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

EL DORADO

CHEMICAL COMPANY

January 23, 2013

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

RE: NPDES Permit AR0000752 Discharge Monitoring Report for period ending December 31, 2012.

Enclosed you will find the Discharge Monitoring Report ending December 31, 2012.
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: *Dec-12*

Type of Violation	*Permit Limit*	*Date of Violation*	*Cause of Violation*	*Corrective Action or Other Narrative*
Outfall 001 / pH Maximum (9.2 su)	pH Maximum - 9.0 su	12/1/12, 12/2/12, 12/7/12	Due to warmer temperatures the beginning of the month, an algal growth in EDCC's final lake that discharges to Outfall 001 led to a high pH.	EDCC personnel monitored pH closely and it was back within limits and stayed within limits the rest of the month.
Outfall 001 / TDS Monthly Average (270.0 mg/L)	237.0 mg/L - Monthly Average	12/3/2012	Unknown	
Outfall 006 / Zinc Monthly Average (340.9 ug/L)	115.62 ug/L Monthly Average	12/4/2012	Unknown	EDCC continues to monitor and evaluate potential sources of the Zinc exceedance.
Outfall 006 / Zinc Daily Max (617.0 ug/L)	231.99 ug/L Daily Max	12/4/2012	Unknown	EDCC continues to monitor and evaluate potential sources of the Zinc exceedance.
Outfall 006 / Lead Monthly Average (57.4 ug/L)	3.8 ug/L Monthly Average	12/4/2012	Unknown	EDCC will continue to monitor and evaluate potential sources of the Lead exceedance.
Outfall 006 / Lead Daily Max (111.0 ug/L)	7.62 ug/L Daily Max	12/4/2012	Unknown	EDCC continues to monitor and evaluate potential sources of the Lead exceedance.
Outfall 006 / TDS Monthly Average (280 mg/L)	291 mg/L Monthly Average	12/4/2012	Unknown	EDCC has land applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006 / TDS Daily Max (500 mg/L)	436.5 mg/L Daily Max	12/4/2012	Unknown	EDCC has land applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 007 / Zinc Monthly Average (172.9 ug/L)	115.62 ug/L Monthly Average	12/4/2012	Unknown	EDCC continues to monitor and evaluate potential sources of the Zinc exceedance.
Outfall 007 / Zinc Daily Max (291.0 ug/L)	231.99 ug/L Daily Max	12/4/2012	Unknown	EDCC continues to monitor and evaluate potential sources of the Zinc exceedance.
Outfall 007 / Lead Monthly Average (30.02 ug/L)	3.8 ug/L Monthly Average	12/4/2012	Unknown	EDCC will continue to monitor and evaluate potential sources of the Lead exceedance.
Outfall 007 / Lead Daily Max (57.10 ug/L)	7.62 ug/L Daily Max	12/4/2012	Unknown	EDCC will continue to monitor and evaluate potential sources of the Lead exceedance.
Outfall 007 / TDS Monthly Average (1031.5 mg/L)	291 mg/L Monthly Average	12/4/2012	Unknown	EDCC has land applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.
Outfall 007 / TDS Daily Max (2000 mg/L)	436.5 mg/L Daily Max	12/4/2012	Unknown	EDCC has land applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.

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

Gregory Withrow

Signature / Date 1/23/13

Bio-Analytical Laboratories (BAL)
ADEQ Certificate #88-0630
Project X4957

Bio-Analytical Laboratories' Executive Summary

Permittee: El Dorado Chemical Company
4500 Northwest Avenue
El Dorado, AR 71731
Project #: X4957
Outfall: 001
Permit #: AR0000752/ AFIN #70-00040
Contact: Larken Pennington
Test Dates: December 11 - 18, 2012
Test Type: Chronic Static Renewal Survival and Reproduction Test using *Ceriodaphnia dubia* (EPA Method 1002.0).
Chronic Static Renewal Survival and Growth Test using *Pimephales promelas* (EPA Method 1000.0).

Results:

For *Ceriodaphnia dubia:*

1. If the NOEC for survival is less than the critical dilution (100%), enter a "1"; otherwise, enter a "0" for Parameter TLP3B - 0.
2. If the NOEC for reproduction is less than the critical dilution, enter a "1"; otherwise, enter a "0" for Parameter TGP3B - 1.
3. Report the NOEC value for survival, Parameter TOP3B - 100%. (based on 100% UV)
4. Report the NOEC value for reproduction, Parameter TPP3B - 0%.
5. Report the largest % coefficient of variation between the control and the critical dilution, Parameter TQP3B - 26.53%.

Note: Treating with UV light reduced the lethal effect but not the nonlethal effect.

For *Pimephales promelas:*

1. If the NOEC for survival is less than the critical dilution (100%), enter a "1";otherwise, enter a "0" for Parameter TLP6C - 0.
2. If the NOEC for growth is less than the critical dilution, enter a "1";otherwise, enter a "0" for Parameter TGP6C- 0.
3. Report the NOEC value for survival, Parameter TOP6C - 100% (based on 100% UV)
4. Report the NOEC value for growth, Parameter TPP6C - 100% (based on 100% UV)
5. Report the largest % coefficient of variation between the control and the critical dilution, Parameter TQP6C - 24.15%

Note: Treating with UV light reduced the toxic effects.

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

Bio-Analytical Laboratories

3240 Spurgin Road
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(318) 745-2772
1-800-259-1246
Fax: (318) 745-2773

THE RESULTS OF TWO CHRONIC DEFINITIVE TOXICITY TESTS FOR OUTFALL 001

AT

EL DORADO CHEMICAL COMPANY
El Dorado, Arkansas

NPDES #AR0000752
AFIN #70-00040

EPA Methods 1000.0 and 1002.0

Project X4957

Test Dates: December 11 - 18, 2012

Report Date: January 4, 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 X4957

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ADEQ #88-0630
Project X4957

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 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, 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.

2.4 Test Concentrations

The test concentrations used in the chronic toxicity tests were 100, 75, 56, 42 and 32 percent effluent, and a reconstituted water control. The critical dilution was 100 percent effluent. The *Ceriodaphnia* test was conducted using 10 replicates of one animal each for a total of 10 animals per concentration. The fathead minnow test was conducted using five replicates of eight animals each for a total of 40 animals per concentration.

2.5 Sample Collection

Three 24-hour composite samples of Outfall 001 were collected by El Dorado Chemical personnel on December 10, 12 and 14, 2012. Upon collection and completion of each composite, the samples were chilled to 4^0 Celsius. The samples were delivered to the laboratory by BAL personnel.

2.6 Sample Preparation

Upon arrival, the samples were logged in, given an identification number and refrigerated unless needed. Prior to use, the samples were warmed to 25 ± 1^0 Celsius. Total residual chlorine levels were measured with a Capital Controls^R amperometric titrator and recorded if present. Total ammonia levels were measured using a HACH^R test strip. Portions of the effluent were treated with an 18 watt ultraviolet light (UV) at a rate of 113 ml per minute. An extra 100 percent concentration was run in the tests to determine if any toxicity was due to a potential pathogen. 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.

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ADEQ #88-0630
Project X4957

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 and growth data was analyzed using Dunnett's Test. The test endpoints in the reference toxicant tests and any other quality control test endpoints were obtained by approved EPA methods of analysis.

3.0 Results and Discussion

The results of the *Ceriodaphnia dubia* test can be found in Table 1. After seven days of exposure, 100 percent survival occurred in the control, 50 percent survival occurred in the 100 percent critical dilution and 70 percent survival occurred in the 100 percent dilution treated with UV light. The average number of neonates per female after three broods in the control was 16.5, while the average number of neonates in the UV treated critical dilution was zero. The No-Observed-Effect-Concentration (NOEC) for survival and reproduction in this test was 100 and zero percent effluent, respectively (p=.05). Treating with UV light reduced the lethal effect but not the non-lethal effect (i.e. lack of survival and reproduction).

The fathead minnow test results can be found in Table 2. Ninety-seven-point-five percent survival occurred in the control, 55 percent survival occurred in the critical dilution and 85 percent survival occurred in the UV treated critical dilution after seven days of exposure. The average weight gained per minnow in the control was 0.545 milligram (mg), while the average gained in the UV treated critical dilution was 0.413 mg. The NOEC for survival and growth in this test was 100 percent effluent (p=.05). Treating with UV light reduced the lethal and non-lethal effects (i.e. lack of survival and growth) in this test, thus the NOEC values were based upon the UV-treated dilution.

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Project X4957

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		16.5	16.5	
32.0	80.0		8.6	6.9	*
42.0	90.0		4.4	4.0	*
56.0	70.0		2.9	2.0	*
75.0	60.0	*	2.2	1.3	*
100.0	50.0	*	2.2	1.1	*
100.0 UV	70.0		0.0	0.0	*

*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	92.5		0.545/0.593+	
32.0	92.5		0.495	
42.0	75.0		0.415	
56.0	57.5		0.275	*
75.0	87.5		0.420	
100.0	55.0	*	0.267	*
100.0 UV	85.0		0.413	

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

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

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ADEQ #88-0630
Project X4957

4.0 Conclusions

The three composite samples of Outfall 001 collected from El Dorado Chemical Company, El Dorado, Arkansas, on December 10, 12 and 14, 2012, were found to be lethally toxic to the *Ceriodaphnia dubia* test organisms in the 100 percent critical dilution after seven days of exposure; however, treating the sample with UV light reduced the lethal effect in this test (p=.05). Nonlethal effects (i.e., lack reproduction) were noted in the *Ceriodaphnia dubia* test (p=.05). Treating the sample with UV light did not reduce the nonlethal effect in the cladoceran test (p=.05). The samples were found to be lethally toxic to the fathead minnow test organisms in the 100 percent dilution after seven days of exposure (p=05). Treating with UV light reduced the lethal and nonlethal effects (i.e. lack of survival and growth) in the fathead minnow test (p=.05).

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ADEQ #88-0630
Project X4957

5.0 References

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

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

APPENDIX A
CHAIN-OF-CUSTODY DOCUMENTS

Bio-Analytical Laboratories
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(318) 745-2772, Fax (318) 745-2773
bioanalytical@att.net

NELAP 01975, ADEQ #88-0630, EPA LA00917

CHAIN OF CUSTODY

Laboratory Use Only:

Company: El Dorado Chemical Company	**Phone:** (870) 863-1484
Address: 4500 Northwest Avenue, El Dorado, AR 71731	**Fax:** (870) 863-1499
Permit #: AR0000752	**Purchase Order:**
Sampler's Signature/Printed Name/Affiliation: KarenPennington/KarenPennington/EDCC	

Analysis:

Date Start / Date End	Time Start / Time End	C	G	# containers	Sample Identification	Chronic Ceriodaphnia	Chronic minnow	Acute minnow(fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	Fecal Coliform	Total Coliform	Lab Control Number:	Project Number: / Temp. upon arrival: / Preservative: (below)
12/9/12 - 12/10/12	8:30 - 8:30	X		8	001	X	X							C6592	X4957 / ice

Relinquished by/Affiliation: KarenPennington/EDCC	**Date:** 12/10/12	**Time:** 1030	**Received by/Affiliation:**	**Date:** 12/10/12	**Time:** 1030
Relinquished by/Affiliation:	**Date:**	**Time:**	**Received by/Affiliation:**	**Date:**	**Time:**
Relinquished by/Affiliation:	**Date:** 12/10/12	**Time:** 1250	**Received by/Affiliation:** R Callahan	**Date:** 12/10/12	**Time:** 1250

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

Comments:

Temperature upon arrival: 3.5
Thermometer #: 19
Tech: RC
Date: 12/10/12

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bioanalytical@att.net

CHAIN OF CUSTODY

NELAP 01975, ADEQ #88-0630, EPA LA00917

Laboratory Use Only:

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

Address: 4500 Northwest Avenue, El Dorado, AR 71731
Fax: (870) 863-1499

Permit #: AR0000752
Purchase Order:

Sampler's Signature/Printed Name/Affiliation: Karen Pennington / Karen Pennington EDCC

Project Number: X4957

Temp. upon arrival:

Analysis:

Date Start / Date End	Time Start / Time End	C	G	# containers	Sample Identification	Chronic Ceriodaphnia	Chronic minnow	Acute minnow(fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	Fecal Coliform	Total Coliform	Lab Control Number:	Preservative: (below)
12-11-12 - 12-12-12	8:30 - 8:30	X		8 half gallon jugs	001	X	X							C6605	ice

Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Karen Pennington EDCC	12/12/12	1050	[signature]	12/12/12	1050
[signature]	12/12/12	1300	R Callahan	12/12/12	1300

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

Comments:

Temperature upon arrival: 4.2
Thermometer #: ~~4.2~~ 29 RC 12/12/12
Tech: RC
Date: 12/12/12

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NELAP 01975, ADEQ #88-0630, EPA LA00917

CHAIN OF CUSTODY

Laboratory Use Only:

Company: El Dorado Chemical Company	**Phone:** (870) 863-1484
Address: 4500 Northwest Avenue, El Dorado, AR 71731	**Fax:** (870) 863-1499
Permit #: AR0000752	**Purchase Order:**
Sampler's Signature/Printed Name/Affiliation: Larken Pennington / Larken Pennington / EDCC	

Analysis:

Date Start / Date End	Time Start / Time End	C	G	# containers	Sample Identification	Chronic Ceriodaphnia	Chronic minnow	Acute minnow(fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	Fecal Coliform	Total Coliform	Lab Control Number:	Preservative: (below)
12-13-12 - 12-14-12	8:30 - 8:30	X		8	001	X	X							C6630	ice

Project Number: X4957

Temperature upon arrival: 2.8°C
Thermometer #: 29
Tech: Lara
Date: 12/14/12

Relinquished by/Affiliation: Larken Pennington / EDCC	**Date:** 12/14/12	**Time:** 1015	**Received by/Affiliation:**	**Date:** 12/14/12	**Time:** 1015
Relinquished by/Affiliation:	**Date:**	**Time:**	**Received by/Affiliation:**	**Date:**	**Time:**
Relinquished by/Affiliation:	**Date:** 12/14/12	**Time:** 1230	**Received by/Affiliation:** Emeagler	**Date:** 12/14/12	**Time:** 1230

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

Comments:

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST

Project# X4957 Date start: 12/11/12 Date end: 12/18/12

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

Adults isolated: Date 12/10/12 Time: 2300

Neonates collected: Date 12/11/12 Time: 0615 Board: V2b5
Dissolved Oxygen Meter: Model YSI55D Serial #06E2089 AU
pH Meter: Model Orion 230A+ Serial #105253
Conductivity Meter: Model Control Company Serial# 80277924
Amperometric Titrator: Model Fischer-Porter Serial # 92W445766

Effluent Initial D.O. (mg/L & %)/Tech	Aerate?/Minutes /Final D.O. (mg/L & %)/Tech	Receiving Water Initial D.O. (mg/L & %)/Tech	Aerate?/Minutes /Final D.O. (mg/L & %)/Tech
0. 10.8/128.4%/RC	0. Y/20/8.6/99.4%/RC	0. N/A	0. N/A
1. 10.6/124.5%/RC	1. Y/20/8.5/99.2%/RC	1.	1.
2. 11.4/132.9%/AH	2. Y/20/8.5/98.6%/RC	2.	2.
3. 12.0/138.3%/RC	3. Y/20/8.5/98.4%/RC	3.	3.
4. 12.1/145.1%/RC	4. Y/20/8.3/97.9%/RC	4.	4.
5. 12.0/147.7%/RC	5. Y/20/8.2/97.6%/RC	5.	5.
RC 12/16/12 6. 9.1/110.0%/RC	6. Y/20/8.4/99.5%/RC	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/RC	1. No/RC	1. 0.25/RC	1. C6592 12/11/12
2. <0.01/AH	2. No/AH	2. 0.25/RC	2. ~~C6605~~ C6605 12/13/12 RC 12/13/12
3. <0.01/RC	3. No/RC	3. 0.25/RC	3. C6630 12/15/12

Comments:
12/14/12 - filtered effluent for c dubia through RC rinsed 60um plankton net to remove outside organisms. RC

