



Certified Mail N° 7007 1490 0005 1011 3540
RETURN RECEIPT REQUESTED

January 17, 2013

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

RE: Discharge Monitoring Report
Magnet Cove Generating Station
Permit Number AR0049611

To Whom It May Concern:

Attached, please find the Monthly Discharge Monitoring Reports listed in the table below:

Discharge Number	Monitoring Period (year, month, day)
AR0049611 – 01A A	2012 / 12 / 01 – 2012 / 12 / 31
AR0049611 – 001 A	2012 / 12 / 01 – 2012 / 12 / 31
AR0049611 – 01B A	2012 / 12 / 01 – 2012 / 12 / 31

Attached, please find the Quarterly Discharge Monitoring Reports listed in the table below:

Discharge Number	Quarterly Period (year, month, day)
TX1 Q	2012 / 10 / 01 – 2012 / 12 / 31

If you have any questions, please feel free to contact me at 501-467-3232 ext 104, or Rob Smith at 501-467-3232 ext 102.

Sincerely,



John M Morgan
Assistant Plant Manager

JM: jmm

Cc: File 8.5.10 – 2012

Direct Line: 501-467-3232 ext 104
Direct Fax: 501-467-3233
Email: john.morgan@aecc.com

Arkansas Analytical, Inc.

Toxicity Test Results
Hot Spring Power Co., LLC
November, 2012
AFIN #30-00337

Pimephales promelas, Acute Toxicity, EPA-821-R-02-012, October 2002

Daphnia pulex, Acute Toxicity, EPA-821-R-02-012, October 2002

Prepared for: **Mr. John Morgan**
Hot Spring Power Co.
410 Henderson
Malvern, AR 72104

Prepared by: Arkansas Analytical, Inc.
11701 I-30, Bldg 1, Suite 115
Little Rock, Arkansas 72209
Lab Number K1211001

Tuesday, November 20, 2012

Introduction

This report contains test results for the toxicity testing of Hot Spring Power Co. The NPDES permit number is AR0049611. The permit requires acute biomonitoring testing once per quarter for both *Daphnia pulex* and *Pimephales promelas*. The test results in this report represent the testing for the fourth quarter of 2012.

The facility is located 6.5 miles North of Malvern and 2.3 miles South of Magnet Cove near Highway 270 in Section 28, Township 3 South, Range 17 West in Hot Spring County, Arkansas. The discharge is to receiving waters named Ouachita River in Segment 2F of the Ouachita River Basin.

Plant Operations

To be provided by permittee.

Source of Effluent and Dilution Water

The samples were 24-hour composites collected at the final discharge of Outfall 001. Mean daily discharge is to be provided by permittee.

Effluent samples were collected as follows:

Sample Collection:	Date, Time Started	Date, Time Ended	Date, Time Received	Storage Temperature (°C)
SAMPLE A:	11-5-12, 0930	11-6-12, 0830	11-6-12, 1406	4
SAMPLE B:	11-6-12, 1030	11-7-12, 0930	11-7-12, 1434	4

The dilution water used was soft synthetic water prepared in the lab.

Chain of custody documentation and flow documentation are located in Appendix A.

Both effluent samples and dilution water samples were analyzed for pH, hardness, total alkalinity, and conductivity. Results are provided in Appendix B.

Dilution Series

Five dilutions in addition to a control (0% effluent) were used in the toxicity tests. The dilutions, which were made with soft synthetic water, were 9%, 12%, 17%, 22%, and 29%. The low-flow effluent concentration (**critical dilution**) was defined as **22% effluent**.

Test Methods

The analyses performed were 48 Hour Static Renewal Acute Toxicity Tests using the fathead minnow, *Pimephales promelas*, and the daphnid, *Daphnia pulex*. The tests were conducted according to EPA-821-R-02-012, October 2002. The endpoint of the test is death, established by either no movement or no reaction to gentle prodding. Raw data is provided in Appendix B. Statistics are provided in Appendix C.

