



May 23, 2016

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

RE: NPDES Permit AR0000752 Discharge Monitoring Report for period ending April 30, 2016.

Enclosed you will find the Discharge Monitoring Reports ending April 30, 2016.

If you have any questions regarding this report, please contact Edward L Pearson at (870) 863-1400.

Sincerely,

A handwritten signature in cursive script that reads "Edward L Pearson".

Edward L Pearson

Environmental Technician

Enclosures

NON-COMPLIANCE REPORT

Facility Name: El Dorado Chemical Company

Permit Number: AR0000752

AFIN:

70-00040

Month / Year: April 30, 2016

Type of Violation	Permit Limit	Date of Violation	Cause of Violation	Corrective Action or Other Narrative
Outfall 006 / Lead Monthly Average (34 ug/L)	3.8 ug/L Monthly Average	4/12/2016	Unknown	EDCC has applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006 / Lead Daily Max. (34 ug/L)	7.62 ug/L Daily Max.	4/12/2016	Unknown	EDCC has applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006/ Zinc Monthly Average (950 ug/L)	115.62 ug/L Monthly Average	4/12/2016	Unknown	EDCC has applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006/ Zinc Daily Max. (950 ug/L)	231.99 ug/L Daily Max.	4/12/2016	Unknown	EDCC has applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 007 / Lead Monthly Average (4.1 ug/L)	3.8 ug/L Monthly Average	4/12/2016	Unknown	EDCC has applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.
Outfall 007/ Zinc Monthly Average (160 ug/L)	115.62 ug/L Monthly Average	4/12/2016	Unknown	EDCC has 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>Kerry Plummer</i> 5-23-16</p> <p>Signature / Date</p>

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X6016

Bio-Analytical Laboratories' Executive Summary

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

Project #: X6016

Outfall: Outfall 006 (contaminated storm water)

Permit #: AR0000752/ AFIN #70-00040

Contact: Mr. Eddie Pearson

Test Dates: April 13 - 15, 2016

Test Type: 48-hour acute toxicity test using *Pimephales promelas* (EPA 2000.0).
48-hour acute toxicity test using *Daphnia pulex* (EPA 2021.0)

Results:

For *Pimephales promelas*:

1. If the NOEC for survival is less than the critical dilution (100.0%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM6C- 0- **Pass**.
2. Report the NOEC for survival, Parameter TOM6C - 100.0%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM6C - 16.69%.

For *Daphnia pulex*:

1. If the NOEC for survival is less than the critical dilution (100.0%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D- 0- **Pass**.
2. Report the NOEC for survival, Parameter TOM3D -100.0%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 20.80%.

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 X6016

**Test Dates: April 13 - 15, 2016
Report Date: May 9, 2016**

Prepared for:
Mr. Eddie Pearson
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 X6016

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 References	8
Appendices	
A- Chain-of-Custody Documents	9
B- Raw Data Sheets	11
C- Statistical Analyses	21
D- Quality Assurance Charts	24
E- Agency Forms	27
F- Report Quality Assurance Form	32

BAL
ADEQ #88-0630
Project X6016

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 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), "Standard Methods for The Examination of Water and Wastewater. 20th Edition" (APHA 1998. Chemical results using this edition are listed in the report as SM 1997), and BAL's standard operating procedures.

2.2 Test Organisms

The fathead minnows were raised in-house and were approximately four days old at test initiation. The minnows were acclimated to dilution water hardness prior to testing. The *Daphnia pulex* test organisms were also raised in-house at test temperature 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 X6016

2.3 Dilution Water

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

2.4 Test Concentrations

The test concentrations used in the tests were 100.0, 75.0, 56.0, 45.0, 32.0 and 22.0 percent effluent and a reconstituted water control. The critical dilution was defined as 100.0 percent effluent. The tests were conducted using five replicates of eight animals each for a total of 40 animals per concentration.

2.5 Sample Collection

One composite sample of Outfall 006 was collected by El Dorado Chemical personnel on April 12, 2016 at 0300 hours. Upon completion of collection, the sample was packed in ice and delivered to the laboratory by BAL personnel. The temperature upon arrival was 1.0^o Celsius.

2.6 Sample Preparation

Upon arrival, the sample was logged in, given an identification number and refrigerated unless needed. Prior to use, the sample was warmed to 25±1^o Celsius. The total residual chlorine level (SM4500-Cl E 1997) was measured in milligrams/Liter (mg/L) with a Capital Controls^R amperometric titrator and recorded if present. The total ammonia level was measured in mg/L using a test strip. Dissolved oxygen (SM4500-O G 1997), pH (SM4500-H+ B 1997) and conductivity (SM2510-B 1997) measurements (in mg/L, standard units and umhos/cm, respectively) were taken on the control and each test concentration at test initiation, at each renewal and at test termination. Alkalinity (SM2320-B 1997) and hardness (SM2340-C 1997) levels were measured in mg/L as CaCO₃ 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.

BAL
ADEQ #88-0630
Project X6016

2.8 Data Analysis

The NOEC and LC₅₀ values values were obtained by approved EPA methods of analysis, using the ToxCalc statistical program.

3.0 Results and Discussion

The results of the tests can be found in Table 1. Significant differences in survival were not noted in the critical dilution in either test after 48 hours of exposure (p=.05). The NOEC value for the fathead and *Daphnia pulex* tests was 100.0 percent effluent (p=.05). The 48-hour LC₅₀ values could not be calculated in either test because greater than 50.0 percent survival occurred in each effluent concentration. A significant difference was noted in the 75.0 percent effluent test concentration in the *Daphnia pulex* test; however, this was thought to be an anomaly and not an indication of a true dose response.

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

Percent Effluent	Percent Survival	
	<i>Pimephales promelas</i>	<i>Daphnia pulex</i>
Control	95.0	100.0
22.0	87.5	90.0
32.0	90.0	87.5
45.0	90.0	85.0
56.0	95.0	97.5
75.0	87.5	42.5
100.0	90.0	82.5

The 48-hour reference toxicant test results indicated 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 X6016

4.0 Conclusions

The sample of Outfall 006 collected from El Dorado Chemical Company, El Dorado, Arkansas, on April 12, 2016, was not found to be lethally toxic to the fathead minnow test organisms nor the *Daphnia pulex* test organisms in the 100.0 percent critical dilution after 48 hours of exposure ($p=.05$). The 48-hour LC_{50} values could not be calculated because greater than 50.0 percent survival occurred in the 100.0 percent dilution ($p=.05$).

BAL
ADEQ #88-0630
Project X6016

5.0 References

- EPA, 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. EPA-821-R-02-012, Office of Water.
- EPA, 2000. Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the National Pollutant Discharge Elimination System. EPA-833-R-00-003, Office of Wastewater Management.
- EPA, 2000. Method Guidance and Recommendations for Whole Effluent (WET) Testing. EPA-821-B-00-04, Office of Water
- APHA, 1998. Standard Methods for The Examination of Water and Wastewater. 20th Edition.

APPENDIX A
CHAIN-OF-CUSTODY DOCUMENTS



Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 827
Doyline, LA 71023

(318) 745-2772
1-800-299-1246
Fax: (318) 745-2775

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

Laboratory Use Only:

Company: El Dorado Chemical Company		Phone: (870) 863-1484		Analysis:				Project Number: X6016 Temp. upon arrival: Temperature upon arrival: 7.0 Thermometer #: EG8 Tech: EG8 Date: 4/12/16 Lab Control Number: Preservative: (below)
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	Recal Coliform Acute Ceriodaphnia Acute Mysid Acute Daphnia species Acute minnow (fresh/marine) Chronic minnow Chronic Ceriodaphnia			
Permit #: AR0000752/AFIN 70-00040		Purchase Order:						
Sampler's Signature/Printed Name/Affiliation: <i>Edward L Pearson / Edward L Pearson / EDCC</i>								
Date Start Date End	Time Start Time End	C	G			# and type of container	Sample Identification	
04-11-16 04-12-16	1500 0300	X		6 half gallon	0016			
Relinquished by/Affiliation: <i>Edward L Pearson</i>		Date: 4/12/16	Time: 3PM	Received by/Affiliation: <i>BAK</i> <i>Eric J. Buopp</i>		Date: 4/12/16	Time: 1500	
Relinquished by/Affiliation: <i>Eric J. Buopp</i>		Date: 4/12/16	Time: 1630	Received by/Affiliation: <i>R Callahan</i>		Date: 4/12/16	Time: 1630	
Relinquished by/Affiliation:		Date:	Time:	Received by/Affiliation:		Date:	Time:	
Method of Shipment: ___ Lab ___ Bus ___ Fed Ex ___ DHL ___ UPS <input checked="" type="checkbox"/> Client ___ Other ___ Tracking # _____								
Comments:								
COC Rev. 3.0								

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES
ACUTE TOXICITY TEST WATER QUALITY DATA

