

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



CHEMICAL COMPANY

October 23, 2012

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 September 30, 2012.

Enclosed you will find the Discharge Monitoring Report ending September 30, 2012.
If you have any questions regarding this report, please contact Larken Pennington at (870) 863-1125.

Sincerely,

A handwritten signature in cursive script that reads "Greg Withrow".

Greg Withrow
General Manager

Enclosures

NON-COMPLIANCE REPORT

Facility Name: El Dorado Chemical Company

Permit Number: AR0000752

AFIN:

70-00040

Month / Year: Sep-12

Type of Violation	Permit Limit	Date of Violation	Cause of Violation	Corrective Action or Other Narrative
Outfall 001 / TDS Monthly Average (270.0 mg/L)	237 mg/L - Monthly Average	9/5/2012	Unknown	
Outfall 002 / NH3-N / Monthly Average and Daily Max (39.5 mg/L)	12 mg/L Monthly Average/ 18 mg/L Daily Max	9/8/2012	Heavy rainfall in a short period of time caused Outfall 002 to discharge.	Discharges from Outfall 002 consist of controlled discharge from the stabilization/pretreatment basin within the wastewater treatment process during periods of excessive rainfall. The sample was taken downstream of the overflow at the outfall. The background concentrations from the creek upstream of outfall 002 could have influenced the results.
Outfall 002 / NO3-N / Monthly Average (68.4 mg/L)	26.3 mg/L Monthly Average	9/8/2012	Heavy rainfall in a short period of time caused Outfall 002 to discharge.	Discharges from Outfall 002 consist of controlled discharge from the stabilization/pretreatment basin within the wastewater treatment process during periods of excessive rainfall. The sample was taken downstream of the overflow at the outfall. The background concentrations from the creek upstream of outfall 002 could have influenced the results.
Outfall 002 / Lead / Monthly Average and Daily Max (8.09 ug/L)	3.8 ug/L Monthly Average/ 7.62 ug/L Daily Max	9/8/2012	Heavy rainfall in a short period of time caused Outfall 002 to discharge.	Discharges from Outfall 002 consist of controlled discharge from the stabilization/pretreatment basin within the wastewater treatment process during periods of excessive rainfall. The sample was taken downstream of the overflow at the outfall. The background concentrations from the creek upstream of outfall 002 could have influenced the results.
Outfall 002 / Copper / Monthly Average and Daily Max (27.2 ug/L)	12.2 ug/L Monthly Average/ 24.48 Daily Max	9/8/2012	Heavy rainfall in a short period of time caused Outfall 002 to discharge.	Discharges from Outfall 002 consist of controlled discharge from the stabilization/pretreatment basin within the wastewater treatment process during periods of excessive rainfall. The sample was taken downstream of the overflow at the outfall. The background concentrations from the creek upstream of outfall 002 could have influenced the results.
Outfall 006 / Zinc Monthly Average and Daily Max (237 ug/L)	115.62 ug/L Monthly Average/ 231.99 Daily Max	9/8/2012	Unknown	EDCC continues to monitor and evaluate potential sources of the Zinc exceedance.
Outfall 006 / Lead Monthly Average (4.49 ug/L)	3.8 ug/L Monthly Average	9/8/2012	Unknown	EDCC will continue to monitor and evaluate potential sources of the Lead exceedance.
Outfall 006 / TDS Monthly Average (420.0 mg/L)	291 mg/L Monthly Average	9/8/2012	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 (155.0 ug/L)	115.62 ug/L Monthly Average	9/8/2012	Unknown	EDCC continues to monitor and evaluate potential sources of the Zinc exceedance.
Outfall 007 / Lead Monthly Average and Daily Max(21.3 ug/L)	3.8 ug/L Monthly Average/ 7.62 ug/L Daily Max	9/8/2012	Unknown	EDCC will continue to monitor and evaluate potential sources of the Lead exceedance.
Outfall 007 / TDS Monthly Average and Daily Max (740.0 mg/L)	291 mg/L Monthly Average/ 436.5 mg/L Daily Max	9/8/2012	Unknown	EDCC has land applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.
<p>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.)</p>				<p style="text-align: center;"><i>Meg Withrow</i></p> <p style="text-align: center;">10/23/12</p> <p>Signature / Date</p>

Bio-Analytical Laboratories (BAL)
ADEQ Certificate #88-0630
Project X4853

Bio-Analytical Laboratories' Executive Summary

Permittee: El Dorado Chemical Company
4500 Northwest Avenue
El Dorado, AR 71731

Project #: X4853

Outfall: 001

Permit #: AR0000752/ AFIN #70-00040

Contact: Larken Pennington

Test Dates: September 5 - 12, 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%.
4. Report the NOEC value for reproduction, Parameter TPP3B - 32%.
5. Report the largest % coefficient of variation between the control and the critical dilution, Parameter TQP3B - 18.72%.

Note: Treating with UV light did not reduce the non-lethal 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%
4. Report the NOEC value for growth, Parameter TPP6C - 100%
5. Report the largest % coefficient of variation between the control and the critical dilution, Parameter TQP6C - 9.39%

Note: Results above based upon 100% UV-treated effluent.

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



Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023

(318) 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 X4853

Test Dates: September 5 - 12, 2012

Report Date: October 3, 2012

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 X4853

TABLE OF CONTENTS

1.0 Introduction	4
2.0 Methods and Materials	4
2.1 Test Methods	4
2.2 Test Organisms	4
2.3 Dilution Water	4
2.4 Test Concentrations	5
2.5 Sample Collection	5
2.6 Sample Preparation	5
2.7 Monitoring of the Tests	5
2.8 Data Analysis	6
3.0 Results and Discussion	6
4.0 Conclusions	8
5.0 References	9
Appendices	
A- Chain-of-Custody Documents	10
B- Raw Data Sheets	14
C- Statistical Analysis	28
D- Quality Assurance Charts	37
E- Agency Forms	42
F- Report Quality Assurance Form	49

BAL
ADEQ #88-0630
Project X4853

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 also raised in-house and were less than 24 hours old at test initiation. The minnows were acclimated to test temperature and dilution water hardness prior to test initiation. Monthly chronic reference toxicant tests, 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.

BAL
ADEQ #88-0630
Project X4853

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 September 5, 7 and 10, 2012. Upon collection and completion of each composite, the samples were chilled to 4° 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 $25 \pm 1^{\circ}$ 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 $25 \pm 1^{\circ}$ Celsius. The fathead minnow test was run in a circulating waterbath, using a Remcor^R heated liquid circulator to keep a constant temperature of $25 \pm 1^{\circ}$ 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.

BAL
ADEQ #88-0630
Project X4853

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

3.0 Results and Discussion

The results of the *Ceriodaphnia dubia* test can be found in Table 1. Ninety percent survival occurred in the control and 70 percent survival occurred in the critical dilution after seven days of exposure. The average number of neonates per female after three broods in the control and in the critical dilution was 24.1, while the average number of neonates in the critical dilution was 10.9. The No-Observed-Effect-Concentration (NOEC) for survival and reproduction in this test was 100 and 32 percent effluent, respectively ($p=.05$). Treating with UV light did not reduce the non-lethal effect.

The fathead minnow test results can be found in Table 2. Significant differences in survival were noted between the control and the 100 percent critical dilution; however, significant differences in survival were not noted between the control and the UV-treated critical dilution. One hundred percent survival occurred in the control, 87.5 percent survival occurred in the critical dilution and 95.0 percent survival occurred in the UV-treated critical dilution after seven days of exposure. The average weight gained per minnow in the control was 0.568 milligram (mg), while the average in the UV-treated critical dilution was 0.560 mg. The NOEC for survival and growth in this test, based on the UV-treated 100 percent dilution, was 100 percent effluent ($p=.05$). Significant differences in growth were noted between the control and the 56 percent dilution, but this was probably an anomaly.

BAL
ADEQ #88-0630
Project X4853

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

Percent Effluent	Percent Survival	Sig.*	Mean # Neonates-Surviving	Mean # Neonates -Total	Sig.*
Control	90.0		25.3	24.1	
32.0	100.0		19.4	19.4	
42.0	90.0		15.1	13.6	*
56.0	90.0		15.2	13.7	*
75.0	90.0		13.3	12.0	*
100.0	70.0		14.0	10.9	*
100.0 UV	80.0		13.9	11.9	*

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

Table 2: Results of the Chronic Definitive Fathead Minnow Test

Percent Effluent	Percent Survival	Sig.*	Mean Dry Weight (mg)	Sig.*
Control	100.0		0.568	
32.0	97.5		0.563	
42.0	95.0		0.540	
56.0	90.0		0.480	*
75.0	97.5		0.555	
100.0	87.5	*	-----	
100.0 UV	95.0		0.560	

*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.

BAL
ADEQ #88-0630
Project X4853

4.0 Conclusions

The three composite samples of Outfall 001 collected from El Dorado Chemical Company, El Dorado, Arkansas, on September 5, 7 and 10, 2012, were found to be lethally toxic to the fathead minnow test organisms but not the *Ceriodaphnia dubia* test organisms in the 100 percent critical dilution after seven days of exposure ($p=.05$). Nonlethal effects (i.e., lack of reproduction) were noted in the *Ceriodaphnia dubia* test ($p=.05$). Treating the sample with UV light did not reduce the toxicity in the cladoceran test, but did reduce the toxicity in the fathead minnow test ($p=.05$). The reported NOEC values for the minnow test are based on the UV-treated dilution.

BAL
ADEQ #88-0630
Project X4853

5.0 References

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

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

APPENDIX A
CHAIN-OF-CUSTODY DOCUMENTS

Bio-Analytical Laboratories
 3240 Spurgin Road
 Doyline, LA 71023
 (318) 745-2772, Fax (318) 745-2773
 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		Analysis:							Project Number: X4853		
Address: 4500 Northwest Avenue, El Dorado, AR 71731		Fax: (870) 863-1499		Chronic Ceriodaphnia	Chronic minnow	Acute minnow(fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	Fecal Coliform	Total Coliform	Lab Control Number:	Temp. upon arrival: 0.3°C #29 9/5/12 Preservative: (below) ice
Permit #: AR0000752		Purchase Order:											
Sampler's Signature/Printed Name/Affiliation: Karen Pennington / Karen Pennington / EDCC													
Date Start Date End	Time Start Time End	C	G	# containers	Sample Identification								
9/4/12 - 9/5/12	8:30 - 8:30	X		8	001		X	X				C10075	
Relinquished by/Affiliation: Karen Pennington				Date: 9/5/12	Time: 9:45	Received by/Affiliation: Brenden Walter				Date: 9/5/12	Time: 09:45		
Relinquished by/Affiliation: Brenden Walter				Date: 9/5/12	Time: 11:30	Received by/Affiliation: J Meagler				Date: 9/5/12	Time: 1130		
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:				Date:	Time:		
Method of Shipment: <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Bus <input type="checkbox"/> Fed Ex <input type="checkbox"/> DHL <input type="checkbox"/> UPS <input type="checkbox"/> Client <input type="checkbox"/> Other Tracking #													
Comments:													

Bio-Analytical Laboratories
 3240 Spurgin Road
 Doyline, LA 71023
 (318) 745-2772, Fax (318) 745-2773
 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		Analysis:							Project Number: 4853			
Address: 4500 Northwest Avenue, El Dorado, AR 71731		Fax: (870) 863-1499		Chronic Ceriodaphnia	Chronic minnow	Acute minnow (fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	Fecal Coliform		Total Coliform	Temp. upon arrival: Temperature upon arrival: 3 Thermometer #: 29 Tech: AA Date: 9/7/12	
Permit #: AR0000752		Purchase Order:												Lab Control Number:
Sampler's Signature/Printed Name/Affiliation: <i>Ronken Pennington / Ronken Pennington / EPC</i>														
Date Start	Date End	Time Start	Time End	C	G	# containers	Sample Identification							
9-6-12	9-7-12	8:30	8:30	X		8	001	X	X				66094	ice
Relinquished by/Affiliation: <i>Ronken Pennington</i>				Date:	Time:	Received by/Affiliation: <i>Bunker Walter</i>				Date:	Time:			
				9/7/12	9:50					9/7/12	09:50			
Relinquished by/Affiliation: <i>Bunker Walter</i>				Date:	Time:	Received by/Affiliation: <i>Carl S. Bragg</i>				Date:	Time:			
				9/7/12	11:35					9/7/12	11:55			
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:				Date:	Time:			
Method of Shipment: <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Bus <input type="checkbox"/> Fed Ex <input type="checkbox"/> DHL <input type="checkbox"/> UPS <input type="checkbox"/> Client <input type="checkbox"/> Other Tracking # _____														
Comments:														

Bio-Analytical Laboratories
 3240 Spurgin Road
 Doyline, LA 71023
 (318) 745-2772, Fax (318) 745-2773
 bioanalytical@atl.net

CHAIN OF CUSTODY

NELAP 01975, ADEQ #83-0630, EPA LA00917

Laboratory Use Only:

Company: El Dorado Chemical Company						Phone: (870) 863-1484		Analysis:						Project Number: X4853	
Address: 4500 Northwest Avenue, El Dorado, AR 71731						Fax: (870) 863-1499		Chronic Ceriodaphnia Chronic minnow Acute minnow/fresh/marine Acute Daphnia species Acute Mysid Acute Ceriodaphnia Fecal Coliform Total Coliform	Lab Control Number:	Temp. upon arrival:		Preservative: (below)			
Permit #: AR0000752						Purchase Order:				C6101	ice				
Sampler's Signature/Printed Name/Affiliation: <i>Larken Pennington / Larken Pennington FDC</i>															
Date Start Date End	Time Start Time End	C	G	# containers	Sample Identification										
9-8-12 - 9-10-12	8:30	X		8	001	X	X								
Relinquished by/Affiliation: <i>Larken Pennington</i>						Date: 9/10/12	Time: 10:30	Received by/Affiliation: <i>[Signature]</i>			Date: 9/10/12	Time: 10:30			
Relinquished by/Affiliation:						Date:	Time:	Received by/Affiliation:			Date:	Time:			
Relinquished by/Affiliation: <i>[Signature]</i>						Date: 9/10/12	Time: 1300	Received by/Affiliation: <i>R Callahan</i>			Date: 9/10/12	Time: 1300			
Method of Shipment: <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Bus <input type="checkbox"/> Fed Ex <input type="checkbox"/> DHL <input type="checkbox"/> UPS <input type="checkbox"/> Client <input type="checkbox"/> Other <input type="checkbox"/> Tracking # _____												Temperature upon arrival: 5.0			
Comments:												Thermometer #: 29			
												Tech: RC			
												Date: 9/10/12			

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST

Project# X4853 Date start: 9/5/12 Date end: 9/12/12

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 9/4/12 Time: 1445

Neonates collected: Date 9/4/12 Time: 0215 Board: V125

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. <u>8.3/102.9%/RC</u>	0. <u>Y/5/7.9/96.7%/RC</u>	0. <u>N/A</u>	0. <u>U/A</u>
1. <u>8.9/108.6%/RC</u>	1. <u>Y/15/8.3/97.1%/RC</u>		1. _____
2. <u>9.4/110.7%/RC</u>	2. <u>Y/15/8.4/98.3%/RC</u>		2. _____
3. <u>9.3/111.8%/AH</u>	3. <u>Y/20/8.2/96.7%/AH</u>		3. _____
4. <u>10.5/118.4%/AH</u>	4. <u>Y/20/8.6/97.5%/AH</u>		4. _____
5. <u>10.2/126.4%/RC</u>	5. <u>Y/25/8.1/95.5%/RC</u>		5. _____
6. <u>9.7/110.1%/RC</u>	6. <u>Y/20/8.7/99.7%/AH</u>		6. _____
7. _____	7. _____		7. _____

Total Residual Chlorine (mg/L)/Tech	Dechlorinated? Amount?/Tech	Ammonia (NH3) (mg/L)/Tech	BAL Sample # Date in Use
-------------------------------------	-----------------------------	---------------------------	--------------------------

1. <u><0.01/RC</u>	1. <u>No/RC</u>	1. <u>1.0/RC</u>	1. <u>C6075 9/5/12</u>
2. <u>0.01/AH</u>	2. <u>No/AH</u>	2. <u>1.0/AH</u>	2. <u>C6094 9/8/12</u>
RC 9/10/12 3. <u><0.01/RC</u>	3. <u>No/RC</u>	3. <u>6.0/RC</u>	3. <u>C6101 9/10/12</u>

Comments:

BIO-ANALYTICAL LABORATORIES
NUMBER NEONATES PER BROOD CERIODAPHNIA

Project # X4853 Test Dates 9/5/12-9/12/12

Client EI Dorado Chemical

Replicate	% Concentration						
	0	32	42	56	75	100	100uv
A	30	21	9	13	8	15	17
B	28	26	20	22	18	16	15
C	17	16	13	9	X	X ³	14
D	30	21	X	14	15	14	13
E	22	14	19	10	3	12	11
F	21	19	16	14	8	11	X ⁴
G	30	21	12	16	17	X ⁴	13
H	27	18	16	17	17	15	15
I	23	18	16	22	20	15	X ⁴
J	X ¹³	20	15	X	14	X ⁴	14
Surviving Mean	25.3	19.4	15.1	15.2	13.3	14.0	13.9
Total Mean	24.1	19.4	13.6	13.7	12.0	10.9	11.9
CV%*	18.72	16.87	22.55	30.24	42.76	13.04	12.45

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

Key: M=male; X=dead adult

Calculated by: [Signature] 9/12/12

Calculations checked by: PA 9/12/12

BIO-ANALYTICAL LABORATORIES
CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST

Project# x4853 Test started: Date 9/5/12 Time 1330
Client El Dorado Chemical Test ended: Date 9/11/12 Time 1330

Technician: Day 0 AH 1 My 2 My 3 AH 4 AH 5 RC 6 RC 7 My 8 _____
Time: Day 0 1320 1 1055 2 1230 3 1800 4 1900 5 1520 6 1305 7 1320 8 _____
Temperature: Day 0 25.2 1 24.5 2 24.2 3 24.1 4 24.1 5 24.6 6 24.5 7 24.1 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	3	0									10		
	4	0	4	4	5	4	3	4	4	4	3	10		
	5	11	10	7	10	8	9	9	9	7	9	10		
	6	16	0	0	0	0	0	0	0	0	0	X	9	
	7	0	14	6	15	10	9	17	14	12			9	
	8													
32	1	0										10		
	2	0										10		
	3	0										10		
	4	3	4	4	3	3	4	4	4	3	3	10		
	5	7	9	3	5	1	4	4	6	3	7	10		
	6	0	0	0	0	0	0	0	0	0	0	10		
	7	11	13	9	13	10	11	13	8	12	10	10		
	8													
42	1	0										10		
	2	0			X	0						9		
	3	0										9		
	4	4	3	3		3	4	3	4	2	3	9		
	5	3	3	1		3	4	0	4	3	0	9		
	6	0	0	0		0	0	2	0	0	2	9		
	7	0	12	9		11	8	7	8	11	10	9		
	8													
56	1	0										10		
	2	0										10		
	3	0										10		
	4	2	4	3	4	3	3	3	2	3	0	9		
	5	2	6	0	0	6	0	0	3	6	X ⁰	9		
	6	0	0	0	0	0	0	0	0	0	0	9		
	7	9	12	6	10	1	11	13	12	13		9		
	8													
75	1	0										10		
	2	0		X	0							9		
	3	0										9		
	4	4	3		4	3	3	4	3	3	2	9		
	5	4	3		0	0	1	3	2	4	0	9		
	6	0			0	0	0	0	0	0	1	9		
	7	0	11		10	0	4	10	12	13	11	9		
	8													
100	1	0										10		
	2	0										10		
	3	0										10		
	4	3	3	3	4	2	3	4	4	3	3	10		
	5	2	2	0	0	0	2	0	0	1	X ¹	9		
	6	0	0	X ⁰	0	0	0	X ⁰	0	1		7		
	7	10	11		10	10	6		11	10		7		
	8													

Key: X=dead adult; X⁰=adult had n neonates before death; M=male

File: Cerio2

BIO-ANALYTICAL LABORATORIES
CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST

Project# 14853

Test started: Date 9/5/12 Time 1320

Client El Dorado Chemical

Test ended: Date 9/12/12 Time 1330

Technician: Day 0 AM 1 AM 2 AM 3 AM 4 AM 5 RC 6 RC 7 AM 8 _____
 Time: Day 0 1320 1 1055 2 1030 3 1800 4 1900 5 1520 6 1305 7 1230 8 _____
 Temperature: Day 0 25.2 1 24.5 2 24.3 3 24.1 4 24.1 5 24.6 6 24.5 7 24.1 8 _____

% Conc.	Day	Concentration										#Live Adults	Total Live Neonates	
		A	B	C	D	E	F	G	H	I	J			
100 UV- TTCd	1	0											10	
	2	0											10	
	3	0											10	
	4	0	3	4	4	3	2	3	3	3	2		10	
	5	0	1	0	1	1	1	0	1	0	0		10	
	6	0	0	0	0	0	1X	1	0	1X	0		8	
	7	12	4	10	8	7		9	11		12		8	
	8													
	1													
	2													
	3													
	4													
	5													
	6													
	7													
	8													
	1													
	2													
	3													
	4													
	5													
	6													
	7													
	8													
	1													
	2													
	3													
	4													
	5													
	6													
	7													
	8													