	<i>Daphnia Pulex</i>	<i>Pimephales promelas</i>
Deviation from method:	None	None
Date, Time Started	11-7-12, 1000	11-7-12, 1100
Date, Time Ended	11-9-12, 0900	11-9-12, 0930
Type and volume of test chambers:	1-ounce plastic cups	500 ml plastic cups
Volume of solution per chamber:	25 milliliters	250 milliliters
Number of organisms per chamber:	8	10
Number of replicates:	5	5
Feeding frequency and amount:	None	None
Acclimation temperature of organisms:	25 degrees Centigrade	25 degrees Centigrade
Test temperature:	25 degrees Centigrade	25 degrees Centigrade

Test Organisms

Scientific name:	<i>Daphnia pulex</i>	<i>Pimephales promelas</i>
Age:	< 24 hours old	11 days old
Source:	In house culture	Aquatox
Diseases and treatment	None	None

Organism History is provided in Appendix D.

Quality Assurance

Test Acceptability

TEST ACCEPTANCE CRITERIA for *Daphnia pulex*

Control Criteria	Results	Pass	Fail
Greater than or equal to 90% survival	100%	X	

TEST ACCEPTANCE CRITERIA for *Pimephales promelas*

Control Criteria	Results	Pass	Fail
Greater than or equal to 90% survival	100%	X	

Reference Toxicant

The reference toxicant used was Potassium Chloride prepared in-house. The tests were performed using moderately hard synthetic as dilution water. The results of the reference toxicant were:

REFERENCE TOXICANT

<i>Daphnia pulex</i> 10/31/12-11/2/12		<i>Pimephales promelas</i> 10/31/12-11/2/12	
NOEC Survival:	1000 ppm KCl	NOEC Survival:	500 ppm KCl
LOEC Survival:	500 ppm KCl	LOEC Survival:	1000 ppm KCl
LC50:	750 ppm KCl	LC50:	1150 ppm KCl

Quality Assurance charts are provided in Appendix E.

Summary of Results
Hot Spring Power Co., LLC

<i>Daphnia pulex</i>			<i>Pimephales promelas</i>		
NOEC / LOEC Survival	29% / NA	PASS	NOEC / LOEC Survival	29% / NA	PASS
LC50	NA	NA	LC50	NA	NA

Conclusion


EPA-821-R-02-012, October 2002, *Pimephales promelas*

The permit issued to Hot Spring Power Co. LLC, AR0049611, specifies that the **critical dilution is 22% effluent**. The effluent samples **did not** exhibit acute toxicity at the critical dilution, and, as such, the effluent samples **passed** the test. Therefore, there is no further action to be taken.

EPA-821-R-02-012, October 2002, *Daphnia pulex*

The permit issued to Hot Spring Power Co. LLC, AR0049611, specifies that the **critical dilution is 22% effluent**. The effluent samples **did not** exhibit acute toxicity at the critical dilution, and, as such, the effluent samples **passed** the test. Therefore, there is no further action to be taken.

Biomonitoring Analysts:



Kenneth Pigue

ACUTE FORMS
FATHEAD MINNOW SURVIVAL RESULTS
(Pimephales promelas)

PERMITTEE: Hot Spring Power

NPDES #: AR0049611

Sample Collection:	Date, Time Started	Date, Time Ended
SAMPLE A:	11-5-12, 0930	11-6-12, 0830
SAMPLE B:	11-6-12, 1030	11-7-12, 0930

Test initiated (date, time): 11-7-12, 1100 Test terminated (date, time): 11-9-12, 0930

Dilution water used: Soft Synthetic

DATA TABLE FOR FATHEAD MINNOW SURVIVAL

Effluent Conc %	Percent Survival in Replicate Chambers						Mean Percent Survival		
	A	B	C	D	E		24 hours	48 hours	CV %
Control	100	100	100	100	100		100	100	0.00
9%	100	100	100	100	100		100	100	
12%	100	100	100	100	100		100	100	
17%	100	100	100	100	100		100	100	
22%	100	100	100	100	100		100	100	0.00
29%	100	100	100	100	100		100	100	

Coefficient of Variation = standard deviation / mean * 100

SUMMARY REPORTING FORMS FOR ACUTE BIOMONITORING
FATHEAD MINNOW LARVAE SURVIVAL
48 hr Acute
Pimephales promelas

1. Dunnett's procedure or Steel's Many-One Rank Test as appropriate:

Is the mean survival at 48 hours significantly different ($p=0.05$) than the control survival for:

a) LOW FLOW OR CRITICAL DILUTION, (100%) YES _____ NO X

2. If you answered NO to 1a. enter [0] otherwise enter [1]: 0

3. Enter the response to item 2 on DMR Form, parameter #TEM6C.

4. Enter percentage for the corresponding parameters below:

a.) Survival NOEC (parameter TOM6C): 29 % effluent.

b.) Coefficient of variation (parameter TQM6C): 0.00 %.

