



Certified Mail N° 7007 1490 0005 1011 4424  
RETURN RECEIPT REQUESTED

July 17, 2012

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

RE: Discharge Monitoring Report  
Hot Spring Power Company, LLC  
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 / 06 / 01 - 2012 / 06 / 30
AR0049611 - 001 A	2012 / 06 / 01 - 2012 / 06 / 30
AR0049611 - 01B A	2012 / 06 / 01 - 2012 / 06 / 30

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

Discharge Number	Quarterly Period (year, month, day)
TX1 Q	2012 / 04 / 01 - 2012 / 06 / 31

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

Sincerely,

Robert Smith  
Plant Manager

RS: jmm

Cc: File 8.5.10 - 2012

Direct Line: 501-467-3232 ext 102  
Direct Fax: 501-467-3233  
Email: [rob.smith@gdfsuezna.com](mailto:rob.smith@gdfsuezna.com)

# Arkansas Analytical, Inc.

Toxicity Test Results  
Hot Spring Power Co., LLC  
May, 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 K1205001**

Monday, May 14, 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 second 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:	5-7-12, 0930	5-8-12, 0830	5-8-12, 1402	4
SAMPLE B:	5-8-12, 1146	5-9-12, 1046	5-9-12, 1350	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	5-8-12, 1440	5-8-12, 1455
Date, Time Ended	5-10-12, 1315	5-10-12, 1320
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

	<i>Daphnia pulex</i>	<i>Pimephales promelas</i>
Scientific name:	<i>Daphnia pulex</i>	<i>Pimephales promelas</i>
Age:	< 24 hours old	9 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	97.5%	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> 5/9-11/12		<i>Pimephales promelas</i> 5/9-11/12	
NOEC Survival:	250 ppm KCl	NOEC Survival:	500 ppm KCl
LOEC Survival:	500 ppm KCl	LOEC Survival:	1000 ppm KCl
LC50:	750 ppm KCl	LC50:	1075 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:	5-7-12, 0930	5-8-12, 0830
SAMPLE B:	5-8-12, 1146	5-9-12, 1046

Test initiated (date, time): 5-8-12, 1455      Test terminated (date, time): 5-10-12, 1320

Dilution water used:      Soft Synthetic

**DATA TABLE FOR FATHEAD MINNOW SURVIVAL**

Effluent Conc %	Percent Survival in Replicate Chambers						Mean Percent Survival		CV %
	A	B	C	D	E		24 hours	48 hours	
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:	5-7-12, 0930	5-8-12, 0830
SAMPLE B:	5-8-12, 1146	5-9-12, 1046

Test initiated (date, time): 5-8-12, 1440      Test terminated (date, time): 5-10-12, 1315

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	87.5	100	100	100	100		100	97.5	5.73
9%	100	100	100	100	100		100	100	
12%	87.5	100	100	87.5	100		100	95	
17%	87.5	100	100	100	100		100	97.5	
22%	87.5	100	100	100	87.5		100	95	7.21
29%	100	100	100	75	100.0		100	95	

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.

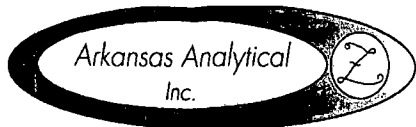
4. Enter percentage corresponding to the parameters below:

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

b.) Coefficient of variation (parameter TQM3D): 7.21 %.

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


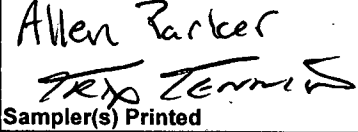

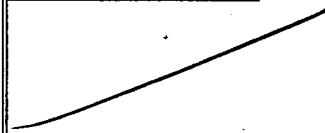
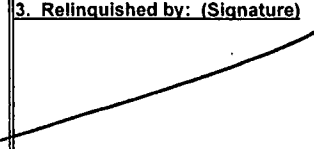
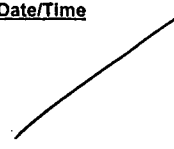

