

# Arkansas Analytical, Inc.

## Toxicity Test Results

**Paragould Light, Water & Cable**  
**NPDES PERMIT NUMBER: AR0033766**  
**First Quarter 2020**  
**AFIN # 28-00470**

Fathead Minnow, *Pimephales promelas*, Larval Survival and Growth Test  
Test 1000.0

*Ceriodaphnia dubia*, Survival and Reproduction Test  
Test 1002.0

Prepared for: **Lisa Ellington**  
**401 Grant Lane**  
**Paragould, Arkansas 72450**

Prepared by: Arkansas Analytical, Inc.  
8100 National Drive  
Little Rock, Arkansas 72209  
**Lab Number K2001009**

Thursday, February 06, 2020

## Plant location

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City of Paragould. The facility is located at 401 Grant Lane, Paragould, AR 72450, approximately 1.4 miles south of U.S. Highway 412 and 0.4 miles west of Arkansas Highway 69 on Grant Lane in Greene County, Arkansas

## Test Methods

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EPA Method 1000.0 *Pimephales promelas*, Larval survival and growth test

- Test chambers: 500 mL plastic cups
- Test solution volume: 250 mL
- Number of test organisms per chamber: 10
- Number of replicates per concentration: 5
- Test temperature 25°C ± 1°C
- Test concentrations: 0%, 32%, 42%, 56%, 80%, 100%
- Dilution water: Moderately hard synthetic
- No deviation from method

EPA Method 1002.0 *Ceriodaphnia dubia*, Survival and reproduction test

- Test chambers: 30 mL plastic cups
- Test solution volume: 15 mL
- Number of test organisms per chamber: 1
- Number of replicates per concentration: 10
- Test temperature 25°C ± 1°C
- Test concentrations: 0%, 32%, 42%, 56%, 80%, 100%
- Dilution water: Moderately hard synthetic
- No deviation from method

## Reference Toxicant Data

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### REFERENCE TOXICANT (Potassium Chloride)

<i>Ceriodaphnia dubia</i> 1/22/20-1/28/20		<i>Pimephales promelas</i> 1/22/20-1/29/20	
NOEC Survival:	250 ppm KCl	NOEC Survival:	500 ppm KCl
LOEC Survival:	500 ppm KCl	LOEC Survival:	1000 ppm KCl
NOEC Reproduction:	125 ppm KCl	NOEC Growth:	250 ppm KCl
LOEC Reproduction:	250 ppm KCl	LOEC Growth:	500 ppm KCl

## Summary of Results

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### Paragould Light, Water & Cable

<i>Ceriodaphnia dubia</i>		<i>Pimephales promelas</i>	
NOEC Survival Parameter: <b>TOP3B</b>	100%	NOEC Survival Parameter: <b>TOP6C</b>	100%
Pass/Fail Survival Parameter: <b>TLP3B</b>	Pass	Pass/Fail Survival Parameter: <b>TLP6C</b>	Pass
NOEC Reproduction Parameter: <b>TPP3B</b>	100%	NOEC Growth Parameter: <b>TPP6C</b>	100%
Pass/Fail Reproduction Parameter: <b>TGP3B</b>	Pass	Pass/Fail Growth Parameter: <b>TGP6C</b>	Pass
%CV Reproduction Parameter: <b>TQP3B</b>	15.1%	%CV Growth Parameter: <b>TQP6C</b>	16.1%
PMSD Reproduction	20.8%	PMSD Growth	17.0%

## Conclusion

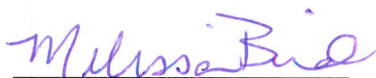
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*Pimephales promelas*, (Method 1000.0): The permit issued to the Paragould Light, Water & Cable, specifies that the **critical dilution is 100% effluent**. The effluent samples **did not** exhibit lethal or sublethal effects at the critical dilution, and, as such, **passed** both portions of the test.

*Ceriodaphnia dubia*, (Method 1002.0): The permit issued to the Paragould Light, Water & Cable, specifies the **critical dilution is 100% effluent**. The effluent samples **did not** exhibit lethal or sublethal effects at the critical dilution, and, as such, **passed** both portions of the test.

