



CHEMICAL COMPANY

March 23, 2016

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

RE: NPDES Permit AR0000752 Discharge Monitoring Report for period ending February 29, 2016.

Enclosed you will find the Discharge Monitoring Reports ending February 29, 2016.

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

Sincerely,

A handwritten signature in cursive script that reads "Edward L. Pearson". The signature is written in black ink and includes a long horizontal flourish at the end.

Edward L Pearson

Environmental Technician

Enclosures

NON-COMPLIANCE REPORT

Facility Name: **El Dorado Chemical Company**

Permit Number: **AR0000752**

AFIN:

70-00040

Month / Year: **Feb-16**

Type of Violation	Permit Limit	Date of Violation	Cause of Violation	Corrective Action or Other Narrative
Outfall 006 / Lead Monthly Average(22ug/L)	3.8 ug/L Monthly Average	2/15/2016	Unknown	EDCC has applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006 / Lead Daily Max. (22ug/L)	7.62 ug/L Daily Max.	2/15/2016	Unknown	EDCC has applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006/ Zinc Monthly Average (590ug/L)	115.62 ug/L Monthly Average	2/15/2016	Unknown	EDCC has applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 006/ Zinc Daily Max.(590 ug/L)	231.99 ug/L Daily Max.	2/15/2016	Unknown	EDCC has applied pelletized lime in the area of outfall 006 in an effort to promote vegetative cover.
Outfall 007 / Lead Monthly Average(8.8ug/L)	3.8 ug/L Monthly Average	2/15/2016	Unknown	EDCC has applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.
Outfall 007 / Lead Daily Max. (8.8ug/L)	7.62 ug/L Daily Max.	2/15/2016	Unknown	EDCC has applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.
Outfall 007/ Zinc Monthly Average (180ug/L)	115.62 ug/L Monthly Average	2/15/2016	Unknown	EDCC has applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.
Outfall 007 / TDS Monthly Average (510 mg/L)	291 mg/L Monthly Average	2/15/2016	Unknown	EDCC has applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.
Outfall 007/ TDS Daily Max.(510 mg/L)	436.5 mg/L Daily Max	2/15/2016	Unknown	EDCC has applied pelletized lime in the area of outfall 007 in an effort to promote vegetative cover.
<p>I CERTIFY THAT UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM WITH THE INFORMATION SUBMITTED HEREIN; AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 U.S.C 1001 AND 33 U.S.C. 1319. (Penalties under these statutes may include fines up to \$10,000 and or maximum imprisonment of between 6 months and 5 years.)</p>				<p style="text-align: center;"><i>Kelly J. Jester</i> 3-21-16</p> <p>Signature / Date</p>

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X5960

Bio-Analytical Laboratories' Executive Summary

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

Project #: X5960

Outfall: Outfall 006 (contaminated storm water)

Permit #: AR0000752/ AFIN #70-00040

Contact: Mr. Eddie Pearson

Test Dates: January 8 - 10, 2016

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

Results:

For *Pimephales promelas*:

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

For *Daphnia pulex*:

1. If the NOEC for survival is less than the critical dilution (100.0%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D- 0- **Pass**.
2. Report the NOEC for survival, Parameter TOM3D -100.0%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM3D - 12.12%.

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



Bio-Analytical Laboratories

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

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

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

EPA Methods 2000.0 and 2021.0

Project X5960

**Test Dates: February 16 - 18, 2016
Report Date: March 3, 2016**

Prepared for:
Mr. Eddie Pearson
El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731

Prepared by:
Ginger Briggs
Bio-Analytical Laboratories
P.O. Box 527
Doyline, LA 71023
ADEQ #88-0630

BAL
ADEQ #88-0630
Project X5960

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BAL
ADEQ #88-0630
Project X5960

1.0 Introduction

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

2.0 Methods and Materials

2.1 Test Methods

All methods followed were according to the latest edition of "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms" (EPA-821-R-02-012), "Standard Methods for The Examination of Water and Wastewater. 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 originally obtained from Aquatic Biosystems, Fort Collins, Colorado (ABS) and were approximately two days old at test initiation. The minnows were acclimated to dilution water hardness prior to testing. The *Daphnia pulex* test organisms were 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 X5960

2.3 Dilution Water

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

2.4 Test Concentrations

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

2.5 Sample Collection

One sample of Outfall 006 were collected by El Dorado Chemical personnel on February 15, 2016 at 1400 hours. Upon completion of collection, the sample was packed in ice and delivered to the laboratory by BAL personnel. The temperature upon arrival was -1.6° 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 E 1997) was measured in milligrams/Liter (mg/L) with a Capital Controls^R amperometric titrator and recorded if present. The total ammonia level was measured in mg/L using a HACH^R test strip. Dissolved oxygen (SM4500-O G 1997), pH (SM4500-H+ B 1997) and conductivity (SM2510-B 1997) measurements (in mg/L, standard units and umhos/cm, respectively) were taken on the control and each test concentration at test initiation, at each renewal and at test termination. Alkalinity (SM2320-B 1997) and hardness (SM2340-C 1997) levels were measured in mg/L as CaCO₃ on the control and the highest effluent concentration.

2.7 Monitoring of the Tests

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

2.8 Data Analysis

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

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ADEQ #88-0630
Project X5960

3.0 Results and Discussion

The results of the tests can be found in Table 1. Significant differences in survival were not noted in the critical dilution in either test after 48 hours of exposure ($p=.05$). The NOEC value for the fathead and *Daphnia pulex* tests was 100.0 percent effluent ($p=.05$). The 48-hour LC_{50} values could not be calculated in either test because greater than 50.0 percent survival occurred in each effluent concentration.

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

Percent Effluent	Percent Survival	
	<i>Pimephales promelas</i>	<i>Daphnia pulex</i>
Control	100.0	92.5
22.0	100.0	95.0
32.0	97.5	97.5
45.0	100.0	87.5
56.0	100.0	95.0
75.0	97.5	95.0
100.0	100.0	95.0

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

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ADEQ #88-0630
Project X5960

4.0 Conclusions

The sample of Outfall 006 collected from El Dorado Chemical Company, El Dorado, Arkansas, on February 15, 2016, were not found to be lethally toxic to the fathead minnow test organisms nor the *Daphnia pulex* test organisms in the 100.0 percent critical dilution after 48 hours of exposure ($p=.05$). The 48-hour LC_{50} values could not be calculated because greater than 50.0 percent survival occurred in the effluent dilutions ($p=.05$).

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ADEQ #88-0630
Project X5960

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

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

Laboratory Use Only:

Company: El Dorado Chemical Company		Phone: (870) 863-1484		Analysis:				Project Number: X5960 Temp. upon arrival: -1.6°C 29 E602/16/16 Preservative: (below)
Address: 4500 Norwest Ave., El Dorado, AR 71731		Fax: (870) 863-7499		Chronic Ceriodaphnia Chronic minnow Acute minnow (fresh/marine) Acute Daphnia species Acute Mysid Acute Ceriodaphnia Fecal Coliform	Lab Control Number:			
Permit #: AR0000752/AFIN 70-00040		Purchase Order:						
Sampler's Signature/Printed Name/Affiliation: Edward Sheu / EDORADO CHEMICAL COMPANY / EDCC								
Date Start Date End	Time Start Time End	C	G			# and type of container	Sample Identification	C12000 TCE
2-15-16 - 2-15-16	1005AM - 1400	✓		6 half gallons	006			
Relinquished by/Affiliation: Edward Sheu / EDCC				Date: 02-16-16	Time: 1000	Received by/Affiliation: J. B. J.	Date: 2-16-16	Time: 1000
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:	Date:	Time:
Relinquished by/Affiliation: J. B. J.				Date: 2-16-16	Time: 1150	Received by/Affiliation: C. J. B. B. B.	Date: 2/16/16	Time: 1150
Method of Shipment: <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Bus <input type="checkbox"/> Fed Ex <input type="checkbox"/> DHL <input type="checkbox"/> UPS <input type="checkbox"/> Client <input type="checkbox"/> Other Tracking # _____								
Comments:								
COC Rev. 3.0								