BIO-ANALYTICAL LABORATORIES
NUMBER NEONATES PER BROOD CERIODAPHNIA

Project # X4957 Test Dates 12/11-18/12

Client El Dorado Chemical

Replicate	% Concentration						
	0	32	42	56	75	100	100uM
A	18	14	5	2	X	4	X
B	21	X	6	2	1	2	0
C	13	11	4	1	X	2	0
D	17	7	5	4	X	1	0
E	18	9	3	X	4	2	0
F	15	6	5	7	2	X	0
G	23	8	4	2	3	X	0
H	16	X	5	2	1	X	0
I	17	7	X	X	X	X	X
J	7	7	3	X	2	X	X
Surviving Mean	16.5	8.6	4.4	2.9	2.2	2.2	0.0
Total Mean	16.5	6.9	4.0	2.0	1.3	1.1	0.0
CV%*	26.53	30.95	22.81	71.24	53.96	49.78	0.00

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

Key: M=male; X=dead adult

Calculated by: AH 12/18/12

Calculations checked by: RC 12/20/12

BIO-ANALYTICAL LABORATORIES
CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST

Project# X4957 Test started: Date 12/11/12 Time 1250
Client El Dorado Chemical Test ended: Date 12/18/12 Time 1250

Technician:	Day0 LM	1 AH	2 AM	3 RC	4 RC	5 RC	6 RC	7 RC	8
Time:	Day0 1230	1 1515	2 1615	3 1335	4 1425	5 1350	6 1420	7 1250	8
Temperature:	Day0 24.4	1 24.3	2 24.4	3 24.2	4 24.1	5 24.2	6 24.3	7 24.6	8

% Conc.	Day	A	B	C	D	E	F	G	H	I	J	#Live Adults	Total Live Neonates
0	1	0										10	
	2	0										10	
	3	0										10	
	4	2	3	3	2	2	3	2	2	0	0	10	
	5	4	6	3	2	5	4	0	4	4	2	10	
	6	6	0	0	0	0	6	8	1	0	5	10	
	7	12	12	7	13	11	8	13	9	13	0	10	
	8												
32	1	0										10	
	2	0										10	
	3	0	X	C					X	0		8	
	4	0		C						0		8	
	5	4		3	2	4	3	2		0	0	8	
	6	0		0	0	0	0	3		3	4	8	
	7	10		8	5	5	3	3		4	3	8	
	8												
42	1	0										10	
	2	0										10	
	3	0										10	
	4	0								X	0	9	
	5	2	3	3	2	1	3	0	0		0	9	
	6	0	0	0	0	2	0	4	4		3	9	
	7	3	3	1	3	0	2	0	1		0	9	
	8												
56	1	0										10	
	2	0				X	0				X	8	
	3	0					C			X		7	
	4	0			2		2	0	2			7	
	5	0	0	0	0		3	0	0			7	
	6	0	0	0	0		0	2	0			7	
	7	2	2	1	2		2	0	0			9	
	8												
75	1	0										10	
	2	0										10	
	3	0		X	0					X	0	8	
	4	0X	0		0X	C					0	6	
	5		0			0	2	0	0		0	6	
	6		1			2	0	0	0		2	6	
	7		0			2	0	3	1		0	6	
	8												
100	1	0										10	
	2	0								X	0	9	
	3	0						X	X		0	7	
	4	0	0	0	0	0	0X				0	6	
	5	2	0	0	0	d2					0	6	
	6	0	0	0	0	0					0X	5	
	7	2	2	2	1	0						5	
	8												

"RC 12/16/12

Key: X=dead adult; X°=adult had n neonates before death; M=male File:Cerio2

BIO-ANALYTICAL LABORATORIES
CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST

Project# X4957 Test started: Date 12/11/12 Time 1250
Client El Dorado Chemical Test ended: Date 12/18/12 Time 1250

Technician:	Day0 JMM	1 AH	2 JMM	3 RC	4 RC	5 RC	6 RC	7 RC	8
Time:	Day0 1250	1 1515	2 1615	3 1335	4 1425	5 1350	6 1420	7 1250	8
Temperature:	Day0 24.4	1 24.3	2 24.4	3 24.2	4 24.1	5 24.2	6 24.3	7 24.6	8

% Conc.	Day	A	B	C	D	E	F	G	H	I	J	#Live Adults	Total Live Neonates
100 uv. trtd	1	9										10	
	2		0									9	
	3		0							X	0	8	
	4		0								X	7	
	5		0	0	0	0	0	0	0			7	
	6		0	0	0	0	2	0	0			7	
	7		0	0	0	0	0	0	0			7	
	8												
	1–8												
	1–8												
	1–8												
	1–8												
	1–8												

Key: X=dead adult; X"=adult had n neonates before death; M=male File:Cerio2

BIO-ANALYTICAL LABORATORIES 7-DAY WATER QUALITY DATA

Project# X4957 Test started: Date 12/1/10 Time 1250
Client El Dorado Chemical Test ended: Date 12/8/10 Time 1250
Organism C. dubia

Day/# water used	0 3419	1	2	3	3422	5	6	7	8
Concentration: Control Soft									
pH	7.8	7.7 / 7.9	8.1 / 7.9	7.8 / 7.9	8.0 / 7.9	7.7 / 7.9	7.8 / 7.8	7.6	
DO (mg/l)	8.6	8.5 / 8.5	8.3 / 8.3	8.3 / 8.5	8.2 / 8.4	8.2 / 8.3	8.4 / 8.4	8.0	
Cond (umhos/cm)	173.2	175.5	177.8	189.2	170.5	171.6	173.2		
Alkalinity (mg/L)	38.0				32.0				
Hardness (mg/L)	58.0				68.0				
Concentration: 32									
pH	7.9	7.9 / 7.9	7.8 / 8.2	7.7 / 8.0	8.0 / 8.1	7.8 / 8.1	7.8 / 8.1	7.6	
DO (mg/l)	8.5	8.5 / 8.5	8.4 / 8.3	8.3 / 8.5	8.2 / 8.3	8.2 / 8.3	8.3 / 8.4	8.0	
Cond (umhos/cm)	258	264	265	273	257	262	262		
Concentration: 42									
pH	7.9	7.9 / 7.9	7.9 / 8.2	7.9 / 8.1	8.1 / 8.3	7.8 / 8.3	7.8 / 8.2	7.6	
DO (mg/l)	8.5	8.5 / 8.5	8.4 / 8.3	8.3 / 8.5	8.3 / 8.3	8.1 / 8.3	8.3 / 8.4	8.0	
Cond (umhos/cm)	285	286	286	298	286	285	287		
Concentration: 56									
pH	8.0	8.0 / 8.0	8.0 / 8.3	7.8 / 8.1	8.0 / 8.3	7.9 / 8.4	7.9 / 8.3	7.7	
DO (mg/l)	8.5	8.6 / 8.5	8.4 / 8.4	8.3 / 8.5	8.3 / 8.3	8.2 / 8.3	8.3 / 8.4	7.9	
Cond (umhos/cm)	323	324	322	331	323	321	326		
Concentration: 75									
pH	8.0	8.0 / 8.1	8.0 / 8.4	7.8 / 8.3	8.0 / 8.4	7.9 / 8.4	7.9 / 8.4	7.7	
DO (mg/l)	8.5	8.6 / 8.5	8.4 / 8.4	8.3 / 8.4	8.4 / 8.2	8.1 / 8.2	8.3 / 8.4	8.0	
Cond (umhos/cm)	373	374	371	378	374	370	378		
Concentration: 100									
pH	8.1	8.0 / 8.1	8.1 / 8.5	7.9 / 8.5	8.0 / 8.6	8.0 / 8.5	7.9 / 8.5	7.8	
DO (mg/l)	8.4	8.7 / 8.5	8.5 / 8.4	8.3 / 8.4	8.3 / 8.2	8.1 / 8.3	8.3 / 8.4	8.0	
Cond (umhos/cm)	440	439	437	441	440	438	445		
Tech-prerenewal	RC	AH	RC	RC	RC	RC	RC	RC	
Tech-postrenewal	———	RC	RC	RC	RC	RC	AH		
Hardness (mg/l)	48.0		40.0		88.0				
Alkalinity (mg/l)	44.0		48.0		48.0				

Key: prerenewal/postrenewal

BIO-ANALYTICAL LABORATORIES 7-DAY WATER QUALITY DATA

Project# X4957 Test started: Date 12/11/12 Time 1250
Client El Dorado Chemical Test ended: Date 12/18/12 Time 1250
Organism C.dubia

Day/# water used	0	1	2	3	4	5	6	7	8
Concentration: ~~Control~~ 100uu-Hrd (AH 12/11/12)									
pH	7.9	7.9/7.9	8.1/8.3	8.0/8.1	8.1/8.2	7.9/8.3	7.9/7.9	7.7	
DO(mg/l)	8.2	8.5/8.2	8.1/8.2	7.9/8.1	8.0/8.1	8.0/8.0	8.2/8.2	7.8	
Cond(umhos/cm)	444	446	439	438	430	430	446		
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	RC	AH	RC	RC	RC	RC	RC	RC	
Tech-postrenewal		RC	RC	RC	RC	RC	AH		
Hardness(mg/l)									
Alkalinity(mg/l)									

Omit AH 12/11/12

Key: prerenewal/postrenewal

BIO-ANALYTICAL LABORATORIES
PIMEPHALES PROMELAS SURVIVAL AND GROWTH DATA SHEET

Project# X4957 Date started: 12/11/12 Date ended 12/18/12

Client/Contact EDCC/El Dorado Chemical
Address 4500 Northwest Avenue El Dorado AR 71731
NPDES# AR0000752 AFIN70-00040
Sample Description 001 Dilution Water Soft Reconstituted
Test Temperature (°C) 25+1° Celsius Technicians EGB/AH/LGZ/RC
Test organism age <48hr Vendor/ID# ABS/730

Feeding Times

Technician/Time/Amount (per replicate)

Day	AM	NOON	PM
0			AH/1510/0.20ml
1	RC/0825/0.10ml	RC/1135/0.10ml	AH/1045/0.10ml
2	RC/0735/0.10ml		RC/1715/0.20ml
3	RC/0820/0.10ml	RC/1300/0.10ml	RC/1500/0.10ml
4	RC/0830/0.10ml	RC/1205/0.10ml	RC/1515/0.10ml
5	RC/0900/0.10ml	RC/1140/0.10ml	RC/1605/0.10ml
6	RC/0810/0.10ml	Shay/1100/0.10ml	Shay/1035/0.10ml

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

	Effluent Initial DO (mg/L&%)/Tech	Aerate?/Minutes /Final DO (mg/L & %)/Tech	Receiving Water Initial DO (mg/L & %)/Tech	Aerate?/Minutes /Final DO (mg/L & %)/Tech
0.	10.8/128.4%/RC	Y/20/8.6/99.4%/RC	NA	
1.	10.6/124.5%/RC	Y/20/8.5/99.2%/RC		
2.	11.4/132.9%/RC	Y/20/8.5/98.6%/RC		
3.	12.0/138.3%/RC	Y/20/8.5/98.4%/RC		
4.	12.1/145.1%/RC	Y/20/8.3/97.9%/RC		
5.	12.0/147.7%/RC	Y/20/8.2/97.6%/RC		
6.	9.1/110.0%/AH	4/00/8.4/99.5%/AH		

	Total Residual Chlorine (mg/L)/Tech	Dechlorinated? Amount?/Tech	Ammonia (NH3) (mg/L)/Tech	BAL Sample # Date in use
1.	<0.01/RC	No/RC	0.25/RC	C6592 12/11/12
2.	<0.01/RC	No/RC	0.25/RC	C6605 12/13/12
3.	<0.01/RC	No/RC	0.25/RC	C6630 12/15/12

Comments:
12/15/12 RC C6605 C6630 - 12/15/12 - filtered effluent thru 60um plankton net to remove outside organisms - RC

BIO-ANALYTICAL LABORATORIES 7-DAY CHRONIC MINNOW SURVIVAL DATA

Project# X4957
Client: El Dorado Chemical

Test started: Date 12/11/12 Time 1515
Test ended: Date 12/18/12 Time 1010

Technician: Day0 JBM	1 EH	2 RC	3 RC	4 RC	5 RC	6 JBM	7 JBM
Time: Day0 1515	1 1445	2 1700	3 1230	4 1500	5 1115	6 1045	7 1010
Temperature Day0 25.3	1 25	2 24.9	3 25.2	4 25.1	5 24.9	6 25	7 24.9

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	7	5
	B	8	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8	8
32	A	8	8	8	8	8	8	8	7
	B	8	8	8	8	8	8	8	7
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	8	7	7	7
	E	8	8	8	8	8	8	8	8
42	A	8	8	8	8	6	6	6	6
	B	8	8	8	8	8	7	7	7
	C	8	8	8	8	7	6	5	5
	D	8	8	8	7	RC 12/13/12 8/7	7	7	7
	E	8	8	8	8	7	5	5	5
56	A	8	8	8	7	5	4	3	3
	B	8	8	8	8	6	6	6	6
	C	8	8	8	6	6	6	6	6
	D	8	8	8	7	7	5	5	5
	E	8	8	8	5	4	4	3	3
75	A	8	8	8	8	7	7	7	7
	B	8	8	8	8	8	7	7	7
	C	8	8	8	8	8	7	7	7
	D	8	8	8	8	8	8	8	8
	E	8	8	8	7	6	6	6	6
100	A	8	8	8	RC 12/13/12 8/7	8/7	6	6	6
	B	8	8	8	8	7	6	6	6
	C	8	8	8	4	3	3	3	3
	D	8	8	8	4	3	3	3	3
	E	8	8	8	7	6	4	4	4

File: Minnow2

BIO-ANALYTICAL LABORATORIES 7-DAY CHRONIC MINNOW SURVIVAL DATA

Project# X4957
Client El Dorado Chemical

Test started: Date 2/11/12 Time 1515
Test ended: Date 2/18/12 Time 1010

	Day 0	1	2	3	4	5	6	7
Technician:	[illegible]	CH	RC	RC	RC	RC	[illegible]	[illegible]
Time:	1515	1445	1700	1230	1200	1115	1015	1010
Temperature	25.3	25	24.9	25.2	~~18~~ 25.1 RC 2/13/12	24.9	25	24.4

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

File: Minnow2

BIO-ANALYTICAL LABORATORIES MINNOW LARVAL GROWTH DATA SHEET

Project#/Client X4957/EDC Test Dates 12/11/12 - 12/18/12

Oven Temperature (° Celsius) 98°C

Conc. %	Replicate/ Pan number	Wt. of pan(g)/ Date weighed: 12/17/12 Tech: JBM	Wt. of pan + larvae(g)/ Date weighed: 12/18/12 Tech: JBM	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	1.3231	1.3263	0.0032	8	0.400	52 0.640
	B 32	1.3255	1.3302	0.0047	8	0.588	
	C 33	1.3289	1.3281	0.0042	8	0.525	
	D 34	1.3244	1.3294	0.0050	8	0.625	
	E 35	1.3002	1.3049	0.0047	8	0.588	
32	A 36	1.3015	1.3052	0.0037	8	0.463	
	B 37	1.2972	1.3007	0.0035	8	0.438	
	C 38	1.3114	1.3160	0.0046	8	0.575	
	D 39	1.3303	1.3339	0.0036	8	0.450	
	E 40	1.3035	1.3079	0.0044	8	0.550	
42	A 41	1.3188	1.3174	0.0036	8	0.450	
	B 42	1.2976	1.3013	0.0037	8	0.463	
	C 43	1.3901	1.3927	0.0026	8	0.325	
	D 44	1.3015	1.3054	0.0037	8	0.463	
	E 45	1.3091	1.3119	0.0028	8	0.350	
56	A 46	1.3005	1.3015	0.0010	8	0.125	
	B 47	1.3120	1.3155	0.0035	8	0.438	
	C 48	1.3153	1.3183	0.0030	8	0.375	
	D 49	1.3026	1.3052	0.0026	8	0.325	
	E 50	1.3136	1.3145	0.0009	8	0.113	
75	A 51	1.3018	1.3051	0.0033	8	0.413	
	B 52	1.3047	1.3081	0.0034	8	0.425	
	C 53	1.3105	1.3137	0.0032	8	0.400	
	D 54	1.2934	1.2973	0.0039	8	0.488	
	E 55	1.3179	1.3209	0.0030	8	0.375	
100	A 56	1.3060	1.3084	0.0024	8	0.300	
	B 57	1.4074	1.4105	0.0031	8	0.388	
	C 58	1.3066	1.3081	0.0015	8	0.188	
	D 59	1.3147	1.3164	0.0017	8	0.213	
	E 60	1.3098	1.3118	0.0020	8	0.250	

