ml	AH/1100/0.10ml	EGB/1450/0.20ml
			GW/1610/0.10ml

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	8.5/99.2%/AH	No/AH	N/A	N/A
1	9.1/113.7%/GW	Y/20/7.8/94.7%/GW		
2	8.7/102.0%/AH	Y/20/8.1/95.5%/AH		
3	9.1/114.3%/LC	Y/20/7.8/92.3%/LC		
4	7.5/89.9%/EGB	No/EGB		
5	9.3/113.8%/EGB	Y/20/8.0/94.9%/EGB		
6	9.5/110.2%/AH	Y/20/8.2/96.0%/AH		

	Total Residual Chlorine(mg/L)/ Tech	Dechlorinated? Amount?/Tech	Ammonia(NH3) (mg/L)/Tech	BAL Sample # Date in use
1	<0.01/AH	No/AH	1.0/AH	C7566 6/18/13
2	<0.01/AH	No/AH	0.25/AH	C7584 6/20/13
3	<0.01/EGB	No/EGB	0.25/EGB	C7602 6/22/13

Comments:

BIO-ANALYTICAL LABORATORIES 7-DAY CHRONIC MINNOW SURVIVAL DATA

Project# X5144 Test started: Date [illegible] Time 1535
Client El Dorado Chemical Test ended: Date [illegible] Time [illegible]

	Day 0	1	2	3	4	5	6	7
Technician:	[illegible]	[illegible]	AH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Time:	1535	[illegible]	1330	[illegible]	0910	0914	1315	[illegible]
Temperature	25	24.9	25.1	25.1	24.9	25.1	25	25.2

Conc. %	Rep.	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
100 UV trtd	A	8	8	8	8	8	2	0	~~8~~ [illegible] 0
	B	8	8	8	8	8	8	~~4~~ 8	8
	C	8	8	8	8	8	6	4	4
	D	8	8	8	8	6	5	5	5
	E	8	8	8	8	5	4	4	4
	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								

[illegible] AH 10/21/13

File: Minnow2

BIO-ANALYTICAL LABORATORIES 7-DAY CHRONIC MINNOW SURVIVAL DATA

Project# X5144 Test started: Date [illegible] Time 1535
Client ~~[illegible]~~ El Dorado Chemical Test ended: Date [illegible] Time [illegible]

	Day0	1	2	3	4	5	6	7
Technician:	[illegible]	[illegible]	[illegible]	[illegible]	EGB	EGB	[illegible]	[illegible]
Time:	1535	1325	1330	1055	0910	0914	1315	[illegible]
Temperature	25	24.9	25.1	25.1	24.9	25.1	25	25.2

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~~ 8 [illegible]
	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	7	7
	B	8	8	8	8	8	8	7	7
	C	8	8	8	8	8	8	6	5
	D	8	8	8	8	8	6	5	5
	E	8	8	8	8	8	8	8	7
42	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	6	6
	C	8	8	8	8	8	8	6	6
	D	8	8	8	8	8	8	7	7
	E	8	7	7	7	7	7	6	6
56	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	8	7	7	6
	C	8	8	8	8	8	4	3	3
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8	8
75	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	6	6
	C	8	8	8	8	8	7	4	4
	D	8	8	8	8	8	3	3	2
	E	8	8	8	8	8	8	6	5
100	A	8	8	8	8	8	8	5	5
	B	8	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	7	7
	D	8	8	8	8	8	4	2	0
	E	8	7	7	7	6	5	5	3

File: Minnow2

BIO-ANALYTICAL LABORATORIES MINNOW LARVAL GROWTH DATA SHEET

Project#/Client X5144/EDCC Test Dates 6/18/13 - 6/25/13
Oven Temperature (° Celsius) 101°C

Conc. %	Replicate/ Pan number	Wt. of pan(g)/ Date weighed: 6/24/13 Tech: SW	Wt. of pan + larvae(g)/ Date weighed: 6/24/13 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*
0	A 31	0.9314	0.9357	0.0043	8	0.538	
	B 32	0.9294	0.9343	0.0049	8	0.613	
	C 33	0.9304	0.9350	0.0046	8	0.575	
	D 34	0.9285	0.9348	0.0063	8	0.788	
	E 35	0.9267	0.9320	0.0053	8	0.663	
32	A 36	0.9283	0.9313	0.003	8	0.375	
	B 37	0.9267	0.9306	0.0039	8	0.488	
	C 38	0.9247	0.9264	0.0017	8	0.213	
	D 39	0.9248	0.9274	0.0026	8	0.325	
	E 40	0.9248	0.9281	0.0033	8	0.413	
42	A 41	0.9199	0.9231	0.0032	8	0.400	
	B 42	0.9202	0.9228	0.0026	8	0.325	
	C 43	0.9238	0.9259	0.0021	8	0.263	
	D 44	0.9217	0.9249	0.0032	8	0.400	
	E 45	0.9248	0.9276	0.0028	8	0.350	
56	A 46	0.9298	0.9329	0.0031	8	0.388	
	B 47	0.9304	0.9330	0.0026	8	0.325	
	C 48	0.9311	0.9328	0.0017	8	0.213	
	D 49	0.9310	0.9349	0.0039	8	0.488	
	E 50	0.9188	0.9227	0.0039	8	0.488	
75	A 51	0.9412	0.9436	0.0024	8	0.300	
	B 52	0.9351	0.9373	0.0022	8	0.275	
	C 53	0.9308	0.9325	0.0017	8	0.213	
	D 54	0.9377	0.9383	0.0006	8	~~0.750~~ 0.075	SW 6/26/13
	E 55	0.9402	0.9423	0.0021	8	0.263	
100	A 56	0.9323	0.9331	0.0008	8	0.100	
	B 57	0.9438	0.9466	0.0028	8	0.350	
	C 58	0.9439	0.9457	0.0018	8	0.225	
	D 59	0.9381	omit	SW 6/26/13			
	E 60	0.9387	0.9393	0.0006	8	0.075	

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

Calculated by: SW 6/26/13 Calculations checked by: AH 6/26/13

BIO-ANALYTICAL LABORATORIES MINNOW LARVAL GROWTH DATA SHEET

Project#/Client X5144 / EDCC Test Dates 6/18/13 - 6/25/13
Oven Temperature (° Celsius) 101°C

Conc. 0/0	Replicate/ Pan number	Wt. of pan(g)/ Date weighed: 6/24/13 Tech: BW	Wt. of pan + larvae(g)/ Date weighed: 6/26/13 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*
100 UV	A 61	0.9364	Omit	6/26/13 BW			
	B 62	0.9372	0.9418	0.0046	8	0.575	
	C 63	0.9377	0.9395	0.0018	8	0.225	
	D 64	0.9434	0.94600	0.00216	8	0.325	
	E 65	0.9366	0.9379	0.0013	8	0.1163	
	A						
	B						
	C						
	D						
	E						
	A						
	B						
	C						
	D						
	E						
	A						
	B						
	C						
	D						
	E						
	A						
	B						
	C						
	D						
	E						
	A						
	B						
	C						
	D						
	E						

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

Calculated by: [signature] 6/26/13 Calculations checked by: AM 6/26/13

BIO-ANALYTICAL LABORATORIES CHRONIC WATER QUALITY DATA

Project# X5144 Test started: Date 6/15/19 Time 1545

Client Eldorado Chemical Test ended: Date 6/22/19 Time 0855

Organism P. promelas

Day/# water used	0350	1	2	3	4 3511	5	6	7	8
Concentration: Control SOF									
pH	7.4	7.4/7.5	7.2/7.5	7.4/7.5	7.3/7.2	7.2/7.4	7.3/7.5	7.3	
DO(mg/l)	8.3	6.8/8.3	6.8/8.2	6.3/7.9	6.3/7.8	6.0/8.1	5.9/8.2	5.9	
Cond(umhos/cm)	1109.1	1167.1	1169.3	1169.1	1172.5	1171.2	1729		
Alkalinity(mg/L)	32.0				28.0				
Hardness (mg/L)	48.0				48.0				
Concentration: 32									
pH	7.4	7.1/7.4	7.1/7.6	7.1/7.4	7.1/7.2	7.0/7.4	7.1/7.6	7.0	
DO(mg/l)	8.3	6.6/8.2	6.6/8.2	5.8/7.9	5.9/7.5	5.9/8.1	5.5/8.2	5.4	
Cond(umhos/cm)	246	242	242	243	251	246	249		
Concentration: 42									
pH	7.3	7.1/7.4	7.1/7.7	7.1/7.5	7.1/7.3	7.0/7.5	7.0/7.6	7.1	
DO(mg/l)	8.2	6.4/8.2	6.6/8.1	5.8/7.9	5.9/7.5	5.9/8.1	5.2/8.1	5.4	
Cond(umhos/cm)	265	262	263	264	273	269	271		
Concentration: 56									
pH	7.3	7.4/7.4	7.1/7.6	7.1/7.5	7.1/7.4	6.9/7.6	7.0/7.7	7.1	
DO(mg/l)	8.2	6.3/8.2	6.5/8.1	5.6/7.8	5.9/7.4	5.4/8.1	5.2/8.1	5.5	
Cond(umhos/cm)	298	297	292	291	300	302	304		
Concentration: 75									
pH	7.2	7.3/7.4	7.1/7.6	7.1/7.5	7.1/7.4	6.9/7.6	7.0/7.7	7.1	
DO(mg/l)	8.0	6.4/8.2	6.5/8.1	5.7/7.8	6.0/7.4	5.2/8.1	5.0/8.1	5.1	
Cond(umhos/cm)	344	330	333	340	342	345	351		
Concentration: 100									
pH	7.1	7.2/7.3	7.1/8.0	7.1/7.5	7.1/7.4	6.9/7.6	6.9/7.7	7.1	
DO(mg/l)	7.7	6.5/8.0	6.4/8.0	5.7/7.7	5.9/7.5	5.6/8.1	4.9/8.1	4.9	
Cond(umhos/cm)	401	398	389	403	404	407	410		
Tech-prerenewal	—	SW	AH	SW	EBB	EBB	SC	SW	
Tech-postrenewal	AH	SW	AH	SC	EBB	EBB	AH		
Alkalinity(mg/l) 100%	40.0	36/36	40		36.0				
Hardness(mg/l) 100%	52.0		52.0		52.0				

Key: prerenewal/postrenewal

BIO-ANALYTICAL LABORATORIES CHRONIC WATER QUALITY DATA

Project# X5144 Test started: Date 6/18/13 Time 1535
Client El Dorado Chemical Test ended: Date 6/25/13 Time 0953
Organism P. promelas

Day/# water used	0	1	2	3	4	5	6	7	8
Concentration: ~~Control~~ AH 6/17/13 100 uw trt'd									
pH	7.2	[illegible]/7.9	7.1/7.4	7.2/7.4	7.2/7.3	7.0/7.6	7.0/7.4	7.2/	
DO (mg/1)	7.8	6.9/7.7	6.4/7.9	5.9/7.4	6.2/7.7	5.8/7.9	5.1/7.9	5.6/	
Cond (umhos/cm)	402	393	393	401	405	402	413		
Alkalinity (mg/L)									
Hardness (mg/L)									
Concentration:									
pH									
DO (mg/1)									
Cond (umhos/cm)									
Concentration:									
pH									
DO (mg/1)									
Cond (umhos/cm)									
Concentration:									
pH									
DO (mg/1)									
Cond (umhos/cm)									
Concentration:									
pH									
DO (mg/1)									
Cond (umhos/cm)									
Concentration:									
pH									
DO (mg/1)									
Cond (umhos/cm)									
Tech-prerenewal		SW	AH	SW	EGB	EGB	LC	SW	
Tech-postrenewal	AH	SW	AH	LC	EGB	EGB	AH		
Alkalinity (mg/l)									
Hardness (mg/l)									

[illegible] AH 6/17/13

Key: prerenewal/postrenewal

APPENDIX C
STATISTICAL ANALYSIS

Ceriodaphnia Survival and Reproduction Test-7 Day Survival

Start Date:	6/18/2013	Test ID:	X5144CD	Sample ID:	1
End Date:	6/25/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	6/18/2013	Protocol:	EPAFW02-EPA/821/R-02-01	Test Species:	CD-Ceriodaphnia dubia

Comments:

Conc-%	1	2	3	4	5	6	7	8	9	10
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
42	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
75	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	0.0000	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	1.0000	1.0000	0	10	10	10		
32	1.0000	1.0000	0	10	10	10	1.0000	0.0500
42	0.9000	0.9000	1	9	10	10	0.5000	0.0500
56	0.9000	0.9000	1	9	10	10	0.5000	0.0500
75	0.8000	0.8000	2	8	10	10	0.2368	0.0500
100	1.0000	1.0000	0	10	10	10	1.0000	0.0500
100UV	1.0000	1.0000	0	10	10	10	1.0000	0.0500

Hypothesis Test (1-tail, 0.05)

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

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	6/18/2013	Test ID:	X5144CD	Sample ID:	1
End Date:	6/25/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	6/18/2013	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	18.000	19.000	18.000	14.000	10.000	18.000	19.000	19.000	15.000	14.000
32	17.000	14.000	18.000	14.000	23.000	22.000	21.000	17.000	10.000	23.000
42	15.000	14.000	11.000	10.000	19.000	18.000	18.000	18.000	18.000	
56	14.000	13.000	7.000	8.000	11.000	13.000	15.000	13.000	12.000	
75	13.000	8.000	11.000	13.000	12.000	16.000	11.000	10.000		
100	5.000	8.000	4.000	7.000	9.000	11.000	13.000	12.000	12.000	13.000
100UV	9.000	10.000	10.000	16.000	11.000	12.000	10.000	13.000	11.000	8.000

			Transform: Untransformed					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	16.400	1.0000	16.400	10.000	19.000	18.450	10		
32	17.900	1.0915	17.900	10.000	23.000	24.486	10	113.00	73.00
42	15.667	0.9553	15.667	10.000	19.000	21.409	9	82.50	60.00
*56	11.778	0.7182	11.778	7.000	15.000	22.774	9	55.50	60.00
*75	11.750	0.7165	11.750	8.000	16.000	20.217	8	45.50	49.00
*100	9.400	0.5732	9.400	4.000	13.000	35.176	10	60.00	73.00
*100UV	11.000	0.6707	11.000	8.000	16.000	20.553	10	64.50	73.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.05)	0.92433	0.895	-0.4679	-0.3301
Bartlett's Test indicates equal variances (p = 0.51)	5.28636	16.8119		

Hypothesis Test (1-tail, 0.05)

Wilcoxon Rank Sum Test Indicates significant differences
Treatments vs D-Control

ECB 10/07/13

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	6/18/2013	Test ID:	X5144CD	Sample ID:	1
End Date:	6/25/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	6/18/2013	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	18.000	19.000	18.000	14.000	10.000	18.000	19.000	19.000	15.000	14.000
32	17.000	14.000	18.000	14.000	23.000	22.000	21.000	17.000	10.000	23.000
42	15.000	14.000	11.000	10.000	19.000	7.000	18.000	18.000	18.000	18.000
56	14.000	13.000	7.000	8.000	0.000	11.000	13.000	15.000	13.000	12.000
75	13.000	8.000	11.000	0.000	13.000	12.000	16.000	0.000	11.000	10.000
100	5.000	8.000	4.000	7.000	9.000	11.000	13.000	12.000	12.000	13.000
100UV	9.000	10.000	10.000	16.000	11.000	12.000	10.000	13.000	11.000	8.000

			Transform: Untransformed					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	16.400	1.0000	16.400	10.000	19.000	18.450	10		
32	17.900	1.0915	17.900	10.000	23.000	24.486	10	113.00	74.00
42	14.800	0.9024	14.800	7.000	19.000	28.275	10	92.50	74.00
*56	10.600	0.6463	10.600	0.000	15.000	42.470	10	65.50	74.00
*75	9.400	0.5732	9.400	0.000	16.000	57.223	10	64.50	74.00
*100	9.400	0.5732	9.400	4.000	13.000	35.176	10	60.00	74.00
*100UV	11.000	0.6707	11.000	8.000	16.000	20.553	10	64.50	74.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.05)	1.13579	0.895	-0.8885	0.39921
Bartlett's Test indicates equal variances (p = 0.24)	7.97099	16.8119		

Hypothesis Test (1-tail, 0.05)

