

December 15, 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 November 30, 2015.

Enclosed you will find the Discharge Monitoring Reports ending November 30, 2015.

If you have any questions regarding this report, please contact David Sartain at (870) 863-1400.

Sincerely,

A handwritten signature in cursive script that reads "David Sartain".


David Sartain

Environmental Coordinator

Enclosures

# NON-COMPLIANCE REPORT

**Facility Name:** EI Dorado Chemical Company  
**Permit Number:** AR0000752                      **AFIN:** 70-00040  
**Month / Year:** Nov-15

Type of Violation	Permit Limit	Date of Violation	Cause of Violation	Corrective Action or Other Narrative
Outfall 006 / Lead Monthly Average (78 ug/L)	3.8 ug/L Monthly Average	11/7/2015	Unknown	EDCC has applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006 / Lead Daily Max. (78 ug/L)	7.62 ug/L Daily Max.	11/7/2015	Unknown	EDCC has applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006 TDS Monthly Average (450 mg/L)	291 mg/L Monthly Average	11/7/2015	Unknown	EDCC has applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006 TDS Daily Max (450 mg/L)	436.5 mg/L Monthly Average	11/7/2015	Unknown	EDCC has applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 007 / Lead Monthly Average (5.6 ug/L)	3.8 ug/L Daily Max.	11/7/2015	Unknown	EDCC has applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 007 / TDS Monthly Average (350 mg/L)	291 mg/L Monthly Average	11/7/2015	Unknown	EDCC has applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
I CERTIFY THAT UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM WITH THE INFORMATION SUBMITTED HEREIN; AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 U.S.C 1001 AND 33 U.S.C. 1319. (Penalties under these statutes may include fines up to \$10,000 and or maximum imprisonment of between 6 months and 5 years.)				 Signature / Date      12/23/15

Bio-Analytical Laboratories (BAL)  
ADEQ#88-0630  
Project X5882

### Bio-Analytical Laboratories' Executive Summary

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

**Project #:** X5882

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

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

**Contact:** Mr. Eddie Pearson

**Test Dates:** November 7 - 11, 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:**

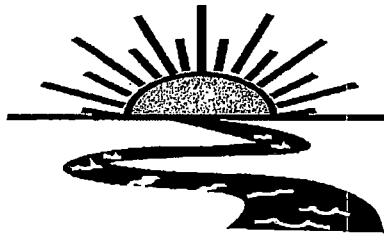
**For *Pimephales promelas*:**

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 - 6.06%.

**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- 1- **Fail**.
2. Report the NOEC for survival, Parameter TOM3D -0.0%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 30.20%.

**This report contains a total of 36 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 Spurgln 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 X5882**

**Test Dates: November 7 - 11, 2015  
Report Date: November 23, 2015**

**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 X5882

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BAL  
ADEQ #88-0630  
Project X5882

## 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.

The fathead minnow test was initiated within 36 hours after the first sample was composited and the *Daphnia pulex* test was initiated within 72 hours after the first sample was composited.

## 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 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.

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ADEQ #88-0630  
Project X5882

### **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**

Two samples of Outfall 007 were collected by El Dorado Chemical personnel on November 7 and 8, 2015, at 0430 and 0800 hours, respectively. Upon completion of collection, the sample was packed in ice and personally delivered to the laboratory. The temperature upon arrival was  $-0.3$  and  $0.3^{\circ}$  Celsius, respectively.

### **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. 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.

### **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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Project X5882

### 3.0 Results and Discussion

The results of the tests can be found in Table 1. Significant differences in survival were not noted in the critical dilution in the minnow test, but were noted in the *Daphnia pulex* test after 48 hours of exposure (p=.05). The NOEC value for the fathead and *Daphnia pulex* test was 100.0 and zero percent effluent, respectively (p=.05). The 48-hour LC<sub>50</sub> value for the fathead minnow test could not be calculated in either test because greater than 50.0 percent survival occurred in each effluent concentration. The 48-hour LC<sub>50</sub> value for the *Daphnia pulex* was 0.454 percent effluent. 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	97.5	100.0
32.0	97.5	32.5
45.0	100.0	30.0
50.0	97.5	37.5
56.0	100.0	22.5
75.0	100.0	32.5
100.0	97.5	27.5

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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ADEQ #88-0630  
Project X5882

#### 4.0 Conclusions

The two samples of Outfall 007 collected from El Dorado Chemical Company, El Dorado, Arkansas, on November 7 and 8, 2015, were not found to be lethally toxic to the fathead minnow test organisms in the 100.0 percent critical dilution after 48 hours of exposure; however, lethal effects were noted in the *Daphnia pulex* test ( $p=.05$ ). The 48-hour  $LC_{50}$  value for the fathead minnow test could not be calculated because greater than 50.0 percent survival occurred in the effluent dilutions ( $p=.05$ ). The 48-hour  $LC_{50}$  value in the *Daphnia pulex* test was 0.454 percent effluent ( $p=.05$ ).

BAL  
ADEQ #88-0630  
Project X5882

### 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**

3240 Spurgin Road (318) 745-2772  
 Post Office Box 527 (318) 745-2773  
 Doyline, LA 71023 Fax: (318) 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> <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:10%; border: none;"></td> <td style="width:10%; border: none;"></td> <td style="width:10%; border: none;"></td> <td style="width:10%; border: none;"></td> <td style="width:10%; border: none;"></td> <td style="width:10%; border: none;"></td> <td style="width:10%; border: none;"></td> <td style="width:10%; border: none;"></td> </tr> <tr> <td style="border: none;">Chronic Ceriodaphnia</td> <td style="border: none;">Chronic minnow</td> <td style="border: none;">Acute minnow (fresh/marine)</td> <td style="border: none;">Acute Daphnia species</td> <td style="border: none;">Acute Mysid</td> <td style="border: none;">Acute Ceriodaphnia</td> <td style="border: none;">Fecal Coliform</td> <td style="border: none;"></td> </tr> </table>												Chronic Ceriodaphnia	Chronic minnow	Acute minnow (fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	Fecal Coliform		<b>Project Number:</b> X5882	
Chronic Ceriodaphnia	Chronic minnow	Acute minnow (fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	Fecal Coliform																			
<b>Address:</b> 4500 Norwest Ave., El Dorado, AR 71731		<b>Fax:</b> (870) 863-7499		<b>Temperature upon arrival:</b> -0.3°C <b>Thermometer #:</b> 29 <b>Tech:</b> CR <b>Date:</b> 11/7/15				<b>Preservative:</b> (below)																	
<b>Permit #:</b> AR0000752/AFIN 70-00040		<b>Purchase Order:</b>						<b>Lab Control Number:</b> C11050		Tce															
<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>																				
Date End	Time End																								
11-06-15	0430		X	6 half gallons	007		X	X																	
11-07-15	0430																								
<b>Relinquished by/Affiliation:</b> <i>Edward L Pearson / EDCC</i>				<b>Date:</b> 11/7/15	<b>Time:</b> 1050	<b>Received by/Affiliation:</b> <i>Cherly Rene</i>				<b>Date:</b> 11/7/15	<b>Time:</b> 1050														
<b>Relinquished by/Affiliation:</b>				<b>Date:</b>	<b>Time:</b>	<b>Received by/Affiliation:</b>				<b>Date:</b>	<b>Time:</b>														
<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 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 <b>Tracking #</b> _____																									
<b>Comments:</b>																									
COC Rev. 3.0																									



**Bio-Analytical Laboratories**

3240 Spurgin Road (318) 745-2772  
 Post Office Box 527 7-603-288-1248  
 Bayline, LA 71023 Fax: (318) 745-2773

NELAP/LELAP 01975, ADEQ 88-0630, TCEQ T104704278, OKDEQ 1420

Laboratory Use Only:

Company: <i>El Dorado Chemical Co</i>		Phone: <i>870 863 1484</i>		Analysis:				Project Number: <i>X5882</i>									
Address: <i>4500 Northwest Ave El Dorado Ar 71736</i>		Fax: <i>870 863 1499</i>						Chronic Ceriodaphnia	Chronic minnow	Acute minnow (fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	Fecal Coliform	Temperature upon arrival: <i>0.3</i>	Thermometer #: <i>29</i>	Tech: <i>OR</i>
Permit #: <i>AR0000752 / AFIN 70-00040</i>		Purchase Order:															
Sampler's Signature/Printed Name/Affiliation: <i>Edward L. Pearson / EDCL</i>																	
Date Start Date End	Time Start Time End	<input checked="" type="checkbox"/>	<input type="checkbox"/>	# and type of container	Sample Identification												
<i>11-07-15</i> <i>11-08-15</i>	<i>0800</i> <i>0800</i>	<input checked="" type="checkbox"/>		<i>4 half gallon</i>	<i>007</i>												<i>Ice</i>
Relinquished by/Affiliation: <i>Edward L. Pearson</i>				Date: <i>11/8/15</i>	Time: <i>1100</i>	Received by/Affiliation: <i>Cherity Ren</i>				Date: <i>11/8/15</i>	Time: <i>1100</i>						
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:				Date:	Time:						
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:				Date:	Time:						
Method of Shipment: <input type="checkbox"/> Lab <input type="checkbox"/> Bus <input type="checkbox"/> Fed Ex <input type="checkbox"/> DHL <input type="checkbox"/> UPS <input checked="" type="checkbox"/> Client <input type="checkbox"/> Other Tracking # _____																	
Comments:																	

