

Arkansas Analytical, Inc.

Toxicity Test Results
City of DeQueen
NPDES PERMIT NUMBER: AR0021733
Second Quarter 2017
AFIN # 67-00023

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

Ceriodaphnia dubia, Survival and Reproduction Test
Test 1002.0

Prepared for: **Mr. Mike Sims**
City of DeQueen
P.O. Box 730
DeQueen, Arkansas 71832

Prepared by: Arkansas Analytical, Inc.
8100 National Drive
Little Rock, Arkansas 72209
Lab Number K1705007

Wednesday, May 24, 2017

Plant location

City of DeQueen. 1/8 mile south from intersection of Coulter Ave. and south of 9th Street on Philip Cox Blvd, in Section 36, Township 8 South, Range 32 West in Sevier County, Arkansas.

Test Methods

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%, 75%, 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%, 75%, 100%
- Dilution water: Moderately hard synthetic
- No deviation from method

Reference Toxicant Data

REFERENCE TOXICANT (Potassium Chloride)

<i>Ceriodaphnia dubia</i> 4/18/17-4/25/17		<i>Pimephales promelas</i> 4/18/17-4/25/17	
NOEC Survival:	500 ppm KCl	NOEC Survival:	500 ppm KCl
LOEC Survival:	1000 ppm KCl	LOEC Survival:	1000 ppm KCl
NOEC Reproduction:	250 ppm KCl	NOEC Growth:	500 ppm KCl
LOEC Reproduction:	500 ppm KCl	LOEC Growth:	1000 ppm KCl

Summary of Results

City of DeQueen

<i>Ceriodaphnia dubia</i>		<i>Pimephales promelas</i>	
NOEC Survival Parameter: TOP3B	100%	NOEC Survival Parameter: TOP6C	100%
Pass/Fail Survival Parameter: TLP3B	Pass	Pass/Fail Survival Parameter: TLP6C	Pass
NOEC Reproduction Parameter: TPP3B	100%	NOEC Growth Parameter: TPP6C	100%
Pass/Fail Reproduction Parameter: TGP3B	Pass	Pass/Fail Growth Parameter: TGP6C	Pass
%CV Reproduction Parameter: TQP3B	32.4%	%CV Growth Parameter: TQP6C	12.6%
PMSD Reproduction	46.1%	PMSD Growth	14.1%

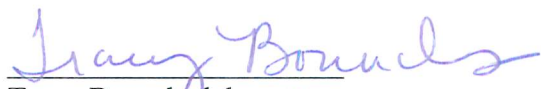
Conclusion

Pimephales promelas, (Method 1000.0): The permit issued to the City of DeQueen, 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 City of DeQueen, 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.

Biomonitoring Analysts: Melissa Bird, Shelby Chappell, Tracy Bounds

Reviewed by:


Tracy Bounds, lab manager

Appendices

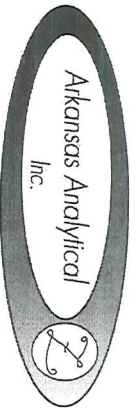
Appendix A.....	Chains of custody
Appendix B.....	Fathead minnow data & statistics
Appendix C.....	<i>Ceriodaphnia dubia</i> data & statistics
Appendix D.....	Water chemistry data
Appendix E.....	Reference toxicant control charts



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

CHAIN OF CUSTODY RECORD

CLIENT INFORMATION		BILLING		Project Description		Turnaround Time		Preservation Codes:				
City of DeQueen Wastewater Plant		City of DeQueen Wastewater Plant		Chronic Toxicity		1 Day (100%) 2 Day (50%) 3 Day (25%)		1. Cool 4 Degrees Centigrade 2. Sulfuric Acid (H ₂ SO ₄), pH < 2 3. Nitric Acid (HNO ₃), pH < 2 4. Thiosulfate for Dechlorination 5. Hydrochloric Acid(HCl) 6. Sodium Hydroxide (NaOH), pH > 12				
514 South 9th		P.O. Box 730		Reporting Information		Routine		TEST PARAMETERS				
DeQueen, AR 71832		DeQueen, AR 71832		Telephone: 870-642-5231		Preservative Code: 1		Bottle Type Code				
Attn: Mike Sims		Fax: 870-642-3117		Email: msims@cityofdequeen.com		Bottle Type: P		G = Glass; P = Plastic V = Vial; A = Amber				
Sampler(s) Signature: <i>[Signature]</i>		Sampler(s) Printed: <i>MS</i>		SAMPLE		Chronic Biomonitoring		Arkansas Analytical Work Order Number: <i>R1705007</i>				
Field Number	SAMPLE COLLECTION Dates	Times	Grab	Comp	Number of Bottles	Sample Matrix	IDENTIFICATION/DESCRIPTION	SAMPLE CONDITION UPON RECEIPT IN LAB				REMARKS / SAMPLE COMMENTS
	5-7-8-17	8:45am-8:00am		X	4	Water	Final Discharge Outfall	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: 2°C 6. TEMPERATURE GUN ID: HHT# 22				<i>Pg # 14088</i>
1. Relinquished by: (Signature) <i>[Signature]</i>		Date/Time: 5-9-17		2. Received by: (Signature) <i>[Signature]</i>		Date/Time: 5-9-17 12:20						
3. Relinquished by: (Signature) <i>[Signature]</i>		Date/Time: 5-9-17 1506		4. Received by lab: (Signature) <i>[Signature]</i>		Date/Time: 5-9-17 12:20						



