

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X5789

Bio-Analytical Laboratories' Executive Summary

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

Project #: X5789

Outfall: Outfall 007 (contaminated storm water)

Permit #: AR0000752/ AFIN #70-00040

Contact: Mr. David Sartain

Test Dates: July 5 - 7, 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*:

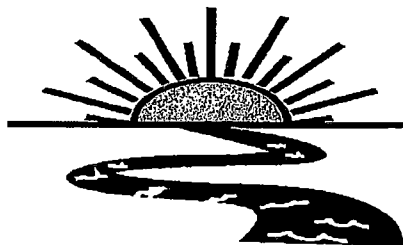
1. If the NOEC for survival is less than the critical dilution (100.0%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM6C- 0- **Pass**.
2. Report the NOEC for survival, Parameter TOM6C - 100.0%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM6C - 12.12%.

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 - 26.28%.

Note: Due to the lack of available neonates less than 24 hours old, only the control and the 100% effluent dilution was set up in this test.

This report contains a total of 31 pages, including this page. The results pertain only to the samples listed in the chain of custody documents in Appendix A. The information contained within meets the requirements set forth by ADEQ. The chemical data in this report is for monitoring purposes only and should not be reported on discharge monitoring reports.



Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023

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

**THE RESULTS OF TWO 48-HOUR ACUTE
TOXICITY TESTS
FOR OUTFALL 007
AT**

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

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

EPA Methods 2000.0 and 2021.0

Project X5789

**Test Dates: July 5 - 7, 2015
Report Date: July 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 X5789

TABLE OF CONTENTS

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

BAL
ADEQ #88-0630
Project X5789

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, 20th Edition" (APHA 1998. Chemical results using this edition are listed in the report as SM 1997), and BAL's standard operating procedures.

2.2 Test Organisms

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

BAL
ADEQ #88-0630
Project X5789

2.3 Dilution Water

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

2.4 Test Concentrations

The test concentrations used in the fathead minnow test were 100.0, 75.0, 56.0, 50.0, 45.0 and 32.0 percent effluent and a reconstituted water control. Due to lack of available neonates, the test concentrations used in the *Daphnia pulex* test were 100.0 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 007 was collected by El Dorado Chemical personnel on July 4, 2015, at 1230 hours. Upon completion of collection, the sample was packed in ice and personally delivered to the laboratory. The temperature upon arrival was 2.8^o Celsius.

2.6 Sample Preparation

Upon arrival, the sample was logged in, given an identification number and refrigerated unless needed. Prior to use, the sample was warmed to 25±1^o Celsius. The total residual chlorine level (SM4500-Cl D 1997) was measured with a Capital Controls^R amperometric titrator and recorded if present. The total ammonia level was measured using a HACH^R test strip. Dissolved oxygen (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^R dual controlled illuminated incubator at a temperature of 25±1^o Celsius. An AEMC^R data logger was used to monitor diurnal temperature throughout the testing period. Light cycle and intensity were recorded twice a month.

2.8 Data Analysis

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

BAL
ADEQ #88-0630
Project X5789

3.0 Results and Discussion

The results of the tests can be found in Table 1. Significant differences in survival were not noted in the critical dilution in either test after 48 hours of exposure ($p=.05$). The NOEC value for both tests was 100.0 percent effluent ($p=.05$). 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>
Test Organism	<i>Pimephales promelas</i>	<i>Daphnia pulex</i>
Control	92.5	100.0
22.0	97.5	-----
32.0	97.5	-----
45.0	97.5	-----
56.0	100.0	-----
75.0	97.5	-----
100.0	95.0	85.0

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

BAL
ADEQ #88-0630
Project X5789

4.0 Conclusions

The sample of Outfall 007 collected from El Dorado Chemical Company, El Dorado, Arkansas, on July 4, 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 ($p=.05$).