X6016
Page 12 of 33

Project# X 6016

Client: EDCC/El Dorado Chemical Company

Address: 4500 Northwest Ave El Dorado AR 71731

NPDES#AR0000752 Outfall 006

Technicians: EGB/RC/MM

Test initiated: Date 4/13/16 Time 1645

Test terminated: Date 4/15/16 Time 1535

Dissolved Oxygen Meter: Model # YSI550A Serial #06E2089 AV

pH Meter: Model #Orion 230A+ Serial #015253

Conductivity Meter: Model # Control Co. Serial #122175539

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>C12337</u>	<u>9.16</u> 112.1%	<u>1/8</u> <u>8.0</u> 94.4%	<u><0.01</u>	<u>NO</u>	<u>0.2</u>	<u>N/A</u>	<u>88.0</u>	<u>16.0</u>	<u>RC</u>
	<u>9.7</u> <u>107.5%</u>	<u>1/9</u> <u>8.3</u> <u>97.6%</u>					<u>1</u>	<u>1</u>	<u>RC</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>Soft H2O</u>	<u>3849</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>6.8</u>	<u>50.0</u>	<u>30.0</u>	<u>EB</u>

Test Species Information

Test Species Info.	<u>D. pulex</u> Species: ID#: <u>BAL/17-77</u>	<u>P. promelas</u> Species: ID#: <u>BAL/040916</u>	Species: ID#:	Species: ID#:
Age	<u><24 hrs</u>	<u>8-10 4 days</u>		
Test Container Size	<u>30 ml</u>	<u>300 ml</u>		
Test volume	<u>25 ml</u>	<u>250 ml</u>		
Feeding: Type	<u>2 hrs</u>	<u>prior to</u>		
Amount	<u>test</u>	<u>initiation</u>		
Aeration?	<u>N/A</u>	<u>N/A</u>		
Amount				
Condition of survivors	<u>Good RC</u> <u>4/15/16</u>	<u>Good RC</u> <u>4/15/16</u>		

Comments: pH = 6.6 (within Range) < 6.0 to > 9.0 mm

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

Project# X6016
 Client EL Dorado Chemical

Sample Description: C06
 Technical: PC
 Time: 24hour, 48hour, 72hour, 96hour
 Temperature (°C): 24, 48, 72, 96

Test started: Date 4/13/16
 Test ended: Date 4/15/16
 Test Species: D. pulex
 ID# BAE17-F11

Dilution %	Replicate	Test Salinity	# Live Organisms				Dissolved Oxygen				pH				Conductivity			
			0 hr	24 hr	48 hr	72 hr	96 hr	0	24	48	72	96	0	24	48	72	96	
0.5%	A	8	8	8	8	8	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	
	B	8	8	8	8	8	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	
	C	8	8	8	8	8	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	
	D	8	8	8	8	8	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	
22.0%	A	8	8	8	8	8	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	
	B	8	8	8	8	8	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	
	C	8	8	8	8	8	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	
	D	8	8	8	8	8	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	
Control	A	8	8	8	8	8	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	
	B	8	8	8	8	8	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	
	C	8	8	8	8	8	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	
	D	8	8	8	8	8	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	

Chemistry Test
 Pre-renal/post-renal

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

Project# X6016

Test started: Date 4/13/16 Time 1645

Client El Dorado Chemical

Test ended: Date 4/15/16 Time 1510

Sample Description 006

Test Species D. pulex ID# BAL/E17-F17

Technician: 0hour PC 24hour PC 48hour PC 72hour / 96hour /

Time: 0hour 1645 24hour 1445 48hour 1510 72hour / 96hour /

Temperature (°C): 0hour 24.9 24hour 24.7 48hour 24.9 72hour / 96hour /

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
32.0	A	N/A	8	8	5			1.7	1.8	1.8			7.2	7.1	7.2			224	241	245		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	6																	
45.0	A	N/A	8	8	6			1.7	1.8	1.8			7.1	7.1	7.1			244	208	248		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	6																	
	E		8	6	6																	
Chemistry Tech prerenewal/postrenewal								PC	PC	PC			PC	PC	PC			PC	PC	PC		

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

Project# X6016
 client EI Dorado Chemical

Test started: Date 4/13/16 Time 1645
 Test ended: Date 4/15/16 Time 1510

Sample Description 006
 Technician: Ohour RC 24hour RC 48hour RC 72hour / 96hour /
 Time: Ohour 1645 24hour 1445 48hour 1510 72hour / 96hour /
 Temperature (°C): Ohour 24.9 24hour 24.7 48hour 24.9 72hour / 96hour /

Test Species D. pulex ID# BAL/E17-F17

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0/0		N/A																				
56.0	A	N/A	8	8	8			1.7	1.3	1.7			7.1	7.2	7.1			260	275	261	281	
	B		8	8	8																	
	C		8	8	8																	
	D		8	7	7																	
	E		8	8	8																	
75.0	A	N/A	8	6	3			1.6	1.1	1.7			7.0	7.2	7.1			292	307	291	311	
	B		8	7	4																	
	C		8	5	4																	
	D		8	6	4																	
	E		8	6	2																	
Chemistry Team prerenewal/postrenewal								RC	RC	RC			RC	RC	RC			RC	RC	RC		

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

Project# X6016
 Client EI Dorado Chemical

Test started: Date 4/13/16 Time 1645
 Test ended: Date 4/15/16 Time 1510
 Test Species D. pulex ID# BAL/E17-R01

Sample Description 006
 Technician: 0hour RC 24hour RC 48hour RC 72hour / 96hour /
 Time: 0hour 1645 24hour 1445 48hour 1510 72hour / 96hour /
 Temperature (°C): 0hour 24.9 24hour 24.7 48hour 24.9 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%		N/A																				
100.0	A	}	8	8	8			15.7	8.4	7.7			6.9	7.0	6.9			334	341	330	348	
	B		8	8	5																	
	C		8	8	8																	
	D		8	7	7																	
	E		8	7	5																	
100.0	A	}	8					/					/					/				
pH adj	B		8																			
	C		8																			
	D		8																			
	E		8																			
Chemistry Tech prerenewal/postrenewal								RC	RC	RC	RC		RC	RC	RC			RC	RC	RC	RC	

ACUTE2 Rev 1.0

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

Project# X6016 Client EL Dorado Chemical

Sample Description C06

Temperature (°C) : 24.4
 Time: hour 1645
 Technician: hour 1645
 hour 1645
 hour 24.4

Test started: Date 4/13/16 Time 1645
 Test ended: Date 4/15/16 Time 1535
 Test Species P. promelas ID# BA1/040916

Test Dilution	Replacete	Test Salinity	# Live Organisms	Dissolved Oxygen	pH	Conductivity	Chemistry Media		Pre-treatment/post-treatment
							MT/PC	PC	
0	0	0	0	0	0	0	PC	PC	
24	8	24	96	72	24	48	PC	PC	
48	8	48	72	48	48	72	PC	PC	
72	8	72	48	24	24	48	PC	PC	
96	8	96	24	0	0	24	PC	PC	
0 soft	D	8	8	7.9	7.5	7.1	PC	PC	
	B	8	8	7.9	7.5	7.1	PC	PC	
	C	8	8	7.9	7.5	7.1	PC	PC	
	E	8	8	7.9	7.5	7.1	PC	PC	
22.0	D	8	7.6	7.8	7.3	7.1	PC	PC	
	B	8	8	7.9	7.5	7.1	PC	PC	
	C	8	8	7.9	7.5	7.1	PC	PC	
	E	8	8	7.9	7.5	7.1	PC	PC	

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

X6016

Project# El Dorado Chemical

Test started: date 4/13/16 Time 1445

Test ended: date 4/15/16 Time 1535

Test Species P. promelas ID# BALT046916

Sample Description 006

Replacatn: 060
 24hour NW
 48hour RC
 72hour RC
 96hour RC

Replacatn: 060
 24hour NW
 48hour RC
 72hour RC
 96hour RC

Replacatn: 060
 24hour NW
 48hour RC
 72hour RC
 96hour RC

Replacatn: 060
 24hour NW
 48hour RC
 72hour RC
 96hour RC

Replacatn: 060
 24hour NW
 48hour RC
 72hour RC
 96hour RC

Replacatn: 060
 24hour NW
 48hour RC
 72hour RC
 96hour RC

Replacatn: 060
 24hour NW
 48hour RC
 72hour RC
 96hour RC

Replacatn: 060
 24hour NW
 48hour RC
 72hour RC
 96hour RC

Replacatn: 060
 24hour NW
 48hour RC
 72hour RC
 96hour RC

Replacatn: 060
 24hour NW
 48hour RC
 72hour RC
 96hour RC

Replacatn: 060
 24hour NW
 48hour RC
 72hour RC
 96hour RC

Replacatn: 060
 24hour NW
 48hour RC
 72hour RC
 96hour RC

Replacatn: 060
 24hour NW
 48hour RC
 72hour RC
 96hour RC

Replacatn: 060
 24hour NW
 48hour RC
 72hour RC
 96hour RC

Replacatn: 060
 24hour NW
 48hour RC
 72hour RC
 96hour RC

Replacatn: 060
 24hour NW
 48hour RC
 72hour RC
 96hour RC

Replacatn: 060
 24hour NW
 48hour RC
 72hour RC
 96hour RC

Replacatn: 060
 24hour NW
 48hour RC
 72hour RC
 96hour RC

Replacatn: 060
 24hour NW
 48hour RC
 72hour RC
 96hour RC

Replacatn: 060
 24hour NW
 48hour RC
 72hour RC
 96hour RC

Replacatn: 060
 24hour NW
 48hour RC
 72hour RC
 96hour RC

Test Dilution	Replacatn	Test Mortality	# Live Organisms						Dissolved Oxygen						Conductivity												
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96					
0%	A	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	
56.0	B	8	8	8	8	8	7.7	8.8	7.6	7.1	7.4	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1
75.0	D	8	8	8	8	8	7.6	8.3	7.6	7.0	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	E	8	8	8	8	8																					
	B	8	8	8	8	8																					
	C	8	8	8	8	8																					
	D	8	8	8	8	8																					
	E	8	8	8	8	8																					