Control
 9/12/12

Key: X=dead adult; X'=adult had n neonates before death; M=male

Project# X4853
 Client El Dorado Chemical
 Organism C. dubia

Test started: Date 9/5/12 Time 1320
 Test ended: Date 9/12/12 Time 1330

Day/# water used	03375	1	2	3	4	53378	63378	7	8
Concentration: ControlSOFT									
pH	7.8	7.9 7.8	7.7 7.6	8.0 7.8	7.9 7.8	7.8 7.8	7.9 8.0	7.9 8.0	8.0
DO (mg/l)	7.5	8.4 8.1	8.3 8.2	8.5 8.1	8.5 8.4	8.3 8.4	8.7 8.4	8.3 8.2	8.2
Cond (umhos/cm)	173.5	177.0	184.5	185.6	184.4	178.1	175.6		
Alkalinity (mg/L)	32.0					32.0			
Hardness (mg/L)	56.0					56.0			
Concentration: 30									
pH	8.3	7.9 8.3	7.8 8.1	8.1 8.1	8.0 8.0	8.1 8.4	8.1 8.4	7.9	
DO (mg/l)	7.6	8.3 8.1	8.2 8.2	8.4 8.1	8.4 8.4	8.2 8.2	8.7 8.5	8.1	
Cond (umhos/cm)	259	263	277	279	278	313	300		
Concentration: 42									
pH	8.5	8.0 8.4	7.9 8.3	8.1 8.2	8.1 8.1	8.2 8.5	8.2 8.5	8.0	
DO (mg/l)	7.6	8.2 8.2	8.2 8.2	8.4 8.1	8.4 8.4	8.2 8.2	8.8 8.5	8.1	
Cond (umhos/cm)	284	285	305	306	304	346	342		
Concentration: 56									
pH	8.5	8.1 8.5	8.0 8.3	8.2 8.3	8.2 8.2	8.2 8.6	8.2 8.5	8.1	
DO (mg/l)	7.7	8.2 8.2	8.1 8.2	8.4 8.1	8.3 8.5	8.2 8.2	8.7 8.6	8.1	
Cond (umhos/cm)	320	323	343	347	343	405	394		
Concentration: 75									
pH	8.6	8.1 8.5	8.1 8.4	8.2 8.4	8.3 8.3	8.3 8.6	8.2 8.5	8.1	
DO (mg/l)	7.8	8.2 8.2	8.1 8.2	8.4 8.1	8.3 8.5	8.1 8.1	8.8 8.6	8.1	
Cond (umhos/cm)	369	374	396	399	396	478	471		
Concentration: 100									
pH	8.6	8.2 8.6	8.1 8.4	8.3 8.4	8.4 8.4	8.3 8.6	8.2 8.5	8.2	
DO (mg/l)	7.8	8.1 8.2	8.1 8.2	8.4 8.1	8.2 8.5	8.1 8.0	8.1 8.6	8.1	
Cond (umhos/cm)	433	435	468	473	467	580	568		
Tech-prerenewal	RC	RC	RC	AH	AH	RC	RC		
Tech-postrenewal		RC	RC	AH	AH	RC	RC		
Hardness (mg/l)	44.0			40.0		36.0			
Alkalinity (mg/l)	96.0			100.0		84.0			

Key: prerenewal/postrenewal

Project# X4853
 Client Eldorado Chemical
 Organism C. dubia

Test started: Date 4/2/12 Time 12:00
 Test ended: Date 4/12/12 Time 1:30

Day/# water used	03315	1	2	3	4	5	6	7	8
Concentration:	Control 100 µM								
pH	8.4	8.4	8.3	8.3	8.3	8.3	8.3	8.1	8.1
DO (mg/l)	7.5	8.0	8.0	8.2	8.1	8.0	8.0	8.4	7.7
Cond (µmhos/cm)	441	436	468	472	469	601	544		
Alkalinity (mg/L)									
Hardness (mg/L)									
Concentration:									
pH	OMLX AH ALK								
DO (mg/l)									
Cond (µmhos/cm)									
Concentration:									
pH	OMLX AH ALK								
DO (mg/l)									
Cond (µmhos/cm)									
Concentration:									
pH	OMLX AH ALK								
DO (mg/l)									
Cond (µmhos/cm)									
Concentration:									
pH	OMLX AH ALK								
DO (mg/l)									
Cond (µmhos/cm)									
Tech-prerenewal	RC	OMLX	OMLX	AH	AH	RC	RC		
Tech-postrenewal		RC	RC	AH	AH	RC	RC	OMLX	
Hardness (mg/l)									
Alkalinity (mg/l)									

Key: prerenewal/postrenewal

BIO-ANALYTICAL LABORATORIES
PIMEPHALES PROMELAS SURVIVAL AND GROWTH DATA SHEET

Project# X4853 Date started: 9/5/12 Date ended 9/12/12

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 24h Vendor/ID# BAL/9512

Feeding Times

Day	Technician/Time/Amount (per replicate)		
	AM	NOON	PM
0			AH/1505/0.20ml
1	RC/0830/0.10ml	RC/1100/0.10ml	AH/1430/0.10ml
2	RC/0820/0.10ml	AH/1055/0.10ml	AH/11330/0.10ml
3		AH/1430/0.20ml	AH/1705/0.20ml
4		AH/1135/0.20ml	AH/1355/0.20ml
5	RC/0810/0.10ml	RC/1105/0.10ml	RC/1540/0.10ml
6	RC/0810/0.10ml	RC/1100/0.10ml	AH/1410/0.10ml

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

Effluent Initial DO (mg/L & %)/Tech	Aerate?/Minutes /Final DO (mg/L & %)/Tech	Receiving Water Initial DO (mg/L & %)/Tech	Aerate?/Minutes /Final DO (mg/L & %)/Tech
0. 8.3/102.9%/AH	0. Y/15/7.9/96.7%/AH	0. NA	0. NA
1. 8.9/108.6%/RC	1. Y/15/8.3/97.1%/RC	1. NA	1. NA
2. 9.4/110.7%/RC	2. Y/15/8.4/98.3%/RC	2. NA	2. NA
3. 9.3/111.82/AH	3. Y/20/8.2/96.72/AH	3. NA	3. NA
4. 10.5/118.42/AH	4. Y/20/8.6/97.52/AH	4. NA	4. NA
5. 10.2/112.0/AH	5. Y/20/8.1/95.52/AH	5. NA	5. NA
6. 9.7/110.1%/RC	6. Y/20/8.7/99.7%/RC	6. NA	6. NA

Total Residual Chlorine (mg/L)/Tech	Dechlorinated? Amount?/Tech	Ammonia (NH3) (mg/L)/Tech	BAL Sample # Date in use
1. <0.01/AH	1. NO/AH	1. 0.0/AH	1. C16075 9/5/12
2. <0.01/AH	2. NO/AH	2. 1.0/AH	2. C16094 9/8/12
3. <0.01/AH	3. NO/AH	3. 6.0/AH	3. C16101 9/10/12

Comments:

BIO-ANALYTICAL LABORATORIES 7-DAY CHRONIC MINNOW SURVIVAL DATA

Project# X4853 Test started: Date 9/5/2 Time 1330
 Client El Dorado Chemical Test ended: Date 9/12/2 Time 1030
 Technician: Day 0 RC/AH 1 RC/AH 2 RC 3 AH 4 AH 5 RC 6 RC/AH 7 AH
 Time: Day 0 1330 1 1010 2 1025 3 1030 4 1345 5 1454 6 1015 7 1030
 Temperature Day 0 25.3 1 25.3 2 26.6 3 25.2 4 25.2 5 25.8 6 25.5 7 25.8

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

accidental
deaths-RC
9/7/12

BIO-ANALYTICAL LABORATORIES 7-DAY CHRONIC MINNOW SURVIVAL DATA

Project# 14853 Test started: Date 9/5/12 Time 1330
 Client El Parado Chemical Test ended: Date 9/12/12 Time 1030
 Technician: Day0 RC/AH 1 28x 2 RC 3 AH 4 AH 5 RC 6 28x 7 AH
 Time: Day0 1330 1 1110 2 1025 3 1030 4 1345 5 2145 6 1015 7 1030
 Temperature Day0 25.9 1 25.3 2 26.6 3 25.2 4 25.2 5 25.8 6 25.5 7 25.2

Conc. %	Rep.	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
100 uv. H ₂ O	A	8	8	8	7	7	7	7	7
	B	8	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8	8
	D	8	8	8	7	7	7	7	7
	E	8	8	8	8	8	8	8	8
	A								
	B								
	C								
	D								
	E								
	A								
	B								
	C								
	D								
	E								
	A								
	B								
	C								
	D								
	E								

Conc'd
9/11/12

Project#/Client: 1850/G66-C-003 Test Dates: 9/15/12-9/12/12
 Over Temperature (° Celsius): 10.2°-10.3°

Conc. %	Replicate/ Pan number	Wt. of pan(g)/ Date weighed: Tech:	Wt. of pan + larvae(g)/ Date weighed: Tech:	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 156	1.0023	1.0069	0.0046	8	0.575	
	B 157	1.0030	1.0076	0.0046	8	0.575	
	C 158	0.9911	0.9962	0.0051	8	0.638	
	D 159	1.0191	1.0233	0.0042	8	0.525	
	E 160	1.0133	1.0175	0.0043	8	0.538	
32	A 161	1.0314	1.0357	0.0043	8	0.538	
	B 162	1.0270	1.0318	0.0048	8	0.600	
	C 163	1.0119	1.0167	0.0048	8	0.600	
	D 164	1.0113	1.0157	0.0044	8	0.550	
	E 165	1.0075	1.0117	0.0042	8	0.525	
42	A 166	1.0269	1.0311	0.0042	7 8	0.525	0.600 EBB 9/26/12 accidental death
	B 167	0.9917	0.9961	0.0044	8	0.550	
	C 168	0.9818	0.9861	0.0043	8	0.538	
	D 169	1.0374	1.0412	0.0038	8	0.475	
	E 170	1.0157	1.0200	0.0043	8	0.538	
56	A 171	1.0259	1.0300	0.0041	8	0.513	
	B 172	1.0200	1.0229	0.0029	8	0.363	
	C 173	1.0194	1.0239	0.0045	8	0.563	
	D 174	1.0294	1.0330	0.0036	8	0.450	
	E 175	0.9726	0.9767	0.0041	8	0.513	
75	A 176	0.9733	0.9784	0.0051	8	0.638	
	B 177	1.0094	1.0134	0.0040	8	0.500	
	C 178	1.0080	1.0126	0.0046	8	0.575	
	D 179	1.0000	1.0044	0.0044	8	0.550	
	E 180	0.9914	0.9955	0.0041	8	0.513	
100	A 181	0.9772	0.9805	0.0033	8	0.413	
	B 182	0.9882	0.9917	0.0035	8	0.438	
	C 183	0.9797	0.9832	0.0035	8	0.438	
	D 184	1.0129	1.0164	0.0035	8	0.438	
	E 185	1.0143	1.0177	0.0034	8	0.425	

* Test acceptance of control weight based on surviving larvae at end of test.
 Calculated by: AA 9/18/12 Calculations checked by: Stacy 9/18/12

BIO-ANALYTICAL LABORATORIES MINNOW LARVAL GROWTH DATA SHEET

Project#/Client X4853/Exc-001 Test Dates 9/5/12-9/12/12

Water Temperature (° Celsius)

Conc.	Replicate/ Pan number	Wt. of pan(g)/ Date weighed: Tech:	Wt. of pan + larvae(g)/ Date weighed: Tech:	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 241	0.9917 9/5/12 JBY	0.9956 9/12/12 JBY	0.0039	8	0.488	
	B 242	1.0060	1.0102	0.0042	8	0.525	
	C 243	1.0070	1.0119	0.0049	8	0.613	
	D 244	1.0238	1.0284	0.0046	8	0.575	
	E 245	1.0335	1.0383	0.0048	8	0.600	
	A						
	B						
	C						
	D						
	E						
	A						
	B						
	C						
	D						
	E						
	A						
	B						
	C						
	D						
	E						
	A						
	B						
	C						
	D						
	E						

Omit 9/5/12
JBY

Test acceptance of control weight based on surviving larvae at end of test.
Calculated by: AH 9/18/12 Calculations checked by: JBY 9/18/12

Project# V4853 Test started: Date 9/5/12 Time 1330
 Client El Dorado Chemical Test ended: Date 9/10/12 Time 1030
 Organism P. promelas

Day/# water used	0315	1	2	3	4	5	0318	6	7	8
Concentration: Control 504										
pH	7.8	7.8	7.6	7.8	7.8	7.8	7.8	7.8	7.9	7.4
DO (mg/l)	7.5	8.1	8.2	8.1	8.4	8.4	8.4	8.4	8.3	6.4
Cond (umhos/cm)	173.5	177.0	184.5	185.6	184.4	178.1	175.6			
Alkalinity (mg/L)	320					320				
Hardness (mg/L)	320					560				
Concentration: 32 560										
pH	8.3	8.3	8.1	8.1	8.0	8.0	8.0	8.4	8.4	7.4
DO (mg/l)	7.6	8.1	8.2	8.1	8.4	8.2	8.5	8.5	6.4	
Cond (umhos/cm)	259	263	277	279	278	313	300			
Concentration: 42										
pH	8.5	8.4	8.3	8.2	8.1	8.5	8.5	8.5	8.5	7.5
DO (mg/l)	7.6	8.2	8.2	8.1	8.4	8.2	8.5	8.5	6.5	
Cond (umhos/cm)	284	285	305	306	304	346	342			
Concentration: 56										
pH	8.5	8.5	8.3	8.3	8.2	8.6	8.5	8.5	8.5	7.5
DO (mg/l)	7.7	8.2	8.2	8.1	8.5	8.2	8.6	8.6	6.3	
Cond (umhos/cm)	320	323	343	347	343	405	394			
Concentration: 75										
pH	8.6	8.5	8.4	8.4	8.3	8.6	8.6	8.5	8.5	7.5
DO (mg/l)	7.8	8.2	8.2	8.1	8.5	8.1	8.6	8.6	6.0	
Cond (umhos/cm)	369	374	396	399	396	478	471			
Concentration: 100										
pH	8.6	8.6	8.4	8.4	8.4	8.6	8.6	8.5	8.5	7.6
DO (mg/l)	7.8	8.2	8.2	8.1	8.5	8.0	8.6	8.6	5.9	
Cond (umhos/cm)	433	435	468	473	410	580	568			
Tech-prerenewal	RC	RC	AH	AH	AH	RC	AH			
Tech-postrenewal		RC	RC	AH	AH	AH	RC	AH		
Hardness (mg/l)	44.0			40.0		36.0				
Alkalinity (mg/l)	96.0			100.0		84.0				

Key: prerenewal/postrenewal

APPENDIX C
STATISTICAL ANALYSIS

Ceriodaphnia Survival and Reproduction Test-7 Day Survival

Start Date: 9/5/2012 Test ID: X4853CD Sample ID: 1
 End Date: 9/12/2012 Lab ID: ADEQ 880630 Sample Type: EFF2-Industrial
 Sample Date: 9/5/2012 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	0.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
42	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
75	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000
100UV	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000

Conc-%	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical
D-Control	0.9000	1.0000	1	9	10	10		
32	1.0000	1.1111	0	10	10	10	0.5000	0.0500
42	0.9000	1.0000	1	9	10	10	0.7632	0.0500
56	0.9000	1.0000	1	9	10	10	0.7632	0.0500
75	0.9000	1.0000	1	9	10	10	0.7632	0.0500
100	0.7000	0.7778	3	7	10	10	0.2910	0.0500
100UV	0.8000	0.8889	2	8	10	10	0.5000	0.0500

Hypothesis Test (1-tail, 0.05)

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

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date: 9/5/2012 Test ID: X4853CD Sample ID: 1
 End Date: 9/12/2012 Lab ID: ADEQ 880630 Sample Type: EFF2-Industrial
 Sample Date: 9/5/2012 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	30.000	28.000	17.000	30.000	22.000	21.000	30.000	27.000	23.000	20.000
32	21.000	26.000	16.000	21.000	14.000	19.000	21.000	18.000	18.000	15.000
42	9.000	20.000	13.000	19.000	16.000	12.000	16.000	16.000	15.000	
56	13.000	22.000	9.000	14.000	10.000	14.000	16.000	17.000	22.000	
75	8.000	18.000	15.000	3.000	8.000	17.000	17.000	20.000	14.000	
100	15.000	16.000	14.000	12.000	11.000	15.000	15.000			
100UV	17.000	15.000	14.000	13.000	11.000	13.000	14.000	14.000		

Conc-%	Mean	N-Mean	Transform: Untransformed				N	t-Stat	1-Tailed Critical	MSD
			Mean	Min	Max	CV%				
D-Control	25.333	1.0000	25.333	17.000	30.000	18.724	9			
*32	19.400	0.7658	19.400	14.000	26.000	16.870	10	3.275	2.471	4.477
*42	15.111	0.5965	15.111	9.000	20.000	22.550	9	5.499	2.471	4.593
*56	15.222	0.6009	15.222	9.000	22.000	30.244	9	5.439	2.471	4.593
*75	13.333	0.5263	13.333	3.000	20.000	42.757	9	6.455	2.471	4.593
*100	14.000	0.5526	14.000	11.000	16.000	13.041	7	5.703	2.471	4.910
*100UV	13.875	0.5477	13.875	11.000	17.000	12.446	8	5.980	2.471	4.735

Auxiliary Tests	Statistic	Critical	Skew	Kurt		
Kolmogorov D Test indicates normal distribution (p > 0.05)	0.61941	0.895	-0.3506	0.10271		
Bartlett's Test indicates equal variances (p = 0.03)	14.4393	16.8119				
Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Bonferroni t Test indicates significant differences Treatments vs D-Control	4.7345	0.18689	167.085	15.5504	7.8E-08	6, 54

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date: 9/5/2012 Test ID: X4853CD Sample ID: 1
 End Date: 9/12/2012 Lab ID: ADEQ 880630 Sample Type: EFF2-Industrial
 Sample Date: 9/5/2012 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	30.000	28.000	17.000	30.000	22.000	21.000	30.000	27.000	23.000	13.000
32	21.000	26.000	16.000	21.000	14.000	19.000	21.000	18.000	18.000	20.000
42	9.000	20.000	13.000	0.000	19.000	16.000	12.000	16.000	16.000	15.000
56	13.000	22.000	9.000	14.000	10.000	14.000	16.000	17.000	22.000	0.000
75	8.000	18.000	0.000	15.000	3.000	8.000	17.000	17.000	20.000	14.000
100	15.000	16.000	3.000	14.000	12.000	11.000	4.000	15.000	15.000	4.000
100UV	17.000	15.000	14.000	13.000	11.000	4.000	13.000	14.000	4.000	14.000

Conc-%	Mean	N-Mean	Transform: Untransformed				N	Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%			
D-Control	24.100	1.0000	24.100	13.000	30.000	24.622	10		
32	19.400	0.8050	19.400	14.000	26.000	16.870	10	77.50	74.00
*42	13.600	0.5643	13.600	0.000	20.000	42.339	10	63.50	74.00
*56	13.700	0.5685	13.700	0.000	22.000	47.311	10	67.00	74.00
*75	12.000	0.4979	12.000	0.000	20.000	56.928	10	64.00	74.00
*100	10.900	0.4523	10.900	3.000	16.000	47.857	10	60.00	74.00
*100UV	11.900	0.4938	11.900	4.000	17.000	37.256	10	61.50	74.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.05)	1.059	0.895	-0.7858	0.10763
Bartlett's Test indicates equal variances (p = 0.45)	5.73316	16.8119		
Hypothesis Test (1-tail, 0.05)				
Steel's Many-One Rank Test indicates significant differences				
Treatments vs D-Control				

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date: 9/5/2012 Test ID: X4853CD Sample ID: 1
 End Date: 9/12/2012 Lab ID: ADEQ 880630 Sample Type: EFF2-Industrial
 Sample Date: 9/5/2012 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	30.000	28.000	17.000	30.000	22.000	21.000	30.000	27.000	23.000	13.000
32	21.000	26.000	16.000	21.000	14.000	19.000	21.000	18.000	18.000	20.000
42	9.000	20.000	13.000	0.000	19.000	16.000	12.000	16.000	16.000	15.000
56	13.000	22.000	9.000	14.000	10.000	14.000	16.000	17.000	22.000	0.000
75	8.000	18.000	0.000	15.000	3.000	8.000	17.000	17.000	20.000	14.000
100	15.000	16.000	3.000	14.000	12.000	11.000	4.000	15.000	15.000	4.000
100UV	17.000	15.000	14.000	13.000	11.000	4.000	13.000	14.000	4.000	14.000

