

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



May 22, 2015

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, 2015.

Enclosed you will find the Discharge Monitoring Reports ending April 30, 2015. The DMR's for Outfall 010-A were entered on the blank DMR forms provided by Amy Schluterman, ADEQ Water Enforcement.

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

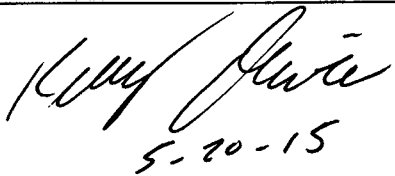
**Facility Name:** EI Dorado Chemical Company

**Permit Number:** AR0000752

**AFIN:**

**70-00040**

**Month / Year:** Apr-15

Type of Violation	Permit Limit	Date of Violation	Cause of Violation	Corrective Action or Other Narrative
Outfall 010 Fecal Coliform Bacteria (No Result Available)	Report Daily	4/26/2015	Lab thermistor dislodged which caused the sample to be overheated.	American Interplex has dealt with the laboratory units and alarms to insure equipment operates properly.
Outfall 006/Zinc Monthly Average (480 ug/L)	115.62 ug/L Monthly Average	4/9/2015	Unknown	EDCC has land applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006 /Zinc Daily Max (480 ug/L)	231.99 ug/L Daily Max	4/9/2015	Unknown	EDCC has land applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006 / Lead Monthly Average (64 ug/L)	3.8 ug/L Monthly Average	4/9/2015	Unknown	EDCC has land applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006 / Lead Daily Max. (64 ug/L)	7.62 ug/L Daily Max.	4/9/2015	Unknown	EDCC has land applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006 TDS Monthly Average (600 mg/L)	291 mg/L Monthly Average	4/9/2015	Unknown	EDCC has land applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006 TDS Daily Max (600 mg/L)	436.5 mg/L Daily Max	4/9/2015	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 (120 ug/L)	115.62 ug/L Monthly Average	4/9/2015	Unknown	EDCC has land applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.
Outfall 007 / Lead Monthly Average (10 ug/L)	3.8 ug/L Monthly Average	4/9/2015	Unknown	EDCC has land applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.
Outfall 007 / Lead Daily Average (10 ug/L)	7.62 ug/L Daily Max.	4/9/2015	Unknown	EDCC has land applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.
Outfall 007 / TDS Monthly Average (2100 mg/L)	291 mg/L Monthly Average	4/9/2015	Unknown	EDCC has land applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.
Outfall 007/TDS Daily Max(2100 mg/L)	436.5 mg/L Daily Max	4/9/2015	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>			 5-20-15 Signature / Date	

Bio-Analytical Laboratories (BAL)  
ADEQ#88-0630  
Project X5713

### Bio-Analytical Laboratories' Executive Summary

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

**Project #:** X5713

**Outfall:** Outfall 006 (contaminated storm water)

**Permit #:** AR0000752/ AFIN #70-00040

**Contact:** Mr. David Sartain

**Test Dates:** April 10 - 12, 2015

**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 - 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**

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

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

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

**EPA Methods 2000.0 and 2021.0**

**Project X5713**

**Test Dates: April 10 - 12, 2015  
Report Date: April 16, 2015**

**Prepared for:**  
Mr. David Sartain  
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 X5713

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BAL  
ADEQ #88-0630  
Project X5713

## 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), "Standard Methods for The Examination of Water and Wastewater. 20<sup>th</sup> 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 six 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.

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ADEQ #88-0630  
Project X5713

### **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 sample of Outfall 006 was collected by El Dorado Chemical personnel on April 9, 2015. Upon completion of collection, the sample was packed in ice and delivered to the laboratory by BAL personnel. The temperature upon arrival was 0.8<sup>o</sup> 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<sup>o</sup> Celsius. The total residual chlorine level (SM4500-Cl D 1997) was measured with a Capital Controls<sup>R</sup> amperometric titrator and recorded if present. The total ammonia level was measured using a HACH<sup>R</sup> test strip. Dissolved oxygen (SM4500-O G 1997), pH (SM4500-H+ B 1997) and conductivity (SM2510-B 1997) measurements 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 on the control and the highest effluent concentration.

### **2.7 Monitoring of the Tests**

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

### **2.8 Data Analysis**

The NOEC and LC<sub>50</sub> values were obtained by approved EPA methods of analysis, using the ToxCalc statistical program.

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### 3.0 Results and Discussion

The results of the tests can be found in Table 1. Significant differences in survival were not noted in the critical dilution in neither test after 48 hours of exposure ( $p=.05$ ). The NOEC values for the tests was 100.0 percent effluent ( $p=.05$ ). The 48-hour  $LC_{50}$  values could not be calculated because greater than 50.0 percent survival occurred in each effluent concentration. See Appendix C- Statistical Analyses, for more information.

**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	92.5
22.0	100.0	97.5
32.0	100.0	100.0
45.0	100.0	100.0
56.0	100.0	100.0
75.0	100.0	100.0
100.0	100.0	100.0

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.



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Project X5713

#### 4.0 Conclusions

The sample of Outfall 006 collected from El Dorado Chemical Company, El Dorado, Arkansas, on April 9, 2015, 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 effluent dilutions ( $p=.05$ ).

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ADEQ #88-0630  
Project X5713

### 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. 20<sup>th</sup> Edition.

**APPENDIX A**  
**CHAIN-OF-CUSTODY DOCUMENTS**



**Bio-Analytical Laboratories**

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Post Office Box 527  
Daytone, LA 71023

(918) 745-2772  
1-800-258-1248  
Fax: (918) 745-2773

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

Laboratory Use Only:

<b>Company:</b> El Dorado Chemical Company		<b>Phone:</b> (870) 863-1484		<b>Analysis:</b>				<b>Project Number:</b> X5713		
<b>Address:</b> 4500 Norwest Ave., El Dorado, AR 71731		<b>Fax:</b> (870) 863-7499		Chronic Ceriodaphnia Chronic minnow Acute minnow/fresh/marine Acute Daphnia species Acute Mysid Acute Ceriodaphnia Fecal Coliform				Temp. upon arrival: 0-8 Thermometer #: 29 Tech: RC Date: 4/10/15		
<b>Permit #:</b> AR0000752/AFIN 70-00040		<b>Purchase Order:</b>							Lab Control Number:	Preservative: (below)
<b>Sampler's Signature/Printed Name/Affiliation:</b> <i>Edward Pearson / Edward Pearson / EDCC</i>										
<b>Date Start</b> Date End	<b>Time Start</b> Time End	C	G	# and type of container	Sample Identification					
4-9-15 -	1800 - 2400	X		6 half gallons	006		X	X		
<b>Relinquished by/Affiliation:</b> <i>Edward Pearson / EDCC</i>				<b>Date:</b> 4/10/15	<b>Time:</b> 0946 0900	<b>Received by/Affiliation:</b> <i>Erin J. Biaggi</i>		<b>Date:</b> 4/10/15	<b>Time:</b> 0946	
<b>Relinquished by/Affiliation:</b> <i>Erin J. Biaggi</i>				<b>Date:</b> 4/10/15	<b>Time:</b> 1145	<b>Received by/Affiliation:</b> <i>R. Calahan</i>		<b>Date:</b> 4/10/15	<b>Time:</b> 1145	
<b>Relinquished by/Affiliation:</b>				<b>Date:</b>	<b>Time:</b>	<b>Received by/Affiliation:</b>		<b>Date:</b>	<b>Time:</b>	
<b>Method of Shipment:</b> <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 <b>Tracking #</b> _____										
<b>Comments:</b>										
COC Rev. 3.0										

**APPENDIX B  
RAW DATA SHEETS**

BIO-ANALYTICAL LABORATORIES  
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X5713