COC Rev. 3.1

**APPENDIX B**  
**RAW DATA SHEETS**

BIO-ANALYTICAL LABORATORIES  
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X5882

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 11/9/15 Time 1345

Test terminated: Date 11/11/15 Time 1615

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
C11650	8.9/107.9%	7/15/9.8 94.2%	0.0	NO	3.0	N/A	100%	100%	CR
C11652	10.1/119.7%	7/16/8.1 96.9%	0.0	↓	3.0		112.0	40.0	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	3787	N/A	N/A	N/A	N/A	7.3	48.0	44.0	CR

Test Species Information

Test Species Info.	Species: <u>D. pulex</u> ID#: <u>BAL/C2-AAA</u>	Species: ID#:	Species: ID#:	Species: ID#:
Age	<u>&lt;24 hrs</u>			
Test Container Size	<u>30ml</u>			
Test volume	<u>25ml</u>			
Feeding: Type	<u>2 hours</u>			
Amount	<u>prior to test initiation</u>			
Aeration?	<u>N/A</u>			
Amount	<u>↓</u>			
Condition of survivors	<u>pat 2.5</u> <u>RC 11/11/15</u>			

Comments:

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

Project# X5882

Test started: Date 11/9/15

Time 1345

Client EDCC

Test ended: Date 11/11/15

Time 1615

Sample Description 007

Test Species D. pulex ID# BAL/C2-A4a

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

Time: Ohour 1345 24hour 1602 48hour 1615 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): Ohour 25.0 24hour 24.9 48hour 25.3 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0/0		N/A																				
0 SAFE	A	}	8	8	8			8.7	<del>7.7</del> 8.7	8.1			7.2	<del>7.3</del> 7.3			1655	<del>2000</del> 165.7	233			
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
RC 0/1/15 7	E		8	8	8																	
32.0	A	}	8	4	0			8.4	<del>7.5</del> 8.4	8.1			7.4	<del>7.3</del> 7.2			328	<del>350</del> 242	303			
	B		8	6	2																	
	C		8	7	4																	
	D		8	5	4																	
	E		8	8	3																	
Chemistry Tech prerenewal/postrenewal			CR <del>CR</del> RC					CR <del>CR</del> RC					CR <del>CR</del> RC									



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

Project# X5882

Test started: Date 11/9/15

Time 1345

Client EDCC

Test ended: Date 11/11/15

Time 1615

Sample Description 007

Test Species D. pulex

ID# BAL/Co-A4a

Technician: Ohour RC 24hour CR 48hour RC 72hour \_\_\_\_\_ 96hour \_\_\_\_\_  
 Time: Ohour 1345 24hour 1602 48hour 1615 72hour \_\_\_\_\_ 96hour \_\_\_\_\_  
 Temperature (°C): Ohour 25.0 24hour 24.9 48hour 25.3 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
<u>40</u>		<u>N/A</u>																				
<u>45.0</u>	<u>A</u>	}	<u>8</u>	<u>7</u>	<u>2</u>			<u>8.3</u>	<u>7.6</u> <del>8.3</del>	<u>8.0</u>			<u>7.4</u>	<u>7.4</u> <del>7.3</del>	<u>7.2</u>			<u>308</u>	<u>403</u> <del>276</del>	<u>333</u>		
	<u>B</u>		<u>8</u>	<u>7</u>	<u>3</u>																	
	<u>C</u>		<u>8</u>	<u>7</u>	<u>2</u>																	
	<u>D</u>		<u>8</u>	<u>7</u>	<u>3</u>																	
	<u>E</u>		<u>8</u>	<u>5</u>	<u>2</u>																	
<u>50.0</u>	<u>A</u>	}	<u>8</u>	<u>6</u>	<u>2</u>			<u>8.2</u>	<u>7.5</u> <del>8.3</del>	<u>8.1</u>			<u>7.4</u>	<u>7.4</u> <del>7.3</del>	<u>7.2</u>			<u>419</u>	<u>444</u> <del>286</del>	<u>353</u>		
	<u>B</u>		<u>8</u>	<u>8</u>	<u>3</u>																	
	<u>C</u>		<u>8</u>	<u>7</u>	<u>4</u>																	
	<u>D</u>		<u>8</u>	<u>7</u>	<u>4</u>																	
	<u>E</u>		<u>8</u>	<u>8</u>	<u>2</u>																	
Chemistry Tech prerenewal/postrenewal			<u>CR</u> <del><u>CR</u></del> <u>RC</u>					<u>CR</u> <del><u>CR</u></del> <u>RC</u>					<u>CR</u> <del><u>CR</u></del> <u>RC</u>									

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

Project# X5882

Test started: Date 11/9/15

Time 1345

Client EDCC

Test ended: Date 11/11/15

Time 1615

Sample Description 007

Test Species D. pulex

ID# BAL/C2-A4a

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

Time: Ohour 1345 24hour 1602 48hour 1615 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): Ohour 25.0 24hour 24.9 48hour 25.5 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
40		N/A																				
56.0	A	}	8	6	1			8.1	<del>7.4</del> 8.3	8.0			7.4	<del>7.4</del> 7.3	7.2			448	<del>471</del> 300	339		
	B		8	5	2																	
	C		8	6	4																	
	D		8	6	0																	
	E		8	7	2																	
75.0	A	}	8	8	4			8.0	<del>7.7</del> 8.2	8.1			7.5	<del>7.4</del> 7.3	7.2			534	<del>545</del> 342	388		
	B		8	5	4																	
	C		8	7	2																	
	D		8	7	3																	
	E		8	6	0																	
Chemistry Tech prerenewal/postrenewal			CR	CR	RC			CR	CR	RC			CR	CR	RC			CR	CR	RC		

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

Project# X5882

Test started: Date 1/9/15

Time 1345

Client EDCC

Test ended: Date 1/11/15

Time 1615

Sample Description 007

Test Species D. pulex

ID# BAL/C2-A4a

Technician: 0hour RC 24hour CR 48hour RC 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Time: 0hour 1345 24hour 1602 48hour 1615 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): 0hour 25.0 24hour 24.9 48hour 25.3 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
		<u>N/A</u>																				
<u>100.0</u>	<u>A</u>		<u>8</u>	<u>6</u>	<u>3</u>			<u>7.8</u>	<del><u>7.2</u></del>	<u>8.0</u>	<u>8.0</u>		<u>7.5</u>	<del><u>7.4</u></del>	<u>7.2</u>		<u>665</u>	<del><u>655</u></del>	<u>411</u>	<u>413</u>		
	<u>B</u>		<u>8</u>	<u>8</u>	<u>3</u>																	
	<u>C</u>		<u>8</u>	<u>6</u>	<u>1</u>																	
	<u>D</u>		<u>8</u>	<u>6</u>	<u>1</u>																	
	<u>E</u>		<u>8</u>	<u>7</u>	<u>3</u>																	
<u>pH 003</u> <u>100.0</u>	<u>A</u>		<u>8</u>																			
	<u>B</u>		<u>8</u>																			
	<u>C</u>		<u>8</u>																			
	<u>D</u>		<u>8</u>																			
	<u>E</u>		<u>8</u>																			
Chemistry Tech prerenewal/postrenewal								<u>CR</u>	<del><u>CR</u></del>	<u>RC</u>			<u>CR</u>	<del><u>CR</u></del>	<u>RC</u>		<u>CR</u>	<del><u>CR</u></del>	<u>RC</u>			

BIO-ANALYTICAL LABORATORIES  
ACUTE TOXICITY TEST WATER QUALITY DATA

X5882  
Page 18 of 36

Project# X5882

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 11/9/15 Time 1338

Test terminated: Date 11/9/15 Time 1518

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
C11650	9.11/16.9%	4/18/7.5/94.3%	0.0	NO	3.0	N/A	100%	100%	CR
C11652	9.11/16.7%	4/15/7.3/91.5%	10.0		3.0		112.0	40.0	

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	3187	N/A	N/A	N/A	N/A	7.3	48.0	44.0	CR

Test Species Information

Test Species Info.	Species: <u>P. promelas</u> ID#: <u>BAL110315 B</u>	Species: ID#:	Species: ID#:	Species: ID#:
Age	<u>4d</u>			
Test Container Size	<u>300ml</u>			
Test volume	<u>250 ml</u>			
Feeding: Type	<u>Fed 2 hours prior to test initiation</u>			
Amount				
Aeration?				
Amount				
Condition of survivors	<u>good CR</u>			

Comments:

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

Project# X5882

Test started: Date 11/7/15

Time 1338

Client EDCC

Test ended: Date 11/9/15

Time 1518

Sample Description 007

Test Species P. promelas ID# BAL110315B

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

Time: Ohour 1338 24hour 1600 48hour 1518 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): Ohour 25.1 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
0/0		N/A																				
0 <sub>50%</sub>	A	}	8	8	8			8.5	<del>7.8</del> 8.7	7.9			7.3	<del>7.1</del> 7.2	7.2			210	<del>178.6</del> 167.7	203		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	7																	
22.0/1/15 #	E		8	8	8																	
32.0	A	}	8	8	8			8.2	<del>7.8</del> 8.4	7.8			7.4	<del>7.3</del> 7.4	7.2			34	<del>310</del> 310	261		
	B		8	8	7																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal							CR	<del>CR</del>	CR			CR	<del>CR</del>	CR			CR	<del>CR</del>	CR			