<b>CLIENT INFORMATION</b>			<b>Project Description</b>			<b>Turnaround Time</b>		<b>Preservation Codes:</b>														
Suez - Hot Spring Power			Acute Toxicity			24 Hour		1. Cool, 4 Degrees Centigrade			4. Thiosulfate for Dechlorination											
410 Henderson Rd.						48 Hour		2. Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> ), pH < 2			5. Hydrochloric Acid(HCl)											
Malvern, AR 72109			<b>Reporting Information</b>			72 Hour		3. Nitric Acid (HNO <sub>3</sub> ), pH < 2			6. Sodium Hydroxide (NaOH), pH > 12											
Attn: John Morgan			Telephone: 501-467-3232			Routine		<b>TEST PARAMETERS</b>						<b>Bottle Type Code</b>								
			Fax: 501-467-3233			Preservative Code: 1									G = Glass; P = Plastic							
			Email: John.Morgan@suezenergyna.com			Bottle Type: P									V = Septum; A = Amber							
 Sampler(s) Signature			 Sampler(s) Printed			Acute Biomonitoring								Arkansas Analytical Work Order Number:								
<b>Field Number</b>	<b>SAMPLE COLLECTION</b>				Number of Bottles										Sample Matrix	<b>SAMPLE IDENTIFICATION/ DESCRIPTION</b>						
	Date/s	Time/s	Grab	Comp																		
	5/7-8/12	0930-0830		X	24										Water	Outfall 001						X
1. Relinquished by: (Signature)		Date/Time		2. Received by: (Signature)			<b>SAMPLE CONDITION UPON RECEIPT IN LAB</b>						<b>REMARKS / SAMPLE COMMENTS</b>									
		5-8-12 1402					1. CUSTODY SEALS: <input checked="" type="checkbox"/> Yes ___ No															
							2. CONTAINERS CORRECT: ___ Yes ___ No															
							3. COC/LABELS AGREE: ___ Yes ___ No															
3. Relinquished by: (Signature)		Date/Time		4. Received by lab: (Signature)			4. PRESERVATION CONFIRMED: ___ Yes ___ No															
							5. RECEIVED ON ICE: <input checked="" type="checkbox"/> Yes ___ No															
							6. TEMPERATURE ON RECEIPT: 40c															
<b>FOR COMPLETION BY LAB ONLY</b>																						

AP  
 5-8-12  
 K1204008  
 K1205001A



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				Acute Toxicity			24 Hour		1. Cool, 4 Degrees Centigrade				4. Thiosulfate for Dechlorination								
410 Henderson Rd.							48 Hour		2. Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> ), pH < 2				5. Hydrochloric Acid(HCl)								
Malvern, AR 72109				Reporting Information			72 Hour		3. Nitric Acid (HNO <sub>3</sub> ), pH < 2				6. Sodium Hydroxide (NaOH), pH > 12								
Attn: John Morgan				Telephone: 501-467-3232			Routine		<b>TEST PARAMETERS</b>								Bottle Type Code				
				Fax: 501-467-3233			Preservative Code: 1										G = Glass; P = Plastic				
				Email: John.Morgan@suezenergyna.com			Bottle Type: P										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														
	Date/s	Time/s					Outfall 001														
	5/8-9/12	1446-1046		X	24	Water						X									
													K1205001B								
1. Relinquished by: (Signature)				Date/Time		2. Received by: (Signature)				SAMPLE CONDITION UPON RECEIPT IN LAB								REMARKS / SAMPLE COMMENTS			
				5/9/12 1350						1. CUSTODY SEALS: <input checked="" type="checkbox"/> Yes ___ No 2. CONTAINERS CORRECT: <input type="checkbox"/> Yes ___ No 3. COC/LABELS AGREE: <input type="checkbox"/> Yes ___ No 4. PRESERVATION CONFIRMED: <input type="checkbox"/> Yes ___ No 5. RECEIVED ON ICE: <input type="checkbox"/> Yes ___ No 6. TEMPERATURE ON RECEIPT: 18°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: <u>R1205002</u>	Test Organism: <u>P promelas</u>
Client: <u>HSP</u>	Age of Organism: <u>9 days old</u>
Date/ Time Started: <u>5/8/12, 1455</u>	Source of Organism: <u>Aqueduct</u>
Date/ Time Ended: <u>5/10/12, 1320</u>	Dilution Water: <u>SS</u>

