



Certified Mail N° 7011 3500 0001 6675 7740
RETURN RECEIPT REQUESTED

July 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	2013 / 06 / 01 - 2013 / 06 / 30
AR0049611 - 001 A	2013 / 06 / 01 - 2013 / 06 / 30
AR0049611 - 01B A	2013 / 06 / 01 - 2013 / 06 / 30

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

Discharge Number	Quarterly Period (year, month, day)
TX1 Q	2013 / 04 / 01 - 2013 / 06 / 30

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 8.5.11 - 2013

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

Arkansas Analytical, Inc.

Toxicity Test Results
AECC – Magnet Cove Plant
May 2013
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**
AECC – Magnet Cove
410 Henderson
Malvern, AR 72104

Prepared by: **Arkansas Analytical, Inc.**
11701 I-30, Bldg 1, Suite 115
Little Rock, Arkansas 72209
Lab Number K1305006

Friday, May 31, 2013

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 2013.

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:	5-13-13, 0930	5-14-13, 0830	5-14-13, 1200	15 (on ice)
SAMPLE B:	5-14-13, 1103	5-15-13, 1003	5-15-13, 1455	10 (on ice)

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 5%, 7%, 10%, 13%, and 17%. The low-flow effluent concentration (**critical dilution**) was defined as **13% 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	5-14-13, 1430	5-14-13, 1445
Date, Time Ended	5-16-13, 1400	5-16-13, 1430
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	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> 4/2/13 – 4/4/13		<i>Pimephales promelas</i> 4/2/13 – 4/4/13	
NOEC Survival:	500 ppm KCl	NOEC Survival:	500 ppm KCl
LOEC Survival:	1000 ppm KCl	LOEC Survival:	1000 ppm KCl
LC50:	716 ppm KCl	LC50:	1009ppm 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	17% / NA	PASS	NOEC / LOEC Survival	17% / 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 13% 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 13% 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:

Ryan Hudgin (signature)
 Ryan Hudgin

ACUTE FORMS
FATHEAD MINNOW SURVIVAL RESULTS
(Pimephales promelas)

PERMITTEE: Hot Spring Power

NPDES #: AR0049611

Sample Collection:	Date, Time Started	Date, Time Ended
SAMPLE A:	5-13-13, 0930	5-14-13, 0830
SAMPLE B:	5-14-13, 1103	5-15-13, 1003

Test initiated (date, time): 5-14-13, 1445 Test terminated (date, time): 5-16-13, 1430

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
5%	100	100	100	100	100		100	100	
7%	100	100	100	100	100		100	100	
10%	100	100	100	100	100		100	100	
13%	100	100	100	100	100		100	100	0.00
17%	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): 17 % 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:	5-13-13, 0930	5-14-13, 0830
SAMPLE B:	5-14-13, 1103	5-15-13, 1003

Test initiated (date, time): 5-14-13, 1430 Test terminated (date, time): 5-16-13, 1400

Dilution water used: Soft Synthetic

DATA TABLE FOR *Daphnia pulex* 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	
5%	100	100	100	100	100	100	100		
7%	100	100	100	100	100	100	100		
10%	100	100	100	100	100	100	100		
13%	100	100	100	100	100	100	100	0.00	
17%	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.

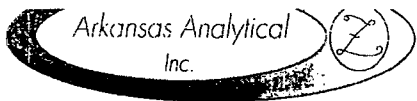
4. Enter percentage corresponding to the parameters below:

a.) Survival NOEC (parameter TOM3D): 17 % effluent.