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

Project# X5882

Test started: Date 11/7/15 Time 1335

Client EDCC

Test ended: Date 11/9/15 Time 1518

Sample Description 007

Test Species P. promelas ID# BAL110315B

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

Time: Ohour 1338 24hour 1600 48hour 1518 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): Ohour 25.1 24hour 25.6 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>8</u>	<u>8</u>	<u>8</u>			<u>8.1</u>	<u>7.9</u> <u>8.2</u>	<u>7.8</u>			<u>7.4</u>	<u>7.3</u> <u>7.4</u>	<u>7.2</u>			<u>490</u>	<u>405</u> <u>413</u>	<u>295</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>50.0</u>	<u>A</u>	}	<u>8</u>	<u>8</u>	<u>8</u>			<u>8.1</u>	<u>7.9</u> <u>8.2</u>	<u>7.8</u>			<u>7.4</u>	<u>7.4</u> <u>7.4</u>	<u>7.2</u>			<u>518</u>	<u>435</u> <u>436</u>	<u>357</u>		
	<u>B</u>		<u>8</u>	<u>7</u>	<u>7</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			<u>CR</u>	<u>CR</u>	<u>CR</u>			<u>CR</u>	<u>CR</u>	<u>CR</u>			<u>CR</u>	<u>CR</u>	<u>CR</u>			<u>CR</u>	<u>CR</u>	<u>CR</u>		

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

Project# X5882

Test started: Date 11/11/15

Time 1338

Client EDCC

Test ended: Date 11/11/15

Time 1518

Sample Description 007

Test Species P. promelas ID# BAL110315B

Technician: 0hour CR 24hour CR 48hour CR 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Time: 0hour 1338 24hour 1400 48hour 1518 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): 0hour 25.1 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
40		N/A																				
56.0	A	}	8	8	8			8.0	<del>7.6</del> 8.1	7.5			7.4	<del>7.4</del> 7.5	7.2			550	<del>401</del> 463	327		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
75.0	A	}	8	8	8			7.8	<del>7.7</del> 7.9	7.1			7.4	<del>7.4</del> 7.5	7.2			410	<del>565</del> 362	374		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								CR	<del>CR</del>	CR			CR	<del>CR</del>	CR			CR	<del>CR</del>	CR		

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

Project# X5882

Test started: Date 11/7/15 Time 1338

Client EDCC

Test ended: Date 11/9/15 Time 1518

Sample Description 007

Test Species P. promelas ID# BALI10315B

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

Time: Ohour 1338 24hour 1600 48hour 1518 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): Ohour 25.1 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
		NIA																				
100.0	A	}	8	8	8			7.6	<del>7.7</del> 7.6	7.6			7.5	<del>7.5</del> 7.5	7.2			820	<del>670</del> 670	440		
	B		8	8	8																	
	C		8	7	7																	
	D		8	8	8																	
	E		8	8	8																	
<del>100.0</del>	A	}	8	8																		
<del>100.0</del>	B		8																			
	C		8																			
	D		8																			
	E		8																			
Chemistry Tech prerenewal/postrenewal								CR	<del>CR</del>	CR			CR	<del>CR</del>	CR			CR	<del>CR</del>	CR		



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

**Daphnid Acute Test-48 Hr Survival**

Start Date: 11/9/2015 Test ID: X5882DP Sample ID: AR0000752/006  
 End Date: 11/11/2015 Lab ID: 880630 Sample Type: EFF2-Industrial  
 Sample Date: 11/7/2015 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
32	0.0000	0.2500	0.5000	0.5000	0.3750
45	0.2500	0.3750	0.2500	0.3750	0.2500
50	0.2500	0.3750	0.5000	0.5000	0.2500
56	0.1250	0.2500	0.5000	0.0000	0.2500
75	0.5000	0.5000	0.2500	0.3750	0.0000
100	0.3750	0.3750	0.1250	0.1250	0.3750

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%	N		
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5		
*32	0.3250	0.3250	0.5862	0.1777	0.7854	43.108	5	15.00	16.00
*45	0.3000	0.3000	0.5778	0.5236	0.6591	12.841	5	15.00	16.00
*50	0.3750	0.3750	0.6554	0.5236	0.7854	19.975	5	15.00	16.00
*56	0.2250	0.2250	0.4743	0.1777	0.7854	47.419	5	15.00	16.00
*75	0.3250	0.3250	0.5862	0.1777	0.7854	43.108	5	15.00	16.00
*100	0.2750	0.2750	0.5400	0.3614	0.6591	30.196	5	15.00	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution ( $p > 0.05$ )	0.94548	0.934	-0.7663	0.79466
Equality of variance cannot be confirmed				
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	<32	32		
Treatments vs D-Control				

**Daphnid Acute Test-48 Hr Survival**

Start Date: 11/9/2015      Test ID: X5882DP      Sample ID: AR0000752/006  
 End Date: 11/11/2015      Lab ID: 880630      Sample Type: EFF2-Industrial  
 Sample Date: 11/7/2015      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
32	0.0000	0.2500	0.5000	0.5000	0.3750
45	0.2500	0.3750	0.2500	0.3750	0.2500
50	0.2500	0.3750	0.5000	0.5000	0.2500
56	0.1250	0.2500	0.5000	0.0000	0.2500
75	0.5000	0.5000	0.2500	0.3750	0.0000
100	0.3750	0.3750	0.1250	0.1250	0.3750

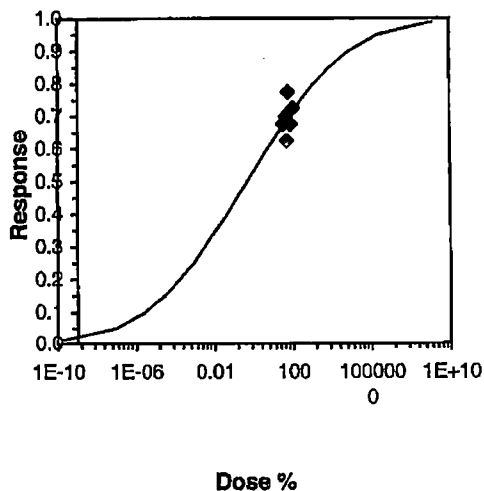
Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					N	Number Resp	Total Number
			Mean	Min	Max	CV%				
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	0	40	
32	0.3250	0.3250	0.5862	0.1777	0.7854	43.108	5	27	40	
45	0.3000	0.3000	0.5778	0.5236	0.6591	12.841	5	28	40	
50	0.3750	0.3750	0.6554	0.5236	0.7854	19.975	5	25	40	
56	0.2250	0.2250	0.4743	0.1777	0.7854	47.419	5	31	40	
75	0.3250	0.3250	0.5862	0.1777	0.7854	43.108	5	27	40	
100	0.2750	0.2750	0.5400	0.3614	0.6591	30.196	5	29	40	

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution ( $p > 0.05$ )	0.94548	0.934	-0.7663	0.79466
Equality of variance cannot be confirmed				

**Maximum Likelihood-Probit**

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	0.2454	0.53775	-0.8086	1.29938	0	2.25113	9.48773	0.68968	-0.343	4.07496	3
Intercept	5.08418	0.9419	3.23806	6.9303							

Point	Probits	%	95% Fiducial Limits	
EC01	2.674	1.5E-10		
EC05	3.355	9E-08		
EC10	3.718	2.7E-06		
EC15	3.964	2.7E-05		
EC20	4.158	0.00017		
EC25	4.326	0.00081		
EC40	4.747	0.04213		
EC50	5.000	0.4539		
EC60	5.253	4.89033		
EC75	5.674	254.378		
EC80	5.842	1220.49		
EC85	6.036	7592.52		
EC90	6.282	75723.9		
EC95	6.645	2289157		
EC99	7.326	1.4E+09		



**Acute Fish Test-48 Hr Survival**

Start Date: 11/7/2015 Test ID: X5882PP Sample ID: AR0000752/006  
 End Date: 11/9/2015 Lab ID: 880630 Sample Type: EFF2-Industrial  
 Sample Date: 11/7/2015 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: PP-Pimephales promelas  
 Comments:

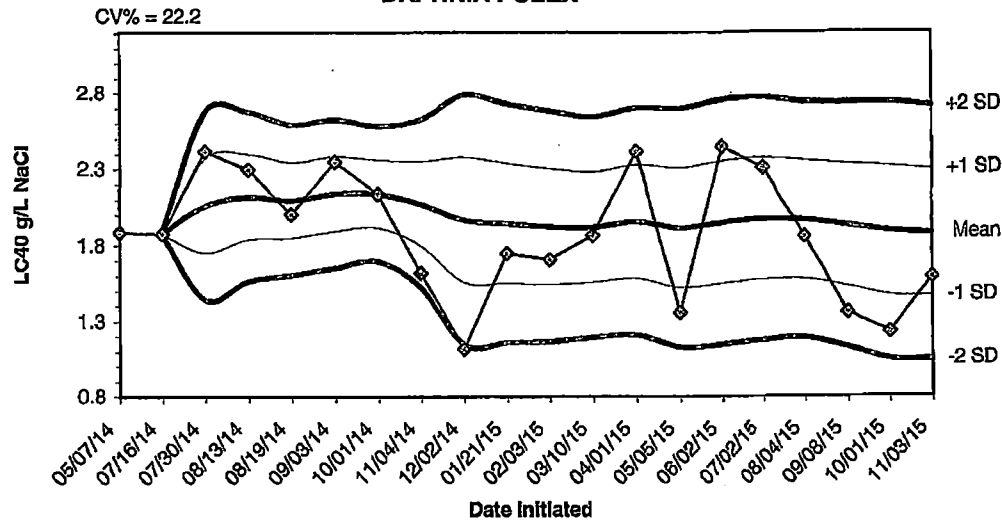
Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	0.8750	1.0000
32	1.0000	0.8750	1.0000	1.0000	1.0000
45	1.0000	1.0000	1.0000	1.0000	1.0000
50	1.0000	0.8750	1.0000	1.0000	1.0000
56	1.0000	1.0000	1.0000	1.0000	1.0000
75	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	0.8750	1.0000	1.0000

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%	N		
D-Control	0.9750	1.0000	1.3564	1.2094	1.3931	6.055	5		
32	0.9750	1.0000	1.3564	1.2094	1.3931	6.055	5	27.50	16.00
45	1.0000	1.0256	1.3931	1.3931	1.3931	0.000	5	30.00	16.00
50	0.9750	1.0000	1.3564	1.2094	1.3931	6.055	5	27.50	16.00
56	1.0000	1.0256	1.3931	1.3931	1.3931	0.000	5	30.00	16.00
75	1.0000	1.0256	1.3931	1.3931	1.3931	0.000	5	30.00	16.00
100	0.9750	1.0000	1.3564	1.2094	1.3931	6.055	5	27.50	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution ( $p \leq 0.05$ )	0.5996	0.934	-2.0743	3.30824
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				

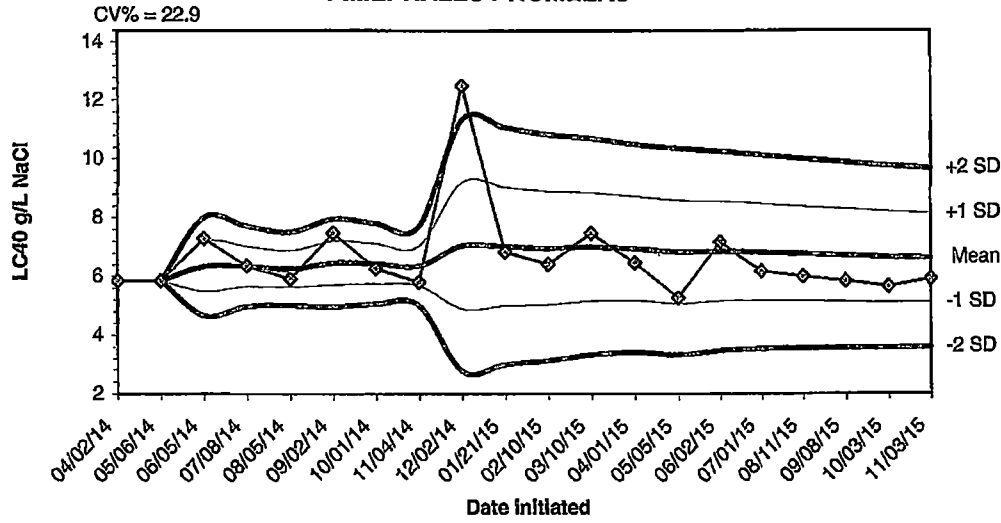
**APPENDIX D**  
**QUALITY ASSURANCE CHARTS**

**2015 48-HOUR ACUTE REFERENCE TOXICANT TEST RESULTS USING  
DAPHNIA PULEX**



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
05/07/14	1.8900					
07/16/14	1.8800	1.8850	1.8779	1.8709	1.8921	1.8991
07/30/14	2.4200	2.0633	1.7544	1.4455	2.3723	2.6812
08/13/14	2.3000	2.1225	1.8439	1.5653	2.4011	2.6797
08/19/14	2.0100	2.1000	1.8535	1.6070	2.3465	2.5930
09/03/14	2.3500	2.1417	1.8987	1.6558	2.3846	2.6275
10/01/14	2.1400	2.1414	1.9197	1.6979	2.3632	2.5850
11/04/14	1.6200	2.0763	1.8003	1.5244	2.3522	2.6281
12/02/14	1.1200	1.9700	1.5598	1.1497	2.3802	2.7903
01/21/15	1.7500	1.9480	1.5551	1.1622	2.3409	2.7338
02/03/15	1.7100	1.9264	1.5468	1.1672	2.3059	2.6855
03/10/15	1.8700	1.9217	1.5594	1.1971	2.2840	2.6462
04/01/15	2.4200	1.9600	1.5866	1.2132	2.3334	2.7068
05/05/15	1.3600	1.9171	1.5242	1.1313	2.3101	2.7030
06/02/15	2.4500	1.9527	1.5498	1.1469	2.3555	2.7584
07/02/15	2.3100	1.9750	1.5757	1.1763	2.3743	2.7737
08/04/15	1.8600	1.9682	1.5806	1.1929	2.3559	2.7435
09/08/15	1.3600	1.9344	1.5320	1.1295	2.3369	2.7394
10/01/15	1.2300	1.8974	1.4742	1.0509	2.3206	2.7438
11/03/15	1.5900	1.8820	1.4644	1.0468	2.2996	2.7172

**2015 48-HOUR ACUTE REFERENCE TOXICANT TEST RESULTS USING  
PIMEPHALES PROMELAS**



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
04/02/14	5.8600					
05/06/14	5.8600	5.8600	5.8600	5.8600	5.8600	5.8600
06/05/14	7.3100	6.3433	5.5062	4.6690	7.1805	8.0176
07/08/14	6.3700	6.3500	5.6663	4.9827	7.0337	7.7173
08/05/14	5.9200	6.2640	5.6415	5.0190	6.8865	7.5090
09/02/14	7.4800	6.4667	5.7207	4.9747	7.2126	7.9586
10/01/14	6.2800	6.4400	5.7554	5.0708	7.1246	7.8092
11/04/14	5.8100	6.3613	5.6894	5.0176	7.0331	7.7049
12/02/14	12.5000	7.0433	4.9028	2.7622	9.1839	11.3245
01/21/15	6.8500	7.0240	5.0049	2.9858	9.0431	11.0622
02/10/15	6.4200	6.9691	5.0450	3.1209	8.8932	10.8173
03/10/15	7.4800	7.0117	5.1712	3.3307	8.8521	10.6926
04/01/15	6.4800	6.9708	5.2025	3.4342	8.7391	10.5073
05/05/15	5.2900	6.8507	5.0934	3.3361	8.8080	10.3653
06/02/15	7.2000	6.8740	5.1782	3.4824	8.5698	10.2656
07/01/15	6.1800	6.8306	5.1832	3.5358	8.4781	10.1255
08/11/15	6.0000	6.7818	5.1740	3.5662	8.3896	9.9974
09/08/15	5.8600	6.7306	5.1557	3.5809	8.3054	9.8803
10/03/15	5.6700	6.8747	5.1250	3.5753	8.2244	9.7741
11/03/15	5.9200	6.6370	5.1192	3.6014	8.1548	9.6726

**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: 11/06/15**      **To: 11/07/15**  
    **From: 11/07/15**      **To: 11/08/15**

**Test Initiated: 11/09/15**

**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	50.0	87.5	75.0	75.0	100.0	75.0
	B	100.0	75.0	87.5	100.0	62.5	62.5	100.0
	C	100.0	87.5	87.5	87.5	75.0	87.5	75.0
	D	100.0	62.5	87.5	87.5	75.0	87.5	75.0
	E	100.0	87.5	62.5	100.0	87.5	75.0	87.5
48-hour	A	100.0	0.0	25.0	25.0	12.5	50.0	37.5
	B	100.0	25.0	37.5	37.5	25.0	50.0	37.5
	C	100.0	50.0	25.0	50.0	50.0	25.0	12.5
	D	100.0	50.0	37.5	50.0	0.0	37.5	12.5
	E	100.0	37.5	25.0	25.0	25.0	0.0	37.5
	Mean	100.0	32.5	30.0	37.5	22.5	32.5	27.5

**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%)**      **X YES**      **NO**  
 b.) **½ 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> =      **4.89% effluent**

**95 % confidence limits: not reliable**

**Method of LC<sub>50</sub> calculation: Probit**

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

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

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

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

**Biomonitoring  
Daphnia 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: Rose, Callahan**  
**Sample Collected**

**From: Date 11/06/15 Time 0430**  
**To: Date 11/07/15 Time 0430**  
**Date 11/09/15 Time 1345**  
**Date 11/11/15 Time 1615**