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

Project# X6016
 Client EI Dorado Chemical

Test started: Date 4/13/16 Time 1645
 Test ended: Date 4/15/16 Time 1535

Sample Description 006
 Technician: 0hour BJ RC 24hour MM 48hour RC 72hour / 96hour /
 Time: 0hour 1645 24hour 1715 48hour 1535 72hour / 96hour /
 Temperature (°C): 0hour 24.4 24hour 25.0 48hour 24.9 72hour / 96hour /

Test Species P. promelas ID# BAL1040916

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
90		N/A																				
100.0	A	}	8	5	5			7.5	8.4	7.5			6.9	6.9	6.9			334	330	353		
	B		8	8	8																	
	C		8	8	7																	
	D		8	8	8																	
	E		8	8	8																	
100.0	A	}	8																			
pHadi	B		8																			
	C		8																			
	D		8																			
	E		8																			
								omit					4/13/16 RC									
								RC					RC					RC				

APPENDIX C
STATISTICAL ANALYSES

Daphnid Acute Test-48 Hr Survival

Start Date: 4/13/2016 Test ID: X6016DP Sample ID: AR0000752
 End Date: 4/15/2016 Lab ID: ADEQ880630 Sample Type: 6
 Sample Date: 4/12/2016 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: DP-Daphnia pulex
 Comments:

Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000
22	0.7500	1.0000	1.0000	1.0000	0.7500
32	0.6250	1.0000	1.0000	1.0000	0.7500
45	0.7500	1.0000	1.0000	0.7500	0.7500
56	1.0000	1.0000	1.0000	0.8750	1.0000
75	0.3750	0.5000	0.5000	0.5000	0.2500
100	1.0000	0.6250	1.0000	0.8750	0.6250

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		
22	0.9000	0.9000	1.2547	1.0472	1.3931	15.099	5	22.50	16.00
32	0.8750	0.8750	1.2276	0.9117	1.3931	18.862	5	22.50	16.00
45	0.8500	0.8500	1.1856	1.0472	1.3931	15.980	5	20.00	16.00
56	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	16.00
*75	0.4250	0.4250	0.7078	0.5236	0.7854	16.472	5	15.00	16.00
100	0.8250	0.8250	1.1638	0.9117	1.3931	20.795	5	20.00	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test Indicates normal distribution ($p > 0.05$)	0.93721	0.934	-0.3313	-0.9621
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				

Acute Fish Test-48 Hr Survival

Start Date: 4/13/2016 Test ID: X6016PP Sample ID: AR0000752
 End Date: 4/15/2016 Lab ID: ADEQ880630 Sample Type: 6
 Sample Date: 4/12/2016 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: PP-Pimephales promelas

Comments:

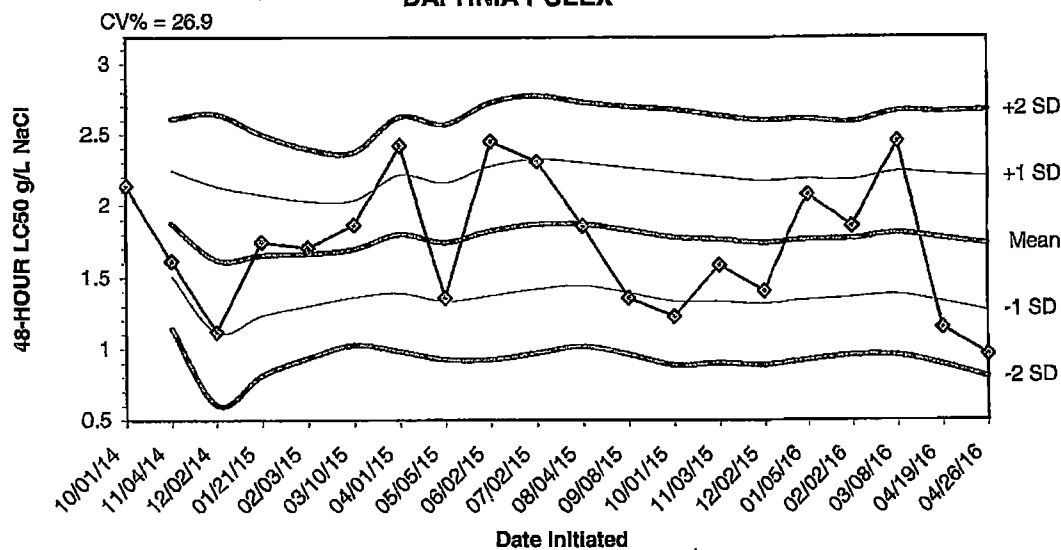
Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	0.7500	1.0000	1.0000
22	0.7500	0.7500	1.0000	1.0000	0.8750
32	0.5000	1.0000	1.0000	1.0000	1.0000
45	0.8750	0.8750	0.8750	1.0000	0.8750
56	0.8750	1.0000	1.0000	0.8750	1.0000
75	0.6250	1.0000	0.8750	1.0000	0.8750
100	0.6250	1.0000	0.8750	1.0000	1.0000

Conc-%	Transform: Arcsin Square Root							Rank Sum	1-Tailed Critical
	Mean	N-Mean	Mean	Min	Max	CV%	N		
D-Control	0.9500	1.0000	1.3239	1.0472	1.3931	11.684	5		
22	0.8750	0.9211	1.2180	1.0472	1.3931	14.204	5	23.00	16.00
32	0.9000	0.9474	1.2715	0.7854	1.3931	21.373	5	27.00	16.00
45	0.9000	0.9474	1.2462	1.2094	1.3931	6.591	5	22.00	16.00
56	0.9500	1.0000	1.3196	1.2094	1.3931	7.623	5	26.00	16.00
75	0.8750	0.9211	1.2234	0.9117	1.3931	16.097	5	23.00	16.00
100	0.9000	0.9474	1.2601	0.9117	1.3931	16.693	5	25.00	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.86476	0.934	-1.2897	1.31088
Bartlett's Test indicates equal variances (p = 0.35)	6.66466	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				