Biomonitoring Analysts: Melissa Bird, Emily Nichols, Jettie Parnell, Ali Abdulrahim

Reviewed by:



Melissa Bird

## Appendices

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Appendix A.....	Chains of custody
Appendix B.....	Fathead minnow data & statistics
Appendix C.....	<i>Ceriodaphnia dubia</i> data & statistics
Appendix D.....	Water chemistry data
Appendix E.....	Reference toxicant control charts



8100 National Drive  
 Little Rock, AR 72209  
 PHONE: 501-455-3233  
 FAX: 501-455-6118

# CHAIN OF CUSTODY RECORD

CLIENT INFORMATION		BILLING INFORMATION		Project Description		Turnaround Time		Preservation Codes:	
Paragould, Light, Water & Cable 401 Grant Lane Paragould, AR 72450		Paragould, Light, Water, & Cable P.O. Box 9 Paragould, AR 72450		Chronic Toxicity  Reporting Information Telephone: 870-239-7795 Fax: 870-239-7791 Email: lellington@paragould.com		1 Day (100%) 2 Day (50%) 3 Day (25%) <i>Routine</i>		1. Cool, 4 Degrees Centigrade 2. Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> ), pH < 2 3. Nitric Acid (HNO <sub>3</sub> ), pH < 2 4. Thiosulfate for Dechlorination 5. Hydrochloric Acid (HCl) 6. Sodium Hydroxide (NaOH), pH > 12	
PO #: 9520LE		Attn: Lisa Ellington		Preservative Code: 1		Bottle Type: P		Bottle Type Code	
NPDES Permit AR0033766		Colin Tester		Chronic Toxicity				G = Glass; P = Plastic V = Septum; A = Amber	
Sampler(s) Signature		Sampler(s) Printed		SAMPLE IDENTIFICATION/ DESCRIPTION				Arkansas Analytical Work Order Number: K2001009	
Field Number	DATE/s	SAMPLE COLLECTION DATE/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix		
	01/20/2020 to 01/21/2020	7:33 AM to 7:24 AM		X	X	4	Water	Effluent Outfall 001 -- Day 1	
1. Relinquished by: (Signature) <i>Steve Parkin</i>		Date/Time	2. Received by: (Signature) <i>VPS</i>		3. Relinquished by: (Signature) <i>VPS</i>		Date/Time	REMARKS / SAMPLE COMMENTS	
		1/15/20 9:00					1/22-2020 1002	1. CUSTODY SEALS: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> 2. CONTAINERS CORRECT: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> 3. COC/LABELS AGREE: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> 4. RECEIVED ON ICE: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> 5. TEMPERATURE ON RECEIPT: <i>10C</i> 6. TEMPERATURE GUN ID: <i>KAT#2</i>	
3. Relinquished by: (Signature)		4. Received by lab: (Signature) <i>Jamanda Johnson</i>						FOR COMPLETION BY LAB ONLY	



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# CHAIN OF CUSTODY RECORD

CLIENT INFORMATION		BILLING INFORMATION		Project Description		Turnaround Time		Preservation Codes:									
Paragould, Light, Water & Cable 401 Grant Lane Paragould, AR 72450		Paragould, Light, Water, & Cable P.O. Box 9 Paragould, AR 72450		Chronic Toxicity  Reporting Information Telephone: 870-239-7795 Fax: 870-239-7791 Email: lellington@paragould.com		1 Day (100%) 2 Day (50%) 3 Day (25%) <i>Routine</i>		1. Cool, 4 Degrees Centigrade 2. Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> ), pH < 2 3. Nitric Acid (HNO <sub>3</sub> ), pH < 2		4. Thiosulfate for Dechlorination 5. Hydrochloric Acid(HCl) 6. Sodium Hydroxide (NaOH), pH > 12		Bottle Type Code G = Glass, P = Plastic V = Septum, A = Amber					
PO #: 9520LE		Attn: Lisa Ellington		NPDES Permit AR0033766		Preservative Code: 1 Bottle Type: P											
 Colin Hester		 Colin Hester		NPDES Permit AR0033766		Chronic Toxicity								Arkansas Analytical Work Order Number: K2001009 B			
Sampler(s) Signature  Colin Hester		Sampler(s) Printed Colin Hester															
Field Number	DATE/s	SAMPLE COLLECTION Time/s	Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION										
	01/21/2020 to 01/22/2020	7:53 AM to 7:19 AM		X	4	Water	Effluent Outfall 001 -- Day 2										
1. Relinquished by: (Signature)  Steve Parks		Date/Time 1/21/20 9:00		2. Received by: (Signature) VRS		SAMPLE CONDITION UPON RECEIPT IN LAB 1. CUSTODY SEALS: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 2. CONTAINERS CORRECT: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 3. COC/LABELS AGREE: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 4. RECEIVED ON ICE: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 5. TEMPERATURE ON RECEIPT: 7.2 6. TEMPERATURE GUN ID: HHT#2											
3. Relinquished by: (Signature)  VRS		Date/Time 1-23-2020 1215		4. Received by lab: (Signature)  Amanda Johnson													
																REMARKS / SAMPLE COMMENTS	