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

APPENDIX A

Chain of Custody Forms

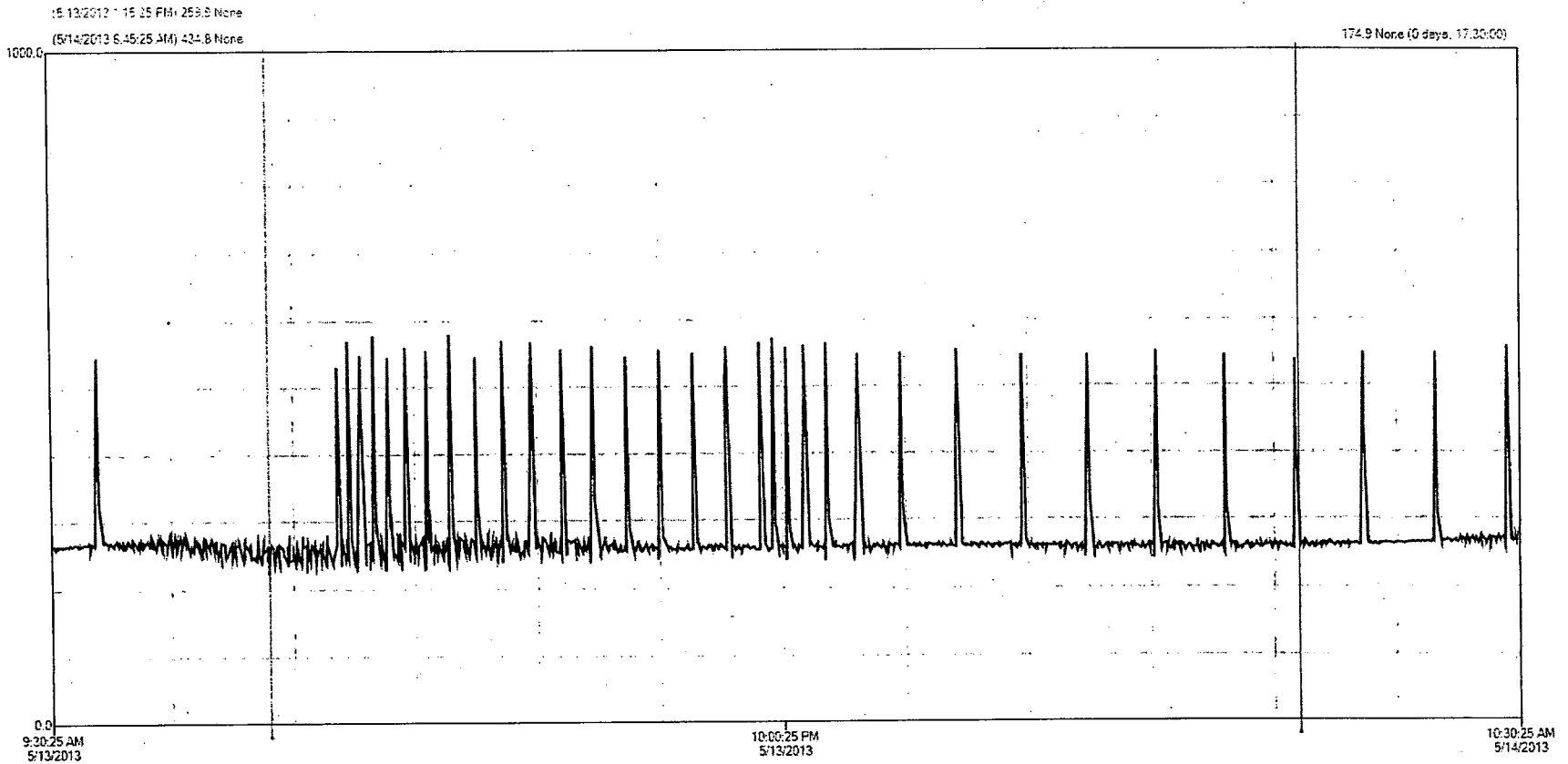


Little Rock, AR 72209
 PHONE: 501-455-3233
 FAX: 501-455-6118

CHAIN OF CUSTODY RECORD

CLIENT INFORMATION			Project Description			Turnaround Time		Preservation Codes:									
AECC - Magnet Cove Plant			Acute Toxicity			24 Hour		1. Cool, 4 Degrees Centigrade				4. Thiosulfate for Dechlorination					
410 Henderson Rd.						48 Hour		2. Sulfuric Acid (H ₂ SO ₄), pH < 2				5. Hydrochloric Acid(HCl).					
Malvern, AR 72109			Reporting Information			72 Hour		3. Nitric Acid (HNO ₃), pH < 2				6. Sodium Hydroxide (NaOH), pH > 12					
Attn: John Morgan			Telephone: 501-467-3232			Routine		TEST PARAMETERS								Bottle Type Code	
			Fax: 501-467-3233			Preservative Code:		1								G = Glass; P = Plastic	
			Email: John.Morgan@aecc.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		Acute Biomonitoring								
	Date/s	Time/s															
	5/13-14/13	0930-0830		X	24	Water	Outfall 001	X								13050067	
1. Relinquished by: (Signature)			Date/Time		2. Received by: (Signature)			SAMPLE CONDITION UPON RECEIPT IN LAB				REMARKS / SAMPLE COMMENTS					
			1200 5-14-13					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: 15°C									
3. Relinquished by: (Signature)			Date/Time		4. Received by lab: (Signature)			FOR COMPLETION BY LAB ONLY									