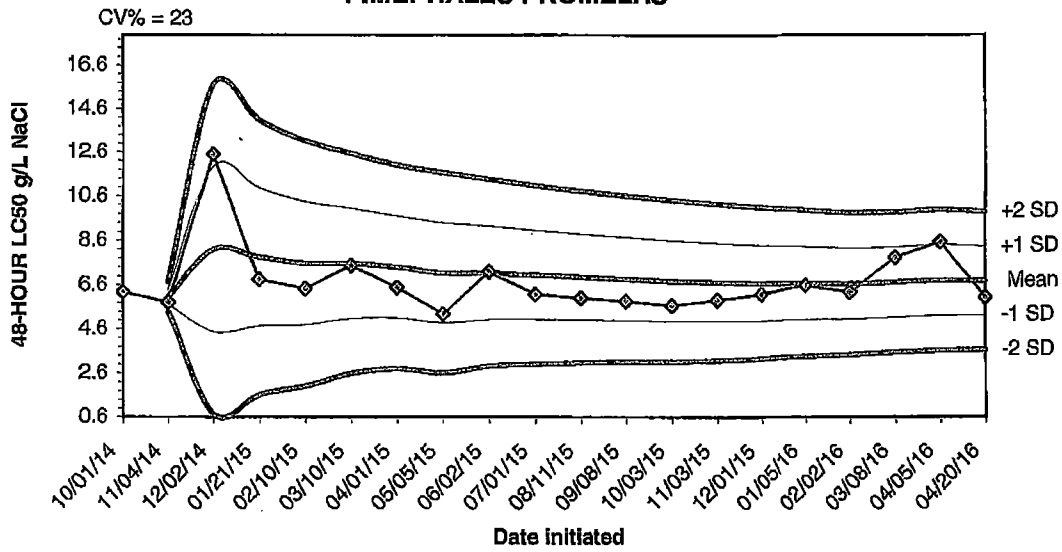
APPENDIX D
QUALITY ASSURANCE CHARTS

**2016 48-HOUR ACUTE REFERENCE TOXICANT TEST RESULTS USING
DAPHNIA PULEX**



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
10/01/14	2.1400					
11/04/14	1.6200	1.8800	1.5123	1.1446	2.2477	2.6154
12/02/14	1.1200	1.6267	1.1166	0.6066	2.1367	2.6467
01/21/15	1.7500	1.6575	1.2365	0.8155	2.0785	2.4995
02/03/15	1.7100	1.6680	1.3027	0.9373	2.0333	2.3987
03/10/15	1.8700	1.7017	1.3647	1.0276	2.0387	2.3757
04/01/15	2.4200	1.8043	1.3940	0.9836	2.2146	2.6249
05/05/15	1.3600	1.7488	1.3377	0.9266	2.1598	2.5709
06/02/15	2.4500	1.8267	1.3767	0.9267	2.2767	2.7267
07/02/15	2.3100	1.8750	1.4240	0.9731	2.3260	2.7769
08/04/15	1.8600	1.8736	1.4458	1.0180	2.3015	2.7293
09/08/15	1.3600	1.8308	1.3968	0.9628	2.2649	2.6989
10/01/15	1.2300	1.7846	1.3369	0.8892	2.2323	2.6801
11/03/15	1.5900	1.7707	1.3374	0.9041	2.2040	2.6373
12/02/15	1.4100	1.7467	1.3189	0.8911	2.1745	2.6023
01/05/16	2.0800	1.7675	1.3459	0.9243	2.1891	2.6107
02/02/16	1.8600	1.7729	1.3641	0.9553	2.1818	2.5906
03/08/16	2.4500	1.8106	1.3830	0.9555	2.2381	2.6656
04/19/16	1.1500	1.7758	1.3335	0.8913	2.2180	2.6603
04/26/16	0.9600	1.7350	1.2675	0.8000	2.2025	2.6700

**2016 48-HOUR ACUTE REFERENCE TOXICANT TEST RESULTS USING
PIMEPHALES PROMELAS**



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
10/01/14	6.2800					
11/04/14	5.8100	6.0450	5.7127	5.3803	6.3773	6.7097
12/02/14	12.5000	8.1967	4.4625	0.7283	11.9309	15.6651
01/21/15	6.8500	7.8600	4.7376	1.6152	10.9824	14.1048
02/10/15	6.4200	7.5720	4.7923	2.0126	10.3517	13.1314
03/10/15	7.4800	7.5567	5.0701	2.5836	10.0432	12.5298
04/01/15	6.4800	7.4029	5.0968	2.7907	9.7089	12.0150
05/05/15	5.2900	7.1388	4.8768	2.6149	9.4007	11.6626
06/02/15	7.2000	7.1456	5.0296	2.9137	9.2615	11.3774
07/01/15	6.1800	7.0490	5.0308	3.0127	9.0672	11.0853
08/11/15	6.0000	6.9536	5.0131	3.0726	8.8942	10.8347
09/08/15	5.8600	6.8625	4.9855	3.1085	8.7396	10.6165
10/03/15	5.6700	6.7708	4.9435	3.1163	8.5980	10.4253
11/03/15	5.9200	6.7100	4.9398	3.1695	8.4802	10.2505
12/01/15	6.1800	6.6747	4.9634	3.2520	8.3860	10.0973
01/05/16	6.5900	6.6694	5.0160	3.3625	8.3228	9.9762
02/02/16	6.2700	6.6459	5.0420	3.4382	8.2497	9.8536
03/08/16	7.8200	6.7111	5.1307	3.5504	8.2915	9.8719
04/05/16	8.5300	6.8068	5.2153	3.6238	8.3984	9.9899
04/20/16	6.0100	6.7670	5.2077	3.6484	8.3263	9.8856

APPENDIX E
AGENCY FORMS

Acute Forms
Daphnia pulex Survival

Permittee: El Dorado Chemical - Outfall 006

NPDES Permit Number: AR0000752/ AFIN 70-00040

Composite Collected From: 4/11/16 To: 4/12/16
From: To:

Test Initiated: 4/13/16

Dilution Water Used: Receiving Water Reconstituted Water

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	22.0	32.0	45.0	56.0	75.0	100.0
24-hour	A	100.0	75.0	100.0	100.0	100.0	75.0	100.0
	B	100.0	100.0	100.0	100.0	100.0	87.5	100.0
	C	100.0	100.0	100.0	100.0	100.0	62.5	100.0
	D	100.0	100.0	100.0	100.0	87.5	75.0	87.5
	E	100.0	75.0	100.0	75.0	100.0	75.0	87.5
48-hour	A	100.0	75.0	62.5	75.0	100.0	37.5	100.0
	B	100.0	100.0	100.0	100.0	100.0	50.0	62.5
	C	100.0	100.0	100.0	100.0	100.0	50.0	100.0
	D	100.0	100.0	100.0	75.0	87.5	50.0	87.5
	E	100.0	75.0	75.0	75.0	100.0	25.0	62.5
	Mean	100.0	90.0	87.5	85.0	67.5	42.5	82.5

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

- a.) LOW FLOW OR CRITICAL DILUTION (100.0%) 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 = N/A% effluent

95 % confidence limits:

Method of LC₅₀ calculation:

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

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

Permittee: El Dorado Chemical - Outfall 006
NPDES Number: AR0000752/ AFIN 70-00040
Contact: Eddie Pearson
Analyst: Callahan
Sample Collected **From:** **Date 4/11/16** **Time 1500**
To: **Date 4/12/16** **Time 0300**
Test Begin **Date 4/13/16** **Time 1645**
Test End **Date 4/15/16** **Time 1510**

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		7.9	8.2	7.7	24.9	24.7	24.9	36.0			52.0			7.5	7.5	7.4
22.0		7.8	8.2	7.8	24.9	24.7	24.9							7.3	7.2	7.3
32.0		7.7	8.2	7.8	24.9	24.7	24.9							7.2	7.1	7.2
45.0		7.7	8.2	7.8	24.9	24.7	24.9							7.1	7.1	7.1
56.0		7.7	8.2	7.7	24.9	24.7	24.9							7.1	7.1	7.1
75.0		7.6	8.3	7.7	24.9	24.7	24.9							7.0	7.0	7.1
100.0		7.5	8.4	7.7	24.9	24.7	24.9	16.0			88.0			6.9	6.9	6.9

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

**Acute Forms
Pimephales promelas Survival**

Permittee: El Dorado Chemical - Outfall 006

NPDES Permit Number: AR0000752/ AFIN 70-00040

Composite Collected

From: 4/11/16

To: 4/12/16

From:

To:

Test Initiated: 4/13/16

Dilution Water Used:

Receiving Water

Reconstituted Water

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	22.0	32.0	45.0	56.0	75.0	100.0
24-hour	A	100.0	87.5	50.0	87.5	100.0	75.0	75.0
	B	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	C	87.5	100.0	100.0	100.0	100.0	100.0	100.0
	D	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	E	100.0	100.0	100.0	100.0	100.0	100.0	100.0
48-hour	A	100.0	75.0	50.0	87.5	87.5	75.0	100.0
	B	100.0	75.0	100.0	87.5	100.0	100.0	100.0
	C	75.0	100.0	100.0	87.5	100.0	100.0	100.0
	D	100.0	100.0	100.0	100.0	87.5	100.0	100.0
	E	100.0	87.5	100.0	87.5	100.0	100.0	100.0
	Mean		95.0	87.5	90.0	90.0	95.0	87.5

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

- a.) LOW FLOW OR CRITICAL DILUTION (100.0%) 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} = N/A % effluent

95 % confidence limits:

Method of LC_{50} calculation:

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

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

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

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

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

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

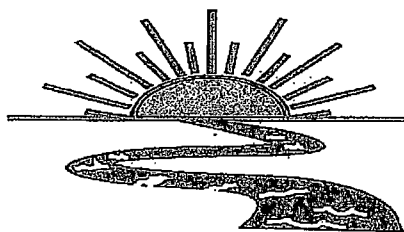
Contact: Eddie Pearson
 Analyst: Callahan, Merritt, Jones

Sample Collected From: Date 4/11/16 Time 1500
 To: Date 4/12/16 Time 0300
 Test Begin Date 4/13/16 Time 1645
 Test End Date 4/15/16 Time 1535

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	7.9	8.2	7.7	24.4	25.0	24.9	36.0				52.0			7.5	7.5	7.1
22.0	7.8	8.2	7.7	24.4	25.0	24.9								7.3	7.2	7.1
32.0	7.7	8.2	7.6	24.4	25.0	24.9								7.2	7.1	7.1
45.0	7.7	8.2	7.6	24.4	25.0	24.9								7.1	7.1	7.0
56.0	7.7	8.2	7.6	24.4	25.0	24.9								7.1	7.1	7.1
75.0	7.6	8.3	7.6	24.4	25.0	24.9								7.0	7.0	7.1
100.0	7.5	8.4	7.5	24.4	25.0	24.9	16.0				88.0			6.9	6.9	6.9