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# CHAIN OF CUSTODY RECORD

CLIENT INFORMATION		BILLING INFORMATION		Project Description		Turnaround Time		Preservation Codes:													
Paragould, Light, Water & Cable 401 Grant Lane Paragould, AR 72450		Paragould, Light, Water, & Cable P.O. Box 9 Paragould, AR 72450		Chronic Toxicity Reporting Information Telephone: 870-239-7795 Fax: 870-239-7791 Email: tellington@paragould.com		1 Day (100%) 2 Day (50%) 3 Day (25%) <i>Routine</i>		1. Cool, 4 Degrees Centigrade 2. Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> ), pH < 2 3. Nitric Acid (HNO <sub>3</sub> ), pH < 2		4. Thiosulfate for Dechlorination 5. Hydrochloric Acid (HCl) 6. Sodium Hydroxide (NaOH), pH > 12			Bottle Type Code G = Glass; P = Plastic V = Septum; A = Amber								
PO #: 9520LE Attn: Lisa Ellington NPDES Permit AR0033766						Preservative Code: Bottle Type:		1 P													
Colin Kester		Colin Kester		Chronic Toxicity						Arkansas Analytical Work Order Number: K2001004			C								
Sampler(s) Signature		Sampler(s) Printed		SAMPLE COLLECTION		SAMPLE IDENTIFICATION/ DESCRIPTION															
Field Number	Date/s	Date/Time	Grab	Comp	Number of Bottles	Sample Matrix															
	01/22/2020 to 01/23/2020	7:57 AM to 7:05 AM		X	4	Water	Effluent Outfall 001 -- Day 3														
Steve Parker		1/23/20 9:00		Date/Time		2. Received by: (Signature) VPS		SAMPLE CONDITION UPON RECEIPT IN LAB		1. CUSTODY SEALS: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		2. CONTAINERS CORRECT: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		3. COC/LABELS AGREE: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		4. RECEIVED ON ICE: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		5. TEMPERATURE ON RECEIPT: 1°C		6. TEMPERATURE GUN ID: HAT#2	
VP5		1-24-2020 1325		Date/Time		4. Received by lab: (Signature) Amanda Johnson		REMARKS / SAMPLE COMMENTS													

# CETIS Summary Report

Report Date: 06 Feb-20 14:27 (p 1 of 2)  
 Test Code/ID: K2001009FH / 17-6799-0909

## Fathead Minnow 7-d Larval Survival and Growth Test

Arkansas Analytical

<b>Batch ID:</b> 01-8205-9781	<b>Test Type:</b> Growth-Survival (7d)	<b>Analyst:</b> Emily Nichols
<b>Start Date:</b> 22 Jan-20 13:10	<b>Protocol:</b> EPA/821/R-02-013 (2002)	<b>Diluent:</b> Mod-Hard Synthetic Water
<b>Ending Date:</b> 29 Jan-20 11:30	<b>Species:</b> Pimephales promelas	<b>Brine:</b> Not Applicable
<b>Test Length:</b> 6d 22h	<b>Taxon:</b> Actinopterygii	<b>Source:</b> Aquatox, AR <b>Age:</b> <24
<b>Sample ID:</b> 11-5090-7700	<b>Code:</b> K2001009FH	<b>Project:</b> WET Quarterly Compliance Test (1Q)
<b>Sample Date:</b> 21 Jan-20 07:24	<b>Material:</b> POTW Effluent	<b>Source:</b> Paragould (AR0033766)
<b>Receipt Date:</b> 22 Jan-20 10:02	<b>CAS (PC):</b>	<b>Station:</b>
<b>Sample Age:</b> 30h (1 °C)	<b>Client:</b> Paragould	

### Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	K2001009B	22 Jan-20 07:19	23 Jan-20 12:15	24 Jan-20 00:00	1
2	K2001009C	23 Jan-20 07:05	24 Jan-20 13:25	26 Jan-20 00:00	1

### Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	TU	PMSD	S
16-7468-0604	7d Survival Rate	Steel Many-One Rank Sum Test	100	>100	n/a	1	5.16%	1
08-3244-0145	Mean Dry Biomass-mg	Dunnett Multiple Comparison Test	100	>100	n/a	1	17.0%	1

### Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits			Overlap	Decision
				Lower	Upper			
16-7468-0604	7d Survival Rate	Control Resp	1	0.8	>>	Yes	Passes Criteria	
08-3244-0145	Mean Dry Biomass-mg	Control Resp	0.6472	0.25	>>	Yes	Passes Criteria	
08-3244-0145	Mean Dry Biomass-mg	PMSD	0.17	0.12	0.3	Yes	Passes Criteria	

### 7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
32		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
42		5	0.9600	0.8920	1.0000	0.9000	1.0000	0.0245	0.0548	5.71%	4.00%
56		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
80		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	2.00%
100		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%

### Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	5	0.6472	0.5178	0.7766	0.497	0.745	0.04661	0.1042	16.10%	0.00%
32		5	0.6702	0.5623	0.7781	0.549	0.753	0.03887	0.08691	12.97%	-3.55%
42		5	0.594	0.5525	0.6355	0.557	0.648	0.01494	0.03342	5.63%	8.22%
56		5	0.6436	0.5494	0.7378	0.561	0.735	0.03394	0.0759	11.79%	0.56%
80		5	0.6158	0.5317	0.6999	0.532	0.692	0.0303	0.06776	11.00%	4.85%
100		5	0.6006	0.5365	0.6647	0.544	0.664	0.02309	0.05162	8.60%	7.20%



# CETIS Summary Report

Report Date: 06 Feb-20 14:27 (p 2 of 2)  
Test Code/ID: K2001009FH / 17-6799-0909

## Fathead Minnow 7-d Larval Survival and Growth Test

Arkansas Analytical

### 7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	L	1.0000	1.0000	1.0000	1.0000	1.0000
32		1.0000	1.0000	1.0000	1.0000	1.0000
42		1.0000	0.9000	0.9000	1.0000	1.0000
56		1.0000	1.0000	1.0000	1.0000	1.0000
80		1.0000	1.0000	1.0000	0.9000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

### Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	L	0.745	0.66	0.739	0.497	0.595
32		0.549	0.753	0.729	0.61	0.71
42		0.557	0.648	0.595	0.582	0.588
56		0.701	0.735	0.561	0.576	0.645
80		0.67	0.62	0.532	0.692	0.565
100		0.634	0.544	0.608	0.553	0.664

### 7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	L	10/10	10/10	10/10	10/10	10/10
32		10/10	10/10	10/10	10/10	10/10
42		10/10	9/10	9/10	10/10	10/10
56		10/10	10/10	10/10	10/10	10/10
80		10/10	10/10	10/10	9/10	10/10
100		10/10	10/10	10/10	10/10	10/10

**CETIS Summary Report**

Report Date: 06 Feb-20 14:31 (p 1 of 2)  
 Test Code/ID: K2001009CD / 13-6269-3020

**Ceriodaphnia 7-d Survival and Reproduction Test**

**Arkansas Analytical**

Batch ID: 06-0316-7190      Test Type: Reproduction-Survival (7d)      Analyst: Emily Nichols  
 Start Date: 22 Jan-20 11:12      Protocol: EPA/821/R-02-013 (2002)      Diluent: Mod-Hard Synthetic Water  
 Ending Date: 28 Jan-20 12:00      Species: Ceriodaphnia dubia      Brine: Not Applicable  
 Test Length: 6d 1h      Taxon: Branchiopoda      Source: In-House Culture      Age: <24