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X5960

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 2/10/10 Time 1523

Test terminated: Date 2/18/10 Time 1541

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
C12060	10.0 / 119.5%	7/12/8.3 / 98.9%	2001	NO	6.0	N/A	100% / 60.0	100% / 24.0	EGB
↓	9.4 / 112.0%	7/18/8.1 / 96.3%	↓	↓	↓	↓	↓	↓	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	3826	N/A	N/A	N/A	N/A	7.2	40.0	28.0	RC

Test Species Information

Test Species Info.	Species: ID#	Species: ID#	Species: ID#	Species: ID#
	<u>D. pulex</u> F10-F10	<u>P. promelas</u> ABS/829		
Age	<u><24 hrs</u>	<u>2 days</u>		
Test Container Size	<u>30 ml</u>	<u>300 ml</u>		
Test volume	<u>25 ml</u>	<u>250 ml</u>		
Feeding: Type	<u>2 hrs prior to test initiation</u>			
Amount				
Aeration?	<u>N/A</u>	<u>N/A</u>		
Amount				
Condition of survivors	<u>fair</u> CR 2/18/10	<u>Good</u> RC 2/18/10		

Comments:

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

Project# X5960

Test started: Date 2/16/14

Time 1523

Client EDCC

Test ended: Date 2/18/14

Time 1541

Sample Description 006

Test Species D. pulex

ID# ED-F10

Technician: Ohour OK 24hour OK 48hour OK 72hour / 96hour /
 Time: Ohour 1523 24hour 1610 48hour 1541 72hour / 96hour /
 Temperature (°C): Ohour 24.7 24hour 24.5 48hour 24.1 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																				
0.5%FT	A		8	8	8			8.3	8.1 8.5	8.0			7.4	7.5 7.3	7.4			175.6	197 184	199		
	B		8	8	8																	
	C		8	8	7																	
	D		8	8	6																	
	E		8	8	8																	
22.0	A		8	8	8			8.4	8.1 8.4	8.1			7.2	7.3 7.1	7.2			201	214 202	224		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	7																	
	E		8	8	7																	
Chemistry Tech prerenewal/postrenewal								EWB	CR RC	CR			EWB	CR RC	CR			EWB	CR RC	CR		

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

Project# X5960

Test started: Date 2/16/16

Time 1523

Client EDCC

Test ended: Date 2/18/16

Time 1641

Sample Description 006

Test Species D. pulex

ID# E10-F10

Technician: 0hour CR 24hour CR 48hour CR 72hour / 96hour /
 Time: 0hour 1623 24hour 1610 48hour 1541 72hour / 96hour /
 Temperature (°C): 0hour 24.7 24hour 24.5 48hour 24.1 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>32.0</u>	<u>A</u>		<u>8</u>	<u>8</u>	<u>8</u>			<u>8.6</u>	<u>8.0</u>	<u>8.5</u>	<u>8.1</u>		<u>7.1</u>	<u>7.2</u>	<u>7.2</u>		<u>213</u>	<u>227</u>	<u>211</u>	<u>232</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>45.0</u>	<u>A</u>		<u>8</u>	<u>8</u>	<u>7</u>			<u>8.6</u>	<u>7.9</u>	<u>8.4</u>	<u>8.0</u>		<u>7.0</u>	<u>7.2</u>	<u>7.1</u>		<u>228</u>	<u>245</u>	<u>225</u>	<u>243</u>		
	<u>B</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
	<u>C</u>		<u>8</u>	<u>7</u>	<u>6</u>																	
	<u>D</u>		<u>8</u>	<u>7</u>	<u>6</u>																	
	<u>E</u>		<u>8</u>	<u>8</u>	<u>8</u>																	
Chemistry Tech prerenewal/postrenewal			<u>ED</u> <u>CR</u> <u>RC</u> <u>CR</u>					<u>ED</u> <u>CR</u> <u>RC</u> <u>CR</u>					<u>ED</u> <u>CR</u> <u>RC</u> <u>CR</u>									

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

Project# X59100

Test started: Date 2/16/16 Time 1523

Client EDCC

Test ended: Date 2/18/16 Time 1541

Sample Description 006

Test Species D. pulex ID# E10-F10

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

Time: 0hour 1523 24hour 1610 48hour 1541 72hour / 96hour /

Temperature (°C): 0hour 24.7 24hour 24.5 48hour 24.1 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			85	78 83	8.0			7.0	7.1 6.9	7.1			244	259 259	259		
	B		8	8	8																	
	C		8	8	7																	
	D		8	8	8																	
	E		8	7	7																	
75.0	A		8	8	7			84	77 82	7.9			6.9	7.1 6.8	7.0			269	281 282	285		
	B		8	8	8																	
	C		8	7	7																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								EB CR RC CR					EB CR RC CR					EB CR RC CR				

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

Project# X5960

Test started: Date 2/16/10 Time 1523

Client EDCC

Test ended: Date 2/18/10 Time 1545

Sample Description 006

Test Species D. pulex ID# E10-F10

Technician: 0hour OK 24hour OK 48hour CR 72hour / 96hour /

Time: 0hour 1523 24hour 1610 48hour 1541 72hour / 96hour /

Temperature (°C): 0hour 24.7 24hour 24.5 48hour 24.1 72hour / 96hour /

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity						
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96		
0.0		N/A																						
100.0	A	}	8	6	6			8.3	7.4	7.9			7.0	6.9	6.8			299	335	337				
	B		8	8	8																			
	C		8	8	8																			
	D		8	8	8																			
	E		8	8	8																			
100.0 pH adj	A	}	8																					
	B		8																					
	C		8																					
	D		8																					
	E		8																					
Chemistry Tech prerenewal/postrenewal			E10-RC CR					E10-RC CR					E10-RC CR											

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

Project# X5960

Test started: Date 2/16/16 Time 1545

Client ED CC

Test ended: Date 2/18/16 Time 1605

Sample Description 006

Test Species P. promelas ID# ABS/829

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

Time: Ohour 1545 24hour 1440 48hour 1605 72hour 96hour

Temperature (°C): Ohour 24.4 24hour 24.5 48hour 24.1 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>9.0</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>8.1</u>	<u>7.5</u>			<u>7.1</u>	<u>7.0</u>	<u>7.0</u>			<u>213</u>	<u>222</u>	<u>211</u>	<u>222</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>45.0</u>	<u>A</u>		<u>8</u>	<u>8</u>	<u>8</u>			<u>8.6</u>	<u>8.4</u>	<u>7.4</u>			<u>7.0</u>	<u>7.0</u>	<u>6.9</u>			<u>228</u>	<u>235</u>	<u>225</u>	<u>236</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>EB</u> <u>CR</u> <u>RC</u> <u>RC</u>					<u>EB</u> <u>CR</u> <u>RC</u> <u>RC</u>					<u>EB</u> <u>CR</u> <u>RC</u> <u>RC</u>				

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

Project# X5960

Test started: Date 2/16/16 Time 1545

Client EDCC

Test ended: Date 2/18/16 Time 1605

Sample Description 006

Test Species P. promelas ID# ABS 829

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

Time: Ohour 1545 24hour 1440 48hour 1605 72hour / 96hour /

Temperature (°C): Ohour 24.4 24hour 24.5 48hour 24.1 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			8.5	8.3	8.3			7.0	6.9	6.9			244	251	239	249	
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
75.0	A	}	8	8	7			8.4	8.2	8.2			6.9	6.9	6.8			269	266	262	273	
	B		8	8	8																	
	C		8	8	7 ^{RC}																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								8.0	8.0	8.0			6.8	6.8	6.8			260	260	260	260	