Conc.	Rep	# Live Organisms			pH		Dissolved O <sub>2</sub> 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	8.0	8.1	8.1	8.3	304	404	164	164	164	164	164	164	164
	B	10	10	10	7.7	7.8	8.0	7.8									
	C	10	10	10													
	D	10	10	10	22.8	23.1											
	E	10	10	10	25.0	25.0											
9	A	10	10	10	8.1	8.1	8.1	8.2									
	B	10	10	10	7.6	7.8	8.0	7.8									
	C	10	10	10													
	D	10	10	10	22.8	22.9											
	E	10	10	10	25.0	25.0											
12	A	10	10	10	8.2	8.3	8.1	8.2									
	B	10	10	10	7.6	7.6	8.0	7.8									
	C	10	10	10													
	D	10	10	10	22.9	22.5											
	E	10	10	10	25.0	25.0											
17	A	10	10	10	8.2	8.2	8.1	8.2									
	B	10	10	10	7.6	7.7	7.9	7.8									
	C	10	10	10													
	D	10	10	10	22.9	22.8											
	E	10	10	10	25.0	25.0											
22	A	10	10	10	8.4	8.4	8.1	8.2									
	B	10	10	10	7.5	7.2	7.7	7.8									
	C	10	10	10													
	D	10	10	10	23.0	22.7											
	E	10	10	10	25.0	25.0											
29	A	10	10	10	8.4	8.4	8.1	8.1	164	176	444	480	1526	1590	0.13	0.10	
	B	10	10	10	7.7	7.1	7.7	7.8									
	C	10	10	10													
	D	10	10	10	23.0	22.8											
	E	10	10	10	25.0	25.0											



Biomonitoring Report  
Acute 24/48 Hour Static Test

Lab Number: <u>81005002</u>	Test Organism: <u>D. Pulex</u>
Client: <u>HSP</u>	Age of Organism: <u>&lt;24 hrs old</u>
Date/ Time Started: <u>5/8/12, 1440</u>	Source of Organism: <u>Inhouse culture</u>
Date/ Time Ended: <u>5/10/12, 1315</u>	Dilution Water: <u>55</u>

Conc.	Rep #	# Live Organisms			pH		Dissolved O <sub>2</sub> 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	7	8.0	8.1	8.1	8.3	304	404	164	164	<0.05	<0.05		
	B	8	8	8	7.8	7.8	8.3	8.2								
	C	8	8	8												
	D	8	8	8	22.8	23.1										
	E	8	8	8	25.0	25.0										
9	A	8	8	8	8.1	8.1	8.1	8.2								
	B	8	8	8	7.8	7.8	8.3	8.2								
	C	8	8	8												
	D	8	8	8	22.8	22.9										
	E	8	8	8	25.0	25.0										
12	A	8	8	7	8.2	8.3	8.1	8.2								
	B	8	8	8	7.8	7.9	8.3	8.2								
	C	8	8	8												
	D	8	8	7	22.9	22.5										
	E	8	8	8	25.0	25.0										
17	A	8	8	7	8.2	8.2	8.1	8.2								
	B	8	8	8	7.8	7.9	8.3	8.2								
	C	8	8	8												
	D	8	8	8	22.9	22.8										
	E	8	8	8	25.0	25.0										
22	A	8	8	7	8.4	8.4	8.1	8.2								
	B	8	8	8	7.9	7.9	8.2	8.2								
	C	8	8	8												
	D	8	8	8	23.0	22.7										
	E	8	8	7	25.0	25.0										
29	A	8	8	8	8.4	8.4	8.1	8.1	164	176	444	480	1526	1590	0.13	0.10
	B	8	8	8	7.9	8.0	8.2	8.2								
	C	8	8	8												
	D	8	8	6	23.0	22.8										
	E	8	8	8	25.0	25.0										

APPENDIX C

Fathead Minnow and *Daphnia pulex* Statistics

AA # K1205002, Pimphales promelas, 48 HR ACUTE, 5-8-12  
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 # K1205002, Pimphales promelas, 48 HR ACUTE, 5-8-12  
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 # K1205002, Pimphales promelas, 48 HR ACUTE, 5-8-12  
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 # K1205001, Pimphales promelas, 48 HR ACUTE, 5-8-12  
 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 # K1205002, DAPHNIA PULEX, 48 HR ACUTE, 5-8-12  
File: Z:\TOXSTAT\WBLUFF\DP5. Transform: ARC SINE(SQUARE ROOT(Y))

Shapiro - Wilk's test for normality

D = 0.231

W = 0.779

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 # K1205002, DAPHNIA PULEX, 48 HR ACUTE, 5-8-12  
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 # K1205002, DAPHNIA PULEX, 48 HR ACUTE, 5-8-12  
FILE: Z:\TOXSTAT\WBLUFF\DP5.  
TRANSFORM: ARC SINE(SQUARE ROOT(Y)) NUMBER OF GROUPS: 6