Sample ID: 18-2731-7859      Code: K2001009CD      Project: WET Quarterly Compliance Test (1Q)  
 Sample Date: 21 Jan-20 07:24      Material: POTW Effluent      Source: Paragould (AR0033766)  
 Receipt Date: 22 Jan-20 10:02      CAS (PC):      Station:  
 Sample Age: 28h (1 °C)      Client: Paragould

**Sample Renewals**

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	K2001009B	22 Jan-20 07:19	23 Jan-20 12:15	24 Jan-20 00:00	1
2	K2001009C	23 Jan-20 07:05	24 Jan-20 13:25	26 Jan-20 00:00	1

**Multiple Comparison Summary**

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	TU	PMSD	S
02-3950-9379	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	100	>100	n/a	1	n/a	1
02-4526-5526	Reproduction	Steel Many-One Rank Sum Test	100	>100	n/a	1	20.8%	1

**Test Acceptability**

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits			Overlap	Decision
				Lower	Upper			
02-3950-9379	7d Survival Rate	Control Resp	1	0.8	>>	Yes	Passes Criteria	
02-4526-5526	Reproduction	Control Resp	32.2	15	>>	Yes	Passes Criteria	
02-4526-5526	Reproduction	PMSD	0.2082	0.13	0.47	Yes	Passes Criteria	

**7d Survival Rate Summary**

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
32		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
42		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
56		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
80		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
100		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%

**Reproduction Summary**

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	10	32.2	28.72	35.68	26	40	1.541	4.872	15.13%	0.00%
32		10	31.2	23.94	38.46	8	41	3.21	10.15	32.54%	3.11%
42		10	35.4	30.35	40.45	21	47	2.232	7.058	19.94%	-9.94%
56		10	36	31.95	40.05	22	43	1.789	5.657	15.71%	-11.80%
80		10	37.6	33.98	41.22	26	43	1.6	5.06	13.46%	-16.77%
100		10	39.6	36.16	43.04	33	47	1.522	4.812	12.15%	-22.98%

**CETIS Summary Report**

Report Date: 06 Feb-20 14:31 (p 2 of 2)  
 Test Code/ID: K2001009CD / 13-6269-3020

**Ceriodaphnia 7-d Survival and Reproduction Test**

**Arkansas Analytical**

**7d Survival Rate Detail**

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	L	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
32		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
42		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
56		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
80		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

**Reproduction Detail**

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	L	36	27	40	33	26	39	29	33	29	30
32		30	8	41	23	35	34	41	31	41	28
42		35	34	32	39	30	47	42	38	21	36
56		37	39	38	34	40	43	38	34	35	22
80		35	37	43	36	43	42	38	40	36	26
100		41	46	47	35	37	42	40	41	34	33

**7d Survival Rate Binomials**

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	L	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
32		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
42		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
56		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
80		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CHEMICAL DATA SHEET FOR CHRONIC TOXICITY TESTING