Conc-%	Mean	N-Mean	Transform: Untransformed				N	t-Stat	1-Tailed	
			Mean	Min	Max	CV%			Critical	MSD
D-Control	24.100	1.0000	24.100	13.000	30.000	24.622	10			
32	19.400	0.8050	19.400	14.000	26.000	16.870	10	1.898	2.347	5.812
*42	13.600	0.5643	13.600	0.000	20.000	42.339	10	4.240	2.347	5.812
*56	13.700	0.5685	13.700	0.000	22.000	47.311	10	4.200	2.347	5.812
*75	12.000	0.4979	12.000	0.000	20.000	56.928	10	4.886	2.347	5.812
*100	10.900	0.4523	10.900	3.000	16.000	47.857	10	5.331	2.347	5.812
*100UV	11.900	0.4938	11.900	4.000	17.000	37.256	10	4.927	2.347	5.812

Auxiliary Tests	Statistic	Critical	Skew	Kurt		
Kolmogorov D Test indicates non-normal distribution (p <= 0.05)	1.059	0.895	-0.7858	0.10763		
Bartlett's Test indicates equal variances (p = 0.45)	5.73316	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	5.81223	0.24117	235.314	30.6603	3.3E-06	6, 63

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date: 9/5/2012 Test ID: X4853CD Sample ID: 1
 End Date: 9/12/2012 Lab ID: ADEQ 88063 Sample Type: EFF2-Industrial
 Sample Date: 9/5/2012 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	30.000	28.000	17.000	30.000	22.000	21.000	30.000	27.000	23.000	13.000
32	21.000	26.000	16.000	21.000	14.000	19.000	21.000	18.000	18.000	20.000
42	9.000	20.000	13.000	0.000	19.000	16.000	12.000	16.000	16.000	15.000
56	13.000	22.000	9.000	14.000	10.000	14.000	16.000	17.000	22.000	0.000
75	8.000	18.000	0.000	15.000	3.000	8.000	17.000	17.000	20.000	14.000
100	15.000	16.000	3.000	14.000	12.000	11.000	4.000	15.000	15.000	4.000
100UV	17.000	15.000	14.000	13.000	11.000	4.000	13.000	14.000	4.000	14.000

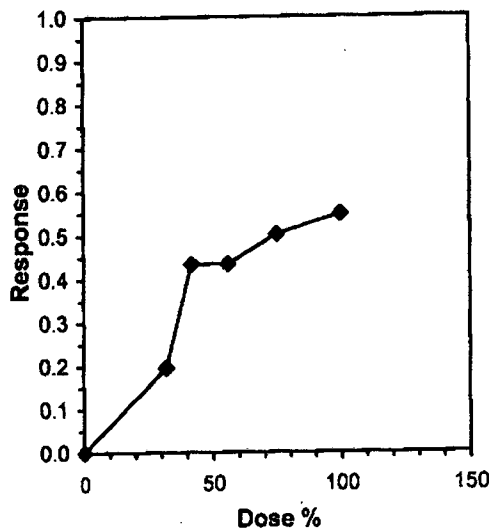
Conc-%	Transform: Untransformed							Isotonic	
	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	24.100	1.0000	24.100	13.000	30.000	24.622	10	24.100	1.0000
32	19.400	0.8050	19.400	14.000	26.000	16.870	10	19.400	0.8050
42	13.600	0.5643	13.600	0.000	20.000	42.339	10	13.650	0.5664
56	13.700	0.5685	13.700	0.000	22.000	47.311	10	13.650	0.5664
75	12.000	0.4979	12.000	0.000	20.000	56.928	10	12.000	0.4979
100	10.900	0.4523	10.900	3.000	16.000	47.857	10	10.900	0.4523
100UV	11.900	0.4938	11.900	4.000	17.000	37.256	10		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution ($p \leq 0.05$)	1.059	0.895	-0.7858	0.10763
Bartlett's Test indicates equal variances ($p = 0.45$)	5.73316	16.8119		

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL	Skew
IC05*	8.204	7.142	5.054	33.169
IC10*	16.409	7.793	10.109	34.776
IC15*	24.613	6.926	15.163	36.744
IC20	32.209	5.686	20.217	38.935
IC25	34.304	5.197	25.271	42.521
IC40	40.591			
IC50	74.424			

* indicates IC estimate less than the lowest concentration



Larval Fish Growth and Survival Test-7 Day Survival

Start Date: 9/5/2012 Test ID: X4853PP Sample ID: 1
 End Date: 9/12/2012 Lab ID: ADEQ880630 Sample Type: EFF2-Industrial
 Sample Date: 9/5/2012 Protocol: EPAFW02-EPA/821/R-02-01 Test Species: PP-Pimephales promelas

Comments:

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

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%	N		
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5		
32	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	16.00
42	0.9500	0.9500	1.3196	1.2094	1.3931	7.623	5	22.50	16.00
56	0.9000	0.9000	1.2504	1.0472	1.3931	11.683	5	20.00	16.00
75	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	16.00
*100	0.8750	0.8750	1.2094	1.2094	1.2094	0.000	5	15.00	16.00
100UV	0.9500	0.9500	1.3196	1.2094	1.3931	7.623	5	22.50	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.91464	0.934	-0.6969	0.26995
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				

Larval Fish Growth and Survival Test-7 Day Growth

Start Date: 9/5/2012 Test ID: X4853PP Sample ID: 1
 End Date: 9/12/2012 Lab ID: ADEQ880630 Sample Type: EFF2-Industrial
 Sample Date: 9/5/2012 Protocol: EPAFW02-EPA/821/R-02-01 Test Species: PP-Pimephales promelas

Comments:

Conc-%	1	2	3	4	5
D-Control	0.5750	0.5750	0.6375	0.5250	0.5250
32	0.5375	0.6000	0.6000	0.5500	0.5250
42	0.6000	0.5500	0.5375	0.4750	0.5375
56	0.5125	0.3825	0.5625	0.4500	0.5125
75	0.6375	0.5000	0.5750	0.5500	0.5125
100	0.4125	0.4375	0.4375	0.4375	0.4250
100UV	0.4875	0.5250	0.6125	0.5750	0.6000
0-SN	0.5750	0.5750	0.6375	0.5250	0.5250

Conc-%	Mean	N-Mean	Transform: Untransformed				N	t-Stat	1-Tailed	
			Mean	Min	Max	CV%			Critical	MSD
D-Control	0.5675	1.0000	0.5675	0.5250	0.6375	8.182	5	0.161	2.443	0.0760
32	0.5625	0.9912	0.5625	0.5250	0.6000	6.285	5	0.884	2.443	0.0760
42	0.5400	0.9515	0.5400	0.4750	0.6000	8.249	5	2.812	2.443	0.0760
*56	0.4800	0.8458	0.4800	0.3625	0.5825	16.011	5	0.402	2.443	0.0760
75	0.5550	0.9780	0.5550	0.5000	0.6375	9.895	5	4.419	2.443	0.0760
*100	0.4300	0.7577	0.4300	0.4125	0.4375	2.600	5	0.241	2.443	0.0760
100UV	0.5600	0.9868	0.5600	0.4875	0.6125	9.391	5	0.000	2.443	0.0760
0-SN	0.5675	1.0000	0.5675	0.5250	0.6375	8.182	5			

Auxiliary Tests	Statistic	Critical	Skew	Kurt		
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.97487	0.94	-0.188	0.06649		
Bartlett's Test indicates equal variances (p = 0.17)	10.2658	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	0.07599	0.13391	0.01281	0.00242	4.3E-04	7, 32

Larval Fish Growth and Survival Test-7 Day Growth

Start Date: 9/5/2012 Test ID: X4853PP Sample ID: 1
 End Date: 9/12/2012 Lab ID: ADEQ880630 Sample Type: EFF2-Industrial
 Sample Date: 9/5/2012 Protocol: EPAFW02-EPA/821/R-02-01 Test Species: PP-Pimephales promelas

Comments:

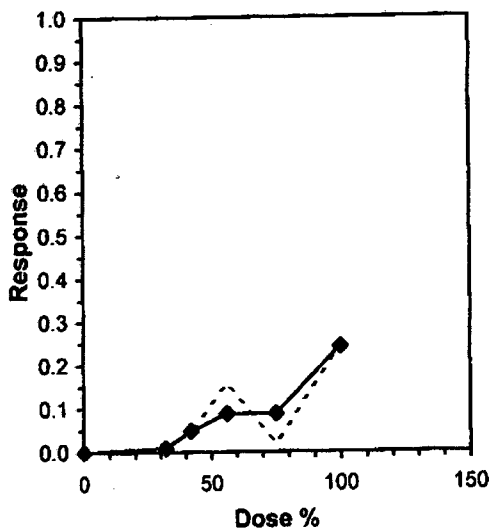
Conc-%	1	2	3	4	5
D-Control	0.5750	0.5750	0.6375	0.5250	0.5250
32	0.5375	0.6000	0.6000	0.5500	0.5250
42	0.6000	0.5500	0.5375	0.4750	0.5375
56	0.5125	0.3625	0.5625	0.4500	0.5125
75	0.6375	0.5000	0.5750	0.5500	0.5125
100	0.4125	0.4375	0.4375	0.4375	0.4250
100UV	0.4875	0.5250	0.6125	0.5750	0.6000
0-SN	0.5750	0.5750	0.6375	0.5250	0.5250

Conc-%	Transform: Untransformed						Isotonic		
	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	0.5675	1.0000	0.5675	0.5250	0.6375	8.182	5	0.5675	1.0000
32	0.5625	0.9912	0.5625	0.5250	0.6000	6.285	5	0.5625	0.9912
42	0.5400	0.9515	0.5400	0.4750	0.6000	8.249	5	0.5400	0.9515
56	0.4800	0.8458	0.4800	0.3625	0.5625	16.011	5	0.5175	0.9119
75	0.5550	0.9780	0.5550	0.5000	0.6375	9.895	5	0.5175	0.9119
100	0.4300	0.7577	0.4300	0.4125	0.4375	2.600	5	0.4300	0.7577
100UV	0.5600	0.9868	0.5600	0.4875	0.6125	9.391	5		
0-SN	0.5675	1.0000	0.5675	0.5250	0.6375	8.182	5		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution ($p > 0.05$)	0.97487	0.94	-0.168	0.06649
Bartlett's Test indicates equal variances ($p = 0.17$)	10.2658	18.4753		

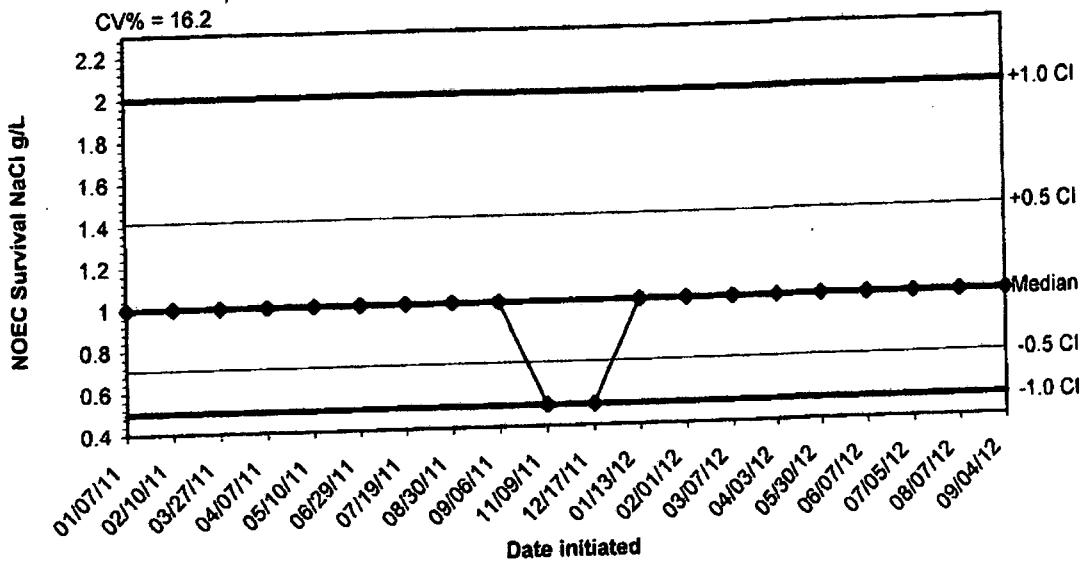
Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)	Skew
IC05	42.544	14.671	7.285 95.077	0.9130
IC10	76.929	16.078	19.722 87.934	-0.1916
IC15	85.036	10.412	35.096 94.730	-2.1135
IC20	93.143			
IC25	>100			
IC40	>100			
IC50	>100			



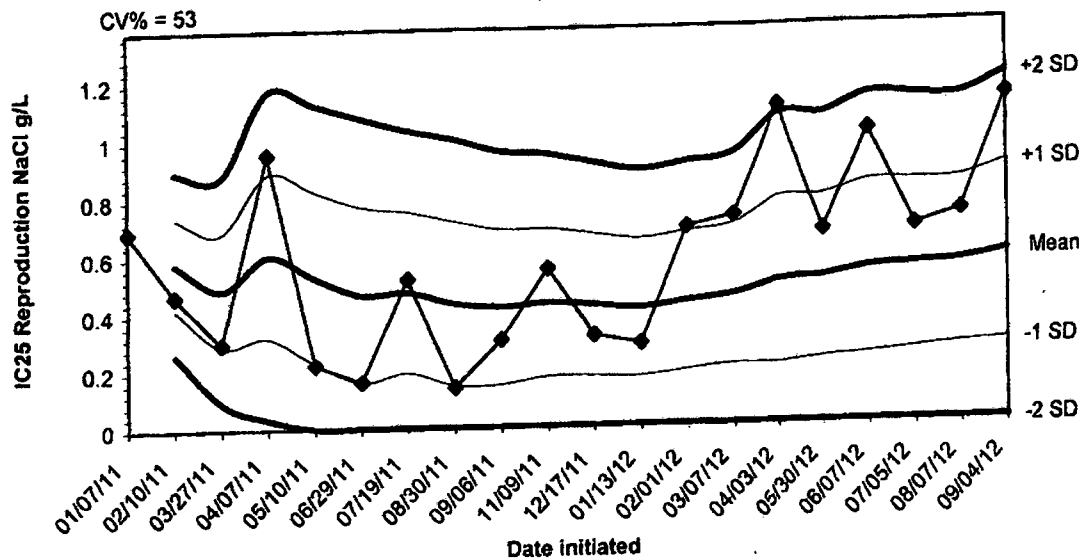
APPENDIX D
QUALITY ASSURANCE CHARTS

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



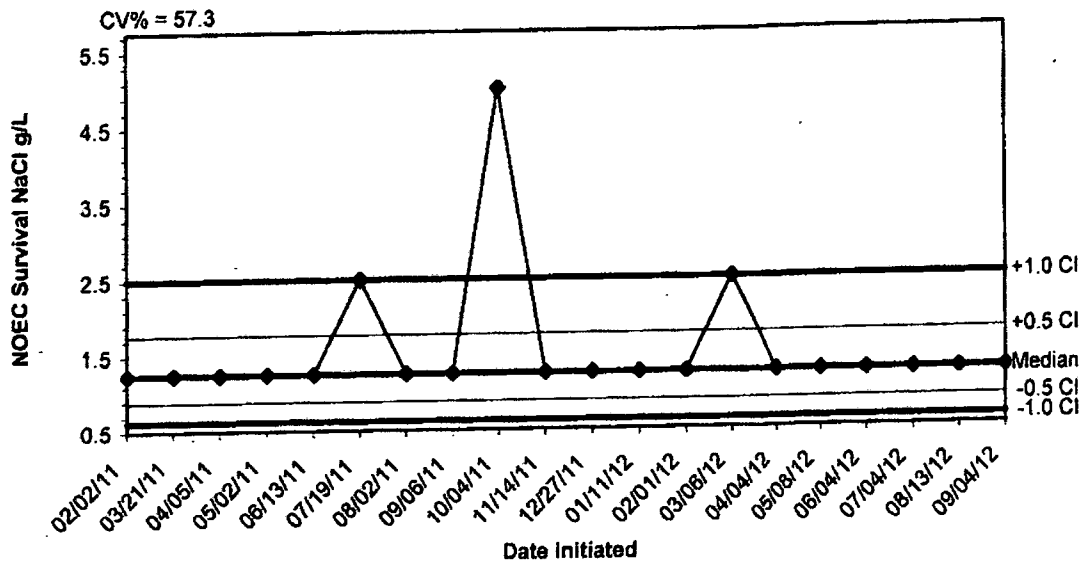
Dates	Values	Median	-0.5 CI	-1.0 CI	+0.5 CI	+1.0 CI
01/07/11	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
02/10/11	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
03/27/11	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
04/07/11	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
05/10/11	1.0000	1.0000	0.7071	0.5000	1.4142	2.0000
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

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



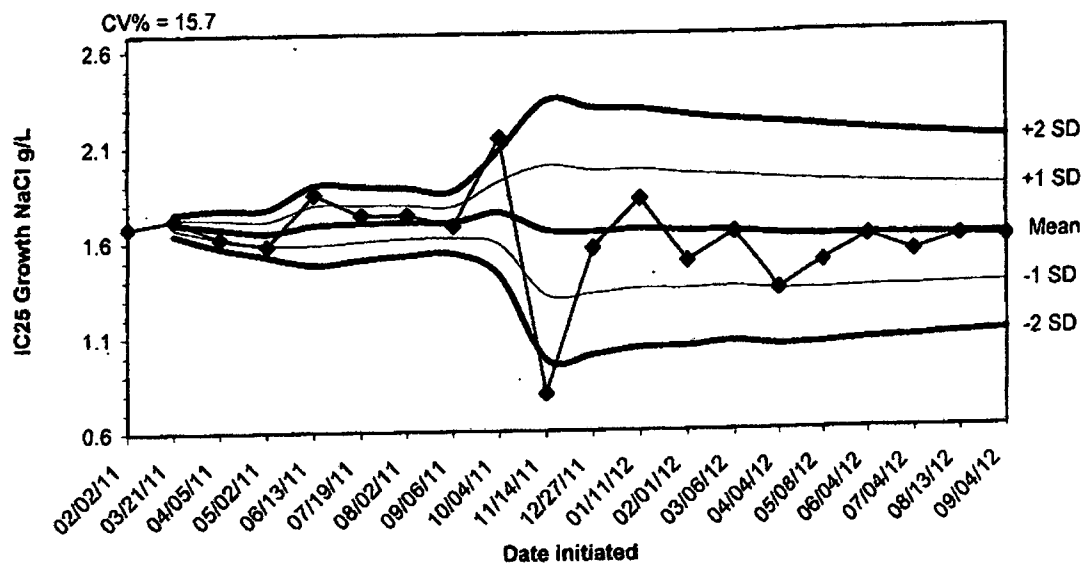
Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
01/07/11	0.6913					
02/10/11	0.4674	0.5794	0.4210	0.2627	0.7377	0.8960
03/27/11	0.2984	0.4857	0.2886	0.0915	0.6828	0.8799
04/07/11	0.9552	0.6031	0.3185	0.0339	0.8877	1.1723
05/10/11	0.2227	0.5270	0.2275	0.0000	0.8265	1.1260
06/29/11	0.1608	0.4660	0.1592	0.0000	0.7727	1.0795
07/19/11	0.5187	0.4735	0.1928	0.0000	0.7542	1.0350
08/30/11	0.1390	0.4317	0.1461	0.0000	0.7172	1.0028
09/06/11	0.3034	0.4174	0.1469	0.0000	0.6879	0.9585
11/09/11	0.5489	0.4306	0.1722	0.0000	0.6890	0.9474
12/17/11	0.3138	0.4200	0.1723	0.0000	0.6676	0.9153
01/13/12	0.2835	0.4086	0.1692	0.0000	0.6480	0.8874
02/01/12	0.6864	0.4300	0.1881	0.0000	0.6718	0.9136
03/07/12	0.7233	0.4509	0.2057	0.0000	0.6961	0.9413
04/03/12	1.1000	0.4942	0.2045	0.0000	0.7839	1.0736
05/30/12	0.6660	0.5049	0.2218	0.0000	0.7881	1.0712
06/07/12	1.0102	0.5346	0.2344	0.0000	0.8349	1.1352
07/05/12	0.6765	0.5425	0.2493	0.0000	0.8358	1.1290
08/07/12	0.7250	0.5521	0.2641	0.0000	0.8402	1.1282
09/04/12	1.1229	0.5807	0.2726	0.0000	0.8887	1.1967

2012 Chronic Reference Toxicant Test Results for Pimephales promelas



Dates	Values	Median	-0.5 CI	-1.0 CI	+0.5 CI	+1.0 CI
02/02/11	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
03/21/11	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
04/05/11	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
05/02/11	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
06/13/11	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
07/19/11	2.5000	1.2500	0.8839	0.6250	1.7678	2.5000
08/02/11	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
09/06/11	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
10/04/11	5.0000	1.2500	0.8839	0.6250	1.7678	2.5000
11/14/11	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
12/27/11	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
01/11/12	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
02/01/12	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
03/08/12	2.5000	1.2500	0.8839	0.6250	1.7678	2.5000
04/04/12	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
05/08/12	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
06/04/12	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
07/04/12	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
08/13/12	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000
09/04/12	1.2500	1.2500	0.8839	0.6250	1.7678	2.5000