Client: EDCC/El Dorado Chemical Company

Address: 4500 Northwest Ave El Dorado AR 71731

NPDES# AR0000752 Outfall 006

Technicians: EGB/RC/CR

Test initiated: Date 4/10/15 Time 1600

Test terminated: Date 4/12/15 Time 1630

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
C10760	8.5/100.7%	4/10/15 11.9	2.0	NO	3.0	N/A	92.0	32.0	EGB
↓	7.8/100.4	No/EGB					↓	↓	EGB

Dilution Water Information

Dilution Water	ID#	Initial D.O (mg/L & %)	Aerate? Minutes/D.O (mg/L & %)	Total Residual Chlorine (mg/L)	Ammonia (NH3) mg/L	pH	Hardness	Alkalinity	Tech
Soft H2O	3714	N/A	N/A	N/A	N/A	7.3	400	28.0	EGB

Test Species Information

Test Species Info.	Species: <u>D. gulex</u> ID#: <u>BAL/mao/120</u>	Species: <u>P. promelas</u> ID#: <u>BAL/040415</u>	Species: ID#:	Species: ID#:
Age	<u>&lt;24 hrs</u>	<u>6 days</u>		
Test Container Size	<u>30 ml</u>	<u>300ml</u>		
Test volume	<u>20 ml</u>	<u>200ml</u>		
Feeding: Type	<u>2 hrs prior to test initiation</u>			
Amount				
Aeration?	<u>N/A</u>	<u>N/A</u>		
Amount				
Condition of survivors	<u>good</u>	<u>good</u>	<u>EGB</u>	<u>4/12/15</u>

Comments:

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

Project# X5713

Test started: Date 4/10/16 Time 1600

Client EI Dorado Chemical

Test ended: Date 4/13/16 Time 1615

Sample Description 006

Test Species D. pulex ID# BAL/m20-N20

Technician: Ohour RC 24hour EGS 48hour ELB 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Time: Ohour 1600 24hour 0900 48hour 1615 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): Ohour 24.3 24hour 24.3 48hour 24.0 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0/0		N/A																				
0 soft	A	[Handwritten mark]	8	8	7			8.4	8.4	8.3			7.6	7.7	7.9			163.1	165.0	164.5	164.7	
	B		8	8	8																	
	C		8	8	6																	
	D		8	8	8																	
	E		8	8	8																	
22.0	A	[Handwritten mark]	8	8	8			8.2	8.4	8.3			7.5	7.7	7.7			207	207	208	210	
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	7																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal			RC [Signature]					RC [Signature]					RC [Signature]									

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

Project# X5713

Test started: Date 4/10/15 Time 1600

Client EI Dorado Chemical

Test ended: Date 4/12/15 Time 1615

Sample Description 006  
 Technician: RC 0hour RC 24hour ELB 48hour ELB  
 Time: 1600 0hour 1600 24hour 1615 48hour 1615  
 Temperature (°C): 24.3 0hour 24.3 24hour 24.3 48hour 24.0 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Species D. pulex ID# BAL/mag-N2o

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
32.0	A	N/A	8	8	8			8.2	8.0	8.2			7.4	7.5	7.7			227	230	274		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
45.0	A	N/A	8	8	8			8.2	8.1	8.1			7.4	7.6	7.6			253	258	294		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal			RC/ELB					RC/ELB					RC/ELB									



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

Project# X5713

Test started: Date 4/10/15 Time 1600

Client El Dorado Chemical

Test ended: Date 4/12/15 Time 1615

Sample Description 0006

Test Species D. pulex ID# BAL/Man-Nzo

Technician: Ohour RC 24hour EB 48hour EB 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Time: Ohour 1600 24hour 0900 48hour 1615 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): Ohour 24.3 24hour 24.3 48hour 24.0 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0%		N/A																				
56.0	A	}	8	8	8			8.1	8.1	8.1			7.4	7.5	7.5			276	275	275		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
75.0	A	}	8	8	8			8.1	8.1	8.0			7.3	7.6	7.5			313	300	300		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal			RC <del>EB</del> EB					RC <del>EB</del> EB					RC <del>EB</del> EB									

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

Project# X5713

Test started: Date 4/10/15

Time 1600

Client El Dorado Chemical *EB*

Test ended: Date 4/12/15

Time 1615

Sample Description 006 <sup>0900</sup>

Test Species D. pulex ID# Mao-Nao

Technician: Ohour RC 24hour EB 48hour EB 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Time: Ohour 1600 24hour 1615 48hour 1615 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): Ohour 24.3 24hour 24.6 48hour 24.0 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0/0		N/A																				
100.0	A	[Wavy line]	8	8	8			1.9	8.0	8.2	8.0		7.3	7.5	7.4	7.4		365	350	370	386	
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
pH adj 100.0	A	[Wavy line]	8																			
	B		8																			
	C		8			N/A																
	D		8																			
	E		8																			
Chemistry Tech prerenewal/postrenewal			RC <i>EB</i>					RC <i>EB</i>					RC <i>EB</i>									

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

Project# X5713

Test started: Date 4/10/15 Time 1655

Client El Dorado Chemical

Test ended: Date 4/12/15 Time 1630

Sample Description 006 EB Test Species P. promelas ID# BAL/040415

Technician: Ohour RC 24hour EB 48hour EB 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Time: Ohour 1655 24hour 0930 48hour 1630 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): Ohour 24.3 24hour 24.3 48hour 24.0 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0%		N/A																				
0 soft	A	}	8	8	8			8.4	8.4	7.9			7.6	7.7	7.8			163	164	187		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
22.0	A	}	8	8	8			8.2	8.4	7.9			7.5	7.6	7.4			207	208	227		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal			RC/EB/EB					RC/EB/EB					RC/EB/EB									

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

Project# X5713

Test started: Date 4/10/15 Time 1655

Client El Dorado Chemical

Test ended: Date 4/12/15 Time 1630

Sample Description 006

Test Species P. promelas ID# BAL/040415

Technician: Ohour RC 24hour EB 48hour EB 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Time: Ohour 1655 24hour 0730 48hour 1630 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): Ohour 24.3 24hour 24.5 48hour 24.0 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
32.0	A	N/A	8	8	8			8.2	8.0	7.7			7.4	7.5	7.4			227	239	244		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
45.0	A		8	8	8			8.2	8.2	7.6			7.4	7.6	7.4			253	259	271		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal			RC <u>EB</u>					RC <u>EB</u>					RC <u>EB</u>									

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

Project# X5713

Test started: Date 4/10/15 Time 1655

Client El Dorado Chemical

Test ended: Date 4/12/15 Time 1630

Sample Description 006 Test Species P. promelas ID# BAL/040415  
 Technician: Ohour RC 24hour EB 48hour EB 72hour \_\_\_\_\_ 96hour \_\_\_\_\_  
 Time: Ohour 1655 24hour 0930 48hour 1630 72hour \_\_\_\_\_ 96hour \_\_\_\_\_  
 Temperature (°C): Ohour 24.3 24hour 24.3 48hour 24.0 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0.10		N/A																				
56.0	A	S	8	8	8			8.1	<del>8.0</del> 7.6				7.4	<del>7.4</del> 7.3			276	<del>276</del> 270				
	B		8	8	8				<del>8.1</del> 7.6					<del>7.5</del> 7.3				<del>276</del> 270				
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
75.0	A	S	8	8	8			8.1	<del>7.9</del> 7.6				7.3	<del>7.4</del> 7.3			313	<del>313</del> 320				
	B		8	8	8				<del>8.1</del> 7.6					<del>7.4</del> 7.3				<del>313</del> 320				
	C		8	8	8				<del>8.1</del> 7.6					<del>7.4</del> 7.3				<del>313</del> 320				
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal			RC <del>EB</del> EB					RC <del>EB</del> EB					RC <del>EB</del> EB									