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	CONTROL	1	0.8750	1.2094
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	0.8750	1.2094
3	12 %	EFFLUENT	2	1.0000	1.3931
3	12 %	EFFLUENT	3	1.0000	1.3931
3	12 %	EFFLUENT	4	0.8750	1.2094
3	12 %	EFFLUENT	5	1.0000	1.3931
4	17 %	EFFLUENT	1	0.8750	1.2094
4	17 %	EFFLUENT	2	1.0000	1.3931
4	17 %	EFFLUENT	3	1.0000	1.3931
4	17 %	EFFLUENT	4	1.0000	1.3931
4	17 %	EFFLUENT	5	1.0000	1.3931
5	22 %	EFFLUENT	1	0.8750	1.2094
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	0.8750	1.2094
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	0.7500	1.0472
6	29 %	EFFLUENT	5	1.0000	1.3931

AA # K1205002, DAPHNIA PULEX, 48 HR ACUTE, 5-8-12  
 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	1.356				
2	9 % EFFLUENT	1.393	30.00	16.00	5.00	
3	12 % EFFLUENT	1.320	25.00	16.00	5.00	
4	17 % EFFLUENT	1.356	27.50	16.00	5.00	
5	22 % EFFLUENT	1.320	25.00	16.00	5.00	
6	29 % EFFLUENT	1.324	27.00	16.00	5.00	

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

APPENDIX D

Organism History

5/8/12

**AQUATOX, INC.**  
416 TWIN POINTS ROAD  
HOT SPRINGS, ARKANSAS 71913  
501-520-0560

**TEST ORGANISM HISTORY**

DATE SHIPPED 5/8/12 CLIENT Ar Analytical

Purchase Order #: \_\_\_\_\_

SPECIES: Pimephales promelas

Quantity Shipped: 780

Age: 9 days 5/8/12

Brood Stock Source: Anderson Farms, AR

Culture Water: Groundwater

Hardness (Mg/l CaCO3): 160

Dissolved Oxygen (Mg/l): 8.2

Temperature (°C): 25.1°C

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  Hatchery reared \_\_\_\_\_ Field collected \_\_\_\_\_  
Hatch date 1/06 Receipt date \_\_\_\_\_  
Lot number 01 0006DP Strain AKO  
Brood Origination EPH 04

### II. Water Quality

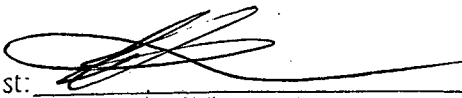
Temperature 23 °C Salinity — ppt DO SAT  
pH 7.2 Hardness ~75 ppm

### III. Culture Conditions

System: Fw static renewal  
Diet: Flake Food \_\_\_\_\_ Phytoplankton  Trout Chow \_\_\_\_\_  
Brine Shrimp \_\_\_\_\_ Rotifers \_\_\_\_\_ Other YCT  
Prophylactic Treatments: \_\_\_\_\_  
Comments: All gravid as of 1:45 pm EST

### IV. Shipping Information

Client: ARK ANAK # of Organisms: 1 culture  
Carrier: FedEx Date Shipped: 1/27/06

Biologist: 