IndustrialSQL Server: Trend



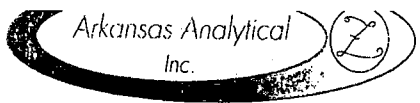
HOTWAV01WP-19GMA98CF101.XQ01 [BestFit - 00:00:04:59:214]

Tag Name	Description	Number	Server	Color	Units	Minimum	Maximum	IO Address	Time Offset	Source Tag	Source Server	Value at X1	Value at X2
<input checked="" type="checkbox"/> 19GMA98CF101.XQ01	COMBINED EFFLUENT...	1	HOTWW...		None	0.0	1000.0	\\HOTWW02WP\FSG...	0:00:00.000			259.9	434.8
<input type="checkbox"/> 19PAB04CL101.XQ01	CLG TWR BASIN LEVEL	2	HOTWW...		In	4.0	48.0	\\HOTWW02WP\FSG...	0:00:00.000			44.4	34.2

Avg. 275.64 GPM

Arkansas Analytical # K1305006
Hot Springs Power
Flow Composite Information

Date	Time	Sample #	Volume (mL)	Flow (GPM)
5/13/2013	0930	1	70	276
5/13/2013	1030	2	70	276
5/13/2013	1130	3	70	276
5/13/2013	1230	4	70	276
5/13/2013	1330	5	70	276
5/13/2013	1430	6	70	276
5/13/2013	1530	7	70	276
5/13/2013	1630	8	70	276
5/13/2013	1730	9	70	276
5/13/2013	1830	10	70	276
5/13/2013	1930	11	70	276
5/13/2013	2030	12	70	276
5/13/2013	2130	13	70	276
5/13/2013	2230	14	70	276
5/13/2013	2330	15	70	276
5/14/2013	0030	16	70	276
5/14/2013	0130	17	70	276
5/14/2013	0230	18	70	276
5/14/2013	0330	19	70	276
5/14/2013	0430	20	70	276
5/14/2013	0530	21	70	276
5/14/2013	0630	22	70	276
5/14/2013	0730	23	70	276
5/14/2013	0830	24	70	276
		TOT VOL=	1680	