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

Calculated by: AH 12/19/12 Calculations checked by: EOB 12/26/12

BIO-ANALYTICAL LABORATORIES MINNOW LARVAL GROWTH DATA SHEET

Project#/Client X4957/EDC Test Dates 12/11/12 - 12/18/12

Oven Temperature (° Celsius) 98°

Conc. %	Replicate/ Pan number	Wt. of pan(g)/ Date weighed: 12/17/12 Tech: BBM	Wt. of pan + larvae(g)/ Date weighed: 12/19/12 Tech: BBM	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	1.3196	1.3230	0.0034	8	0.425	
	B 62	1.3024	1.3067	0.0043	8	0.538	
	C 63	1.3062	1.3099	0.0037	8	0.463	
	D 64	1.2969	1.2991	0.0022	8	0.275	
	E 65	1.3112	1.3141	0.0029	8	0.363	
	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						

DMSO

12/17/12 OBB

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

Calculated by: AH 12/19/12 Calculations checked by: OBB 12/26/12

BIO-ANALYTICAL LABORATORIES 7-DAY WATER QUALITY DATA

Project# X4957 Test started: Date 8/19 Time 1515
Client El Dorado Chemical Test ended: Date 8/26 Time 1010
Organism P. promelas

Day/# water used	8419	1	2	3	4 3422	5	6	7	8
Concentration: Control Soft									
pH	7.8	7.6 / 7.9	7.6 / 7.9	7.6 / 7.9	7.6 / 7.9	7.5 / 7.9	7.4 / 7.8	7.4	
DO(mg/l)	8.6	7.4 / 8.5	7.2 / 8.3	7.3 / 8.5	7.1 / 8.4	6.9 / 8.3	7.1 / 8.4	6.7	
Cond(umhos/cm)	173.2	175.5	177.8	189.2	170.5	171.6	173.2		
Alkalinity(mg/L)	32.0				32.0				
Hardness (mg/L)	52.0				68.0				
Concentration: 32									
pH	7.9	7.6 / 7.9	7.4 / 8.2	7.6 / 8.0	7.5 / 8.1	7.3 / 8.1	7.4 / 8.1	7.4	
DO(mg/l)	8.5	7.3 / 8.5	7.1 / 8.3	7.2 / 8.5	7.0 / 8.3	6.5 / 8.3	7.0 / 8.4	7.1	
Cond(umhos/cm)	258	264	265	273	257	262	262		
Concentration: 42									
pH	7.9	7.6 / 7.9	7.5 / 8.2	7.6 / 8.1	7.5 / 8.3	7.5 / 8.3	7.4 / 8.2	7.4	
DO(mg/l)	8.5	7.3 / 8.5	7.1 / 8.3	7.3 / 8.5	7.1 / 8.3	6.6 / 8.3	6.9 / 8.4	6.9	
Cond(umhos/cm)	285	286	286	298	286	285	287		
Concentration: 56									
pH	8.0	7.6 / 8.0	7.5 / 8.3	7.6 / 8.1	7.6 / 8.3	7.5 / 8.4	7.4 / 8.3	7.5	
DO(mg/l)	8.5	7.3 / 8.5	7.1 / 8.4	7.3 / 8.5	7.1 / 8.3	6.7 / 8.3	6.8 / 8.4	6.8	
Cond(umhos/cm)	323	324	322	331	323	321	326		
Concentration: 75									
pH	8.0	7.6 / 8.1	7.6 / 8.4	7.6 / 8.3	7.6 / 8.4	7.5 / 8.4	7.4 / 8.4	7.5	
DO(mg/l)	8.5	7.2 / 8.5	7.1 / 8.4	7.1 / 8.4	7.0 / 8.2	6.9 / 8.2	6.8 / 8.4	6.6	
Cond(umhos/cm)	373	374	371	378	374	370	378		
Concentration: 100									
pH	8.1	7.6 / 8.1	7.6 / 8.5	7.7 / 8.5	7.6 / 8.6	7.5 / 8.5	7.4 / 8.5	7.4	
DO(mg/l)	8.4	7.2 / 8.5	7.2 / 8.4	7.1 / 8.4	7.0 / 8.2	6.8 / 8.3	6.8 / 8.4	6.6	
Cond(umhos/cm)	440	439	437	441	440	438	445		
Tech-prerenewal	RC	AM	RC	RC	RC	RC	dm		
Tech-postrenewal	—	RC	RC	RC	RC	RC	AM	dm	
Hardness(mg/l)	48.0		40.0		68.0				
Alkalinity(mg/l)	44.0		48.0		48.0				

Key: prerenewal/postrenewal

BIO-ANALYTICAL LABORATORIES 7-DAY WATER QUALITY DATA

Project# X4957 Test started: Date 2/11/12 Time 1515
Client El Dorado Chemical Test ended: Date 2/18/12 Time 1010
Organism P. promelas

Day/# water used	0	1	2	3	4	5	6	7	8
Concentration: Control 100 UV trt'd									
pH	7.9	7.6/7.9	7.5/8.3	7.7/8.1	7.7/8.2	6.5/8.3	7.5/7.9	7.4	
DO(mg/l)	8.2	7.4/8.2	6.6/8.2	7.2/8.1	7.1/8.1	6.5/8.0	6.6/8.2	6.4	
Cond(umhos/cm)	444	446	439	438	430	430	446		
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	RC	AH	RC	RC	RC	RC	[illegible]		
Tech-postrenewal	—	RC	RC	RC	RC	RC	AH	[illegible]	
Hardness(mg/l)									
Alkalinity(mg/l)									

Omit AH 2/10/12

Key: prerenewal/postrenewal

APPENDIX C
STATISTICAL ANALYSIS

Ceriodaphnia Survival and Reproduction Test-7 Day Survival

Start Date:	12/11/2012	Test ID:	X4957CD	Sample ID:	1
End Date:	12/18/2012	Lab ID:	ADEQ 880630	Sample Type:	EFF2-Industrial
Sample Date:	12/11/2012	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	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
42	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000
56	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	0.0000	0.0000
75	0.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
100UV	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000

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	0.8000	0.8000	2	8	10	10	0.2368	0.0500
42	0.9000	0.9000	1	9	10	10	0.5000	0.0500
56	0.7000	0.7000	3	7	10	10	0.1053	0.0500
*75	0.6000	0.6000	4	6	10	10	0.0433	0.0500
*100	0.5000	0.5000	5	5	10	10	0.0163	0.0500
100UV	0.7000	0.7000	3	7	10	10	0.1053	0.0500

Hypothesis Test (1-tail, 0.05)

Fisher's Exact Test indicates significant differences
Treatments vs D-Control

EGB 12/16/12

Reviewed by:_____

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	12/11/2012	Test ID:	X4957CD	Sample ID:	1
End Date:	12/18/2012	Lab ID:	ADEQ 880630	Sample Type:	EFF2-Industrial
Sample Date:	12/11/2012	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	21.000	13.000	17.000	18.000	15.000	23.000	16.000	17.000	7.000
32	14.000	11.000	7.000	9.000	6.000	8.000	7.000	7.000		
42	5.000	6.000	4.000	5.000	3.000	5.000	4.000	5.000	3.000	
56	2.000	2.000	1.000	4.000	7.000	2.000	2.000			
75	1.000	4.000	2.000	3.000	1.000	2.000				
100	4.000	2.000	2.000	1.000	2.000					
100UV	0.000	0.000	0.000	0.000	0.000	0.000	0.000			

			Transform: Untransformed					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	16.500	1.0000	16.5000	7.0000	23.0000	26.533	10		
*32	8.625	0.5227	8.6250	6.0000	14.0000	30.948	8	42.50	49.00
*42	4.444	0.2694	4.4444	3.0000	6.0000	22.810	9	45.00	60.00
*56	2.857	0.1732	2.8571	1.0000	7.0000	71.239	7	28.50	38.00
*75	2.167	0.1313	2.1667	1.0000	4.0000	53.956	6	21.00	29.00
*100	2.200	0.1333	2.2000	1.0000	4.0000	49.793	5	15.00	20.00
*100UV	0.000	0.0000	0.0000	0.0000	0.0000	0.000	7	28.00	38.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.05)	1.26856	0.895	-0.5511	6.30017
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)

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

ToxCalc v5.0.23

Reviewed by: EBB 12/16/12

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	12/11/2012	Test ID:	X4957CD	Sample ID:	1
End Date:	12/18/2012	Lab ID:	ADEQ 880630	Sample Type:	EFF2-Industrial
Sample Date:	12/11/2012	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	21.000	13.000	17.000	18.000	15.000	23.000	16.000	17.000	7.000
32	14.000	0.000	11.000	7.000	9.000	6.000	8.000	0.000	7.000	7.000
42	5.000	6.000	4.000	5.000	3.000	5.000	4.000	5.000	0.000	3.000
56	2.000	2.000	1.000	4.000	0.000	7.000	2.000	2.000	0.000	0.000
75	0.000	1.000	0.000	0.000	4.000	2.000	3.000	1.000	0.000	2.000
100	4.000	2.000	2.000	1.000	2.000	0.000	0.000	0.000	0.000	0.000
100UV	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

			Transform: Untransformed					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	16.500	1.0000	16.5000	7.0000	23.0000	26.533	10		
*32	6.900	0.4182	6.9000	0.0000	14.0000	62.783	10	61.50	74.00
*42	4.000	0.2424	4.0000	0.0000	6.0000	42.492	10	55.00	74.00
*56	2.000	0.1212	2.0000	0.0000	7.0000	108.012	10	55.50	74.00
*75	1.300	0.0788	1.3000	0.0000	4.0000	109.087	10	55.00	74.00
*100	1.100	0.0667	1.1000	0.0000	4.0000	124.575	10	55.00	74.00
*100UV	0.000	0.0000	0.0000	0.0000	0.0000	0.000	10	55.00	74.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.05)	1.48583	0.895	-0.6033	4.1087
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: EVB 12/26/12

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date: 12/11/2012 Test ID: X4957CD Sample ID: 1
End Date: 12/18/2012 Lab ID: ADEQ 880630 Sample Type: EFF2-Industrial
Sample Date: 12/11/2012 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	21.000	13.000	17.000	18.000	15.000	23.000	16.000	17.000	7.000
32	14.000	0.000	11.000	7.000	9.000	6.000	8.000	0.000	7.000	7.000
42	5.000	6.000	4.000	5.000	3.000	5.000	4.000	5.000	0.000	3.000
56	2.000	2.000	1.000	4.000	0.000	7.000	2.000	2.000	0.000	0.000
75	0.000	1.000	0.000	0.000	4.000	2.000	3.000	1.000	0.000	2.000
100	4.000	2.000	2.000	1.000	2.000	0.000	0.000	0.000	0.000	0.000
100UV	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	16.500	1.0000	16.5000	7.0000	23.0000	26.533	10			
*32	6.900	0.4182	6.9000	0.0000	14.0000	62.783	10	8.082	2.347	2.7879
*42	4.000	0.2424	4.0000	0.0000	6.0000	42.492	10	10.524	2.347	2.7879
*56	2.000	0.1212	2.0000	0.0000	7.0000	108.012	10	12.208	2.347	2.7879
*75	1.300	0.0788	1.3000	0.0000	4.0000	109.087	10	12.797	2.347	2.7879
*100	1.100	0.0667	1.1000	0.0000	4.0000	124.575	10	12.965	2.347	2.7879
*100UV	0.000	0.0000	0.0000	0.0000	0.0000	0.000	10	13.892	2.347	2.7879

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.05)	1.48583	0.895	-0.6033	4.1087
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	2.78786	0.16896	330.495	7.05397	2.2E-21	6, 63
Treatments vs D-Control						

EVB 12/26/12
Reviewed by:

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	12/11/2012	Test ID:	X4957CD	Sample ID:	1
End Date:	12/18/2012	Lab ID:	ADEQ 880630	Sample Type:	EFF2-Industrial
Sample Date:	12/11/2012	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	21.000	13.000	17.000	18.000	15.000	23.000	16.000	17.000	7.000
32	14.000	0.000	11.000	7.000	9.000	6.000	8.000	0.000	7.000	7.000
42	5.000	6.000	4.000	5.000	3.000	5.000	4.000	5.000	0.000	3.000
56	2.000	2.000	1.000	4.000	0.000	7.000	2.000	2.000	0.000	0.000
75	0.000	1.000	0.000	0.000	4.000	2.000	3.000	1.000	0.000	2.000
100	4.000	2.000	2.000	1.000	2.000	0.000	0.000	0.000	0.000	0.000
100UV	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

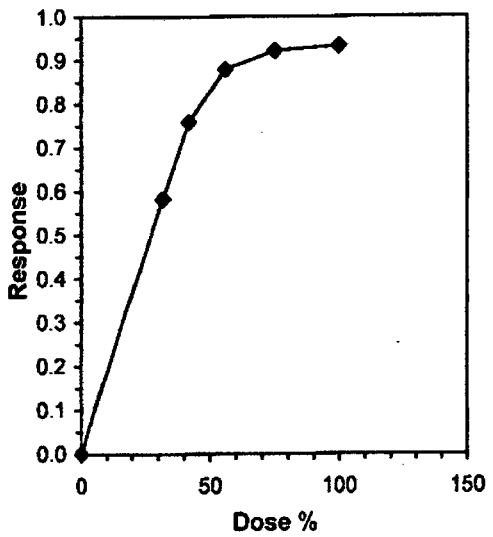
			Transform: Untransformed					Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	16.500	1.0000	16.5000	7.0000	23.0000	26.533	10	16.500	1.0000
32	6.900	0.4182	6.9000	0.0000	14.0000	62.783	10	6.900	0.4182
42	4.000	0.2424	4.0000	0.0000	6.0000	42.492	10	4.000	0.2424
56	2.000	0.1212	2.0000	0.0000	7.0000	108.012	10	2.000	0.1212
75	1.300	0.0788	1.3000	0.0000	4.0000	109.087	10	1.300	0.0788
100	1.100	0.0667	1.1000	0.0000	4.0000	124.575	10	1.100	0.0667
100UV	0.000	0.0000	0.0000	0.0000	0.0000	0.000	10		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.05)	1.31702	0.895	-0.5606	3.12711
Bartlett's Test indicates unequal variances (p = 1.80E-04)	24.4245	15.0863		

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05*	2.750	0.380	2.158	3.535	0.6131
IC10*	5.500	0.760	4.317	7.070	0.6131
IC15*	8.250	1.140	6.475	10.606	0.6131
IC20*	11.000	1.521	8.633	14.141	0.6131
IC25*	13.750	1.901	10.791	17.676	0.6131
IC40*	22.000	3.028	17.266	28.282	0.5781
IC50*	27.500	3.429	21.583	33.643	0.1596

* indicates IC estimate less than the lowest concentration



ToxCalc v5.0.23

Reviewed by: EVB 12/6/12

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:	12/11/2012	Test ID:	X4957PP	Sample ID:	1
End Date:	12/18/2012	Lab ID:	ADEQ 880630	Sample Type:	EFF2-Industrial
Sample Date:	12/11/2012	Protocol:	EPAFW02-EPA/821/R-02-01	Test Species:	PP-Pimephales promelas

Comments:

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

			Transform: Arcsin Square Root					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.9250	1.0000	1.2968	0.9117	1.3931	16.600	5			
32	0.9250	1.0000	1.2829	1.2094	1.3931	7.841	5	0.133	2.409	0.2517
42	0.7500	0.8108	1.0579	0.9117	1.2094	14.081	5	2.286	2.409	0.2517
*56	0.5750	0.6216	0.8648	0.6591	1.0472	22.643	5	4.133	2.409	0.2517
75	0.8750	0.9459	1.2137	1.0472	1.3931	10.087	5	0.795	2.409	0.2517
*100	0.5500	0.5946	0.8396	0.6591	1.0472	23.395	5	4.375	2.409	0.2517
100UV	0.8500	0.9189	1.1813	1.0472	1.3931	12.150	5	1.106	2.409	0.2517

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.94517	0.934	-0.4132	-0.4536
Bartlett's Test indicates equal variances (p = 0.79)	3.17197	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	0.17863	0.19274	0.18034	0.02731	2.0E-04	6, 28