Fathead Minnow

Lab # / Sample ID 162001009

Test Start (Date/Time) 1-22-2020/1310

Client: Paragould

Test End (Date/Time) 1-29-2020/1130

Day of Test

		1	2	3	4	5	6	7	notes
<b>Control</b>	<u>MHS054</u>	<u>1/22</u>	<u>1/23</u>	<u>1/24</u>	<u>1/25</u>	<u>1/26</u>	<u>1/27</u>	<u>1/28</u>	
D.O. (mg/L)	INITIAL	<u>7.9</u>	<u>7.6</u>	<u>7.4</u>	<u>8.5</u>	<u>8.3</u>	<u>8.5</u>	<u>8.4</u>	
	FINAL	<u>6.7</u>	<u>7.9</u>	<u>7.7</u>	<u>7.5</u>	<u>6.9</u>	<u>7.7</u>	<u>7.6</u>	
pH (s.u.)	INITIAL	<u>8.2</u>	<u>7.7</u>	<u>7.3</u>	<u>5.7</u>	<u>6.8</u>	<u>8.3</u>	<u>7.5</u>	
	FINAL	<u>7.4</u>	<u>7.7</u>	<u>6.2</u>	<u>2.6</u>	<u>6.4</u>	<u>6.4</u>	<u>4.74</u>	
temp (C)	INITIAL	<u>21</u>	<u>21</u>	<u>23</u>	<u>22</u>	<u>23</u>	<u>23</u>	<u>23</u>	
	FINAL	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	
ALKALINITY (mg/L)		<u>64</u>							
HARDNESS (mg/L)		<u>96</u>							
CONDUCTIVITY (umhc)		<u>323</u>							
CHLORINE (mg/L)		<u>40.05</u>							
<b>CONC: 32%</b>									
D.O. (mg/L)	INITIAL	<u>8.3</u>	<u>7.8</u>	<u>8.1</u>	<u>8.5</u>	<u>8.4</u>	<u>8.5</u>	<u>8.5</u>	
	FINAL	<u>6.8</u>	<u>7.8</u>	<u>7.9</u>	<u>7.3</u>	<u>7.2</u>	<u>7.5</u>	<u>7.8</u>	
pH (s.u.)	INITIAL	<u>8.1</u>	<u>7.9</u>	<u>7.9</u>	<u>7.0</u>	<u>7.2</u>	<u>8.2</u>	<u>7.9</u>	
	FINAL	<u>7.5</u>	<u>7.8</u>	<u>6.9</u>	<u>2.6</u>	<u>7.0</u>	<u>6.6</u>	<u>7.5</u>	
temp (C)	INITIAL	<u>21</u>	<u>23</u>	<u>24</u>	<u>22</u>	<u>22</u>	<u>22</u>	<u>23</u>	
	FINAL	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	
<b>CONC: 42%</b>									
D.O. (mg/L)	INITIAL	<u>8.5</u>	<u>8.0</u>	<u>8.5</u>	<u>8.5</u>	<u>9.1</u>	<u>8.5</u>	<u>8.7</u>	
	FINAL	<u>7.0</u>	<u>7.6</u>	<u>7.8</u>	<u>7.8</u>	<u>7.2</u>	<u>7.4</u>	<u>7.5</u>	
pH (mg/L)	INITIAL	<u>8.1</u>	<u>7.9</u>	<u>7.8</u>	<u>7.4</u>	<u>7.3</u>	<u>8.1</u>	<u>7.8</u>	
	FINAL	<u>7.5</u>	<u>7.7</u>	<u>7.4</u>	<u>7.7</u>	<u>7.0</u>	<u>6.8</u>	<u>7.6</u>	
temp (C)	INITIAL	<u>21</u>	<u>23</u>	<u>23</u>	<u>22</u>	<u>22</u>	<u>22</u>	<u>23</u>	