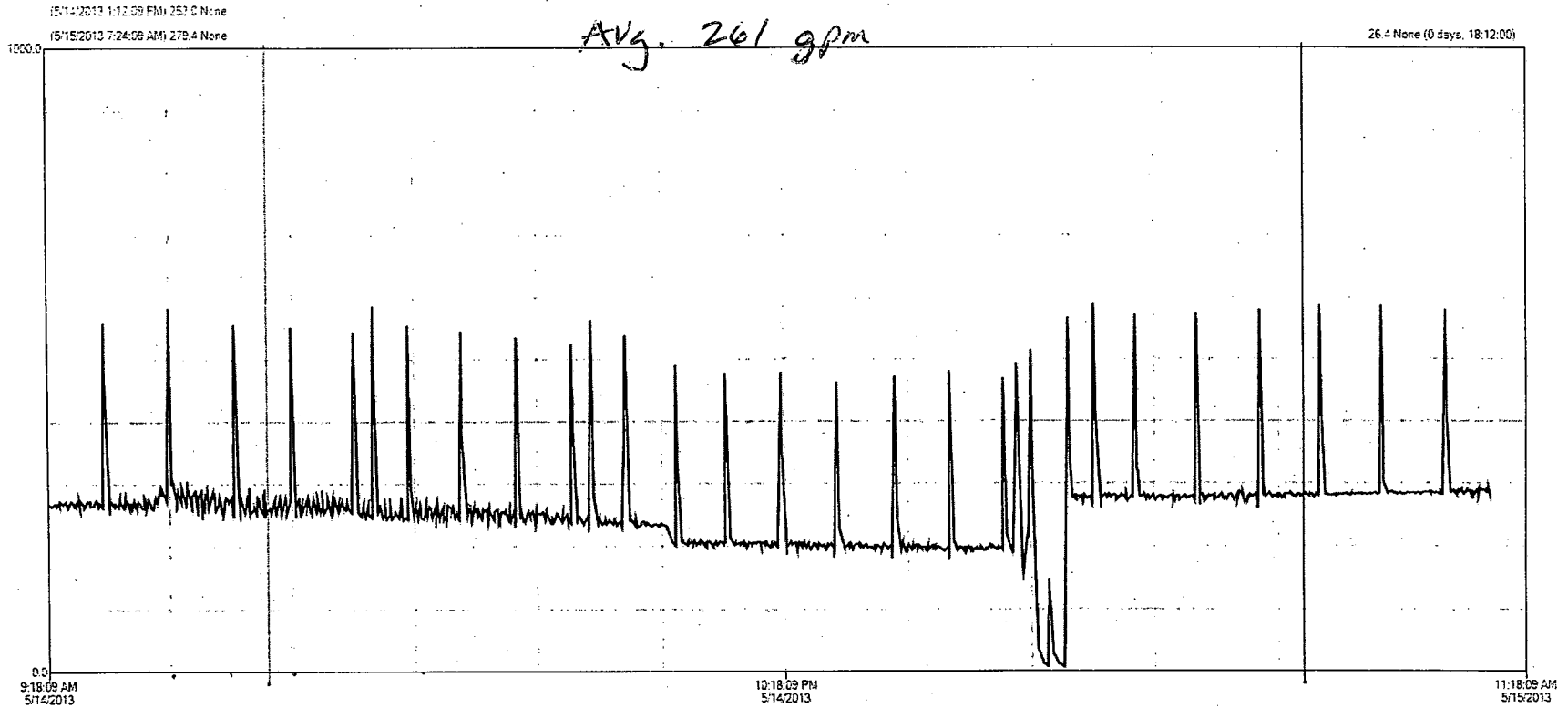


Little Rock, AR 72209
PHONE: 501-455-3233
FAX: 501-455-6118

CHAIN OF CUSTODY RECORD

Form with sections: CLIENT INFORMATION, Project Description, Turnaround Time, Preservation Codes, TEST PARAMETERS, Sampler(s) Signature, Field Number, SAMPLE COLLECTION, SAMPLE IDENTIFICATION/ DESCRIPTION, Relinquished by, Received by, SAMPLE CONDITION UPON RECEIPT IN LAB, REMARKS / SAMPLE COMMENTS.

IndustrialSQL Server: Trend



HOTWW01:P:19GMA88CF101.XQ01 [BestFit - 00 00:05:30.633]

Tag Name	Description	Number	Server	Color	Units	Minimum	Maximum	IO Address	Time Offset	Source Tag	Source Server	Value at X1	Value at X2
<input checked="" type="checkbox"/> 19GMA88CF101.XQ01	COMBINED EFFLUENT...	1	HOTWW...		None	0.0	1000.0	\\HOTWW02WPFVFSG...	0:00:00.000			253.0	279.4
<input type="checkbox"/> 19PAB04C...	CLG TWR BASIN LEVEL	2	HOTWW...		in	4.0	48.0	\\HOTWW02WPFVFSG...	0:00:00.000			30.1	33.5

Arkansas Analytical # K1305006
Hot Springs Power
Flow Composite Information

Date	Time	Sample #	Volume (mL)	Flow (GPM)
5/14/2013	1100	1	77	275
5/14/2013	1200	2	77	275
5/14/2013	1300	3	77	275
5/14/2013	400	4	77	275
5/14/2013	1500	5	77	275
5/14/2013	1600	6	77	275
5/14/2013	1700	7	70	250
5/14/2013	1800	8	70	250
5/14/2013	1900	9	70	250
5/14/2013	2000	10	56	200
5/14/2013	21000	11	56	200
5/14/2013	2200	12	56	200
5/15/2013	2300	13	56	200
5/15/2013	2400	14	56	200
5/15/2013	0100	15	56	200
5/15/2013	0200	16	0	
5/15/2013	0300	17	80	285
5/15/2013	0400	18	80	285
5/15/2013	0500	19	80	285
5/15/2013	0600	20	80	285
5/15/2013	0700	21	80	285
5/15/2013	0800	22	80	285
5/15/2013	0900	23	80	285
5/15/2013	1000	24	80	285
TOT VOL=			1651	