BAL
ADEQ #88-0630
Project X5789

5.0 References

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

APPENDIX A
CHAIN-OF-CUSTODY DOCUMENTS



Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 627
Doyline, LA 71023

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

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

Laboratory Use Only:

Company: El Dorado Chemical Company		Phone: (870) 863-1484		Analysis:					Project Number: 15789 Temp. upon arrival: 2.8°C Therm 29 EGB 7/4/15 Preservative: (below) ICE							
Address: 4500 Norwest Ave., El Dorado, AR 71731		Fax: (870) 863-7499		Chronic Ceriodaphnia	Chronic minnow	Acute minnow (fresh/marine)	Acute Daphnia species	Acute Mysid		Acute Ceriodaphnia	Fecal Coliform					
Permit #: AR0000752/AFIN 70-00040		Purchase Order:														
Sampler's Signature/Printed Name/Affiliation: Edward L Pearson / Edward L Pearson / @ EDC																
Date Start Date End	Time Start Time End	C	G						# and type of container			Sample Identification		Lab Control Number:		
07-04-15 07-04-15	0830 1230	✓	-	6 half gallons	007		C11179									
Relinquished by/Affiliation: Edward L Pearson				Date: 07-04-15	Time: 1400	Received by/Affiliation: C. J. Bupp			Date: 7/4/15	Time: 1400						
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:			Date:	Time:						
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:			Date:	Time:						
Method of Shipment: <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Bus <input type="checkbox"/> Fed Ex <input type="checkbox"/> DHL <input type="checkbox"/> UPS <input checked="" type="checkbox"/> Client <input type="checkbox"/> Other Tracking # _____																
Comments: RC 7/16/15																
COC Rev. 3.0																

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X5789

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 7/5/15 Time 1130

Test terminated: Date 7/7/15 Time 1145

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
<u>C1179</u>	<u>8.2</u> <u>99.5%</u>	<u>No/EGB</u>	<u><0.01</u>	<u>NO</u>	<u>0.25</u>	<u>N/A</u>	<u>208.0</u>	<u>20.0</u>	<u>EGB</u>
	<u>8H</u> <u>10.1%</u>	<u>✓ 10/8.1</u> <u>0.32/CR</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </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	Hardness	Alkalinity	Tech
<u>Soft H2O</u>	<u>3745</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>7.0</u>	<u>48.0</u>	<u>28.0</u>	<u>EGB</u>
<u>↓</u>	<u>3749</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>7.6</u>	<u>56.0</u>	<u>246</u>	<u>CR</u>

Test Species Information

Test Species Info.	Species: <u>P. promelas</u> ID#: <u>065815</u>	Species: <u>D. pulex</u> ID#: <u>061050</u>	Species: ID#:	Species: ID#:
Age	<u>7 days</u>	<u><24 hours</u>		
Test Container Size	<u>250 ml</u>	<u>30.0 ml</u>		
Test volume	<u>200 ml</u>	<u>25.0 ml</u>		
Feeding: Type	<u>Artemia YCT/Algae</u>			
Amount	<u>2.0 hours before initiation</u>			
Aeration? Amount	<u>N/A</u>			
Condition of survivors	<u>good 7/7/15</u> <u>CR</u>			

Comments: Due to lack of available neonates, only control and 100% dilutions were set up in the D. pulex test. EGB 7/5/15

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

Project# X5789

Test started: Date 7/5/15 Time 1130

Client EDCC

Test ended: Date 7/7/15 Time 1050

Sample Description 007

Test Species D. pulex ID# 00-50

Technician: 0hour EBB 24hour CR 48hour CR 72hour _____ 96hour _____

Time: 0hour 1130 24hour 1412 48hour 1050 72hour _____ 96hour _____

Temperature (°C): 0hour 25.5 24hour 26.5 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
0%		N/A																				
0 _{50%}	A	}	8	8	8			8.0	8.1	8.3	8.1		7.3	7.4	7.4		167.8	233	191.4			
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
EC 0/1/15	E		8	8	8																	
32.0	A	}	8					8.0					7.1				295					
	B		8																			
	C		8																			
	D		8																			
	E		8																			
Chemistry Tech prerenewal/postrenewal								EBB	CR	CR			EBB	CR	CR		EBB	CR	CR			