ToxCalc v5.0.23

Reviewed by: EDB 12/26/12

Larval Fish Growth and Survival Test-7 Day Growth

Start Date:	12/11/2012	Test ID:	X4957PP	Sample ID:	1
End Date:	12/18/2012	Lab ID:	ADEQ 880630	Sample Type:	EFF2-Industrial
Sample Date:	12/11/2012	Protocol:	EPAFW02-EPA/821/R-02-01	Test Species:	PP-Pimephales promelas

Comments:

Conc-%	1	2	3	4	5
D-Control	0.4000	0.5875	0.5250	0.6250	0.5875
32	0.4625	0.4375	0.5750	0.4500	0.5500
42	0.4500	0.4625	0.3250	0.4875	0.3500
56	0.1250	0.4375	0.3750	0.3250	0.1125
75	0.4125	0.4250	0.4000	0.4875	0.3750
100	0.3000	0.3875	0.1875	0.2125	0.2500
100UV	0.4250	0.5375	0.4625	0.2750	0.3625
O-SN	0.6400	0.5875	0.5250	0.6250	0.5875

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.5450	1.0000	0.5450	0.4000	0.6250	16.267	5			
32	0.4950	0.9083	0.4950	0.4375	0.5750	12.702	5	0.921	2.443	0.1327
42	0.4150	0.7615	0.4150	0.3250	0.4875	17.485	5	2.394	2.443	0.1327
*56	0.2750	0.5046	0.2750	0.1125	0.4375	53.878	5	4.971	2.443	0.1327
75	0.4200	0.7706	0.4200	0.3750	0.4875	10.005	5	2.302	2.443	0.1327
*100	0.2675	0.4908	0.2675	0.1875	0.3875	29.665	5	5.109	2.443	0.1327
100UV	0.4125	0.7569	0.4125	0.2750	0.5375	24.148	5	2.440	2.443	0.1327
O-SN	0.5930	1.0881	0.5930	0.5250	0.6400	7.503	5	-0.884	2.443	0.1327

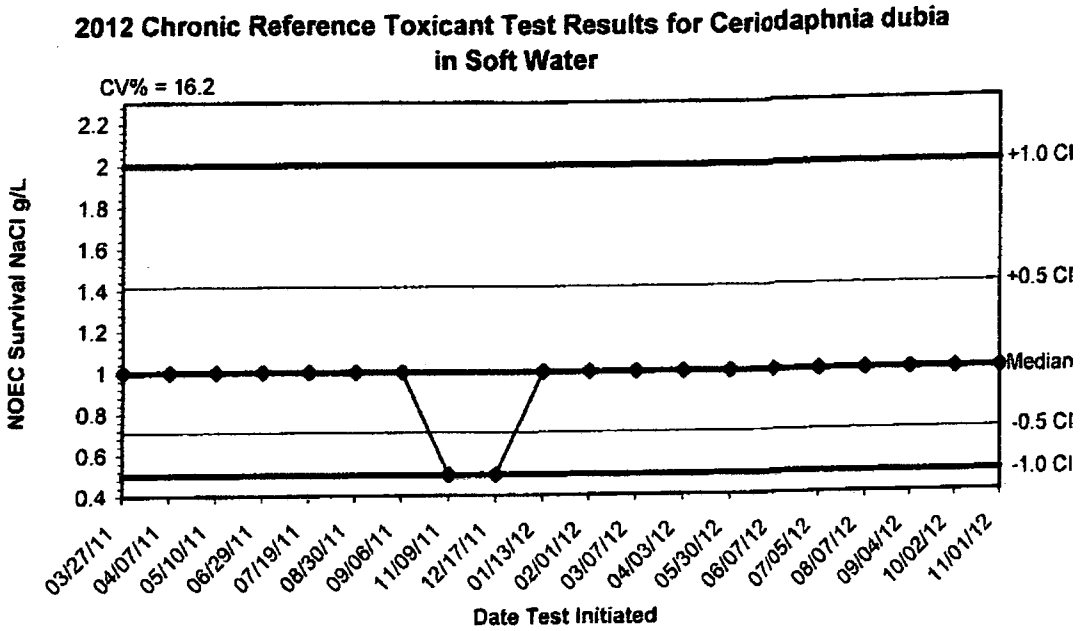
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.97433	0.94	-0.2458	-0.2997
Bartlett's Test indicates equal variances (p = 0.27)	8.81988	18.4753		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test indicates significant differences Treatments vs D-Control	0.13266	0.24341	0.06789	0.00737	3.4E-06	7, 32

ToxCalc v5.0.23

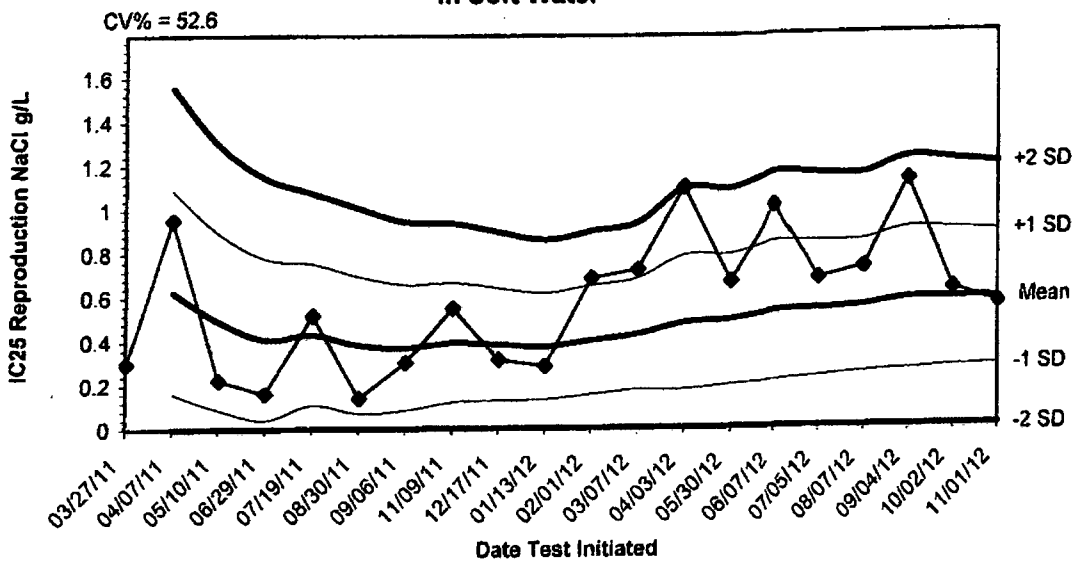
Reviewed by: EVP 12/26/12

APPENDIX D
QUALITY ASSURANCE CHARTS



Dates	Values	Median	-0.5 CI	-1.0 CI	+0.5 CI	+1.0 CI
03/27/11	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
04/07/11	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
05/10/11	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
06/29/11	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
07/19/11	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
08/30/11	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
09/06/11	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
11/09/11	0.5000	1.0000	0.7071	0.5000	1.4142	2.0000
12/17/11	0.5000	1.0000	0.7071	0.5000	1.4142	2.0000
01/13/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
02/01/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
03/07/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
04/03/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
05/30/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
06/07/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
07/05/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
08/07/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
09/04/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
10/02/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
11/01/12	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000

2012 Chronic Reference Toxicant Test Results for Ceriodaphnia dubia in Soft Water



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
03/27/11	0.2984					
04/07/11	0.9552	0.6268	0.1624	0.0000	1.0912	1.5557
05/10/11	0.2227	0.4921	0.0893	0.0000	0.8949	1.2978
06/29/11	0.1608	0.4093	0.0410	0.0000	0.7775	1.1458
07/19/11	0.5187	0.4312	0.1085	0.0000	0.7538	1.0765
08/30/11	0.1390	0.3825	0.0702	0.0000	0.6947	1.0070
09/06/11	0.3034	0.3712	0.0845	0.0000	0.6578	0.9444
11/09/11	0.5489	0.3934	0.1207	0.0000	0.6661	0.9388
12/17/11	0.3138	0.3845	0.1281	0.0000	0.6410	0.8975
01/13/12	0.2835	0.3744	0.1305	0.0000	0.6183	0.8622
02/01/12	0.6864	0.4028	0.1530	0.0000	0.6526	0.9024
03/07/12	0.7233	0.4295	0.1740	0.0000	0.6850	0.9405
04/03/12	1.1000	0.4811	0.1738	0.0000	0.7884	1.0956
05/30/12	0.6660	0.4943	0.1950	0.0000	0.7936	1.0929
06/07/12	1.0102	0.5287	0.2110	0.0000	0.8464	1.1641
07/05/12	0.6765	0.5379	0.2288	0.0000	0.8471	1.1562
08/07/12	0.7250	0.5489	0.2462	0.0000	0.8517	1.1544
09/04/12	1.1229	0.5808	0.2574	0.0000	0.9042	1.2276
10/02/12	0.6225	0.5830	0.2686	0.0000	0.8974	1.2118
11/01/12	0.5553	0.5816	0.2755	0.0000	0.8877	1.1938

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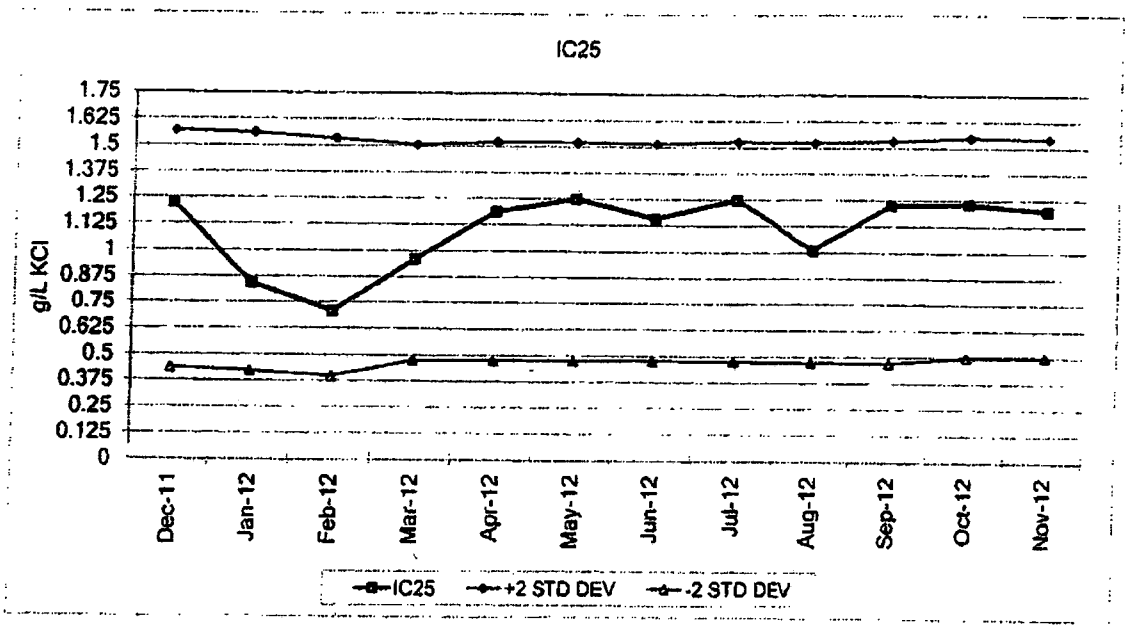
Tel:970/484-5091 Fax:970/484-2514

Pimephales promelas



Chronic 7 Day Survival Test Data

Date	NOEC (g/L KCl)	LOEC (g/L KCl)
Jun-12	0.50	1.0
Jul-12	0.50	1.0
Aug-12	0.50	1.0
Sep-12	0.50	1.0
Oct-12	0.50	1.0
Nov-12	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
Jun-12	1.158	1.256	0.673	0.997	1.516	0.478
Jul-12	1.250	1.250	0.250	1.002	1.529	0.475
Aug-12	1.011	1.394	0.483	0.999	1.524	0.473
Sep-12	1.226	1.265	0.883	1.002	1.533	0.472
Oct-12	1.232	1.261	0.949	1.026	1.550	0.502
Nov-12	1.201	1.265	1.091	1.024	1.545	0.503

**Current Test Dates: 11/7-14/2012

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**	**12/9/12**	**To**	**0830**	**12/10/12**
Composite 2 Collected From	**0830**	**12/11/12**	**To**	**0830**	**12/12/12**
Composite 3 Collected From	**0830**	**12/13/12**	**To**	**0830**	**12/14/12**
Test initiated:	1250 **am/pm**			12/11/12	**date**
Test terminated:	1250 **am/pm**			12/18/12	**date**

Dilution water used: **Receiving** X **Reconstituted**

PERCENT SURVIVAL

Time of Reading	Percent Effluent						
	0	32	42	56	75	100	100 UV
24h	100	100	100	100	100	100	100
48h	100	100	100	80	100	90	90
End of test	100	80	90	70	60	50	70

NUMBER OF YOUNG PRODUCED PER FEMALE @ END OF TEST

Rep	0	32	42	56	75	100	100 UV
A	18	14	5	2	D	4	D
B	21	D	6	2	1	2	0
C	13	11	4	1	D	2	0
D	17	7	5	4	D	1	0
E	18	9	3	D	4	2	0
F	15	6	5	7	2	D	0
G	23	8	4	2	3	D	0
H	16	D	5	2	1	D	0
I	17	7	D	D	D	D	D
J	7	7	3	D	2	D	D
Surv. Mean	16.5	8.6	4.4	2.9	2.2	2.2	0.0
Total Mean	16.5	6.9	4.0	2.0	1.3	1.1	0.0
CV%*	26.53	30.95	22.81	71.24	53.96	49.78	0.00

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

PMSD = 16.9%

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 (based on 100% UV)**
b) NOEC reproduction:	**0% effluent**
c) LOEC survival:	**N/A% effluent**
d) LOEC reproduction:	**32% effluent**

Biomonitoring Form
Chronic Toxicity Summary Form
Ceriodaphnia dubia
Chemical Parameters Chart

ermittee: El Dorado Chemical - Outfall 001
PDES No.: AR0000752/ AFIN 70-00040
ontact: Larken Pennington
nalyst: Haughton, Zeagler, Callahan

Sample No. 1 Collected: Date: 12/10/12 Time: 0830
Sample No. 2 Collected: Date: 12/12/12 Time: 0830
Sample No. 3 Collected: Date: 12/14/12 Time: 0830
Test Begin: Date: 12/11/12 Time: 1250
Test End: Date: 12/18/12 Time: 1250

ilution: 0

Day:	1	2	3	4	5	6	7	Comments
emp (C)	24.3	24.4	24.2	24.1	24.2	24.3	24.6	
O Initial	8.5	8.3	8.3	8.2	8.2	8.4	8.0	
O Final	8.5	8.3	8.5	8.4	8.3	8.4		
H Initial	7.7	8.1	7.8	8.0	7.7	7.8	7.6	
H Final	7.9	7.9	7.9	7.9	7.9	7.8		
lkalinity	32.0			32.0				
ardness	52.0			68.0				
onductivity	175.5	177.8	189.2	170.5	171.6	173.2		
hlorine	<.01			<.01				

Dilution: 56

Day:	1	2	3	4	5	6	7	Comments
Temp (C)	24.3	24.4	24.2	24.1	24.2	24.3	24.6	
DO Initial	8.6	8.4	8.3	8.3	8.2	8.3	7.9	
DO Final	8.5	8.4	8.5	8.3	8.3	8.4		
pH Initial	8.0	8.0	7.8	8.0	7.9	7.9	7.7	
pH Final	8.0	8.3	8.1	8.3	8.4	8.3		
Alkalinity								
Hardness								
Conductivity	324	322	331	323	321	326		
Chlorine								

ilution: 32

Day	1	2	3	4	5	6	7	Comments
emp (C)	24.3	24.4	24.2	24.1	24.2	24.3	24.6	
O Initial	8.5	8.4	8.3	8.2	8.2	8.3	8.0	
O Final	8.5	8.3	8.5	8.3	8.3	8.4		
H Initial	7.9	7.8	7.7	8.0	7.8	7.8	7.6	
H Final	7.9	8.2	8.0	8.1	8.1	8.1		
lkalinity								
ardness								
onductivity	264	265	273	257	262	262		
hlorine								