APPENDIX B

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

Biomonitoring Report

Acute 24/48 Hour Static Test

Lab Number: 61305006	Test Organism: Pimephales Promelas
Client: HSP	Age of Organism: 11 days old
Date/ Time Started: 5-14-13 1445	Source of Organism: Aquatox
Date/ Time Ended: 5-16-13 1430	Dilution Water: 55

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	7.6	7.9	8.5	8.5	34	+	48	+	145	+	<.005	+
	B	↓	↓	↓	7.7	7.4	6.4	6.9								
	C	↓	↓	↓												
	D	↓	↓	↓	22	22										
	E	↓	↓	↓	25	25										
5	A	10	10	10	7.6	7.7	8.5	8.5	70	56	134	106	616	560	<.005	0.07
	B	↓	↓	↓	7.4	7.4	6.6	7.2								
	C	↓	↓	↓												
	D	↓	↓	↓	22	22										
	E	↓	↓	↓	25	25										
7	A	10	10	10	7.5	7.8	8.5	8.5								
	B	↓	↓	↓	7.3	7.3 7.3	6.8	6.9								
	C	↓	↓	↓												
	D	↓	↓	↓	22	22										
	E	↓	↓	↓	25	25										
10	A	10	10	10	7.6	7.7	8.5	8.4								
	B	↓	↓	↓	7.3	7.3 7.3	6.6	6.6								
	C	↓	↓	↓												
	D	↓	↓	↓	23	22										
	E	↓	↓	↓	25	25										
13	A	10	10	10	7.6	7.7	8.6	8.4								
	B	↓	↓	↓	7.4	7.2	6.5	6.6								
	C	↓	↓	↓	7.2 7.2											
	D	↓	↓	↓	22	23										
	E	↓	↓	↓	25	25										
17	A	10	10	10	7.6	8.6 8.6	8.6	8.5								
	B	↓	↓	↓	7.4	7.3	6.4	6.4								
	C	↓	↓	↓												
	D	↓	↓	↓	23	23										
	E	↓	↓	↓	25	25										

Biomonitoring Report
Acute 24/48 Hour Static Test

Lab Number: K1305006	Test Organism: Daphnia Pulex
Client: HSP	Age of Organism: c 24 hrs old
Date/ Time Started: 5-14-13 1430	Source of Organism: In house culture
Date/ Time Ended: 5-16-13 1400	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	8	8	8	7.6	7.9	8.5	8.5	34	-	48	-	145	-	<0.05	-
	B				7.7	7.6	7.8	7.7								
	C															
	D				22	22										
	E				25	25										
5	A	8	8	8	7.6	7.7	8.5	8.5	70	56	134	106	616	560	<0.05	0.07
	B				7.6	7.5	7.9	7.7								
	C															
	D				22	22										
	E				25	25										
7	A	8	8	8	7.5	7.8	8.5	8.5								
	B				7.7	7.5	8.0	7.8								
	C															
	D				22	22										
	E				25	25										
10	A	8	8	8	7.6	7.7	8.5	8.4								
	B				7.6	7.5	8.0	7.8								
	C															
	D				23	22										
	E				25	25										
13	A	8	8	8	7.6	7.7	8.6	8.4								
	B			8	7.6	7.5	8.0	7.7								
	C															
	D				22	23										
	E				25	25										
17	A	8	8	8	7.6	7.8	8.6	8.5								
	B				7.6	7.5	8.0	7.8								
	C															
	D				23	23										
	E				25	25										

APPENDIX C

Fathead Minnow and *Daphnia pulex* Statistics

AA # K1305006, Pimephales promelas, 48 HR ACUTE, 5-14-13
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 # K1305006, Pimephales promelas, 48 HR ACUTE, 5-14-13
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 # K1305006, Pimephales promelas, 48 HR ACUTE, 5-14-13
 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	5 % EFFLUENT	1	1.0000	1.4120
2	5 % EFFLUENT	2	1.0000	1.4120
2	5 % EFFLUENT	3	1.0000	1.4120
2	5 % EFFLUENT	4	1.0000	1.4120
2	5 % EFFLUENT	5	1.0000	1.4120
3	7 % EFFLUENT	1	1.0000	1.4120
3	7 % EFFLUENT	2	1.0000	1.4120
3	7 % EFFLUENT	3	1.0000	1.4120
3	7 % EFFLUENT	4	1.0000	1.4120
3	7 % EFFLUENT	5	1.0000	1.4120
4	10 % EFFLUENT	1	1.0000	1.4120
4	10 % EFFLUENT	2	1.0000	1.4120
4	10 % EFFLUENT	3	1.0000	1.4120
4	10 % EFFLUENT	4	1.0000	1.4120
4	10 % EFFLUENT	5	1.0000	1.4120
5	13 % EFFLUENT	1	1.0000	1.4120
5	13 % EFFLUENT	2	1.0000	1.4120
5	13 % EFFLUENT	3	1.0000	1.4120
5	13 % EFFLUENT	4	1.0000	1.4120
5	13 % EFFLUENT	5	1.0000	1.4120
6	17 % EFFLUENT	1	1.0000	1.4120
6	17 % EFFLUENT	2	1.0000	1.4120
6	17 % EFFLUENT	3	1.0000	1.4120
6	17 % EFFLUENT	4	1.0000	1.4120
6	17 % EFFLUENT	5	1.0000	1.4120