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

Project# X5713  
 Client El Dorado Chemical

Test started: Date 4/10/15 Time 1655  
 Test ended: Date 4/12/15 Time 1630

Sample Description 006 Test Species P. promelas ID# BAL/040415  
 Technician: Ohour RC 24hour RC 48hour RC 72hour \_\_\_\_\_ 96hour \_\_\_\_\_  
 Time: Ohour 1655 24hour 0930 48hour 1630 72hour \_\_\_\_\_ 96hour \_\_\_\_\_  
 Temperature (°C): Ohour 24.3 24hour 24.3 48hour 24.0 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution %	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
100.0	A	N/A	8	8	8			7.9	7.9	7.3			7.3	7.4	7.2			365	365	365		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
<del>100</del>	<del>A</del>		<del>8</del>																			
	B		8																			
	C		8																			
	D		8																			
	E		8																			
Chemistry Tech prerenewal/postrenewal			RC <u>RC</u>					RC <u>RC</u>					RC <u>RC</u>									

**APPENDIX C**  
**STATISTICAL ANALYSES**

**Daphnid Acute Test-48 Hr Survival**

Start Date: 4/10/2015      Test ID: X5713DP      Sample ID: AR0000752006  
 End Date: 4/12/2015      Lab ID: ADEQ880630      Sample Type: EFF2-Industrial  
 Sample Date: 4/10/2015      Protocol: EPAAW02-EPA/821/R-02-01      Test Species: DP-Daphnia pulex

Comments:

Conc-%	1	2	3	4	5
D-Control	0.8750	1.0000	0.7500	1.0000	1.0000
22	1.0000	1.0000	1.0000	0.8750	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
45	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-%	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	1.0000	1.0811	1.3931	1.3931	1.3931	0.000	5	32.50 16.00	
45	1.0000	1.0811	1.3931	1.3931	1.3931	0.000	5	32.50 16.00	
56	1.0000	1.0811	1.3931	1.3931	1.3931	0.000	5	32.50 16.00	
75	1.0000	1.0811	1.3931	1.3931	1.3931	0.000	5	32.50 16.00	
100	1.0000	1.0811	1.3931	1.3931	1.3931	0.000	5	32.50 16.00	

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.65014	0.934	-1.9341	7.75955
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: 4/10/2015      Test ID: X5713PP      Sample ID: AR0000752006  
 End Date: 4/12/2015      Lab ID: ADEQ880630      Sample Type: EFF2-Industrial  
 Sample Date: 4/10/2015      Protocol: EPAAW02-EPA/821/R-02-01      Test Species: PP-Pimephales promelas

Comments:

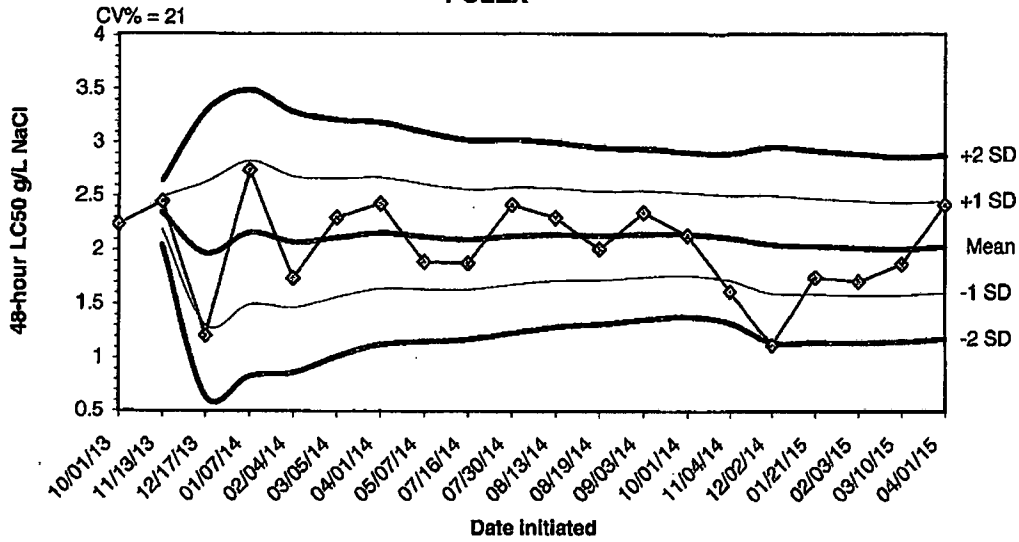
Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000
22	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
45	1.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	1.0000	1.0000	1.0000
75	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000	1.0000

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
45	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				
<b>Hypothesis Test (1-tail, 0.05)</b>	<b>NOEC</b>	<b>LOEC</b>	<b>ChV</b>	<b>TU</b>
Steel's Many-One Rank Test	100	>100		1
Treatments vs D-Control				

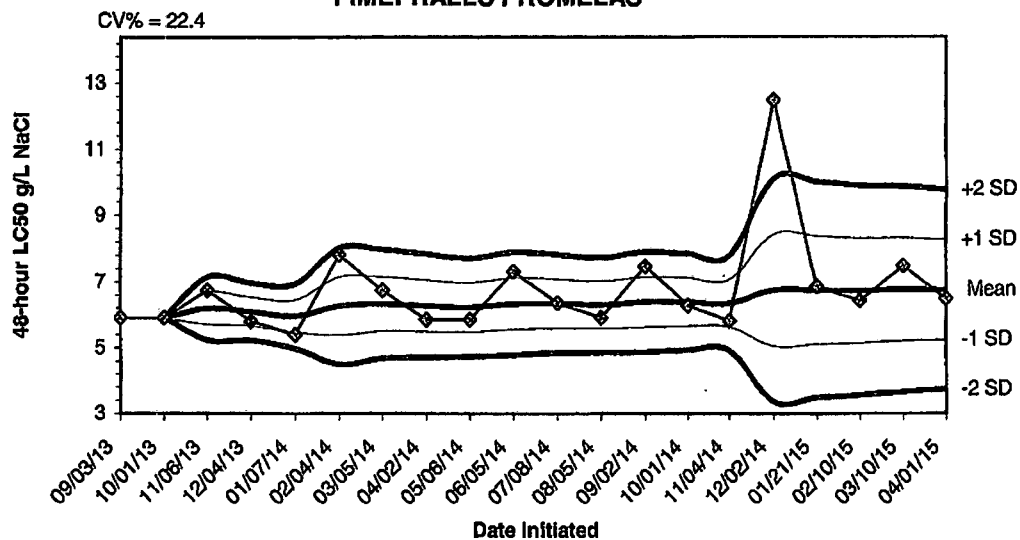
**APPENDIX D**  
**QUALITY ASSURANCE CHARTS**