*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
1-800-259-1248
Fax: (318) 745-2773

REPORT QUALITY ASSURANCE FORM

Client: El Dorado Chemical Company / 006

Project#: X 6016

Chain of Custody Documents Checked by: RC 4/22/16
Technician/Date

Raw Data Documents Checked by: RC 4/22/16
Technician/Date

Statistical Analysis Package Checked by: EGB 5/9/16
Quality Manager/Date

Quality Control Data Checked by: EGB 5/2/16
Quality Manager/Date

Report Checked by: EGB 5/9/16
Quality Manager/Date

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

Quality Manager

5/9/16
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 X6017

Bio-Analytical Laboratories' Executive Summary

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

Project #: X6017

Outfall: Outfall 007 (contaminated storm water)

Permit #: AR0000752/ AFIN #70-00040

Contact: Mr. Eddie Pearson

Test Dates: April 13 - 15, 2016

Test Type: 48-hour acute toxicity test using *Pimephales promelas* (EPA 2000.0).
48-hour acute toxicity test using *Daphnia pulex* (EPA 2021.0)

Results:

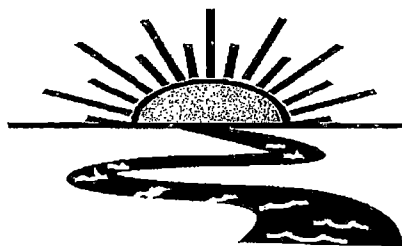
For *Pimephales promelas*:

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

For *Daphnia pulex*:

1. If the NOEC for survival is less than the critical dilution (100.0%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D- 0- **Pass**.
2. Report the NOEC for survival, Parameter TOM3D -100.0%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 22.96%.

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 007
AT**

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

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

EPA Methods 2000.0 and 2021.0

Project X6017

**Test Dates: April 13 - 15, 2016
Report Date: May 9, 2016**

Prepared for:
Mr. Eddie Pearson
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 X6017

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 References	8
Appendices	
A- Chain-of-Custody Documents	9
B- Raw Data Sheets	11
C- Statistical Analyses	21
D- Quality Assurance Charts	24
E- Agency Forms	27
F- Report Quality Assurance Form	32

BAL
ADEQ #88-0630
Project X6017

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), "Standard Methods for The Examination of Water and Wastewater. 20th Edition" (APHA 1998. Chemical results using this edition are listed in the report as SM 1997), and BAL's standard operating procedures.

2.2 Test Organisms

The fathead minnows were raised in-house and were approximately four days old at test initiation. The minnows were acclimated to dilution water hardness prior to testing. The *Daphnia pulex* test organisms were also raised in-house at test temperature 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 X6017

2.3 Dilution Water

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

2.4 Test Concentrations

The test concentrations used in the tests were 100.0, 75.0, 56.0, 50.0, 45.0, and 32.0 percent effluent and a reconstituted water control. The critical dilution was defined as 100.0 percent effluent. The tests were conducted using five replicates of eight animals each for a total of 40 animals per concentration.

2.5 Sample Collection

One composite sample of Outfall 007 was collected by El Dorado Chemical personnel on April 12, 2016 at 0315 hours. Upon completion of collection, the sample was packed in ice and delivered to the laboratory by BAL personnel. The temperature upon arrival was 1.0⁰ Celsius.

2.6 Sample Preparation

Upon arrival, the sample was logged in, given an identification number and refrigerated unless needed. Prior to use, the sample was warmed to 25±1⁰ Celsius. The total residual chlorine level (SM4500-Cl E 1997) was measured in milligrams/Liter (mg/l) with a Capital Controls^R amperometric titrator and recorded if present. The total ammonia level was measured in mg/L using a test strip. Dissolved oxygen (SM4500-O G 1997), pH (SM4500-H+ B 1997) and conductivity (SM2510-B 1997) measurements (in mg/L, standard units and umhos/cm, respectively) were taken on the control and each test concentration at test initiation, at each renewal and at test termination. Alkalinity (SM2320-B 1997) and hardness (SM2340-C 1997) levels were measured in mg/L as CaCO₃ 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.

BAL
ADEQ #88-0630
Project X6017

2.8 Data Analysis

The NOEC and LC₅₀ values were obtained by approved EPA methods of analysis, using the ToxCalc statistical program.

3.0 Results and Discussion

The results of the tests can be found in Table 1. Significant differences in survival were not noted in the critical dilution in either test after 48 hours of exposure (p=.05). The NOEC value for the fathead and *Daphnia pulex* tests was 100.0 percent effluent (p=.05). The 48-hour LC₅₀ values could not be calculated in either test because greater than 50.0 percent survival occurred in each effluent concentration.

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

Percent Effluent	Percent Survival	
	<i>Pimephales promelas</i>	<i>Daphnia pulex</i>
Control	100.0	97.5
22.0	100.0	100.0
32.0	95.0	87.5
45.0	100.0	87.5
56.0	100.0	90.0
75.0	97.5	87.5
100.0	100.0	80.0

The 48-hour reference toxicant test results indicated 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 X6017

4.0 Conclusions

The sample of Outfall 007 collected from El Dorado Chemical Company, El Dorado, Arkansas, on April 12, 2016, was not found to be lethally toxic to the fathead minnow test organisms nor the *Daphnia pulex* test organisms in the 100.0 percent critical dilution after 48 hours of exposure ($p=.05$). The 48-hour LC_{50} values could not be calculated because greater than 50.0 percent survival occurred in the 100.0 percent dilution ($p=.05$).

BAL
ADEQ #88-0630
Project X6017

5.0 References

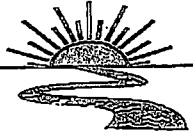
EPA, 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. EPA-821-R-02-012, Office of Water.

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

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

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

APPENDIX A
CHAIN-OF-CUSTODY DOCUMENTS



Bio-Analytical Laboratories

3240 Spangin Road
Post Office Box 827
Doyline, LA 71023

(318) 745-2772
1-800-259-1248
Fax: (318) 745-2773

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

Laboratory Use Only:

Company: El Dorado Chemical Company				Phone: (870) 863-1484		Analysis: Chronic Ceriodaphnia Chronic minnow Acute minnow (fresh/marine) Acute Daphnia species Acute Mysid Acute Ceriodaphnia Fecal Coliform						Project Number: X6017			
Address: 4500 Norwest Ave., El Dorado, AR 71731				Fax: (870) 863-7499								Temp. upon arrival: Temperature upon arrival: 1.0			
Permit #: AR0000752/AFIN 70-00040				Purchase Order:		Thermometer #: 29		Tech: <i>ESB</i>		Date: 4/12/16		Preservative: (below)			
Sampler's Signature/Printed Name/Affiliation: <i>Edward L Pearson / Edward L Pearson / EDCC</i>												Lab Control Number:			
Date Start	Date End	C	G	# and type of container		Sample Identification									
04-11-16	1515			6 half gallon		007						C12338			
04-12-16	0315	✓										ICE			
Relinquished by/Affiliation: <i>Edward L Pearson</i>				Date: 4/12/16		Time: 3 pm		Received by/Affiliation: <i>BR</i> <i>Erin L Bragg</i>				Date: 4/12/16		Time: 1500	
Relinquished by/Affiliation: <i>Erin L Bragg</i>				Date: 4/12/16		Time: 1630		Received by/Affiliation: <i>L Callahan</i>				Date: 4/12/16		Time: 1630	
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:															
COC Rev. 3.0															

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X6017

Client: EDCC/El Dorado Chemical Company

Address: 4500 Northwest Ave El Dorado AR 71731

NPDES#AR0000752 Outfall 007

Technicians: EGB/RC/MM

Test initiated: Date 4/13/16 Time 1645

Test terminated: Date 4/15/16 Time 1610

Dissolved Oxygen Meter: Model # YSI550A Serial #06E2089 AV

pH Meter: Model #Orion 230A+ Serial #015253

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
C12338	9.9 / 115.5%	10/7.9 / 93.1%	<0.01	NO	0.2	N/A	212.0	12.0	RC
	10.2 / 115.3%	6/8.4 / 96.5%							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	3849	N/A	N/A	N/A	N/A	6.8	52.0	36.0	RC

Test Species Information

Test Species Info.	D. palex Species: ID#: BAL/E17-fn	P. promelas Species: ID#: BAL/D4C910	Species: ID#:	Species: ID#:
Age	<24 hrs	~4 days		
Test Container Size	30 ml	300 ml		
Test volume	25 ml	250 ml		
Feeding: Type	2 hrs	prior to		
Amount	test	initiation		
Aeration?	N/A	N/A		
Amount	1	1		
Condition of survivors	Good RC 4/15/16 good dB			