ACUTE FORMS
***Daphnia pulex* SURVIVAL RESULTS**

Permittee: Hot Spring Power

NPDES #: AR0049611

Sample Collection:	Date, Time Started	Date, Time Ended
SAMPLE A:	11-5-12, 0930	11-6-12, 0830
SAMPLE B:	11-6-12, 1030	11-7-12, 0930

Test initiated (date, time): 11-7-12, 1000 Test terminated (date, time): 11-9-12, 0900

Dilution water used: Soft Synthetic

DATA TABLE FOR *Daphnia pulex* SURVIVAL

Effluent Conc %	Percent Survival in Replicate Chambers						Mean Percent Survival		
	A	B	C	D	E		24 hours	48 hours	CV %
Control	100	100	100	100	100		100	100	0.00
9%	100	100	100	100	100		100	100	
12%	100	100	100	100	100		100	100	
17%	100	100	87.5	100	100		100	97.5	
22%	100	100	100	100	100		100	100	0.00
29%	100	100	100	100	100		100	100	

Coefficient of Variation = standard deviation/ mean * 100

SUMMARY REPORTING FORMS FOR ACUTE BIOMONITORING
Daphnia pulex SURVIVAL
48 hr Acute

1. Dunnett's procedure or Steel's Many-One Rank Test as appropriate:

Is the mean survival at 48 hours significantly different ($p=0.05$) than the control survival for:

a) LOW FLOW OR CRITICAL DILUTION, (100%) YES _____ NO X

2. If you answered NO to 1a. Enter [0] otherwise enter [1]: 0

3. Enter the response to item 2 on DMR Form, parameter #TEM3D.

4. Enter percentage corresponding to the parameters below:

a.) Survival NOEC (parameter TOM3D): 29 % effluent.

b.) Coefficient of variation (parameter TQM3D): 0.00 %.


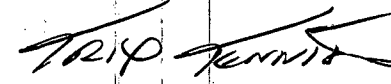
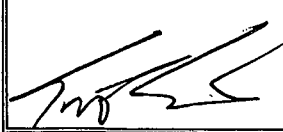
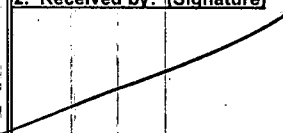
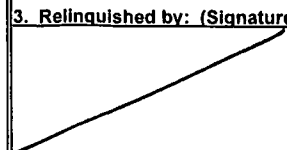
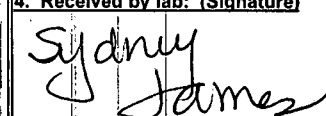
APPENDIX A

Chain of Custody Forms



11701 Interstate 30, Bldg. 1, Ste. 115
 Little Rock, AR 72209
 PHONE: 501-455-3233
 FAX: 501-455-6118

CHAIN OF CUSTODY RECORD

CLIENT INFORMATION			Project Description			Turnaround Time		Preservation Codes:											
Suez - Hot Spring Power 410 Henderson Rd. Malvern, AR 72109 Attn: John Morgan			Acute Toxicity			24 Hour	48 Hour	72 Hour	Routine	1. Cool, 4 Degrees Centigrade				4. Thiosulfate for Dechlorination					
			Reporting Information							2. Sulfuric Acid (H ₂ SO ₄), pH < 2				5. Hydrochloric Acid (HCl)					
			Telephone: 501-467-3232							3. Nitric Acid (HNO ₃), pH < 2				6. Sodium Hydroxide (NaOH), pH > 12					
			Fax: 501-467-3233							TEST PARAMETERS								Bottle Type Code	
			Email: John.Morgan@suezeneryna.com			Preservative Code: 1		Bottle Type: P										G = Glass; P = Plastic V = Septum; A = Amber	
 Sampler(s) Signature			 Sampler(s) Printed							Acute Biomonitoring								Arkansas Analytical Work Order Number:	
Field Number	SAMPLE COLLECTION		Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION												
	11/6-7/12 1030-0930			X	24	Water	Outfall 001					X		K2110013					
1. Relinquished by: (Signature)			Date/Time		2. Received by: (Signature)			SAMPLE CONDITION UPON RECEIPT IN LAB					REMARKS / SAMPLE COMMENTS						
			11/7/12 1434					1. CUSTODY SEALS: <input checked="" type="checkbox"/> Yes ___ No 2. CONTAINERS CORRECT: ___ Yes ___ No 3. COC/LABELS AGREE: ___ Yes ___ No 4. PRESERVATION CONFIRMED: ___ Yes ___ No 5. RECEIVED ON ICE: ___ Yes ___ No 6. TEMPERATURE ON RECEIPT: 11°C											
3. Relinquished by: (Signature)			Date/Time		4. Received by lab: (Signature)			FOR COMPLETION BY LAB ONLY											
																			