2012 Chronic Reference Toxicant Test Results for Pimephales promelas



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
02/02/11	1.6800					
03/21/11	1.7200	1.7000	1.6717	1.6434	1.7283	1.7566
04/05/11	1.6200	1.6733	1.6230	1.5727	1.7237	1.7740
05/02/11	1.5800	1.6500	1.5878	1.5256	1.7122	1.7744
06/13/11	1.8500	1.6900	1.5856	1.4812	1.7944	1.8988
07/19/11	1.7400	1.6983	1.6027	1.5072	1.7939	1.8895
08/02/11	1.7400	1.7043	1.6156	1.5270	1.7930	1.8816
09/06/11	1.6800	1.7013	1.6187	1.5362	1.7838	1.8663
10/04/11	2.1400	1.7500	1.5846	1.4192	1.9154	2.0808
11/14/11	0.7959	1.6546	1.3150	0.9753	1.9942	2.3338
12/27/11	1.5600	1.6460	1.3225	0.9991	1.9694	2.2929
01/11/12	1.8182	1.6603	1.3480	1.0356	1.9727	2.2851
02/01/12	1.4900	1.6472	1.3444	1.0417	1.9500	2.2528
03/06/12	1.6400	1.6467	1.3558	1.0649	1.9376	2.2286
04/04/12	1.3400	1.6263	1.3350	1.0437	1.9176	2.2089
05/08/12	1.4800	1.6171	1.3333	1.0495	1.9009	2.1847
06/04/12	1.6119	1.6168	1.3420	1.0673	1.8916	2.1664
07/04/12	1.5255	1.6118	1.3443	1.0769	1.8792	2.1466
08/13/12	1.6031	1.6113	1.3514	1.0915	1.8712	2.1311
09/04/12	1.5956	1.6105	1.3575	1.1045	1.8635	2.1165

APPENDIX E
AGENCY FORMS

**SUMMARY REPORTING FORMS
CHRONIC BIOMONITORING**

Ceriodaphnia dubia Survival and Reproduction

Permittee: El Dorado Chemical Company
Outfall 001

NPDES No.: AR0000752
AFIN: 70-00040

	Time	Date	Time	Date
Composite 1 Collected From	0830	9/4/12 To	0830	9/5/12
Composite 2 Collected From	0830	9/6/12 To	0830	9/7/12
Composite 3 Collected From	0830	9/9/12 To	0830	9/10/12
Test initiated:	1320 am/pm		9/5/12	date
Test terminated:	1330 am/pm		9/12/12	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	100	100	100	100
End of test	90	100	90	90	90	70	80

NUMBER OF YOUNG PRODUCED PER FEMALE @ END OF TEST

Rep	0	32	42	56	75	100	100 UV
A	30	21	9	13	8	15	17
B	28	26	20	22	18	16	15
C	17	16	13	9	D	D3	14
D	30	21	D	14	15	14	13
E	22	14	19	10	3	12	11
F	21	19	16	14	8	11	D4
G	30	21	12	16	17	D4	13
H	27	18	16	17	17	15	15
I	23	18	16	22	20	15	D4
J	D13	20	15	D	14	D4	14
Surv. Mean	25.3	19.4	15.1	15.2	13.3	14.0	13.9
Total Mean	24.1	19.4	13.6	13.7	12.0	10.9	11.9
CV%*	18.72	16.87	22.55	30.24	42.76	13.04	12.45

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

PMSD = 24.1%

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) 1/2 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) 1/2 LOW FLOW DILUTION (N/A %):		YES	NO

3. If you answered NO to 1. a) and 2. a) enter (0) otherwise enter (1): 1

4. If you answered NO to 1. b) and 2. b) enter (0) otherwise enter (1): N/A

5. Enter response to item 3 on DMR Form, parameter #TEP3B.

6. Enter response to item 4 on DMR Form, parameter #TFP3B.

7. Enter percent effluent corresponding to each NOEC below and circle lowest number:

a) NOEC survival:	100% effluent
b) NOEC reproduction:	32% effluent
c) LOEC survival:	N/A% effluent
d) LOEC reproduction:	42% effluent

**Biomonitoring Form
Chronic Toxicity Summary Form
Ceriodaphnia dubia
Chemical Parameters Chart**

Contract: El Dorado Chemical
DES No.: AR0000752/ AFIN 70-00040
Contact: Larken Pennington
Analyst: Houghton, Zeagler, Callahan

Sample No. 1 Collected: Date: 9/3/12 Time: 0830
Sample No. 2 Collected: Date: 9/7/12 Time: 0830
Sample No. 3 Collected: Date: 9/10/12 Time: 0830
Test Begin: Date: 9/5/12 Time: 1320
Test End: Date: 9/12/12 Time: 1330

Dilution: 0 Day:									Dilution: 56 Day:								
	1	2	3	4	5	6	7	Comments		1	2	3	4	5	6	7	Comments
Temp (C)	24.5	24.2	24.1	24.1	24.6	24.5	24.1		Temp (C)	24.5	24.2	24.1	24.1	24.6	24.5	24.1	
DO Initial	8.4	8.3	8.5	8.5	8.3	8.7	8.1		DO Initial	8.2	8.1	8.4	8.3	8.2	8.7	8.1	
DO Final	8.1	8.2	8.1	8.4	8.4	8.3			DO Final	8.2	8.2	8.1	8.5	8.2	8.6		
pH Initial	7.9	7.7	8.0	7.9	7.9	8.0	8.0		pH Initial	8.1	8.0	8.2	8.2	8.2	8.2	8.1	
pH Final	7.8	7.6	7.8	7.8	7.8	7.9			pH Final	8.5	8.3	8.3	8.2	8.6	8.5		
Alkalinity	32.0				32.0				Alkalinity								
Hardness	56.0				56.0				Hardness								
Conductivity	177.0	184.5	185.6	184.4	178.1	175.6			Conductivity	323	343	347	343	405	394		
Chlorine	<.01				<.01				Chlorine								
Dilution: 32 Day									Dilution: 75 Day								
	1	2	3	4	5	6	7	Comments		1	2	3	4	5	6	7	Comments
Temp (C)	24.5	24.2	24.1	24.1	24.6	24.5	24.1		Temp (C)	24.5	24.2	24.1	24.1	24.6	24.5	24.1	
DO Initial	8.3	8.2	8.4	8.4	8.2	8.7	8.1		DO Initial	8.1	8.1	8.4	8.3	8.1	8.8	8.1	
DO Final	8.1	8.2	8.1	8.4	8.2	8.5			DO Final	8.2	8.2	8.1	8.5	8.1	8.6		
pH Initial	7.9	7.8	8.1	8.0	8.1	8.1	7.9		pH Initial	8.1	8.1	8.2	8.3	8.3	8.2	8.1	
pH Final	8.3	8.1	8.1	8.0	8.4	8.4			pH Final	8.5	8.4	8.4	8.3	8.6	8.5		
Alkalinity									Alkalinity								
Hardness									Hardness								
Conductivity	263	277	279	278	313	300			Conductivity	374	396	399	396	478	471		
Chlorine									Chlorine								
Dilution: 42 Day									Dilution: 100 Day								
	1	2	3	4	5	6	7	Comments		1	2	3	4	5	6	7	Comments
Temp (C)	24.5	24.2	24.1	24.1	24.6	24.5	24.1		Temp (C)	24.5	24.2	24.1	24.1	24.6	24.5	24.1	
DO Initial	8.2	8.2	8.4	8.4	8.2	8.8	8.1		DO Initial	8.1	8.1	8.4	8.2	8.1	8.7	8.1	
DO Final	8.2	8.2	8.1	8.4	8.2	8.5			DO Final	8.2	8.2	8.1	8.5	8.0	8.6		
pH Initial	8.0	7.9	8.1	8.1	8.2	8.2	8.0		pH Initial	8.2	8.1	8.3	8.4	8.3	8.2	8.2	
pH Final	8.4	8.3	8.2	8.1	8.5	8.5			pH Final	8.6	8.4	8.4	8.4	8.6	8.5		
Alkalinity									Alkalinity	96.0		100.0		84.0			
Hardness									Hardness	44.0		40.0		36.0			
Conductivity	285	305	306	304	346	342			Conductivity	435	468	473	467	580	568		
Chlorine									Chlorine	<.01		<.01		<.01			
Dilution: 100 UV Day																	
	1	2	3	4	5	6	7	Comments									
Temp (C)	24.5	24.2	24.1	24.1	24.6	24.5	24.1										
DO Initial	8.0	8.0	8.3	8.1	8.0	8.4	7.7										
DO Final	8.0	8.0	7.9	8.2	7.8	8.4											
pH Initial	8.2	8.1	8.2	8.3	8.4	8.1	8.1										
pH Final	8.4	8.3	8.3	8.3	8.5	8.7											
Alkalinity																	
Hardness																	
Conductivity	436	468	472	469	601	544											

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

Permittee: El Dorado Chemical
Outfall 001

NPDES No.: AR0000752
AFIN: 70-00040

	Time	Date	Time	Date
Composite 1 Collected from:	0830	9/4/12 To	0830	9/5/12
Composite 2 Collected from:	0830	9/6/12 To	0830	9/7/12
Composite 3 Collected from:	0830	9/9/12 To	0830	9/10/12

Test initiated: 1330 am/pm 9/5/12 date
 Test terminated: 1030 am/pm 9/12/12 date
 Dilution water used: Receiving Reconstituted

DATA TABLE FOR SURVIVAL

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

DATA TABLE FOR GROWTH

Effluent Conc. %	Average Dry Weight in milligrams in replicate chambers					Mean Dry Weight mg	CV*
	A	B	C	D	E		
0	0.575	0.575	0.638	0.525	0.538	0.568	8.18
32	0.538	0.600	0.600	0.550	0.525	0.563	6.29
42	0.600	0.550	0.538	0.475	0.538	0.540	8.25
56	0.513	0.363	0.563	0.450	0.513	0.480	16.01
75	0.638	0.500	0.575	0.550	0.513	0.555	9.90
100 UV	0.413	0.438	0.438	0.438	0.425	0.560	9.39

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

PMSD = 13.4%

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 (based on 100% UV) |
| b) 1/2 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 (based on 100% UV) |
| b) 1/2 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

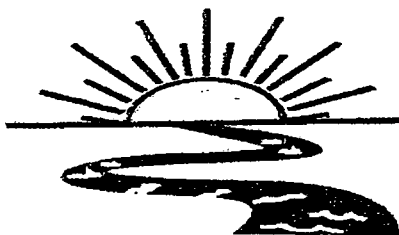
5. Enter response to item 3 on DMR Form, parameter #TEP6C.

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 |

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#: X4853

Chain of Custody Documents Checked by: JSM 9/25/12
Technician/Date

Raw Data Documents Checked by: JSM 9/25/12
Technician/Date

Statistical Analysis Package Checked by: EGG 9/26/12
Quality Manager/Date

Quality Control Data Checked by: EGG 9/20/12
Quality Manager/Date

Report Checked by: EGG 10/3/12
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.

Cynthia H. Bruggs
Quality Manager

10/3/12
Date

No part of this work may be altered in any form or by any means without written permission from Bio-Analytical Laboratories.

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X4858

Bio-Analytical Laboratories' Executive Summary

Permittee: El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731

Project #: X4858

Outfall: Outfall 002

Permit #: AR0000752/ AFIN #70-00040

Contact: Ms. Larken Pennington

Test Dates: September 9 - 11, 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 - 0.00%.

For *Daphnia pulex*:

1. If the NOEC for survival is less than the critical dilution (100%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D - 0.
2. Report the NOEC for survival, Parameter TOM3D - 100%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 17.85%.

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 002
AT**

**EL DORADO CHEMICAL COMPANY
El Dorado, Arkansas**

**NPDES #AR0000752
AFIN #70-00040**

EPA Methods 2000.0 and 2021.0

Project X4858

**Test Dates: September 9 - 11, 2012
Report Date: October 3, 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 X4858

TABLE OF CONTENTS

1.0 Introduction	4
2.0 Methods and Materials	4
2.1 Test Methods	4
2.2 Test Organisms	4
2.3 Dilution Water	5
2.4 Test Concentrations	5
2.5 Sample Collection	5
2.6 Sample Preparation	5
2.7 Monitoring of the Tests	5
2.8 Data Analysis	5
3.0 Results and Discussion	6
4.0 Conclusions	7
5.0 Reference	8
Appendices	
A- Chain-of-Custody Documents	9
B- Raw Data Sheets	11
C- Statistical Analysis	19
D- Quality Assurance Charts	22
E- Agency Forms	25
F- Report Quality Assurance Form	30

BAL
ADEQ #88-0630
Project X4858

1.0 Introduction

Bio-Analytical Laboratories (BAL), Doyline, Louisiana conducted two 48-hour acute toxicity tests for Outfall 002 at El Dorado Chemical Company, El Dorado, Arkansas. The test organisms used were the fathead minnow, *Pimephales promelas* and the cladoceran, *Daphnia pulex*. The purpose of this study is to determine if an appropriately dilute effluent sample adversely affects the survival of the test organism. Toxicity is defined as a statistically significant difference at the 95 percent confidence level between the survival of the test organisms in the critical dilution (the effluent concentration representative of the proportion of effluent in the receiving water during critical low flow or critical mixing conditions) compared to the survival of the test organisms in the control. The test endpoints are the No-Observed-Effect-Concentration (NOEC), which is defined as the highest effluent concentration that is not statistically different from the control, and the 48-hour LC_{50} , the concentration in which 50 percent of the test organisms died.

2.0 Methods and Materials

2.1 Test Methods

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

2.2 Test Organisms

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

BAL
ADEQ #88-0630
Project X4858

2.3 Dilution Water

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

2.4 Test Concentrations

The test concentrations used in the tests were 100, 75.0, 56.0, 42.0 and 32.0 percent effluent and a reconstituted water control. The critical dilution was defined as 100 percent effluent. The tests were conducted using five replicates of eight animals each for a total of 40 animals per concentration.

2.5 Sample Collection

One sample of Outfall 002 was collected by El Dorado Chemical personnel on September 8, 2012. Upon completion of collection, the sample was chilled to 4⁰ Celsius and personally delivered to Bio-Analytical Laboratories.

2.6 Sample Preparation

Upon arrival, the sample was logged in, given an identification number and refrigerated unless needed. Prior to use, the sample was warmed to 25±1⁰ 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±1⁰ 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 LC₅₀ values were obtained by approved EPA methods of analysis, using the ToxCalc statistical program.

BAL
ADEQ #88-0630
Project X4858

3.0 Results and Discussion

The results of the tests can be found in Table 1. Significant differences in survival were not noted in the critical dilution in either test ($p=.05$). 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	
	<i>Pimephales promelas</i>	<i>Daphnia pulex</i>
Test Organism		
Control	100.0	95.0
32.0	97.5	92.5
42.0	100.0	97.5
56.0	100.0	87.5
75.0	100.0	95.0
100.0	100.0	85.0

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 X4858

4.0 Conclusions

The sample of Outfall 002 collected from El Dorado Chemical Company, El Dorado, Arkansas, on September 8, 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 X4858

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
 Doyline, LA 71023
 (318) 745-2772, Fax (318) 745-2773
 bioanalytical@atla.net

CHAIN OF CUSTODY

NELAP 01975, ADEQ #88-0630, EPA LA00917

Company: El Dorado Chemical Company						Phone: (870) 863-1484		Analysis:								Project Number: K4858				
Address: 4500 Northwest Avenue, El Dorado, AR 71731						Fax: (870) 863-1499		Chronic Ceriodaphnia	Chronic minnow	Acute minnow (fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	Fecal Coliform	Total Coliform	Temp. upon arrival:	Preservative: (below)			
Permit #: AR0000752						Purchase Order:														
Sampler's Signature/Printed Name/Affiliation: Larken Remington / Larken Remington / EDCC																				
Date Start	Date End	Time Start	Time End	C	G	# containers	Sample Identification									Temperature upon arrival:	Thermometer #:	Date:	Lab #:	
9/8/12		8:30			X	10	002									CL097	29	9/9/12		Ice
Relinquished by/Affiliation: Larken Remington / EDCC						Date: 9/9/12		Time: 1415		Received by/Affiliation: Aimee Haughton						Date: 9/9/12		Time: 1415		
Relinquished by/Affiliation:						Date:		Time:		Received by/Affiliation:						Date:		Time:		
Relinquished by/Affiliation:						Date:		Time:		Received by/Affiliation:						Date:		Time:		
Method of Shipment: <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Bus <input type="checkbox"/> Fed Ex <input type="checkbox"/> DHL <input type="checkbox"/> UPS <input checked="" type="checkbox"/> Client <input type="checkbox"/> Other																				
Comments: <div style="display: flex; align-items: center;"> 2009 2009/9/12 </div>																				

**APPENDIX B
RAW DATA SHEETS**

BIO-ANALYTICAL LABORATORIES
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X4858

Client: EDCC/El Dorado Chemical Company

Address: 4500 Northwest Ave El Dorado AR 71731

NPDES# AR0000752 Outfall 002

Technicians: EGB/AH/LGZ/RC

Test initiated: Date 9/9/12 Time 1515

Test terminated: Date 9/11/12 Time 1440

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
CL097	7.1/81.3%	NO	LO.01	NO	3.0	N/A	84.0	36.0	AH
	7.9/92.3%	No							RC

Dilution Water Information

Dilution Water	ID#	Initial D.O (mg/L & %)	Aerate? Minutes/D.O (mg/L & %)	Total Residual Chlorine (mg/L)	Ammonia (NH3) mg/L	pH	Hardness	Alkalinity	Tech
Soft H2O	3375	NA	NA	NA	NA	7.9	56.0	32.0	RC

Test Species Information

Test Species Info.	Species: <u>D.pulex</u> ID# <u>BA110-210</u>	Species: <u>P.gammas</u> ID# <u>BA19712</u>	Species: ID#:	Species: ID#:
Age	<u>42h</u>	<u>~2d</u>		
Test Container Size	<u>30ml</u>	<u>250ml</u>		
Test volume	<u>85ml</u>	<u>200ml</u>		
Feeding: Type	<u>YCT: Algae</u>	<u>Artemia</u>		
Amount	<u>Fed this phor to test initiation</u>			
Aeration?	<u>NA</u>	<u>NA</u>		
Amount				
Condition of survivors	<u>Good</u>		<u>Good AH</u>	

Comments:

9/11/12

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

Project# X4858

Test started: Date 9/9/12

Time 1515

Client Elorado Chemical

Test ended: Date 9/11/12

Time 1345

Sample Description 002

Test Species D. pulex

ID# BA1X10-210

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

Time: Ohour 1515 24hour 1240 48hour 1348 72hour 1348 96hour 1348

Temperature (°C): Ohour 24.2 24hour 24.3 48hour 24.3 72hour 24.3 96hour 24.3

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	6			8.4	8.4	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9
	B		8	8	8																							
	C		8	8	8																							
	D		8	8	8																							
	E		8	8	8																							
32	A		8	8	8			8.1	8.3	7.9			7.4	7.2	7.2			4.76	4.63	4.51	4.57							
	B		8	8	8																							
	C		8	8	7																							
	D		8	8	8																							
	E		8	7	6																							
Chemistry Tech prerenewal/postrenewal								AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH

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

Project# X4858

Test started: Date 9/9/12

Time 1515

Client El Dorado Chemical

Test ended: Date 9/11/12

Time 1345

Sample Description 002

Test Species D. pulex

ID# BA1 X10-210

Technician: Ohour AH 24hour AH 48hour RC 72hour RC 96hour RC
 Time: Ohour 1515 24hour 1240 48hour 1345 72hour 1345 96hour 1345
 Temperature (°C): Ohour 24.2 24hour 24.3 48hour 24.3 72hour 24.3 96hour 24.3

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
42	A	NA	8	8	8			8.0	8.2	7.9			7.1	7.1	7.6			500	538	645		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	7																	
56	A		8	8	6			7.9	8.0	7.9			7.0	7.5	7.6			682	646	645	653	
	B		8	8	7																	
	C		8	8	7																	
	D		8	8	8																	
	E		8	8	7																	
Chemistry Tech prerenewal/postrenewal							AH/AH/RC/RC/RC					AH/AH/RC/RC/RC					AH/AH/RC/RC/RC					

ACUTE2 020809 Rev.