Dilution: 75

Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.3	24.4	24.2	24.1	24.2	24.3	24.6	
DO Initial	8.6	8.4	8.3	8.4	8.1	8.3	8.0	
DO Final	8.5	8.4	8.4	8.2	8.2	8.4		
pH Initial	8.0	8.0	7.8	8.0	7.9	7.9	7.7	
pH Final	8.1	8.4	8.3	8.4	8.4	8.4		
Alkalinity								
Hardness								
Conductivity	374	371	378	374	370	378		
Chlorine								

ilution: 42

Day	1	2	3	4	5	6	7	Comments
emp (C)	24.3	24.4	24.2	24.1	24.2	24.3	24.6	
O Initial	8.5	8.4	8.3	8.3	8.1	8.3	8.0	
O Final	8.5	8.3	8.5	8.3	8.3	8.4		
H Initial	7.9	7.9	7.9	8.1	7.8	7.8	7.6	
H Final	7.9	8.2	8.1	8.3	8.3	8.2		
lkalinity								
ardness								
onductivity	286	286	298	286	285	287		
hlorine								

Dilution: 100

Day	1	2	3	4	5	6	7	Comments
Temp (C)	24.3	24.4	24.2	24.1	24.2	24.3	24.6	
DO Initial	8.7	8.5	8.3	8.3	8.1	8.3	8.0	
DO Final	8.5	8.4	8.4	8.2	8.3	8.4		
pH Initial	8.0	8.1	7.9	8.0	8.0	7.9	7.8	
pH Final	8.1	8.5	8.5	8.6	8.5	8.5		
Alkalinity	44.0	48.0		48.0				
Hardness	48.0	40.0		88.0				
Conductivity	439	437	441	440	438	445		
Chlorine	<.01	<.01		<.01				

ilution: 100 UV

Day	1	2	3	4	5	6	7	Comments
emp (C)	24.3	24.4	24.2	24.1	24.2	24.3	24.6	
O Initial	8.5	8.1	7.9	8.0	8.0	8.2	7.8	
O Final	8.2	8.2	8.1	8.1	8.0	8.2		
H Initial	7.9	8.1	8.0	8.1	7.9	7.9	7.7	
H Final	7.9	8.3	8.1	8.2	8.3	7.9		
lkalinity								
ardness								
onductivity	446	439	438	430	430	446		
hlorine								

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**	**12/9/12**	**To**	**0830**	**12/10/12**
Composite 2 Collected from:	**0830**	**12/11/12**	**To**	**0830**	**12/12/12**
Composite 3 Collected from:	**0830**	**12/13/12**	**To**	**0830**	**12/14/12**
Test initiated:	1515	**am/pm**		12/11/12	**date**
Test terminated:	1010	**am/pm**		12/18/12	**date**
Dilution water used:		**Receiving**		**X**	**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	62.5	100	100	100	100	100	100	92.5	16.60
32	87.5	87.5	100	87.5	100	100	100	92.5	7.84
42	75.0	87.5	62.5	87.5	62.5	100	100	75.0	14.08
56	37.5	75.0	75.0	62.5	37.5	100	100	57.5	22.64
75	87.5	87.5	87.5	100	75.0	100	100	87.5	10.09
100	75.0	75.0	37.5	37.5	50.0	100	100	55.0	23.40
100 UV	87.5	100	87.5	75.0	75.0	100	100	85.0	12.15

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	0.400	0.588	0.525	0.625	0.588	0.545	16.27
32	0.463	0.438	0.575	0.450	0.550	0.495	12.70
42	0.450	0.463	0.325	0.463	0.350	0.415	17.49
56	0.125	0.438	0.375	0.325	0.113	0.275	53.88
75	0.413	0.425	0.400	0.488	0.375	0.420	10.01
100	0.300	0.388	0.188	0.213	0.250	0.268	29.67
100 UV	0.425	0.538	0.463	0.275	0.363	0.413	24.15
0-SN	0.640	0.588	0.525	0.625	0.588	0.593	7.50

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

PMSD = 24.3%

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

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

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

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

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

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

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

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

a.) NOEC survival	**100% effluent (based on 100% UV).**
b.) NOEC growth	**100% effluent (based on 100% UV).**
c.) LOEC survival	**N/A% effluent**
d.) LOEC growth	**N/A% effluent**

Biomonitoring Form
Chronic Toxicity Summary Form
Pimephales promelas
Chemical Parameters Chart

mittee: El Dorado Chemical - Outfall 001
DES No.: AR0000752/ AFIN 70-00040
ntact: Larken Pennington
alyst: Haughton, Zeagler, Callahan

Sample No. 1 Collected: Date: 12/10/12 Time: 0830
Sample No. 2 Collected: Date: 12/12/12 Time: 0830
Sample No. 3 Collected: Date: 12/14/12 Time: 0830
Test Begin: Date: 12/11/12 Time: 1515
Test End: Date: 12/18/12 Time: 1010

ution: 0

	Day: 1	2	3	4	5	6	7	Comments
mp (C)	25.0	24.9	25.2	25.1	24.9	25.0	24.9	
Initial	7.4	7.2	7.3	7.1	6.9	7.1	6.7	
Final	8.5	8.3	8.5	8.4	8.3	8.4		
Initial	7.6	7.6	7.6	7.6	7.5	7.4	7.4	
Final	7.9	7.9	7.9	7.9	7.9	7.8		
alinity	32.0			32.0				
rdness	52.0			68.0				
nductivity	175.5	177.8	189.2	170.5	171.6	173.2		
lorine	<.01			<.01				

Dilution: 56

	Day: 1	2	3	4	5	6	7	Comments
Temp (C)	25.0	24.9	25.2	25.1	24.9	25.0	24.9	
DO Initial	7.3	7.1	7.3	7.1	6.7	6.8	6.8	
DO Final	8.5	8.4	8.5	8.3	8.3	8.4		
pH Initial	7.6	7.5	7.6	7.6	7.5	7.4	7.5	
pH Final	8.0	8.3	8.1	8.3	8.4	8.3		
Alkalinity								
Hardness								
Conductivity	324	322	331	323	321	326		
Chlorine								

ution: 32

	Day 1	2	3	4	5	6	7	Comments
mp (C)	25.0	24.9	25.2	25.1	24.9	25.0	24.9	
Initial	7.3	7.1	7.2	7.0	6.5	7.0	7.1	
Final	8.5	8.3	8.5	8.3	8.3	8.4		
Initial	7.6	7.4	7.6	7.5	7.3	7.4	7.4	
Final	7.9	8.2	8.0	8.1	8.1	8.1		
alinity								
rdness								
nductivity	264	265	273	257	262	262		
lorine								

Dilution: 75

	Day 1	2	3	4	5	6	7	Comments
Temp (C)	25.0	24.9	25.2	25.1	24.9	25.0	24.9	
DO Initial	7.2	7.1	7.1	7.0	6.9	6.8	6.6	
DO Final	8.5	8.4	8.4	8.2	8.2	8.4		
pH Initial	7.6	7.6	7.6	7.6	7.5	7.4	7.5	
pH Final	8.1	8.4	8.3	8.4	8.4	8.4		
Alkalinity								
Hardness								
Conductivity	374	371	378	374	371	378		
Chlorine								

ution: 42

	Day 1	2	3	4	5	6	7	Comments
mp (C)	25.0	24.9	25.2	25.1	24.9	25.0	24.9	
Initial	7.3	7.1	7.3	7.1	6.6	6.9	6.9	
Final	8.5	8.3	8.5	8.3	8.3	8.4		
Initial	7.6	7.5	7.6	7.5	7.5	7.4	7.4	
Final	7.9	8.2	8.1	8.3	8.3	8.2		
alinity								
rdness								
nductivity	286	286	298	286	285	287		
lorine								

Dilution: 100

	Day 1	2	3	4	5	6	7	Comments
Temp (C)	25.0	24.9	25.2	25.1	24.9	25.0	24.9	
DO Initial	7.2	7.2	7.1	7.0	6.8	6.8	6.6	
DO Final	8.5	8.4	8.4	8.2	8.3	8.4		
pH Initial	7.6	7.6	7.7	7.6	7.5	7.4	7.4	
pH Final	8.1	8.5	8.5	8.6	8.5	8.5		
Alkalinity	44.0	48.0		48.0				100%
Hardness	48.0	40.0		88.0				100%
Conductivity	439	437	441	440	438	445		
Chlorine	<.01	<.01		<.01				100%

ution: 100 UV

	Day 1	2	3	4	5	6	7	Comments
mp (C)	25.0	24.9	25.2	25.1	24.9	25.0	24.9	
Initial	7.4	6.6	7.2	7.1	6.5	6.6	6.4	
Final	8.2	8.2	8.1	8.1	8.0	8.2		
Initial	7.6	7.5	7.7	7.7	7.5	7.5	7.4	
Final	7.9	8.3	8.1	8.2	8.3	7.9		
alinity								
rdness								
nductivity	446	439	438	430	430	446		
lorine								

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#: X4957

Chain of Custody Documents Checked by: AH 12/20/12
Technician/Date

Raw Data Documents Checked by: AH 12/20/12
Technician/Date

Statistical Analysis Package Checked by: EGB 12/20/12
Quality Manager/Date

Quality Control Data Checked by: EGB 11/26/12
Quality Manager/Date

Report Checked by: EGB 1/4/13
Quality Manager/Date

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

Erin G. Braggo, BS
Quality Manager

1/4/13
Date

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X4952

Bio-Analytical Laboratories' Executive Summary

Permittee: El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731
Project #: X4952
Outfall: Outfall 006
Permit #: AR0000752/ AFIN #70-00040
Contact: Ms. Larken Pennington
Test Dates: December 5 - 7, 2012
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 - 6.06%.

For *Daphnia pulex:*

1. If the NOEC for survival is less than the critical dilution (100%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D- 0.
2. Report the NOEC for survival, Parameter TOM3D -100%.
3.Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 7.62%.

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

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 X4952

Test Dates: December 5 - 7, 2012
Report Date: December 20, 2012

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 X4952

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BAL
ADEQ #88-0630
Project X4952

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 three 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 X4952

2.3 Dilution Water

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

2.4 Test Concentrations

The test concentrations used in the fathead minnow test were 100, 75.0, 56.0, 42.0, 32.0 and 22.0 percent effluent and a reconstituted water control. Due to lack of available daphnid neonates at test initiation, the test concentrations used in the *Daphnia pulex* test were 100 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 December 4, 2012. Upon completion of collection, the sample was chilled to 4^0 Celsius and delivered to Bio-Analytical Laboratories by BAL personnel.

2.6 Sample Preparation

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

2.7 Monitoring of the Tests

The tests were run in a Precision^R dual controlled illuminated incubator at a temperature of 25 ± 1^0 Celsius. An AEMC^R data logger was used to monitor diurnal temperature throughout the testing period. Light cycle and intensity were recorded twice a month.

2.8 Data Analysis

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

BAL
ADEQ #88-0630
Project X4952

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	97.5	95.0
22.0	100.0	90.0
32.0	100.0	----
42.0	100.0	----
56.0	100.0	----
75.0	100.0	----
100.0	100.0	97.5

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

BAL
ADEQ #88-0630
Project X4952

4.0 Conclusions

The sample of Outfall 006 collected from El Dorado Chemical Company, El Dorado, Arkansas, on December 4, 2012, 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 X4952

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
1-800-259-1240
Fax: (318) 746-2773

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

Laboratory Use Only:

Company: El Dorado Chemical Company	Phone: (870) 863-1484	Analysis:								
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: Karen Pennington / Karen 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: X4952 / Temp. upon arrival: / Preservative: (below)
12/4/12	6:20pm		X	6 half gallon	006			X	X				C6555	ICE

Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Karen Pennington / EDCC	12/4/12	1000		12/5/12	1000
Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Relinquished by/Affiliation:	Date: 12/5/12	Time: 1210	Received by/Affiliation: R Callahan	Date: 12/5/12	Time: 1210

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

Comments:

Temperature upon arrival: 3.6
Thermometer #: 29
~~Tech: RC~~
Date: 12/5/12

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X4952

Client: EDCC/El Dorado Chemical Company

Address: 4500 Northwest Ave El Dorado AR 71731

NPDES#AR0000752 Outfall 006

Technicians: EGB/AH/LGZ/RC

Test initiated: Date 12/5/12 Time 1520

Test terminated: Date 12/7/12 Time 1400

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	Alkalinity	Tech
C6555	9.6/120.1%	Y/30/8.4 98.6%	<0.01	NO	>6.0	N/A	240.0	36.0	RC
	9.6/113.4%	9/20 8.4/97.7%							
	9.0/118.6%	N/20 8.0/95.7%							

Dilution Water Information

Dilution Water	ID#	Initial D.O (mg/L & %)	Aerate? Minutes/D.O (mg/L & %)	Total Residual Chlorine (mg/L)	Ammonia (NH3) mg/L	pH	Hardness	Alkalinity	Tech
		N/A	N/A	N/A	N/A				
Soft H20	34116					7.8	48.0	32.0	

Test Species Information

Test Species Info.	Species: D.pulex ID#: BAL A10-C10	Species: P.promelas ID#: BAL 12212	Species: ID#:	Species: ID#:
Age	<24h	3 d		
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	Fair AK 12/8/12	Good 12/7/12		

Comments:

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

Project# X4952 | Test started: Date 12/5/12 | Time 1547

Client El Dorado Chemical | Test ended: Date 12/7/12 | Time 1400

Sample Description 006 | Test Species D. pulex | ID# BAL/A10-C10

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

Time: 0hour 1547 24hour 1330 48hour 1400 72hour — 96hour —

Temperature (°C): 0hour 24.0 24hour 25.0 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
0	A	NA	8	7	7			8.3	8.4/8.3 (AH 12/6/12 8.4)	8.5			7.9	7.9/7.9 (AH 12/6/12 7.8)	7.9			180.8	237/181.5 (AH 12/6/12 179.7)	243		
	B		8	8	8																	
	C		8	7	7																	
	D		8	8	8																	
	E		8	8	8																	
22	A		8	7	7			8.2	8.3/8.3	8.3			7.7	7.8/7.8	7.7			289	321/279	327		
	B		8	7	7																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	6																	
Chemistry Tech prerenewal/postrenewal								AH	RC/RC	AH			AH	RC/RC	AH			AH	RC/RC	AH		

ACUTE2 020809 Rev.

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

Project# X4952

Client El Dorado Chemical

Sample Description 006

Test started: Date 12/5/12 Time 1547

Test ended: Date 12/7/12 Time 1400

Test Species D. pulex ID# BBL/A10-C10

Technician:	Ohour AH	24hour RC	48hour AH	72hour ___	96hour ___
Time:	Ohour 1547	24hour 1330	48hour 1400	72hour ___	96hour ___
Temperature (°C):	Ohour 24	24hour 25.0	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
		NA																				
100	A		8	8	8			8.2	7.8/7.8	7.7			7.7	7.6/7.7	7.5			605	628/618	694		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	7	7																	
100 Blank	A		8						/					/					/			
	B		8																			
	C		8																			
	D		8																			
	E		8																			
Chemistry Tech prerenewal/postrenewal								AH	RC/RC	AH			AH	RC/RC	AH			AH	RC/RC	AH		

ACUTE2 020809 Rev.

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

Project# X4952

Client El Dorado Chemical

Sample Description 006

Test started: Date 12/5/12 Time 1520

Test ended: Date 12/7/12 Time 1400

Test Species P. promelas ID# BAL 12212

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

Time: Ohour 1520 24hour 1610 48hour 1408 72hour ____ 96hour ____

Temperature (°C): Ohour 24.9 24hour 24.5 48hour 25 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			8.2	7.9/8.3	7.6			7.8	7.1/7.9	7.5			180.8	209/186	177.7		
	B		8	8	8																	
	C		8	8	8																	
	D		8	7	7																	
	E		8	8	8																	
22	A		8	8	8			8.2	7.7/8.2	7.5			7.7	7.6/7.7	7.4			279	300/289	305		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								AH	[illegible]/RC	[illegible]			AH	[illegible]/RC	[illegible]			AH	[illegible]/RC	[illegible]		

ACUTE2 020809 Rev.

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

Project# X4952 — Test started: Date 12/5/12 Time 1520

Client El Dorado Chemical — Test ended: Date 12/7/12 Time 1400

Sample Description DOC — Test Species P. promelas ID# BAL 12a1a

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

Time: Ohour 1520 24hour 1010 48hour 1400 72hour ____ 96hour ____

Temperature (°C): Ohour 24.9 24hour 24.5 48hour 25 72hour ____ 96hour ____

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
		NA	0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
32	A		8	8	8			8.1	7.7/8.7	7.5			7.8	7.6/7.8	7.5			319	339/331	340		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
42	A		8	8	8			8.1	7.7/8.0	7.5			7.7	7.6/7.7	7.5			369	380/367	383		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								AH	[illegible]/RC	[illegible]			AH	[illegible]/RC	[illegible]			AH	[illegible]/RC	[illegible]		

ACUTE2 020809 Rev.