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

Project# X5960

Test started: Date 2/16/16 Time 1545

Client EDCC

Test ended: Date 2/18/16 Time 1605

Sample Description 006

Test Species P. promelas ID# ABS/829

Technician: 0hour RC 24hour CR 48hour RC 72hour / 96hour /
 Time: 0hour 1545 24hour 1440 48hour 1605 72hour / 96hour /
 Temperature (°C): 0hour 24.4 24hour 24.5 48hour 24.1 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% 100.0		N/A																				
100.0	A	N/A	8	8	8			8.3	9.4	9.1	1.0		7.0	6.8	6.7			299	296	300	306	
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
100.0 pH Adj	A		8																			
	B		8																			
	C		8																			
	D		8																			
	E		8																			
Chemistry Tech prerenewal/postrenewal								RC	RC	RC	RC		RC	RC	RC	RC		RC	RC	RC	RC	

APPENDIX C
STATISTICAL ANALYSES

Daphnid Acute Test-48 Hr Survival

Start Date: 2/16/2016 Test ID: X5960DP Sample ID: AR0000752/006
 End Date: 2/18/2016 Lab ID: ADEQ880630 Sample Type: EFF2-Industrial
 Sample Date: 2/17/2016 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: DP-Daphnia pulex

Comments:

Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	0.8750	0.7500	1.0000
22	1.0000	1.0000	1.0000	0.8750	0.8750
32	1.0000	1.0000	1.0000	0.8750	1.0000
45	0.8750	1.0000	0.7500	0.7500	1.0000
56	1.0000	1.0000	0.8750	1.0000	0.8750
75	0.8750	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		
22	0.9500	1.0270	1.3196	1.2094	1.3931	7.623	5	28.50	16.00
32	0.9750	1.0541	1.3564	1.2094	1.3931	6.055	5	30.50	16.00
45	0.8750	0.9459	1.2180	1.0472	1.3931	14.204	5	24.50	16.00
56	0.9500	1.0270	1.3196	1.2094	1.3931	7.623	5	28.50	16.00
75	0.9500	1.0270	1.3196	1.2094	1.3931	7.623	5	28.50	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 ($p \leq 0.05$)	0.87376	0.934	-0.7358	-0.4441
Bartlett's Test indicates equal variances ($p = 0.73$)	3.62638	16.8119		
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs D-Control				

Acute Fish Test-48 Hr Survival

Start Date: 2/16/2016 Test ID: X5960PP Sample ID: AR0000752/006
 End Date: 2/18/2016 Lab ID: ADEQ880630 Sample Type: EFF2-Industrial
 Sample Date: 2/17/2016 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: PP-Pimephales promelas

Comments:

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

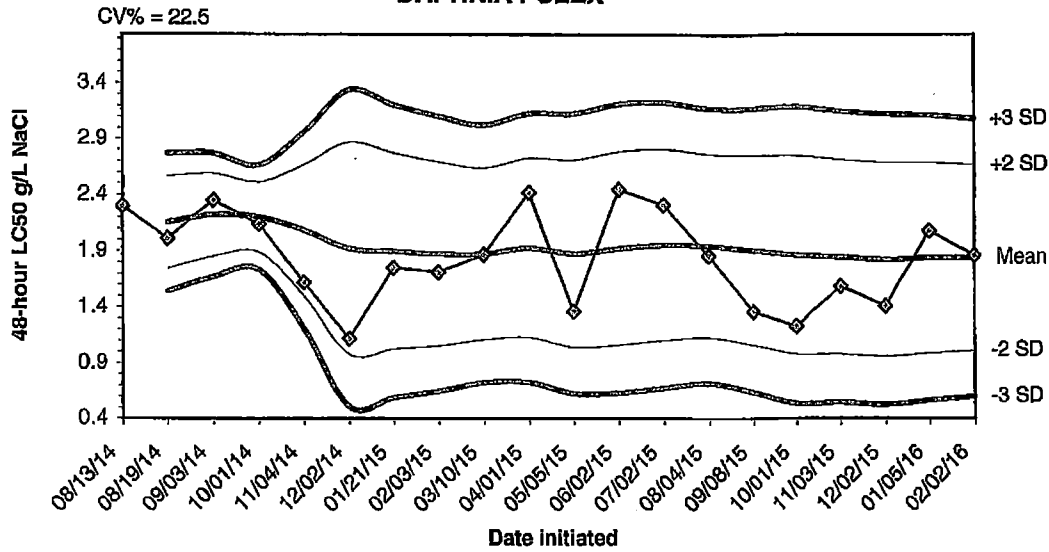
Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					N	Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%				
D-Control	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5			
22	1.0000	1.0000	1.3931	1.3931	1.3931	0.000	5	27.50	16.00	
32	0.9750	0.9750	1.3564	1.2094	1.3931	6.055	5	25.00	16.00	
45	1.0000	1.0000	1.3931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

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.51902	0.934	-2.9335	9.90057
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
3/2/16

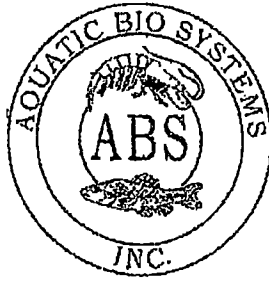
APPENDIX D
QUALITY ASSURANCE CHARTS

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



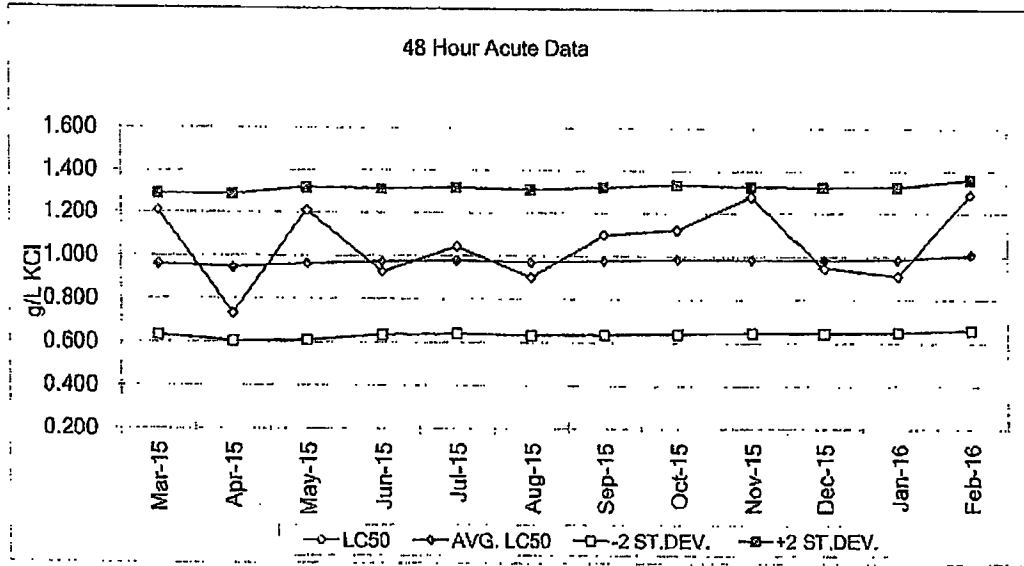
Dates	Values	Mean	-2 SD	-3 SD	+2 SD	+3 SD
08/13/14	2.3000					
08/19/14	2.0100	2.1550	1.7449	1.5398	2.5651	2.7702
09/03/14	2.3500	2.2200	1.8528	1.6693	2.5872	2.7707
10/01/14	2.1400	2.2000	1.8897	1.7346	2.5103	2.6654
11/04/14	1.6200	2.0840	1.4998	1.2077	2.6682	2.9603
12/02/14	1.1200	1.9233	0.9786	0.5062	2.8681	3.3405
01/21/15	1.7500	1.8986	1.0262	0.5900	2.7709	3.2071
02/03/15	1.7100	1.8750	1.0564	0.6471	2.6936	3.1029
03/10/15	1.8700	1.8744	1.1087	0.7259	2.6402	3.0230
04/01/15	2.4200	1.9290	1.1289	0.7288	2.7291	3.1292
05/05/15	1.3600	1.8773	1.0442	0.6277	2.7103	3.1268
06/02/15	2.4500	1.9250	1.0647	0.6345	2.7853	3.2155
07/02/15	2.3100	1.9546	1.1037	0.6782	2.8056	3.2310
08/04/15	1.8600	1.9479	1.1287	0.7192	2.7670	3.1765
09/08/15	1.3600	1.9087	1.0630	0.6401	2.7544	3.1772
10/01/15	1.2300	1.8663	0.9816	0.5392	2.7509	3.1933
11/03/15	1.5900	1.8500	0.9830	0.5495	2.7170	3.1505
12/02/15	1.4100	1.8256	0.9592	0.5261	2.6919	3.1250
01/05/16	2.0800	1.8389	0.9890	0.5640	2.6889	3.1139
02/02/16	1.8600	1.8400	1.0127	0.5990	2.6673	3.0810