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

EOB 6/27/13

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	6/18/2013	Test ID:	X5144CD	Sample ID:	1
End Date:	6/25/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	6/18/2013	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	18.000	19.000	18.000	14.000	10.000	18.000	19.000	19.000	15.000	14.000
32	17.000	14.000	18.000	14.000	23.000	22.000	21.000	17.000	10.000	23.000
42	15.000	14.000	11.000	10.000	19.000	7.000	18.000	18.000	18.000	18.000
56	14.000	13.000	7.000	8.000	0.000	11.000	13.000	15.000	13.000	12.000
75	13.000	8.000	11.000	0.000	13.000	12.000	16.000	0.000	11.000	10.000
100	5.000	8.000	4.000	7.000	9.000	11.000	13.000	12.000	12.000	13.000
100UV	9.000	10.000	10.000	16.000	11.000	12.000	10.000	13.000	11.000	8.000

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	16.400	1.0000	16.400	10.000	19.000	18.450	10			
32	17.900	1.0915	17.900	10.000	23.000	24.486	10	-0.842	2.347	4.182
42	14.800	0.9024	14.800	7.000	19.000	28.275	10	0.898	2.347	4.182
*56	10.600	0.6463	10.600	0.000	15.000	42.470	10	3.255	2.347	4.182
*75	9.400	0.5732	9.400	0.000	16.000	57.223	10	3.929	2.347	4.182
*100	9.400	0.5732	9.400	4.000	13.000	35.176	10	3.929	2.347	4.182
*100UV	11.000	0.6707	11.000	8.000	16.000	20.553	10	3.031	2.347	4.182

Auxiliary Tests	Statistic	Critical		Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.05)	1.13579	0.895		-0.8885	0.39921
Bartlett's Test indicates equal variances (p = 0.24)	7.97099	16.8119			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Dunnett's Test indicates significant differences Treatments vs D-Control	4.18221	0.25501	123.614	15.8746	2.8E-06	6, 63

EOB 6/27/13

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:	6/18/2013	Test ID:	X5144PP	Sample ID:	1
End Date:	6/25/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	6/18/2013	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	1.0000	1.0000	1.0000
32	0.8750	0.8750	0.6250	0.6250	0.8750
42	1.0000	0.7500	0.7500	0.8750	0.7500
56	1.0000	0.7500	0.3750	1.0000	1.0000
75	1.0000	0.7500	0.5000	0.2500	0.6250
100	0.6250	1.0000	0.8750	0.0000	0.3750
100UV	0.0000	1.0000	0.5000	0.6250	0.5000

			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	0.7750	0.7750	1.0904	0.9117	1.2094	14.954	5	15.00	16.00
42	0.8250	0.8250	1.1488	1.0472	1.3931	13.367	5	17.50	16.00
56	0.8250	0.8250	1.1771	0.6591	1.3931	27.698	5	22.50	16.00
75	0.6250	0.6250	0.9322	0.5236	1.3931	34.535	5	17.50	16.00
100	0.5750	0.5750	0.8702	0.1777	1.3931	54.942	5	17.50	16.00
100UV	0.5250	0.5250	0.8107	0.1777	1.3931	53.462	5	17.50	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution ($p > 0.05$)	0.95224	0.934	-0.4058	0.89645
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)

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

Reviewed by: ECB 12/27/13

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:	6/18/2013	Test ID:	X5144PP	Sample ID:	1
End Date:	6/25/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	6/18/2013	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	1.0000	1.0000	1.0000
32	0.8750	0.8750	0.6250	0.6250	0.8750
42	1.0000	0.7500	0.7500	0.8750	0.7500
56	1.0000	0.7500	0.3750	1.0000	1.0000
75	1.0000	0.7500	0.5000	0.2500	0.6250
100	0.6250	1.0000	0.8750	0.0000	0.3750
100UV	0.0000	1.0000	0.5000	0.6250	0.5000

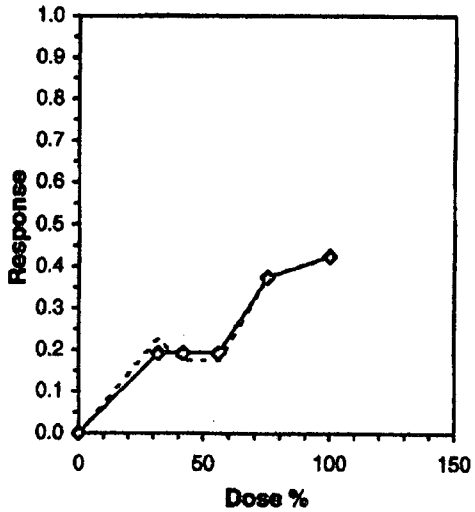
			Transform: Arcsin Square Root					Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	1.0000	1.0000
32	0.7750	0.7750	1.0904	0.9117	1.2094	14.954	5	0.8083	0.8083
42	0.8250	0.8250	1.1488	1.0472	1.3931	13.367	5	0.8083	0.8083
56	0.8250	0.8250	1.1771	0.6591	1.3931	27.698	5	0.8083	0.8083
75	0.6250	0.6250	0.9322	0.5236	1.3931	34.535	5	0.6250	0.6250
100	0.5750	0.5750	0.8702	0.1777	1.3931	54.942	5	0.5750	0.5750
100UV	0.5250	0.5250	0.8107	0.1777	1.3931	53.462	5		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.95224	0.934	-0.4058	0.89645
Equality of variance cannot be confirmed				

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)		Skew
IC05*	8.348	2.290	5.617	19.826	1.0801
IC10*	16.696	7.383	11.234	62.002	3.3083
IC15*	25.043	14.017	16.851	77.178	1.1400
IC20	56.864				
IC25	62.045				
IC40	87.500				
IC50	>100				

* Indicates IC estimate less than the lowest concentration



ToxCalc v5.0.23

Reviewed by: 7/13

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:	6/18/2013	Test ID:	X5144PP	Sample ID:	1
End Date:	6/25/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	6/18/2013	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	1.0000	1.0000	1.0000
32	0.8750	0.8750	0.6250	0.6250	0.8750
42	1.0000	0.7500	0.7500	0.8750	0.7500
56	1.0000	0.7500	0.3750	1.0000	1.0000
75	1.0000	0.7500	0.5000	0.2500	0.6250
100	0.6250	1.0000	0.8750	0.0000	0.3750
100UV	0.0000	1.0000	0.5000	0.6250	0.5000

			Transform: Arcsin Square Root					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5			
32	0.7750	0.7750	1.0904	0.9117	1.2094	14.954	5	1.540	2.409	0.4736
42	0.8250	0.8250	1.1488	1.0472	1.3931	13.367	5	1.242	2.409	0.4736
56	0.8250	0.8250	1.1771	0.6591	1.3931	27.698	5	1.098	2.409	0.4736
75	0.6250	0.6250	0.9322	0.5236	1.3931	34.535	5	2.344	2.409	0.4736
*100	0.5750	0.5750	0.8702	0.1777	1.3931	54.942	5	2.659	2.409	0.4736
*100UV	0.5250	0.5250	0.8107	0.1777	1.3931	53.462	5	2.962	2.409	0.4736

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.95224	0.934	-0.4058	0.89645
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test indicates significant differences	0.33623	0.34708	0.20666	0.09665	0.08022	6, 28
Treatments vs D-Control						

ToxCalc v5.0.23

Reviewed by: EOB 6/27/13

Larval Fish Growth and Survivel Test-7 Day Growth

Start Date:	6/18/2013	Test ID:	X5144PP	Sample ID:	1
End Date:	6/25/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	6/18/2013	Protocol:	EPAFW02-EPA/821/R-02-01	Test Species:	PP-Pimephales promelas

Comments:

Conc-%	1	2	3	4	5
D-Control	0.5375	0.6125	0.5750	0.7875	0.6625
32	0.3750	0.4875	0.2125	0.3250	0.4125
42	0.4000	0.3250	0.2625	0.4000	0.3500
56	0.3875	0.3250	0.2125	0.4875	0.4875
75	0.3000	0.2750	0.2125	0.0750	0.2625
100	0.1000	0.3500	0.2250	0.0000	0.0750
100UV	0.0000	0.5750	0.2250	0.3250	0.1625
0-SN	0.5375	0.6125	0.5750	0.7875	0.6625

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.6350	1.0000	0.6350	0.5375	0.7875	15.273	5			
*32	0.3625	0.5709	0.3625	0.2125	0.4875	28.330	5	3.536	2.443	0.1882
*42	0.3475	0.5472	0.3475	0.2625	0.4000	16.562	5	3.731	2.443	0.1882
*56	0.3800	0.5984	0.3800	0.2125	0.4875	30.647	5	3.309	2.443	0.1882
*75	0.2250	0.3543	0.2250	0.0750	0.3000	39.869	5	5.320	2.443	0.1882
*100	0.1500	0.2362	0.1500	0.0000	0.3500	92.045	5	6.293	2.443	0.1882
*100UV	0.2575	0.4055	0.2575	0.0000	0.5750	82.781	5	4.898	2.443	0.1882
0-SN	0.6350	1.0000	0.6350	0.5375	0.7875	15.273	5	0.000	2.443	0.1882

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.98867	0.94	0.33786	0.89845
Bartlett's Test indicates equal variances (p = 0.37)	7.6427	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	0.18823	0.29643	0.15933	0.01485	7.0E-07	7, 32

ToxCalc v5.0.23

Reviewed by: EOB 10/27/13

Larval Fish Growth and Survival Test-7 Day Growth

Start Date:	6/18/2013	Test ID:	X5144PP	Sample ID:	1
End Date:	6/25/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	6/18/2013	Protocol:	EPAFW02-EPA/821/R-02-01	Test Species:	PP-Pimephales promelas

Comments:

Conc-%	1	2	3	4	5
D-Control	0.5375	0.6125	0.5750	0.7875	0.6625
32	0.3750	0.4875	0.2125	0.3250	0.4125
42	0.4000	0.3250	0.2625	0.4000	0.3500
56	0.3875	0.3250	0.2125	0.4875	0.4875
75	0.3000	0.2750	0.2125	0.0750	0.2625
100	0.1000	0.3500	0.2250	0.0000	0.0750
100UV	0.0000	0.5750	0.2250	0.3250	0.1625
0-SN	0.5375	0.6125	0.5750	0.7875	0.6625

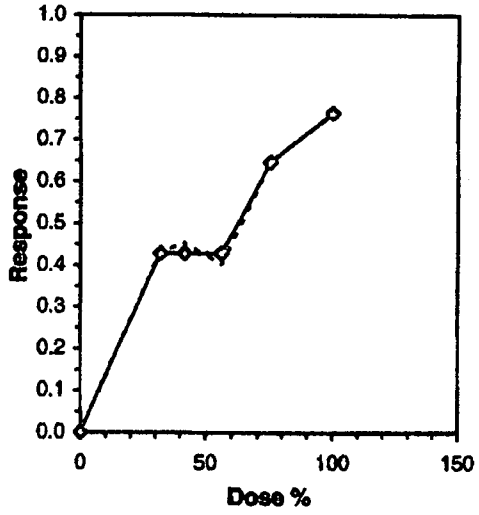
			Transform: Untransformed					Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	0.6350	1.0000	0.6350	0.5375	0.7875	15.273	5	0.6350	1.0000
32	0.3625	0.5709	0.3625	0.2125	0.4875	28.330	5	0.3633	0.5722
42	0.3475	0.5472	0.3475	0.2625	0.4000	16.562	5	0.3633	0.5722
56	0.3800	0.5984	0.3800	0.2125	0.4875	30.647	5	0.3633	0.5722
75	0.2250	0.3543	0.2250	0.0750	0.3000	39.869	5	0.2250	0.3543
100	0.1500	0.2362	0.1500	0.0000	0.3500	92.045	5	0.1500	0.2362
100UV	0.2575	0.4055	0.2575	0.0000	0.5750	82.781	5		
0-SN	0.6350	1.0000	0.6350	0.5375	0.7875	15.273	5		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.98867	0.94	0.33786	0.89845
Bartlett's Test indicates equal variances (p = 0.37)	7.6427	18.4753		

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)		Skew
IC05*	3.740	0.677	2.958	6.853	1.1109
IC10*	7.480	1.354	5.916	13.706	1.1109
IC15*	11.220	2.032	8.874	20.559	1.1109
IC20*	14.960	2.709	11.832	27.412	1.1109
IC25*	18.699	3.381	14.790	34.265	1.1008
IC40*	29.919	12.845	23.664	77.300	0.7113
IC50	62.295	7.407	26.638	76.092	-1.9860

* Indicates IC estimate less than the lowest concentration

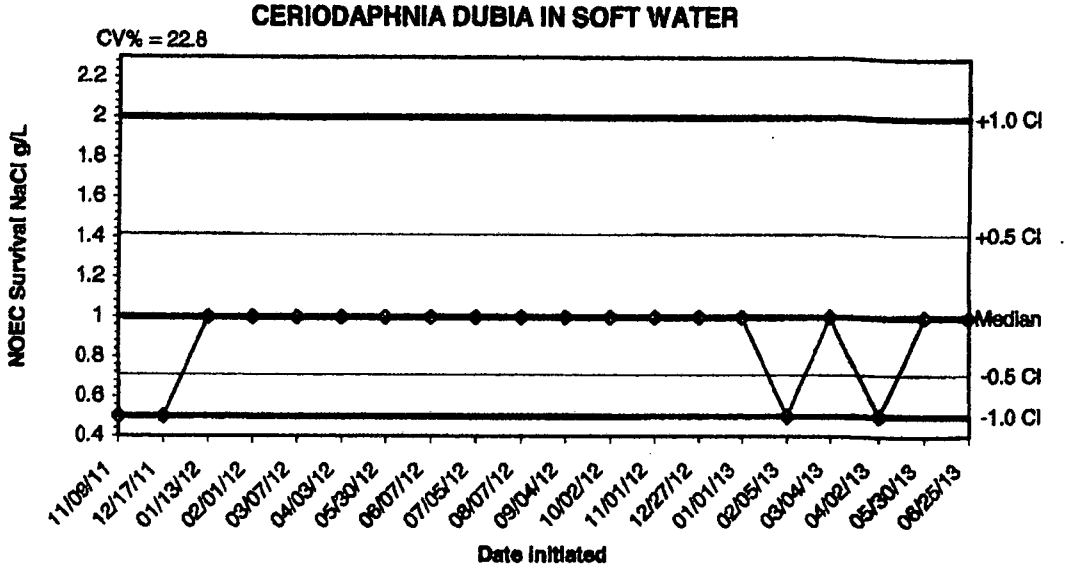


ToxCalc v5.0.23

Reviewed by: EOB 6/27/13

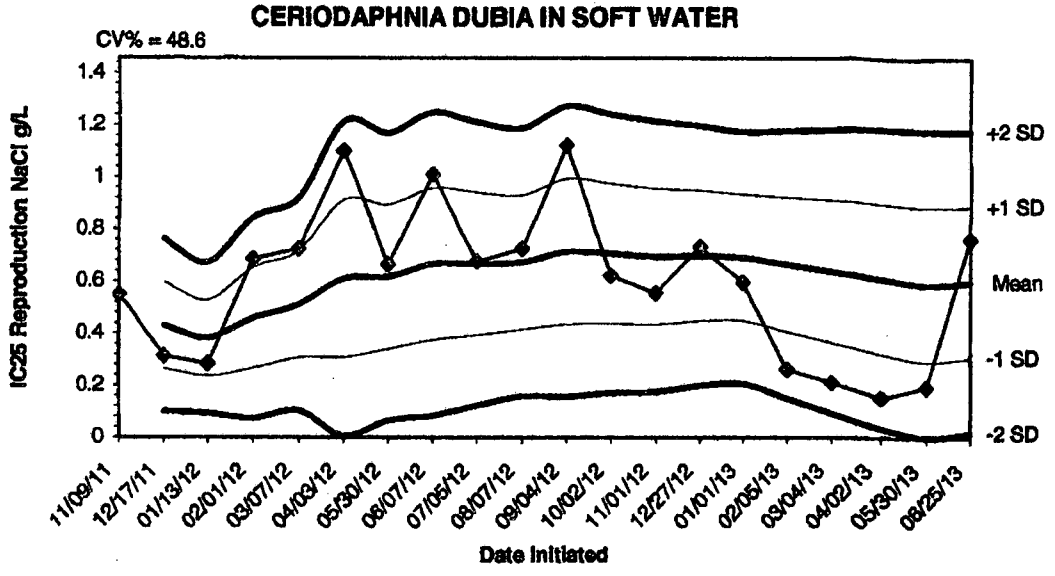
APPENDIX D
QUALITY ASSURANCE CHARTS

2013 CHRONIC REFERENCE TOXICANT TEST RESULTS USING CERIODAPHNIA DUBIA IN SOFT WATER



Dates	Values	Median	-0.5 CI	-1.0 CI	+0.5 CI	+1.0 CI
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
05/30/13	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
06/25/13	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000