VOID
EBB 7/5/15

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

Project# X5789

Test started: Date 7/5/15 Time 1130

Client EDCC

Test ended: Date 7/7/15 Time 1050

Sample Description 007

Test Species D. pulex ID# 00-50

Technician: Ohour ECB 24hour CR 48hour CR 72hour _____ 96hour _____
 Time: Ohour 1130 24hour 1412 48hour 1050 72hour _____ 96hour _____
 Temperature (°C): Ohour 25.5 24hour 25.5 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	
		N/A																					
100.0	A	}	8	8	3			8.0	8.0	8.0			6.7	7.4	7.3			546	567	597			
	B		8	6	6																		
	C		8	8	6																		
	D		8	6	6																		
	E		8	8	7																		
pH adj 100.0	A	}	8																				
	B		8																				
	C		8																				
	D		8																				
	E		8																				
Chemistry Tech prerenewal/postrenewal								ECB	CR	CR			ECB	CR	CR			ECB	CR	CR			

VOLTD
ECB 7/5/15

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

Project# X5789

Test started: Date 7/5/15 Time 1040

Client EDCC

Test ended: Date 7/7/15 Time 1145

Sample Description 007

Test Species P. promelas ID# 062815

Technician: 0hour EB 24hour CR 48hour CR 72hour _____ 96hour _____

Time: 0hour 1040 24hour 1450 48hour 1145 72hour _____ 96hour _____

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

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0%		N/A																				
0 SAFE	A	}	8	8	8			8.0	7.8 7.3	7.9			7.3	7.2 7.4	7.2			167.8	188.5 173.7	181.8		
	B		8	8	8																	
	C		8	8	8																	
	D		8	7	7																	
EC 0/1/15 ♀	E		8	6	6																	
32.0	A	}	8	8	8			8.0	7.8 8.1	7.8			7.1	7.2 7.2	7.2			295	312 299	309		
	B		8	8	8																	
	C		8	7	7																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal			EB CR CR CA					EB CR CR CR					EB CR CR CR									

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

Project# X5789

Test started: Date 7/5/15 Time 1040

Client EDCC

Test ended: Date 7/7/15 Time 1145

Sample Description 007

Test Species P. promelas ID# 062815

Technician: Ohour ELB 24hour CR 48hour CR 72hour _____ 96hour _____

Time: Ohour 1040 24hour 1450 48hour 1145 72hour _____ 96hour _____

Temperature (°C): Ohour 24.9 24hour 24.9 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>8.0</u>	<u>7.7</u>	<u>7.7</u>			<u>7.0</u>	<u>7.2</u>	<u>7.2</u>			<u>345</u>	<u>362</u>	<u>365</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>7</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>7</u>			<u>8.0</u>	<u>7.7</u>	<u>7.7</u>			<u>6.9</u>	<u>7.2</u>	<u>7.2</u>			<u>365</u>	<u>366</u>	<u>381</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>ELB</u> <u>CR</u> <u>CR</u>					<u>ELB</u> <u>CR</u> <u>CR</u>					<u>ELB</u> <u>CR</u> <u>CR</u>				

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

Project# X5789

Test started: Date 7/5/15 Time 1040

Client EDCC

Test ended: Date 7/7/15 Time 1145

Sample Description 007

Test Species P. promelas ID# 062815

Technician: Ohour ELB 24hour CR 48hour CR 72hour _____ 96hour _____

Time: Ohour 1040 24hour 1450 48hour 1145 72hour _____ 96hour _____

Temperature (°C): Ohour 24.9 24hour 24.9 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>56.0</u>	<u>A</u>	<u>(</u>	<u>8</u>	<u>8</u>	<u>8</u>			<u>7.7</u>	<u>7.7</u>	<u>7.7</u>			<u>6.9</u>	<u>7.2</u>	<u>7.2</u>			<u>382</u>	<u>401</u>	<u>408</u>		
	<u>B</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
	<u>C</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
	<u>D</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
	<u>E</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
<u>75.0</u>	<u>A</u>	<u>)</u>	<u>8</u>	<u>8</u>	<u>8</u>			<u>8.0</u>	<u>7.4</u>	<u>7.4</u>			<u>6.8</u>	<u>7.2</u>	<u>7.2</u>			<u>460</u>	<u>474</u>	<u>475</u>		
	<u>B</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
	<u>C</u>		<u>8</u>	<u>8</u>	<u>7</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>ELB</u> <u>CR</u> <u>CR</u>					<u>ELB</u> <u>CR</u> <u>CR</u>					<u>ELB</u> <u>CR</u> <u>CR</u>									