1 - 800 - 927 - 1650

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

APPENDIX E

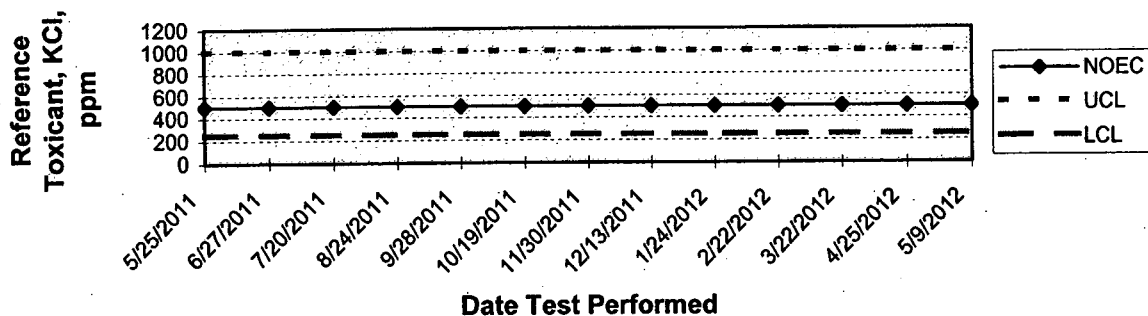
Quality Assurance Charts

# ARKANSAS ANALYTICAL, INC.

FATHEAD MINNOW NOEC

QUALITY ASSURANCE

48 HOUR ACUTE

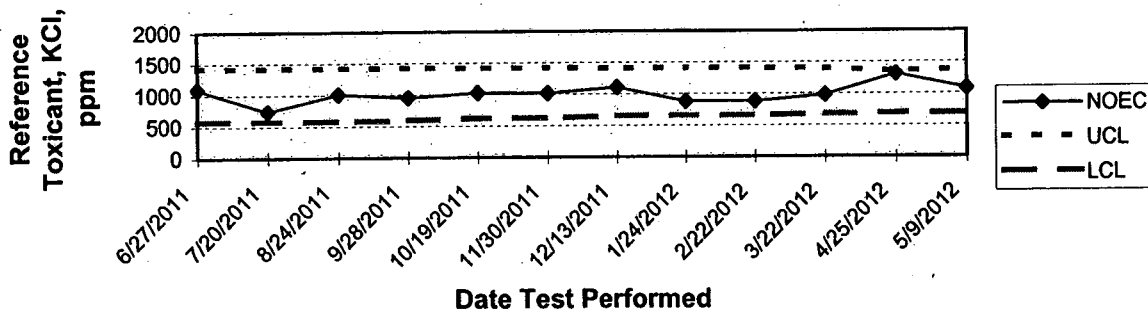


# ARKANSAS ANALYTICAL, INC.

FATHEAD MINNOW LC50

QUALITY ASSURANCE

48 HOUR ACUTE

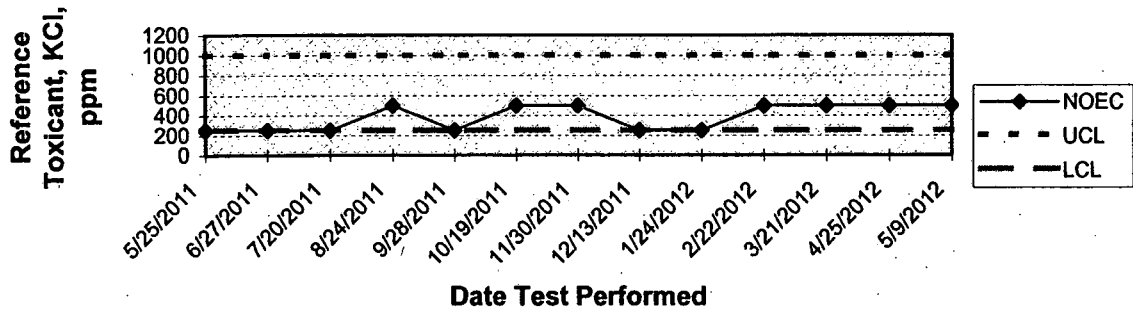


# ARKANSAS ANALYTICAL, INC.

*DAPHNIA PULEX* NOEC

QUALITY ASSURANCE

48 HOUR ACUTE

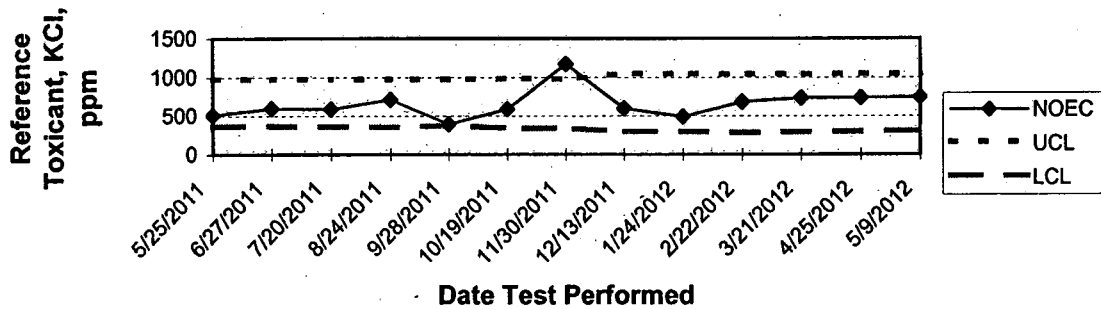


# ARKANSAS ANALYTICAL, INC.

*DAPHNIA PULEX* LC50

QUALITY ASSURANCE

48 HOUR ACUTE



Hot Spizina Power  
410 Henderson Road  
Malvern, Ar 72104



ADEQ  
NPDES Enforcement Section  
5301 North Shore Drive  
North Little Rock, AR 72118-5317