APPENDIX B

Physical, Chemical, and Raw Data for Fathead Minnow and *Daphnia pulex*

Biomonitoring Report
Acute 24/48 Hour Static Test

Lab Number: K1211001	Test Organism: <i>P. promelas</i>
Client: HSP	Age of Organism: 11 days old
Date/ Time Started: 11-7-12 1100	Source of Organism: Aquatox
Date/ Time Ended: 11-9-12 0930	Dilution Water: SS

Conc.	Rep #	# Live Organisms			pH		Dissolved O ₂ mg/L		Alkalinity mg/L		Hardness mg/L		Conductivity		T Res Cl mg/L	
		0 hr	24 hr	48 hr	24 hr	48 hr	24 hr	48 hr	24 hr	48 hr	24 hr	48 hr	24 hr	48 hr	24 hr	48 hr
0	A	10	10	10	7.7	7.8	8.7	8.7	34	7	42	7	151	7	60.05	7
	B	↓	↓	↓	7.4	7.5	6.6	6.9								2
	C	↓	↓	↓												
	D	↓	↓	↓	22	22										
	E	↓	↓	↓	25	25										
9	A	10	10	10	7.9	7.8	8.6	8.6								
	B	↓	↓	↓	7.4	7.4	6.6	7.2								
	C	↓	↓	↓												
	D	↓	↓	↓	22	23	22									
	E	↓	↓	↓	25	25										
12	A	10	10	10	7.9	7.8	8.7	8.6								
	B	↓	↓	↓	7.3	7.5	6.6	7.0								
	C	↓	↓	↓												
	D	↓	↓	↓	22	23										
	E	↓	↓	↓	25	25										
17	A	10	10	10	7.9	7.7	8.7	8.5								
	B	↓	↓	↓	7.3	7.4	6.4	7.0								
	C	↓	↓	↓												
	D	↓	↓	↓	22	22										
	E	↓	↓	↓	25	25										
22	A	10	10	10	7.8	7.7	8.7	8.5								
	B	↓	↓	↓	7.4	7.4	6.6	7.2								
	C	↓	↓	↓												
	D	↓	↓	↓	22	23	22									
	E	↓	↓	↓	25	25										
29	A	10	10	10	7.8	8.0	8.5	8.6	94	102	354	310	1284	1191	60.05	0.09
	B	↓	↓	↓	7.2	7.4	6.3	7.5								
	C	↓	↓	↓												
	D	↓	↓	↓	22	24										
	E	↓	↓	↓	25	25										

Biomonitoring Report
Acute 24/48 Hour Static Test

Lab Number: K1211001	Test Organism: <i>D. Pulex</i>
Client: HSP	Age of Organism: < 24 hrs old
Date/ Time Started: 11-7-12 1000	Source of Organism: In house culture
Date/ Time Ended: 11-9-12 0900	Dilution Water: 35