**2015 ACUTE REFERENCE TOXICANT TEST RESULTS USING DAPHNIA  
PULEX**



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
10/01/13	2.2400					
11/13/13	2.4500	2.3450	2.1965	2.0480	2.4935	2.6420
12/17/13	1.2100	1.9667	1.3030	0.6394	2.6303	3.2940
01/07/14	2.7400	2.1600	1.4943	0.8286	2.8257	3.4914
02/04/14	1.7400	2.0760	1.4697	0.8634	2.6823	3.2886
03/05/14	2.3000	2.1133	1.5634	1.0134	2.6633	3.2133
04/01/14	2.4300	2.1586	1.6425	1.1263	2.6747	3.1908
05/07/14	1.8900	2.1250	1.6378	1.1506	2.6122	3.0994
07/16/14	1.8800	2.0978	1.6348	1.1718	2.5608	3.0237
07/30/14	2.4200	2.1300	1.6818	1.2335	2.5782	3.0265
08/13/14	2.3000	2.1455	1.7171	1.2888	2.5738	3.0021
08/19/14	2.0100	2.1342	1.7239	1.3137	2.5444	2.9547
09/03/14	2.3500	2.1508	1.7535	1.3561	2.5481	2.9454
10/01/14	2.1400	2.1500	1.7683	1.3865	2.5317	2.9135
11/04/14	1.6200	2.1147	1.7222	1.3297	2.5071	2.8996
12/02/14	1.1200	2.0525	1.5991	1.1456	2.5059	2.9594
01/21/15	1.7500	2.0347	1.5896	1.1444	2.4798	2.9250
02/03/15	1.7100	2.0167	1.5781	1.1395	2.4552	2.8938
03/10/15	1.8700	2.0089	1.5814	1.1539	2.4365	2.8640
04/01/15	2.4200	2.0295	1.6033	1.1772	2.4557	2.8818

**2015 ACUTE REFERENCE TOXICANT TEST RESULTS USING  
PIMEPHALES PROMELAS**



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
09/03/13	5.9200					
10/01/13	5.9200	5.9200	5.9200	5.9200	5.9200	5.9200
11/06/13	6.7500	6.1967	5.7175	5.2383	6.6759	7.1551
12/04/13	5.8100	6.1000	5.6636	5.2272	6.5364	6.9728
01/07/14	5.4000	5.9600	5.4692	4.9785	6.4508	6.9415
02/04/14	7.8200	6.2700	5.3929	4.5158	7.1471	8.0242
03/05/14	6.7500	6.3386	5.5176	4.6966	7.1595	7.9805
04/02/14	5.8600	6.2788	5.5001	4.7214	7.0574	7.8361
05/06/14	5.8600	6.2322	5.4906	4.7490	6.9739	7.7155
06/05/14	7.3100	6.3400	5.5621	4.7843	7.1179	7.8957
07/08/14	6.3700	6.3427	5.6047	4.8687	7.0807	7.8187
08/05/14	5.9200	6.3075	5.5933	4.8792	7.0217	7.7358
09/02/14	7.4800	6.3977	5.6405	4.8834	7.1548	7.9120
10/01/14	6.2800	6.3893	5.6612	4.9330	7.1174	7.8455
11/04/14	5.8100	6.3507	5.6333	4.9159	7.0681	7.7855
12/02/14	12.5000	6.7350	5.0487	3.3623	8.4213	10.1077
01/21/15	6.8500	6.7418	5.1087	3.4757	8.3748	10.0078
02/10/15	6.4200	6.7239	5.1378	3.5517	8.3100	9.8961
03/10/15	7.4800	6.7637	5.2126	3.6614	8.3148	9.8659
04/01/15	6.4800	6.7495	5.2384	3.7273	8.2606	9.7717

**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: 4/09/15      To: 4/09/15  
From:      To:

Test Initiated: 4/10/15

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	100.0	100.0	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	100.0	100.0	100.0	100.0	100.0
48-hour	A	87.5	100.0	100.0	100.0	100.0	100.0	100.0
	B	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	C	75.0	100.0	100.0	100.0	100.0	100.0	100.0
	D	100.0	87.5	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
	Mean	92.5	97.5	100.0	100.0	100.0	100.0	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<sub>50</sub> below:

LC<sub>50</sub> =      N/A % effluent

95 % confidence limits:

Method of LC<sub>50</sub> 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: David Sartain

Analyst: Briggs, Callahan, Rose

Sample Collected From: Date 4/09/15 Time 1800

To: Date 4/09/15 Time 2400

Test Begin Date 4/10/15 Time 1600

Test End Date 4/12/15 Time 1615

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	8.3	24.3	24.3	24.0	28.0				40.0			7.6	7.7	7.9
22.0	8.2	8.4	8.3	24.3	24.3	24.0								7.5	7.6	7.7
32.0	8.2	8.0	8.2	24.3	24.3	24.0								7.4	7.4	7.7
45.0	8.2	8.2	8.1	24.3	24.3	24.0								7.4	7.5	7.6
56.0	8.1	8.1	8.1	24.3	24.3	24.0								7.4	7.5	7.5
75.0	8.1	8.1	8.0	24.3	24.3	24.0								7.3	7.6	7.5
100.0	7.9	8.2	8.0	24.3	24.3	24.0	32.0				92.0			7.3	7.4	7.4

\*This Form is to be submitted with each DMR.

Alkalinity and hardness to be reported as mg/l CaCO<sub>3</sub>

**Acute Forms**  
**Pimephales promelas Survival**

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

Composite Collected      From: 4/09/15      To: 4/09/15  
From:      To:

Test Initiated: 4/10/15

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	100.0	100.0	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	100.0	100.0	100.0	100.0	100.0
48-hour	A	100.0	100.0	100.0	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	100.0	100.0	100.0	100.0	100.0
	Mean	100.0	100.0	100.0	100.0	100.0	100.0	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<sub>50</sub> below:

LC<sub>50</sub> =      N/A % effluent

95 % confidence limits:

Method of LC<sub>50</sub> 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: David Sartain

Analyst: Briggs, Callahan, Rose

Sample Collected From: Date 4/09/15 Time 1800

To: Date 4/09/15 Time 2400

Test Begin Date 4/10/15 Time 1655

Test End Date 4/12/15 Time 1630

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	24.3	24.3	24.0	28.0			40.0			7.6	7.7	7.8
22.0		8.2	8.4	7.9	24.3	24.3	24.0							7.5	7.6	7.4
32.0		8.2	8.0	7.7	24.3	24.3	24.0							7.4	7.4	7.4
45.0		8.2	8.2	7.6	24.3	24.3	24.0							7.4	7.5	7.4
56.0		8.1	8.1	7.6	24.3	24.3	24.0							7.4	7.5	7.3
75.0		8.1	8.1	7.6	24.3	24.3	24.0							7.3	7.6	7.3
100.0		7.9	8.2	7.3	24.3	24.3	24.0	32.0			92.0			7.3	7.4	7.2

\*This Form is to be submitted with each DMR.

Alkalinity and hardness to be reported as mg/l CaCO<sub>3</sub>

**APPENDIX F**  
**REPORT QUALITY ASSURANCE FORM**



## Bio-Analytical Laboratories

3240 Spurgin Road  
Post Office Box 527  
Doyline, LA 71023

(318) 746-2772  
1-800-268-1246  
Fax: (318) 746-2773

### REPORT QUALITY ASSURANCE FORM

Client: Eldorado Chemical 006

Project#: X5713

Chain of Custody Documents Checked by: EGB/4-20-15  
Technician/Date

Raw Data Documents Checked by: EGB/4-20-15  
Technician/Date

Statistical Analysis Package Checked by: EGB/4-16-15  
Quality Manager/Date

Quality Control Data Checked by: EGB/4-16-15  
Quality Manager/Date

Report Checked by: EGB/4-20-15  
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 L. Baupp, BS 4-20-15  
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.

Bio-Analytical Laboratories (BAL)  
ADEQ#88-0630  
Project X5714

### Bio-Analytical Laboratories' Executive Summary

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

**Project #:** X5714

**Outfall:** Outfall 007 (contaminated storm water)

**Permit #:** AR0000752/ AFIN #70-00040

**Contact:** Mr. David Sartain

**Test Dates:** April 10 - 12, 2015

**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 - 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

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**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 X5714**

**Test Dates: April 10 - 12, 2015  
Report Date: April 16, 2015**

**Prepared for:**  
Mr. David Sartain  
El Dorado Chemical Company  
P.O. Box 231  
El Dorado, AR 71731

**Prepared by:**  
Ginger Briggs  
Bio-Analytical Laboratories  
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Doyline, LA 71023  
ADEQ #88-0630

BAL  
ADEQ #88-0630  
Project X5714

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BAL  
ADEQ #88-0630  
Project X5714

## 1.0 Introduction

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

## 2.0 Methods and Materials

### 2.1 Test Methods

All methods followed were according to the latest edition of "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms" (EPA-821-R-02-012), "Standard Methods for The Examination of Water and Wastewater. 20<sup>th</sup> 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 at test temperature and were approximately six days old at test initiation. The minnows were acclimated to dilution water hardness prior to test initiation. 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.