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

Project# X4858

Test started: Date 9/9/12

Time 1515

Client El Dorado Chemical

Test ended: Date 9/11/12

Time 1345

Sample Description 002

Test Species D. pulex

ID# BA1 X10-210

Technician: Ohour AM 24hour AM 48hour AM 72hour AM 96hour AM

Time: Ohour 1515 24hour 1210 48hour 1305 72hour 1 96hour 1

Temperature (°C): Ohour 24.2 24hour 21.3 48hour 24.2 72hour 1 96hour 1

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
75	A	NA	8	8	8			7.7	7.8	7.8			6.9	7.5	7.5			842	804	804		
	B		8	8	7																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	7																	
100	A		8	8	8			7.3	7.8	7.8			6.8	7.4	7.5			1062	985	999		
	B		8	8	7																	
	C		8	8	8																	
	D		8	6	5																	
	E		8	7	6																	
Chemistry Tech prerenewal/postrenewal							AM	AM	AM	AM	AM	AM	AM	AM	AM	AM	AM	AM	AM	AM	AM	AM

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

Project# X4858

Test started: Date 9/9/12 Time 1635

Client El Dorado Chemical

Test ended: Date 9/11/12 Time 1440

Sample Description 002

Test Species P. promelas ID# PAU 9712

Technician: Ohour AH 24hour RC AH 48hour AH 72hour RC AH 96hour RC AH
 Time: Ohour 1635 24hour 1545 48hour 1440 72hour RC AH 96hour RC AH
 Temperature (°C): Ohour 24.2 24hour 24.2 48hour 24.3 72hour RC AH 96hour RC AH

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	8	8			8.4	7.8 8.4	7.9			7.9	7.4 7.6	7.8			189	181 181	190		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
32	A		8	8	7			8.1	7.8 8.3	7.9			7.4	7.5 7.2	7.7			470	465 451	473		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal							AH	RC AH RC AH	AH			AH	RC AH RC AH	AH			AH	RC AH RC AH	AH			

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

Project# X4858

Test started: Date 9/9/12 Time 1635

Client El Dorado Chemical

Test ended: Date 9/11/12 Time 1440

Sample Description 002

Test Species P. promelas ID# PA19712

Technician: Ohour AM 24hour AM 48hour AM 72hour _____ 96hour _____
 Time: Ohour 1635 24hour 1245 48hour 1440 72hour _____ 96hour _____
 Temperature (°C): Ohour 21.2 24hour 24.0 48hour 24.3 72hour _____ 96hour _____

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
42	A	NA	8	8	8			8.0	7.7	7.9			7.1	7.5	7.7			500	547	551		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
56	A		8	8	8			7.9	7.7	7.8			7.0	7.5	7.7			682	659	664		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal							AM AM AM					AM AM AM					AM AM AM					

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

Project# X4858

Test started: Date 9/9/12 Time 10:35

Client El Dorado Chemical

Test ended: Date 9/11/12 Time 14:40

Sample Description 002

Test Species P. promelas ID# BA19712

Technician: Ohour AH 24hour DM 48hour AH 72hour 96hour
 Time: Ohour 10:35 24hour 12:45 48hour 14:40 72hour 96hour
 Temperature (°C): Ohour 24.2 24hour 24.2 48hour 24.3 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		
75	A	NA	8	8	8			7.7	7.7	7.7			6.9	7.4	7.0			812	808	806	821			
	B		8	8	8																			
	C		8	8	8																			
	D		8	8	8																			
	E		8	8	8																			
100	A		8	8	8			7.3	7.6	7.7			6.8	7.4	7.6			1062	1044	1007	1038			
	B		8	8	8																			
	C		8	8	8																			
	D		8	8	8																			
	E		8	8	8																			
Chemistry Tech prerenewal/postrenewal							AH	DM	AH			AH	DM	AH			AH	DM	AH					

ACUTE2 020809 Rev.

APPENDIX C
STATISTICAL ANALYSIS

Daphnid Acute Test-48 Hr Survival

Start Date: 9/9/2012 Test ID: X4858DP Sample ID: 2
 End Date: 9/11/2012 Lab ID: ADEQ 880630 Sample Type: EFF2-Industrial
 Sample Date: 9/9/2012 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: CD-Ceriodaphnia dubia
 Comments:

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

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%	N		
D-Control	0.9500	1.0000	1.3239	1.0472	1.3931	11.684	5		
32	0.9250	0.9737	1.2872	1.0472	1.3931	12.116	5	25.50	16.00
42	0.9750	1.0263	1.3564	1.2094	1.3931	6.055	5	28.00	16.00
56	0.8750	0.9211	1.2137	1.0472	1.3931	10.087	5	21.50	16.00
75	0.9500	1.0000	1.3196	1.2094	1.3931	7.623	5	26.00	16.00
100	0.8500	0.8947	1.1909	0.9117	1.3931	17.846	5	22.50	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution ($p \leq 0.05$)	0.91708	0.927	-0.6846	-0.1851
Bartlett's Test indicates equal variances ($p = 0.53$)	4.10103	15.0863		
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs D-Control				

Acute Fish Test-48 Hr Survival

Start Date: 9/9/2012 Test ID: X4858PP Sample ID: 2
 End Date: 9/11/2012 Lab ID: ADEQ 880630 Sample Type: EFF2-Industrial
 Sample Date: 9/9/2012 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: PP-Pimephales promelas

Comments:

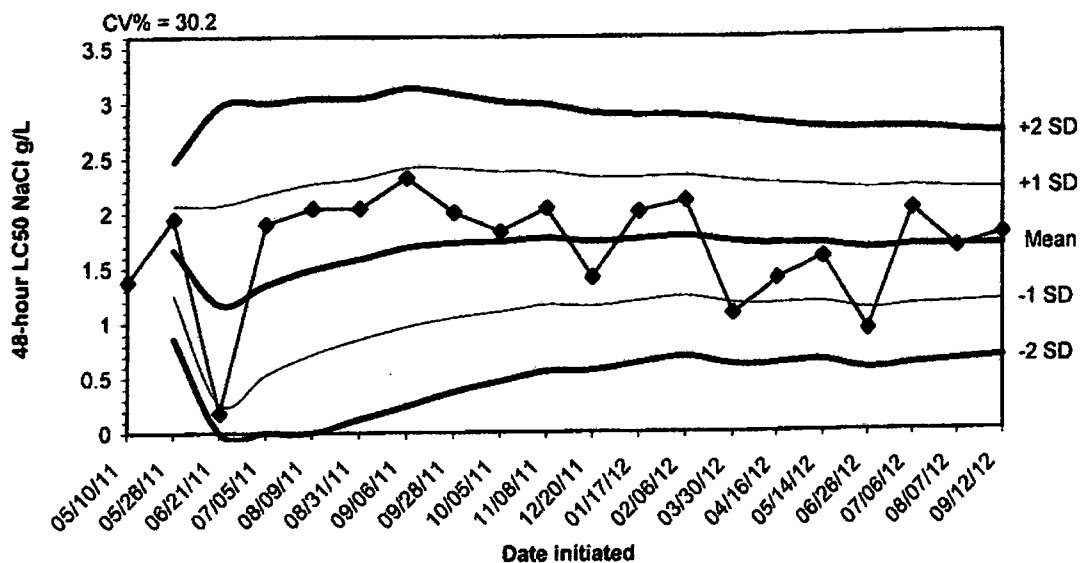
Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000
32	0.8750	1.0000	1.0000	1.0000	1.0000
42	1.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	1.0000	1.0000	1.0000
75	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000	1.0000

Conc-%	Transform: Arcsin Square Root						Rank Sum	1-Tailed Critical
	Mean	N-Mean	Mean	Min	Max	CV%		
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	
32	0.9750	0.9750	1.3584	1.2094	1.3931	6.055	5	25.00
42	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50
56	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50
75	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50
100	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution ($p \leq 0.05$)	0.41613	0.927	-3.8705	19.8512
Equality of variance cannot be confirmed				
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs D-Control				

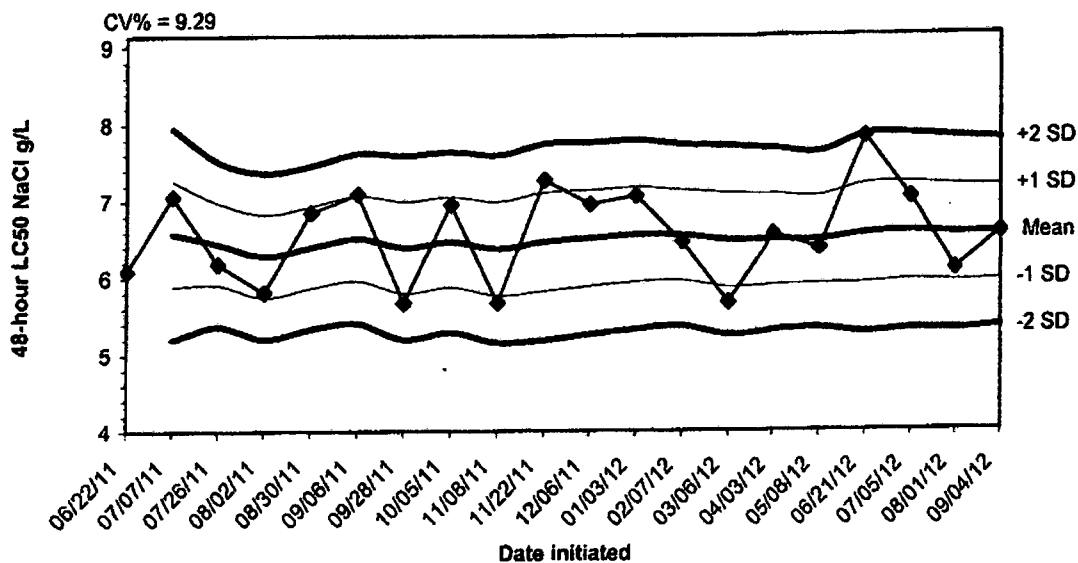
APPENDIX D
QUALITY ASSURANCE CHARTS

2012 48-hour Reference Toxicant Test Results for *Daphnia pulex*



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
05/10/11	1.3800					
05/26/11	1.9500	1.6650	1.2619	0.8589	2.0681	2.4711
06/21/11	0.1800	1.1700	0.2665	0.0000	2.0735	2.9770
07/05/11	1.9000	1.3525	0.5294	0.0000	2.1756	2.9986
08/09/11	2.0400	1.4900	0.7137	0.0000	2.2663	3.0425
08/31/11	2.0400	1.5817	0.8519	0.1222	2.3114	3.0411
09/06/11	2.3200	1.6871	0.9649	0.2427	2.4094	3.1316
09/28/11	2.0000	1.7263	1.0485	0.3708	2.4040	3.0817
10/05/11	1.8300	1.7378	1.1029	0.4679	2.3727	3.0076
11/08/11	2.0400	1.7680	1.1618	0.5556	2.3742	2.9804
12/20/11	1.4100	1.7355	1.1503	0.5652	2.3206	2.9057
01/17/12	2.0100	1.7583	1.1948	0.6313	2.3218	2.8853
02/06/12	2.1100	1.7854	1.2371	0.6889	2.3336	2.8819
03/30/12	1.0800	1.7350	1.1755	0.6161	2.2945	2.8539
04/16/12	1.3900	1.7120	1.1656	0.6192	2.2584	2.8048
05/14/12	1.5800	1.7038	1.1748	0.6459	2.2327	2.7816
06/26/12	0.9200	1.6576	1.1114	0.5651	2.2039	2.7502
07/06/12	2.0100	1.6772	1.1408	0.6044	2.2136	2.7501
08/07/12	1.6600	1.6763	1.1550	0.6337	2.1976	2.7190
09/12/12	1.7800	1.6815	1.1735	0.6658	2.1895	2.6974

2012 48-hour Reference Toxicant Test Results for Pimephales promelas



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
06/22/11	6.0900					
07/07/11	7.0600	6.5750	5.8891	5.2032	7.2609	7.9468
07/26/11	6.1800	6.4433	5.9074	5.3715	6.9793	7.5152
08/02/11	5.8100	6.2850	5.7448	5.2047	6.8252	7.3653
08/30/11	6.8500	6.3980	5.8663	5.3347	6.9297	7.4613
09/06/11	7.0900	6.5133	5.9602	5.4071	7.0665	7.6196
09/28/11	5.6700	6.3929	5.7957	5.1986	6.9900	7.5871
10/05/11	6.9500	6.4625	5.8756	5.2888	7.0494	7.6362
11/08/11	5.6700	6.3744	5.7652	5.1560	6.9837	7.5929
11/22/11	7.2700	6.4640	5.8236	5.1832	7.1044	7.7448
12/06/11	6.9500	6.5082	5.8832	5.2583	7.1331	7.7581
01/03/12	7.0600	6.5542	5.9374	5.3206	7.1710	7.7878
02/07/12	6.4600	6.5469	5.9558	5.3647	7.1380	7.7292
03/06/12	5.6700	6.4843	5.8699	5.2555	7.0987	7.7131
04/03/12	6.5600	6.4893	5.8970	5.3046	7.0817	7.6741
05/08/12	6.3700	6.4819	5.9088	5.3358	7.0549	7.6280
06/21/12	7.8200	6.5606	5.9178	5.2750	7.2034	7.8462
07/05/12	7.0300	6.5867	5.9533	5.3200	7.2200	7.8534
08/01/12	6.0900	6.5605	5.9346	5.3088	7.1865	7.8124
09/04/12	6.5700	6.5610	5.9517	5.3425	7.1703	7.7795

APPENDIX E
AGENCY FORMS

Acute Forms
Daphnia pulex Survival

Permittee: El Dorado Chemical - Outfall 002
NPDES Permit Number: AR0000752/ AFIN 70-00040

Composite Collected From: 9/8/12 To: 9/8/12
From: To:

Test Initiated: 9/9/12

Dilution Water Used: Receiving Water X Reconstituted Water

Dilution Series Results - Percent Survival

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

1. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate: Is the mean survival at 48 hours significantly different ($p=.05$) than the control survival for the % effluent corresponding to:

- a.) LOW FLOW OR CRITICAL DILUTION (100%) YES X NO
b.) 1/2 LOW FLOW OR 2X CRITICAL DILUTION (N/A%) YES NO

2. Enter percent effluent corresponding to the LC₅₀ below:

LC₅₀ = N/A % effluent

95 % confidence limits: N/A

Method of LC₅₀ calculation: N/A

3. If you answered NO to 1.a) enter (P) otherwise enter (F): P

4. Enter response to item 3 on DMR Form, parameter TEM3D

5. If you answered NO to 1.b) enter (P) otherwise enter (F): N/A

6. Enter response to item 5 on DMR Form, parameter TFM3D

**Biomonitoring
Daphnia 48 hour Acute Static Renewal
Chemical Parameters Chart***

Permittee: El Dorado Chemical - Outfall 002
 NPDES Number: AR0000752/ AFIN 70-00040
 Contact: Larken Pennington
 Analyst: Haughton, Zeagler

Sample Collected From: Date 9/8/12 Time 0830
 To: Date 9/8/12 Time 0830
 Test Begin Date 9/9/12 Time 1515
 Test End Date 9/11/12 Time 1345

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		8.4	8.4	7.9	24.2	24.3	24.3	32.0			56.0			7.9	7.6	7.8
32		8.1	8.3	7.9	24.2	24.3	24.3							7.4	7.2	7.6
42		8.0	8.2	7.9	24.2	24.3	24.3							7.1	7.1	7.6
56		7.9	8.2	7.9	24.2	24.3	24.3							7.0	7.0	7.6
75		7.7	8.2	7.8	24.2	24.3	24.3							6.9	6.9	7.5
100		7.3	8.3	7.8	24.2	24.3	24.3	36.0			84.0			6.8	6.9	7.5

*This Form is to be submitted with each DMR.
 Alkalinity and hardness to be reported as mg/l CaCO₃

**Acute Forms
Fathead Minnow Survival**

Permittee: El Dorado Chemical - Outfall 002
NPDES Permit Number: AR0000752/ AFIN 70-00040

Composite Collected **From: 9/8/12** **To: 9/8/12**
 From: **To:**

Test Initiated: 9/9/12

Dilution Water Used: **Receiving Water** **X** **Reconstituted Water**

Dilution Series Results - Percent Survival

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

1. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate: Is the mean survival at 48 hours significantly different (p=.05) than the control survival for the % effluent corresponding to:

- a.) **LOW FLOW OR CRITICAL DILUTION (100%)** **YES** **X** **NO**
 b.) **½ LOW FLOW OR 2X CRITICAL DILUTION (N/A%)** **YES** **NO**

2. Enter percent effluent corresponding to the LC₅₀ below:

LC₅₀ = N/A% effluent

95 % confidence limits: N/A

Method of LC₅₀ calculation: N/A

3. If you answered NO to 1.a) enter (P) otherwise enter (F): P

4. Enter response to item 3 on DMR Form, parameter TEM3D

5. If you answered NO to 1.b) enter (P) otherwise enter (F): N/A

6. Enter response to item 5 on DMR Form, parameter TFM3D

**Biomonitoring
Daphnia 48 hour Acute Static Renewal
Chemical Parameters Chart***

**Permittee: El Dorado Chemical - Outfall 002
NPDES Number: AR0000752/ AFIN 70-00040**

Contact: Larken Pennington

Analyst: Haughton, Zeagler

Sample Collected From: Date 9/8/12 Time 0830

To: Date 9/8/12 Time 0830

Test Begin Date 9/9/12 Time 1635

Test End Date 9/11/12 Time 1440

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		8.4	8.4		24.2	24.2	24.3	32.0			56.0			7.9	7.6	7.8
32		8.1	8.3		24.2	24.2	24.3							7.4	7.2	7.7
42		8.0	8.2		24.2	24.2	24.3							7.1	7.1	7.7
56		7.9	8.2		24.2	24.2	24.3							7.0	7.0	7.7
75		7.7	8.2		24.2	24.2	24.3							6.9	6.9	7.6
100		7.3	8.3		24.2	24.2	24.3	36.0			84.0			6.8	6.9	7.6

*This Form is to be submitted with each DMR.
Alkalinity and hardness to be reported as mg/l CaCO₃

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 - 002

Project#: X4858

Chain of Custody Documents Checked by: DM 9/25/12
Technician/Date

Raw Data Documents Checked by: DM 9/25/12
Technician/Date

Statistical Analysis Package Checked by: EGB 9/25/12
Quality Manager/Date

Quality Control Data Checked by: EGB 9/20/12
Quality Manager/Date

Report Checked by: EGB 10/3/12
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.

Erin H. Beappes
Quality Manager

10/3/12
Date

No part of this work may be altered in any form or by any means without written permission from Bio-Analytical Laboratories.

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X4859

Bio-Analytical Laboratories' Executive Summary

Permittee: El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731

Project #: X4859

Outfall: Outfall 006

Permit #: AR0000752/ AFIN #70-00040

Contact: Ms. Larken Pennington

Test Dates: September 9 - 11, 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 - 0.00%.

For *Daphnia pulex*:

1. If the NOEC for survival is less than the critical dilution (100%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D- 0.
2. Report the NOEC for survival, Parameter TOM3D -100%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 12.12%.

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



Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023

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

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

**EL DORADO CHEMICAL COMPANY
El Dorado, Arkansas**

**NPDES #AR0000752
AFIN #70-00040**

EPA Methods 2000.0 and 2021.0

Project X4859

Test Dates: September 9 - 11, 2012

Report Date: October 3, 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 X4859

TABLE OF CONTENTS

1.0 Introduction	4
2.0 Methods and Materials	4
2.1 Test Methods	4
2.2 Test Organisms	4
2.3 Dilution Water	5
2.4 Test Concentrations	5
2.5 Sample Collection	5
2.6 Sample Preparation	5
2.7 Monitoring of the Tests	5
2.8 Data Analysis	5
3.0 Results and Discussion	6
4.0 Conclusions	7
5.0 Reference	8
Appendices	
A- Chain-of-Custody Documents	9
B- Raw Data Sheets	11
C- Statistical Analysis	21
D- Quality Assurance Charts	24
E- Agency Forms	27
F- Report Quality Assurance Form	32

BAL
ADEQ #88-0630
Project X4859

1.0 Introduction

Bio-Analytical Laboratories (BAL), Doyline, Louisiana conducted two 48-hour acute toxicity tests for Outfall 006 at El Dorado Chemical Company, El Dorado, Arkansas. The test organisms used were the fathead minnow, *Pimephales promelas* and the cladoceran, *Daphnia pulex*. The purpose of this study is to determine if an appropriately dilute effluent sample adversely affects the survival of the test organism. Toxicity is defined as a statistically significant difference at the 95 percent confidence level between the survival of the test organisms in the critical dilution (the effluent concentration representative of the proportion of effluent in the receiving water during critical low flow or critical mixing conditions) compared to the survival of the test organisms in the control. The test endpoints are the No-Observed-Effect-Concentration (NOEC), which is defined as the highest effluent concentration that is not statistically different from the control, and the 48-hour LC_{50} , the concentration in which 50 percent of the test organisms died.

2.0 Methods and Materials

2.1 Test Methods

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

2.2 Test Organisms

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

BAL
ADEQ #88-0630
Project X4859

2.3 Dilution Water

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

2.4 Test Concentrations

The test concentrations used in the tests were 100, 75.0, 56.0, 42.0, 32.0 and 22.0 percent effluent and a reconstituted water control. The critical dilution was defined as 100 percent effluent. The tests were conducted using five replicates of eight animals each for a total of 40 animals per concentration.

2.5 Sample Collection

One sample of Outfall 006 was collected by El Dorado Chemical personnel on September 8, 2012. Upon completion of collection, the sample was chilled to 4^o Celsius and personally delivered to Bio-Analytical Laboratories.

2.6 Sample Preparation

Upon arrival, the sample was logged in, given an identification number and refrigerated unless needed. Prior to use, the sample was warmed to 25±1^o 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^o 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 LC₅₀ values were obtained by approved EPA methods of analysis, using the ToxCalc statistical program.