Conc.	Rep #	# Live Organisms			pH ^{7.8}		Dissolved O ₂ mg/L		Alkalinity mg/L		Hardness mg/L		Conductivity		T Res Cl mg/L	
		0 hr	24 hr	48 hr	24 hr	48 hr	24 hr	48 hr	24 hr	48 hr	24 hr	48 hr	24 hr	48 hr	24 hr	48 hr
0	A	8	8	8	7.7	8.2	8.7	8.7	34	7	42	+	151	-	<0.05	+
	B	↓	↓	↓	8.1	7.4	8.3	7.9								2
	C	↓	↓	↓												
	D	↓	↓	↓	22	22										
	E	↓	↓	↓	25	25										
9	A	8	8	8	7.9	7.8	8.6	8.6								
	B	↓	↓	↓	8.0	7.4	8.3	8.2								
	C	↓	↓	↓												
	D	↓	↓	↓	22	23										
	E	↓	↓	↓	25	25										
12	A	8	8	8	7.9	7.8	8.7	8.6								
	B	↓	↓	↓	8.0	8.1	8.3	8.0								
	C	↓	↓	↓												
	D	↓	↓	↓	22	23										
	E	↓	↓	↓	25	25										
17	A	8	8	8	7.9	7.7	8.7	8.5								
	B	↓	↓	8	8.0	7.5	8.3	8.0								
	C	↓	↓	7												
	D	↓	↓	8	22	22										
	E	↓	↓	8	25	25										
22	A	8	8	8	7.8	7.7	8.7	8.5								-
	B	↓	↓	↓	7.9	7.5	8.3	8.0								
	C	↓	↓	↓												
	D	↓	↓	↓	22	23										
	E	↓	↓	↓	25	25										
29	A	8	8	8	7.8	8.0	8.5	8.6	94	102	354	310	1284	1191	<0.05	0.09
	B	↓	↓	↓	7.9	7.4	8.3	8.0								
	C	↓	↓	↓												
	D	↓	↓	↓	22	24										
	E	↓	↓	↓	25	25										

APPENDIX C

Fathead Minnow and *Daphnia pulex* Statistics

AA # K1211001, Pimphales promelas, 48 HR ACUTE, 11-7-12
File: Z:\TOXSTAT\WBLUFF\FH5. Transform: ARC SINE(SQUARE ROOT(Y))

Shapiro - Wilk's test for normality

D = 0.000

W = 0.000

Critical W (P = 0.05) (n = 30) = 0.927

Critical W (P = 0.01) (n = 30) = 0.900

Data FAIL normality test. Try another transformation.

Warning - The first three homogeneity tests are sensitive to non-normal data and should not be performed.

AA # K1211001, Pimphales promelas, 48 HR ACUTE, 11-7-12
File: Z:\TOXSTAT\WBLUFF\FH5. Transform: ARC SINE(SQUARE ROOT(Y))

Hartley's test for homogeneity of variance
Bartlett's test for homogeneity of variance

These two tests can not be performed because at least one group has zero variance.

Data FAIL to meet homogeneity of variance assumption.
Additional transformations are useless.

TITLE: AA # K1211001, Pimphales promelas, 48 HR ACUTE, 11-7-12
FILE: Z:\TOXSTAT\WBLUFF\FH5.
TRANSFORM: ARC SINE(SQUARE ROOT(Y)) NUMBER OF GROUPS: 6

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	CONTROL	1	1.0000	1.4120
1	CONTROL	2	1.0000	1.4120
1	CONTROL	3	1.0000	1.4120
1	CONTROL	4	1.0000	1.4120
1	CONTROL	5	1.0000	1.4120
2	9 % EFFLUENT	1	1.0000	1.4120
2	9 % EFFLUENT	2	1.0000	1.4120
2	9 % EFFLUENT	3	1.0000	1.4120
2	9 % EFFLUENT	4	1.0000	1.4120
2	9 % EFFLUENT	5	1.0000	1.4120

3	12 %	EFFLUENT	1	1.0000	1.4120
3	12 %	EFFLUENT	2	1.0000	1.4120
3	12 %	EFFLUENT	3	1.0000	1.4120
3	12 %	EFFLUENT	4	1.0000	1.4120
3	12 %	EFFLUENT	5	1.0000	1.4120
4	17 %	EFFLUENT	1	1.0000	1.4120
4	17 %	EFFLUENT	2	1.0000	1.4120
4	17 %	EFFLUENT	3	1.0000	1.4120
4	17 %	EFFLUENT	4	1.0000	1.4120
4	17 %	EFFLUENT	5	1.0000	1.4120
5	22 %	EFFLUENT	1	1.0000	1.4120
5	22 %	EFFLUENT	2	1.0000	1.4120
5	22 %	EFFLUENT	3	1.0000	1.4120
5	22 %	EFFLUENT	4	1.0000	1.4120
5	22 %	EFFLUENT	5	1.0000	1.4120
6	29 %	EFFLUENT	1	1.0000	1.4120
6	29 %	EFFLUENT	2	1.0000	1.4120
6	29 %	EFFLUENT	3	1.0000	1.4120
6	29 %	EFFLUENT	4	1.0000	1.4120
6	29 %	EFFLUENT	5	1.0000	1.4120