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

Project# X5789

Test started: Date 7/5/15 Time 1040

Client EDCC

Test ended: Date 7/7/15 Time 1145

Sample Description 007

Test Species P. promelas ID# 060815

Technician: 0hour EGS 24hour CR 48hour CR 72hour _____ 96hour _____

Time: 0hour 1040 24hour 1450 48hour 1145 72hour _____ 96hour _____

Temperature (°C): 0hour 24.9 24hour 24.9 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>N/A</u>																				
<u>100.0</u>	<u>A</u>		<u>8</u>	<u>6</u>	<u>6</u>			<u>8.0</u>	<u>7.6</u>	<u>7.6</u>			<u>6.7</u>	<u>7.1</u>	<u>7.2</u>			<u>546</u>	<u>560</u>	<u>557</u>	<u>572</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>pH 005</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>EGS</u>	<u>CR</u>	<u>CR</u>			<u>EGS</u>	<u>CR</u>	<u>CR</u>			<u>EGS</u>	<u>CR</u>	<u>CR</u>		

VOID
EGS 7/5/15

APPENDIX C
STATISTICAL ANALYSES

Daphnid Acute Test-48 Hr Survival

Start Date: 7/5/2015 Test ID: X5789DP Sample ID: AR0000752-007
 End Date: 7/7/2015 Lab ID: ADEQ880630 Sample Type: EFF2-Industrial
 Sample Date: 7/4/2015 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
100	0.3750	1.0000	1.0000	1.0000	0.8750

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root				N	Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%			
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	22.50	19.00
100	0.8500	0.8500	1.2095	0.6591	1.3931	26.278	5		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.67171	0.842	-2.1645	5.97129
Equality of variance cannot be confirmed				
Hypothesis Test (1-tail, 0.05)				
Wilcoxon Two-Sample Test indicates no significant differences				
Treatments vs D-Control				

ECB
7/16/15

Acute Fish Test-48 Hr Survival

Start Date: 7/5/2015 Test ID: X5789PP Sample ID: AR0000752-007
 End Date: 7/7/2015 Lab ID: ADEQ880630 Sample Type: EFF2-Industrial
 Sample Date: 7/4/2015 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	0.7500
32	1.0000	1.0000	0.8750	1.0000	1.0000
45	1.0000	1.0000	1.0000	0.8750	1.0000
50	0.8750	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	1.0000	1.0000	1.0000
75	1.0000	1.0000	0.8750	1.0000	1.0000
100	0.7500	1.0000	1.0000	1.0000	1.0000

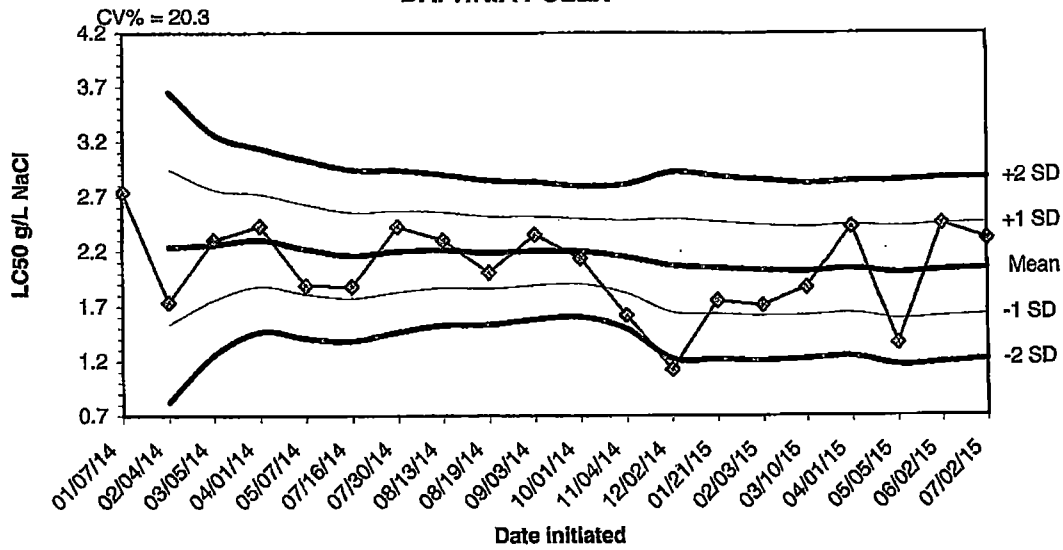
Conc-%	Mean	N-Mean	Transform: Arcsin Square Root				N	Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%			
D-Control	0.9250	1.0000	1.2872	1.0472	1.3931	12.116	5		
32	0.9750	1.0541	1.3564	1.2094	1.3931	6.055	5	30.50	16.00
45	0.9750	1.0541	1.3564	1.2094	1.3931	6.055	5	30.50	16.00
50	0.9750	1.0541	1.3564	1.2094	1.3931	6.055	5	30.50	16.00
56	1.0000	1.0811	1.3931	1.3931	1.3931	0.000	5	32.50	16.00
75	0.9750	1.0541	1.3564	1.2094	1.3931	6.055	5	30.50	16.00
100	0.9500	1.0270	1.3239	1.0472	1.3931	11.684	5	29.50	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.76406	0.934	-1.5915	1.90259
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				