	FINAL	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	
<b>CONC: 56%</b>									
D.O. (mg/L)	INITIAL	<u>8.6</u>	<u>8.1</u>	<u>8.6</u>	<u>9.2</u>	<u>9.4</u>	<u>8.5</u>	<u>8.8</u>	
	FINAL	<u>6.8</u>	<u>7.5</u>	<u>7.4</u>	<u>7.4</u>	<u>7.2</u>	<u>7.5</u>	<u>7.3</u>	
pH (s.u.)	INITIAL	<u>8.0</u>	<u>7.8</u>	<u>7.8</u>	<u>7.4</u>	<u>7.4</u>	<u>8.0</u>	<u>7.7</u>	
	FINAL	<u>7.5</u>	<u>7.7</u>	<u>7.5</u>	<u>7.9</u>	<u>7.3</u>	<u>7.1</u>	<u>7.6</u>	
temp (C)	INITIAL	<u>21</u>	<u>23</u>	<u>23</u>	<u>26</u>	<u>21</u>	<u>22</u>	<u>23</u>	
	FINAL	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	
<b>CONC: 80%</b>									
D.O. (mg/L)	INITIAL	<u>8.7</u>	<u>8.2</u>	<u>8.8</u>	<u>10.4</u>	<u>10.8</u>	<u>8.5</u>	<u>8.9</u>	
	FINAL	<u>6.4</u>	<u>7.4</u>	<u>7.7</u>	<u>7.2</u>	<u>7.1</u>	<u>7.4</u>	<u>6.7</u>	
pH (s.u.)	INITIAL	<u>7.9</u>	<u>7.7</u>	<u>7.7</u>	<u>7.5</u>	<u>7.5</u>	<u>8.0</u>	<u>7.7</u>	
	FINAL	<u>7.6</u>	<u>7.8</u>	<u>7.8</u>	<u>7.8</u>	<u>7.4</u>	<u>7.5</u>	<u>7.6</u>	
temp (C)	INITIAL	<u>21</u>	<u>24</u>	<u>23</u>	<u>18</u>	<u>20</u>	<u>22</u>	<u>24</u>	
	FINAL	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	
<b>CONC: 100%</b>									
D.O. (mg/L)	INITIAL	<u>8.8</u>	<u>8.3</u>	<u>9.2</u>	<u>11.1</u>	<u>10.8</u>	<u>8.5</u>	<u>9.2</u>	
	FINAL	<u>6.8</u>	<u>7.5</u>	<u>7.6</u>	<u>7.3</u>	<u>7.1</u>	<u>7.4</u>	<u>6.9</u>	
pH (s.u.)	INITIAL	<u>7.9</u>	<u>7.7</u>	<u>7.7</u>	<u>7.5</u>	<u>7.5</u>	<u>7.9</u>	<u>7.6</u>	
	FINAL	<u>7.7</u>	<u>7.8</u>	<u>7.9</u>	<u>8.0</u>	<u>7.6</u>	<u>7.6</u>	<u>7.7</u>	
temp (C)	INITIAL	<u>21</u>	<u>24</u>	<u>24</u>	<u>18</u>	<u>18</u>	<u>23</u>	<u>24</u>	
	FINAL	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	
<b>CONC: 100%</b>		<u>A</u>	<u>A</u>	<u>B</u>	<u>B</u>	<u>C</u>	<u>C</u>	<u>C</u>	
ALKALINITY (mg/L)		<u>92</u>		<u>116</u>		<u>88</u>			
HARDNESS (mg/L)		<u>66</u>		<u>80</u>		<u>78</u>			
CONDUCTIVITY (umhc)		<u>436</u>		<u>487</u>		<u>537</u>			
CHLORINE (mg/L)		<u>40.05</u>		<u>40.05</u>		<u>40.05</u>			