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Project X5714

### 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 tests were conducted using five replicates of eight animals each for a total of 40 animals per concentration.

### 2.5 Sample Collection

One sample of Outfall 007 was collected by El Dorado Chemical personnel on April 10, 2015. Upon completion of collection, the sample was packed in ice and delivered to the laboratory by BAL personnel. The temperature upon arrival was 0.9° 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  $25 \pm 1^{\circ}$  Celsius. The total residual chlorine level (SM4500-Cl D 1997) was measured with a Capital Controls<sup>R</sup> amperometric titrator and recorded if present. The total ammonia level was measured using a HACH<sup>R</sup> test strip. An aliquot of the sample was adjusted from an initial pH of 3.9 to a pH range of 6.0-9.0. An extra 100.0 percent dilution was added to each test in order to document any lethality due to low pH. Dissolved oxygen (SM4500-O G 1997), pH (SM4500-H+ B 1997) and conductivity (SM2510-B 1997) measurements 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 on the control and the highest effluent concentration.

### 2.7 Monitoring of the Tests

The tests were run in a Precision<sup>R</sup> dual controlled illuminated incubator at a temperature of  $25 \pm 1^{\circ}$  Celsius. An AEMC<sup>R</sup> data logger was used to monitor diurnal temperature throughout the testing period. Light cycle and intensity were recorded twice a month.



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## 2.8 Data Analysis

The NOEC and LC<sub>50</sub> 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 neither tests after 48 hours of exposure (p=.05). The NOEC for survival for the *Daphnia pulex* and the fathead minnow test was 100.0 percent effluent (p=.05). The 48 hour LC<sub>50</sub> values for the *Daphnia pulex* and the fathead minnow test could not be determined because greater than 50.0 percent survival occurred in the 100.0 percent effluent dilution.

**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	92.5
32.0	100.0	95.0
45.0	100.0	92.5
50.0	100.0	92.5
56.0	100.0	95.0
75.0	100.0	92.5
100.0	100.0	92.5

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.

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Project X5714

#### 4.0 Conclusions

The sample of Outfall 007 collected from El Dorado Chemical Company, El Dorado, Arkansas, on April 10, 2015, 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 ( $p=.05$ ).

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### 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. 20<sup>th</sup> Edition.

**APPENDIX A**  
**CHAIN-OF-CUSTODY DOCUMENTS**



**Bio-Analytical Laboratories**

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

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Laboratory Use Only:

<b>Company:</b> El Dorado Chemical Company		<b>Phone:</b> (870) 863-1484		<b>Analysis:</b>						<b>Project Number:</b> X5714	
<b>Address:</b> 4500 Norwest Ave., El Dorado, AR 71731		<b>Fax:</b> (870) 863-7499		Chronic Ceriodaphnia	Chronic minnow	Acute minnow (fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	Fecal Coliform	temperature upon arrival: <b>Thermometer #: 29</b> <b>Tech: RC</b> <b>Date: 4/10/15</b> Preservative: (below) <b>Ice</b>
<b>Permit #:</b> AR0000752/AFIN 70-00040		<b>Purchase Order:</b>									
<b>Sampler's Signature/Printed Name/Affiliation:</b> <i>Edward L Pearson / Edward L Pearson / EDCC</i>											
<b>Date Start</b>	<b>Time Start</b>	<b>C</b>	<b>G</b>	<b># and type of container</b>	<b>Sample Identification</b>						<b>Lab Control Number:</b>
4-9-15	1830			6 half gallons	007			X	X		C10761
4-10-15	0030	X									
<b>Relinquished by/Affiliation:</b> <i>Edward L Pearson</i>				<b>Date:</b> 4/10/15	<b>Time:</b> 0946 0900	<b>Received by/Affiliation:</b> <i>Erin S. Bragg</i>				<b>Date:</b> 4/10/15	<b>Time:</b> 0946
<b>Relinquished by/Affiliation:</b> <i>Erin S. Bragg</i>				<b>Date:</b> 4/10/15	<b>Time:</b> 1145	<b>Received by/Affiliation:</b> <i>R. Calisher</i>				<b>Date:</b> 4/10/15	<b>Time:</b> 1145
<b>Relinquished by/Affiliation:</b>				<b>Date:</b>	<b>Time:</b>	<b>Received by/Affiliation:</b>				<b>Date:</b>	<b>Time:</b>
<b>Method of Shipment:</b> <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 <b>Tracking #</b> _____											
<b>Comments:</b>											
COC Rev. 3.0											

RC 4/10/15  
Temp upon arrival: 6.9°C

**APPENDIX B  
RAW DATA SHEETS**

BIO-ANALYTICAL LABORATORIES  
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X5714

Client: EDCC/El Dorado Chemical Company

Address: 4500 Northwest Ave El Dorado AR 71731

NPDES# AR0000752 Outfall 007

Technicians: EGB/RC/CR

Test initiated: Date 4/10/15 Time 1620

Test terminated: Date 4/12/15 Time 1640

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
C10761	8.7/101.97	4/10/15 2.1/98.2	2.0	NO	3.0	N/A	412.0	48.0	EGB
	8.0/100.0	No/EGB	1	1	1	1	↓	↓	EGB

Dilution Water Information

Dilution Water	ID#	Initial D.O (mg/L & %)	Aerate? Minutes/D.O (mg/L & %)	Total Residual Chlorine (mg/L)	Ammonia (NH3) mg/L	pH	Hardness	Alkalinity	Tech
Soft H2O	3714	N/A	N/A	N/A	N/A	73	400	28.0	EGB

Test Species Information

Test Species Info.	Species: ID#	Species: ID#	Species: ID#	Species: ID#
Age	D. pulex RAL/L19-M19	P. promelas B ALV40415		
Test Container Size	< 24 hrs	← 6d ~ 6 days	EGB	4/10/15
Test volume	30 ml	300 ml		
Feeding: Type	20 ml	200 ml		
Amount	2 hrs	→		
Aeration?	Prior to test initiation			
Amount	N/A	N/A		
Condition of survivors	1	1		
	good	good	EGB	4/12/15

Comments:

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

Project# X5714  
 Client EI Dorado Chemical

Test started: Date 4/10/15 Time 1620  
 Test ended: Date 4/12/15 Time 1620

Sample Description 007 Test Species D. pulex ID# BAL/L19-M19  
 Technician: 0hour RC 24hour RC 48hour RC 72hour \_\_\_\_\_ 96hour \_\_\_\_\_  
 Time: 0hour 1620 24hour 0915 48hour 1100 72hour \_\_\_\_\_ 96hour \_\_\_\_\_  
 Temperature (°C): 0hour 24.3 24hour 24.3 48hour 24.6 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0.0		N/A																				
0.0 soft	A	}	8	8	8			8.3	8.3	8.2			7.6	7.7	7.9			167.1	167.1	167.1		
	B		8	8	6																	
	C		8	8	8																	
	D		8	7	7																	
	E		8	8	8																	
32.0	A	}	8	8	8			8.2	8.2	8.2			7.4	7.6	7.7			500	515	576		
	B		8	8	8																	
	C		8	7	7																	
	D		8	7	7																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal			RC <u>RC</u>					RC <u>RC</u>					RC <u>RC</u>									