2013 CHRONIC REFERENCE TOXICANT TEST RESULTS USING CERIODAPHNIA DUBIA IN SOFT WATER



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
11/09/11	0.5489					
12/17/11	0.3138	0.4314	0.2651	0.0989	0.5976	0.7638
01/13/12	0.2835	0.3821	0.2368	0.0915	0.5273	0.6726
02/01/12	0.6864	0.4582	0.2652	0.0723	0.6511	0.8440
03/07/12	0.7233	0.5112	0.3063	0.1014	0.7161	0.9210
04/03/12	1.1000	0.6093	0.3070	0.0048	0.9116	1.2139
05/30/12	0.6860	0.6174	0.3406	0.0639	0.8942	1.1709
06/07/12	1.0102	0.6665	0.3751	0.0836	0.9580	1.2494
07/05/12	0.6765	0.6676	0.3950	0.1223	0.9403	1.2129
08/07/12	0.7250	0.6734	0.4157	0.1580	0.9311	1.1887
09/04/12	1.1229	0.7142	0.4347	0.1552	0.9938	1.2733
10/02/12	0.6225	0.7066	0.4388	0.1709	0.9744	1.2422
11/01/12	0.5553	0.6949	0.4351	0.1753	0.9548	1.2146
12/27/12	0.7326	0.6976	0.4478	0.1979	0.9475	1.1973
01/01/13	0.5948	0.6908	0.4486	0.2063	0.9330	1.1752
02/05/13	0.2615	0.6640	0.4065	0.1491	0.9214	1.1788
03/04/13	0.2108	0.6373	0.3649	0.0925	0.9097	1.1821
04/02/13	0.1529	0.6104	0.3225	0.0346	0.8983	1.1862
05/30/13	0.1943	0.5885	0.2929	0.0000	0.8841	1.1797
06/25/13	0.7643	0.5973	0.3069	0.0165	0.8877	1.1781

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Fort Collins, Colorado 80524

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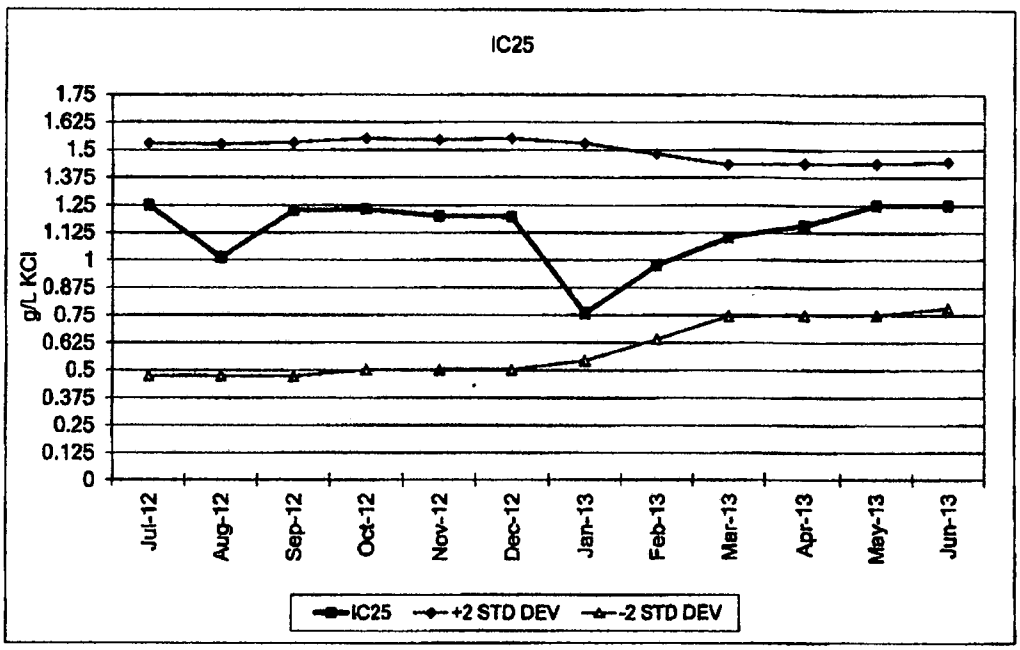
Tel:970/484-5091 Fax:970/484-2514

Pimephales promelas



Chronic 7 Day Survival Test Data

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

IC 25 for Growth Test

Date	IC25 g/L KCl	95% Confidence (upper)	(lower)	Avg. IC25 g/L KCl	+2 STD DEV	-2 STD DEV
Jan-13	0.760	1.474	0.362	1.037	1.530	0.544
Feb-13	0.977	1.414	0.439	1.062	1.482	0.643
Mar-13	1.103	1.288	0.885	1.090	1.433	0.746
Apr-13	1.158	1.283	0.930	1.095	1.439	0.751
May-13	1.250	1.250	1.162	1.095	1.439	0.751
Jun-13	1.250	1.250	1.162	1.114	1.446	0.782

**Current Test Dates: 06/05-12/2013

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**	**6/16/13 To**	**0830**	**6/17/13**
Composite 2 Collected From	**0830**	**6/18/13 To**	**0830**	**6/19/13**
Composite 3 Collected From	**0830**	**6/20/13 To**	**0830**	**6/21/13**
Test initiated:	1725 **am/pm**		6/18/13	**date**
Test terminated:	1315 **am/pm**		6/25/13	**date**
Dilution water used:	**Receiving**		**Reconstituted**	

PERCENT SURVIVAL

Time of Reading	Percent Effluent						
	0	32	42	56	75	100	100 UV
24h	100	100	100	100	90	100	100
48h	100	100	100	90	90	100	100
End of test	100	100	100	90	80	100	100

NUMBER OF YOUNG PRODUCED PER FEMALE @ END OF TEST

Rep	0	32	42	56	75	100	100 UV
A	18	17	15	14	13	5	9
B	19	14	14	13	8	8	10
C	18	18	11	7	11	4	10
D	14	14	10	8	D	7	16
E	10	23	19	D	13	9	11
F	18	22	D7	11	12	11	12
G	19	21	18	13	16	13	10
H	19	17	18	15	D	12	13
I	15	10	18	13	11	12	11
J	14	23	18	12	10	13	8
Surv. Mean	16.4	17.9	15.7	11.8	11.8	9.4	11.0
Total Mean	16.4	17.9	14.8	10.6	9.4	9.4	11.0
CV%*	18.45	24.49	21.41	22.77	20.22	35.18	20.55

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

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

a) NOEC survival:	**100% effluent**
b) NOEC reproduction:	**42% effluent**
c) LOEC survival:	**N/A% effluent**
d) LOEC reproduction:	**56% effluent**

Biomonitoring Form
Chronic Toxicity Summary Form
Ceriodaphnia dubia
Chemical Parameters Chart

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

Sample No. 1 Collected: Date: 6/17/13 Time: 0239
Sample No. 2 Collected: Date: 6/19/13 Time: 0330
Sample No. 3 Collected: Date: 6/21/13 Time: 0830
Test Begin: Date: 6/18/13 Time: 1725
Test End: Date: 6/25/13 Time: 1515

Dilution: 0 Day:	1	2	3	4	5	6	7	Comments
Temp (C)	24.4	24.5	24.3	24.5	24.5	24.3	24.2	
DO Initial	8.0	8.0	7.8	7.8	8.1	8.1	7.9	
DO Final	8.3	8.2	7.9	7.8	8.1	8.2		
pH Initial	7.5	7.5	7.6	8.4	7.6	7.5	7.5	
pH Final	7.5	7.5	7.5	7.2	7.4	7.5		
Alkalinity	32.0			28.0				
Hardness	48.0			48.0				
Conductivity	167.1	169.3	169.6	172.5	171.2	172.9		
Chlorine	<.01			<.01				

Dilution: 56 Day:	1	2	3	4	5	6	7	Comments
Temp (C)	24.4	24.5	24.3	24.5	24.5	24.3	24.2	
DO Initial	7.9	7.8	7.7	7.6	7.8	7.9	8.1	
DO Final	8.2	8.1	7.8	7.4	8.1	8.1		
pH Initial	7.5	7.3	7.5	7.7	7.5	7.6	7.4	
pH Final	7.4	7.6	7.5	7.4	7.6	7.7		
Alkalinity								
Hardness								
Conductivity	297	292	297	330	332	334		
Chlorine								

Dilution: 32 Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.4	24.5	24.3	24.5	24.5	24.3	24.2	
DO Initial	7.9	7.9	7.8	7.6	8.1	8.0	8.1	
DO Final	8.2	8.2	7.9	7.5	8.1	8.2		
pH Initial	7.4	7.4	7.5	8.0	7.5	7.5	7.4	
pH Final	7.4	7.6	7.4	7.2	7.4	7.6		
Alkalinity								
Hardness								
Conductivity	242	242	243	251	246	249		
Chlorine								

Dilution: 75 Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.4	24.5	24.3	24.5	24.5	24.3	24.2	
DO Initial	7.9	7.7	7.6	7.6	7.8	7.9	8.1	
DO Final	8.2	8.1	7.8	7.4	8.1	8.1		
pH Initial	7.3	7.4	7.5	7.7	7.5	7.6	7.4	
pH Final	7.4	7.6	7.5	7.4	7.6	7.7		
Alkalinity								
Hardness								
Conductivity	333	333	342	342	345	351		
Chlorine								

Dilution: 42 Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.4	24.5	24.3	24.5	24.5	24.3	24.2	
DO Initial	7.9	7.9	7.7	7.6	8.0	8.0	8.1	
DO Final	8.2	8.1	7.9	7.5	8.1	8.1		
pH Initial	7.4	7.3	7.5	7.8	7.5	7.6	7.4	
pH Final	7.4	7.7	7.5	7.3	7.5	7.6		
Alkalinity								
Hardness								
Conductivity	262	263	264	273	269	271		
Chlorine								

Dilution: 100 Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.4	24.5	24.3	24.5	24.5	24.3	24.2	
DO Initial	7.9	7.7	7.6	7.5	7.9	7.9	8.0	
DO Final	8.0	8.0	7.7	7.5	8.1	8.1		
pH Initial	7.3	7.3	7.5	7.6	7.5	7.6	7.5	
pH Final	7.5	8.0	7.5	8.4	7.6	7.7		
Alkalinity	40.0	36.0		36.0				
Hardness	52.0	52.0		52.0				
Conductivity	398	399	403	404	407	419		
Chlorine	<.01	<.01		<.01				

Dilution: 100 UV Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.4	24.5	24.3	24.5	24.5	24.3	24.2	
DO Initial	7.8	7.7	7.6	7.5	7.8	7.7	8.0	
DO Final	7.7	7.9	7.4	7.7	7.9	7.9		
pH Initial	7.3	7.3	7.5	7.6	7.6	7.6	7.5	
pH Final	7.4	7.4	7.4	7.3	7.6	7.4		
Alkalinity								
Hardness								
Conductivity	395	393	401	405	402	413		
Chlorine								

SUMMARY REPORTING FORMS CHRONIC BIOMONITORING FATHEAD MINNOW LARVAE GROWTH AND SURVIVAL

(Pimephales promelas)

Permittee: El Dorado Chemical **NPDES No.: AR0000752**

Outfall 001 **AFIN: 70-00040**

	Time	Date	Time	Date
Composite 1 Collected from:	**0830**	**6/16/13 To**	**0830**	**6/17/13**
Composite 2 Collected from:	**0830**	**6/18/13 To**	**0830**	**6/19/13**
Composite 3 Collected from:	**0830**	**6/20/13 To**	**0830**	**6/21/13**

Test initiated:	1725	**am/pm**	6/18/13	**date**
Test terminated:	1315	**am/pm**	6/25/13	**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	100	100	100	100	100	100	0.00
32	87.5	87.5	62.5	62.5	87.5	100	100	77.5	14.95
42	100	75.0	75.0	87.5	75.0	97.5	97.5	82.5	13.37
56	100	75.0	37.5	100	100	100	100	82.5	27.70
75	100	75.0	50.0	25.0	62.5	100	100	62.5	34.54
100	62.5	100	87.5	0.0	37.5	97.5	97.5	57.5	54.94
100 UV	0.0	100	50.0	62.5	50.0	100	100	52.5	53.46

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	0.538	0.613	0.575	0.788	0.663	0.635	15.27
32	0.375	0.488	0.213	0.325	0.413	0.363	28.33
42	0.400	0.325	0.263	0.400	0.350	0.348	16.56
56	0.388	0.325	0.213	0.488	0.488	0.380	30.65
75	0.300	0.275	0.213	0.075	0.263	0.225	39.87

*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%)**	**X YES**	**NO**
b) ½ LOW FLOW DILUTION	**(N/A%)**	**YES**	**NO**

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

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

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

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

a.) NOEC survival	**75.0% effluent**
b.) NOEC growth	**0.0% effluent**
c.) LOEC survival	**100.0% effluent**
d.) LOEC growth	**32.0% effluent**

Biomonitoring Form
Chronic Toxicity Summary Form
Pimephales promelas
Chemical Parameters Chart

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

Sample No. 1 Collected: Date: 6/17/13 Time: 0930
Sample No. 2 Collected: Date: 6/19/13 Time: 0830
Sample No. 3 Collected: Date: 6/21/13 Time: 0830
Test Begin: Date: 6/18/13 Time: 1535
Test End: Date: 6/25/13 Time: 0955

Dilution: 0 — Day:

	1	2	3	4	5	6	7	Comments
Temp (C)	24.9	25.1	25.1	24.9	25.1	25.0	25.2	
DO Initial	6.8	6.8	6.3	6.3	6.0	5.9	5.7	
DO Final	8.3	8.2	7.9	7.8	8.1	8.2		
pH Initial	7.1	7.2	7.1	7.3	7.2	7.3	7.3	
pH Final	7.5	7.5	7.5	7.2	7.4	7.5		
Alkalinity	32.0			28.0				
Hardness	48.0			48.0				
Conductivity	167.1	169.3	169.6	172.5	171.2	172.9		
Chlorine	<.01			<.01				

Dilution: 56 — Day:

	1	2	3	4	5	6	7	Comments
Temp (C)	24.9	25.1	25.1	24.9	25.1	25.1	25.2	
DO Initial	6.3	6.5	5.6	5.9	5.4	5.3	5.5	
DO Final	8.2	8.1	7.8	7.4	8.1	8.1		
pH Initial	7.1	7.1	7.1	7.1	6.9	7.0	7.1	
pH Final	7.4	7.6	7.5	7.4	7.6	7.7		
Alkalinity								
Hardness								
Conductivity	297	292	297	303	302	304		
Chlorine								

Dilution: 32 — Day

	1	2	3	4	5	6	7	Comments
Temp (C)	24.9	25.1	25.1	24.9	25.1	25.0	25.2	
DO Initial	6.6	6.6	5.8	5.9	5.9	5.5	5.4	
DO Final	8.2	8.2	7.9	7.5	8.1	8.2		
pH Initial	7.1	7.1	7.1	7.1	7.0	7.1	7.0	
pH Final	7.4	7.6	7.4	7.2	7.4	7.6		
Alkalinity								
Hardness								
Conductivity	242	242	243	251	246	249		
Chlorine								

Dilution: 75 — Day

	1	2	3	4	5	6	7	Comments
Temp (C)	24.9	25.1	25.1	24.9	25.1	25.1	25.2	
DO Initial	6.4	6.5	5.7	6.0	5.2	5.0	5.1	
DO Final	8.2	8.1	7.8	7.4	8.1	8.1		
pH Initial	7.2	7.1	7.1	7.1	6.9	7.0	7.1	
pH Final	7.4	7.6	7.5	7.4	7.6	7.7		
Alkalinity								
Hardness								
Conductivity	333	333	342	342	345	351		
Chlorine								

Dilution: 42 — Day

	1	2	3	4	5	6	7	Comments
Temp (C)	24.9	25.1	25.1	24.9	25.1	25.0	25.2	
DO Initial	6.4	6.6	5.8	5.9	5.9	5.2	5.4	
DO Final	8.2	8.1	7.9	7.5	8.1	8.1		
pH Initial	7.1	7.1	7.1	7.1	7.0	7.0	7.1	
pH Final	7.4	7.7	7.5	7.3	7.5	7.6		
Alkalinity								
Hardness								
Conductivity	262	263	264	273	269	271		
Chlorine								

Dilution: 100 — Day

	1	2	3	4	5	6	7	Comments
Temp (C)	24.9	25.1	25.1	24.9	25.1	25.1	25.2	
DO Initial	6.5	6.4	5.7	5.9	5.6	4.9	4.9	
DO Final	8.0	8.0	7.7	7.5	8.1	8.1		
pH Initial	7.2	7.1	7.1	7.1	6.9	6.9	7.1	
pH Final	7.5	8.0	7.5	7.4	7.6	7.7		
Alkalinity	40.0	36.0		36.0				
Hardness	52.0	52.0		52.0				
Conductivity	398	399	403	404	407	410		
Chlorine	<.01	<.01		<.01				

Dilution: 100 UV — Day

	1	2	3	4	5	6	7	Comments
Temp (C)	24.9	25.1	25.1	24.9	25.1	25.0	25.2	
DO Initial	6.9	6.4	5.9	6.2	5.8	5.1	5.5	
DO Final	7.7	7.9	7.4	7.7	7.9	7.9		
pH Initial	7.4	7.1	7.2	7.2	7.0	7.0	7.2	
pH Final	7.4	7.4	7.4	7.3	7.6	7.4		
Alkalinity								
Hardness								
Conductivity	395	393	401	405	402	413		
Chlorine								

APPENDIX F
REPORT QUALITY ASSURANCE FORM

Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023

(318) 746-2772
1-800-259-1246
Fax: (318) 746-2773

REPORT QUALITY ASSURANCE FORM (v. 31612)

Client: El Dorado Chemical

Project#: X5144

Chain of Custody Documents Checked by: AH 6/26/13
Technician/Date

Raw Data Documents Checked by: AH 6/26/13
Technician/Date

Statistical Analysis Package Checked by: EGB 6/27/13
Quality Manager/Date

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

Report Checked by: EGB 7/18/13
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. Breaux BS
Quality Manager

7/18/13
Date

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X5118

Bio-Analytical Laboratories' Executive Summary

Permittee: El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731
Project #: X5118
Outfall: Outfall 002 (overflow pond for process water and storm water)
Permit #: AR0000752/ AFIN #70-00040
Contact: Ms. Larken Pennington
Test Dates: June 2 - 4, 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- 1.
2. Report the NOEC for survival, Parameter TOM3D - 32%.
3.Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 10.02%.