**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		8.7	8.7	8.1	25.0	24.9	25.3	44.0			48.0			7.2	7.3	7.3
32.0		8.4	8.4	8.1	25.0	24.9	25.3							7.4	7.2	7.2
45.0		8.3	8.3	8.0	25.0	24.9	25.3							7.4	7.3	7.2
50.0		8.2	8.3	8.1	25.0	24.9	25.3							7.4	7.3	7.2
56.0		8.1	8.3	8.0	25.0	24.9	25.3							7.4	7.3	7.2
75.0		8.0	8.2	8.1	25.0	24.9	25.3							7.5	7.3	7.2
100.0		7.8	8.0	8.0	25.0	24.9	25.3	48.0	40.0		224.0	112.0		7.5	7.3	7.2

\*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: 11/06/15 To: 11/07/15**  
**From: 11/07/15 To: 11/08/15**

**Test Initiated: 11/07/15**

**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	100.0	100.0	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0	87.5
	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	87.5	100.0	87.5	100.0	100.0	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0	87.5
	D	87.5	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	97.5	97.5	100.0	97.5	100.0	100.0	97.5

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

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

95 % confidence limits: N/A

Method of LC<sub>50</sub> calculation: N/A

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

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

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

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

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

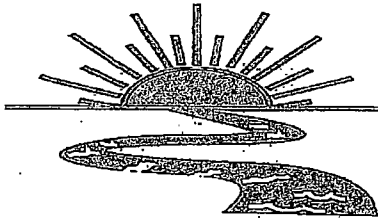
Permittee: El Dorado Chemical - Outfall 007  
 NPDES Number: AR0000752/ AFIN 70-00040  
 Contact: Eddie Pearson  
 Analyst: Rose, Callahan  
 Sample Collected

From: Date 11/06/15 Time 0430  
 To: Date 11/07/15 Time 0430  
 Date 11/07/15 Time 1338  
 Date 11/09/15 Time 1518

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	8.5	8.7	7.9	25.1	25.0	24.9	44.0				48.0			7.3	7.2	7.2
32.0	8.2	8.4	7.8	25.1	25.0	24.9								7.4	7.4	7.2
45.0	8.1	8.2	7.8	25.1	25.0	24.9								7.4	7.4	7.2
50.0	8.1	8.2	7.8	25.1	25.0	24.9								7.4	7.4	7.2
56.0	8.0	8.1	7.8	25.1	25.0	24.9								7.4	7.5	7.2
75.0	7.8	7.9	7.7	25.1	25.0	24.9								7.4	7.5	7.2
100.0	7.6	7.6	7.6	25.1	25.0	24.9	48.0	40.0			224.0	112.0		7.5	7.5	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) 745-2772  
1-800-259-1246  
Fax: (318) 745-2773

## REPORT QUALITY ASSURANCE FORM

Client: El Dorado Chemical / 007

Project#: X 5882

Chain of Custody Documents Checked by: RC 11/13/15  
Technician/Date

Raw Data Documents Checked by: RC 11/13/15  
Technician/Date

Statistical Analysis Package Checked by: EGB 11/16/15  
Quality Manager/Date

Quality Control Data Checked by: EGB 11/16/15  
Quality Manager/Date

Report Checked by: EGB 11/23/15  
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 P. Bragg, BS  
Quality Manager

11/23/15  
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 X5881

### Bio-Analytical Laboratories' Executive Summary

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

**Project #:** X5881

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

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

**Contact:** Mr. Eddie Pearson

**Test Dates:** November 7 - 11, 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:**

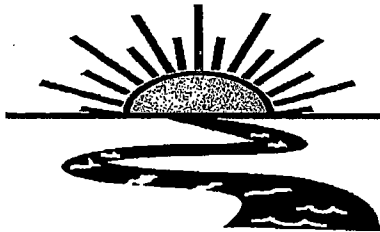
**For *Pimephales promelas*:**

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 - 6.06%.

**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- 1- **Fail**.
2. Report the NOEC for survival, Parameter TOM3D -75.0%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 23.39%.

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



## Bio-Analytical Laboratories

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**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 X5881**

**Test Dates: November 7 - 11, 2015  
Report Date: November 23, 2015**

**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 X5881

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BAL  
ADEQ #88-0630  
Project X5881

## 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<sub>50</sub>, the concentration in which 50 percent of the test organisms died.

The fathead minnow test was initiated within 36 hours after the first sample was composited and the *Daphnia pulex* test was initiated within 72 hours after the first sample was composited.

## 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 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.

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ADEQ #88-0630  
Project X5881

### **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**

Two samples of Outfall 006 were collected by El Dorado Chemical personnel on November 7 and 8, 2015, at 0415 and 0800 hours, respectively. Upon completion of collection, the sample was packed in ice and personally delivered to the laboratory. The temperature upon arrival was 0.8 and 0.3° Celsius, respectively.

### **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. 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.

### **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.

BAL  
ADEQ #88-0630  
Project X5881

### 3.0 Results and Discussion

The results of the tests can be found in Table 1. Significant differences in survival were not noted in the critical dilution in the minnow test, but were noted in the *Daphnia pulex* test after 48 hours of exposure ( $p=.05$ ). The NOEC value for the fathead and *Daphnia pulex* test was 100.0 and 75.0 percent effluent, respectively ( $p=.05$ ). The 48-hour  $LC_{50}$  values could not be calculated in either test 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	100.0
22.0	97.5	97.5
32.0	97.5	75.0
45.0	100.0	77.5
56.0	97.5	75.0
75.0	97.5	75.0
100.0	97.5	62.5

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 X5881

#### 4.0 Conclusions

The two samples of Outfall 006 collected from El Dorado Chemical Company, El Dorado, Arkansas, on November 7 and 8, 2015, were not found to be lethally toxic to the fathead minnow test organisms in the 100.0 percent critical dilution after 48 hours of exposure; however, lethal effects were noted in the *Daphnia pulex* test ( $p=.05$ ). 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 X5881

### 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**

3240 Spurgin Road (918) 745-2772  
 Post Office Box 527 T-093-256-1249  
 Doyline, LA 71023 Fax: (918) 745-2773

NELAP/LELAP 01975, ADEQ 88-0630, TCEQ T104704278, OKDEQ 1420

Laboratory Use Only:

Company: <i>EI Dorado Chemical Co</i>		Phone: <i>870 863 1484</i>		Analysis:				Project Number: <i>X5881</i>		
Address: <i>4500 Northwest Ave EI Dorado Ar 71230</i>		Fax: <i>870 863 1499</i>		Chronic Ceriodaphnia	Chronic minnow	Acute minnow (fresh/marine)	Acute Daphnia species	Acute Mysid	Acute Ceriodaphnia	
Permit #: <i>AR 0000752 / AFEN 70-00040</i>		Purchase Order:								Fecal Coliform
Sampler's Signature/Printed Name/Affiliation: <i>Edward L Pearson / Edward L Pearson / EDCC</i>				Tech: <i>CR</i>	Date: <i>11/8/15</i>	Lab Control Number:	Preservative: (below)			
Date Start Date End	Time Start Time End	C	G					# and type of container	Sample Identification	
<i>11-07-15</i> <i>11-08-15</i>	<i>0800</i> <i>0800</i>	<i>X</i>		<i>4 half Gallons</i>	<i>006</i>		<i>X</i>	<i>X</i>	<i>C11651</i>	<i>Ice</i>
Relinquished by/Affiliation: <i>Edward L Pearson</i>				Date: <i>11/8/15</i>	Time: <i>1100</i>	Received by/Affiliation: <i>Cherity Ruc</i>		Date: <i>11/8/15</i>	Time: <i>1100</i>	
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:		Date:	Time:	
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:		Date:	Time:	
Method of Shipment: <input type="checkbox"/> Lab <input type="checkbox"/> Bus <input type="checkbox"/> Fed Ex <input type="checkbox"/> DHL <input type="checkbox"/> UPS <input type="checkbox"/> Client <input checked="" type="checkbox"/> Other Tracking # _____										
Comments:										

COC Rev. 3.1

**APPENDIX B**  
**RAW DATA SHEETS**

BIO-ANALYTICAL LABORATORIES  
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X5881

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 11/9/15 Time 1410

Test terminated: Date 11/11/15 Time 1625

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
C11641	5.7/105.7%	4/15/9.9 95.0%	0.0	NO	3.0	N/A	100.0	100%	CR
C11651	0.9/17.2%	7/18/8.2/ 97.4%	0.0		3.0		64.0	28.0	

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	3787	N/A	N/A	N/A	N/A	7.3	48.0	44.0	CR

Test Species Information

Test Species Info.	Species: ID#:	Species: ID#:	Species: ID#:	Species: ID#:
Age	Species: <u>D. pulch</u> ID#: <u>QAL/Cs-A4a</u>			
Test Container Size	<u>&lt; 24 hrs</u>			
Test volume	<u>30ml</u>			
Feeding: Type	<u>25ml</u>			
Amount	<u>2 hrs prior</u>			
Aeration?	<u>to test initiation</u>			
Amount	<u>N/A</u>			
Condition of survivors	<u>1</u>			
	<u>pale / 2.75</u>			
	<u>Re 11/11/15</u>			

Comments:

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

Project# X5881

Test started: Date 11/9/15 Time 1410

Client EDCC

Test ended: Date 11/11/15 Time 1625

Sample Description 006

Test Species D. pulex ID# BAL/Ca-A4a

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

Time: Ohour 1410 24hour 1513 48hour 1625 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): Ohour 25.0 24hour 24.9 48hour 25.3 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0/0		N/A																				
0 <sub>start</sub>	A	}	8	8	8			8.7	<del>7.7</del> 8.1	8.1			7.2	<del>7.3</del> 7.3			1655	<del>2010</del> 165.7	233			
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
RC @ 1/15 7	E		8	8	8																	
22.0	A	}	8	8	8			8.4	<del>7.9</del> 8.5	7.9			7.2	<del>7.1</del> 7.1			205	<del>833</del> 155	224			
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	7	7																	
Chemistry Tech prerenewal/postrenewal			CR <del>CR</del> RC					CR <del>CR</del> RC					CR <del>CR</del> RC									

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

Project# X5881

Test started: Date 11/11/15

Time 1410

Client EDCC

Test ended: Date 11/11/15

Time 1625

Sample Description 006 <sup>offsite</sup>

Test Species D. pulex

ID# BAL/Ca-A4a

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

Time: Ohour 1410 24hour 1515 48hour 1625 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): Ohour 25.0 24hour 24.9 48hour 25.3 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
<u>90</u>		<u>N/A</u>																				
<u>32.0</u>	<u>A</u>		<u>8</u>	<u>8</u>	<u>8</u>			<u>8.4</u>	<u>7.8</u> <u>8.5</u>	<u>7.7</u>			<u>7.2</u>	<u>7.1</u> <u>7.2</u>	<u>7.1</u>			<u>221</u>	<u>252</u> <u>192</u>	<u>217</u>		
	<u>B</u>		<u>8</u>	<u>6</u>	<u>6</u>																	
	<u>C</u>		<u>8</u>	<u>6</u>	<u>6</u>																	
	<u>D</u>		<u>8</u>	<u>5</u>	<u>5</u>																	
	<u>E</u>		<u>8</u>	<u>6</u>	<u>5</u>																	
<u>45.0</u>	<u>A</u>		<u>8</u>	<u>8</u>	<u>7</u>			<u>8.3</u>	<u>7.7</u> <u>8.4</u>	<u>7.7</u>			<u>7.2</u>	<u>7.1</u> <u>7.2</u>	<u>7.0</u>			<u>244</u>	<u>272</u> <u>151</u>	<u>221</u>		
	<u>B</u>		<u>8</u>	<u>8</u>	<u>5</u>																	
	<u>C</u>		<u>8</u>	<u>8</u>	<u>5</u>																	
	<u>D</u>		<u>8</u>	<u>8</u>	<u>6</u>																	
	<u>E</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
Chemistry Tech prerenewal/postrenewal								<u>CR</u>	<u>CR</u>	<u>CR</u>	<u>RC</u>		<u>CR</u>	<u>CR</u>	<u>CR</u>	<u>RC</u>		<u>CR</u>	<u>CR</u>	<u>CR</u>	<u>RC</u>	

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

Project# X5881

Test started: Date 11/9/15

Time 1410

Client EDCC

Test ended: Date 11/11/15

Time 1625

Sample Description 006

Test Species D. pulex

ID# BAL/C2-174a

Technician: RC 24hour CR 48hour RC 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Time: 1410 24hour SB 48hour 1625 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): 25.0 24hour 24.9 48hour 25.3 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
9%		N/A																				
56.0	A	}	8	6	6			8.2	<del>7.4</del> 8.3	7.7			7.2	<del>7.1</del> 7.2	7.0		263	<del>282</del> 281.4	222			
	B		8	6	6																	
	C		8	8	6																	
	D		8	7	4																	
	E		8	8	<del>8</del>	RC w/ntg																
75.0	A	}	8	8	8			8.1	<del>7.2</del> 8.2	7.1			7.2	<del>7.0</del> 7.7	6.9		247	<del>248</del> 200	239			
	B		8	7	5																	
	C		8	7	7																	
	D		8	5	5																	
	E		8	5	5																	
Chemistry Tech prerenewal/postrenewal								<del>CR</del> CR	<del>CR</del> CR	RC			<del>CR</del> CR	<del>CR</del> CR	RC			<del>CR</del> CR	<del>CR</del> CR	RC		

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

Project# X5881

Test started: Date 11/9/15

Time 1410

Client EDCC

Test ended: Date 11/11/15

Time 1625

Sample Description 006

Test Species D. pulex

ID# BAL/C2-A4

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

Time: Ohour 1410 24hour 1513 48hour 1625 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): Ohour 25.0 24hour 24.9 48hour 25.3 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity										
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96						
010		N/A																										
100.0	A	}	8	7	7 <sup>RC</sup>	7 <sup>RC</sup>		7.9	7.0	7.5			7.2	7.0	6.9			348	352	354	352							
	B		8	5	3																							
	C		8	8	4																							
	D		8	7	5																							
	E		8	8	6																							
100.0 pH Adj	A	}	8																									
	B		8																									
	C		8																									
	D		8																									
	E		8																									
Chemistry Tech prerenewal/postrenewal								CR	CR	RC					CR	CR	RC					CR	CR	RC				

BIO-ANALYTICAL LABORATORIES  
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X5881

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 11/7/15 Time 1307

Test terminated: Date 11/9/15 Time 1602

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)	Dechlor inated? Amount?	Ammonia (NH3) mg/L	Salinity	Hard-ness	Alkal-inity	Tech
<u>C11649</u>	<u>9.0/114.1%</u>	<u>7/15/7.6</u> <u>91.9%</u>	<u>0.0</u>	<u>NO</u>	<u>3.0</u>	<u>N/A</u>	<u>100%</u> <u>132.0</u>	<u>100%</u> <u>36.0</u> <u>36.0</u>	<u>W/ndis</u> <u>RC</u> <u>CR</u>
<u>C11651</u>	<u>9.3/118.1%</u>	<u>7/15/9.5</u> <u>91.4%</u>	<u>0.0</u>	<u> </u>	<u>3.0</u>	<u> </u>	<u>64.0</u> <u>234.0</u> <u>RC</u> <u>143/15</u>	<u>28.0</u> <u>48.0</u>	<u>CR</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	Hard-ness	Alkal-inity	Tech
<u>Soft H2O</u>	<u>3787</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>7.3</u>	<u>48.0</u>	<u>44.0</u>	<u>CR</u>

Test Species Information

Test Species Info.	Species: <u>P. promelas</u> ID#: <u>BRL103193</u>	Species: ID#:	Species: ID#:	Species: ID#:
Age	<u>4d</u>			
Test Container Size	<u>300 ml</u>			
Test volume	<u>250 ml</u>			
Feeding: Type	<u>Fed 2 hours prior to</u>			
Amount	<u>test initiation</u>			
Aeration?	<u>N/A</u>			
Amount				
Condition of survivors	<u>3000</u> <u>CR</u>			

Comments:



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

Project# X5881

Test started: Date 11/7/15

Time 1307

Client EDCC

Test ended: Date 11/9/15

Time 1602

Sample Description 006

Test Species P. promelas ID# BAL110315B

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

Time: Ohour 1307 24hour 1600 48hour 1602 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): Ohour 25.0 24hour 25.0 48hour 25.0 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0%		N/A																				
0.50FT	A		8	8	8			8.5	<del>7.9</del> 8.8	8.0			7.3	<del>7.3</del> 7.1	7.1			207	<del>182.3</del> 161.7	184.3		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
22.0	A		8	8	8			8.3	<del>7.9</del> 8.4	7.9			7.3	<del>7.1</del> 7.1	7.1			253	<del>27</del> 212	194.4		
	B		8	7	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								CR	<del>CR</del>	CR			CR	<del>CR</del>	CR			CR	<del>CR</del>	CR		

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

Project# X5881

Test started: Date 11/7/15 Time 1307

Client EDGC

Test ended: Date 11/9/15 Time 1602

Sample Description 006

Test Species P. promelas ID# BALI0315B

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

Time: Ohour 1307 24hour 1600 48hour 1602 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): Ohour 25.0 24hour 25.0 48hour 25.0 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
<u>90</u>		<u>N/A</u>																				
<u>32.0</u>	<u>A</u>		<u>8</u>	<u>8</u>	<u>8</u>			<u>5.2</u>	<u>7.3</u> <u>7.2</u>	<u>7.8</u>			<u>7.3</u>	<u>7.1</u> <u>7.1</u>	<u>7.1</u>			<u>272</u>	<u>239</u> <u>228</u>	<u>198</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>7</u>																	
<u>45.0</u>	<u>A</u>		<u>8</u>	<u>8</u>	<u>8</u>			<u>5.1</u>	<u>7.3</u> <u>7.0</u>	<u>7.8</u>			<u>7.3</u>	<u>7.1</u> <u>7.1</u>	<u>7.0</u>			<u>300</u>	<u>259</u> <u>253</u>	<u>202</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								<u>CR</u>	<u>CR</u> <u>CR</u>	<u>CR</u>			<u>CR</u>	<u>CR</u> <u>CR</u>	<u>CR</u>			<u>CR</u>	<u>CR</u> <u>CR</u>	<u>CR</u>		