AA # K1211001, Pimphales promelas, 48 HR ACUTE, 11-7-12
 File: Z:\TOXSTAT\WBLUFF\FH5. Transform: ARC SINE(SQUARE ROOT(Y))

STEEL'S MANY-ONE RANK TEST - Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	RANK SUM	CRIT. VALUE	df	SIG
1	CONTROL	1.412				
2	9 % EFFLUENT	1.412	27.50	16.00	5.00	
3	12 % EFFLUENT	1.412	27.50	16.00	5.00	
4	17 % EFFLUENT	1.412	27.50	16.00	5.00	
5	22 % EFFLUENT	1.412	27.50	16.00	5.00	
6	29 % EFFLUENT	1.412	27.50	16.00	5.00	

Critical values use $k = 5$, are 1 tailed, and $\alpha = 0.05$

AA # K1211001, DAPHNIA PULEX, 48 HR ACUTE, 11-7-12
File: Z:/toxstat/wbluff\DP5. Transform: ARC SINE(SQUARE ROOT(Y))

Shapiro - Wilk's test for normality

D = 0.027

W = 0.416

Critical W (P = 0.05) (n = 30) = 0.927

Critical W (P = 0.01) (n = 30) = 0.900

Data FAIL normality test. Try another transformation.

Warning - The first three homogeneity tests are sensitive to non-normal data and should not be performed.

AA # K1211001, DAPHNIA PULEX, 48 HR ACUTE, 11-7-12
File: Z:/toxstat/wbluff\DP5. Transform: ARC SINE(SQUARE ROOT(Y))

Hartley's test for homogeneity of variance

Bartlett's test for homogeneity of variance

These two tests can not be performed because at least one group has zero variance.

Data FAIL to meet homogeneity of variance assumption.
Additional transformations are useless.

TITLE: AA # K1211001, DAPHNIA PULEX, 48 HR ACUTE, 11-7-12
FILE: Z:/toxstat/wbluff\DP5.
TRANSFORM: ARC SINE(SQUARE ROOT(Y)) NUMBER OF GROUPS: 6

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	CONTROL	1	1.0000	1.3931
1	CONTROL	2	1.0000	1.3931
1	CONTROL	3	1.0000	1.3931
1	CONTROL	4	1.0000	1.3931
1	CONTROL	5	1.0000	1.3931
2	9 % EFFLUENT	1	1.0000	1.3931
2	9 % EFFLUENT	2	1.0000	1.3931
2	9 % EFFLUENT	3	1.0000	1.3931
2	9 % EFFLUENT	4	1.0000	1.3931
2	9 % EFFLUENT	5	1.0000	1.3931

3	12 %	EFFLUENT	1	1.0000	1.3931
3	12 %	EFFLUENT	2	1.0000	1.3931
3	12 %	EFFLUENT	3	1.0000	1.3931
3	12 %	EFFLUENT	4	1.0000	1.3931
3	12 %	EFFLUENT	5	1.0000	1.3931
4	17 %	EFFLUENT	1	1.0000	1.3931
4	17 %	EFFLUENT	2	1.0000	1.3931
4	17 %	EFFLUENT	3	0.8750	1.2094
4	17 %	EFFLUENT	4	1.0000	1.3931
4	17 %	EFFLUENT	5	1.0000	1.3931
5	22 %	EFFLUENT	1	1.0000	1.3931
5	22 %	EFFLUENT	2	1.0000	1.3931
5	22 %	EFFLUENT	3	1.0000	1.3931
5	22 %	EFFLUENT	4	1.0000	1.3931
5	22 %	EFFLUENT	5	1.0000	1.3931
6	29 %	EFFLUENT	1	1.0000	1.3931
6	29 %	EFFLUENT	2	1.0000	1.3931
6	29 %	EFFLUENT	3	1.0000	1.3931
6	29 %	EFFLUENT	4	1.0000	1.3931
6	29 %	EFFLUENT	5	1.0000	1.3931