This report contains a total of 31 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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THE RESULTS OF TWO 48-HOUR ACUTE TOXICITY TESTS FOR OUTFALL 002 AT

EL DORADO CHEMICAL COMPANY
El Dorado, Arkansas

NPDES #AR0000752
AFIN #70-00040

EPA Methods 2000.0 and 2021.0

Project X5118

Test Dates: June 2 - 4, 2013
Report Date: June 25, 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 X5118

TABLE OF CONTENTS

BAL
ADEQ #88-0630
Project X5118

1.0 Introduction

Bio-Analytical Laboratories (BAL), Doyline, Louisiana conducted two 48-hour acute toxicity tests for Outfall 002 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 five 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.

BAL
ADEQ #88-0630
Project X5118

2.3 Dilution Water

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

2.4 Test Concentrations

The test concentrations used in the tests were 100, 75.0, 56.0, 42.0 and 32.0 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 002 was collected by El Dorado Chemical personnel on June 1, 2013. Upon completion of collection, the sample was chilled to 4^0 Celsius and personally delivered to Bio-Analytical Laboratories.

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.

BAL
ADEQ #88-0630
Project X5118

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 critical dilution in the minnow test (p=.05). The NOEC value for the minnow test was 100 percent effluent (p=.05). Significant differences in survival were noted in the effluent dilutions in the *Daphnia pulex* test. An erratic dose response occurred in the daphnid data; however, after further investigation, it was determined that the NOEC value for survival was 32 percent effluent (p=.05). A 48-hour LC_{50} could not be determined because greater than 50 percent survival occurred in the effluent dilutions. See Appendix C- Statistical Analysis , for more information.

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

[illegible]	[illegible]	[illegible]
Test Organism	*Pimephales promelas*	*Daphnia pulex*
Control	100.0	95.0
32.0	97.5	95.0
42.0	100.0	72.5
56.0	100.0	87.5
75.0	100.0	75.0
100.0	100.0	75.0

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

BAL
ADEQ #88-0630
Project X5118

4.0 Conclusions

The sample of Outfall 002 collected from El Dorado Chemical Company, El Dorado, Arkansas, on June 1, 2013, was not found to be lethally toxic to the fathead minnow test organisms in the 100 percent critical dilution after 48 hours of exposure; however, lethal effects were noted in the *Daphnia pulex* test (p=.05). A 48-hour LC_{50} value could not be determined because greater than 50 percent survival occurred in the effluent dilutions in the test (p=.05).

BAL
ADEQ #88-0630
Project X5118

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 627
Doyline, LA 71023
(318) 746-2772
1-800-259-1245
Fax: (318) 746-2773

NELAP/LELAP 01975, ADEQ 88-0530, TCEQ T104704278

Laboratory Use Only:

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

Date Start / Date End	Time Start / Time End	C	G	# and type of container	Sample Identification	Chronic Ceriodaphnia	Chronic minnow	Acute minnow (fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	Fecal Coliform	Lab Control Number:	Project Number: X5118 / Temp. upon arrival: 2.2°C #29 EBB 6/2/13 / Preservative: (below)
6/1/13	10:30PM		X	6 half gallon	002			X	X				C7480	ice

Relinquished by/Affiliation: Larken Pennington / EDCC	Date: 6/2/13	Time: 1410	Received by/Affiliation: BAL Erin L Beaty	Date: 6/2/13	Time: 1410
Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:

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# X5118

Client: EDCC/El Dorado Chemical Company

Address: 4500 Northwest Ave El Dorado AR 71731

NPDES# AR0000752 Outfall 002

Technicians: EGB/AH/LC/GW

Test initiated: Date 6/2/13 Time 1540

Test terminated: Date 6/4/13 Time 1460

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)	Dechlor inated? Amount?	Ammonia (NH3) mg/L	Salinity	Hard-ness 100%	Alkal-inity 100%	Tech
C7480	9.0 / 111.7%	Y/20 / 7.6/94.2%	<0.01	NO	3.0	N/A	56.0	24.0	EGB
↓	9.2 / 114.0%	Y/20 / 8.3/97.2%	↓	↓	↓	↓	↓	↓	

Dilution Water Information

Dilution Water	ID#	Initial D.O (mg/L & %)	Aerate? Minutes/D.O (mg/L & %)	Total Residual Chlorine (mg/L)	Ammonia (NH3) mg/L	pH	Hard-ness	Alkal-inity	Tech
Soft H20	3500	N/A	———	———	——→	7.6	48.0	28.0	EGB
↓	↓								

Test Species Information

Test Species Info.	Species: P. promelas ID#: 52813	Species: D. pulex ID#: ~~[illegible]~~	Species: ID#:	Species: ID#:
Age	5 days	<24 hrs		
Test Container Size	250ml	30ml		
Test volume	200ml	~~20 25ml~~ 25ml		
Feeding: Type	Artemia	Algae/YCT		
Amount	acclimation	acclimation		
Aeration? Amount	N/A	N/A		
Condition of survivors	good EGB 6/4/13	good EGB 6/4/13		

Comments:

ACUTE1 020809 Rev.

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

Project# X5118

Client El Dorado Chemical

Sample Description 002

Test started: Date 6/2/13 Time 1540

Test ended: Date 6/4/13 Time 1435

Test Species D. pulex ID# A3 J3 6/2

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

Time: Ohour 1540 24hour 1510 48hour 1435 72hour ____ 96hour ____

Temperature (°C): Ohour 24.6 24hour 23.4 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
0	A		8	7	7			8.0	8.1/8.2	8.4			7.6	7.5/7.4	7.9			277	223/273	287		
	B		8	8	8																	
	C		8	7	7																	
	D		8	8	8																	
	E		8	8	8																	
32	A		8	8	8			7.9	9.9/8.2	8.3			7.3	7.4/7.3	7.7			264	228/261	320		
	B		8	7	7																	
	C		8	8	7																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								EGB	SW/EGB	EGB			EGB	SW/EGB	EGB			EGB	SW/EGB	EGB		

ACUTE2 020809 Rev.

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

Project# X5118

Client El Dorado Chemical

Sample Description 002

Technician: Ohour EBB 24hour SW 48hour EBB 72hour ____ 96hour ____

Time: Ohour 1540 24hour 1510 48hour 1435 72hour ____ 96hour ____

Temperature (°C): Ohour 24.6 24hour 23.6 48hour 24.8 72hour ____ 96hour ____

Test started: Date 6/2/13 Time 1540

Test ended: Date 6/4/13 Time 1435

Test Species D. pulex ID# N3J3 EBB 6/2

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0/0																						
75	A	N/A	8	4	4			7.8	7.8/8.2	8.1			7.4	7.4/7.3	7.3			395	401/395	444		
	B	|	8	6	6																	
	C	|	8	6	6																	
	D	|	8	8	8																	
	E	|	8	7	6																	
100	A	|	8	5	6			8.0	7.8/8.2	8.1			7.3	7.4/7.3	7.1			461	461/468	506		
	B	|	8	7	7																	
	C	|	8	7	6																	
	D	|	8	7	6																	
	E	|	8	5	5																	
Chemistry Tech prerenewal/postrenewal								EBB	SW/EBB	EBB			EBB	SW/EBB	EBB			EBB	SW/EBB	EBB		

ACUTE2 020809 Rev.

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

Project# X5118

Client El Dorado Chemical

Test started: Date 6/2/13 Time 1620

Test ended: Date 6/4/13 Time 1480

Sample Description 003

Test Species P. promelas ID# 52813

Technician: Ohour EB 24hour BW 48hour EB 72hour ____ 96hour ____

Time: Ohour 1600 24hour 1550 48hour 1430 72hour ____ 96hour ____

Temperature (°C): Ohour 25 24hour 25.0 48hour 25.0 72hour ____ 96hour ____

Test Dilution %	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0	A		8	8	8			8.0	7.5/8.2	7.4			7.6	7.2/7.4	7.4			177	206/173	198		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
32	A		8	8	8			7.9	7.5/8.0	7.4			7.3	7.1/7.3	7.2			264	282/296	283		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	7	7																	
Chemistry Tech prerenewal/postrenewal								EB	BW/EB	EB			EB	BW/EB	EB			EB	BW/EB	EB		

ACUTE2 020809 Rev.

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

Project# X5118

Client El Dorado Chemical

Sample Description 002

Test started: Date 6/2/13 Time 1620

Test ended: Date 6/4/13 Time 1450

Test Species P. promelas ID# 52813

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

Time: 0hour 1620 24hour 1550 48hour 1450 72hour — 96hour —

Temperature (^0C): 0hour 25 24hour 26 48hour 26.0 72hour — 96hour —

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
010			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
42	A	N/A	8	8	8			7.9	7.4/8.2	7.2			7.5	7.2/7.3	7.2			289	305/286	307		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
56	A		8	8	8			7.9	7.3/8.2	7.3			7.4	7.1/7.3	7.0			325	344/328	346		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								EGB	[illegible]/[illegible]	EGB			EGB	[illegible]/[illegible]	EGB			EGB	[illegible]/[illegible]	EGB		

ACUTE2 020809 Rev.

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

Project# X5118

Client El Dorado Chemical

Test started: Date 6/2/13 Time 1620

Test ended: Date 6/4/13 Time 1450

Sample Description 002 Test Species P. promelas ID# 52813

Technician: Ohour ECB 24hour [illegible] 48hour ECB 72hour _____ 96hour _____

Time: Ohour 1620 24hour 1550 48hour 1456 72hour _____ 96hour _____

Temperature (°C): Ohour 25 24hour 25 6/3/13 48hour 25.0 72hour _____ 96hour _____

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
0/0			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
75	A	N/A	8	8	8			7.8	8.3	7.2			7.4	7.1/7.3	7.0			325	411/325	404		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
100	A		8	8	8			8.0	8.2/8.3	7.2			7.3	7.1/7.3	7.0			461	490/485	479		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								ECB	DW/ECB	ECB			ECB	DW/ECB	ECB			ECB	DW/ECB			

ACUTE2 020809 Rev.

APPENDIX C
STATISTICAL ANALYSIS

Daphnid Acute Test-48 Hr Survival

Start Date:	6/2/2013	Test ID:	X5118DP	Sample ID:	2
End Date:	6/4/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	6/2/2013	Protocol:	EPAAW02-EPA/821/R-02-01	Test Species:	DP-Daphnia pulex
Comments:					

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

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.9500	1.0000	1.3196	1.2094	1.3931	7.623	5			
32	0.9500	1.0000	1.3196	1.2094	1.3931	7.623	5	0.000	2.360	0.2207
*42	0.7250	0.7632	1.0273	0.7854	1.2094	14.833	5	3.126	2.360	0.2207
56	0.8750	0.9211	1.2180	1.0472	1.3931	14.204	5	1.087	2.360	0.2207
*75	0.7500	0.7895	1.0640	0.7854	1.3931	20.308	5	2.733	2.360	0.2207
*100	0.7500	0.7895	1.0526	0.9117	1.2094	10.024	5	2.856	2.360	0.2207

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.97235	0.927	0.07237	0.23995
Bartlett's Test indicates equal variances (p = 0.56)	3.95278	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test Treatments vs D-Control	32	42	36.6606	3.125	0.14487	0.15441	0.09241	0.02187	0.00676	5, 24

ToxCalc v5.0.23

Reviewed by: EGB 6/11/13

Acute Fish Test-48 Hr Survival

Start Date:	6/2/2013	Test ID:	X5118PP	Sample ID:	2
End Date:	6/4/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	6/2/2013	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	0.8750
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

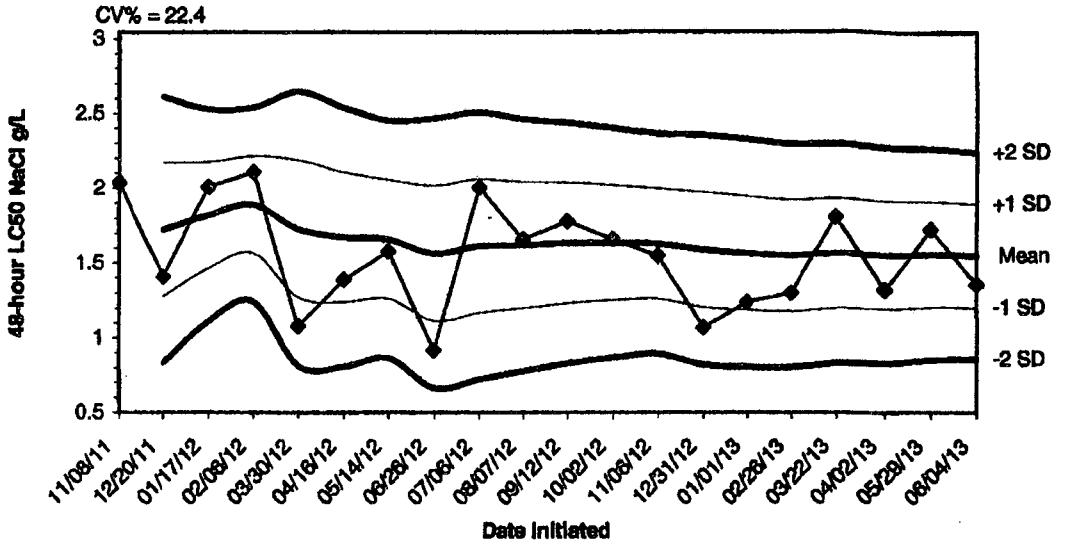
			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5		
32	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	16.00
42	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
56	1.0000	1.0000	1.3931	1.3931	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 non-normal distribution (p <= 0.05)					0.41613	0.927	-3.8705	19.8512
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								