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

Project# X5714  
 Client EI Dorado Chemical

Test started: Date 4/10/15 Time 1620  
 Test ended: Date 4/12/15 Time 1620

Sample Description 307 Test Species D. pulex ID# BAL/N19-M9  
 Technician: Ohour RC 24hour EB 48hour EB 72hour \_\_\_\_\_ 96hour \_\_\_\_\_  
 Time: Ohour 1620 24hour 0915 48hour 1020 72hour \_\_\_\_\_ 96hour \_\_\_\_\_  
 Temperature (°C): Ohour 24.3 24hour 24.3 48hour 24.0 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
40		N/A																				
45.0	A	}	8	8	8			8.2	8.2	8.1			7.4	7.4	7.7			604	601	600	676	
	B		8	8	8																	
	C		8	7	7																	
	D		8	7	7																	
	E		8	7	7																	
50.0	A	}	8	8	8			8.2	8.2	8.1			7.4	7.4	7.7			644	600	600	679	
	B		8	7	7																	
	C		8	7	7																	
	D		8	7	7																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal			RC <u>EB</u>					RC <u>EB</u>					RC <u>EB</u>									

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

Project# X5714  
 Client EI Dorado Chemical

Test started: Date 4/10/15 Time 1620  
 Test ended: Date 4/12/15 Time 1620

Sample Description 007 Test Species D. pulex ID# BAL/L19-M19  
 Technician: Ohour RC 24hour EB 48hour EB 72hour \_\_\_\_\_ 96hour \_\_\_\_\_  
 Time: Ohour 1620 24hour 0915 48hour 1620 72hour \_\_\_\_\_ 96hour \_\_\_\_\_  
 Temperature (°C): Ohour 24.3 24hour 24.3 48hour 24.0 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0/0		N/A																				
56.0	A	}	8	8	8			8.1	<del>8.1</del>	8.1			7.4	<del>7.5</del>	7.7			695	<del>701</del>	700	745	
	B		8	6	6																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
75.0	A	}	8	8	8			8.1	<del>8.1</del>	8.1			7.4	<del>7.5</del>	7.7			867	<del>869</del>	868	904	
	B		8	7	7																	
	C		8	7	7																	
	D		8	7	7																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal			RC <del>EB</del>					RC <del>EB</del>					RC <del>EB</del>									

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

Project# X5714  
 Client EI Dorado Chemical

Test started: Date 4/10/15 Time 1620  
 Test ended: Date 4/12/15 Time 1620  
 Test Species D. pulex ID# 13AL/L19-N19

Sample Description 307  
 Technician: Ohour RC 24hour EB 48hour EB 72hour \_\_\_\_\_ 96hour \_\_\_\_\_  
 Time: Ohour 1620 24hour 0115 48hour 1120 72hour \_\_\_\_\_ 96hour \_\_\_\_\_  
 Temperature (°C): Ohour 24.3 24hour 24.3 48hour 24.0 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0%		N/A																				
100.0	A	}	8	8	8			8.0	8.2	8.1			7.3	7.3	7.7			1081	1080	1092		
	B		8	8	8																	
	C		8	7	7																	
	D		8	7	7																	
	E		8	7	7																	
100.0	A	}	8	8																		
	B		8																			
	C		8		EB	N/A																
	D		8																			
	E		8																			
Chemistry Tech prerenewal/postrenewal								RC	EB	EB			RC	EB	EB			RC	EB	EB		

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

Project# X5714

Test started: Date 4/10/15 Time 1715

Client EI Dorado Chemical

Test ended: Date 4/12/15 Time 1640

Sample Description 007

Test Species P. promelas ID# BAL04015

Technician: Ohour CK 24hour EB 48hour EB 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Time: Ohour 1715 24hour 0945 48hour 1640 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): Ohour 24.3 24hour 24.3 48hour 24.0 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
9/10		N/A																				
0 soft	A	}	8	8	8			8.3	8.0/8.3	7.9			7.6	7.8/7.7	7.6			167.1	168.9/167.0	194.7		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
32.0	A	}	8	8	8			6.2	8.0/6.2	7.5			7.4	7.1/7.5	7.5			500	551/550	528		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal			RC <u>EB</u>					RC <u>EB</u>					RC <u>EB</u>									

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

Project# X5714  
 Client El Dorado Chemical

Test started: Date 4/10/15 Time 1715  
 Test ended: Date 4/12/15 Time 1640  
 Test Species P. promelas ID# BAL04015

Sample Description 007  
 Technician: Ohour CR 24hour EAB 48hour EAB 72hour \_\_\_\_\_ 96hour \_\_\_\_\_  
 Time: Ohour 1715 24hour 0945 48hour 1640 72hour \_\_\_\_\_ 96hour \_\_\_\_\_  
 Temperature (°C): Ohour 24.3 24hour 24.3 48hour 24.0 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
90		N/A																				
45.0	A	}	8	8	8			8.2	8.2	7.3			7.4	7.5	7.4			604	600	609		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
50.0	A	}	8	8	8			8.2	8.2	7.4			7.4	7.5	7.4			644	600	670		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal			RC <u>EAB</u>					RC <u>EAB</u>					RC <u>EAB</u>									

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

Project# X5714  
 Client EI Dorado Chemical  
 Sample Description 007  
 Technician: CR 24hour EB 48hour EB  
 Time: 1715 24hour 0945 48hour 1640  
 Temperature (°C): 24.3 24hour 24.3 48hour 24.0

Test started: Date 4/10/15 Time 1715  
 Test ended: Date 4/12/15 Time 1640  
 Test Species P. promelas ID# BAL010415

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
810		N/A																				
56.0	A	}	8	8	8			8.1	8.0	7.9			7.4	7.3	7.4			695	701	700	731	
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
75.0	A	}	8	8	8			8.1	8.0	7.5			7.4	7.3	7.4			867	858	858	904	
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal			RC <u>EB</u>					RC <u>EB</u>					RC <u>EB</u>									

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

Project# X5714

Test started: Date 4/10/15 Time 1715

Client El Dorado Chemical

Test ended: Date 4/12/15 Time 1640

Sample Description 007

Test Species P. promelas ID# DAL4045

Technician: Ohour CR 24hour EB 48hour EB 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Time: Ohour 1715 24hour 0945 48hour 1640 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): Ohour 24.3 24hour 24.3 48hour 24.0 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0/0		N/A																				
100.0	A	}	8	8				8.0	8.0	7.4			7.3	7.2	7.4		1081	1100	1115			
	B		8	8																		
	C		8	8																		
	D		8	8																		
	E		8	8																		
<del>100.0</del>	<del>A</del>	}	<del>8</del>																			
	<del>B</del>		<del>8</del>																			
	<del>C</del>		<del>8</del>																			
	<del>D</del>		<del>8</del>																			
	<del>E</del>		<del>8</del>																			
Chemistry Tech prerenewal/postrenewal			RC <del>EB</del> <del>EB</del>					RC <del>EB</del> <del>EB</del>					RC <del>EB</del> <del>EB</del>									

**APPENDIX C**  
**STATISTICAL ANALYSES**



**Daphnid Acute Test-48 Hr Survival**

Start Date: 4/10/2015 Test ID: X5714DP Sample ID: AR0000752007  
 End Date: 4/12/2015 Lab ID: ADEQ880630 Sample Type: EFF2-Industrial  
 Sample Date: 4/10/2015 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: DP-Daphnia pulex  
 Comments:

Conc-%	1	2	3	4	5
D-Control	1.0000	0.7500	1.0000	0.8750	1.0000
32	1.0000	1.0000	0.8750	0.8750	1.0000
45	1.0000	1.0000	0.8750	0.8750	0.8750
50	1.0000	0.8750	0.8750	0.8750	1.0000
56	1.0000	0.7500	1.0000	1.0000	1.0000
75	1.0000	0.8750	0.8750	0.8750	1.0000
100	1.0000	1.0000	0.8750	0.8750	0.8750

Conc-%	Transform: Arcsin Square Root							Rank	1-Tailed
	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	0.9250	1.0000	1.2872	1.0472	1.3931	12.116	5		
32	0.9500	1.0270	1.3196	1.2094	1.3931	7.623	5	28.50	16.00
45	0.9250	1.0000	1.2829	1.2094	1.3931	7.841	5	26.50	16.00
50	0.9250	1.0000	1.2829	1.2094	1.3931	7.841	5	26.50	16.00
56	0.9500	1.0270	1.3239	1.0472	1.3931	11.684	5	29.50	16.00
75	0.9250	1.0000	1.2829	1.2094	1.3931	7.841	5	26.50	16.00
100	0.9250	1.0000	1.2829	1.2094	1.3931	7.841	5	26.50	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution ( $p \leq 0.05$ )	0.81461	0.934	-0.65	-0.2746
Bartlett's Test indicates equal variances ( $p = 0.90$ )	2.17295	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: 4/10/2015 Test ID: X5714PP Sample ID: AR0000752007  
 End Date: 4/12/2015 Lab ID: ADEQ880630 Sample Type: EFF2-Industrial  
 Sample Date: 4/10/2015 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: PP-Pimephales promelas  
 Comments:

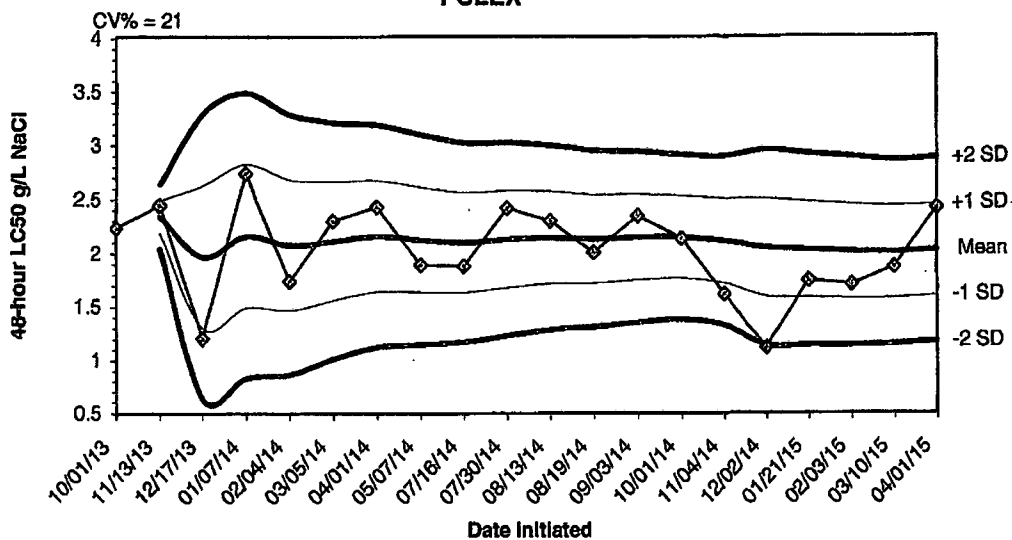
Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
45	1.0000	1.0000	1.0000	1.0000	1.0000
50	1.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	1.0000	1.0000	1.0000
75	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000	1.0000

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root				CV%	N	Rank Sum	1-Tailed Critical
			Mean	Min	Max					
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	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	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	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				
<b>Hypothesis Test (1-tail, 0.05)</b>	<b>NOEC</b>	<b>LOEC</b>	<b>ChV</b>	<b>TU</b>
Steel's Many-One Rank Test	100	>100		1
Treatments vs D-Control				

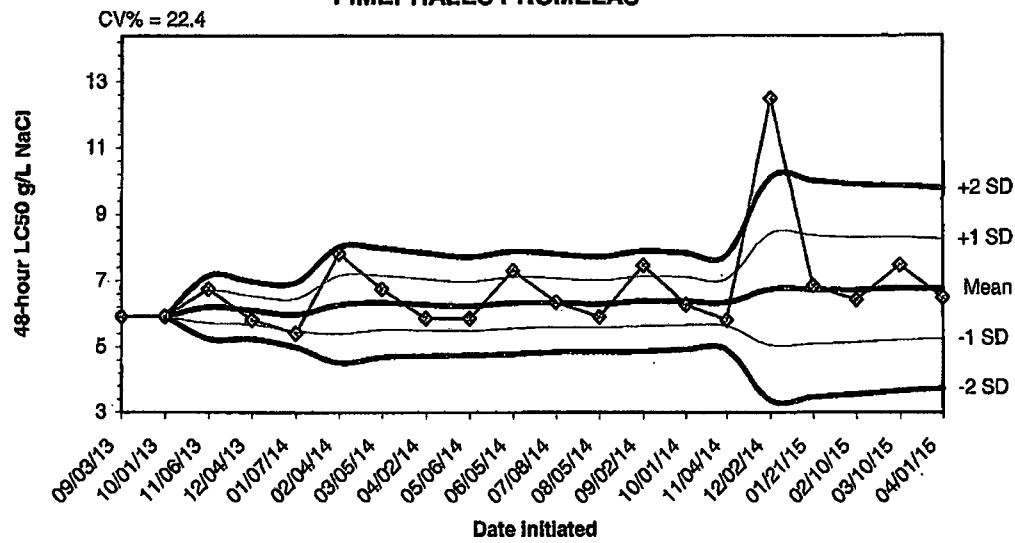
**APPENDIX D**  
**QUALITY ASSURANCE CHARTS**

2015 ACUTE REFERENCE TOXICANT TEST RESULTS USING DAPHNIA  
PULEX



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
10/01/13	2.2400					
11/13/13	2.4500	2.3450	2.1965	2.0480	2.4935	2.6420
12/17/13	1.2100	1.9667	1.3030	0.6394	2.6303	3.2940
01/07/14	2.7400	2.1600	1.4943	0.8286	2.8257	3.4914
02/04/14	1.7400	2.0760	1.4697	0.8634	2.6823	3.2886
03/05/14	2.3000	2.1133	1.5634	1.0134	2.6633	3.2133
04/01/14	2.4300	2.1586	1.6425	1.1263	2.6747	3.1908
05/07/14	1.8900	2.1250	1.6378	1.1506	2.6122	3.0994
07/16/14	1.8800	2.0978	1.6348	1.1718	2.5608	3.0237
07/30/14	2.4200	2.1300	1.6818	1.2335	2.5782	3.0265
08/13/14	2.3000	2.1455	1.7171	1.2888	2.5738	3.0021
08/19/14	2.0100	2.1342	1.7239	1.3137	2.5444	2.9547
09/03/14	2.3500	2.1508	1.7535	1.3561	2.5481	2.9454
10/01/14	2.1400	2.1500	1.7683	1.3865	2.5317	2.9135
11/04/14	1.6200	2.1147	1.7222	1.3297	2.5071	2.8996
12/02/14	1.1200	2.0525	1.5991	1.1456	2.5059	2.9594
01/21/15	1.7500	2.0347	1.5896	1.1444	2.4798	2.9250
02/03/15	1.7100	2.0167	1.5781	1.1395	2.4552	2.8938
03/10/15	1.8700	2.0089	1.5814	1.1539	2.4365	2.8640
04/01/15	2.4200	2.0295	1.6033	1.1772	2.4557	2.8818