BAL
ADEQ #88-0630
Project X4859

3.0 Results and Discussion

The results of the tests can be found in Table 1. Significant differences in survival were not noted in the critical dilution in either test ($p=.05$). 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	
	<i>Pimephales promelas</i>	<i>Daphnia pulex</i>
Test Organism		
Control	100.0	92.5
22.0	100.0	97.5
32.0	100.0	95.0
42.0	100.0	97.5
56.0	100.0	95.0
75.0	100.0	97.5
100.0	100.0	95.0

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 X4859

4.0 Conclusions

The sample of Outfall 006 collected from El Dorado Chemical Company, El Dorado, Arkansas, on September 8, 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 X4859

5.0 Reference

EPA, 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. EPA-821-R-02-012, Office of Water.

APPENDIX A
CHAIN-OF-CUSTODY DOCUMENTS



Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Daytone, LA 71025

(510) 745-2773
1-800-259-1248
Fax: (510) 745-2773

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

Laboratory Use Only:

Company: El Dorado Chemical Company		Phone: (870) 863-1484		Analysis:				Project Number: 4859 Temp. upon arrival: 0.2°C Temperature upon arrival: 0.2°C Thermometer #: 89 Tech: FH Date: 9/9/12 Lab Control Number: Preservative: (below) ice
Address: 4500 Norwest Ave., El Dorado, AR 71731		Fax: (870) 863-7499		Chronic Ceriodaphnia Chronic minnow Acute minnow (fresh/marine) Acute Daphnia species Acute Mysid Acute Ceriodaphnia Fecal Coliform				
Permit #: AR0000752/AFIN 70-00040		Purchase Order:						
Sampler's Signature/Printed Name/Affiliation: Hanken Pennington / EDCO								
Date Start Date End	Time Start Time End	C	G		# and type of container	Sample Identification		
9/8/12	7:20 am		X	6 half gallon	006	X X		
Relinquished by/Affiliation: Hanken Pennington / EDCO		Date: 9/9/12	Time: 1415	Received by/Affiliation: Anne Houghton		Date: 9/9/12	Time: 1415	
Relinquished by/Affiliation:		Date:	Time:	Received by/Affiliation:		Date:	Time:	
Relinquished by/Affiliation:		Date:	Time:	Received by/Affiliation:		Date:	Time:	
Method of Shipment: <input type="checkbox"/> Lab <input type="checkbox"/> Bus <input type="checkbox"/> Fed Ex <input type="checkbox"/> DHL <input type="checkbox"/> UPS <input checked="" type="checkbox"/> Client <input type="checkbox"/> Other Tracking # _____								
Comments:								

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X4859

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 9/9/12 Time 1545

Test terminated: Date 9/11/12 Time 1455

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
<u>06098</u>	<u>6.7/76.8%</u>	<u>4/20 8.5/96.7%</u>	<u>LO.01</u>	<u>NO</u>	<u>6.0</u>	<u>N/A</u>	<u>176.0</u>	<u>20.0</u>	<u>AH</u>
	<u>8.1/44.3%</u>	<u>No</u>							<u>AH</u>

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
		<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>				
<u>Soft H2O</u>	<u>8375</u>					<u>7.8</u>	<u>56.0</u>	<u>32.0</u>	<u>AH</u>

Test Species Information

Test Species Info.	Species ID#	Species ID#	Species ID#	Species ID#
	<u>D. pulex</u>	<u>Promelas</u>		
Age	<u>484h</u>	<u>~2d</u>		
Test Container Size	<u>30ml</u>	<u>250ml</u>		
Test volume	<u>25ml</u>	<u>200ml</u>		
Feeding: Type	<u>VCT: Algae</u>	<u>Artemia</u>		
Amount	<u>Feed 2hrs prior to test initiation</u>			
Aeration?	<u>NA</u>	<u>NA</u>		
Amount				
Condition of survivors	<u>Good</u>	<u>Good</u>		

Comments:

9/11/12

9/11/12

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

Project# X4859

Test started: Date 9/9/12

Time 1545

Client El Dorado Chemical

Test ended: Date 9/11/12

Time 1400

Sample Description 006

Test Species D. pulex

ID# BAU Xu-Zu

Technician: Ohour AH 24hour AH 48hour AH 72hour AH 96hour AH
 Time: Ohour 1545 24hour 1315 48hour 1400 72hour --- 96hour ---
 Temperature (°C): Ohour 24.2 24hour 24 48hour 24.2 72hour --- 96hour ---

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity						
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96		
0	A	NA	8	8	8			8.4	8.2 8.5	8.1			7.8	7.6 7.7	7.9			20.9	20.8 19.1	22.5				
	B		8	6	6																			
	C		8	7	7																			
	D		8	8	8																			
	E		8	8	8																			
22	A		8	8	8			8.4	8.1 8.4	8.0			7.6	7.6 7.7	7.7			29.0	29.1 28.2	30.0				
	B		8	8	7																			
	C		8	8	8																			
	D		8	8	8																			
	E		8	8	8																			
Chemistry Tech prerenewal/postrenewal			AH AH/RC <u>ahg</u>					AH AH/RC <u>ahg</u>					AH AH/RC <u>ahg</u>											

ACUTE2 020809 Rev.

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

Project# X4859

Test started: Date 9/9/12

Time 1545

Client El Dorado Chemical

Test ended: Date 9/11/12

Time 1400

Sample Description 006

Test Species D. pulex

ID# BA1X11-21

Technician: 0hour PH 24hour PH 48hour PH 72hour PH 96hour PH

Time: 0hour 1545 24hour 1315 48hour 1400 72hour PH 96hour PH

Temperature (°C): 0hour 24.2 24hour 21 48hour 24.2 72hour PH 96hour PH

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity						
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96		
32	A	NA	8	8	8			8.4	8.1	8.3	7.9			7.6	7.6	7.7			341	337	341	344		
	B		8	8	8																			
	C		8	8	8																			
	D		8	6	6																			
	E		8	8	8																			
	F																							
42	A		8	8	7			8.4	8.0	8.3	7.9			7.5	7.5	7.6			357	378	365	381		
	B		8	8	8																			
	C		8	8	8																			
	D		8	8	8																			
	E		8	8	8																			
	F																							
Chemistry Tech prerenewal/postrenewal							PH/PH/ RC/RC/					PH/PH/ RC/RC/					PH/PH/ RC/RC/							

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

Project# X4859

Test started: Date 9/1/12

Time 515

Client El Dorado Chemical

Test ended: Date 9/1/12

Time 1400

Sample Description 006

Test Species D. pulex

ID# BAU/X11-24

Technician: 0hour PH 24hour PH 48hour PH 72hour PH 96hour PH

Time: 0hour 1545 24hour 1315 48hour 1400 72hour PH 96hour PH

Temperature (°C): 0hour 24.2 24hour 21 48hour 24.2 72hour PH 96hour PH

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
56	A	N/A	8	8	8			8.4	8.3	7.8			7.4	7.4	7.5			452	430	448		
	B		8	8	8																	
	C		8	8	8																	
	D		8	7	6																	
	E		8	8	8																	
75	A		8	8	8			8.4	7.9	7.8			7.4	7.4	7.5			515	519	531		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E	7	8	8	7																	
Chemistry Tech prerenewal/postrenewal								PH	PH	PH	PH	PH	PH	PH	PH	PH	PH	PH	PH	PH	PH	PH

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

Project# X4859

Test started: Date 9/9/12

Time 1545

Client El Dorado Chemical

Test ended: Date 9/11/12

Time 1400

Sample Description 006

Test Species D. pulex

ID# BAU-X11-211

Technician: Ohour AM 24hour AM 48hour AM 72hour AM 96hour AM
 Time: Ohour 1545 24hour 1315 48hour 1400 72hour AM 96hour AM
 Temperature (°C): Ohour 21.2 24hour 24 48hour 24.2 72hour AM 96hour AM

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity						
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96		
100	A	NA	8	8	8			8.4	7.8	7.8			7.3	7.2	7.4			665	633	650				
	B		8	8	7																			
	C		8	8	8																			
	D		8	8	8																			
	E		8	8	7																			
 A B C D E 			8																					
			8																					
			8																					
			8																					
			8																					
Chemistry Tech prerenewal/postrenewal																								

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

Project# X4859

Test started: Date 9/9/12 Time 1055

Client El Dorado Chemical

Test ended: Date 9/11/12 Time 1455

Sample Description 006

Test Species P. promelas ID# PAU19712

Technician: Ohour AH 24hour dyg 48hour dyg 72hour dyg 96hour dyg
 Time: Ohour 1655 24hour 1310 48hour 1455 72hour dyg 96hour dyg
 Temperature (°C): Ohour 24.2 24hour 24.2 48hour 24.3 72hour dyg 96hour dyg

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	8	8			8.4	7.8	8.5	7.9			7.8	7.6	7.7	7.7			190.9	198.4	199.1	201			
	B		8	8	8																					
	C		8	8	8																					
	D		8	8	8																					
	E		8	8	8																					
22	A		8	8	8			8.4	7.8	8.4	7.9			7.6	7.5	7.4	7.6			290	291	292	295			
	B		8	8	8																					
	C		8	8	8																					
	D		8	8	8																					
	E		8	8	8																					
Chemistry Tech prerenewal/postrenewal							AH <u>dyg</u> / <u>RE</u> <u>dyg</u>					AH <u>dyg</u> / <u>RE</u> <u>dyg</u>					AH <u>dyg</u> / <u>RE</u> <u>dyg</u>									

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

Project# X4859

Test started: Date 9/11/12 Time 1655

client El Dorado Chemical

Test ended: Date 9/11/12 Time 1455

Sample Description 006

Test Species P. promelas ID# BA19712

Technician: Ohour AH 24hour RC 48hour RC 72hour RC 96hour RC

Time: Ohour 1655 24hour 1310 48hour 1455 72hour RC 96hour RC

Temperature (°C): Ohour 24.2 24hour 24.2 48hour 24.3 72hour RC 96hour RC

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
32	A	NA	8	8	8			8.478	8.3	7.9			7.075	7.2	7.6			341	335	333		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
42	A		8	8	8			8.478	8.3	7.8			7.575	7.1	7.5			387	374	379		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal							AH <u>RC</u>					AH <u>RC</u>					AH <u>RC</u>					

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

Project# X4859

Test started: Date 9/9/12

Time 1655

client El Dorado Chemical

Test ended: Date 9/11/12

Time 1455

Sample Description 006

Test Species P. promelas ID# BA19712

Technician: Ohour AH 24hour ahm 48hour ahm 72hour ahm 96hour ahm
 Time: Ohour 1655 24hour 1310 48hour 1455 72hour ahm 96hour ahm
 Temperature (°C): Ohour 24.2 24hour 24.2 48hour 24.3 72hour ahm 96hour ahm

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
56	A	NA	8	8	8			8.4	7.8	7.8			7.4	7.3	7.5			452	439	443		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
75	A		8	8	8			8.4	7.7	7.7			7.4	7.3	7.4			545	539	533		
	B		8	8	8													RC	519	519		
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal							AH <u>ahm</u> RC <u>ahm</u>					AH <u>ahm</u> RC <u>ahm</u>					AH <u>ahm</u> RC <u>ahm</u>					

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

Project# X4859

Test started: Date 9/9/12 Time 1655

Client El Dorado Chemical

Test ended: Date 9/11/12 Time 1455

Sample Description 006

Test Species P. promelas ID# PAU972

Technician: 0hour AH 24hour RC 48hour RC 72hour RC 96hour RC
 Time: 0hour 1655 24hour 1310 48hour 1455 72hour RC 96hour RC
 Temperature (°C): 0hour 24.2 24hour 24.8 48hour 24.3 72hour RC 96hour RC

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
100	A	NA	8	8	8			8.4	7.5	7.6			7.3	7.1	7.3			6.5	6.5	6.5		
	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 RC					AH RC					AH RC									

APPENDIX C
STATISTICAL ANALYSIS

Daphnid Acute Test-48 Hr Survival

Start Date: 9/9/2012 Test ID: X4859DP Sample ID: 6
 End Date: 9/11/2012 Lab ID: ADEQ 880630 Sample Type: EFF2-Industrial
 Sample Date: 9/9/2012 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: CD-Ceriodaphnia dubia
 Comments:

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

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root				N	Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%			
D-Control	0.9250	1.0000	1.2872	1.0472	1.3931	12.116	5		
22	0.9750	1.0541	1.3564	1.2094	1.3931	6.055	5	30.50 16.00	
32	0.9500	1.0270	1.3239	1.0472	1.3931	11.684	5	29.50 16.00	
42	0.9750	1.0541	1.3564	1.2094	1.3931	6.055	5	30.50 16.00	
56	0.9500	1.0270	1.3239	1.0472	1.3931	11.684	5	29.50 16.00	
75	0.9750	1.0541	1.3564	1.2094	1.3931	6.055	5	30.50 16.00	
100	0.9500	1.0270	1.3196	1.2094	1.3931	7.623	5	28.50 16.00	

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.74767	0.934	-1.433	0.92238
Bartlett's Test indicates equal variances (p = 0.62)	4.40925	16.8119		
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs D-Control				

Acute Fish Test-48 Hr Survival

Start Date: 9/9/2012 Test ID: X4859PP Sample ID: 6
 End Date: 9/11/2012 Lab ID: ADEQ 880630 Sample Type: EFF2-Industrial
 Sample Date: 9/9/2012 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: PP-Pimephales promelas

Comments:

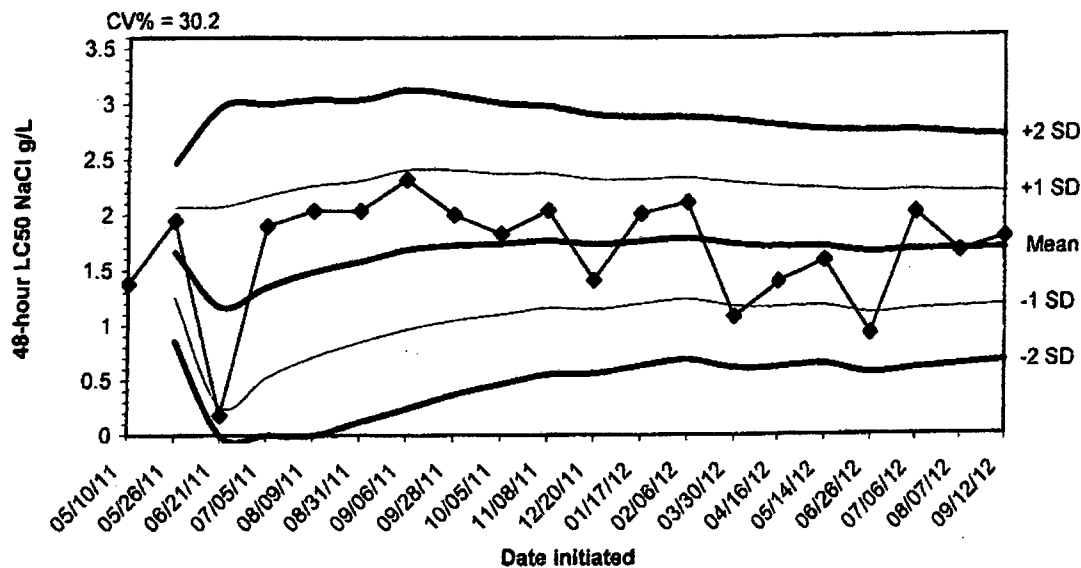
Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000
22	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
42	1.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	1.0000	1.0000	1.0000
75	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000	1.0000

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

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	1	0.934		
Equality of variance cannot be confirmed				
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs D-Control				

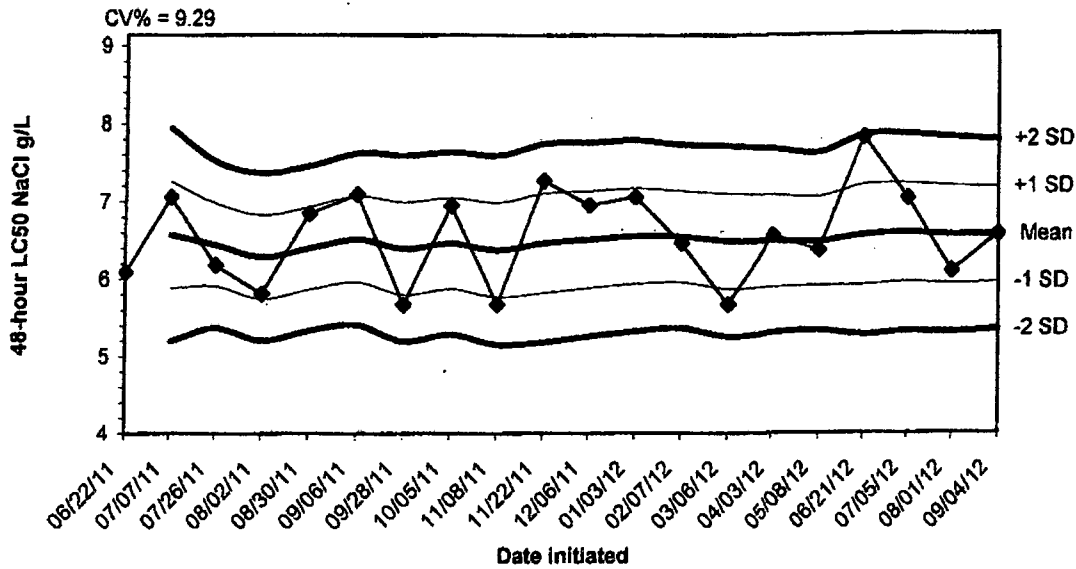
APPENDIX D
QUALITY ASSURANCE CHARTS

2012 48-hour Reference Toxicant Test Results for *Daphnia pulex*



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
05/10/11	1.3800					
05/26/11	1.9500	1.6650	1.2619	0.8589	2.0681	2.4711
06/21/11	0.1800	1.1700	0.2665	0.0000	2.0735	2.9770
07/05/11	1.9000	1.3525	0.5294	0.0000	2.1756	2.9986
08/09/11	2.0400	1.4900	0.7137	0.0000	2.2663	3.0425
08/31/11	2.0400	1.5817	0.8519	0.1222	2.3114	3.0411
09/06/11	2.3200	1.6871	0.9649	0.2427	2.4094	3.1316
09/28/11	2.0000	1.7263	1.0485	0.3708	2.4040	3.0817
10/05/11	1.8300	1.7378	1.1029	0.4679	2.3727	3.0076
11/08/11	2.0400	1.7680	1.1618	0.5556	2.3742	2.9804
12/20/11	1.4100	1.7355	1.1503	0.5652	2.3206	2.9057
01/17/12	2.0100	1.7583	1.1948	0.6313	2.3218	2.8853
02/06/12	2.1100	1.7854	1.2371	0.6889	2.3336	2.8819
03/30/12	1.0800	1.7350	1.1755	0.6161	2.2945	2.8539
04/16/12	1.3900	1.7120	1.1656	0.6192	2.2584	2.8048
05/14/12	1.5800	1.7038	1.1748	0.6459	2.2327	2.7616
06/26/12	0.9200	1.6576	1.1114	0.5651	2.2039	2.7502
07/06/12	2.0100	1.6772	1.1408	0.6044	2.2136	2.7501
08/07/12	1.6600	1.6763	1.1550	0.6337	2.1976	2.7190
09/12/12	1.7800	1.6815	1.1735	0.6656	2.1895	2.6974

2012 48-hour Reference Toxicant Test Results for *Pimephales promelas*



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
06/22/11	6.0900					
07/07/11	7.0600	6.5750	5.8891	5.2032	7.2609	7.9468
07/26/11	6.1800	6.4433	5.9074	5.3715	6.9793	7.5152
08/02/11	5.8100	6.2850	5.7448	5.2047	6.8252	7.3653
08/30/11	6.8500	6.3980	5.8663	5.3347	6.9297	7.4613
09/06/11	7.0900	6.5133	5.9602	5.4071	7.0665	7.6196
09/28/11	5.6700	6.3929	5.7957	5.1986	6.9900	7.5871
10/05/11	6.9500	6.4625	5.8756	5.2888	7.0494	7.6362
11/08/11	5.6700	6.3744	5.7652	5.1560	6.9837	7.5929
11/22/11	7.2700	6.4640	5.8236	5.1832	7.1044	7.7448
12/06/11	6.9500	6.5082	5.8832	5.2583	7.1331	7.7581
01/03/12	7.0600	6.5542	5.9374	5.3206	7.1710	7.7878
02/07/12	6.4800	6.5469	5.9558	5.3647	7.1380	7.7292
03/06/12	5.6700	6.4843	5.8699	5.2555	7.0987	7.7131
04/03/12	6.5600	6.4893	5.8970	5.3046	7.0817	7.6741
05/08/12	6.3700	6.4819	5.9088	5.3358	7.0549	7.6280
06/21/12	7.8200	6.5606	5.9178	5.2750	7.2034	7.8462
07/05/12	7.0300	6.5867	5.9533	5.3200	7.2200	7.8534
08/01/12	6.0900	6.5605	5.9346	5.3086	7.1865	7.8124
09/04/12	6.5700	6.5610	5.9517	5.3425	7.1703	7.7795

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: 9/8/12** **To: 9/8/12**
 From: **To:**