EAB 6/11/13

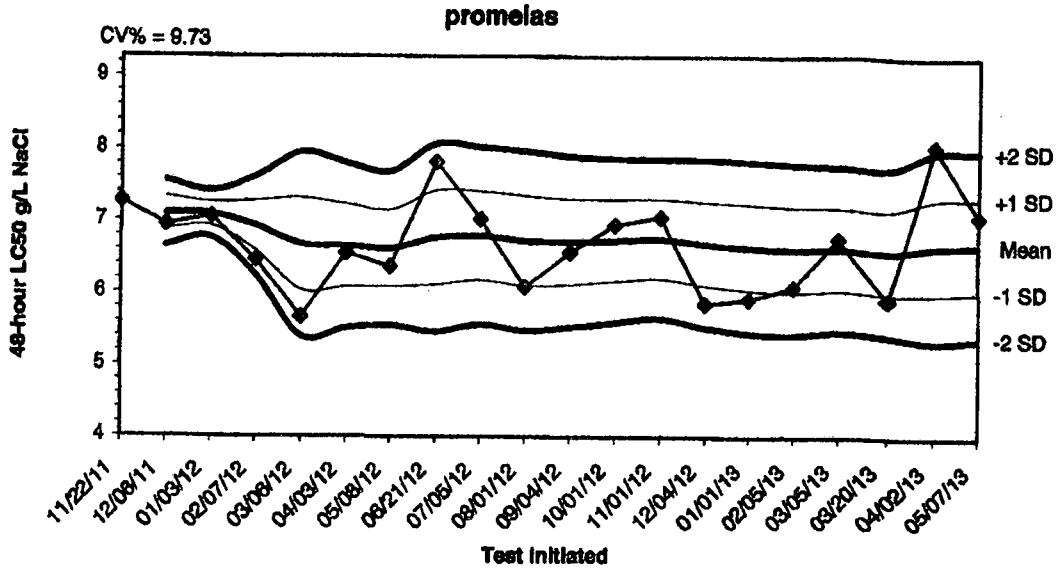
APPENDIX D
QUALITY ASSURANCE CHARTS

2013 48-hour Reference Toxicant Test Results Using Daphnia pulex



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

2013 48-Hour Acute Reference Toxicant Test Results for Pimephales promelas



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
11/22/11	7.2700					
12/06/11	6.9500	7.1100	6.8837	6.6575	7.3363	7.5625
01/03/12	7.0600	7.0933	6.9308	6.7682	7.2559	7.4185
02/07/12	6.4600	6.9350	6.5916	6.2483	7.2784	7.6217
03/06/12	5.6700	6.6820	6.0429	5.4038	7.3211	7.9602
04/03/12	6.5600	6.6617	6.0879	5.5140	7.2355	7.8093
05/08/12	6.3700	6.6200	6.0847	5.5494	7.1553	7.6906
06/21/12	7.8200	6.7700	6.1176	5.4652	7.4224	8.0748
07/05/12	7.0300	6.7989	6.1825	5.5662	7.4153	8.0316
08/01/12	6.0900	6.7280	6.1051	5.4823	7.3509	7.9737
09/04/12	6.5700	6.7136	6.1208	5.5280	7.3064	7.8993
10/01/12	6.9500	6.7333	6.1640	5.5947	7.3027	7.8720
11/01/12	7.0600	6.7585	6.2059	5.6533	7.3110	7.8636
12/04/12	5.8600	6.6943	6.1116	5.5289	7.2770	7.8596
01/01/13	5.9200	6.6427	6.0467	5.4507	7.2387	7.8347
02/05/13	6.0900	6.6081	6.0160	5.4238	7.2003	7.7924
03/05/13	6.7700	6.6176	6.0430	5.4683	7.1923	7.7670
03/20/13	5.9200	6.5789	5.9976	5.4164	7.1602	7.7414
04/02/13	8.0700	6.6574	5.9970	5.3366	7.3178	7.9782
05/07/13	7.0900	6.6790	6.0290	5.3790	7.3290	7.9790

APPENDIX E
AGENCY FORMS

Acute Forms
Daphnia pulex Survival

Permittee: El Dorado Chemical - Outfall 002
NPDES Permit Number: AR0000752/ AFIN 70-00040
Composite Collected **From: 6/1/13** **To: 6/1/13**
From: **To:**
Test Initiated: 6/2/13
Dilution Water Used: **Receiving Water** **X** **Reconstituted Water**

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	32	42	56	75	100
24-hour	A	87.5	100	87.5	75.0	50.0	75.0
	B	100	87.5	75.0	100	75.0	87.5
	C	87.5	100	75.0	75.0	75.0	87.5
	D	100	100	50.0	100	100	87.5
	E	100	100	75.0	87.5	87.5	62.5
48-hour	A	87.5	100	87.5	75.0	50.0	75.0
	B	100	87.5	75.0	100	75.0	87.5
	C	87.5	87.5	75.0	75.0	75.0	75.0
	D	100	100	50.0	100	100	75.0
	E	100	100	75.0	87.5	75.0	62.5
	Mean	95.0	95.0	72.5	87.5	75.0	75.0

1. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate: Is the mean survival at 48 hours significantly different (p=.05) than the control survival for the % effluent corresponding to:
a.) LOW FLOW OR CRITICAL DILUTION (100%) **X** **YES** **NO**
b.)½ LOW FLOW OR 2X CRITICAL DILUTION (N/A%) **YES** **NO**
2. Enter percent effluent corresponding to the LC_{50} below:
LC_{50} = N/A% effluent
95 % confidence limits: N/A
Method of LC_{50} calculation: N/A
3. If you answered NO to 1.a) enter (P) otherwise enter (F): F
4. Enter response to item 3 on DMR Form, parameter TEM3D
5. If you answered NO to 1.b) enter (P) otherwise enter (F): N/A
6. Enter response to item 5 on DMR Form, parameter TFM3D

Biomonitoring
Daphnia 48 hour Acute Static Renewal
Chemical Parameters Chart*

Permittee: El Dorado Chemical - Outfall 002
NPDES Number: AR0000752/ AFIN 70-00040
Contact: Larken Pennington
Analyst: Briggs, Williams
Sample Collected **From:** **Date 6/1/13** **Time 1030**
To: **Date 6/1/13** **Time 1030**
Test Begin **Date 6/2/13** **Time 1540**
Test End **Date 6/4/13** **Time 1435**

Parameter	D.O.			Temperature			Alkalinity			Hardness			pH		
Dilut./Time	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs
0	8.0	8.2	8.4	24.6	23.6	24.8	28.0			48.0			7.6	7.4	7.9
32	7.9	8.2	8.3	24.6	23.6	24.8							7.3	7.3	7.7
42	7.9	8.2	8.3	24.6	23.6	24.8							7.5	7.3	7.4
56	7.9	8.2	8.2	24.6	23.6	24.8							7.4	7.3	7.4
75	7.8	8.3	8.1	24.6	23.6	24.8							7.4	7.3	7.3
100	8.0	8.3	8.1	24.6	23.6	24.8	24.0			56.0			7.3	7.3	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 002
NPDES Permit Number: AR0000752/ AFIN 70-00040
Composite Collected **From: 6/1/13** **To: 6/1/13**
From: **To:**
Test Initiated: 6/2/13
Dilution Water Used: **Receiving Water** **X Reconstituted Water**

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	32	42	56	75	100
24-hour	A	100	100	100	100	100	100
	B	100	100	100	100	100	100
	C	100	100	100	100	100	100
	D	100	100	100	100	100	100
	E	100	87.5	100	100	100	100
48-hour	A	100	100	100	100	100	100
	B	100	100	100	100	100	100
	C	100	100	100	100	100	100
	D	100	100	100	100	100	100
	E	100	87.5	100	100	100	100
	Mean	100	97.5	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
Daphnia 48 hour Acute Static Renewal
Chemical Parameters Chart*

Permittee: El Dorado Chemical - Outfall 002
NPDES Number: AR0000752/ AFIN 70-00040
Contact: Larken Pennington
Analyst: Briggs, Williams
Sample Collected **From:** **Date 6/1/13** **Time 1030**
To: **Date 6/1/13** **Time 1030**
Test Begin **Date 6/2/13** **Time 1620**
Test End **Date 6/4/13** **Time 1450**

Parameter	D.O.			Temperature			Alkalinity			Hardness			pH		
Dilut./Time	0hrs.	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs
0	8.0	8.2	7.4	25.0	25.0	25.0	28.0			48.0			7.6	7.4	7.4
32	7.9	8.2	7.4	25.0	25.0	25.0							7.3	7.3	7.2
42	7.9	8.2	7.2	25.0	25.0	25.0							7.5	7.3	7.2
56	7.9	8.2	7.3	25.0	25.0	25.0							7.4	7.3	7.0
75	7.8	8.3	7.2	25.0	25.0	25.0							7.4	7.3	7.0
100	8.0	8.3	7.2	25.0	25.0	25.0	24.0			56.0			7.3	7.3	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 627
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#: X5118

Chain of Custody Documents Checked by: AH 6/12/13
Technician/Date

Raw Data Documents Checked by: AH 6/12/13
Technician/Date

Statistical Analysis Package Checked by: EGB 6/11/13
Quality Manager/Date

Quality Control Data Checked by: EGB 6/11/13
Quality Manager/Date

Report Checked by: EGB 6/25/13
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.

Quality Manager

6/25/13
Date

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X5132

Bio-Analytical Laboratories' Executive Summary

Permittee: El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731
Project #: X5132
Outfall: Outfall 006 (contaminated storm water)
Permit #: AR0000752/ AFIN #70-00040
Contact: Ms. Larken Pennington
Test Dates: June 7 - 9, 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 - 11.68%.

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 - 15.10%.

This report contains a total of 33 pages, including this page. The results pertain only to the samples listed in the chain of custody documents in Appendix A. The information contained within meets the requirements set forth by ADEQ. The chemical data in this report is for monitoring purposes only and should not be reported on discharge monitoring reports.

Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023

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

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

EL DORADO CHEMICAL COMPANY
El Dorado, Arkansas

NPDES #AR0000752
AFIN #70-00040

EPA Methods 2000.0 and 2021.0

Project X5132

Test Dates: June 7 - 9, 2013
Report Date: June 26, 2013

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

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

BAL
ADEQ #88-0630
Project X5132

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BAL
ADEQ #88-0630
Project X5132

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 eight 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.

BAL
ADEQ #88-0630
Project X5132

2.3 Dilution Water

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

2.4 Test Concentrations

The test concentrations used in the tests were 100, 75.0, 56.0, 42.0, 32.0 and 22.0 percent effluent and a reconstituted water control. The critical dilution was defined as 100 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 June 6, 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. 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 X5132

2.8 Data Analysis

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

3.0 Results and Discussion

The results of the tests can be found in Table 1. Significant differences in survival were not noted in the 100 percent critical dilution after 48 hours of exposure (p=.05). The NOEC value for both tests was 100 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	95.0	90.0
32.0	90.0	100.0
42.0	92.5	92.5
56.0	97.5	92.5
75.0	97.5	95.0
100.0	90.0	90.0

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

BAL
ADEQ #88-0630
Project X5132

4.0 Conclusions

The sample of Outfall 006 collected from El Dorado Chemical Company, El Dorado, Arkansas, on June 6, 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).

BAL
ADEQ #88-0630
Project X5132

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) 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: [signature] / DAVID SARTAIN / EDC

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:	Preservative: (below)
6.6.13 / 6.6.13	1315 - 2015	✓		6 half gallon	006			X	X				C7523	ICE

Project Number: X5132

Temp. upon arrival: Temperature upon arrival: 0.3°C
Thermometer #: 29
Tech: [initials]
Date: 6/7/13

Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
[signature] / EDCC	6-7-13	0950	[signature]	6-7-13	0950
[signature]	6-7-13	1320	L Colby	6/7/13	1320

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# X5132

Client: EDCC/El Dorado Chemical Company

Address: 4500 Northwest Ave El Dorado AR 71731

NPDES#AR0000752 Outfall 006

Technicians: EGB/AH/LC/GW

Test initiated: Date 6/7/13 Time 1620

Test terminated: Date 6/9/13 Time 1500

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 1003	Alkalinity 1003	Tech
C7523	10.7/128.3%	Y/30 & 1/9.68	<0.01	NO	6.0	N/A	88.0	16.0	LC
↓	10.0/12.3	Y/30/7.9/93.6%	↓	↓	↓	↓	↓	↓	EGB
		↓		↓		↓			

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	3504					7.3	48.0	28.0	AH
↓	↓								

Test Species Information

Test Species Info.	Species: D. pulex ID#: BAL 13-14	Species: P. promelas ID#: BAL 53013	Species: ID#:	Species: ID#:
Age	<24h	~8d		
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 6/9/13 SC	Good		

Comments:

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

Project# X5132

Client El Dorado Chemical

Sample Description 006

Test started: Date 6/7/13 Time 1020

Test ended: Date 6/9/13 Time 1435

Test Species D. pulex ID# BAL IS-J4

Technician: 0hour AH 24hour SW 48hour SW 72hour ___ 96hour ___

Time: 0hour 1020 24hour 1435 48hour 1435 72hour ___ 96hour ___

Temperature (°C): 0hour 24 24hour 24.5 48hour 24.4 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	6	6			8.1	7.8/8.2	7.9			7.3	6.9/7.4	6.9			1663	224/167	210		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	7																	
	E		8	8	8																	
22	A		8	8	8			8.1	7.7/8.1	7.9			7.1	7.1/7.1	7.1			391	392/368	412		
	B		8	7	6																	
	C		8	8	7																	
	D		8	8	8																	
	E		8	7	7																	
Chemistry Tech prerenewal/postrenewal								LC	SW/GB	SW			LC	SW/GB	SW			LC	SW/GB	SW		

ACUTE2 020809 Rev.

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

Project# X5132

Client El Dorado Chemical

Sample Description OOL6

Technician:

Time:

Temperature (°C):

Test started: Date 6/7/13 Time 1620

Test ended: Date 6/9/13 Time 1435

Test Species D. pulex ID# BATCH 3-14

	Ohour	24hour	48hour	72hour	96hour
Technician:	AH	SW	SW		
Time:	1620	1435	1435		
Temperature (°C):	24	24.5	24.4		

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																				
32	A		8	8	8			8.1	7.7/8.0	7.9			7.2	7.7/7.0	7.1			488	504/512	531		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
42	A		8	6	6			8.1	7.7/8.0	7.9			7.1	7.7/7.0	7.1			583	594/612	653		
	B		8	8	8																	
	C		8	8	7																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								LC	SW/SW	SW			LC	SW/SW	SW			LC	SW/SW	SW		

ACUTE2 020809 Rev.

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

Project# X5132

Client El Dorado Chemical

Test started: Date 6/7/13 Time 1620

Test ended: Date 6/9/13 Time 1435

Sample Description 0006

Test Species D. pulex ID# BAL I3-J4

Technician: Ohour AH 24hour GW 48hour GW 72hour ____ 96hour ____

Time: Ohour 1620 24hour 1435 48hour 1435 72hour ____ 96hour ____

Temperature (°C): Ohour 24 24hour 24.5 48hour 24.4 72hour ____ 96hour ____

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
		N/A																				
56	A		8	8	7			8.0	7.0/7.7	7.9			7.1	7.0/7.0	7.0			723	693/695	735		
	B		8	7	7																	
	C		8	7	7																	
	D		8	8	8																	
	E		8	8	8																	
75	A		8	7	7			8.1	7.0/7.8	7.9			7.0	7.1/7.1	6.9			912	875/901	1090		
	B		8	8	8																	
	C		8	8	8																	
	D		8	7	7																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								LC	GW/ELB	GW			LC	GW/ELB	GW			LC	GW/ELB	GW		

ACUTE2 020809 Rev.

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

Project# X5132

Client El Dorado Chemical

Sample Description 006

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

Time: Ohour 1620 24hour 1435 48hour 1435 72hour ____ 96hour ____

Temperature (°C): Ohour 24 24hour 24.3 48hour 24.4 72hour ____ 96hour ____

Test started: Date 6/7/13 Time 1620

Test ended: Date 6/9/13 Time 1435

Test Species D. pulex ID# BAL-IC3-J4

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
		NA	0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
100	A		8	8	8			8.1	7.6/7.7	7.9			6.9	7.1/7.1	6.8			1158	1051/1134	1276		
	B		8	8	8																	
	C		8	6	6																	
	D		8	8	8																	
	E		8	6	6																	
	A		8	8																		
	B		8	8																		
	C		8	8																		
	D		8	8																		
	E		8	5																		
Chemistry Tech prerenewal/postrenewal								SC	SW/EB	SW			SC	SW/EB	SW			SC	SW/EB	SW		

AH 6/7/13 SW 6/9/13

ACUTE2 020809 Rev.