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

Project# X5881

Test started: Date 11/7/15

Time 1307

Client EDCC

Test ended: Date 11/9/15

Time 1602

Sample Description 006

Test Species P. promelas

ID# BAL110315B

Technician: 0hour CR 24hour CR 48hour CR 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Time: 0hour 1307 24hour 1600 48hour 1602 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): 0hour 25.0 24hour 25.0 48hour 25.0 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0%		N/A																				
56.0	A		8	8	8			8.0	<del>7.7</del> 7.9	7.7			7.3	<del>7.1</del> 7.1	7.0			<del>326</del> 326	<del>318</del> 313	210		
	B		8	7	7																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
75.0	A		8	8	8			7.8	<del>7.7</del> 8.0	7.7			7.3	<del>7.2</del> 6.9	7.0			367	<del>314</del> 307	220		
	B		8	8	8																	
	C		8	8	7																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								<del>CR</del> CR	<del>CR</del> CR				<del>CR</del> CR	<del>CR</del> CR			<del>CR</del> CR	<del>CR</del> CR				

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

Project# X5881

Test started: Date 11/7/15 Time 1307

Client EDCC

Test ended: Date 11/9/15 Time 1602

Sample Description 006

Test Species P. promelas ID# BAL11035B

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

Time: Ohour 1307 24hour 1600 48hour 1602 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Temperature (°C): Ohour 25.0 24hour 25.0 48hour 25.0 72hour \_\_\_\_\_ 96hour \_\_\_\_\_

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
<u>0.0</u>		<u>N/A</u>																				
<u>100.0</u>	<u>A</u>		<u>8</u>	<u>8</u>	<u>8</u>			<u>7.6</u>	<u>7.6</u> <u>8.1</u>	<u>7.5</u>			<u>7.2</u>	<u>7.2</u> <u>6.8</u>	<u>7.0</u>			<u>426</u>	<u>360</u> <u>351</u>	<u>238</u>		
	<u>B</u>		<u>8</u>	<u>8</u>	<u>7</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>100.0</u> <u>pH Adj.</u>	<u>A</u>		<u>8</u>																			
	<u>B</u>		<u>8</u>																			
	<u>C</u>		<u>8</u>																			
	<u>D</u>		<u>8</u>																			
	<u>E</u>		<u>8</u>																			
Chemistry Tech prerenewal/postrenewal								<u>CR</u>	<u>CR</u> <u>CR</u>	<u>CR</u>			<u>CR</u>	<u>CR</u> <u>CR</u>	<u>CR</u>			<u>CR</u>	<u>CR</u> <u>CR</u>	<u>CR</u>		

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

**Daphnid Acute Test-48 Hr Survival**

Start Date: 11/9/2015      Test ID: X5881DP      Sample ID: AR0000752/006  
 End Date: 11/11/2015      Lab ID: 880830      Sample Type: EFF2-Industrial  
 Sample Date: 11/7/2015      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	1.0000	1.0000	1.0000	1.0000	0.8750
32	1.0000	0.7500	0.7500	0.6250	0.6250
45	0.8750	0.6250	0.6250	0.7500	1.0000
56	0.7500	0.7500	0.7500	0.5000	1.0000
75	1.0000	0.6250	0.8750	0.6250	0.6250
100	0.8750	0.3750	0.5000	0.6250	0.7500

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	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	16.00
32	0.7500	0.7500	1.0622	0.9117	1.3931	18.545	5	17.50	16.00
45	0.7750	0.7750	1.0946	0.9117	1.3931	18.911	5	17.50	16.00
56	0.7500	0.7500	1.0640	0.7854	1.3931	20.308	5	17.50	16.00
75	0.7500	0.7500	1.0675	0.9117	1.3931	20.890	5	17.50	16.00
*100	0.6250	0.6250	0.9226	0.6591	1.2094	23.386	5	15.00	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution ( $p \leq 0.05$ )	0.91031	0.934	0.60329	-0.1021
Equality of variance cannot be confirmed				
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	75	100	86.6025	1.33333
Treatments vs D-Control				

**Acute Fish Test-48 Hr Survival**

Start Date: 11/7/2015      Test ID: X5881PP      Sample ID: AR0000752/006  
 End Date: 11/9/2015      Lab ID: 880630      Sample Type: EFF2-Industrial  
 Sample Date: 11/7/2015      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	0.8750	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	0.8750
45	1.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	0.8750	1.0000	1.0000	1.0000
75	1.0000	1.0000	0.8750	1.0000	1.0000
100	1.0000	0.8750	1.0000	1.0000	1.0000

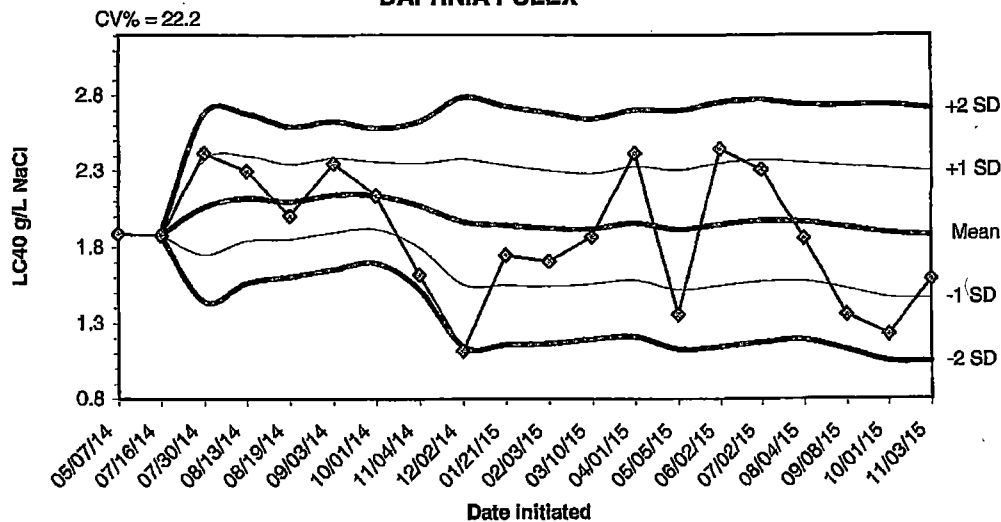
Conc-%	Transform: Arcsin Square Root							Rank Sum	1-Tailed Critical
	Mean	N-Mean	Mean	Min	Max	CV%	N		
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5		
22	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	16.00
32	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	16.00
45	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00
56	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	16.00
75	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	16.00
100	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution ( $p \leq 0.05$ )	0.58602	0.934	-1.8553	1.98977
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**

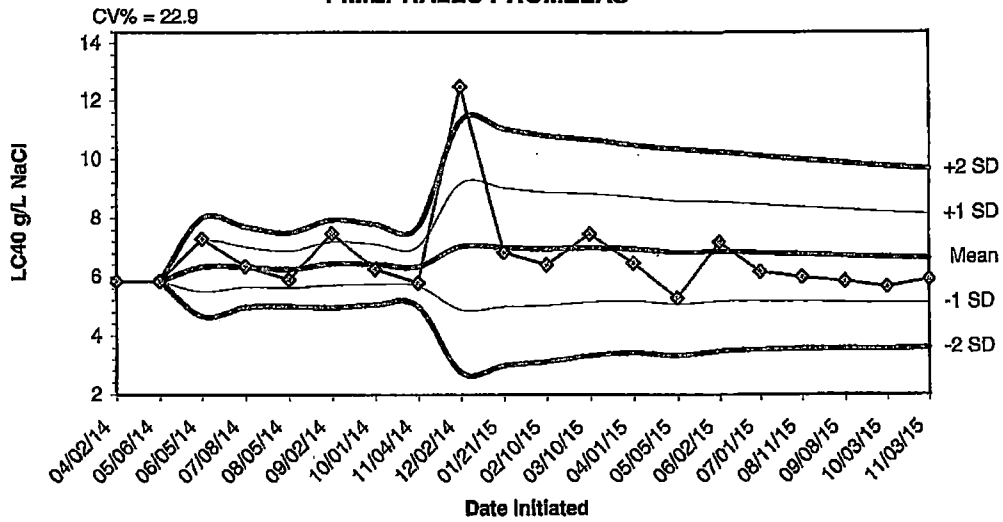


**2015 48-HOUR ACUTE REFERENCE TOXICANT TEST RESULTS USING  
DAPHNIA PULEX**



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
05/07/14	1.8900					
07/16/14	1.8800	1.8850	1.8779	1.8709	1.8921	1.8991
07/30/14	2.4200	2.0633	1.7544	1.4455	2.3723	2.6812
08/13/14	2.3000	2.1225	1.8439	1.5653	2.4011	2.6797
08/19/14	2.0100	2.1000	1.8535	1.6070	2.3465	2.5930
09/03/14	2.3500	2.1417	1.8987	1.6558	2.3846	2.6275
10/01/14	2.1400	2.1414	1.9197	1.6979	2.3632	2.5850
11/04/14	1.6200	2.0763	1.8003	1.5244	2.3522	2.6281
12/02/14	1.1200	1.9700	1.5598	1.1497	2.3802	2.7903
01/21/15	1.7500	1.9480	1.5551	1.1622	2.3409	2.7338
02/03/15	1.7100	1.9264	1.5468	1.1672	2.3059	2.6855
03/10/15	1.8700	1.9217	1.5594	1.1971	2.2840	2.6462
04/01/15	2.4200	1.9600	1.5866	1.2132	2.3334	2.7068
05/05/15	1.3600	1.9171	1.5242	1.1313	2.3101	2.7030
06/02/15	2.4500	1.9527	1.5498	1.1469	2.3555	2.7584
07/02/15	2.3100	1.9750	1.5757	1.1763	2.3743	2.7737
08/04/15	1.8600	1.9682	1.5806	1.1929	2.3559	2.7435
09/08/15	1.3600	1.9344	1.5320	1.1295	2.3369	2.7394
10/01/15	1.2300	1.8974	1.4742	1.0509	2.3206	2.7438
11/03/15	1.5900	1.8820	1.4644	1.0468	2.2996	2.7172