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

Project# X4952

Client El Dorado Chemical

Sample Description 006

Test started: Date 12/5/12 Time 1520

Test ended: Date 12/7/12 Time 1400

Test Species P. promelas ID# BAL1222

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

Time: Ohour 1520 24hour 1618 48hour 1400 72hour ____ 96hour ____

Temperature (°C): Ohour 24.9 24hour 24.5 48hour 25 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			8.1	7.6/8.3	7.4			7.7	7.6/7.7	7.4			419	443/430	451		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
75	A		8	8	8			8.2	7.5/8.3	7.4			7.7	7.6/7.7	7.4			502	526/503	525		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								AH	[illegible]/RC	[illegible]			AH	[illegible]/RC	[illegible]			AH	[illegible]/RC	[illegible]		

ACUTE2 020809 Rev.

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

Project# X4952

Client El Dorado Chemical

Sample Description 0010

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

Time: Ohour 1520 24hour 1610 48hour 1400 72hour ____ 96hour ____

Temperature (°C): Ohour 24.9 24hour 24.5 48hour 25 72hour ____ 96hour ____

Test started: Date 12/5/12 Time 1520

Test ended: Date 12/7/12 Time 1400

Test Species P. promelas ID# BAL12212

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			8.2	7.4/8.2	7.3			7.7	7.5/7.7	7.4			600	631/625	625		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
	A		8						/					/					/			
	B		8																			
	C		8																			
	D		8																			
	E		8																			
Chemistry Tech prerenewal/postrenewal								AH	AH/RC	LDM			AH	AH/RC	LDM			AH	AH/RC	LDM		

ACUTE2 020809 Rev.

APPENDIX C
STATISTICAL ANALYSIS

Daphnid Acute Test-48 Hr Survival

Start Date:	12/5/2012	Test ID:	X4952DP	Sample ID:	AR0000752 NPDES 006
End Date:	12/7/2012	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	12/4/2012	Protocol:	EPAAW02-EPA/821/R-02-01	Test Species:	DP-Daphnia pulex
Comments:					

Conc-%	1	2	3	4	5
D-Control	0.8750	1.0000	0.8750	1.0000	1.0000
22	0.8750	0.8750	1.0000	1.0000	0.7500
100	1.0000	1.0000	1.0000	1.0000	0.8750

			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			
22	0.9000	0.9474	1.2504	1.0472	1.3931	11.683	5	0.969	2.110	0.1506
100	0.9750	1.0263	1.3564	1.2094	1.3931	6.055	5	-0.515	2.110	0.1506

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.92757	0.881	-0.5196	-0.6378
Bartlett's Test indicates equal variances (p = 0.53)	1.25703	9.21034		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test Treatments vs D-Control	100	>100		1	0.09115	0.09715	0.01446	0.01274	0.35352	2, 12

ToxCalc v5.0.23

Reviewed by EW 12/19/12

Acute Fish Test-48 Hr Survival

Start Date:	12/5/2012	Test ID:	X4952DP	Sample ID:	AR0000752 NPDES 006
End Date:	12/7/2012	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	12/4/2012	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	0.8750	1.0000
22	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
42	1.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	1.0000	1.0000	1.0000
75	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000	1.0000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	0.9750	1.0000	1.3564	1.2094	1.3931	6.055	5		
22	1.0000	1.0256	1.3931	1.3931	1.3931	0.000	5	30.00	16.00
32	1.0000	1.0256	1.3931	1.3931	1.3931	0.000	5	30.00	16.00
42	1.0000	1.0256	1.3931	1.3931	1.3931	0.000	5	30.00	16.00
56	1.0000	1.0256	1.3931	1.3931	1.3931	0.000	5	30.00	16.00
75	1.0000	1.0256	1.3931	1.3931	1.3931	0.000	5	30.00	16.00
100	1.0000	1.0256	1.3931	1.3931	1.3931	0.000	5	30.00	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.38831	0.934	-4.1486	23.0852
Equality of variance cannot be confirmed				

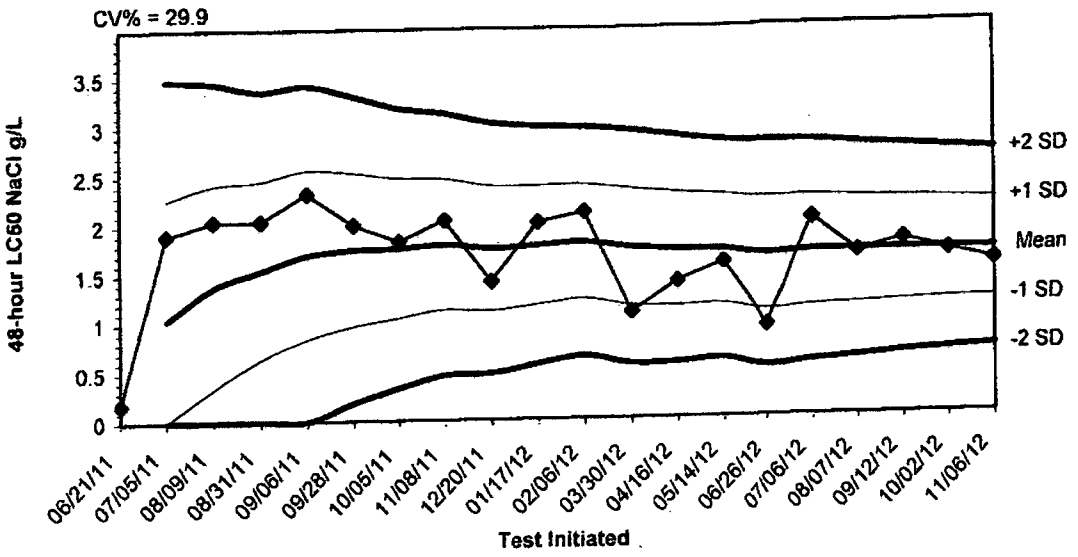
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs D-Control				

ToxCalc v5.0.23

Reviewed by: ECB 12/9/12

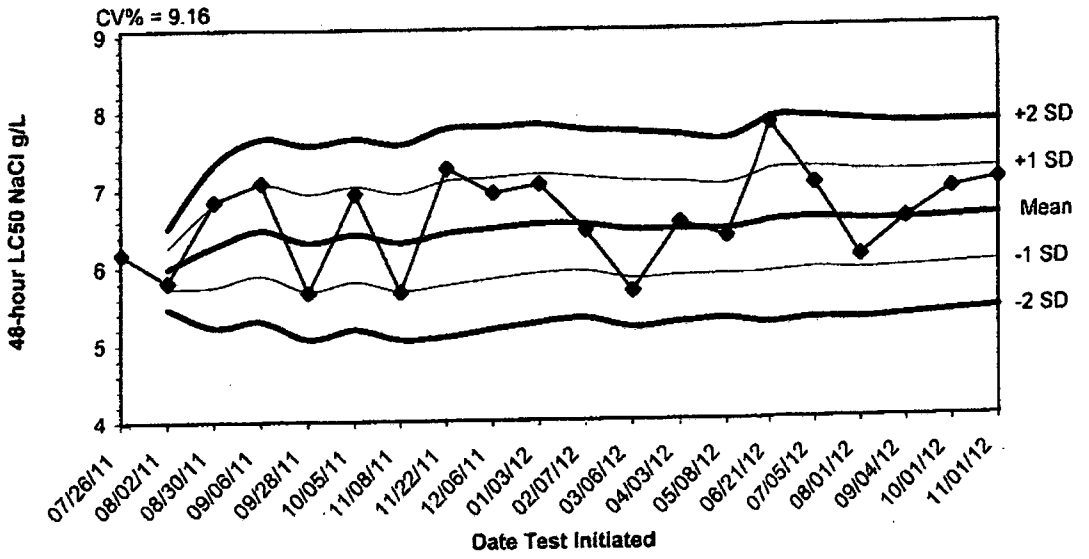
APPENDIX D
QUALITY ASSURANCE CHARTS

48-hour Acute Reference Toxicant Test Results for Daphnia pulex



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
06/21/11	0.1800					
07/05/11	1.9000	1.0400	0.0000	0.0000	2.2562	3.4724
08/09/11	2.0400	1.3733	0.3375	0.0000	2.4092	3.4450
08/31/11	2.0400	1.5400	0.6309	0.0000	2.4491	3.3581
09/06/11	2.3200	1.6960	0.8349	0.0000	2.5571	3.4182
09/28/11	2.0000	1.7467	0.9665	0.1864	2.5268	3.3069
10/05/11	1.8300	1.7586	1.0457	0.3329	2.4714	3.1843
11/08/11	2.0400	1.7938	1.1263	0.4589	2.4612	3.1286
12/20/11	1.4100	1.7511	1.1138	0.4765	2.3884	3.0257
01/17/12	2.0100	1.7770	1.1706	0.5642	2.3834	2.9898
02/06/12	2.1100	1.8073	1.2233	0.6393	2.3912	2.9752
03/30/12	1.0800	1.7467	1.1516	0.5565	2.3417	2.9368
04/16/12	1.3900	1.7192	1.1410	0.5627	2.2975	2.8757
05/14/12	1.5800	1.7093	1.1525	0.5957	2.2661	2.8229
06/26/12	0.9200	1.6567	1.0827	0.5088	2.2306	2.8046
07/06/12	2.0100	1.6788	1.1173	0.5558	2.2402	2.8017
08/07/12	1.6600	1.6776	1.1340	0.5903	2.2213	2.7650
09/12/12	1.7800	1.6833	1.1553	0.6273	2.2113	2.7393
10/02/12	1.6600	1.6821	1.1690	0.6558	2.1953	2.7084
11/06/12	1.5500	1.6755	1.1752	0.6748	2.1758	2.6762

2012 48-hour Reference Toxicant Test Results for Pimephales promelas



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
07/26/11	6.1800					
08/02/11	5.8100	5.9950	5.7334	5.4717	6.2566	6.5183
08/30/11	6.8500	6.2800	5.7528	5.2257	6.8072	7.3343
09/06/11	7.0900	6.4825	5.8915	5.3005	7.0735	7.6645
09/28/11	5.6700	6.3200	5.6923	5.0646	6.9477	7.5754
10/05/11	6.9500	6.4250	5.8075	5.1899	7.0425	7.6601
11/08/11	5.6700	6.3171	5.6853	5.0535	6.9490	7.5808
11/22/11	7.2700	6.4363	5.7612	5.0862	7.1113	7.7863
12/06/11	6.9500	6.4933	5.8391	5.1848	7.1476	7.8018
01/03/12	7.0600	6.5500	5.9077	5.2653	7.1923	7.8347
02/07/12	6.4600	6.5418	5.9318	5.3219	7.1518	7.7618
03/06/12	5.6700	6.4692	5.8355	5.2017	7.1029	7.7366
04/03/12	6.5600	6.4762	5.8689	5.2616	7.0834	7.6907
05/08/12	6.3700	6.4686	5.8845	5.3003	7.0527	7.6368
06/21/12	7.8200	6.5587	5.8964	5.2342	7.2209	7.8832
07/05/12	7.0300	6.5881	5.9376	5.2870	7.2387	7.8892
08/01/12	6.0900	6.5588	5.9174	5.2761	7.2002	7.8416
09/04/12	6.5700	6.5594	5.9372	5.3150	7.1817	7.8039
10/01/12	6.9500	6.5800	5.9687	5.3574	7.1913	7.8026
11/01/12	7.0600	6.6040	5.9994	5.3948	7.2086	7.8132

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: 12/04/12 To: 12/04/12
From: To:

Test Initiated: 12/05/12
Dilution Water Used: Receiving Water X Reconstituted Water

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	22	100				
24-hour	A	87.5	87.5	100				
	B	100	87.5	100				
	C	87.5	100	100				
	D	100	100	100				
	E	100	100	87.5				
48-hour	A	87.5	87.5	100				
	B	100	87.5	100				
	C	87.5	100	100				
	D	100	100	100				
	E	100	75.0	87.5				
	Mean	95.0	90.0	97.5				

1. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate: Is the mean survival at 48 hours significantly different (p=.05) than the control survival for the % effluent corresponding to:
a.) LOW FLOW OR CRITICAL DILUTION (100%) YES X NO
b.)½ LOW FLOW OR 2X CRITICAL DILUTION (N/A%) YES NO
2. Enter percent effluent corresponding to the LC_{50} below:
LC_{50} = N/A% effluent
95 % confidence limits:
Method of LC_{50} calculation:
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, Callahan

Sample Collected	**From:**	**Date 12/4/12**	**Time 1820**
	To:	**Date 12/4/12**	**Time 1820**
Test Begin		**Date 12/5/12**	**Time 1547**
Test End		**Date 12/7/12**	**Time 1400**

Parameter	D.O.			Temperature			Alkalinity			Hardness			pH		
Dilut./Time	0hrs.	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs
0	8.3	8.4	8.5	24.0	25.0	24.5	32.0			48.0			7.9	7.8	7.9
22	8.2	8.3	8.3	24.0	25.0	24.5							7.7	7.8	7.7
100	8.2	7.8	7.7	24.0	25.0	24.5	36.0			240.0			7.7	7.7	7.5

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

Acute Forms
Pimephales promelas (Fathead minnow) Survival

Permittee: El Dorado Chemical - Outfall 006
NPDES Permit Number: AR0000752/ AFIN 70-00040
Composite Collected From: 12/04/12 To: 12/04/12
From: To:

Test Initiated: 12/05/12
Dilution Water Used: Receiving Water X Reconstituted Water

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	22	32	42	56	75	100
24-hour	A	100	100	100	100	100	100	100
	B	100	100	100	100	100	100	100
	C	100	100	100	100	100	100	100
	D	87.5	100	100	100	100	100	100
	E	100	100	100	100	100	100	100
48-hour	A	100	100	100	100	100	100	100
	B	100	100	100	100	100	100	100
	C	100	100	100	100	100	100	100
	D	87.5	100	100	100	100	100	100
	E	100	100	100	100	100	100	100
	Mean	97.5	100	100	100	100	100	100

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

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

Permittee: El Dorado Chemical - Outfall 006
NPDES Number: AR0000752/ AFIN 70-00040
Contact: Larken Pennington
Analyst: Haughton, Callahan
Sample Collected **From:** **Date 12/4/12** **Time 1820**
To: **Date 12/4/12** **Time 1820**
Test Begin **Date 12/5/12** **Time 1520**
Test End **Date 12/7/12** **Time 1400**

Parameter	D.O.			Temperature			Alkalinity			Hardness			pH		
Dilut./Time	0hrs.	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs
0	8.2	8.3	7.6	24.0	24.5	25.0	32.0			48.0			7.8	7.9	7.5
22	8.2	8.2	7.5	24.0	24.5	25.0							7.7	7.7	7.4
32	8.1	8.2	7.5	24.0	24.5	25.0							7.8	7.8	7.5
42	8.1	8.2	7.5	24.0	24.5	25.0							7.7	7.7	7.5
56	8.1	8.2	7.4	24.0	24.5	25.0							7.7	7.7	7.4
75	8.2	8.2	7.4	24.0	24.5	25.0							7.7	7.7	7.4
100	8.2	8.2	73	24.0	24.5	25.0	36.0			240.0			7.7	7.7	7.4

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

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#: X4952

Chain of Custody Documents Checked by: ECB 12/19/12
Technician/Date

Raw Data Documents Checked by: ECB 12/19/12
Technician/Date

Statistical Analysis Package Checked by: ECB 12/19/12
Quality Manager/Date

Quality Control Data Checked by: ECB 11/26/12
Quality Manager/Date

Report Checked by: ECB 12/20/12
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 L. Boggs, BS
Quality Manager

12/20/12
Date

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X4953

Bio-Analytical Laboratories' Executive Summary

Permittee: El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731
Project #: X4953
Outfall: Outfall 007
Permit #: AR0000752/ AFIN #70-00040
Contact: Ms. Larken Pennington
Test Dates: December 5 - 7, 2012
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%.

For *Daphnia pulex:*

1. If the NOEC for survival is less than the critical dilution (100%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D- 1.
2. Report the NOEC for survival, Parameter TOM3D -0%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 7.62%.