AA # K1211001, DAPHNIA PULEX, 48 HR ACUTE, 11-7-12
 File: Z:/toxstat/wbluff\DP5. Transform: ARC SINE(SQUARE ROOT(Y))

STEEL'S MANY-ONE RANK TEST

Ho: Control < Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	RANK SUM	CRIT. VALUE	df	SIG
1	CONTROL	1.393				
2	9 % EFFLUENT	1.393	27.50	16.00	5.00	
3	12 % EFFLUENT	1.393	27.50	16.00	5.00	
4	17 % EFFLUENT	1.356	25.00	16.00	5.00	
5	22 % EFFLUENT	1.393	27.50	16.00	5.00	
6	29 % EFFLUENT	1.393	27.50	16.00	5.00	

Critical values use k = 5, are 1 tailed, and alpha = 0.05

APPENDIX D

Organism History

AQUATOX, INC.

416 TWIN POINTS ROAD
HOT SPRINGS, ARKANSAS 71913
501-520-0560

TEST ORGANISM HISTORY

DATE SHIPPED 11/6/12 CLIENT AR Analytical

Purchase Order #: _____

SPECIES: Pimephales promelas

Quantity Shipped: 600

Age: 10 days on 11/6/12

Brood Stock Source: Anderson Farms, AR

Culture Water: Groundwater

Hardness (Mg/l CaCO₃): 160

Dissolved Oxygen (Mg/l): 8.1

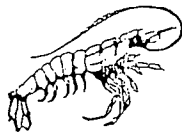
Temperature (°C): 25.10C

Feeding: Artemia

Comments: _____

Shipped Via: Federal Express UPS Overnight Shuttle

Packaged By: _____



Aquatic Research Organisms

DATA SHEET

I. Organism History

Species: Daphnia pulex

Source: Lab reared X Hatchery reared _____ Field collected _____

Hatch date 7/06 Receipt date _____

Lot number 01 00 06 DP Strain AKO

Brood Origination EPA 04

II. Water Quality

Temperature 23 °C Salinity — ppt DO SAT

pH 7.2 Hardness ~75 ppm

III. Culture Conditions

System: Fw static renewal

Diet: Flake Food _____ Phytoplankton X Trout Chow _____

Brine Shrimp _____ Rotifers _____ Other YCT

Prophylactic Treatments: _____

Comments: All gravid as of 1:45 pm EST

IV. Shipping Information

Client: ARK ANAH # of Organisms: 1 culture

Carrier: FedEx Date Shipped: 7/27/06

Biologist: [Signature]

1 - 800 - 927 - 1650

PO Box 1271 • One Lafayette Road • Hampton, NH 03842 • (603) 926-1650

APPENDIX E

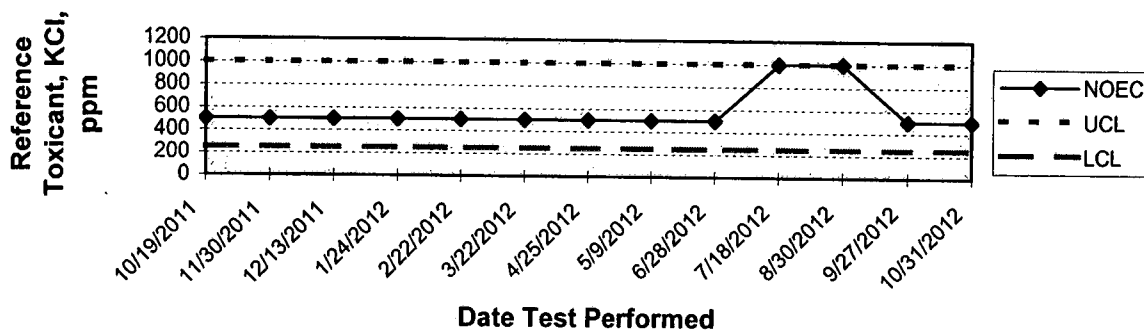
Quality Assurance Charts

ARKANSAS ANALYTICAL, INC.