EGB
7/11/15

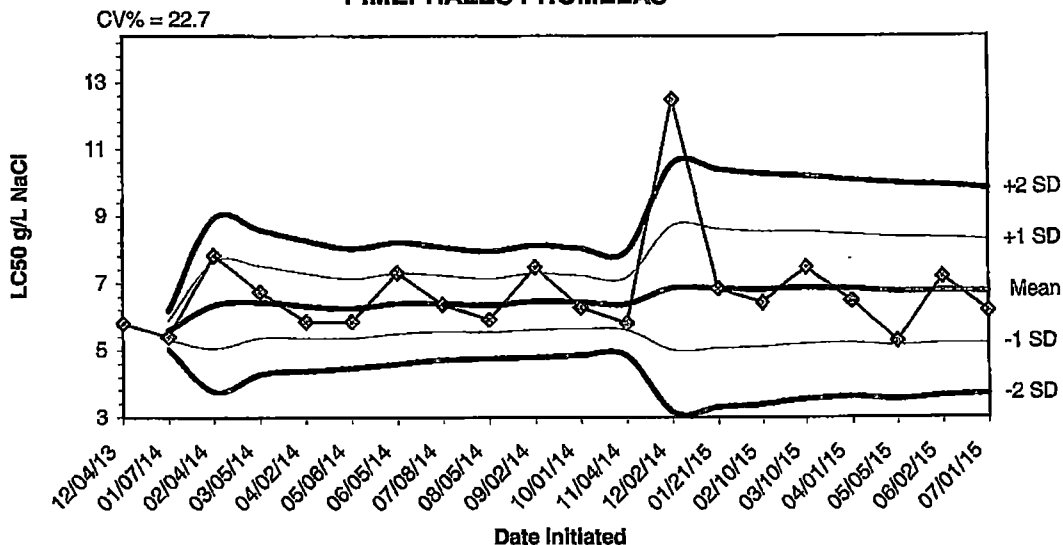
APPENDIX D
QUALITY ASSURANCE CHARTS

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



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
01/07/14	2.7400					
02/04/14	1.7400	2.2400	1.5329	0.8258	2.9471	3.6542
03/05/14	2.3000	2.2600	1.7588	1.2576	2.7612	3.2624
04/01/14	2.4300	2.3025	1.8845	1.4666	2.7205	3.1384
05/07/14	1.8900	2.2200	1.8137	1.4075	2.6263	3.0325
07/16/14	1.8800	2.1633	1.7744	1.3854	2.5523	2.9413
07/30/14	2.4200	2.2000	1.8319	1.4638	2.5681	2.9362
08/13/14	2.3000	2.2125	1.8699	1.5272	2.5551	2.8978
08/19/14	2.0100	2.1900	1.8625	1.5349	2.5175	2.8451
09/03/14	2.3500	2.2060	1.8931	1.5802	2.5189	2.8318
10/01/14	2.1400	2.2000	1.9025	1.6050	2.4975	2.7950
11/04/14	1.6200	2.1517	1.8223	1.4929	2.4811	2.8105
12/02/14	1.1200	2.0723	1.6465	1.2206	2.4981	2.9240
01/21/15	1.7500	2.0493	1.6312	1.2131	2.4674	2.8855
02/03/15	1.7100	2.0267	1.6144	1.2021	2.4390	2.8513
03/10/15	1.8700	2.0169	1.6166	1.2164	2.4171	2.8174
04/01/15	2.4200	2.0406	1.6409	1.2412	2.4403	2.8399
05/05/15	1.3600	2.0028	1.5832	1.1635	2.4224	2.8420
06/02/15	2.4500	2.0263	1.6058	1.1853	2.4468	2.8673
07/02/15	2.3100	2.0405	1.6263	1.2121	2.4547	2.8689

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



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
12/04/13	5.8100					
01/07/14	5.4000	5.6050	5.3151	5.0252	5.8949	6.1848
02/04/14	7.8200	6.3433	5.0482	3.7530	7.6385	8.9336
03/05/14	6.7500	6.4450	5.3681	4.2913	7.5219	8.5987
04/02/14	5.8600	6.3280	5.3594	4.3908	7.2966	8.2652
05/06/14	5.8600	6.2500	5.3628	4.4757	7.1372	8.0243
06/05/14	7.3100	6.4014	5.4979	4.5944	7.3050	8.2085
07/08/14	6.3700	6.3975	5.5609	4.7243	7.2341	8.0707
08/05/14	5.9200	6.3444	5.5459	4.7473	7.1430	7.9416
09/02/14	7.4800	6.4580	5.6238	4.7897	7.2922	8.1263
10/01/14	6.2800	6.4418	5.6486	4.8555	7.2350	8.0282
11/04/14	5.8100	6.3892	5.6112	4.8333	7.1671	7.9450
12/02/14	12.5000	6.8592	5.0079	3.1567	8.7105	10.5618