Test Initiated: 9/9/12

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	75.0	100	100	100	100	100	100
	C	87.5	100	100	100	100	100	100
	D	100	100	75.0	100	87.5	100	100
	E	100	100	100	100	100	100	100
48-hour	A	100	100	100	87.5	100	100	100
	B	75.0	87.5	100	100	100	100	87.5
	C	87.5	100	100	100	100	100	100
	D	100	100	75.0	100	75.0	100	100
	E	100	100	100	100	100	87.5	87.5
	Mean	92.5	97.5	95.0	97.5	95.0	97.5	95.0

1. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate: Is the mean survival at 48 hours significantly different (p=.05) than the control survival for the % effluent corresponding to:

- a.) **LOW FLOW OR CRITICAL DILUTION (100%)** **YES** **X** **NO**
 b.) **1/2 LOW FLOW OR 2X CRITICAL DILUTION (N/A%)** **YES** **NO**

2. Enter percent effluent corresponding to the LC₅₀ below:

LC₅₀ = N/A% effluent

95 % confidence limits: N/A

Method of LC₅₀ calculation: N/A

3. If you answered NO to 1.a) enter (P) otherwise enter (F): P

4. Enter response to item 3 on DMR Form, parameter TEM3D

5. If you answered NO to 1.b) enter (P) otherwise enter (F): N/A

6. Enter response to item 5 on DMR Form, parameter TFM3D

**Biomonitoring
Daphnia 48 hour Acute Static Renewal
Chemical Parameters Chart***

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

From: Date 9/8/12 Time 0720
 To: Date 9/8/12 Time 0720
 Date 9/9/12 Time 1545
 Date 9/11/12 Time 1400

Test Begin
 Test End

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		8.4	8.5	8.1	24.2	24.0	24.2	32.0			56.0			7.8	7.7	7.9
22		8.4	8.4	8.0	24.2	24.0	24.2							7.6	7.4	7.7
32		8.4	8.3	7.9	24.2	24.0	24.2							7.6	7.2	7.7
42		8.4	8.3	7.9	24.2	24.0	24.2							7.5	7.1	7.6
56		8.4	8.3	7.8	24.2	24.0	24.2							7.4	7.0	7.5
75		8.4	7.9	7.8	24.2	24.0	24.2							7.4	6.9	7.5
100		8.4	7.3	7.8	24.2	24.0	24.2	20.0			176.0			7.3	6.6	7.4

*This Form is to be submitted with each DMR.
 Alkalinity and hardness to be reported as mg/l CaCO₃

**Acute Forms
Fathead minnow Survival**

**Permittee: El Dorado Chemical - Outfall 006
NPDES Permit Number: AR0000752/ AFIN 70-00040**

**Composite Collected From: 9/8/12 To: 9/8/12
From: To:**

Test Initiated: 9/9/12

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	100	100	100	100	100	100	100
	E	100	100	100	100	100	100	100
48-hour	A	100	100	100	100	100	100	100
	B	100	100	100	100	100	100	100
	C	100	100	100	100	100	100	100
	D	100	100	100	100	100	100	100
	E	100	100	100	100	100	100	100
	Mean	100	100	100	100	100	100	100

1. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate: Is the mean survival at 48 hours significantly different (p=.05) than the control survival for the % effluent corresponding to:

- a.) LOW FLOW OR CRITICAL DILUTION (100%) YES X NO**
b.) 1/2 LOW FLOW OR 2X CRITICAL DILUTION (N/A %) YES NO

2. Enter percent effluent corresponding to the LC₅₀ below:

LC₅₀ = N/A % effluent

95 % confidence limits: N/A

Method of LC₅₀ calculation: N/A

- 3. If you answered NO to 1.a) enter (P) otherwise enter (F): P**
4. Enter response to item 3 on DMR Form, parameter TEM3D
5. If you answered NO to 1.b) enter (P) otherwise enter (F): N/A
6. Enter response to item 5 on DMR Form, parameter TFM3D

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

**Permittee: El Dorado Chemical - Outfall 006
NPDES Number: AR0000752/ AFIN 70-00040**

Contact: Larken Pennington

Analyst: Haughton, Zeagler

Sample Collected From: Date 9/8/12 Time 0720

To: Date 9/8/12 Time 0720

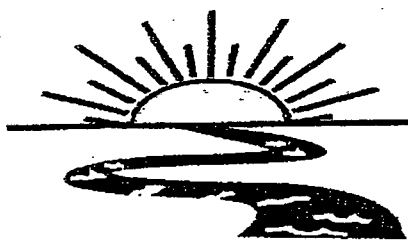
Test Begin Date 9/9/12 Time 1655

Test End Date 9/11/12 Time 1455

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		8.4	8.5	7.9	24.2	24.2	24.3	32.0			56.0			7.8	7.7	7.7
22		8.4	8.4	7.9	24.2	24.2	24.3							7.6	7.4	7.6
32		8.4	8.3	7.9	24.2	24.2	24.3							7.6	7.2	7.6
42		8.4	8.3	7.8	24.2	24.2	24.3							7.5	7.1	7.5
56		8.4	8.3	7.8	24.2	24.2	24.3							7.4	7.0	7.5
75		8.4	7.9	7.7	24.2	24.2	24.3							7.4	6.9	7.4
100		8.4	7.3	7.6	24.2	24.2	24.3	20.0			176.0			7.3	6.6	7.3

*This Form is to be submitted with each DMR.
Alkalinity and hardness to be reported as mg/l CaCO₃

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 - 006

Project#: X4859

Chain of Custody Documents Checked by: DMY 9/25/12
Technician/Date

Raw Data Documents Checked by: DMY 9/25/12
Technician/Date

Statistical Analysis Package Checked by: EGG 9/25/12
Quality Manager/Date

Quality Control Data Checked by: EGG 9/20/12
Quality Manager/Date

Report Checked by: EGG 10/3/12
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 S. Burpp, BS
Quality Manager

10/3/12
Date

No part of this work may be altered in any form or by any means without written permission from Bio-Analytical Laboratories.

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X4860

Bio-Analytical Laboratories' Executive Summary

Permittee: El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731

Project #: X4860

Outfall: Outfall 007

Permit #: AR0000752/ AFIN #70-00040

Contact: Ms. Larken Pennington

Test Dates: September 9 - 11, 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 - 56%.
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 - 50%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 6.06%.

This report contains a total of 35 pages, including this page. The results pertain only to the samples listed in the chain of custody documents in Appendix A. The information contained within meets the requirements set forth by ADEQ. The chemical data in this report is for monitoring purposes only and should not be reported on discharge monitoring reports.



Bio-Analytical Laboratories

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 007
AT**

**EL DORADO CHEMICAL COMPANY
El Dorado, Arkansas**

**NPDES #AR0000752
AFIN #70-00040**

EPA Methods 2000.0 and 2021.0

Project X4860

Test Dates: September 9 - 11, 2012

Report Date: October 3, 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 X4860

TABLE OF CONTENTS

1.0 Introduction	4
2.0 Methods and Materials	4
2.1 Test Methods	4
2.2 Test Organisms	4
2.3 Dilution Water	5
2.4 Test Concentrations	5
2.5 Sample Collection	5
2.6 Sample Preparation	5
2.7 Monitoring of the Tests	5
2.8 Data Analysis	5
3.0 Results and Discussion	6
4.0 Conclusions	7
5.0 Reference	8
Appendices	
A- Chain-of-Custody Documents	9
B- Raw Data Sheets	11
C- Statistical Analysis	21
D- Quality Assurance Charts	26
E- Agency Forms	29
F- Report Quality Assurance Form	34

BAL
ADEQ #88-0630
Project X4860

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 LC₅₀, the concentration in which 50 percent of the test organisms died.

2.0 Methods and Materials

2.1 Test Methods

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

2.2 Test Organisms

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

BAL
ADEQ #88-0630
Project X4860

2.3 Dilution Water

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

2.4 Test Concentrations

The test concentrations used in the tests were 100, 75.0, 56.0, 50.0, 42.0 and 32.0 percent effluent and a reconstituted water control. The critical dilution was defined as 100 percent effluent. The tests were conducted using five replicates of eight animals each for a total of 40 animals per concentration.

2.5 Sample Collection

One sample of Outfall 007 was collected by El Dorado Chemical personnel on September 8, 2012. Upon completion of collection, the sample was chilled to 4° Celsius and personally delivered to Bio-Analytical Laboratories.

2.6 Sample Preparation

Upon arrival, the sample was logged in, given an identification number and refrigerated unless needed. Prior to use, the sample was warmed to $25 \pm 1^{\circ}$ 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 $25 \pm 1^{\circ}$ 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 LC₅₀ values were obtained by approved EPA methods of analysis, using the ToxCalc statistical program.

BAL
ADEQ #88-0630
Project X4860

3.0 Results and Discussion

The results of the tests can be found in Table 1. Significant differences in survival were noted in the critical dilution in both tests ($p=.05$). The NOEC value for the fathead minnow test and the *Daphnia pulex* test were 56 and 50 percent effluent, respectively ($p=.05$). The 48-hour LC_{50} value for the fathead minnow test and the *Daphnia pulex* test were 65.40 and 61.19 percent, respectively ($p=.05$).

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

Percent Effluent	Percent Survival	
	<i>Pimephales promelas</i>	<i>Daphnia pulex</i>
Test Organism		
Control	100.0	97.5
32.0	100.0	92.5
42.0	97.5	95.0
50.0	100.0	80.0
56.0	85.0	75.0
75.0	17.5	7.5
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 X4860

4.0 Conclusions

The sample of Outfall 007 collected from El Dorado Chemical Company, El Dorado, Arkansas, on September 8, 2012, was found to be lethally toxic to the *Daphnia pulex* test organisms and the fathead minnow test organisms in the 100 percent critical dilution after 48 hours of exposure ($p=.05$).

BAL
ADEQ #88-0630
Project X4860

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 227
Bossier, LA 71025

(318) 748-2772
1-800-396-1246
Fax: (318) 748-2773

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

Laboratory Use Only:

Company: El Dorado Chemical Company		Phone: (870) 863-1484		Analysis:				Project Number: X4860 Temp. upon arrival: 0.1°C Thermometer #: 29 Tech: PH Date: 9/9/12 Lab Control Number: Preservative: (below) ice	
Address: 4500 Norwest Ave., El Dorado, AR 71731		Fax: (870) 863-7499		Chronic Ceriodaphnia	Chronic minnow	Acute minnow/fresh/marine	Acute Daphnia species		
Permit #: AR0000752/AFIN 70-00040		Purchase Order:		Acute Mysid			Acute Ceriodaphnia		
Sampler's Signature/Printed Name/Affiliation: Larken Pennington / Larken Pennington / EDCC				Fecal Coliform					
Date Start Date End	Time Start Time End	C	G	# and type of container	Sample Identification				
9/8/12	9:30		X	6 half gallon	007		X	X	
Relinquished by/Affiliation: Larken Pennington / EDCC				Date: 9/9/12	Time: 1415	Received by/Affiliation: Drew Haughton		Date: 9/9/12	Time: 1415
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:		Date:	Time:
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:		Date:	Time:
Method of Shipment: <input type="checkbox"/> Lab <input type="checkbox"/> Bus <input type="checkbox"/> Fed Ex <input type="checkbox"/> DHL <input type="checkbox"/> UPS <input checked="" type="checkbox"/> Client <input type="checkbox"/> Other Tracking # _____									
Comments:									

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X4860

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 9/9/12 Time 1600

Test terminated: Date 9/11/12 Time 1525

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
C6099	9.3/106.8%	4/20 8.5/97.0%	40.01	NO	6.0	N/A	312.0	24.0	AH
	9.1/106.0%	7/15/8.4 9.7.8%							RC

Dilution Water Information

Dilution Water	ID#	Initial D.O (mg/L & %)	Aerate? Minutes/D.O (mg/L & %)	Total Residual Chlorine (mg/L)	Ammonia (NH3) mg/L	pH	Hardness	Alkalinity	Tech
Soft H2O	3375	NA	NA	NA	NA	7.8	56.0	32.0	AH

Test Species Information

Test Species Info.	Species: <u>D. pulx</u> ID#: <u>BALNo-210</u>	Species: <u>P. ornata</u> ID#: <u>BAL9712</u>	Species: ID#:	Species: ID#:
Age	<u>42h</u>	<u>~2d</u>		
Test Container Size	<u>30ml</u>	<u>250ml</u>		
Test volume	<u>25ml</u>	<u>200ml</u>		
Feeding: Type	<u>YCT: Algae</u>	<u>Artemia</u>		
Amount	<u>Feed 2hrs prior to test initiation</u>			
Aeration?				
Amount	<u>NA</u>	<u>NA</u>		
Condition of survivors	<u>Good</u>	<u>GOOD</u>		

Comments:

9/11/12

GOOD AH / LGZ
9/11/12

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

Project# X4860

Test started: Date 9/9/12 Time 1600

Client El Dorado Chemical

Test ended: Date 9/11/12 Time 1410

Sample Description 007

Test Species D. pulex ID# BAC X10-210

Technician: Ohour AH 24hour AH 48hour AH 72hour AH 96hour AH
 Time: Ohour 1600 24hour 1255 48hour 1410 72hour 1410 96hour 1410
 Temperature (°C): Ohour 24.2 24hour 24 48hour 24.2 72hour 24 96hour 24

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	8	8			8.4	8.4	8.0			7.8	7.6	7.9			189	189	189		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	7																	
	E		8	8	8																	
30	A		8	7	6			8.4	8.4	8.0			7.2	7.2	7.2			1195	1075	1071		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	7																	
Chemistry Tech prerenewal/postrenewal								AH	AH	AH			AH	AH	AH			AH	AH	AH		

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

Project# X4860

Test started: Date 9/1/12 Time 1200

Client El Dorado Chemical

Test ended: Date 9/1/12 Time 1410

Sample Description 007

Test Species D. pulex ID# BAU110210

Technician: Ohour AH 24hour AH 48hour RC 72hour RC 96hour RC
 Time: Ohour 1600 24hour 1255 48hour 1410 72hour RC 96hour RC
 Temperature (°C): Ohour 21.2 24hour 21 48hour 24.0 72hour RC 96hour RC

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
42	A	NA	8	8	8			8.4	8.4	8.0			7.1	7.2	7.2			172	133	148	135	
	B		8	8	8																	
	C		8	8	7																	
	D		8	8	8																	
	E		8	8	7																	
50	A		8	5	5			8.4	8.4	8.0			7.0	7.1	7.0			169	153	167	167	
	B		8	5	5																	
	C		8	8	8																	
	D		8	8	5																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal							AH	AH	RC	RC	RC	AH	AH	RC	RC	RC	AH	AH	RC	RC	RC	

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

Project# X4860

Test started: Date 9/1/12 Time 1600

Client El Dorado Chemical

Test ended: Date 9/11/12 Time 1410

Sample Description 007

Test Species D. pulex ID# BAU X10-210

Technician: Ohour AH 24hour AH 48hour AH 72hour RC 96hour RC
 Time: Ohour 1600 24hour 1255 48hour 1410 72hour RC 96hour RC
 Temperature (°C): Ohour 21.2 24hour 21 48hour 24.2 72hour RC 96hour RC

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity						
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96		
56	A	NA	8	6	6			8.5	8.4	8.0			7.0	7.1	7.0			1850	1746	1842	1861			
	B		8	7	6																			
	C		8	6	5																			
	D		8	7	6																			
	E		8	8	7																			
75	A		8	2	2			8.4	8.4	8.0			7.1	7.1	6.9			2650	2380	2480	2500			
	B		8	0	0																			
	C		8	1	0																			
	D		8	3	1																			
	E		8	1	0																			
Chemistry Tech prerenewal/postrenewal			AH	AH	AH	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC

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

Project# X4860

Test started: Date 9/1/12 Time 1735

Client El Dorado Chemical

Test ended: Date 9/1/12 Time 1525

Sample Description 007

Test Species P. promelas ID# BA19712

Technician: AH 24hour AH 48hour AH/RC 72hour RC 96hour RC
 Time: 0hour 1735 24hour 1335 48hour 1525 72hour RC 96hour RC
 Temperature (°C): 0hour 24.2 24hour 24.2 48hour 24.3 72hour RC 96hour RC

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	8	8			8.4	7.9	8.4	8.0			7.8	7.9	7.9			189.8	206	189	206		
	B		8	8	8																			
	C		8	8	8																			
	D		8	8	8																			
	E		8	8	8																			
32	A		8	8	8			8.4	7.8	8.4	8.0			7.2	7.3	7.2			119.5	139	119	119		
	B		8	8	8																			
	C		8	8	8																			
	D		8	8	8																			
	E		8	8	8																			
Chemistry Tech prerenewal/postrenewal							AH	AH	RC	RC			AH	AH	RC	RC			AH	AH	RC	RC		

ACUTE2 020809 Rev.

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

Project# X4860

Test started: Date 9/9/12 Time 1735

Client El Dorado Chemical

Test ended: Date 9/11/12 Time 1525

Sample Description 007

Test Species P. promelas ID# PA19712

Technician: Ohour AH 24hour AM 48hour AM/RC 72hour RC 96hour RC
 Time: Ohour 1735 24hour 1335 48hour 1625 72hour RC 96hour RC
 Temperature (°C): Ohour 24.2 24hour 24.2 48hour 24.3 72hour RC 96hour RC

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
42	A	NA	8	8	8			8.4	8.4	7.9			7.1	7.2	7.2			1472	1430	1448	1478	
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	7																	
50	A		8	8	8			8.4	8.4	7.9			7.0	7.1	7.1			1496	1432	1472	1470	
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								AH	RC	RC			AH	RC	RC			AH	RC	RC		

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

Project# X4860

Test started: Date 9/9/12 Time 1:35

Client El Dorado Chemical

Test ended: Date 9/11/12 Time 1:25

Sample Description 007

Test Species P. promelas ID# PA/9712

Technician: Ohour AM 24hour AM 48hour AM/16/dec 72hour AM 96hour AM
 Time: Ohour 1:35 24hour 1:35 48hour 1:35 72hour AM 96hour AM
 Temperature (°C): Ohour 24.2 24hour 24.2 48hour 24.3 72hour AM 96hour AM

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity							
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96			
56	A	NA	8	8	8			8.5	8.4	7.9			7.0	7.1	7.1			1880	1881	1840	1896				
	B		8	8	8																				
	C		8	8	7																				
	D		8	8	6																				
	E		8	8	5																				
75	A		8	2	1			8.4	7.9	7.9			7.1	7.0	7.0			2650	2520	2480	2550				
	B		8	4	3																				
	C		8	5	2																				
	D		8	2	1																				
	E		8	2	0																				
Chemistry Tech prerenewal/postrenewal																									

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

Project# X4860

Test started: Date 9/9/12 Time 1730

client El Dorado Chemical

Test ended: Date 9/11/12 Time 1525

Sample Description 007

Test Species P. promelas ID# PA/9712

Technician: Ohour PH 24hour PH 48hour PH/RC 72hour PH 96hour PH
 Time: Ohour 1735 24hour 1335 48hour 1525 72hour PH 96hour PH
 Temperature (°C): Ohour 24.2 24hour 24.2 48hour 24.3 72hour PH 96hour PH

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
100	A	NA	8	1	0			8.4	7.3	7.9			7.1	6.8	7.0			3470	3330	3300	2350	
	B		8	0	0			RC	9/11/12	7.9			RC	9/11/12	6.8			RC	9/11/12	3340		
	C		8	1	0																	
	D		8	0	0																	
	E		8	1	0																	
WATER			A	8				/					/					/				
WATER			B	8																		
WATER			C	8																		
WATER			D	8																		
WATER			E	8																		
Chemistry Tech prerenewal/postrenewal							PH	RC	RC		PH	RC	RC		PH	RC	RC					

APPENDIX C
STATISTICAL ANALYSIS

Daphnid Acute Test-48 Hr Survival

Start Date: 9/9/2012 Test ID: X4860DP Sample ID: 7
 End Date: 9/11/2012 Lab ID: ADEQ 880630 Sample Type: EFF2-Industrial
 Sample Date: 9/9/2012 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: CD-Ceriodaphnia dubia
 Comments:

Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	0.8750	1.0000
32	0.7500	1.0000	1.0000	1.0000	0.8750
42	1.0000	1.0000	0.8750	1.0000	0.8750
50	0.6250	0.6250	1.0000	0.7500	1.0000
56	0.7500	0.7500	0.6250	0.7500	0.8750
75	0.2500	0.0000	0.0000	0.1250	0.0000
100	0.0000	0.0000	0.0000	0.0000	0.0000

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					N	t-Stat	1-Tailed	
			Mean	Min	Max	CV%	Critical			MSD	
D-Control	0.9750	1.0000	1.3564	1.2094	1.3931	6.055	5				
32	0.9250	0.9487	1.2872	1.0472	1.3931	12.116	5	0.724	2.360	0.2254	
42	0.9500	0.9744	1.3196	1.2094	1.3931	7.623	5	0.385	2.360	0.2254	
50	0.8000	0.8205	1.1314	0.9117	1.3931	21.676	5	2.356	2.360	0.2254	
*56	0.7500	0.7692	1.0526	0.9117	1.2094	10.024	5	3.181	2.360	0.2254	
*75	0.0750	0.0769	0.2836	0.1777	0.5236	54.987	5	11.234	2.360	0.2254	
100	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5				