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

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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 X4953

Test Dates: December 5 - 7, 2012
Report Date: December 20, 2012

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 X4953

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BAL
ADEQ #88-0630
Project X4953

1.0 Introduction

Bio-Analytical Laboratories (BAL), Doyline, Louisiana conducted two 48-hour acute toxicity tests for Outfall 007 at El Dorado Chemical Company, El Dorado, Arkansas. The test organisms used were the fathead minnow, *Pimephales promelas* and the cladoceran, *Daphnia pulex*. The purpose of this study is to determine if an appropriately dilute effluent sample adversely affects the survival of the test organism. Toxicity is defined as a statistically significant difference at the 95 percent confidence level between the survival of the test organisms in the critical dilution (the effluent concentration representative of the proportion of effluent in the receiving water during critical low flow or critical mixing conditions) compared to the survival of the test organisms in the control. The test endpoints are the No-Observed-Effect-Concentration (NOEC), which is defined as the highest effluent concentration that is not statistically different from the control, and the 48-hour LC_{50}, the concentration in which 50 percent of the test organisms died.

2.0 Methods and Materials

2.1 Test Methods

All methods followed were according to the latest edition of "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms" (EPA-821-R-02-012).

2.2 Test Organisms

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

2.3 Dilution Water

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

2.4 Test Concentrations

The test concentrations used in the fathead minnow test were 100, 75.0, 56.0, 50.0, 42.0 and 32.0 percent effluent and a reconstituted water control. Due to lack of available daphnid neonates at test initiation, the test concentrations used in the *Daphnia pulex* test were 100 and 50.0 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 December 4, 2012. Upon completion of collection, the sample was chilled to 4^0 Celsius and delivered to Bio-Analytical Laboratories by BAL personnel.

2.6 Sample Preparation

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

2.7 Monitoring of the Tests

The tests were run in a Precision^R dual controlled illuminated incubator at a temperature of 25 ± 1^0 Celsius. An AEMC^R data logger was used to monitor diurnal temperature throughout the testing period. Light cycle and intensity were recorded twice a month.

2.8 Data Analysis

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

BAL
ADEQ #88-0630
Project X4953

3.0 Results and Discussion

The results of the tests can be found in Table 1. Significant differences in survival were noted in the 100 percent critical dilution after 24 hours of exposure (p=.05). The NOEC value for both tests was zero percent effluent (p=.05). The 48-hour LC_{50} value for the fathead minnow and the *Daphnia pulex* test was 16.0 and 23.0 percent effluent, respectively (p=.05).

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

Percent Effluent	**Percent Survival**	
Test Organism	*Pimephales promelas* (Fathead Minnow)	*Daphnia pulex*
Control	100.0	95.0
32.0	0.0	0.0
42.0	0.0	----
50.0	0.0	----
56.0	0.0	----
75.0	0.0	----
100.0	0.0	0.0

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 X4953

4.0 Conclusions

The sample of Outfall 007 collected from El Dorado Chemical Company, El Dorado, Arkansas, on December 4, 2012, was found to be lethally toxic to the *Daphnia pulex* test organisms nor the fathead minnow test organisms in the 100 percent critical dilution after 24 hours of exposure (p=.05).

BAL
ADEQ #88-0630
Project X4953

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

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

Laboratory Use Only:

Company: El Dorado Chemical Company	Phone: (870) 863-1484	Analysis:							Project Number: X4953
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: 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:	Preservative: (below)
12/4/12	6:30pm		X	6 half gallon	007			X	X				C6556	ICE

Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Larken Pennington / EDCC	12/4/12	1000	[signature]	12/5/12	1000
Relinquished by/Affiliation:	Date:	Time:	Received by/Affiliation:	Date:	Time:
Relinquished by/Affiliation: [signature]	Date: 12/5/12	Time: 1210	Received by/Affiliation: R Callehan	Date: 12/5/12	Time: 1210

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

Comments:

Temperature upon arrival: 3.0
Thermometer #: 29
Tech: [illegible]
Date: 12/5/12

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X4953

Client: EDCC/El Dorado Chemical Company

Address: 4500 Northwest Ave El Dorado AR 71731

NPDES#AR0000752 Outfall 007

Technicians: EGB/AH/LGZ/RC

Test initiated: Date 12/5/12 Time 1610

Test terminated: Date 12/7/12 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	Alkalinity	Tech
Cl0556	9.6/116.6	8/20/8.4 98.2%	<0.01	NO	>6.0	N/A	1096.0	68.0	RC
↓	9.6/113.8	4/20 8H 97.9%	↓	↓	↓	↓			↓
				↓		↓			

Dilution Water Information

Dilution Water	ID#	Initial D.O (mg/L & %)	Aerate? Minutes/D.O (mg/L & %)	Total Residual Chlorine (mg/L)	Ammonia (NH3) mg/L	pH	Hardness	Alkalinity	Tech
		NA	NA	NA	NA				
Soft H2O	3416					7.8	48.0	30.0	NaHCO3
↓									

Test Species Information

Test Species Info.	Species: Daphnia pulex ID#: BBL/A10-C10	Species: Pimephales promelas ID#: BBL/12-15-12	Species: ID#:	Species: ID#:
Age	<24h	3days		
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 RC	good		

Comments:

12/5/12. D. pulex died in effluent dilutions ~2 hours after introduction. EGB
Fathead minnows looked sick ~2 hours after introduction. EGB

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

Project# X4953

Client Eldorado Chemical

Sample Description 007

Test started: Date 12/5/12 Time 1600

Test ended: Date 12/7/12 Time 1400

Test Species D. pulex ID# A10-C10

Technician: Ohour EB 24hour EB 48hour EB 72hour _____ 96hour _____

Time: Ohour 1600 24hour 1515 48hour 1400 72hour _____ 96hour _____

Temperature (°C): Ohour 24.9 24hour 24.9 48hour 25.2 72hour _____ 96hour _____

Test Dilution %	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0	A	N/A	8	7	7			8.2	8.1/8.2	8.0			7.9	7.5/7.8	7.8			171	219/151	200		
	B		8	8	8																	
	C		8	7	7																	
	D		8	8	8																	
	E		8	8	8																	
																		12/7/12 EB				
50	A		8	0	0			8.2	7.9				7.3	7.0				1080 ~~1220~~	1050 ~~1250~~			
	B		8	0	0																	
	C		8	0	0																	
	D		8	0	0																	
	E		8	0	0																	
Chemistry Tech prerenewal/postrenewal								EB	EB	EB			EB	EB	EB			EB	EB	EB		

ACUTE2 020809 Rev.

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

Project# X4953

Client El Dorado Chemical

Sample Description 007

Test started: Date 12/5/12 Time 1600

Test ended: Date 12/7/12 Time 1400

Test Species D. pulex ID# A10-C10

Technician:	Ohour EB	24hour EB	48hour EB	72hour	96hour
Time:	Ohour 1600	24hour 1515	48hour 1420	72hour	96hour
Temperature (°C):	Ohour 24.9	24hour 24.9	48hour 25.2	72hour	96hour

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0/0																						
100	A	N/A	8	0	0			8.3	7.2				7.3	6.5				1640	1650			
	B	"	8	0	0																	
	C	"	8	0	0																	
	D	"	8	0	0																	
	E	"	8	0	6																	
Chemistry Tech prerenewal/postrenewal								EB	EB	EB			EB	EB	EB			EB	EB	EB		

ACUTE2 020809 Rev.

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

Project# X4953

Client El Dorado Chemical

Sample Description 007

Test started: Date 12/5/12 Time 1610

Test ended: Date 12/7/12 Time 1445

Test Species P. promelas ID# BAL12212

Technician: Ohour SJM 24hour JM 48hour JM 72hour ____ 96hour ____

Time: Ohour 1610 24hour 1530 48hour 1445 72hour ____ 96hour ____

Temperature (°C): Ohour 24.9 24hour 24.7 48hour 25 72hour ____ 96hour ____

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
		NA	0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0	A		8	8	8			8.2	7.9/8.2	7.9			7.9	7.8/7.8	7.7			179.1	203/181.2	196.9		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
32	A		8	0				8.2	7.5				7.3	7.0				732	780			
	B		8	0																		
	C		8	0																		
	D		8	0																		
	E		8	0																		
Chemistry Tech prerenewal/postrenewal								AH	SJM/AH	JM			AH	SJM/AH	JM			AH	SJM/AH	JM		

ACUTE2 020809 Rev.

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

Project# X4953

Client El Dorado Chemical

Sample Description 007

Test started: Date 12/5/12 Time 1610

Test ended: Date 12/7/12 Time 1445

Test Species P. promelas ID# BA4 12012

Technician: Ohour LM 24hour LM 48hour ____ 72hour ____ 96hour ____

Time: Ohour 1610 24hour 1530 48hour ____ 72hour ____ 96hour ____

Temperature (°C): Ohour 24.9 24hour 24.7 48hour ____ 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	8				8.3	7.4				7.3	7.0				9450	9370			
	B		8	8																		
	C		8	8																		
	D		8	8																		
	E		8	8																		
50	A		8	8				8.3	7.4				7.3	6.9				10880	10800			
	B		8	8																		
	C		8	8																		
	D		8	8																		
	E		8	8																		
Chemistry Tech prerenewal/postrenewal								AH	LM/AH				AH	LM/AH				AH	LM			

ACUTE2 020809 Rev.

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

Project# X4953
Client El Dorado Chemical
Sample Description 007

Test started: Date 12/5/12 Time 1610
Test ended: Date 12/7/12 Time 1445
Test Species P. promelas ID# BAH 12312

Technician: 0hour [illegible] 24hour [illegible] 48hour ____ 72hour ____ 96hour ____
Time: 0hour 1610 24hour 1530 48hour ____ 72hour ____ 96hour ____
Temperature (°C): 0hour 24.9 24hour 24.7 48hour ____ 72hour ____ 96hour ____

Test Dilution	Replicate	Test Salinity	# Live Organisms 0 hr	24	48	72	96	Dissolved Oxygen 0	24	48	72	96	pH 0	24	48	72	96	Conductivity 0	24	48	72	96
		NA																				
56	A		8	0				8.3	7.4				7.3	6.9				12050	11980			
	B		8	0																		
	C		8	0																		
	D		8	0																		
	E		8	0																		
75	A		8	0				8.3	7.3				7.3	6.8				13050	12990			
	B		8	0																		
	C		8	0																		
	D		8	0																		
	E		8	0																		
Chemistry Tech prerenewal/postrenewal								AH	[illegible]				AH	[illegible]				AH	[illegible]			

ACUTE2 020809 Rev.

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

Project# X4953

Client El Dorado Chemical

Sample Description 007

Test started: Date 12/5/12 Time 1610

Test ended: Date 12/7/12 Time 1445

Test Species P. promelas ID# BAL 12212

Technician: Ohour LBM 24hour LBM 48hour ____ 72hour ____ 96hour ____

Time: Ohour 1618 24hour 1536 48hour ____ 72hour ____ 96hour ____

Temperature (°C): Ohour 24.9 24hour 24.7 48hour ____ 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				8.3	7.3				7.3	6.6				1641	1622			
	B		8	0																		
	C		8	0																		
	D		8	0																		
	E		8	0																		
	A		8																			
	B		8																			
	C		8																			
	D		8																			
	E		8																			
Chemistry Tech prerenewal/postrenewal								RH					RH					RH				

ACUTE2 020809 Rev.

APPENDIX C
STATISTICAL ANALYSIS

Daphnid Acute Test-48 Hr Survival

Start Date:	12/5/2012	Test ID:	X4953DP	Sample ID:	AR0000752
End Date:	12/7/2012	Lab ID:	ADEQ880630	Sample Type:	EFF2-Industrial
Sample Date:	12/4/2012	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
50	0.0000	0.0000	0.0000	0.0000	0.0000
100	0.0000	0.0000	0.0000	0.0000	0.0000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	0.9500	1.0000	1.3196	1.2094	1.3931	7.623	5		
*50	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	15.00	18.00
*100	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	15.00	18.00

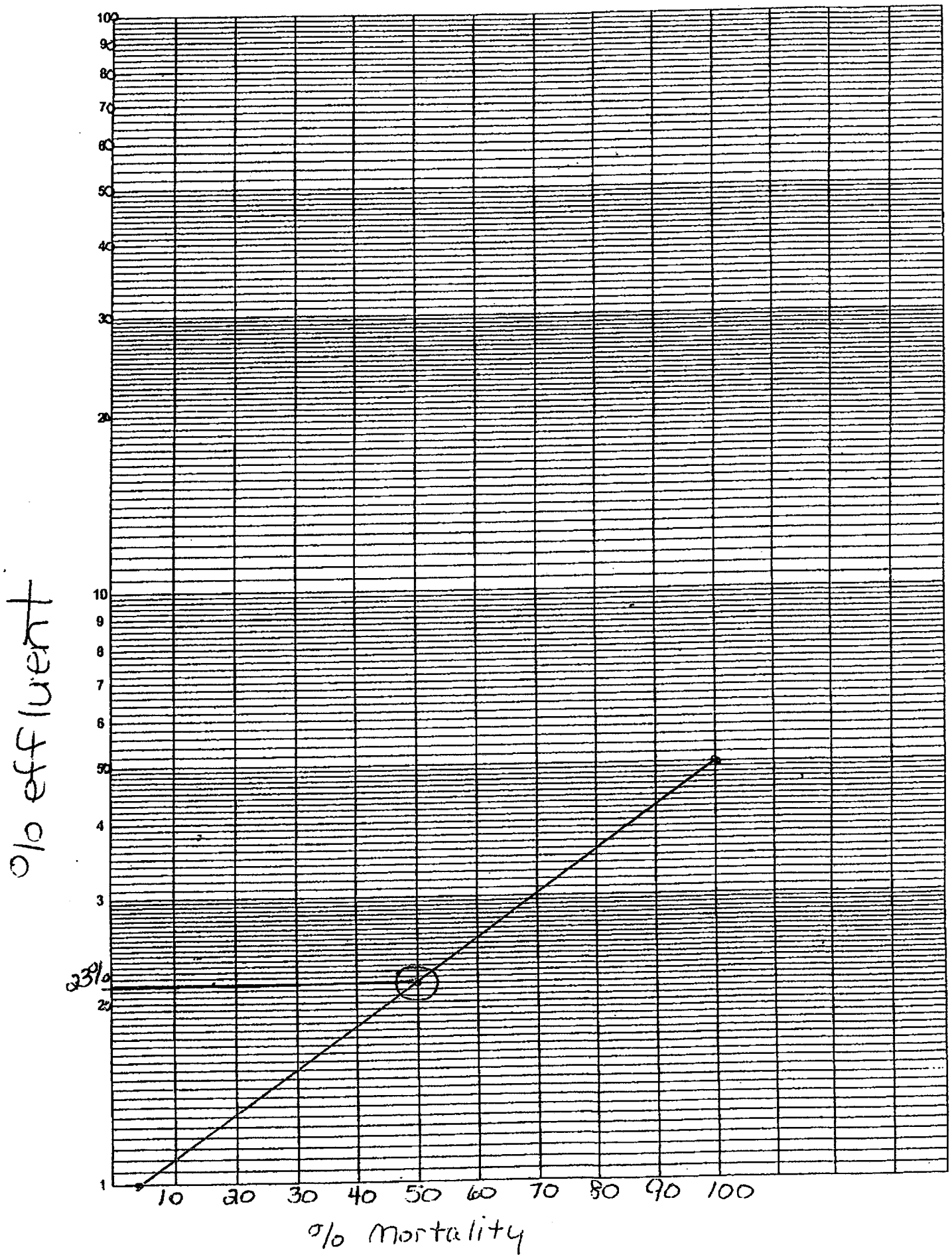
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.74482	0.881	-0.7882	1.25641
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	<50	50		
Treatments vs D-Control				

ToxCalc v5.0.23

Reviewed by: EGB 12/19/12

X4953 D.pulex vs. 007



Acute Fish Test-48 Hr Survival

Start Date: 12/5/2012
End Date: 12/7/2012
Sample Date: 12/4/2012
Comments:

Test ID: X4953PP
Lab ID: ADEQ880630
Protocol: EPAAW02-EPA/821/R-02-01

Sample ID: AR0000752 007
Sample Type: EFF2-Industrial
Test Species: PP-Pimephales promelas

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

Transform: Arcsin Square Root

Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Rank Sum	1-Tailed Critical
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5		
*32	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	15.00	16.00
*42	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	15.00	16.00
*50	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	15.00	16.00
*56	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	15.00	16.00
*75	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	15.00	16.00
*100	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	15.00	16.00