**2015 ACUTE REFERENCE TOXICANT TEST RESULTS USING  
PIMEPHALES PROMELAS**



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
09/03/13	5.9200					
10/01/13	5.9200	5.9200	5.9200	5.9200	5.9200	5.9200
11/06/13	6.7500	6.1967	5.7175	5.2383	6.6759	7.1551
12/04/13	5.8100	6.1000	5.6636	5.2272	6.5364	6.9728
01/07/14	5.4000	5.9600	5.4692	4.9785	6.4508	6.9415
02/04/14	7.8200	6.2700	5.3929	4.5158	7.1471	8.0242
03/05/14	6.7500	6.3386	5.5176	4.6966	7.1595	7.9805
04/02/14	5.8600	6.2788	5.5001	4.7214	7.0574	7.8361
05/06/14	5.8600	6.2322	5.4906	4.7490	6.9739	7.7155
06/05/14	7.3100	6.3400	5.5621	4.7843	7.1179	7.8957
07/08/14	6.3700	6.3427	5.6047	4.8667	7.0807	7.8187
08/05/14	5.9200	6.3075	5.5933	4.8792	7.0217	7.7358
09/02/14	7.4800	6.3977	5.6405	4.8834	7.1548	7.9120
10/01/14	6.2800	6.3893	5.6612	4.9330	7.1174	7.8455
11/04/14	5.8100	6.3507	5.6333	4.9159	7.0681	7.7855
12/02/14	12.5000	6.7350	5.0487	3.3623	8.4213	10.1077
01/21/15	6.8500	6.7418	5.1087	3.4757	8.3748	10.0078
02/10/15	6.4200	6.7239	5.1378	3.5517	8.3100	9.8961
03/10/15	7.4800	6.7637	5.2126	3.6614	8.3148	9.8659
04/01/15	6.4800	6.7495	5.2384	3.7273	8.2606	9.7717

**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: 4/09/15**

**To: 4/10/15**

**From:**

**To:**

**Test Initiated: 4/10/15**

**Dilution Water Used:**

**Receiving Water**

**X 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	100.0	100.0	100.0	100.0
	B	100.0	100.0	100.0	87.5	75.0	87.5	100.0
	C	100.0	87.5	87.5	87.5	100.0	87.5	87.5
	D	87.5	87.5	87.5	87.5	100.0	87.5	87.5
	E	100.0	100.0	87.5	100.0	100.0	100.0	87.5
48-hour	A	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	B	75.0	100.0	100.0	87.5	75.0	87.5	100.0
	C	100.0	87.5	87.5	87.5	100.0	87.5	87.5
	D	87.5	87.5	87.5	87.5	100.0	87.5	87.5
	E	100.0	100.0	87.5	100.0	100.0	100.0	87.5
	Mean	92.5	95.0	92.5	92.5	95.0	92.5	92.5

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

- a.) **LOW FLOW OR CRITICAL DILUTION (100.0%)**      YES      X NO  
b.) **1/2 LOW FLOW OR 2X CRITICAL DILUTION (N/A %)**      YES      NO

**2. Enter percent effluent corresponding to the LC<sub>50</sub> below:**

LC<sub>50</sub> =      % effluent

**95 % confidence limits: %**

**Method of LC<sub>50</sub> 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: David Sartain**

**Analyst: Briggs, Callahan, Rose**

**Sample Collected From: Date 4/09/15 Time 1830**

**To: Date 4/10/15 Time 0030**

**Test Begin Date 4/10/15 Time 1620**

**Test End Date 4/12/15 Time 1620**

Parameter	D.O			Temperature			Alkalinity			Hardness			pH			
	Dilut./Time	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs
0		8.3	8.3	8.2	24.3	24.3	24.0	28.0			40.0			7.6	7.7	7.9
32.0		8.2	8.2	8.2	24.3	24.3	24.0							7.4	7.5	7.7
45.0		8.2	8.2	8.1	24.3	24.3	24.0							7.4	7.4	7.7
50.0		8.2	8.2	8.1	24.3	24.3	24.0							7.4	7.4	7.7
56.0		8.1	8.1	8.1	24.3	24.3	24.0							7.4	7.3	7.7
75.0		8.1	8.0	8.1	24.3	24.3	24.0							7.4	7.3	7.7
100.0		8.0	8.0	8.1	24.3	24.3	24.0	48.0			412.0			7.3	7.2	7.7

\*This Form is to be submitted with each DMR.

Alkalinity and hardness to be reported as mg/l CaCO<sub>3</sub>



**Acute Forms**  
**Pimephales promelas Survival**

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

Composite Collected      From: 4/09/15      To: 4/10/15  
From:      To:

Test Initiated: 4/10/15

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	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	100.0	100.0	100.0	100.0	100.0
48-hour	A	100.0	100.0	100.0	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	100.0	100.0	100.0	100.0	100.0
	Mean	100.0	100.0	100.0	100.0	100.0	100.0	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:

$LC_{50}$  =      % effluent

95 % confidence limits: %

Method of  $LC_{50}$  calculation:

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

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

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

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

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

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

Contact: David Sartain  
Analyst: Briggs, Callahan, Rose  
Sample Collected

From: Date 4/09/15 Time 1830  
To: Date 4/10/15 Time 0030  
Date 4/10/15 Time 1715  
Date 4/12/15 Time 1640

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		8.3	8.3	7.9	24.3	24.3	24.0	28.0			40.0			7.6	7.7	7.6
32.0		8.2	8.2	7.5	24.3	24.3	24.0							7.4	7.5	7.5
45.0		8.2	8.2	7.3	24.3	24.3	24.0							7.4	7.4	7.4
50.0		8.2	8.2	7.4	24.3	24.3	24.0							7.4	7.4	7.4
56.0		8.1	8.1	7.5	24.3	24.3	24.0							7.4	7.3	7.4
75.0		8.1	8.0	7.5	24.3	24.3	24.0							7.4	7.3	7.4
100.0		8.0	8.0	7.4	24.3	24.3	24.0	48.0			412.0			7.3	7.2	7.4

\*This Form is to be submitted with each DMR.  
Alkalinity and hardness to be reported as mg/l CaCO<sub>3</sub>

**APPENDIX F**  
**REPORT QUALITY ASSURANCE FORM**



## Bio-Analytical Laboratories

3240 Spurgin Road  
Post Office Box 527  
Doyle, LA 71023

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

### REPORT QUALITY ASSURANCE FORM

Client: Eldorado Chemical 007

Project#: X5714

Chain of Custody Documents Checked by: ECB/4-20-15  
Technician/Date

Raw Data Documents Checked by: ECB/4-20-15  
Technician/Date

Statistical Analysis Package Checked by: ECB/4-16-15  
Quality Manager/Date

Quality Control Data Checked by: ECB/4-16-15  
Quality Manager/Date

Report Checked by: ECB/4-20-15  
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 L. Baugg, BS  
Quality Manager

4-20-15  
Date

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From: (870) 863-1400      Origin ID: ELDA  
 Eddie Pearson  
 ELDORADO CHEMICAL COMPANY  
 4500 NORTH WEST AVE  
 ELDORADO, AR 71730



Ship Date: 21MAY15  
 ActWgt: 1.5 LB  
 CAD: 5887030/INET3810

Delivery Address Bar Code



SHIP TO: (501) 682-0744      BILL SENDER  
**Water Enforcement Branch**  
**ADEQ - AR. DEPT. ENVIR. QUALITY**  
**5301 Northshore Drive**  
  
**NORTH LITTLE ROCK, AR 72118**

Ref #  
 Invoice #  
 PO #  
 Dept #

**FRI - 22 MAY 9:00A**  
**FIRST OVERNIGHT**

TRK# 7736 5849 0576

0201

**72118**  
 AR-US  
 LIT

**X1 LITA**



537.03/0918/EE40

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