1300 Blue Spruce Drive, Suite
Fort Collins, Colorado 80524



Toll Free: 800/331-5916
Tel:970/484-5091 Fax:970/484-2514

REFERENCE TOXICANT LC50
Pimephales promelas



48 HOUR ACUTE TOXICITY DATA FOR
Pimephales promelas

DATE	LC50 (g/L KCl)	95% CONFIDENCE (upper)	(lower)	AVG.LC50 (g/L KCl)	METHOD	+2 STD	-2 STD
Sep 15	1.097	1.230	0.978	0.979	SPKR	1.3207	0.6377
Oct 15	1.122	1.246	1.011	0.988	SPKR	1.3343	0.6421
Nov 15	1.278	1.391	1.175	0.986	SPKR	1.3252	0.6473
Dec 15	0.949	1.059	0.851	0.985	SPKR	1.3239	0.6453
Jan 16	0.911	1.024	0.810	0.987	Probit	1.3236	0.6498
Feb 16	1.289	1.421	1.170	1.010	SPKR	1.3588	0.6622

**Current Test Dates: 2/3-5/2016

Aquatic BioSystems, Inc • Quality Research Organisms

APPENDIX E
AGENCY FORMS

Acute Forms
Daphnia pulex Survival

Permittee: El Dorado Chemical - Outfall 006

NPDES Permit Number: AR0000752/ AFIN 70-00040

Composite Collected

From: 2/15/16

To: 2/15/16

From:

To:

Test Initiated: 2/16/16

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	75.0
	B	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	C	100.0	100.0	100.0	87.5	100.0	87.5	100.0
	D	100.0	100.0	100.0	87.5	100.0	100.0	100.0
	E	100.0	100.0	100.0	100.0	87.5	100.0	100.0
48-hour	A	100.0	100.0	100.0	87.5	100.0	87.5	75.0
	B	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	C	87.5	100.0	100.0	75.0	87.5	87.5	100.0
	D	75.0	87.5	87.5	75.0	100.0	100.0	100.0
	E	100.0	87.5	100.0	100.0	87.5	100.0	100.0
	Mean	92.5	95.0	97.5	87.5	95.0	95.0	95.0

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

- a.) **LOW FLOW OR CRITICAL DILUTION (100.0%)** 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:

Method of LC₅₀ calculation:

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

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

Permittee: El Dorado Chemical - Outfall 006
 NPDES Number: AR0000752/ AFIN 70-00040
 Contact: Eddie Pearson
 Analyst: Briggs, Callahan, Rose
 Sample Collected From: Date 2/15/16 Time 1000
 To: Date 2/15/16 Time 1400
 Test Begin Date 2/16/16 Time 1523
 Test End Date 2/18/16 Time 1541

Parameter	D.O.			Temperature			Alkalinity			Hardness			pH			
	Dilut./Time	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs
0	8.3	8.5	8.0	24.7	24.5	24.1	20.0				40.0			7.4	7.3	7.4
22.0	8.4	8.4	8.1	24.7	24.5	24.1								7.2	7.1	7.2
32.0	8.6	8.5	8.1	24.7	24.5	24.1								7.1	7.0	7.2
45.0	8.6	8.4	8.0	24.7	24.5	24.1								7.0	7.0	7.1
56.0	8.2	8.3	8.0	24.7	24.5	24.1								7.0	6.9	7.1
75.0	8.4	8.2	7.9	24.7	24.5	24.1								6.9	6.8	7.0
100.0	8.3	7.9	7.9	24.7	24.5	24.1	24.0				60.0			7.0	6.7	6.8

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

Acute Forms
Pimephales promelas (Fathead minnow) Survival

Permittee: El Dorado Chemical - Outfall 006

NPDES Permit Number: AR0000752/ AFIN 70-00040

Composite Collected From: 2/15/16 To: 2/15/16
From: To:

Test Initiated: 2/16/16

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	100.0	100.0	100.0	100.0	100.0	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	D	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	E	100.0	100.0	100.0	100.0	100.0	100.0	100.0
48-hour	A	100.0	100.0	100.0	100.0	100.0	87.5	100.0
	B	100.0	100.0	87.5	100.0	100.0	100.0	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	D	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	E	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Mean	100.0	100.0	97.5	100.0	100.0	97.5	100.0

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

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

2. Enter percent effluent corresponding to the LC₅₀ below:

LC₅₀ = N/A % effluent

95 % confidence limits:

Method of LC₅₀ calculation:

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

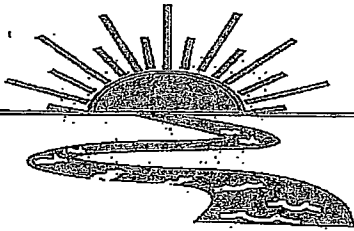
Biomonitoring
Fathead minnow 48 hour Acute Static Renewal
Chemical Parameters Chart*

Permittee: El Dorado Chemical - Outfall 006
NPDES Number: AR0000752/ AFIN 70-00040
Contact: Eddie Pearson
Analyst: Briggs, Callahan, Rose
Sample Collected From: Date 2/15/16 Time 1000
To: Date 2/15/16 Time 1400
Test Begin Date 2/16/16 Time 1545
Test End Date 2/18/16 Time 1605

Parameter	D.O.			Temperature			Alkalinity			Hardness			pH			
	Dilut./Time	0hrs.	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs	0hrs	24hrs	48hrs
0		8.3	8.5	7.6	24.4	24.5	24.1	20.0			40.0			7.4	7.3	7.2
22.0		8.4	8.4	7.6	24.4	24.5	24.1							7.2	7.1	7.0
32.0		8.6	8.5	7.5	24.4	24.5	24.1							7.1	7.0	7.0
45.0		8.6	8.4	7.4	24.4	24.5	24.1							7.0	7.0	6.9
56.0		8.5	8.3	7.3	24.4	24.5	24.1							7.0	6.9	6.9
75.0		8.4	8.2	7.2	24.4	24.5	24.1							6.9	6.8	6.8
100.0		8.3	7.9	7.0	24.4	24.5	24.1	24.0			60.0			7.0	6.7	6.7