Comments: pH = 6.3 (within Range <6.0 - >9.0) RC

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

Project# X6017

Test started: Date 4/13/16 Time 1645

Client EDCC

Test ended: Date 4/15/16 Time 1520

Sample Description 007

Test Species D. pulex ID# BAL/En-F17

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

Time: 4160hour 141645 24hour 1515 48hour 1520 72hour / 96hour /

Temperature (°C): 0hour 24.9 24hour 24.7 48hour 24.9 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%		N/A																				
0 _{soft}	A	}	8	8	8			7.9	8.1 ^{8.2}	7.9			7.4	7.4 ^{7.5}	7.4			1745	1743 ¹⁷⁴³	209		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	7																	
RC 0/1/15 7	E		8	8	8																	
32.0	A	}	8	8	8			7.7	8.2 ^{8.2}	7.8			7.1	7.1 ^{7.3}	7.2			318	318 ³⁴³	351		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal			RC	RC	RC			RC	RC	RC			RC	RC	RC			RC	RC	RC		

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

Project# X6017

Test started: Date 4/13/16 Time 1645

Client EDCC

Test ended: Date 4/15/16 Time 1520

Sample Description 007

Test Species D. pulex ID# BAL/E17-F17

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

Time: Ohour 1645 24hour 1515 48hour 1520 72hour / 96hour /

Temperature (°C): Ohour 24.5 24hour 24.7 48hour 24.9 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
<u>20</u>		<u>N/A</u>																				
<u>45.0</u>	<u>A</u>	<u>(</u>	<u>8</u>	<u>8</u>	<u>6</u>			<u>1.7</u>	<u>1.1</u>	<u>1.8</u>			<u>7.0</u>	<u>7.2</u>	<u>7.2</u>			<u>369</u>	<u>394</u>	<u>370</u>	<u>403</u>	
	<u>B</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
	<u>C</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
	<u>D</u>		<u>8</u>	<u>8</u>	<u>5</u>																	
	<u>E</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
<u>50.0</u>	<u>A</u>	<u>(</u>	<u>8</u>	<u>7</u>	<u>7</u>			<u>1.7</u>	<u>1.1</u>	<u>1.8</u>			<u>7.0</u>	<u>7.2</u>	<u>7.2</u>			<u>393</u>	<u>415</u>	<u>418</u>	<u>433</u>	
	<u>B</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
	<u>C</u>		<u>8</u>	<u>8</u>	<u>6</u>																	
	<u>D</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
	<u>E</u>		<u>8</u>	<u>8</u>	<u>6</u>																	
Chemistry Tech prerenewal/postrenewal								<u>RC</u>	<u>RC</u>	<u>RC</u>			<u>RC</u>	<u>RC</u>	<u>RC</u>			<u>RC</u>	<u>RC</u>	<u>RC</u>		

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

Project# X6017

Test started: Date 4/13/16 Time 1645

Client EDCC

Test ended: Date 4/15/16 Time 1520

Sample Description 007

Test Species D. pulex ID# BAL/E17-F17

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

Time: Ohour 1645 24hour 1515 48hour 1520 72hour / 96hour /

Temperature (°C): Ohour 24.5 24hour 24.7 48hour 24.9 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
90		N/A																				
56.0	A	}	8	8	8			7.7	7.0	7.8			6.9	7.2	7.2			420	442	452		
	B		8	8	6																	
	C		8	8	8																	
	D		8	8	7																	
	E		8	8	7																	
75.0	A	}	8	8	8			7.7	6.9	7.8			6.7	7.1	7.1			419	416	515		
	B		8	8	7																	
	C		8	8	6																	
	D		8	8	8																	
	E		8	8	6																	
Chemistry Tech prerenewal/postrenewal.								RC	RC	RC			RC	RC	RC			RC	RC	RC		

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

Project# X6017
 Client EOCC

Test started: Date 4/13/16 Time 1645
 Test ended: Date 4/15/16 Time 1520
 Test Species D. pullex ID# BAL/Er Er

Sample Description 007
 Technician: 0hour RC 24hour RC 48hour RC 72hour / 96hour /
 Time: 0hour 1645 24hour 1515 48hour 1520 72hour / 96hour /
 Temperature (°C): 0hour 24.5 24hour 24.7 48hour 24.9 72hour / 96hour /

Test Dilution	Replicate	Test Salinity	† Live Organisms					24.9 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
90		N/A																				
100.0	A	}	8	8	8			7.5	8.1	7.7			6.6	6.9	6.9			6.04	6.13	6.11	6.44	
	B		8	8	4																	
	C		8	8	8																	
	D		8	8	6																	
	E		8	8	6																	
100.0	A	}	8																			
PH adj	B		8																			
	C		8																			
	D		8																			
	E		8																			
Chemistry Tech Prerenewal/postrenewal							RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC	RC		

ACUTE2 Rev 1.0

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

Project# X6017

Test started: Date 4/13/16 Time 1800

Client EDCC

Test ended: Date 4/15/16 Time 1610

Sample Description 007

Test Species P. promelas ID# BAL/040916

Technician: Ohour ELB 24hour MM 48hour ELB 72hour / 96hour /
 Time: Ohour 1800 24hour 1745 48hour 1610 72hour / 96hour /
 Temperature (°C): Ohour 25.0 24hour 25.0 48hour 24.9 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%		N/A																				
0.50%	A	}	8	8	8			7.96	8.1	7.6			7.4	7.4	7.2			174.5	174.3	173		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
32.0	A	}	8	8	8			7.7	8.2	7.6			7.1	7.1	7.1			318	318	313		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal			RC <u>MM</u> / RC <u>ELB</u>					RC <u>MM</u> / RC <u>ELB</u>					RC <u>MM</u> / RC <u>ELB</u>									

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

Project# X6017

Test started: Date 4/13/16 Time 1800

Client EDCC

Test ended: Date 4/15/16 Time 1610

Sample Description 007

Test Species P. promelas ID# BAL/04-916

Technician: 0hour EB 24hour MM 48hour EB 72hour / 96hour /

Time: 0hour 1800 24hour 1745 48hour 1610 72hour / 96hour /

Temperature (°C): 0hour 25.0 24hour 25.0 48hour 24.9 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
<u>40</u>		<u>N/A</u>																				
<u>45.0</u>	<u>A</u>	<u>(</u>	<u>8</u>	<u>7</u>	<u>7</u>			<u>7.7</u>	<u>8.2</u>	<u>7.5</u>			<u>7.0</u>	<u>7.1</u>	<u>7.1</u>			<u>369</u>	<u>370</u>	<u>395</u>		
	<u>B</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
	<u>C</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
	<u>D</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
	<u>E</u>		<u>8</u>	<u>7</u>	<u>7</u>																	
<u>50.0</u>	<u>A</u>	<u>(</u>	<u>8</u>	<u>8</u>	<u>8</u>			<u>7.7</u>	<u>8.2</u>	<u>7.5</u>			<u>7.0</u>	<u>7.1</u>	<u>7.1</u>			<u>393</u>	<u>418</u>	<u>430</u>		
	<u>B</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
	<u>C</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
	<u>D</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
	<u>E</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
Chemistry Tech prerenewal/postrenewal			RC <u>MM</u> / RC <u>EB</u>					RC <u>MM</u> / RC <u>EB</u>					RC <u>MM</u> / RC <u>EB</u>									

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

Project# X6017

Test started: Date 4/13/16 Time 1800

Client EDCC

Test ended: Date 4/15/16 Time 1610

Sample Description 007
 Technician: EGG 24hour MIA 48hour EGG
 Time: 1600 24hour 7.95 48hour 11.10
 Temperature (°C): 25.0 24hour 25.0 48hour 24.9

Test Species P. promelas ID# BAL/040916
 72hour / 96hour /
 72hour / 96hour /
 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
<u>40</u>		<u>N/A</u>																				
<u>56.0</u>	<u>A</u>	<u>(bracket)</u>	<u>8</u>	<u>8</u>	<u>8</u>			<u>7.7</u>	<u>8.2</u>	<u>7.5</u>			<u>6.9</u>	<u>7.2</u>	<u>7.2</u>			<u>420</u>	<u>494</u>	<u>394</u>	<u>400</u>	
	<u>B</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
	<u>C</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
	<u>D</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
	<u>E</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
<u>75.0</u>	<u>A</u>	<u>(bracket)</u>	<u>8</u>	<u>8</u>	<u>8</u>			<u>7.7</u>	<u>8.3</u>	<u>7.5</u>			<u>6.7</u>	<u>7.0</u>	<u>7.0</u>			<u>497</u>	<u>513</u>	<u>492</u>	<u>501</u>	
	<u>B</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
	<u>C</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
	<u>D</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
	<u>E</u>		<u>8</u>	<u>7</u>	<u>7</u>																	
Chemistry Tech prerenewal/postrenewal.			RC <u>MIA</u> / RC <u>EGG</u>					RC <u>MIA</u> / RC <u>EGG</u>					RC <u>MIA</u> / RC <u>EGG</u>									