AA # K1305006, Pimephales promelas, 48 HR ACUTE, 5-14-13
 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	5 % EFFLUENT	1.412	27.50	16.00	5.00	
3	7 % EFFLUENT	1.412	27.50	16.00	5.00	
4	10 % EFFLUENT	1.412	27.50	16.00	5.00	
5	13 % EFFLUENT	1.412	27.50	16.00	5.00	
6	17 % EFFLUENT	1.412	27.50	16.00	5.00	

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

TITLE: AA # K1305006, DAPHNIA PULEX, 48 HR ACUTE, 5-14-13
 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	5 % EFFLUENT	1	1.0000	1.3931
2	5 % EFFLUENT	2	1.0000	1.3931
2	5 % EFFLUENT	3	1.0000	1.3931
2	5 % EFFLUENT	4	1.0000	1.3931
2	5 % EFFLUENT	5	1.0000	1.3931
3	7 % EFFLUENT	1	1.0000	1.3931
3	7 % EFFLUENT	2	1.0000	1.3931
3	7 % EFFLUENT	3	1.0000	1.3931
3	7 % EFFLUENT	4	1.0000	1.3931
3	7 % EFFLUENT	5	1.0000	1.3931
4	10 % EFFLUENT	1	1.0000	1.3931
4	10 % EFFLUENT	2	1.0000	1.3931
4	10 % EFFLUENT	3	1.0000	1.3931
4	10 % EFFLUENT	4	1.0000	1.3931
4	10 % EFFLUENT	5	1.0000	1.3931
5	13 % EFFLUENT	1	1.0000	1.3931
5	13 % EFFLUENT	2	1.0000	1.3931
5	13 % EFFLUENT	3	1.0000	1.3931
5	13 % EFFLUENT	4	1.0000	1.3931
5	13 % EFFLUENT	5	1.0000	1.3931
6	17 % EFFLUENT	1	1.0000	1.3931
6	17 % EFFLUENT	2	1.0000	1.3931
6	17 % EFFLUENT	3	1.0000	1.3931
6	17 % EFFLUENT	4	1.0000	1.3931
6	17 % EFFLUENT	5	1.0000	1.3931

AA # K1305006, DAPHNIA PULEX, 48 HR ACUTE, 5-14-13
 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	5 % EFFLUENT	1.393	27.50	16.00	5.00	
3	7 % EFFLUENT	1.393	27.50	16.00	5.00	
4	10 % EFFLUENT	1.393	27.50	16.00	5.00	
5	13 % EFFLUENT	1.393	27.50	16.00	5.00	
6	17 % EFFLUENT	1.393	27.50	16.00	5.00	

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

LA # K1305006, DAPHNIA PULEX, 48 HR ACUTE, 5-14-13
File: Z:/TOXSTAT/wbluff\DP5. Transform: ARC SINE(SQUARE ROOT(Y))

Shapiro - Wilk's test for normality

W = 0.000

L = 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.

LA # K1305006, DAPHNIA PULEX, 48 HR ACUTE, 5-14-13
File: Z:/TOXSTAT/wbluff\DP5. Transform: ARC SINE(SQUARE ROOT(Y))

Bartley'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.

APPENDIX D

Organism History

AQUATOX, INC.