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

APPENDIX F
REPORT QUALITY ASSURANCE FORM



Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023

(318) 745-2772
1-800-258-1246
Fax: (318) 745-2773

REPORT QUALITY ASSURANCE FORM

Client: El Dorado Chemical Company 1006

Project#: X 5960

Chain of Custody Documents Checked by: RC 3/2/16
Technician/Date

Raw Data Documents Checked by: RC 3/2/16
Technician/Date

Statistical Analysis Package Checked by: EGG 3/2/16
Quality Manager/Date

Quality Control Data Checked by: EGG 2/8/16
Quality Manager/Date

Report Checked by: EGG 3/4/16
Quality Manager/Date

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

Erin L. Bugg, BS 3/4/16
Quality Manager Date

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

Bio-Analytical Laboratories (BAL)
ADEQ#88-0630
Project X5961

Bio-Analytical Laboratories' Executive Summary

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

Project #: X5961

Outfall: Outfall 007 (contaminated storm water)

Permit #: AR0000752/ AFIN #70-00040

Contact: Mr. Eddie Pearson

Test Dates: February 16 - 18, 2016

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

Results:

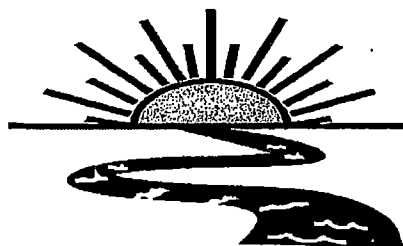
For *Pimephales promelas*:

1. If the NOEC for survival is less than the critical dilution (100.0%), enter a "1"; otherwise, enter a "0" for Parameter No. TEM6C- 0- **Pass**.
2. Report the NOEC for survival, Parameter TOM6C - 100.0%.
3. Report the highest (critical dilution or control) Coefficient of Variation, Parameter TQM6C - 11.68%.

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 - 11.68%.

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



Bio-Analytical Laboratories

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Doyline, LA 71023

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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 X5961

**Test Dates: February 16 - 18, 2016
Report Date: March 4, 2016**

Prepared for:
Mr. Eddie Pearson
El Dorado Chemical Company
P.O. Box 231
El Dorado, AR 71731

Prepared by:
Ginger Briggs
Bio-Analytical Laboratories
P.O. Box 527
Doyline, LA 71023
ADEQ #88-0630

BAL
ADEQ #88-0630
Project X5961

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BAL
ADEQ #88-0630
Project X5961

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 originally obtained from Aquatic Biosystems, Fort Collins, Colorado (ABS) and were approximately two 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
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2.3 Dilution Water

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

2.4 Test Concentrations

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

2.5 Sample Collection

One sample of Outfall 007 were collected by El Dorado Chemical personnel on February 15, 2016, at 1430 hours. Upon completion of collection, the sample was packed in ice and delivered to the laboratory by BAL personnel. The temperature upon arrival was 1.6^o 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±1^o Celsius. The total residual chlorine level (SM4500-Cl E 1997) was measured in milligrams/Liter (mg/L) with a Capital Controls^R amperometric titrator and recorded if present. The total ammonia level was measured in mg/L using a HACH^R test strip. Dissolved oxygen (SM4500-O G 1997), pH (SM4500-H+ B 1997) and conductivity (SM2510-B 1997) measurements (in mg/L, standard units and umhos/cm, respectively) were taken on the control and each test concentration at test initiation, at each renewal and at test termination. Alkalinity (SM2320-B 1997) and hardness (SM2340-C 1997) levels were measured in mg/L as CaCO₃ on the control and the highest effluent concentration.

2.7 Monitoring of the Tests

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

2.8 Data Analysis

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

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Project X5961

3.0 Results and Discussion

The results of the tests can be found in Table 1. Significant differences in survival were not noted in the critical dilution in either test after 48 hours of exposure ($p=.05$). The NOEC value for the fathead and *Daphnia pulex* tests was 100.0 percent effluent ($p=.05$). The 48-hour LC_{50} values could not be calculated in either test because greater than 50.0 percent survival occurred in each effluent concentration.

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

Percent Effluent	Percent Survival	
	<i>Pimephales promelas</i>	<i>Daphnia pulex</i>
Control	100.0	95.0
32.0	97.5	97.5
45.0	95.0	100.0
50.0	100.0	95.0
56.0	100.0	90.0
75.0	95.0	92.5
100.0	97.5	97.5

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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4.0 Conclusions

The sample of Outfall 007 collected from El Dorado Chemical Company, El Dorado, Arkansas, on February 16, 2016, were 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 LC₅₀ values could not be calculated because greater than 50.0 percent survival occurred in the effluent dilutions (p=.05).

BAL
ADEQ #88-0630
Project X5961

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 527
Doyline, LA 71023

(518) 745-2772
1-800-259-1245
Fax: (518) 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: X5961						
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	Temp. upon arrival: 16°C #29 EGD 2/16/16		
Permit #: AR0000752/AFIN 70-00040		Purchase Order:											Lab Control Number:	Preservative: (below)
Sampler's Signature/Printed Name/Affiliation: <i>Edward Pearson / Edward L. Pearson / EDC</i>														
Date Start Date End	Time Start Time End	C	G					# and type of container					Sample Identification	
02-15-16 02-15-16	1030 1430	X		6 half gallons	Outfall 007		X	X						
Relinquished by/Affiliation: <i>Edward Pearson / EDC</i>				Date: 02/16/16	Time: 1000	Received by/Affiliation: <i>J. B. [Signature]</i>		Date: 2/16/16	Time: 1000					
Relinquished by/Affiliation:				Date:	Time:	Received by/Affiliation:		Date:	Time:					
Relinquished by/Affiliation: <i>J. B. [Signature]</i>				Date: 2/16/16	Time: 1140	Received by/Affiliation: <i>C. W. Baupp</i>		Date: 2/16/16	Time: 1140					
Method of Shipment: <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Bus <input type="checkbox"/> Fed Ex <input type="checkbox"/> DHL <input type="checkbox"/> UPS <input type="checkbox"/> Client <input type="checkbox"/> Other Tracking # _____														
Comments:														
COC Rev. 3.0														

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES
ACUTE TOXICITY TEST WATER QUALITY DATA

Project# X59601

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 2/16/16 Time 1553

Test terminated: Date 2/18/16 Time 1545

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
C13001	9.8 / 131.5%	Y/12/1.6 / 93.6% EGB	<0.01	NO	6.0	N/A	100%	100%	EGB
↓	9.8 / 15.2%	Y/18/8.2 / 97.7%	↓		↓		↓		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	3826	N/A	N/A	N/A	N/A	7.2	40.0	20.0	RC

Test Species Information

Test Species Info.	D. pulex Species: ID#: F10-G10	P. promelas Species: ID#: ABS/829	Species: ID#:	Species: ID#:
Age	< 24 hrs	2 days		
Test Container Size	30 ml	300 ml		
Test volume	25 ml	250 ml		
Feeding: Type	2 hrs prior to test initiation			
Amount				
Aeration?	N/A	N/A		
Amount				
Condition of survivors	fair CR 2/18/16	Good RC 2/18/16		

Comments:

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

Project# X59101

Test started: Date 2/16/14

Time 1553

Client EDCC

Test ended: Date 2/18/14

Time 1552

Sample Description 007

Test Species D. pulex

ID# F10-010

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

Time: Ohour 1553 24hour 1643 48hour 1552 72hour / 96hour /

Temperature (°C): Ohour 24.7 24hour 24.5 48hour 24.1 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	N/A	8	8	8			8.2	7.7 8.3	8.1			7.4	7.3 7.4	7.3			176.9	198 170.9	194.0			
	B		8	8	8																		
	C		8	8	6																		
	D		8	8	8																		
2.0% ♀	E		8	8	8																		
32.0	A		8	8	8			8.4	7.7 8.3	8.1			7.1	7.3 7.1	7.3			200	299 281	301			
	B		8	8	8																		
	C		8	8	8																		
	D		8	8	7																		
	E		8	8	8																		
Chemistry Tech prerenewal/postrenewal								EB	CR PC	CR			EB	CR PC	CR			EB	CR PC	CR			