FATHEAD MINNOW NOEC

QUALITY ASSURANCE

48 HOUR ACUTE

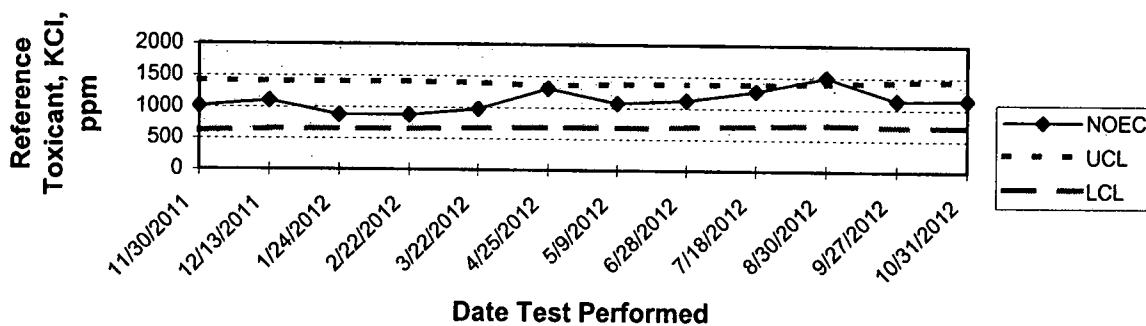


ARKANSAS ANALYTICAL, INC.

FATHEAD MINNOW LC50

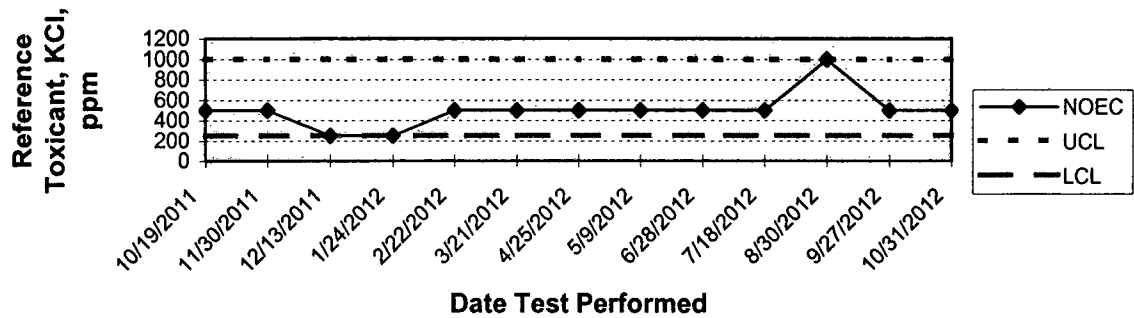
QUALITY ASSURANCE

48 HOUR ACUTE



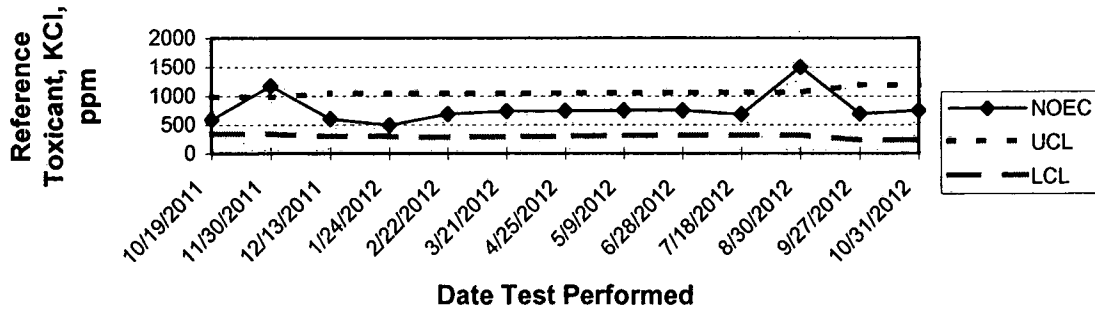
ARKANSAS ANALYTICAL, INC.

DAPHNIA PULEX NOEC QUALITY ASSURANCE 48 HOUR ACUTE



ARKANSAS ANALYTICAL, INC.

DAPHNIA PULEX LC50 QUALITY ASSURANCE 48 HOUR ACUTE



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