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

TEST ORGANISM HISTORY

DATE SHIPPED 5/14/13 CLIENT Ag Analytical
Ryan

Purchase Order #: _____

SPECIES: Pimephales promelas

Quantity Shipped: 300

Age: 10 days on 5/14/13

Brood Stock Source: Anderson Farms, AR

Culture Water: Groundwater

Hardness (Mg/l CaCO₃): 160

Dissolved Oxygen (Mg/l): 8.1

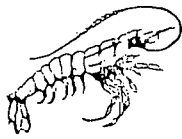
Temperature (°C): 25.1°C

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 7/06 Receipt date _____
Lot number 01 00 06 DP Strain ARKO
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 ANAH # of Organisms: 1 culture
Carrier: FedEx Date Shipped: 7/7/06

Biologist: 

1 - 800 - 927 - 1650

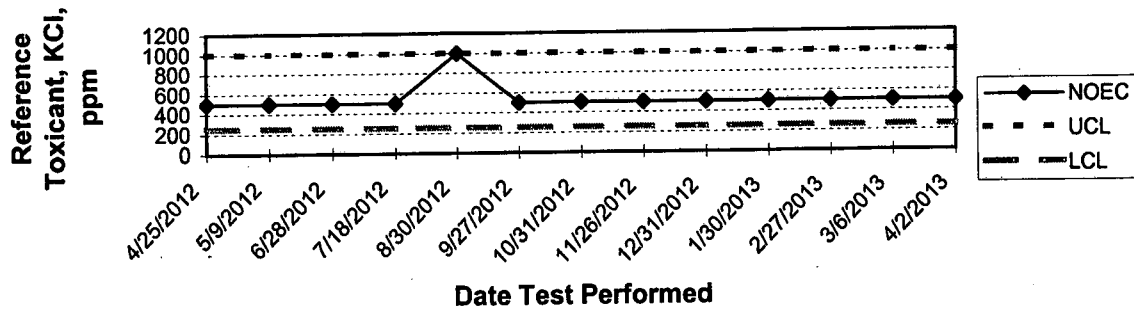
PO Box 1271 • One Lafayette Road • Hampton, NH 03842 • (603) 926-1650

APPENDIX E

Quality Assurance Charts

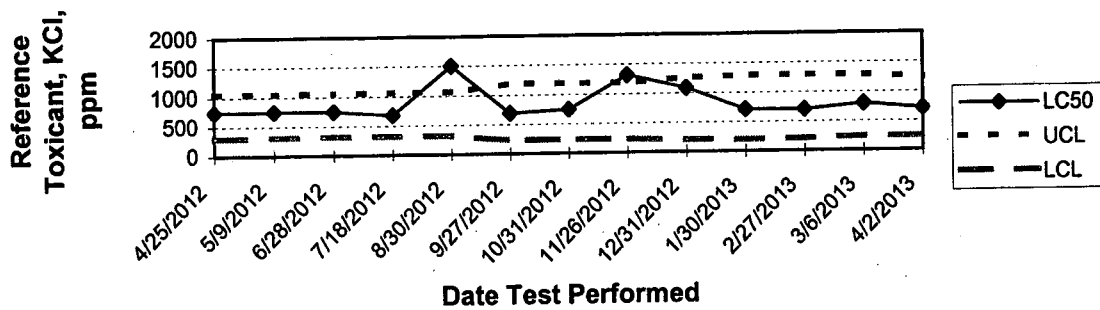
ARKANSAS ANALYTICAL, INC.

DAPHNIA PULEX NOEC QUALITY ASSURANCE 48 HOUR ACUTE

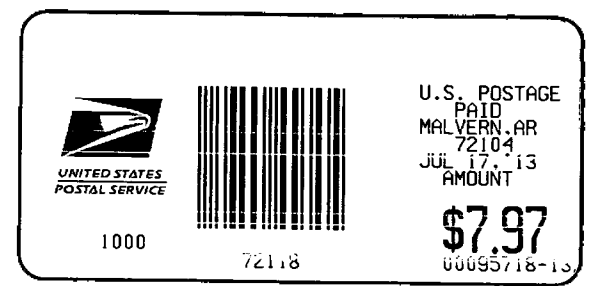


ARKANSAS ANALYTICAL, INC.

DAPHNIA PULEX LC50 QUALITY ASSURANCE 48 HOUR ACUTE



MARST COW GENERATING
410 HENDERSON RD
MALVERN, AR 72104



ADEQ
NPDES ENFORCEMENT
5301 NORTHSIDE DR
NORTH LITTLE ROCK, AR 72118-5317