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

Project# X6017

Test started: Date 4/13/16 Time 800

Client EDCC

Test ended: Date 4/15/16 Time 1610

Sample Description 007

Test Species P. promelas ID# BAL/040916

Technician: Ohour EGS 24hour MM 48hour EGB 72hour / 96hour /

Time: Ohour 800 24hour 1745 48hour 1610 72hour / 96hour /

Temperature (°C): Ohour 23.0 24hour 25.0 48hour 24.9 72hour / 96hour /

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
100.0	A	NIA	8	8	8			7.5	6.7	7.5			6.6	6.8	6.8			604	611	609		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
pH 0.0 100.0	A	NIA	8																			
	B		8																			
	C		8																			
	D		8																			
	E		8																			
Chemistry Tech prerenewal/postrenewal								RC	RC	EGB			RC	RC	EGB			RC	RC	EGB		

APPENDIX C
STATISTICAL ANALYSES

Daphnid Acute Test-48 Hr Survival

Start Date: 4/13/2016 Test ID: X6017DP Sample ID: AR0000752
 End Date: 4/15/2016 Lab ID: ADEQ880630 Sample Type: 7
 Sample Date: 4/12/2016 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	1.0000	1.0000	1.0000	1.0000	1.0000
42	0.7500	1.0000	1.0000	0.6250	1.0000
50	0.8750	1.0000	0.7500	1.0000	0.7500
56	1.0000	0.7500	1.0000	0.8750	0.8750
75	1.0000	0.8750	0.7500	1.0000	0.7500
100	1.0000	0.5000	1.0000	0.7500	0.7500

Transform: Arcsin Square Root

Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N
D-Control	0.9750	1.0000	1.3564	1.2094	1.3931	6.055	5
32	1.0000	1.0256	1.3931	1.3931	1.3931	0.000	5
42	0.8750	0.8974	1.2276	0.9117	1.3931	18.862	5
50	0.8750	0.8974	1.2180	1.0472	1.3931	14.204	5
56	0.9000	0.9231	1.2504	1.0472	1.3931	11.683	5
75	0.8750	0.8974	1.2180	1.0472	1.3931	14.204	5
100	0.8000	0.8205	1.1332	0.7854	1.3931	22.963	5

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.94725	0.934	-0.2924	-0.5454
Equality of variance cannot be confirmed				

Daphnid Acute Test-48 Hr Survival

Start Date: 4/13/2016 Test ID: X6017PP Sample ID: AR0000752
 End Date: 4/15/2016 Lab ID: ADEQ880630 Sample Type: 7
 Sample Date: 4/12/2016 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: CD-Ceriodaphnia dubla
 Comments:

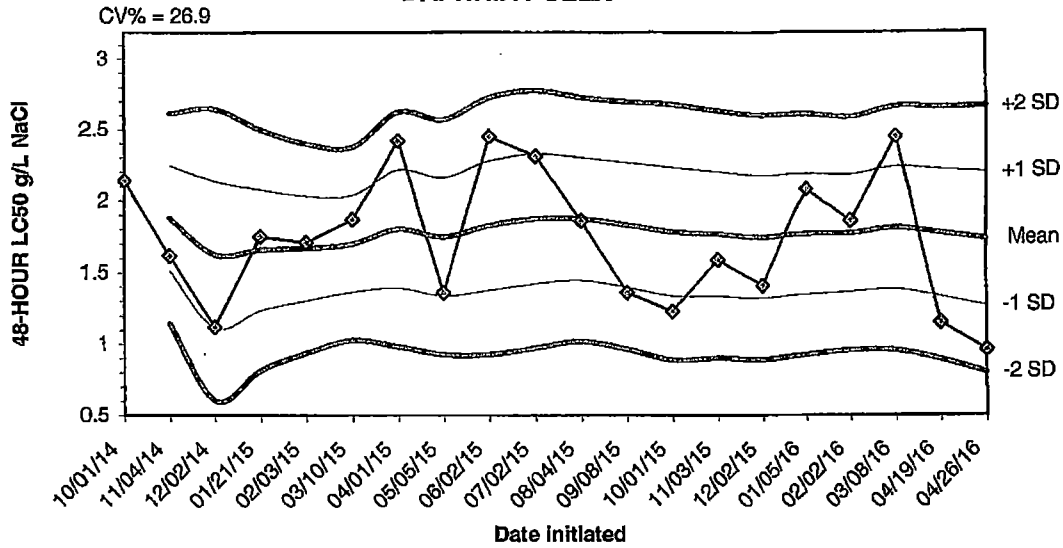
Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
45	0.8750	1.0000	1.0000	1.0000	0.8750
50	1.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	1.0000	1.0000	1.0000
75	1.0000	1.0000	1.0000	1.0000	0.8750
100	1.0000	1.0000	1.0000	1.0000	1.0000

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	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
45	0.9500	0.9500	1.3196	1.2094	1.3931	7.623	5	22.50	16.00
50	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
56	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
75	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	16.00
100	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00

Auxillary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution ($p \leq 0.05$)	0.67398	0.934	-1.5743	4.34273
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				

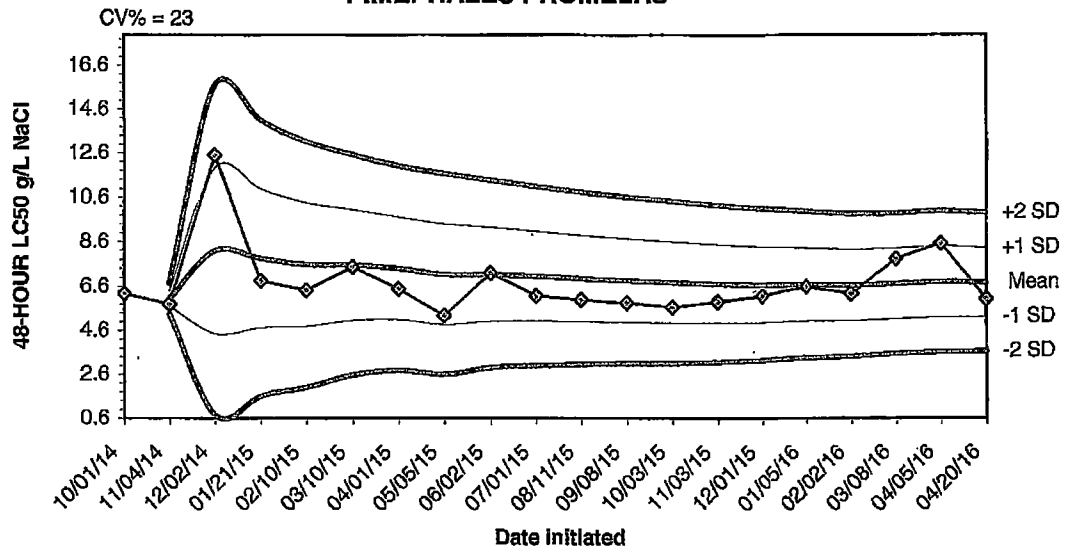
APPENDIX D
QUALITY ASSURANCE CHARTS

**2016 48-HOUR ACUTE REFERENCE TOXICANT TEST RESULTS USING
DAPHNIA PULEX**



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
10/01/14	2.1400					
11/04/14	1.6200	1.8800	1.5123	1.1446	2.2477	2.6154
12/02/14	1.1200	1.6267	1.1166	0.6066	2.1367	2.6467
01/21/15	1.7500	1.6575	1.2365	0.8155	2.0785	2.4995
02/03/15	1.7100	1.6680	1.3027	0.9373	2.0333	2.3987
03/10/15	1.8700	1.7017	1.3647	1.0276	2.0387	2.3757
04/01/15	2.4200	1.8043	1.3940	0.9836	2.2146	2.6249
05/05/15	1.3600	1.7488	1.3377	0.9266	2.1598	2.5709
06/02/15	2.4500	1.8267	1.3767	0.9267	2.2767	2.7267
07/02/15	2.3100	1.8750	1.4240	0.9731	2.3260	2.7769
08/04/15	1.8600	1.8736	1.4458	1.0180	2.3015	2.7293
09/08/15	1.3600	1.8308	1.3968	0.9628	2.2649	2.6989
10/01/15	1.2300	1.7846	1.3369	0.8892	2.2323	2.6801
11/03/15	1.5900	1.7707	1.3374	0.9041	2.2040	2.6373
12/02/15	1.4100	1.7467	1.3189	0.8911	2.1745	2.6023
01/05/16	2.0800	1.7675	1.3459	0.9243	2.1891	2.6107
02/02/16	1.8600	1.7729	1.3641	0.9553	2.1818	2.5906
03/08/16	2.4500	1.8106	1.3830	0.9555	2.2381	2.6656
04/19/16	1.1500	1.7758	1.3335	0.8913	2.2180	2.6603
04/26/16	0.9600	1.7350	1.2675	0.8000	2.2025	2.6700