on  
1-28-2020

CHEMICAL DATA SHEET FOR CHRONIC TOXICITY TESTING

Ceriodaphnia Dubia

Lab # / Sample ID *K2001009*

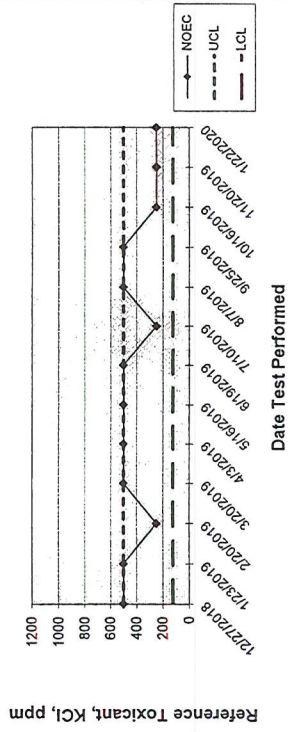
Test Start (Date/Time) *1-22-2020/1112*

Client: *Paragould*

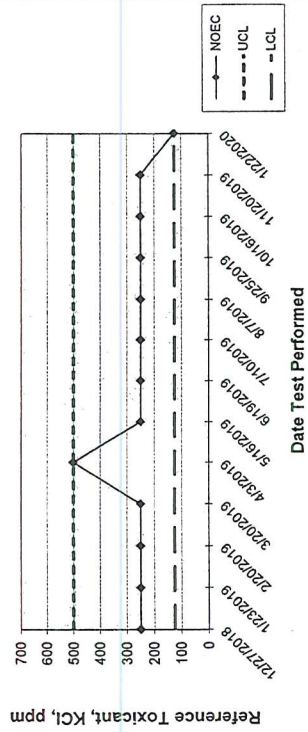
Test End (Date/Time) *1-28-2020/1200*

		Day of Test							notes/remarks
		1	2	3	4	5	6	7	
<b>Control</b>	MHS 054	1/22	1/23	1/24	1/25	1/26	1/27	1/28	
D.O. (mg/L)	INITIAL	7.9	7.6	7.9	8.5	8.3	8.5	8.4	
	FINAL	8.3	8.3	8.3	8.6	8.8	8.2		
pH (s.u.)	INITIAL	8.2	7.7	7.3	6.7	6.8	8.3	7.5	
	FINAL	8.3	7.9	7.4	8.0	7.7	8.4		
temp (C)	INITIAL	21	21	23	22	23	23	23	
	FINAL	25	25	25	25	25	25		
ALKALINITY (mg/L)		64							
HARDNESS (mg/L)		96							
CONDUCTIVITY (umhos/cm)		323							
CHLORINE (mg/L)		0.05							
<b>CONC:</b>	<i>32%</i>								
D.O. (mg/L)	INITIAL	8.3	7.8	8.1	8.5	8.4	8.5	8.5	
	FINAL	8.4	8.4	8.4	8.5	8.5	8.2		
pH (s.u.)	INITIAL	8.1	7.9	7.9	7.0	7.2	8.2	7.9	
	FINAL	8.3	7.9	7.5	8.0	7.8	8.2		
temp (C)	INITIAL	21	23	24	22	22	22	23	
	FINAL	25	25	25	25	25	25		
<b>CONC:</b>	<i>42%</i>								
D.O. (mg/L)	INITIAL	8.5	8.0	8.5	8.6	9.1	8.5	8.7	
	FINAL	8.5	8.5	8.5	8.6	8.4	8.3		
pH (mg/L)	INITIAL	8.1	7.9	7.8	7.4	7.3	8.1	7.8	
	FINAL	8.2	8.0	7.7	8.0	7.9	8.1		
temp (C)	INITIAL	21	23	23	22	22	22	23	
	FINAL	25	25	25	22	25	25		
<b>CONC:</b>	<i>56%</i>								
D.O. (mg/L)	INITIAL	8.6	8.1	8.6	9.2	9.4	8.5	8.8	
	FINAL	8.6	8.5	8.6	8.6	8.4	8.3		
pH (s.u.)	INITIAL	8.0	7.8	7.8	7.4	7.4	8.0	7.7	
	FINAL	8.2	8.1	7.9	8.1	8.0	8.1		
temp (C)	INITIAL	21	23	23	20	21	22	23	
	FINAL	25	25	25	25	25	25		
<b>CONC:</b>	<i>80%</i>								
D.O. (mg/L)	INITIAL	8.7	8.2	8.8	10.4	10.1	8.5	8.9	
	FINAL	8.6	8.5	8.6	8.6	8.4	8.3		
pH (s.u.)	INITIAL	7.9	7.7	7.7	7.5	7.5	8.0	7.7	
	FINAL	8.2	8.1	8.0	8.1	8.0	8.1		
temp (C)	INITIAL	21	24	23	18	20	22	24	
	FINAL	25	25	25	25	25	25		
<b>CONC:</b>	<i>100%</i>								
D.O. (mg/L)	INITIAL	8.8	8.3	9.2	11.1	10.8	8.6	9.2	
	FINAL	8.6	8.5	8.7	8.6	8.4	8.4		
pH (s.u.)	INITIAL	7.9	7.7	7.7	7.5	7.5	7.9	7.6	
	FINAL	8.3	8.2	8.1	8.2	8.1	8.1		
temp (C)	INITIAL	21	24	24	18	18	23	24	
	FINAL	25	25	25	25	25	25		
<b>CONC:</b>	<i>100%</i>	A	A	B	B	C	C	C	
ALKALINITY (mg/L)		92		116		88			
HARDNESS (mg/L)		160		80		78			
CONDUCTIVITY (umhos/cm)		436		487		537			
CHLORINE (mg/L)		0.05		0.05		0.05			

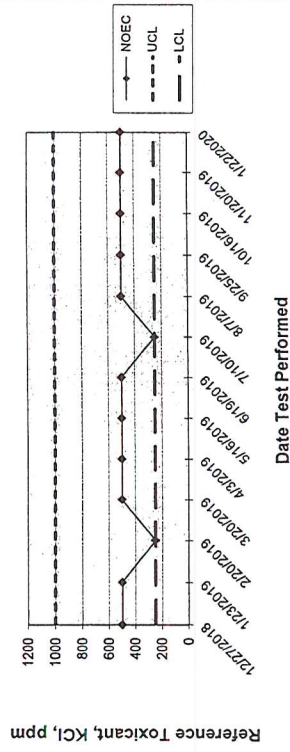
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