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

Project# X5132

Client El Dorado Chemical

Sample Description 006

Test started: Date 6/7/13 Time 1655

Test ended: Date 6/9/13 Time 1500

Test Species P. promelas ID# BAL 5301/3

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

Time: 0hour 1655 24hour 1520 48hour 1500 72hour — 96hour —

Temperature (°C): 0hour 24.0 24hour 24.4 48hour 24.5 72hour — 96hour —

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
		NA	0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0	A		8	8	8			8.1	7.4/8.2	7.8			7.3	6.3/7.4	7.2			1663	1894/1075?	1587?		
	B		8	8	8																	
	C		8	8	7																	
	D		8	8	8																	
	E		8	8	8																	
22	A		8	8	8			8.1	7.6/8.1	7.8			7.1	6.4/7.1	7.0			391	365/368	347		
	B		8	8	8																	
	C		8	8	7																	
	D		8	7	7																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								JC	SW/EB	SW			JC	SW/EB	SW			JC	SW/EB	SW		

ACUTE2 020809 Rev.

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

Project# X5132

Client El Dorado Chemical

Sample Description 006

Test started: Date 6/7/13 Time 1655

Test ended: Date 6/9/13 Time 1500

Test Species P. promelas ID# BAL 5303

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

Time: 0hour 1655 24hour 1520 48hour 1500 72hour — 96hour —

Temperature (°C): 0hour 24.0 24hour 24.4 48hour 24.5 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
32	A	NA	8	8	8			8.1	7.4/8.0	7.8			7.2	6.8/7.0	7.0			488	493/512	505		
	B		8	6	5																	
	C		8	8	8																	
	D		8	7	7																	
	E		8	8	8																	
42	A		8	8	8			8.1	7.6/8.0	7.8			7.1	6.9/7.0	7.0			593	540/611	623		
	B		8	8	7																	
	C		8	8	8																	
	D		8	8	7																	
	E		8	7	7																	
Chemistry Tech prerenewal/postrenewal								LC	SW/BB	SW			LC	SW/BB	SW			LC	SW/BB	SW		

ACUTE2 020809 Rev.

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

Project# X5132

Client El Dorado Chemical

Sample Description 0016

Test started: Date 6/1/13 Time 1655

Test ended: Date 6/9/13 Time 1520

Test Species P. promelas ID# BBL/53013

Technician:	Ohour SW	24hour SW	48hour SW	72hour	96hour
Time:	Ohour 1655	24hour 1520	48hour 1500	72hour	96hour
Temperature (°C):	Ohour 24.0	24hour 24.4	48hour 24.5	72hour	96hour

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
		NA	0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
56	A		8	8	8			8.0	7.8/7.7	7.6			7.1	6.9/7.0	6.9			723	739/723	745		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	7																	
75	A		8	8	8			8.1	7.9/7.8	7.6			7.0	6.9/7.1	6.8			912	899/901	934		
	B		8	7	7																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								LC	SW/SW	SW			LC	SW/SW	SW			LC	SW/SW	SW		

ACUTE2 020809 Rev.

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

Project# X5132
Client El Dorado Chemical
Sample Description 006

Test started: Date 6/7/13 Time 1615
Test ended: Date 6/9/13 Time 1520
Test Species P. promelas ID# BAL 15302

Technician: 0hour 8W 24hour 8W 48hour 8W 72hour — 96hour —
Time: 0hour 1655 24hour 1520 48hour 1500 72hour — 96hour —
Temperature (°C): 0hour 24.0 24hour 24.4 48hour 24.5 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
100	A	NA	8	8	8			8.1	7.5/7.9	7.6			6.9	6.7/7.1	6.7			1158	1176/1136	1129		
	B		8	7	6																	
	C		8	8	8																	
	D		8	7	7																	
	E		8	7	7																	
Void 6/2/13	A		8						/					/					/			
	B		8																			
	C		8																			
	D		8																			
	E		8																			
Chemistry Tech prerenewal/postrenewal								LC	8W/EB	8W			LC	8W/EB	8W			LC	8W/EB	8W		

ACUTE2 020809 Rev.

APPENDIX C
STATISTICAL ANALYSIS

Daphnid Acute Test-48 Hr Survival

Start Date:	6/7/2013	Test ID:	X5132DP	Sample ID:	6
End Date:	6/9/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	6/7/2013	Protocol:	EPAAW02-EPA/821/R-02-01	Test Species:	CD-Ceriodaphnia dubia
Comments:					

Conc-%	1	2	3	4	5
D-Control	0.7500	1.0000	1.0000	0.8750	1.0000
22	1.0000	0.7500	0.8750	1.0000	0.8750
32	1.0000	1.0000	1.0000	1.0000	1.0000
42	0.7500	1.0000	0.8750	1.0000	1.0000
56	0.8750	0.8750	0.8750	1.0000	1.0000
75	0.8750	1.0000	1.0000	0.8750	1.0000
100	1.0000	1.0000	0.7500	1.0000	0.7500

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	0.9250	1.0000	1.2872	1.0472	1.3931	12.116	5		
22	0.9000	0.9730	1.2504	1.0472	1.3931	11.683	5	25.50	16.00
32	1.0000	1.0811	1.3931	1.3931	1.3931	0.000	5	32.50	16.00
42	0.9250	1.0000	1.2872	1.0472	1.3931	12.116	5	27.50	16.00
56	0.9250	1.0000	1.2829	1.2094	1.3931	7.841	5	26.50	16.00
75	0.9500	1.0270	1.3196	1.2094	1.3931	7.623	5	28.50	16.00
100	0.9000	0.9730	1.2547	1.0472	1.3931	15.099	5	26.50	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.8849	0.934	-0.5888	-0.8011
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: EQB 6/11/13

Acute Fish Test-48 Hr Survival

Start Date:	6/7/2013	Test ID:	X5132PP	Sample ID:	6
End Date:	6/9/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	6/7/2013	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	0.8750	0.8750	1.0000
32	1.0000	0.6250	1.0000	0.8750	1.0000
42	1.0000	0.8750	1.0000	0.8750	0.8750
56	1.0000	1.0000	1.0000	1.0000	0.8750
75	1.0000	0.8750	1.0000	1.0000	1.0000
100	1.0000	0.7500	1.0000	0.8750	0.8750

			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	0.9500	0.9500	1.3196	1.2094	1.3931	7.623	5	22.50	16.00
32	0.9000	0.9000	1.2601	0.9117	1.3931	16.693	5	22.50	16.00
42	0.9250	0.9250	1.2829	1.2094	1.3931	7.841	5	20.00	16.00
56	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	16.00
75	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	16.00
100	0.9000	0.9000	1.2504	1.0472	1.3931	11.683	5	20.00	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.92058	0.934	-1.0872	1.83674
Equality of variance cannot be confirmed				

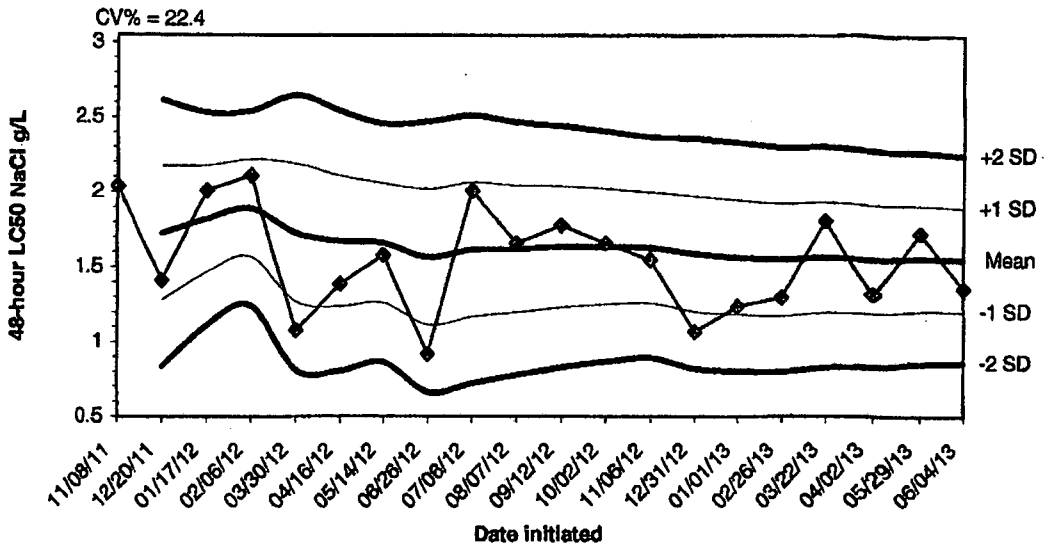
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs D-Control				

ToxCalc v5.0.23

Reviewed by: EAB 6/11/13

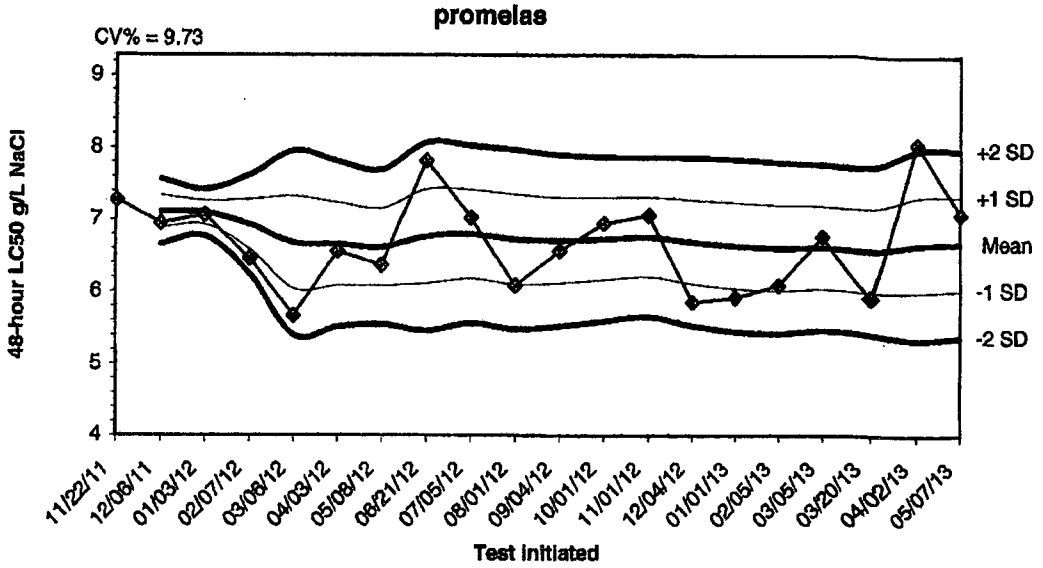
APPENDIX D
QUALITY ASSURANCE CHARTS

2013 48-hour Reference Toxicant Test Results Using Daphnia pulex



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

2013 48-Hour Acute Reference Toxicant Test Results for Pimephales promelas



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
11/22/11	7.2700					
12/06/11	6.9500	7.1100	6.8837	6.6575	7.3363	7.5625
01/03/12	7.0600	7.0933	6.9308	6.7682	7.2559	7.4185
02/07/12	6.4600	6.9350	6.5916	6.2483	7.2784	7.6217
03/06/12	5.6700	6.6820	6.0429	5.4038	7.3211	7.9602
04/03/12	6.5600	6.6617	6.0879	5.5140	7.2355	7.8093
05/08/12	6.3700	6.6200	6.0847	5.5494	7.1553	7.6906
06/21/12	7.8200	6.7700	6.1176	5.4652	7.4224	8.0748
07/05/12	7.0300	6.7989	6.1825	5.5662	7.4153	8.0316
08/01/12	6.0900	6.7280	6.1051	5.4823	7.3509	7.9737
09/04/12	6.5700	6.7136	6.1208	5.5280	7.3064	7.8993
10/01/12	6.9500	6.7333	6.1640	5.5947	7.3027	7.8720
11/01/12	7.0600	6.7585	6.2059	5.6533	7.3110	7.8636
12/04/12	5.8600	6.6943	6.1116	5.5289	7.2770	7.8596
01/01/13	5.9200	6.6427	6.0467	5.4507	7.2387	7.8347
02/05/13	6.0900	6.6081	6.0160	5.4238	7.2003	7.7924
03/05/13	6.7700	6.6176	6.0430	5.4683	7.1923	7.7670
03/20/13	5.9200	6.5789	5.9976	5.4164	7.1602	7.7414
04/02/13	8.0700	6.6574	5.9970	5.3366	7.3178	7.9782
05/07/13	7.0900	6.6790	6.0290	5.3790	7.3290	7.9790

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: 6/6/13** **To: 6/6/13**
From: **To:**
Test Initiated: 6/7/13
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	75.0	100	100	75.0	100	87.5	100
	B	100	87.5	100	100	87.5	100	100
	C	100	100	100	100	87.5	100	75.0
	D	100	100	100	100	100	87.5	100
	E	100	87.5	100	100	100	100	75.0
48-hour	A	75.0	100	100	75.0	87.5	87.5	100
	B	100	75.0	100	100	87.5	100	100
	C	100	87.5	100	87.5	87.5	100	75.0
	D	87.5	100	100	100	100	87.5	100
	E	100	87.5	100	100	100	100	75.0
	Mean	92.5	90.0	100	92.5	92.5	95.0	90.0

1. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate: Is the mean survival at 48 hours significantly different (p=.05) than the control survival for the % effluent corresponding to:
a.) LOW FLOW OR CRITICAL DILUTION (100%) **YES** **X NO**
b.)½ LOW FLOW OR 2X CRITICAL DILUTION (N/A%) **YES** **NO**
2. Enter percent effluent corresponding to the LC_{50} below:
LC_{50} = N/A% effluent
95 % confidence limits: N/A
Method of LC_{50} calculation: N/A
3. If you answered NO to 1.a) enter (P) otherwise enter (F): P
4. Enter response to item 3 on DMR Form, parameter TEM3D
5. If you answered NO to 1.b) enter (P) otherwise enter (F): N/A
6. Enter response to item 5 on DMR Form, parameter TFM3D

Biomonitoring
Daphnia 48 hour Acute Static Renewal
Chemical Parameters Chart*

Permittee: El Dorado Chemical - Outfall 006
NPDES Number: AR0000752/ AFIN 70-00040
Contact: Larken Pennington
Analyst: Haughton, Williams

Sample Collected	**From:**	**Date 6/6/13**	**Time 1215**
	To:	**Date 6/6/13**	**Time 2015**
Test Begin		**Date 6/7/13**	**Time 1620**
Test End		**Date 6/9/13**	**Time 1435**

Parameter	D.O.			Temperature			Alkalinity			Hardness			pH		
Dilut./Time	0hrs.	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs
0	8.1	8.2	7.9	24.0	24.5	24.4	28.0			48.0			7.3	7.4	6.9
22	8.1	8.1	7.9	24.0	24.5	24.4							7.1	7.1	7.1
32	8.1	8.0	7.9	24.0	24.5	24.4							7.2	7.0	7.1
42	8.1	8.0	7.9	24.0	24.5	24.4							7.1	7.0	7.1
56	8.0	7.7	7.9	24.0	24.5	24.4							7.1	7.0	7.0
75	8.1	7.8	7.9	24.0	24.5	24.4							7.0	7.1	6.9
100	8.1	7.9	7.9	24.0	24.5	24.4	16.0			88.0			6.9	7.1	6.8

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

Acute Forms
Pimephales promelas Survival

Permittee: El Dorado Chemical - Outfall 006
NPDES Permit Number: AR0000752/ AFIN 70-00040
Composite Collected **From: 6/6/13** **To: 6/6/13**
From: **To:**
Test Initiated: 6/7/13
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	75.0	100	100	87.5	87.5
	C	100	100	100	100	100	100	100
	D	100	87.5	87.5	100	100	100	87.5
	E	100	100	100	87.5	100	100	87.5
48-hour	A	100	100	100	100	100	100	100
	B	100	100	62.5	87.5	100	87.5	75.0
	C	100	87.5	100	100	100	100	100
	D	100	87.5	87.5	87.5	100	100	87.5
	E	100	100	100	87.5	87.5	100	87.5
	Mean	100	95.0	90.0	92.5	97.5	97.5	90.0

1. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate: Is the mean survival at 48 hours significantly different (p=.05) than the control survival for the % effluent corresponding to:
a.) LOW FLOW OR CRITICAL DILUTION (100%) **YES** **X NO**
b.)½ LOW FLOW OR 2X CRITICAL DILUTION (N/A%) **YES** **NO**
2. Enter percent effluent corresponding to the LC_{50} below:
LC_{50} = N/A% effluent
95 % confidence limits: N/A
Method of LC_{50} calculation: N/A
3. If you answered NO to 1.a) enter (P) otherwise enter (F): P
4. Enter response to item 3 on DMR Form, parameter TEM3D
5. If you answered NO to 1.b) enter (P) otherwise enter (F): N/A
6. Enter response to item 5 on DMR Form, parameter TFM3D

Biomonitoring
Pimephales promelas 48 hour Acute Static Renewal
Chemical Parameters Chart*

Permittee: El Dorado Chemical - Outfall 006
NPDES Number: AR0000752/ AFIN 70-00040
Contact: Larken Pennington
Analyst: Williams

Sample Collected	**From:**	**Date 6/6/13**	**Time 1215**
	To:	**Date 6/6/13**	**Time 2015**
Test Begin		**Date 6/7/13**	**Time 1655**
Test End		**Date 6/9/13**	**Time 1500**

Parameter	D.O.			Temperature			Alkalinity			Hardness			pH		
Dilut./Time	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs
0	8.1	8.2	7.8	24.0	24.4	24.5	28.0			48.0			7.3	7.4	7.2
22	8.1	8.1	7.8	24.0	24.4	24.5							7.1	7.1	7.0
32	8.1	8.0	7.8	24.0	24.4	24.5							7.2	7.0	7.0
42	8.1	8.0	7.8	24.0	24.4	24.5							7.1	7.0	7.0
56	8.0	7.7	7.6	24.0	24.4	24.5							7.1	7.0	6.9
75	8.1	7.8	7.6	24.0	24.4	24.5							7.0	7.1	6.8
100	8.1	7.9	7.6	24.0	24.4	24.5	16.0			88.0			6.9	7.1	6.7

*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#: X5132

Chain of Custody Documents Checked by: AH 6/12/13
Technician/Date

Raw Data Documents Checked by: AH 6/12/13
Technician/Date

Statistical Analysis Package Checked by: EGB 6/11/13
Quality Manager/Date

Quality Control Data Checked by: EGB 6/11/13
Quality Manager/Date

Report Checked by: EGB 6/26/13
Quality Manager/Date

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

Ellen S. Boggs, BS
Quality Manager

6/26/13
Date

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X5130

Bio-Analytical Laboratories' Executive Summary

Permittee: El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731
Project #: X5130
Outfall: Outfall 007 (contaminated storm water)
Permit #: AR0000752/ AFIN #70-00040
Contact: Ms. Larken Pennington
Test Dates: June 7 - 9, 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 - 0%.
3.Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM6C - 0.00%.