Auxiliary Tests		Statistic	Critical	Skew	Kurt						
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)		0.95565	0.927	0.15221	-0.5481						
Bartlett's Test indicates equal variances (p = 0.31)		6.00457	15.0863								
Hypothesis Test (1-tail, 0.05)		NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test		50	56	52.915	2	0.13599	0.14244	0.81392	0.0228	2.3E-10	5, 24
Treatments vs D-Control											

Daphnid Acute Test-48 Hr Survival

Start Date: 9/9/2012 Test ID: X4860DP Sample ID: 7
 End Date: 9/11/2012 Lab ID: ADEQ 880630 Sample Type: EFF2-Industrial
 Sample Date: 9/9/2012 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: CD-Ceriodaphnia dubia
 Comments:

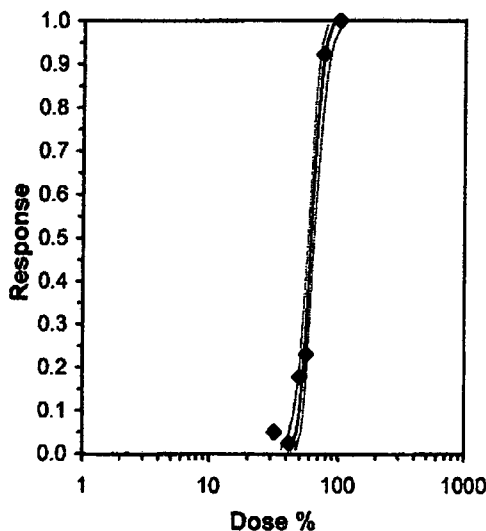
Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	0.8750	1.0000
32	0.7500	1.0000	1.0000	1.0000	0.8750
42	1.0000	1.0000	0.8750	1.0000	0.8750
50	0.6250	0.6250	1.0000	0.7500	1.0000
56	0.7500	0.7500	0.6250	0.7500	0.8750
75	0.2500	0.0000	0.0000	0.1250	0.0000
100	0.0000	0.0000	0.0000	0.0000	0.0000

Conc-%	Transform: Arcsin Square Root							Number Resp	Total Number
	Mean	N-Mean	Mean	Min	Max	CV%	N		
D-Control	0.9750	1.0000	1.3564	1.2094	1.3931	6.055	5	1	40
32	0.9250	0.9487	1.2872	1.0472	1.3931	12.116	5	3	40
42	0.9500	0.9744	1.3196	1.2094	1.3931	7.623	5	2	40
50	0.8000	0.8205	1.1314	0.9117	1.3931	21.676	5	8	40
56	0.7500	0.7692	1.0526	0.9117	1.2094	10.024	5	10	40
75	0.0750	0.0769	0.2836	0.1777	0.5236	54.987	5	37	40
100	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	40	40

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.95565	0.927	0.15221	-0.5481
Bartlett's Test indicates equal variances (p = 0.31)	6.00457	15.0863		

Maximum Likelihood-Probit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	15.0629	2.30684	10.5415	19.5843	0.025	2.61924	9.48773	0.62342	1.78669	0.06639	6
Intercept	-21.913	4.10533	-29.959	-13.866							
TSCR	0.05201	0.02128	0.0103	0.09372							
Point	Probits	%	95% Fiducial Limits								
EC01	2.674	42.8795	36.4413	47.0509							
EC05	3.355	47.5875	42.1171	51.1858							
EC10	3.718	50.3051	45.4358	53.6075							
EC15	3.964	52.2258	47.7784	55.3554							
EC20	4.158	53.8044	49.6889	56.8278							
EC25	4.326	55.1968	51.3526	58.1629							
EC40	4.747	58.8671	55.5709	61.9179							
EC50	5.000	61.1916	58.0626	64.5263							
EC60	5.253	63.6079	60.4814	67.4499							
EC75	5.674	67.8376	64.3482	73.0334							
EC80	5.842	69.593	65.8494	75.491							
EC85	6.036	71.6967	67.5909	78.5211							
EC90	6.282	74.4341	69.7854	82.5808							
EC95	6.645	78.6848	73.0773	89.0996							
EC99	7.326	87.3241	79.489	102.991							



Acute Fish Test-48 Hr Survival

Start Date: 9/9/2012 Test ID: X4860PP Sample ID: 7
 End Date: 9/11/2012 Lab ID: ADEQ 880630 Sample Type: EFF2-Industrial
 Sample Date: 9/9/2012 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	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
42	1.0000	1.0000	1.0000	1.0000	0.8750
50	1.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	0.8750	0.7500	0.6250
75	0.1250	0.3750	0.2500	0.1250	0.0000
100	0.0000	0.0000	0.0000	0.0000	0.0000

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root				N	Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%			
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5		
32	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
42	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	16.00
50	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
56	0.8500	0.8500	1.1909	0.9117	1.3931	17.846	5	20.00	16.00
*75	0.1750	0.1750	0.4166	0.1777	0.6591	43.834	5	15.00	16.00
100	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.84298	0.927	-0.2799	1.93055
Equality of variance cannot be confirmed				
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	56	75	64.8074	1.78571
Treatments vs D-Control				

Acute Fish Test-48 Hr Survival

Start Date: 9/9/2012 Test ID: X4860PP Sample ID: 7
 End Date: 9/11/2012 Lab ID: ADEQ 880630 Sample Type: EFF2-Industrial
 Sample Date: 9/9/2012 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	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
42	1.0000	1.0000	1.0000	1.0000	0.8750
50	1.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	0.8750	0.7500	0.6250
75	0.1250	0.3750	0.2500	0.1250	0.0000
100	0.0000	0.0000	0.0000	0.0000	0.0000

Conc-%	Transform: Arcsin Square Root							Number Resp	Total Number
	Mean	N-Mean	Mean	Min	Max	CV%	N		
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	40
32	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	40
42	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	1	40
50	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	40
56	0.8500	0.8500	1.1909	0.9117	1.3931	17.846	5	6	40
75	0.1750	0.1750	0.4166	0.1777	0.6591	43.834	5	33	40
100	0.0000	0.0000	0.1777	0.1777	0.1777	0.000	5	40	40

Auxiliary Tests

Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05) Statistic: 0.84298 Critical: 0.927 Skew: -0.2799 Kurt: 1.93055
 Equality of variance cannot be confirmed

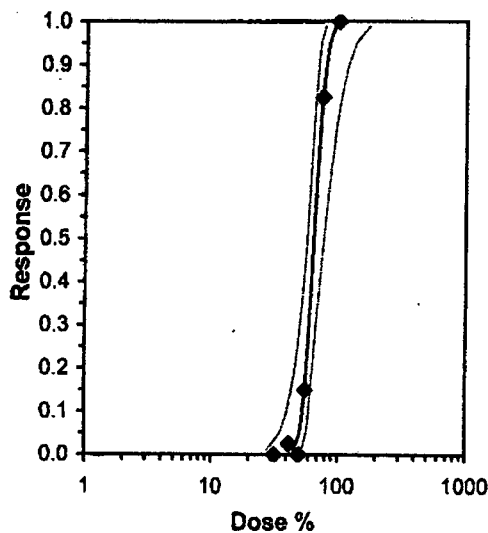
Maximum Likelihood-Probfit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	14.9909	3.24594	5.97869	24.003	0	12.6373	9.48773	1.3E-02	1.81555	0.06671	4
Intercept	-22.217	5.83513	-38.418	-6.0157							

TSCR

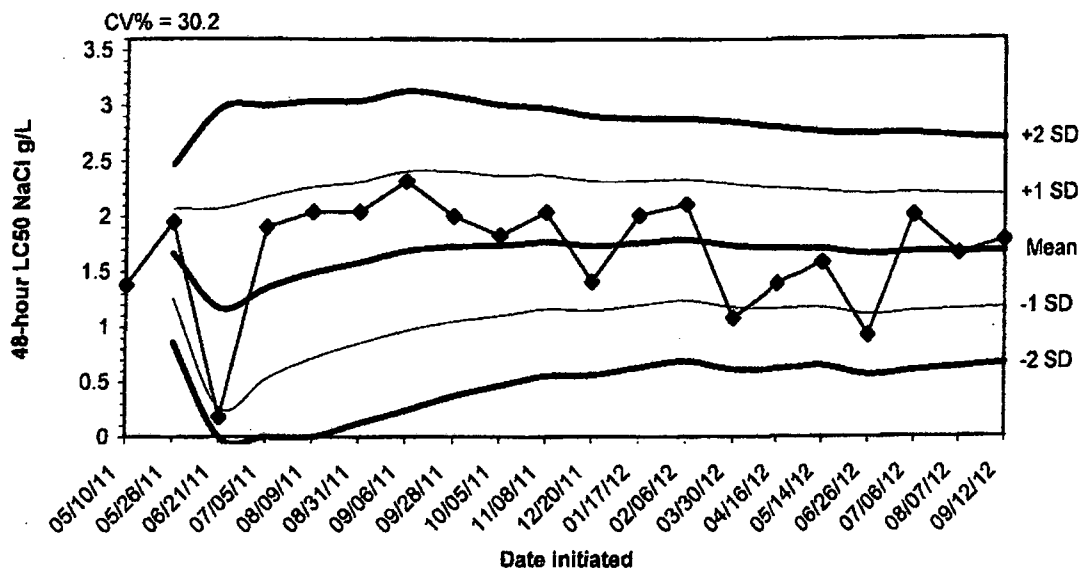
Point	Probits	%	95% Fiducial Limits	
EC01	2.674	45.7471	27.6949	53.0834
EC05	3.355	50.7954	35.5299	57.4307
EC10	3.718	53.7105	40.3707	60.1968
EC15	3.964	55.7713	43.843	62.3664
EC20	4.158	57.4653	46.6674	64.3484
EC25	4.326	58.9597	49.0899	66.2944
EC40	4.747	62.8998	54.8823	72.6143
EC50	5.000	65.3956	57.968	77.6598
EC60	5.253	67.9905	60.7199	83.7497
EC75	5.674	72.534	64.7355	96.1961
EC80	5.842	74.4202	66.2029	101.939
EC85	6.036	76.6807	67.8586	109.223
EC90	6.282	79.6228	69.888	119.324
EC95	6.645	84.1922	72.842	136.348
EC99	7.326	93.483	78.384	175.866

Significant heterogeneity detected (p = 1.32E-02)



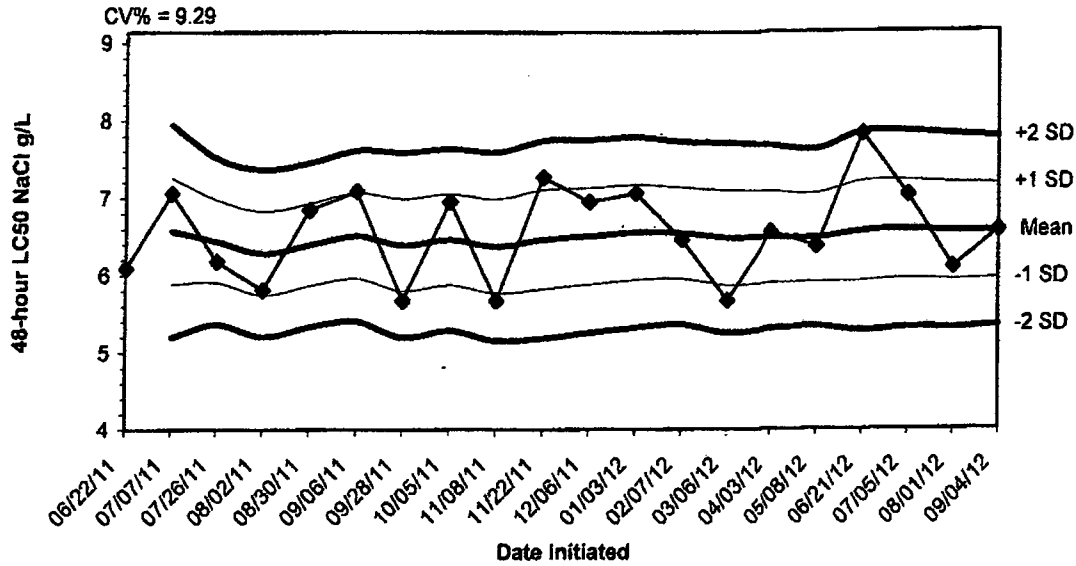
APPENDIX D
QUALITY ASSURANCE CHARTS

2012 48-hour Reference Toxicant Test Results for *Daphnia pulex*



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
05/10/11	1.3800					
05/26/11	1.9500	1.6650	1.2619	0.8589	2.0681	2.4711
06/21/11	0.1800	1.1700	0.2665	0.0000	2.0735	2.9770
07/05/11	1.9000	1.3525	0.5294	0.0000	2.1756	2.9986
08/09/11	2.0400	1.4900	0.7137	0.0000	2.2663	3.0425
08/31/11	2.0400	1.5817	0.8519	0.1222	2.3114	3.0411
09/06/11	2.3200	1.6871	0.9649	0.2427	2.4094	3.1316
09/28/11	2.0000	1.7263	1.0485	0.3708	2.4040	3.0817
10/05/11	1.8300	1.7378	1.1029	0.4879	2.3727	3.0076
11/08/11	2.0400	1.7680	1.1618	0.5556	2.3742	2.9804
12/20/11	1.4100	1.7355	1.1503	0.5852	2.3206	2.9057
01/17/12	2.0100	1.7583	1.1948	0.6313	2.3218	2.8853
02/06/12	2.1100	1.7854	1.2371	0.6889	2.3336	2.8819
03/30/12	1.0800	1.7350	1.1755	0.6161	2.2945	2.8539
04/16/12	1.3900	1.7120	1.1656	0.6192	2.2584	2.8048
05/14/12	1.5800	1.7038	1.1748	0.6459	2.2327	2.7616
06/26/12	0.9200	1.6576	1.1114	0.5651	2.2039	2.7502
07/06/12	2.0100	1.6772	1.1408	0.6044	2.2136	2.7501
08/07/12	1.6600	1.6763	1.1550	0.6337	2.1976	2.7190
09/12/12	1.7800	1.6815	1.1735	0.6656	2.1895	2.6974

2012 48-hour Reference Toxicant Test Results for *Pimephales promelas*



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
06/22/11	6.0900					
07/07/11	7.0600	6.5750	5.8891	5.2032	7.2609	7.9468
07/26/11	6.1800	6.4433	5.9074	5.3715	6.9793	7.5152
08/02/11	5.8100	6.2850	5.7448	5.2047	6.8252	7.3653
08/30/11	6.8500	6.3980	5.8663	5.3347	6.9297	7.4613
09/06/11	7.0900	6.5133	5.9602	5.4071	7.0665	7.6196
09/28/11	5.6700	6.3929	5.7957	5.1986	6.9900	7.5871
10/05/11	6.9500	6.4625	5.8756	5.2888	7.0494	7.6362
11/08/11	5.6700	6.3744	5.7652	5.1560	6.9837	7.5929
11/22/11	7.2700	6.4640	5.8236	5.1832	7.1044	7.7448
12/06/11	6.9500	6.5082	5.8832	5.2583	7.1331	7.7581
01/03/12	7.0600	6.5542	5.9374	5.3206	7.1710	7.7878
02/07/12	6.4600	6.5469	5.9558	5.3647	7.1380	7.7292
03/06/12	5.6700	6.4843	5.8699	5.2555	7.0987	7.7131
04/03/12	6.5600	6.4893	5.8970	5.3046	7.0817	7.6741
05/08/12	6.3700	6.4819	5.9088	5.3358	7.0549	7.6280
06/21/12	7.8200	6.5606	5.9178	5.2750	7.2034	7.8462
07/05/12	7.0300	6.5867	5.9533	5.3200	7.2200	7.8534
08/01/12	6.0900	6.5605	5.9346	5.3086	7.1865	7.8124
09/04/12	6.5700	6.5610	5.9517	5.3425	7.1703	7.7795

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: 9/8/12 To: 9/8/12
From: To:

Test Initiated: 9/9/12

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	87.5	100	62.5	75.0	25.0	0
	B	100	100	100	62.5	87.5	0.0	0
	C	100	100	100	100	75.0	12.5	0
	D	100	100	100	100	87.5	37.5	0
	E	100	100	100	100	100	12.5	0
48-hour	A	100	75.0	100	62.5	75.0	25.0	0
	B	100	100	100	62.5	75.0	0.0	0
	C	100	100	87.5	100	62.5	0.0	0
	D	87.5	100	100	75.0	75.0	12.5	0
	E	100	87.5	87.5	100	87.5	0.0	0
	Mean	97.5	92.5	95.0	80.0	75.0	7.5	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.) 1/2 LOW FLOW OR 2X CRITICAL DILUTION (N/A%) YES NO

2. Enter percent effluent corresponding to the LC_{50} below:

LC_{50} = 61.19% effluent
95 % confidence limits: 64.53 - 58.06
Method of LC_{50} calculation: Probit

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, Zeagler

Sample Collected From: Date 9/8/12 Time 0730

To: Date 9/8/12 Time 0730

Test Begin Date 9/9/12 Time 1600

Test End Date 9/11/12 Time 1410

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		8.4	8.4	8.0	24.2	24.0	24.2	32.0			56.0			7.8	7.6	7.9
32		8.4	8.4	8.0	24.2	24.0	24.2							7.2	7.2	7.2
42		8.4	8.4	8.0	24.2	24.0	24.2							7.1	7.2	7.2
50		8.4	8.4	8.0	24.2	24.0	24.2							7.0	7.1	7.0
56		8.5	8.4	8.0	24.2	24.0	24.2							7.0	7.1	7.0
75		8.4	8.4	8.0	24.2	24.0	24.2							7.1	7.2	6.9
100		8.4	7.9		24.0	24.0		24.0			312.0			7.1	6.9	

*This Form is to be submitted with each DMR.

Alkalinity and hardness to be reported as mg/l CaCO₃

**Acute Forms
Fathead Minnow Survival**

Permittee: El Dorado Chemical - Outfall 007
NPDES Permit Number: AR0000752/ AFIN 70-00040

Composite Collected From: 9/8/12 To: 9/8/12
From: To:

Test Initiated: 9/9/12

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	100	100	100	100	12.5	12.5
	B	100	100	100	100	100	50.0	0.0
	C	100	100	100	100	100	62.5	12.5
	D	100	100	100	100	100	25.0	0.0
	E	100	100	100	100	100	25.0	12.5
48-hour	A	100	100	100	100	100	12.0	0
	B	100	100	100	100	100	37.5	0
	C	100	100	100	100	87.5	25.0	0
	D	100	100	100	100	75.0	12.5	0
	E	100	100	87.5	100	62.5	0.0	0
	Mean	100	100	97.5	100	85.0	17.5	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.) 1/2 LOW FLOW OR 2X CRITICAL DILUTION (N/A%) YES NO

2. Enter percent effluent corresponding to the LC₅₀ below:

LC₅₀ = 65.40% effluent

95 % confidence limits: 77.66 - 57.97

Method of LC₅₀ calculation: Probit

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, Zeagler**

**Sample Collected From: Date 9/8/12 Time 0730
 To: Date 9/8/12 Time 0730
Test Begin Date 9/9/12 Time 1735
Test End Date 9/11/12 Time 1525**

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		8.4	8.4	8.0	24.2	24.2	24.3	32.0			56.0			7.8	7.6	7.9
32		8.4	8.4	8.0	24.2	24.2	24.3							7.2	7.2	7.2
42		8.4	8.4	7.9	24.2	24.2	24.3							7.1	7.2	7.2
50		8.4	8.4	7.9	24.2	24.2	24.3							7.0	7.1	7.1
56		8.5	8.4	7.9	24.2	24.2	24.3							7.0	7.1	7.1
75		8.4	8.4	7.9	24.2	24.2	24.3							7.1	7.2	7.0
100		8.4	7.3		24.0	24.2	24.3	24.0			312.0			7.1	6.8	

*This Form is to be submitted with each DMR.
Alkalinity and hardness to be reported as mg/l CaCO₃

APPENDIX F
REPORT QUALITY ASSURANCE FORM



Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Dayline, LA 71023

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

REPORT QUALITY ASSURANCE FORM (v. 31612)

Client: El Dorado Chemical - 007

Project#: X4860

Chain of Custody Documents Checked by: LSM 9/25/12
Technician/Date

Raw Data Documents Checked by: LSM 9/25/12
Technician/Date

Statistical Analysis Package Checked by: EGB 9/25/12
Quality Manager/Date

Quality Control Data Checked by: EGB 9/20/12
Quality Manager/Date

Report Checked by: EGB 10/3/12
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 S. Bruggs
Quality Manager

10/3/12
Date

No part of this work may be altered in any form or by any means without written permission from Bio-Analytical Laboratories.

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

Origin ID: ELDA



J12201210150325

El Dorado, AR 71730

SHIP TO: (501) 682-0655

BILL SENDER

ADEQ - Water Division Enforcement
5301 NORTSHORE DR

NORTH LITTLE ROCK, AR 72118

Ship Date: 23OCT12
ActWgt: 2.0 LB
CAD: 5887030/NET3300

Delivery Address Bar Code



Ref #
Invoice #
PO #
Dept #

WED - 24 OCT A4
PRIORITY OVERNIGHT

TRK# 7939 1068 0554

0201

X2 LITA

72118

AR-US

LIT