Auxiliary Tests

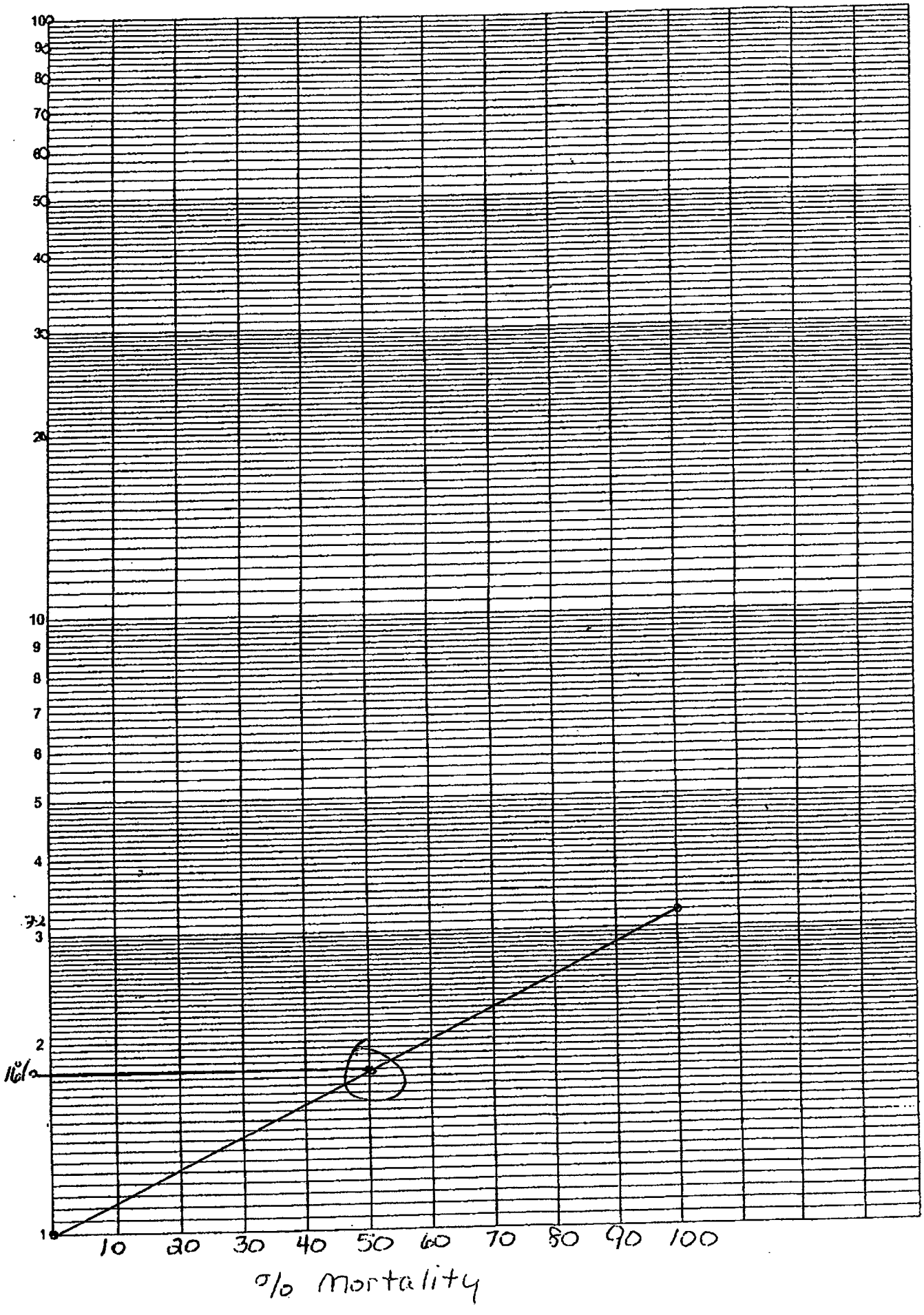
	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	1	0.934		
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)

	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test Treatments vs D-Control	<32	32		

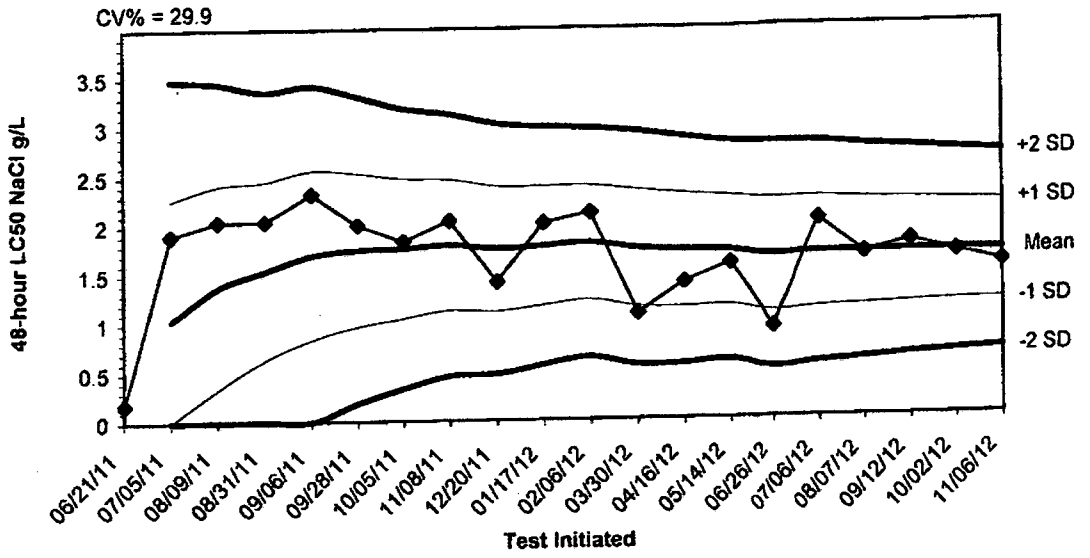
12/19/12
Review

X4953 P. promelas vs 007



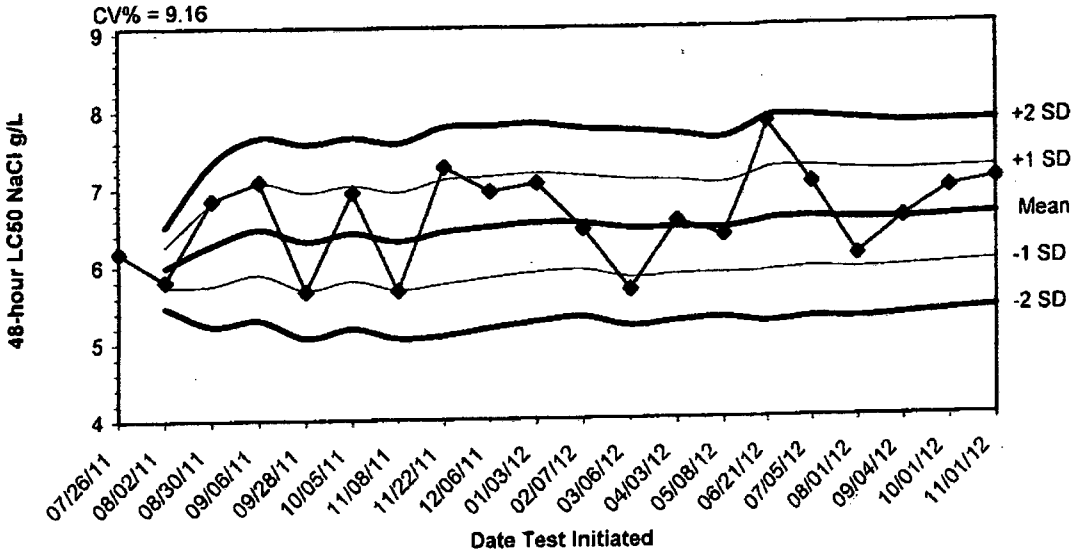
APPENDIX D
QUALITY ASSURANCE CHARTS

48-hour Acute Reference Toxicant Test Results for Daphnia pulex



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
06/21/11	0.1800					
07/05/11	1.9000	1.0400	0.0000	0.0000	2.2562	3.4724
08/09/11	2.0400	1.3733	0.3375	0.0000	2.4092	3.4450
08/31/11	2.0400	1.5400	0.6309	0.0000	2.4491	3.3581
09/06/11	2.3200	1.6960	0.8349	0.0000	2.5571	3.4182
09/28/11	2.0000	1.7467	0.9665	0.1864	2.5268	3.3069
10/05/11	1.8300	1.7586	1.0457	0.3329	2.4714	3.1843
11/08/11	2.0400	1.7938	1.1263	0.4589	2.4612	3.1286
12/20/11	1.4100	1.7511	1.1138	0.4765	2.3884	3.0257
01/17/12	2.0100	1.7770	1.1706	0.5642	2.3834	2.9898
02/06/12	2.1100	1.8073	1.2233	0.6393	2.3912	2.9752
03/30/12	1.0800	1.7467	1.1516	0.5565	2.3417	2.9368
04/16/12	1.3900	1.7192	1.1410	0.5627	2.2975	2.8757
05/14/12	1.5800	1.7093	1.1525	0.5957	2.2661	2.8229
06/26/12	0.9200	1.6567	1.0827	0.5088	2.2306	2.8046
07/06/12	2.0100	1.6788	1.1173	0.5558	2.2402	2.8017
08/07/12	1.6600	1.6776	1.1340	0.5903	2.2213	2.7650
09/12/12	1.7800	1.6833	1.1553	0.6273	2.2113	2.7393
10/02/12	1.6600	1.6821	1.1690	0.6558	2.1953	2.7084
11/06/12	1.5500	1.6755	1.1752	0.6748	2.1758	2.6762

2012 48-hour Reference Toxicant Test Results for Pimephales promelas



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
07/26/11	6.1800					
08/02/11	5.8100	5.9950	5.7334	5.4717	6.2566	6.5183
08/30/11	6.8500	6.2800	5.7528	5.2257	6.8072	7.3343
09/06/11	7.0900	6.4825	5.8915	5.3005	7.0735	7.6645
09/28/11	5.6700	6.3200	5.6923	5.0646	6.9477	7.5754
10/05/11	6.9500	6.4250	5.8075	5.1899	7.0425	7.6601
11/08/11	5.6700	6.3171	5.6853	5.0535	6.9490	7.5808
11/22/11	7.2700	6.4363	5.7612	5.0862	7.1113	7.7863
12/06/11	6.9500	6.4933	5.8391	5.1848	7.1476	7.8018
01/03/12	7.0600	6.5500	5.9077	5.2653	7.1923	7.8347
02/07/12	6.4600	6.5418	5.9318	5.3219	7.1518	7.7618
03/06/12	5.6700	6.4692	5.8355	5.2017	7.1029	7.7366
04/03/12	6.5600	6.4762	5.8689	5.2616	7.0834	7.6907
05/08/12	6.3700	6.4686	5.8845	5.3003	7.0527	7.6368
06/21/12	7.8200	6.5587	5.8964	5.2342	7.2209	7.8832
07/05/12	7.0300	6.5881	5.9376	5.2870	7.2387	7.8892
08/01/12	6.0900	6.5588	5.9174	5.2761	7.2002	7.8416
09/04/12	6.5700	6.5594	5.9372	5.3150	7.1817	7.8039
10/01/12	6.9500	6.5800	5.9687	5.3574	7.1913	7.8026
11/01/12	7.0600	6.6040	5.9994	5.3948	7.2086	7.8132

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: 12/04/12 To: 12/04/12
From: To:

Test Initiated: 12/05/12
Dilution Water Used: Receiving Water X Reconstituted Water

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	50	100				
24-hour	A	87.5	0	0				
	B	100	0	0				
	C	87.5	0	0				
	D	100	0	0				
	E	100	0	0				
48-hour	A	87.5	0	0				
	B	100	0	0				
	C	87.5	0	0				
	D	100	0	0				
	E	100	0	0				
	Mean	95.0	0	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} = 23% effluent
95 % confidence limits: N/A
Method of LC_{50} calculation: Graphical
3. If you answered NO to 1.a) enter (P) otherwise enter (F): F
4. Enter response to item 3 on DMR Form, parameter TEM3D
5. If you answered NO to 1.b) enter (P) otherwise enter (F): N/A
6. Enter response to item 5 on DMR Form, parameter TFM3D

Biomonitoring
Daphnia 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, Callahan
Sample Collected **From:** **Date 12/4/12** **Time 1830**
To: **Date 12/4/12** **Time 1830**
Test Begin **Date 12/5/12** **Time 1600**
Test End **Date 12/7/12** **Time 1400**

Parameter	D.O.			Temperature			Alkalinity			Hardness			pH		
Dilut./Time	0hrs.	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs
0	8.2	8.2	8.0	24.9	24.9	25.2	32.0			48.0			7.9	7.8	7.8
50	8.2	7.9		24.9	24.9								7.3	7.0	
100	8.3	7.2		24.9	24.9		68.0			1096.0			7.3	6.5	

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

Acute Forms
Pimephales promelas (Fathead Minnow) Survival

Permittee: El Dorado Chemical - Outfall 007
NPDES Permit Number: AR0000752/ AFIN 70-00040
Composite Collected From: 12/04/12 To: 12/04/12
From: To:

Test Initiated: 12/05/12
Dilution Water Used: Receiving Water X Reconstituted Water

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	32	42	50	56	75	100
24-hour	A	100	0	0	0	0	0	0
	B	100	0	0	0	0	0	0
	C	100	0	0	0	0	0	0
	D	100	0	0	0	0	0	0
	E	100	0	0	0	0	0	0
48-hour	A	100	0	0	0	0	0	0
	B	100	0	0	0	0	0	0
	C	100	0	0	0	0	0	0
	D	100	0	0	0	0	0	0
	E	100	0	0	0	0	0	0
	Mean	100	0	0	0	0	0	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} = 16% effluent
95 % confidence limits: N/A
Method of LC_{50} calculation: Graphical
3. If you answered NO to 1.a) enter (P) otherwise enter (F): F
4. Enter response to item 3 on DMR Form, parameter TEM3D
5. If you answered NO to 1.b) enter (P) otherwise enter (F): N/A
6. Enter response to item 5 on DMR Form, parameter TFM3D

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

Permittee: El Dorado Chemical - Outfall 007
NPDES Number: AR0000752/ AFIN 70-00040
Contact: Larken Pennington
Analyst: Haughton, Callahan
Sample Collected **From:** **Date 12/4/12** **Time 1830**
To: **Date 12/4/12** **Time 1830**
Test Begin **Date 12/5/12** **Time 1610**
Test End **Date 12/7/12** **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	8.2	8.2	7.9	24.9	24.7	25.0	32.0			48.0			7.9	7.8	7.7
32	8.2	7.5		24.9	24.7								7.3	7.0	
42	8.3	7.4		24.9	24.7								73	7.0	
50	8.3	7.4		24.9	24.7								7.3	6.9	
56	8.3	7.4		24.9	24.7								7.3	6.8	
75	8.3	7.3		24.9	24.7								7.3	6.8	
100	8.3	7.2		24.9	24.7		68.0			1096.0			7.3	6.6	

*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#: X4953

Chain of Custody Documents Checked by: EGB 12/19/12
Technician/Date

Raw Data Documents Checked by: EGB 12/19/12
Technician/Date

Statistical Analysis Package Checked by: EGB 12/19/12
Quality Manager/Date

Quality Control Data Checked by: EGB 11/26/12
Quality Manager/Date

Report Checked by: EGB 12/20/12
Quality Manager/Date

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

Cindy S. Briggs, BS — 12/20/12

Quality Manager — Date

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Page 1 of 2

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Larken Pennington
EL DORADO CHEMICAL COMPANY
4500 Northwest Ave.

El Dorado, AR 71730

Origin ID: ELDA

FedEx Express

E

J13101212190326

SHIP TO: (501) 682-0655 BILL SENDER

ADEQ - Water Division Enforcement
5301 Northshore Drive

NORTH LITTLE ROCK, AR 72118

Ship Date: 23JAN13
ActWgt: 2.0 LB
CAD: 5887030/INET3370

Delivery Address Bar Code

Ref #
Invoice #
PO #
Dept #

THU - 24 JAN A4
PRIORITY OVERNIGHT

TRK# 0201 7945 8653 2928

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