-Note: Adjusting the pH of the sample to 6.0-9.0 reduced toxicity.

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 - 42%.
3.Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 0.00%.

-Note: Adjusting the pH of the sample to 6.0-9.0 reduced the toxicity in the sample.

This report contains a total of 35 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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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 X5130

Test Dates: June 6 - 8, 2013
Report Date: June 26, 2013

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

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

BAL
ADEQ #88-0630
Project X5130

TABLE OF CONTENTS

BAL
ADEQ #88-0630
Project X5130

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 ten 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 tests were 100, 75.0, 56.0, 50.0, 42.0 and 32.0 percent effluent and a reconstituted water control. The critical dilution was defined as 100 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 June 6, 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 pH was less than 6.0. It was adjusted to a range of 6.0-9.0 using 1 Normal Sodium Hydroxide solution (1.0 N NaOH). An extra 100 percent concentration was run on the pH adjusted sample. 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 X5130

2.8 Data Analysis

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

3.0 Results and Discussion

The results of the tests can be found in Table 1. Significant differences in survival were noted in the 100 percent critical dilution after 48 hours of exposure (p=.05). The NOEC value for the *Daphnia pulex* and the fathead minnow test were 42 and zero percent effluent, respectively (p=.05). The 48-hour LC_{50} value for the *Daphnia pulex* test and the fathead minnow test was 44.6 and 36.0 percent effluent, respectively. Increasing the pH of the sample reduced the toxicity to the test organisms.

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	87.5	100.0
32.0	0.0	85.0
42.0	0.0	0.0
56.0	0.0	0.0
75.0	0.0	0.0
100.0	0.0	0.0
100.0 pH adj	85.0	90.0

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

BAL
ADEQ #88-0630
Project X5130

4.0 Conclusions

The sample of Outfall 007 collected from El Dorado Chemical Company, El Dorado, Arkansas, on June 6, 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 48 hours of exposure (p=.05). Raising the pH of the sample reduced the toxicity in both tests (p=.05).

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 627
Doyline, LA 71023
(318) 745-2772
1-800-238-1246
Fax: (318) 745-2773

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

Laboratory Use Only:

Company: El Dorado Chemical Company	Phone: (870) 863-1484	Analysis:							Project Number: X5130
Address: 4500 Norwest Ave., El Dorado, AR 71731	Fax: (870) 863-7499								
Permit #: AR0000752/AFIN 70-00040	Purchase Order:								Temp. upon arrival:
Sampler's Signature/Printed Name/Affiliation: Gil Lt									Temperature upon arrival: 0.5°C Thermometer #: DC Tech: Date: 6/7/13

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	Control Number:	Preservative: (below)
6.6.13 - 6.6.13	1425 - 1025	✓		6 half gallon	007			X	X				7520	1C

Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Gil Lt IEDCC	6-7-13	0950		6-7-13	0950
Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Relinquished by/Affiliation:	Date: 6-7-13	Time: 1320	Received by/Affiliation:	Date: 6/7/13	Time: 1320

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# X5130

Client: EDCC/El Dorado Chemical Company

Address: 4500 Northwest Ave El Dorado AR 71731

NPDES#AR0000752 Outfall 007

Technicians: EGB/AH/LC/GW

Test initiated: Date 6/7/13 Time 1615

Test terminated: Date 6/9/13 Time 1445

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 1002	Alkalinity 1002	Tech
C7520	9.1/112.0%	Y/20 8.1/97.1%	LO.01	NO	3.0	N/A	1680.0	0	LC
↓	9.7/120.1%	Y/20 7.9/98.6%	↓	↓	↓	↓			EGB
				↓		↓			

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	3504						48.0	28.0	AH
↓	↓								

Test Species Information

Test Species Info.	Species: D.Duboscqui ID#: BA/F3.J4	Species: P.promelas ID#: BA/553/3	Species: ID#:	Species: ID#:
Age	<24h	10days		
Test Container Size	30ml	250ml		
Test volume	25ml	200ml		
Feeding: Type	YCT. Algae	Artemia		
Amount	Fed 7hrs prior to test initiation			
Aeration?	NA	NA		
Amount				
Condition of survivors	Good 6/9/13	Good		

Comments:

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

Project# X5130

Client El Dorado Chemical

Sample Description 007

Test started: Date 6/7/13 Time 1615

Test ended: Date 6/9/13 Time 1420

Test Species D. pulex ID# BA J3-J4

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

Time: 0hour 1615 24hour 1410 48hour 1420 72hour — 96hour —

Temperature (^0C): 0hour 24 24hour 24.4 48hour 24.4 72hour — 96hour —

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0	A	NA	8	6	6			8.1	7.9/8.5	7.9			7.3	7.4/7.5	7.4			167	220/[illegible]	203		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	7																	
	E		8	8	8																	
32	A		8	8	8			8.1	7.9/8.2	8.0			6.2	6.3/5.8	6.8			138	[illegible]	194		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								LC	JW/EB	JW			LC	JW/EB	JW			LC	JW/EB	JW		

ACUTE2 020809 Rev.

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

Project# X5130
Client El Dorado Chemical
Sample Description 007

Test started: Date 6/7/13 Time 1615
Test ended: Date 6/9/13 Time ~~1620~~ 1420 SW 6/9/13
Test Species D. pulex ID# BA/I3-J4

Technician: 0hour AH 24hour SW 48hour SW 72hour — 96hour —
Time: 0hour 1615 24hour 1410 48hour 1420 72hour — 96hour —
Temperature (^{0}C): 0hour 24 24hour 24.4 48hour 24.4 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	8	8			8.1	7.8/7.9	7.9			5.1	6.4/4.8	6.7			903	853/883	970		
	B		8	8	7																	
	C		8	8	7																	
	D		8	8	6																	
	E		8	8	6																	
50	A		8	3	0			8.1	7.7/7.9	8.0			4.6	5.1/4.6	4.8			1054	1029/1084	1142		
	B		8	2	0																	
	C		8	1	0																	
	D		8	2	0																	
	E		8	3	0																	
Chemistry Tech prerenewal/postrenewal								LC	SW/AH	SW			LC	SW/SW	SW			LC	SW/SW	SW		

ACUTE2 020809 Rev.

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

Project# X5130

Client El Dorado Chemical

Sample Description 007

Test started: Date 6/7/13 Time 1615

Test ended: Date 6/9/13 Time 1420

Test Species D. pulex ID# BAL I3-J4

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

Time: 0hour 1615 24hour 1410 48hour 1420 72hour — 96hour —

Temperature (°C): 0hour 24 24hour 24.4 48hour 24.4 72hour — 96hour —

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
56	A	NA	8	0	–			8.1	7.7/7.9	8.0			4.9	4.8/4.6	4.7			1136	1134/1160	1272		
	B		8	0	–																	
	C		8	3	0																	
	D		8	2	0																	
	E		8	2	0																	
75	A		8	0	–			8.1	7.8				4.6	4.8				1446	1284			
	B		8	0	–																	
	C		8	0	–																	
	D		8	0	–																	
	E		8	0	–																	
Chemistry Tech prerenewal/postrenewal								LC	gw/gw	gw			LC	gw/gw	gw			LC	gw/gw	gw		

ACUTE2 020809 Rev.

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

Project# X5130

Client El Dorado Chemical

Test started: Date 6/7/13 Time 1615

Test ended: Date 6/9/13 Time 1430

Sample Description 007

Test Species D. pulex ID# BAL 13-34

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

Time: Ohour 1615 24hour 1410 48hour 1430 72hour ____ 96hour ____

Temperature (°C): Ohour 24 24hour 24.4 48hour 24.4 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	0	-			8.1	7.8				4.5	4.6				1899	1613			
	B		8	0	-																	
	C		8	0	-																	
	D		8	0	-																	
	E		8	0	-																	
100	A		8	8	7			8.0	7.9/8.1	7.8			6.2	6.2/6.1	5.9			1848	1644/1617	2020		
pH Adj	B		8	8	6																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	7	7																	
Chemistry Tech prerenewal/postrenewal								LC	SW/EOB	SW			LC	SW/EOB	SW			LC	SW/EOB	SW		

ACUTE2 020809 Rev.

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

Project# X5130

Client El Dorado Chemical

Sample Description 007

Test started: Date 6/7/13 Time 1645

Test ended: Date 6/9/13 Time 1445

Test Species P. promelas ID# 52813

Technician: 0hour JC 24hour SW 48hour SW 72hour — 96hour —

Time: 0hour 1645 24hour 1500 48hour 1445 72hour — 96hour —

Temperature (°C): 0hour 24.0 24hour 24.5 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			8.1	7.6/8.5	7.8			7.3	7.3/7.5	7.2			167	1806/1802	1795		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
32	A		8	8	7			8.1	7.7/8.2	7.8			6.2	6.4/5.8	6.5			738	728/717	746		
	B		8	8	8																	
	C		8	8	4																	
	D		8	7	7																	
	E		8	7	7																	
Chemistry Tech prerenewal/postrenewal								JC	SW/BB	SW			JC	SW/BB	SW			JC	SW/BB	SW		

ACUTE2 020809 Rev.

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

Project# X5130

Client El Dorado Chemical

Sample Description 007

Test started: Date 6/7/13 Time 1645

Test ended: Date 6/9/13 Time 1445

Test Species P. promelas ID# BAL 5283

Technician:	Ohour SC	24hour SW	48hour SW	72hour	96hour	
Time:	Ohour 1645	24hour 1500	48hour 1445	72hour	96hour	
Temperature (°C):	Ohour 24.0	24hour 24.5	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
42	A		8	0	-			8.1	7.5				8.1	8.2				903	884			
	B		8	0	-																	
	C		8	0	-																	
	D		8	0	-																	
	E		8	0	-																	
50	A		8	0	-			8.1	7.6				7.6	7.8				1054	1027			
	B		8	0	-																	
	C		8	0	-																	
	D		8	0	-																	
	E		8	0	-																	
Chemistry Tech prerenewal/postrenewal								SC	SW				SC	SW				SC	SW			

ACUTE2 020809 Rev.

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

Project# X5130

Client El Dorado Chemical

Sample Description 007

Test started: Date 6/7/13 Time 1645

Test ended: Date 6/9/13 Time 1445

Test Species P. promelas ID# Batch 52813

Technician: Ohour LC 24hour BW 48hour BW 72hour ____ 96hour ____

Time: Ohour 1645 24hour 1500 48hour 1445 72hour ____ 96hour ____

Temperature (°C): Ohour 24.0 24hour 24.5 48hour 24.5 72hour ____ 96hour ____

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
		NA	0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
56	A		8	0	-			8.1	7.3				4.9	4.7				1136	1113			
	B		8	0	-																	
	C		8	0	-																	
	D		8	0	-																	
	E		8	0	-																	
75	A		8	0	-			8.1	7.6				4.6	4.3				1446	1414			
	B		8	0	-																	
	C		8	0	-																	
	D		8	0	-																	
	E		8	0	-																	
Chemistry Tech prerenewal/postrenewal								LC	BW				LC	BW				LC	BW			

ACUTE2 020809 Rev.

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

Project# X5130

Client El Dorado Chemical

Sample Description 007

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

Time: Ohour 1645 24hour 1510 48hour 1445 72hour ____ 96hour ____

Temperature (°C): Ohour 24.0 24hour 24.8 48hour 24.5 72hour ____ 96hour ____

Test started: Date 6/7/13 Time 1645

Test ended: Date 6/9/13 Time 1445

Test Species P. promelas ID# BAL-5813

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
		N/A							7.5					4.9	SW 6/9/13				1795			
100	A		8	0	-			8.1	7.2				4.5	5.1				1879	1845	SW 6/9/13		
	B		8	0	-			SW 6/9/13														
	C		8	0	-																	
	D		8	0	-																	
	E		8	0	-																	
									7.2										1875	SW 6/9/13		
100 PH Adj	A		8	8	8			8.0	7.5	7.5			6.2	5.9	SW 6/9/13			1898	1875	1920		
	B		8	6	5			SW 6/9/13						6.1	6.4				1845			
	C		8	7	6																	
	D		8	8	8																	
	E		8	8	7																	
Chemistry Tech prerenewal/postrenewal								JC	SW EAB	SW			JC	SW EAB	H			JC	SW EAB	SW		

ACUTE2 020809 Rev.