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

Project# X59101

Test started: Date 2/16/16

Time 1553

Client EDCC

Test ended: Date 2/18/16

Time 1652

Sample Description 007

Test Species D. pulex

ID# FD-G10

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

Time: Ohour 1553 24hour 1643 48hour 1552 72hour / 96hour /

Temperature (°C): Ohour 24.7 24hour 24.5 48hour 24.7 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>45.0</u>	<u>A</u>	<u>{</u>	<u>8</u>	<u>8</u>	<u>8</u>			<u>8.4</u>	<u>7.1</u> <u>8.4</u>	<u>8.0</u>			<u>7.1</u>	<u>7.2</u> <u>7.1</u>	<u>7.3</u>			<u>286</u>	<u>342</u> <u>321</u>	<u>344</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>{</u>	<u>8</u>	<u>8</u>	<u>7</u>			<u>8.4</u>	<u>7.1</u> <u>8.4</u>	<u>8.0</u>			<u>7.1</u>	<u>7.2</u> <u>7.0</u>	<u>7.2</u>			<u>359</u>	<u>366</u> <u>344</u>	<u>373</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>																	
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>		

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

Project# X59101

Test started: Date 2/16/10

Time 1553

Client EDCC

Test ended: Date 2/18/10

Time 1552

Sample Description 007

Test Species D. pulex

ID# F10-G10

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

Time: Ohour 1553 24hour 1643 48hour 1552 72hour / 96hour /

Temperature (°C): Ohour 24.7 24hour 24.5 48hour 24.1 72hour / 96hour /

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
90		N/A																				
56.0	A	}	8	8	7			8.4	8.4 ^{7.7}	7.9			7.0	7.2 ^{7.2}	7.2			346	358 ³⁹⁷	396		
	B		8	6	6																	
	C		8	8	7																	
	D		8	8	8																	
	E		8	8	8																	
75.0	A	}	8	8	6			8.4	8.4 ^{7.10}	7.9			7.0	7.2 ^{7.2}	7.1			346	458 ⁴⁶²	471		
	B		8	8	7																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								ED	CR ^{CR}	CR			ED	CR ^{CR}	CR			ED	CR ^{CR}	CR		

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

Project# X5961

Test started: Date 2/16/16

Time 1533

Client EDCC

Test ended: Date 2/18/16

Time 1552

Sample Description 007

Test Species D. pulex

ID# F10-010

Technician: Ohour CR 24hour CR 48hour CR 72hour / 96hour /
 Time: Ohour 1553 24hour 1643 48hour 1552 72hour / 96hour /
 Temperature (°C): Ohour 24.7 24hour 24.5 48hour 24.1 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	7			8.2	7.6	7.9			6.9	7.1	7.0			132	361	305	600	
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
pH 100.0	A	}	8																			
	B		8																			
	C		8																			
	D		8																			
	E		8																			
Chemistry Tech prerenewal/postrenewal								CR	CR	CR			CR	CR	CR			CR	CR	CR		

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

Project# X59601

Test started: Date 2/16/16 Time 1615

Client EDCC

Test ended: Date 2/18/16 Time 1345

Sample Description 007

Test Species P. promelas ID# ABS/829

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

Time: Ohour 1615 24hour 1510 48hour 1345 72hour / 96hour /

Temperature (°C): Ohour 24.4 24hour 24.5 48hour 24.1 72hour / 96hour /

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
0/0		N/A																				
0 _{soft}	A	}	8	8	8			8.2	8.3	8.1			7.4	7.4	7.1			176.9	180.9	186.4		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
200/15 7	E		8	8	8																	
32.0	A	}	8	7	7			8.4	8.3	8.0			7.1	7.1	7.0			200	287	294		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								ESB	CR	CR	RC		ESB	CR	CR	RC		ESB	CR	CR	RC	

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

Project# X5961

Test started: Date 2/16/16 Time 1615

Client EDCC

Test ended: Date 2/18/16 Time 1945

Sample Description 007

Test Species P. promelas ID# ABS/829

Technician: 0hour RC 24hour OK 48hour RC 72hour / 96hour /
 Time: 0hour 1615 24hour 1510 48hour 1545 72hour / 96hour /
 Temperature (°C): 0hour 24.4 24hour 24.5 48hour 24.1 72hour / 96hour /

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
<u>40</u>		<u>N/A</u>																				
<u>45.0</u>	<u>A</u>	<u>(</u>	<u>8</u>	<u>8</u>	<u>8</u>			<u>8.4</u>	<u>7.1</u> <u>8.4</u>	<u>1.9</u>			<u>7.1</u>	<u>7.1</u> <u>7.1</u>	<u>7.0</u>			<u>286</u>	<u>325</u> <u>321</u>	<u>336</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>6</u>																	
<u>50.0</u>	<u>A</u>	<u>(</u>	<u>8</u>	<u>8</u>	<u>8</u>			<u>8.4</u>	<u>7.1</u> <u>8.4</u>	<u>1.9</u>			<u>7.1</u>	<u>7.1</u> <u>7.0</u>	<u>6.9</u>			<u>329</u>	<u>343</u> <u>344</u>	<u>360</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>EDD</u> <u>OK</u> <u>RC</u>					<u>EDD</u> <u>OK</u> <u>RC</u>					<u>EDD</u> <u>OK</u> <u>RC</u>									

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

Project# X59101

Test started: Date 2/16/16 Time 1615

Client EDCC

Test ended: Date 2/18/16 Time 1545

Sample Description 007

Test Species P. promelas ID# ABS/829

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

Time: Ohour 1615 24hour 1510 48hour 1545 72hour / 96hour /

Temperature (°C): Ohour 24.4 24hour 24.5 48hour 24.1 72hour / 96hour /

Test Dilution	Replicate	Test Salinity	# Live Organisms					Dissolved Oxygen					pH					Conductivity				
			0 hr	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
90		N/A																				
56.0	A	}	8	8	8			8.4	7.0 8.4	7.9			7.0	7.1 7.0	7.0			346	361 358	379		
	B		8	8	8																	
	C		8	8	8																	
	D		8	8	8																	
	E		8	8	8																	
75.0	A	}	8	8	7			8.4	7.0 8.4	7.8			7.0	7.0 6.9	6.9			346	419 422	442		
	B		8	8	8																	
	C		8	8	7																	
	D		8	8	8																	
	E		8	8	8																	
Chemistry Tech prerenewal/postrenewal								RC CR	RC				RC CR	RC			RC CR	RC				

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

Project# X5961

Test started: Date 2/16/16 Time 1615

Client EDCC

Test ended: Date 2/18/16 Time 1545

Sample Description 007

Test Species P. promelas ID# ABS/829

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

Time: Ohour 1615 24hour 1510 48hour 1545 72hour / 96hour /

Temperature (°C): Ohour 24.4 24hour 24.5 48hour 24.1 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>NIA</u>																				
<u>100.0</u>	<u>A</u>		<u>8</u>	<u>7</u>	<u>7</u>			<u>8.2</u>	<u>7.5</u> <u>8.4</u>	<u>7.8</u>			<u>6.9</u>	<u>7.0</u> <u>6.8</u>	<u>6.8</u>			<u>430</u>	<u>505</u> <u>505</u>	<u>528</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 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>RC</u>					<u>RC</u>					<u>RC</u>				

APPENDIX C
STATISTICAL ANALYSES

Daphnid Acute Test-48 Hr Survival

Start Date: 2/16/2016 Test ID: X5961DP Sample ID: AR0000752/007
 End Date: 2/18/2016 Lab ID: ADEQ880630 Sample Type: EFF2-Industrial
 Sample Date: 2/17/2016 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: DP-Daphnia pulex

Comments:

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

Conc-%	Transform: Arcsin Square Root							Rank Sum	1-Tailed Critical
	Mean	N-Mean	Mean	Min	Max	CV%	N		
D-Control	0.9500	1.0000	1.3239	1.0472	1.3931	11.684	5		
32	0.9750	1.0263	1.3564	1.2094	1.3931	6.055	5	28.00	16.00
45	1.0000	1.0526	1.3931	1.3931	1.3931	0.000	5	30.00	16.00
50	0.9500	1.0000	1.3196	1.2094	1.3931	7.623	5	26.00	16.00
56	0.9000	0.9474	1.2504	1.0472	1.3931	11.683	5	23.50	16.00
75	0.9250	0.9737	1.2872	1.0472	1.3931	12.116	5	25.50	16.00
100	0.9750	1.0263	1.3564	1.2094	1.3931	6.055	5	28.00	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.88689	0.934	-1.1072	0.67216
Equality of variance cannot be confirmed				
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs D-Control				

Acute Fish Test-48 Hr Survival

Start Date: 2/16/2016 Test ID: X5961PP Sample ID: AR0000752/007
 End Date: 2/18/2016 Lab ID: ADEQ880630 Sample Type: EFF2-Industrial
 Sample Date: 2/17/2016 Protocol: EPAAW02-EPA/821/R-02-01 Test Species: PP-Pimephales promelas
 Comments:

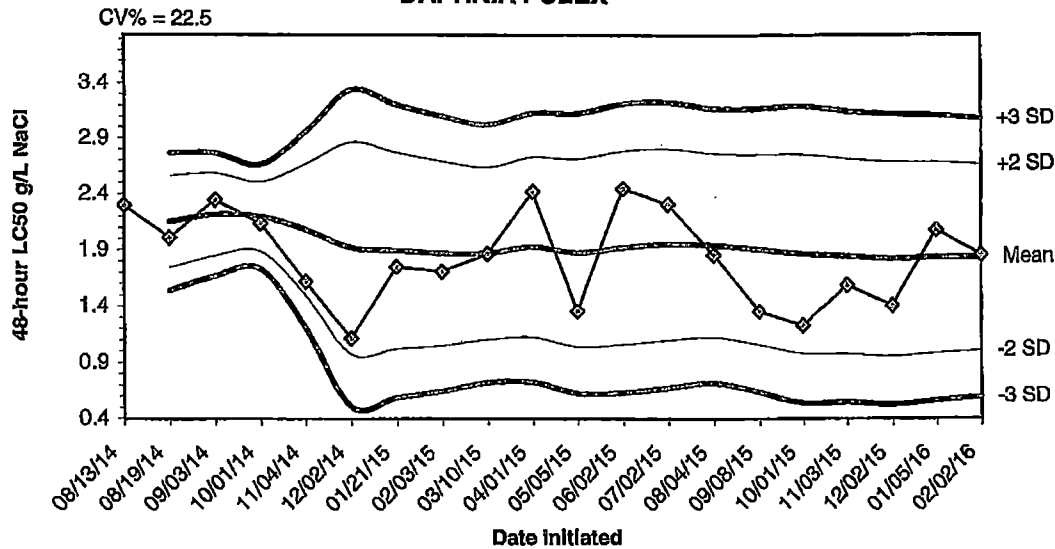
Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	0.7500	1.0000	1.0000
32	0.8750	1.0000	1.0000	1.0000	1.0000
45	1.0000	1.0000	1.0000	1.0000	0.7500
50	1.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	1.0000	1.0000	1.0000
75	0.8750	1.0000	0.8750	1.0000	1.0000
100	0.8750	1.0000	1.0000	1.0000	1.0000

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root				N	Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%			
D-Control	0.9500	1.0000	1.3239	1.0472	1.3931	11.684	5		
32	0.9750	1.0263	1.3564	1.2094	1.3931	6.055	5	28.00	16.00
45	0.9500	1.0000	1.3239	1.0472	1.3931	11.684	5	27.50	16.00
50	1.0000	1.0526	1.3931	1.3931	1.3931	0.000	5	30.00	16.00
56	1.0000	1.0526	1.3931	1.3931	1.3931	0.000	5	30.00	16.00
75	0.9500	1.0000	1.3196	1.2094	1.3931	7.623	5	26.00	16.00
100	0.9750	1.0263	1.3564	1.2094	1.3931	6.055	5	28.00	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.7252	0.934	-1.9082	3.28752
Equality of variance cannot be confirmed				
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1
Treatments vs D-Control				

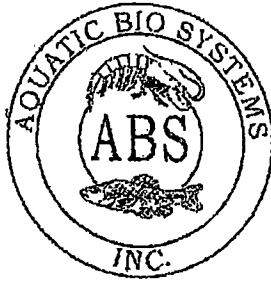
APPENDIX D
QUALITY ASSURANCE CHARTS

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



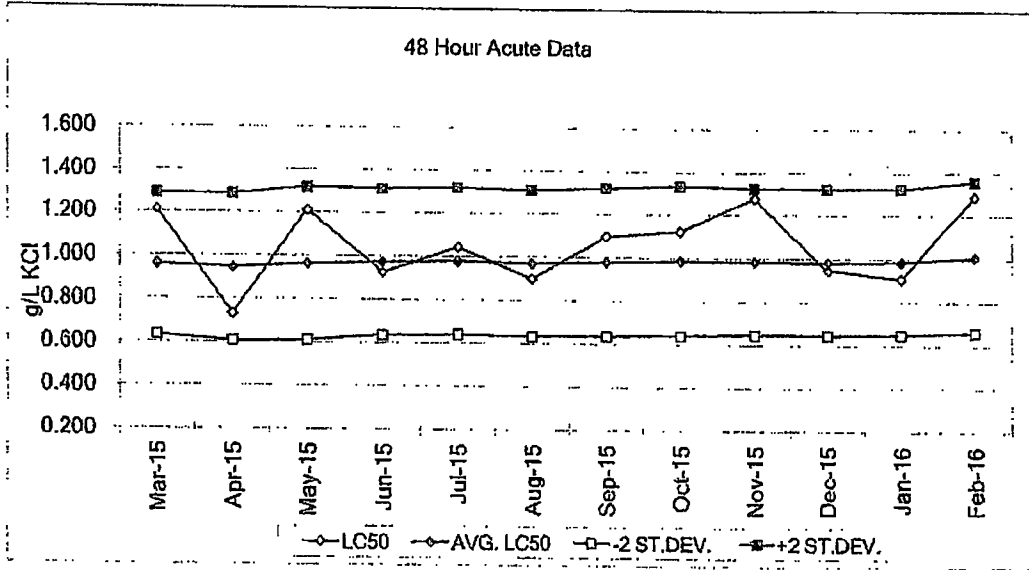
Dates	Values	Mean	-2 SD	-3 SD	+2 SD	+3 SD
08/13/14	2.3000					
08/19/14	2.0100	2.1550	1.7449	1.5398	2.5651	2.7702
09/03/14	2.3500	2.2200	1.8528	1.6693	2.5872	2.7707
10/01/14	2.1400	2.2000	1.8897	1.7346	2.5103	2.6654
11/04/14	1.6200	2.0840	1.4998	1.2077	2.6682	2.9603
12/02/14	1.1200	1.9233	0.9786	0.5062	2.8681	3.3405
01/21/15	1.7500	1.8986	1.0262	0.5900	2.7709	3.2071
02/03/15	1.7100	1.8750	1.0564	0.6471	2.6936	3.1029
03/10/15	1.8700	1.8744	1.1087	0.7259	2.6402	3.0230
04/01/15	2.4200	1.9290	1.1289	0.7288	2.7291	3.1292
05/05/15	1.3600	1.8773	1.0442	0.6277	2.7103	3.1268
06/02/15	2.4500	1.9250	1.0647	0.6345	2.7853	3.2155
07/02/15	2.3100	1.9546	1.1037	0.6782	2.8056	3.2310
08/04/15	1.8600	1.9479	1.1287	0.7192	2.7670	3.1765
09/08/15	1.3600	1.9087	1.0630	0.6401	2.7544	3.1772
10/01/15	1.2300	1.8663	0.9816	0.5392	2.7509	3.1933
11/03/15	1.5900	1.8500	0.9830	0.5495	2.7170	3.1505
12/02/15	1.4100	1.8256	0.9592	0.5261	2.6919	3.1250
01/05/16	2.0800	1.8389	0.9890	0.5640	2.6889	3.1139
02/02/16	1.8600	1.8400	1.0127	0.5990	2.6673	3.0810