01/21/15	6.8500	6.8586	5.0799	3.3013	8.6372	10.4159
02/10/15	6.4200	6.8293	5.1116	3.3940	8.5470	10.2647
03/10/15	7.4800	6.8700	5.2026	3.5352	8.5374	10.2048
04/01/15	6.4800	6.8471	5.2298	3.6126	8.4643	10.0815
05/05/15	5.2900	6.7606	5.1493	3.5380	8.3718	9.9831
06/02/15	7.2000	6.7837	5.2146	3.6454	8.3528	9.9220
07/01/15	6.1800	6.7535	5.2203	3.6870	8.2867	9.8200

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: 7/04/15

To: 7/04/15

From:

To:

Test Initiated: 7/05/15

Dilution Water Used:

Receiving Water

X Reconstituted Water

Dilution Series Results - Percent Survival

TIME OF READING	REP	0	100.0					
24-hour	A	100.0	100.0					
	B	100.0	100.0					
	C	100.0	100.0					
	D	100.0	100.0					
	E	100.0	100.0					
48-hour	A	100.0	37.5					
	B	100.0	100.0					
	C	100.0	100.0					
	D	100.0	100.0					
	E	100.0	87.5					
	Mean	100.0	85.0					

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

- a.) **LOW FLOW OR CRITICAL DILUTION (100.0%)** YES X NO
b.) **½ LOW FLOW OR 2X CRITICAL DILUTION (N/A %)** YES NO

2. Enter percent effluent corresponding to the LC₅₀ below:

LC₅₀ = N/A % effluent

95 % confidence limits: N/A

Method of LC₅₀ calculation: N/A

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

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

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

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

**Biomonitoring
Daphnia 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, Rose

Sample Collected From: Date 7/04/15 Time 0800
 To: Date 7/04/15 Time 1230
 Test Begin Date 7/05/15 Time 1130
 Test End Date 7/07/15 Time 1050

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		8.0	8.3	8.1	25.5	25.5	25.5	28.0	24.0		48.0	56.0		7.3	7.4	7.4
100.0		8.0	7.9	8.0	25.5	25.5	25.5	20.0			208.0			6.7	7.2	7.3

*This Form is to be submitted with each DMR.
 Alkalinity and Hardness tested on control and unadjusted effluent. Alkalinity and hardness to be reported as mg/l CaCO₃.