APPENDIX C
STATISTICAL ANALYSIS

Daphnid Acute Test-48 Hr Survival

Start Date:	6/7/2013	Test ID:	X5130DP	Sample ID:	7
End Date:	6/9/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	6/7/2013	Protocol:	EPAAW02-EPA/821/R-02-01	Test Species:	CD-Ceriodaphnia dubia
Comments:					

Conc-%	1	2	3	4	5
D-Control	0.7500	1.0000	1.0000	0.8750	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
42	1.0000	0.8750	0.8750	0.7500	0.7500
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	0.8750	0.7500	1.0000	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	1.2872	1.0472	1.3931	12.116	5		
32	1.0000	1.0811	1.3931	1.3931	1.3931	0.000	5	32.50	17.00
42	0.8500	0.9189	1.1813	1.0472	1.3931	12.150	5	22.50	17.00
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	0.9000	0.9730	1.2504	1.0472	1.3931	11.683	5	25.50	17.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.96419	0.905	-0.3098	-0.2239
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: EVB 6/11/13

Daphnid Acute Test-48 Hr Survival

Start Date:	6/7/2013	Test ID:	X5130DP	Sample ID:	7
End Date:	6/9/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	6/7/2013	Protocol:	EPAAW02-EPA/821/R-02-01	Test Species:	CD-Ceriodaphnia dubia
Comments:					

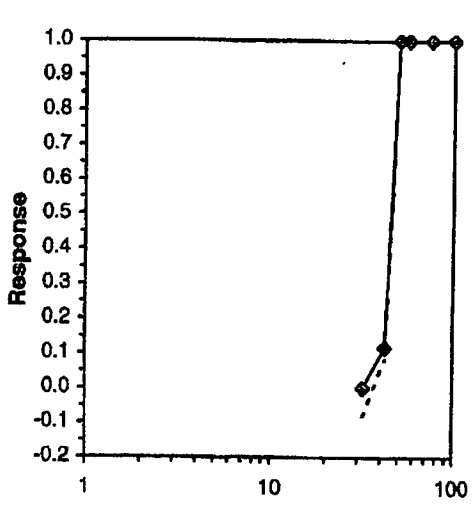
Conc-%	1	2	3	4	5
D-Control	0.7500	1.0000	1.0000	0.8750	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
42	1.0000	0.8750	0.8750	0.7500	0.7500
50	0.0000	0.0000	0.0000	0.0000	0.0000
56	0.0000	0.0000	0.0000	0.0000	0.0000
75	0.0000	0.0000	0.0000	0.0000	0.0000
100	0.0000	0.0000	0.0000	0.0000	0.0000
100PHADJ	0.8750	0.7500	1.0000	1.0000	0.8750

			Transform: Arcsin Square Root					Number	Total
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Resp	Number
D-Control	0.9250	1.0000	1.2872	1.0472	1.3931	12.116	5	3	40
32	1.0000	1.0811	1.3931	1.3931	1.3931	0.000	5	0	40
42	0.8500	0.9189	1.1813	1.0472	1.3931	12.150	5	6	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	0.9000	0.9730	1.2504	1.0472	1.3931	11.683	5		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.96419	0.905	-0.3098	-0.2239
Equality of variance cannot be confirmed				

Trimmed Spearman-Karber

Trim Level	EC50	95% CL	
0.0%	44.646	43.645	45.670
5.0%	45.061	43.818	46.339
10.0%	45.283	43.471	47.170
20.0%	45.300	44.789	45.817
Auto-0.0%	44.646	43.645	45.670



ToxCalc v5.0.23

Reviewed by: SCB 10/11/13

Acute Fish Test-48 Hr Survival

Start Date:	6/7/2013	Test ID:	X5130PP	Sample ID:	7
End Date:	6/9/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	6/7/2013	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	0.8750	1.0000	0.7500	0.8750	0.8750
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	0.6250	0.7500	1.0000	0.8750

			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	0.8750	0.8750	1.2137	1.0472	1.3931	10.087	5	17.50	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	0.8500	0.8500	1.1909	0.9117	1.3931	17.846	5	20.00	18.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.86271	0.881	-0.2573	0.56254
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)

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

ToxCalc v5.0.23

Reviewed by: ELB 10/11/13

Acute Fish Test-48 Hr Survival

Start Date:	6/7/2013	Test ID:	X5130PP	Sample ID:	7
End Date:	6/9/2013	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	6/7/2013	Protocol:	EPAAW02-EPA/821/R-02-01	Test Species:	PP-Pimephales promelas
Comments:					

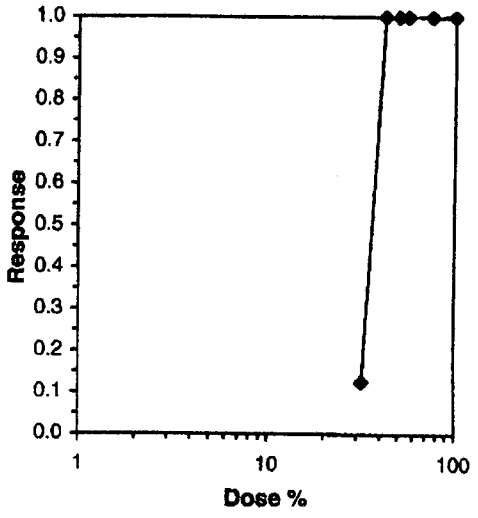
Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000
32	0.8750	1.0000	0.7500	0.8750	0.8750
42	0.0000	0.0000	0.0000	0.0000	0.0000
50	0.0000	0.0000	0.0000	0.0000	0.0000
56	0.0000	0.0000	0.0000	0.0000	0.0000
75	0.0000	0.0000	0.0000	0.0000	0.0000
100	0.0000	0.0000	0.0000	0.0000	0.0000
100PHADJ	1.0000	0.6250	0.7500	1.0000	0.8750

			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	0.8750	0.8750	1.2137	1.0472	1.3931	10.087	5	5	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	0.8500	0.8500	1.1909	0.9117	1.3931	17.846	5		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.86271	0.881	-0.2573	0.56254
Equality of variance cannot be confirmed				

Trimmed Spearman-Karber

Trim Level	EC50	95% CL	
0.0%			
5.0%			
10.0%			
20.0%	35.955	35.294	36.629
Auto-12.5%	35.955	35.294	36.629

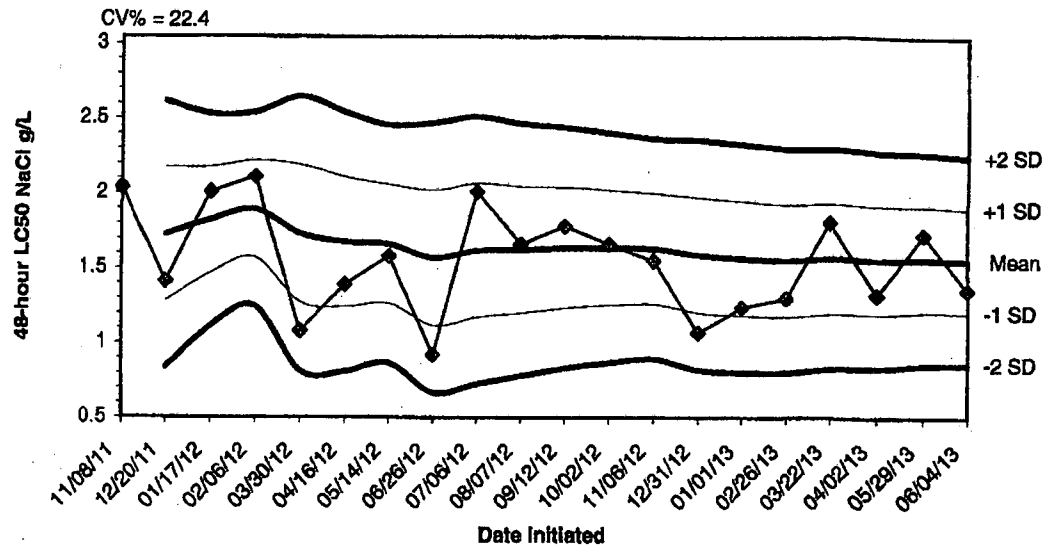


ToxCalc v5.0.23

Reviewed by: EQB 6/11/13

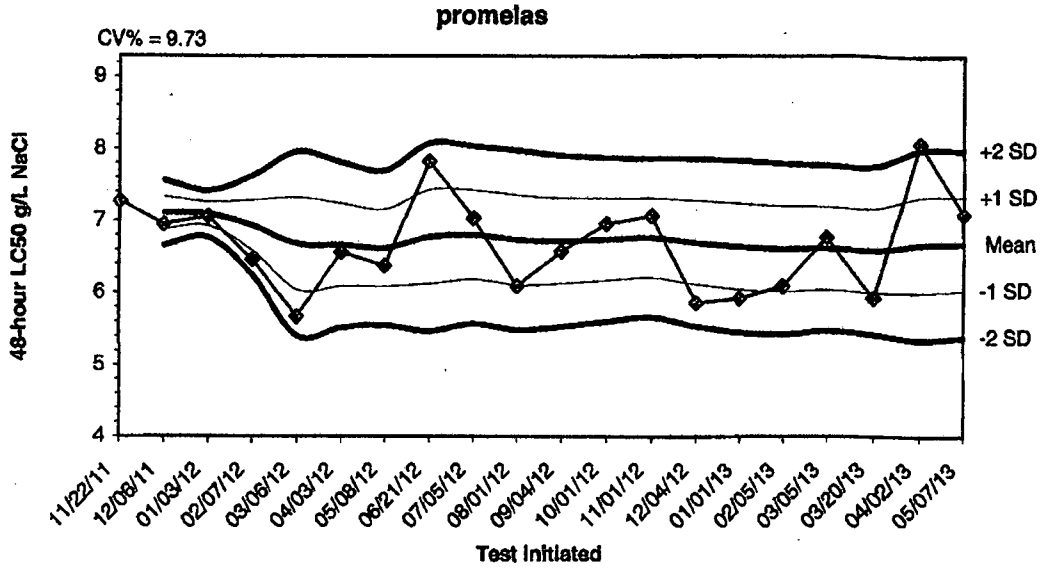
APPENDIX D
QUALITY ASSURANCE CHARTS

2013 48-hour Reference Toxicant Test Results Using Daphnia pulex



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

2013 48-Hour Acute Reference Toxicant Test Results for Pimephales promelas



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
11/22/11	7.2700					
12/06/11	6.9500	7.1100	6.8837	6.6575	7.3363	7.5625
01/03/12	7.0600	7.0933	6.9308	6.7682	7.2559	7.4185
02/07/12	6.4600	6.9350	6.5916	6.2483	7.2784	7.6217
03/06/12	5.6700	6.6820	6.0429	5.4038	7.3211	7.9602
04/03/12	6.5600	6.6617	6.0879	5.5140	7.2355	7.8093
05/08/12	6.3700	6.6200	6.0847	5.5494	7.1553	7.6906
06/21/12	7.8200	6.7700	6.1176	5.4652	7.4224	8.0748
07/05/12	7.0300	6.7989	6.1825	5.5662	7.4153	8.0316
08/01/12	6.0900	6.7280	6.1051	5.4823	7.3509	7.9737
09/04/12	6.5700	6.7136	6.1208	5.5280	7.3064	7.8993
10/01/12	6.9500	6.7333	6.1640	5.5947	7.3027	7.8720
11/01/12	7.0600	6.7585	6.2059	5.6533	7.3110	7.8636
12/04/12	5.8600	6.6943	6.1116	5.5289	7.2770	7.8596
01/01/13	5.9200	6.6427	6.0467	5.4507	7.2387	7.8347
02/05/13	6.0900	6.6081	6.0160	5.4238	7.2003	7.7924
03/05/13	6.7700	6.6176	6.0430	5.4683	7.1923	7.7670
03/20/13	5.9200	6.5789	5.9976	5.4164	7.1602	7.7414
04/02/13	8.0700	6.6574	5.9970	5.3366	7.3178	7.9782
05/07/13	7.0900	6.6790	6.0290	5.3790	7.3290	7.9790

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: 6/6/13** **To: 6/6/13**
From: **To:**
Test Initiated: 6/7/13
Dilution Water Used: **Receiving Water** **Reconstituted Water**

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	32	42	50	56	75	100	100 pH adj
24-hour	A	75.0	100	100	37.5	0	0	0	100
	B	100	100	100	25.0	0	0	0	100
	C	100	100	100	12.0	37.5	0	0	100
	D	100	100	100	25.0	25.0	0	0	100
	E	100	100	100	37.5	25.0	0	0	87.5
48-hour	A	75.0	100	100	0	0	0	0	87.5
	B	100	100	87.5	0	0	0	0	75.0
	C	100	100	87.5	0	0	0	0	100
	D	87.5	100	75.0	0	0	0	0	100
	E	100	100	75.0	0	0	0	0	87.5
	Mean	92.5	100	85.0	0	0	0	0	90.0

1. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate: Is the mean survival at 48 hours significantly different (p=.05) than the control survival for the % effluent corresponding to:
a.) LOW FLOW OR CRITICAL DILUTION (100%) 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} = 44.6% effluent
95 % confidence limits: 45.7 - 43.6
Method of LC_{50} calculation: Spearman Karber
3. If you answered NO to 1.a) enter (P) otherwise enter (F): F
4. Enter response to item 3 on DMR Form, parameter TEM3D
5. If you answered NO to 1.b) enter (P) otherwise enter (F): N/A
6. Enter response to item 5 on DMR Form, parameter TFM3D

Biomonitoring
Daphnia 48 hour Acute Static Renewal
Chemical Parameters Chart*

Permittee: El Dorado Chemical - Outfall 007
NPDES Number: AR0000752/ AFIN 70-00040
Contact: Larken Pennington
Analyst: Haughton, Williams

Sample Collected	**From:**	**Date 6/6/13**	**Time 1225**
	To:	**Date 6/6/13**	**Time 2025**
Test Begin		**Date 6/7/13**	**Time 1615**
Test End		**Date 6/9/13**	**Time 1420**

Parameter	D.O.			Temperature			Alkalinity			Hardness			pH		
Dilut./Time	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs
0	8.1	8.5	7.9	24.0	24.4	24.4	28.0			48.0			7.3	7.5	7.4
32	8.1	8.2	8.0	24.0	24.4	24.4							6.2	5.8	6.8
42	8.1	7.9	7.9	24.0	24.4	24.4							5.1	4.8	6.7
50	8.1	7.9	8.0	24.0	24.4	24.4							4.6	4.8	4.8
56	8.1	7.9	8.0	24.0	24.4	24.4							4.6	4.6	4.7
75	8.1	7.8		24.0	24.4								4.6	4.8	
100	8.1	7.8		24.0	24.4		0.0			680.0			4.5	4.6	
100 UV	8.0	8.1	7.8	24.0	24.4	24.4							6.2	6.1	5.9

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

Acute Forms
Pimephales promelas Survival

Permittee: El Dorado Chemical - Outfall 007
NPDES Permit Number: AR0000752/ AFIN 70-00040
Composite Collected **From: 6/6/13** **To: 6/6/13**
From: **To:**
Test Initiated: 6/7/13
Dilution Water Used: **Receiving Water** **Reconstituted Water**

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	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	75.0
	C	100	100	0	0	0	0	0	87.5
	D	100	87.5	0	0	0	0	0	100
	E	100	87.5	0	0	0	0	0	100
48-hour	A	100	87.5	0	0	0	0	0	100
	B	100	100	0	0	0	0	0	62.5
	C	100	75.0	0	0	0	0	0	75.0
	D	100	87.5	0	0	0	0	0	100
	E	100	87.5	0	0	0	0	0	87.5
	Mean	100	87.5	0	0	0	0	0	85.0

1. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate: Is the mean survival at 48 hours significantly different (p=.05) than the control survival for the % effluent corresponding to:
a.) LOW FLOW OR CRITICAL DILUTION (100%) **X YES** **NO**
b.)½ LOW FLOW OR 2X CRITICAL DILUTION (N/A%) **YES** **NO**
2. Enter percent effluent corresponding to the LC_{50} below:
LC_{50} = 36.0% effluent
95 % confidence limits: 36.6 - 35.3
Method of LC_{50} calculation: Trimmed Spearman Karber
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
Pimephales promelas 48 hour Acute Static Renewal
Chemical Parameters Chart*

Permittee: El Dorado Chemical - Outfall 007
NPDES Number: AR0000752/ AFIN 70-00040
Contact: Larken Pennington
Analyst: Cotty, Williams
Sample Collected **From:** **Date 6/6/13** **Time 1225**
To: **Date 6/6/13** **Time 2025**
Test Begin **Date 6/7/13** **Time 1645**
Test End **Date 6/9/13** **Time 1445**

Parameter	D.O.			Temperature			Alkalinity			Hardness			pH		
Dilut./Time	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs
0	8.1	8.5	7.8	24.0	24.5	24.5	28.0			48.0			7.3	7.5	7.2
32	8.1	8.2	7.8	24.0	24.5	24.5							6.2	5.8	6.5
42	8.1	7.5		24.0	24.5								5.1	5.2	
50	8.1	7.6		24.0	24.5								4.6	4.8	
56	8.1	7.5		24.0	24.5								4.6	4.7	
75	8.1	7.6		24.0	24.5								4.6	4.5	
100	8.1	7.5		24.0	24.5		0.0			680.0			4.5	4.8	
100 UV	8.0	8.1	7.5	24.0	24.5	24.5							6.2	6.1	6.4

*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#: X5130

Chain of Custody Documents Checked by: DH 6/12/13
Technician/Date

Raw Data Documents Checked by: DH 6/12/13
Technician/Date

Statistical Analysis Package Checked by: EGB 6/11/13
Quality Manager/Date

Quality Control Data Checked by: EGB 6/11/13
Quality Manager/Date

Report Checked by: EGB 6/20/13
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.

Quality Manager

6/20/13
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: 24JUL13
ActWgt: 3.0 LB
CAD: 5887030/INET3370

Delivery Address Bar Code

Ref #
Invoice #
PO #
Dept #

SHIP TO: (870) 863-1125 BILL SENDER

ADEQ - Water Division Enforcement
ADEQ - Water Division Enforcement
5301 NORTHSHORE DR

NORTH LITTLE ROCK, AR 72118

THU - 25 JUL 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **7963 0197 6558**

X2 LITA

72118
AR-US
LIT

518G1/AA04/93AB

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

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Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.