1300 Blue Spruce Drive, Suite
Fort Collins, Colorado 80524



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Tel:970/484-5091 Fax:970/484-2514

REFERENCE TOXICANT LC50
Pimephales promelas



48 HOUR ACUTE TOXICITY DATA FOR
Pimephales promelas

DATE	LC50 (g/L KCl)	95% CONFIDENCE (upper) (lower)	AVG.LC50 (g/L KCl)	METHOD	+2 STD	-2 STD
Sep 15	1.097	1.230 0.978	0.979	SPKR	1.3207	0.6377
Oct 15	1.122	1.246 1.011	0.988	SPKR	1.3343	0.6421
Nov 15	1.278	1.391 1.175	0.986	SPKR	1.3252	0.6473
Dec 15	0.949	1.059 0.851	0.985	SPKR	1.3239	0.6453
Jan 16	0.911	1.024 0.810	0.987	Probit	1.3236	0.6498
Feb 16	1.289	1.421 1.170	1.010	SPKR	1.3588	0.6622

**Current Test Dates: 2/3-5/2016

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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: 2/15/16 To: 2/15/16
From: To:

Test Initiated: 2/16/16

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	100.0	75.0	100.0	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	D	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	E	100.0	100.0	100.0	100.0	100.0	100.0	100.0
48-hour	A	100.0	100.0	100.0	87.5	87.5	75.0	87.5
	B	100.0	100.0	100.0	100.0	75.0	87.5	100.0
	C	75.0	100.0	100.0	100.0	87.5	100.0	100.0
	D	100.0	87.5	100.0	100.0	100.0	100.0	100.0
	E	100.0	100.0	100.0	87.5	100.0	100.0	100.0
	Mean	95.0	97.5	100.0	95.0	90.0	92.5	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.) 1/2 LOW FLOW OR 2X CRITICAL DILUTION (N/A%) YES NO

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

LC_{50} = N/A % effluent

95 % confidence limits:

Method of LC_{50} calculation:

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

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

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

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

**Biomonitoring
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: Briggs, Callahan, Rose

Sample Collected From: Date 2/15/16 Time 1030

To: Date 2/15/16 Time 1430

Test Begin Date 2/16/16 Time 1553

Test End Date 2/18/16 Time 1552

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		8.2	8.3	8.1	24.7	24.5	24.7	20.0			40.0			7.4	7.4	7.3
32.0		8.4	8.3	8.1	24.7	24.5	24.7							7.1	7.1	7.3
45.0		8.4	8.4	8.0	24.7	24.5	24.7							7.1	7.1	7.3
50.0		8.4	8.4	8.0	24.7	24.5	24.7							7.1	7.0	7.2
56.0		8.4	8.4	7.9	24.7	24.5	24.7							7.0	7.0	7.2
75.0		8.4	8.4	7.9	24.7	24.5	24.7							7.0	6.9	7.1
100.0		8.2	8.4	7.9	24.7	24.5	24.7	20.0			168.0			6.9	6.8	7.0

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

Acute Forms
Pimephales promelas (Fathead minnow) Survival

Permittee: El Dorado Chemical - Outfall 007

NPDES Permit Number: AR0000752/ AFIN 70-00040

Composite Collected From: 2/15/16 To: 2/15/16
From: To:

Test Initiated: 2/16/16

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	87.5	100.0	100.0	100.0	100.0	100.0
	B	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	D	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	E	100.0	100.0	100.0	100.0	100.0	100.0	100.0
48-hour	A	100.0	87.5	100.0	100.0	100.0	75.0	87.5
	B	100.0	100.0	100.0	100.0	100.0	87.5	100.0
	C	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	D	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	E	100.0	100.0	75.0	100.0	100.0	100.0	100.0
	Mean	100.0	97.5	95.0	100.0	100.0	95.0	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_{50} below:

LC_{50} = N/A % effluent

95 % confidence limits:

Method of LC_{50} calculation:

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

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

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

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

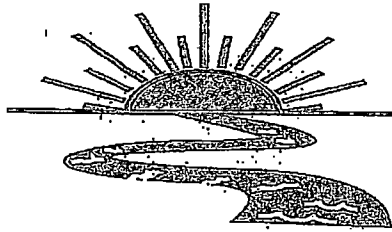
**Biomonitoring
 Fathead Minnow 48 hour Acute Static Renewal
 Chemical Parameters Chart***

Permittee: El Dorado Chemical - Outfall 007
 NPDES Number: AR0000752/ AFIN 70-00040
 Contact: Eddie Pearson
 Analyst: Briggs, Callahan, Rose
 Sample Collected From: Date 2/15/16 Time 1030
 To: Date 2/15/16 Time 1430
 Test Begin Date 2/16/16 Time 1615
 Test End Date 2/18/16 Time 1545

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	8.2	8.3	8.1	24.4	24.5	24.1	20.0				40.0			7.4	7.4	7.1
32.0	8.4	8.3	8.0	24.4	24.5	24.1								7.1	7.1	7.0
45.0	8.4	8.4	7.9	24.4	24.5	24.1								7.1	7.1	7.0
50.0	8.4	8.4	7.9	24.4	24.5	24.1								7.1	7.0	6.9
56.0	8.4	8.4	7.9	24.4	24.5	24.1								7.0	7.0	7.0
75.0	8.4	8.4	7.8	24.4	24.5	24.1								7.0	6.9	6.9
100.0	8.2	8.4	7.8	24.4	24.5	24.1	20.0				168.0			6.9	6.8	6.8

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

APPENDIX F
REPORT QUALITY ASSURANCE FORM



Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023

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

REPORT QUALITY ASSURANCE FORM

Client: El Dorado Chemical Company/1007

Project#: X5961

Chain of Custody Documents Checked by: RC 3/2/16
Technician/Date

Raw Data Documents Checked by: RC 3/2/16
Technician/Date

Statistical Analysis Package Checked by: EGB 3/2/16
Quality Manager/Date

Quality Control Data Checked by: EGB 2/8/16
Quality Manager/Date

Report Checked by: EGB 3/4/16
Quality Manager/Date

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

[Signature]
Quality Manager

Date

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4500 NORTH WEST AVE

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BILL SENDER

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ADEQ
5301 NORTSHORE DR

NORTH LITTLE ROCK AR 72118

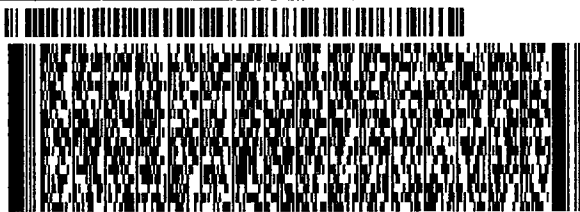
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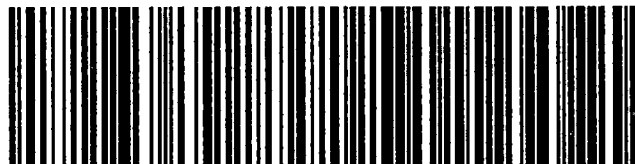
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