**2015 48-HOUR ACUTE REFERENCE TOXICANT TEST RESULTS USING  
PIMEPHALES PROMELAS**



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
04/02/14	5.8600					
05/06/14	5.8600	5.8600	5.8600	5.8600	5.8600	5.8600
06/05/14	7.3100	6.3433	5.5062	4.6690	7.1805	8.0176
07/08/14	6.3700	6.3500	5.6663	4.9827	7.0337	7.7173
08/05/14	5.9200	6.2640	5.6415	5.0190	6.8865	7.5090
09/02/14	7.4800	6.4667	5.7207	4.9747	7.2126	7.9586
10/01/14	6.2800	6.4400	5.7554	5.0708	7.1246	7.8092
11/04/14	5.8100	6.3613	5.6894	5.0176	7.0331	7.7049
12/02/14	12.5000	7.0433	4.9028	2.7622	9.1839	11.3245
01/21/15	6.8500	7.0240	5.0049	2.9858	9.0431	11.0622
02/10/15	6.4200	6.9691	5.0450	3.1209	8.8932	10.8173
03/10/15	7.4800	7.0117	5.1712	3.3307	8.8521	10.6926
04/01/15	6.4800	6.9708	5.2025	3.4342	8.7391	10.5073
05/05/15	5.2900	6.8507	5.0934	3.3361	8.6080	10.3653
06/02/15	7.2000	6.8740	5.1782	3.4824	8.5698	10.2656
07/01/15	6.1800	6.8306	5.1832	3.5358	8.4781	10.1255
08/11/15	6.0000	6.7818	5.1740	3.5662	8.3896	9.9974
09/08/15	5.8600	6.7306	5.1557	3.5809	8.3054	9.8803
10/03/15	5.6700	6.6747	5.1250	3.5753	8.2244	9.7741
11/03/15	5.9200	6.6370	5.1192	3.6014	8.1548	9.6726

**APPENDIX E**  
**AGENCY FORMS**

**Acute Forms  
Daphnia pulèx Survival**

Permittee: El Dorado Chemical - Outfall 006

NPDES Permit Number: AR0000752/ AFIN 70-00040

Composite Collected      From: 11/06/15      To: 11/07/15  
    From: 11/07/15      To: 11/08/15

Test Initiated: 11/09/15

Dilution Water Used:      Receiving Water      X 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	75.0	100.0	87.5
	B	100.0	100.0	75.0	100.0	75.0	87.5	62.5
	C	100.0	100.0	75.0	100.0	100.0	87.5	100.0
	D	100.0	100.0	62.5	100.0	87.5	62.5	87.5
	E	100.0	87.5	75.0	100.0	100.0	62.5	100.0
48-hour	A	100.0	100.0	100.0	87.5	75.0	100.0	87.5
	B	100.0	100.0	75.0	62.5	75.0	75.0	37.5
	C	100.0	100.0	75.0	62.5	75.0	87.5	50.0
	D	100.0	100.0	62.5	75.0	50.0	62.5	62.5
	E	100.0	87.5	62.5	100.0	100.0	62.5	75.0
	Mean	100.0	97.5	75.0	77.5	75.0	75.0	62.5

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%)      X 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) F

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

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

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

**Biomonitoring  
Daphnia 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, Rose**

**Sample Collected**      **From:**      **Date 11/06/15**      **Time 0415**  
**To:**      **Date 11/07/15**      **Time 0415**  
**Test Begin**      **Date 11/09/15**      **Time 1410**  
**Test End**      **Date 11/11/15**      **Time 1625**

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	8.7	8.7	8.1	25.0	24.9	25.3	44.0				48.0			7.2	7.3	7.3
22.0	8.4	8.5	7.9	24.0	24.9	25.3								7.2	7.2	7.1
32.0	8.4	8.5	7.7	24.0	24.9	25.3								7.2	7.2	7.1
45.0	8.3	8.4	7.7	24.0	24.9	25.3								7.2	7.2	7.0
56.0	8.2	8.3	7.7	24.0	24.9	25.3								7.2	7.2	7.0
75.0	8.1	8.2	7.7	24.0	24.9	25.3								7.2	7.2	6.9
100.0	7.9	8.0	7.5	24.0	24.9	25.3	36.0	28.0			132.0	64.0		7.2	7.1	6.9

\*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: 11/06/15**      **To: 11/07/15**  
    **From: 11/07/15**      **To: 11/08/15**

**Test Initiated: 11/07/15**

**Dilution Water Used:**      **Receiving Water**      **X 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	87.5	100.0	100.0	87.5	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	87.5	100.0	100.0	87.5	100.0	87.5
	C	100.0	100.0	100.0	100.0	100.0	87.5	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	100.0	100.0
	Mean	100.0	97.5	97.5	100.0	97.5	97.5	97.5

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

- a.) **LOW FLOW OR CRITICAL DILUTION (100.0%)**      YES      X NO  
 b.) **½ 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  
Fathead minnow 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, Rose  
 Sample Collected

From:           Date 11/06/15   Time 0415  
 To:             Date 11/07/15   Time 0415  
                   Date 11/07/15   Time 1307  
                   Date 11/09/15   Time 1602

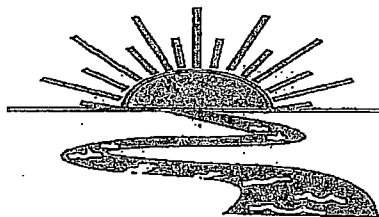
Test Begin  
 Test End

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		8.5	8.8	8.0	25.0	25.0	25.0	44.0			48.0			7.3	7.1	7.1
22.0		8.3	8.4	7.9	25.0	25.0	25.0							7.3	7.1	7.1
32.0		8.2	8.2	7.8	25.0	25.0	25.0							7.3	7.1	7.1
45.0		8.1	8.0	7.8	25.0	25.0	25.0							7.3	7.1	7.0
56.0		8.0	7.9	7.7	25.0	25.0	25.0							7.3	7.1	7.0
75.0		7.8	8.0	7.7	25.0	25.0	25.0							7.3	6.9	7.0
100.0		7.6	8.1	7.5	25.0	25.0	25.0	36.0	28.0		132.0	64.0		7.2	6.8	7.0

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

## REPORT QUALITY ASSURANCE FORM

Client: X 5881

Project#: E1 Dorado Chemical /006

Chain of Custody Documents Checked by: RC 11/13/15  
Technician/Date

Raw Data Documents Checked by: RC 11/13/15  
Technician/Date

Statistical Analysis Package Checked by: EOB 11/10/15  
Quality Manager/Date

Quality Control Data Checked by: EOB 11/10/15  
Quality Manager/Date

Report Checked by: EOB 11/23/15  
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.

Kevin S. Braapp, BS  
Quality Manager

11/23/15  
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) 863-1403  
DAVID SARTAIN  
EL DORADO CHEMICAL COMPANY  
4500 NW AVE

SHIP DATE: 23DEC15  
ACTWGT: 5.00 LB  
CAD: 5887030/INET3670

EL DORADO, AR 71730  
UNITED STATES US

BILL SENDER

TO **WATER ENFORCEMENT BRANCH**  
**ADEQ**  
**5301 NORTSHORE DR**

**NORTH LITTLE ROCK AR 72118**

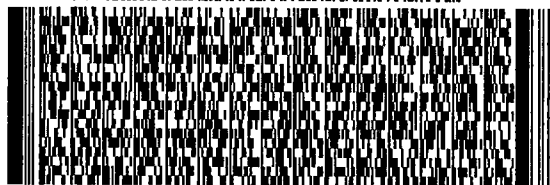
(870) 863-1484

REF:

INV:

PO:

DEPT:



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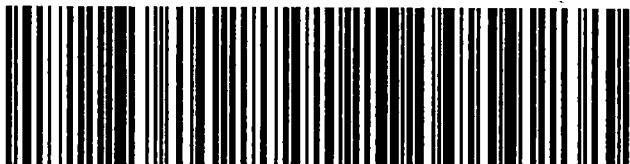
**THU - 24 DEC 10:30A**  
**PRIORITY OVERNIGHT**

TRK#  
0201

**7752 8349 9500**

**X2 LITA**

**72118**  
**AR-US LIT**



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