Acute Forms
Pimephales promelas Survival

Permittee: El Dorado Chemical - Outfall 007

NPDES Permit Number: AR0000752/ AFIN 70-00040

Composite Collected

From: 7/04/15

To: 7/04/15

From:

To:

Test Initiated: 7/05/15

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	75.0
	B	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	C	100.0	87.5	100.0	100.0	100.0	100.0	100.0
	D	87.5	100.0	100.0	100.0	100.0	100.0	100.0
	E	75.0	100.0	100.0	100.0	100.0	100.0	100.0
48-hour	A	100.0	100.0	100.0	87.5	100.0	100.0	75.0
	B	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	C	100.0	87.5	100.0	100.0	100.0	87.5	100.0
	D	87.5	100.0	87.5	100.0	100.0	100.0	100.0
	E	75.0	100.0	100.0	100.0	100.0	100.0	100.0
	Mean	92.5	97.5	97.5	97.5	97.5	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.) **½ LOW FLOW OR 2X CRITICAL DILUTION (N/A%)** YES NO

2. Enter percent effluent corresponding to the LC₅₀ below:

LC₅₀ = N/A% effluent

95 % confidence limits: N/A

Method of LC₅₀ calculation: N/A

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

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

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

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

**Biomonitoring
Pimephales promelas 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, Rose**

**Sample Collected From: Date 7/04/15 Time 0800
 To: Date 7/04/15 Time 1230
Test Begin Date 7/05/15 Time 1040
Test End Date 7/07/15 Time 1145**

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		8.0	8.3	7.9	24.9	24.9	24.9	28.0	24.0		48.0	56.0		7.3	7.4	7.2
32.0		8.0	8.1	7.8	24.9	24.9	24.9							7.1	7.2	7.2
45.0		8.0	8.1	7.7	24.9	24.9	24.9							7.0	7.2	7.2
50.0		8.0	8.1	7.7	24.9	24.9	24.9							6.9	7.2	7.2
56.0		7.7	8.0	7.7	24.9	24.9	24.9							6.9	7.2	7.2
75.0		8.0	8.0	7.6	24.9	24.9	24.9							6.8	7.2	7.2
100.0		8.0	7.9	7.6	24.9	24.9	24.9	20.0			208.0			6.7	7.2	7.2

*This Form is to be submitted with each DMR.

Alkalinity and Hardness tested on control and unadjusted effluent. Alkalinity and hardness to be reported as mg/l CaCO₃.

APPENDIX F
REPORT QUALITY ASSURANCE FORM



Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023

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

REPORT QUALITY ASSURANCE FORM

Client: EI Dorado Chemical - 007

Project#: X5789

Chain of Custody Documents Checked by: RC 7/16/15
Technician/Date

Raw Data Documents Checked by: RC 7/16/15
Technician/Date

Statistical Analysis Package Checked by: EGB 7/16/15
Quality Manager/Date

Quality Control Data Checked by: EGB 7/16/15
Quality Manager/Date

Report Checked by: EGB 7/16/15
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 H. Baggett BS 7/16/15
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.

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

SHIP DATE: 24AUG15
ACTWGT: 2.00 LB
CAD: 5887030/NET3670

ELDORADO, AR 71730
UNITED STATES US

BILL SENDER

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

NORTH LITTLE ROCK AR 72118

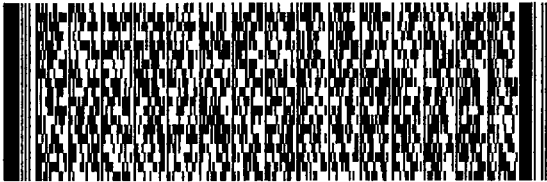
(870) 863-1484

REF:

INV:
PO:

DEPT:

538.U/FECAG1.D0



FedEx
Express



J18201 6002631ur

TUE - 25 AUG 10:30A
PRIORITY OVERNIGHT

TRK#
0201 **7743 4884 6074**

X2 LITA

72118
AR-US **LIT**