**2016 48-HOUR ACUTE REFERENCE TOXICANT TEST RESULTS USING
PIMEPHALES PROMELAS**



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
10/01/14	6.2800					
11/04/14	5.8100	6.0450	5.7127	5.3803	6.3773	6.7097
12/02/14	12.5000	8.1967	4.4625	0.7283	11.9309	15.6651
01/21/15	6.8500	7.8600	4.7376	1.6152	10.9824	14.1048
02/10/15	6.4200	7.5720	4.7923	2.0126	10.3517	13.1314
03/10/15	7.4800	7.5567	5.0701	2.5836	10.0432	12.5298
04/01/15	6.4800	7.4029	5.0968	2.7907	9.7089	12.0150
05/05/15	5.2900	7.1388	4.8768	2.6149	9.4007	11.6626
06/02/15	7.2000	7.1456	5.0296	2.9137	9.2615	11.3774
07/01/15	6.1800	7.0490	5.0308	3.0127	9.0672	11.0853
08/11/15	6.0000	6.9536	5.0131	3.0726	8.8942	10.8347
09/08/15	5.8600	6.8625	4.9855	3.1085	8.7395	10.6165
10/03/15	5.6700	6.7708	4.9435	3.1163	8.5980	10.4253
11/03/15	5.9200	6.7100	4.9398	3.1695	8.4802	10.2505
12/01/15	6.1800	6.6747	4.9634	3.2520	8.3860	10.0973
01/05/16	6.5900	6.6694	5.0160	3.3625	8.3228	9.9762
02/02/16	6.2700	6.6459	5.0420	3.4382	8.2497	9.8536
03/08/16	7.8200	6.7111	5.1307	3.5504	8.2915	9.8719
04/05/16	8.5300	6.8068	5.2153	3.6238	8.3984	9.9899
04/20/16	6.0100	6.7670	5.2077	3.6484	8.3263	9.8856

APPENDIX E
AGENCY FORMS

Acute Forms
Daphnia pulex Survival

Permittee: El Dorado Chemical - Outfall 007

NPDES Permit Number: AR0000752/ AFIN 70-00040

Composite Collected From: 4/11/16 To: 4/12/16
From: To:

Test Initiated: 4/13/16

Dilution Water Used: Receiving Water Reconstituted Water

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	32.0	45.0	50.0	56.0	75.0	100.0
24-hour	A	100.0	100.0	100.0	87.5	100.0	100.0	100.0
	B	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	D	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	E	100.0	100.0	100.0	100.0	100.0	100.0	100.0
48-hour	A	100.0	100.0	75.0	87.5	100.0	100.0	100.0
	B	100.0	100.0	100.0	100.0	75.0	87.5	50.0
	C	100.0	100.0	100.0	75.0	100.0	75.0	100.0
	D	87.5	100.0	62.5	100.0	87.5	100.0	75.0
	E	100.0	100.0	100.0	75.0	87.5	75.0	75.0
	Mean	97.5	100.0	87.5	87.5	90.0	87.5	80.0

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 (100.0%) 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 = N/A % effluent

95 % confidence limits:

Method of LC₅₀ calculation:

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

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

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

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

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

Permittee: El Dorado Chemical - Outfall 007
 NPDES Number: AR0000752/ AFIN 70-00040
 Contact: Eddie Pearson
 Analyst: Callahan
 Sample Collected

From: Date 4/11/16 Time 1515
 To: Date 4/12/16 Time 0315
 Date 4/13/16 Time 1645
 Date 4/15/16 Time 1520

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	7.9	8.1	7.9	24.9	24.7	24.9	36.0				52.0			7.4	7.4	7.4
32.0	7.7	8.2	7.8	24.9	24.7	24.9								7.1	7.1	7.2
45.0	7.7	8.2	7.8	24.9	24.7	24.9								7.0	7.0	7.2
50.0	7.7	8.2	7.8	24.9	24.7	24.9								7.0	7.0	7.2
56.0	7.7	8.2	7.8	24.9	24.7	24.9								6.9	6.9	7.2
75.0	7.7	8.3	7.8	24.9	24.7	24.9								6.7	7.1	7.1
100.0	7.5	8.5	7.7	24.9	24.7	24.9	12.0				212.0			6.6	6.3	6.9

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

**Acute Forms
Pimephales promelas Survival**

Permittee: El Dorado Chemical - Outfall 007

NPDES Permit Number: AR0000752/ AFIN 70-00040

Composite Collected

From: 4/11/16

To: 4/12/16

From:

To:

Test Initiated: 4/13/16

Dilution Water Used:

Receiving Water

Reconstituted Water

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	32.0	45.0	50.0	56.0	75.0	100.0
24-hour	A	100.0	100.0	87.5	100.0	100.0	100.0	100.0
	B	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	D	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	E	100.0	100.0	87.5	100.0	100.0	87.5	100.0
48-hour	A	100.0	100.0	87.5	100.0	100.0	100.0	100.0
	B	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	D	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	E	100.0	100.0	87.5	100.0	100.0	87.5	100.0
	Mean	100.0	100.0	95.0	100.0	100.0	97.5	100.0

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

- a.) LOW FLOW OR CRITICAL DILUTION (100.0%) 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} = N/A% effluent

95 % confidence limits:

Method of LC_{50} calculation:

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

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

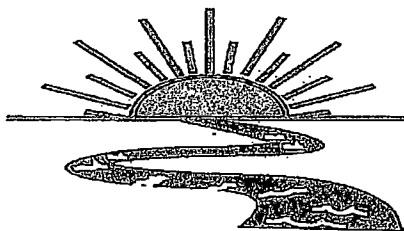
Permittee: El Dorado Chemical - Outfall 007
 NPDES Number: AR0000752/ AFIN 70-00040
 Contact: Eddie Pearson
 Analyst: Merritt, Briggs

Sample Collected From: Date 4/11/16 Time 1515
 To: Date 4/12/16 Time 0315
 Test Begin Date 4/13/16 Time 1800
 Test End Date 4/15/16 Time 1610

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	7.9	8.1	7.6	25.0	25.0	24.9	36.0				52.0			7.4	7.4	7.2
32.0	7.7	8.2	7.6	25.0	25.0	24.9								7.1	7.1	7.1
45.0	7.7	8.2	7.5	25.0	25.0	24.9								7.0	7.0	7.1
50.0	7.7	8.2	7.5	25.0	25.0	24.9								7.0	7.0	7.1
56.0	7.7	8.2	7.5	25.0	25.0	24.9								6.9	6.9	7.2
75.0	7.7	8.3	7.5	25.0	25.0	24.9								6.7	6.8	7.0
100.0	7.5	8.5	7.5	25.0	25.0	24.9	12.0				212.0			6.6	6.3	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
Doyline, LA 71023

(318) 745-2772
1-800-259-1246
Fax: (318) 746-2773

REPORT QUALITY ASSURANCE FORM

Client: El Dorado Chemical Company/007

Project#: X6017

Chain of Custody Documents Checked by: RC 4/22/16
Technician/Date

Raw Data Documents Checked by: RC 4/22/16
Technician/Date

Statistical Analysis Package Checked by: EGB 5/9/16
Quality Manager/Date

Quality Control Data Checked by: EGB 5/2/16
Quality Manager/Date

Report Checked by: EGB 5/9/16
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.

Quinn H. Brugga, BS 5/9/16
Quality Manager Date

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

ORIGIN ID:ELDA (870) 863-1400
EDDIE PEARSON
ELDORADO CHEMICAL COMPANY
4500 NORTH WEST AVE

SHIP DATE: 23MAY16
ACTWGT: 5.00 LB
CAD: 5887030/NET3730

ELDORADO, AR 71730
UNITED STATES US

BILL SENDER

TO WATER ENFORCEMENT BRANCH
ADEQ
5301 NORTSHORE DR

NORTH LITTLE ROCK AR 72118

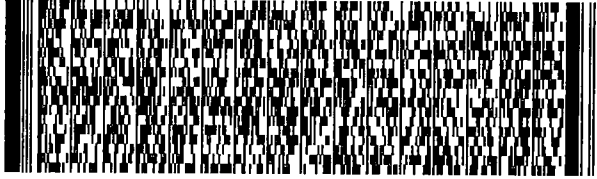
(870) 863-1484

REF:

INV:
PO:

DEPT:

540,116323/2ZF



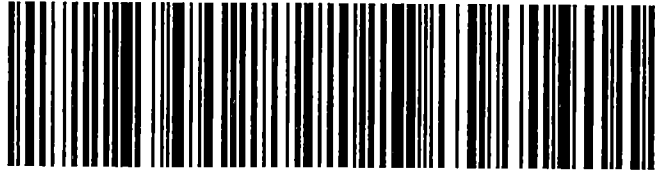
41610162060107

TUE - 24 MAY 10:30A
PRIORITY OVERNIGHT

TRK# 7763 4765 1795
0201

X2 LITA

72118
AR-US LIT



After printing this label:

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

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

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