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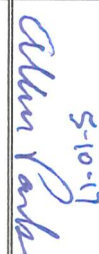

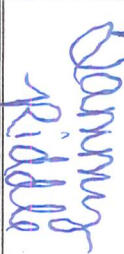
CHAIN OF CUSTODY RECORD

CLIENT INFORMATION		BILLING		Project Description		Turnaround Time		Preservation Codes:	
City of DeQueen Wastewater Plant		City of DeQueen Wastewater Plant		Chronic Toxicity		1 Day (100%) 2 Day (50%) 3 Day (25%)		1. Cool, 4 Degrees Centigrade 2. Sulfuric Acid (H ₂ SO ₄), pH < 2 3. Nitric Acid (HNO ₃), pH < 2 4. Thiosulfate for Dechlorination 5. Hydrochloric Acid(HCl) 6. Sodium Hydroxide (NaOH), pH > 12	
514 South 9th		P.O. Box 730		Reporting Information		Routine		TEST PARAMETERS	
DeQueen, AR 71832		DeQueen, AR 71832		Telephone: 870-642-5231		Preservative Code: 1		Bottle Type Code	
Attn: Mike Sims		Fax: 870-642-3117		Email: msims@cityofdequeen.com		Bottle Type: P		G = Glass, P = Plastic V = Septum, A = Amber	
Sampler(s) Signature:		Sampler(s) Printed: MS		SAMPLE IDENTIFICATION/DESCRIPTION		Chronic Biomonitoring		Arkansas Analytical Work Order Number: K1705007	
Field Number	SAMPLE COLLECTION Dates/	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	Final Discharge Outfall		
	5-9-17	8:00-8:30		X	4	Water		X	B
1. Relinquished by: (Signature)		Date/Time		2. Received by: (Signature)		Date/Time		REMARKS / SAMPLE COMMENTS	
		5-9-17				12:30 pm		PO# 74088	
3. Relinquished by: (Signature)		Date/Time		4. Received by lab: (Signature)		Date/Time		SAMPLE CONDITION UPON RECEIPT IN LAB	
		5-9-17		Sammy Riddle		1500		1. CUSTODY SEALS: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> 2. CONTAINERS CORRECT: Yes <input type="checkbox"/> No <input type="checkbox"/> 3. COC/LABELS AGREE: Yes <input type="checkbox"/> No <input type="checkbox"/> 4. RECEIVED ON ICE: Yes <input type="checkbox"/> No <input type="checkbox"/> 5. TEMPERATURE ON RECEIPT: °C 6. TEMPERATURE GUN ID: HHT# 2	
FOR COMPLETION BY LAB ONLY									



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CHAIN OF CUSTODY RECORD

CLIENT INFORMATION		BILLING		Project Description		Turnaround Time		Preservation Codes:	
City of DeQueen Wastewater Plant		City of DeQueen Wastewater Plant		Chronic Toxicity		1 Day (100%) 2 Day (50%) 3 Day (25%)		1. Cool 4 Degrees Centigrade 2. Sulfuric Acid (H ₂ SO ₄), pH < 2 3. Nitric Acid (HNO ₃), pH < 2	
514 South 9th		P.O. Box 730		Reporting Information		Routine Telephone: 870-642-5231 Fax: 870-642-3117		4. Thiosulfate for Dechlorination 5. Hydrochloric Acid(HCl) 6. Sodium Hydroxide (NaOH), pH > 12	
DeQueen, AR 71832		DeQueen, AR 71832		Attn: Mike Sims		Email: msims@cityofdequeen.com Bottle Code: P Bottle Type:		TEST PARAMETERS G = Glass; P = Plastic V = Septum; A = Amber	
Sampler(s) Signature 		Sampler(s) Printed MS		SAMPLE COLLECTION Field Number: 5-9-10-17 Dates/s: 8:10-8:40 Grab: X Number of Bottles: 4 Sample Matrix: Water Final Discharge Outfall: X		IDENTIFICATION/DESCRIPTION Chronic Biomonitoring		Arkansas Analytical Work Order Number: K1705007 C	
1. Relinquished by: (Signature) 		Date/Time 5-10-17		2. Received by: (Signature) 1323 5-10-17 		SAMPLE CONDITION UPON RECEIPT IN LAB 1. CUSTODY SEALS: <input checked="" type="checkbox"/> Yes ___ No 2. CONTAINERS CORRECT: <input checked="" type="checkbox"/> Yes ___ No 3. COC/LABELS AGREE: <input checked="" type="checkbox"/> Yes ___ No 4. RECEIVED ON ICE: <input checked="" type="checkbox"/> Yes ___ No 5. TEMPERATURE ON RECEIPT: 3 °C 6. TEMPERATURE GUN ID: HHT# 2		REMARKS / SAMPLE COMMENTS P# 14088	
3. Relinquished by: (Signature) 		Date/Time 5-10-17		4. Received by lab: (Signature) 					

CETIS Summary Report

Report Date: 24 May-17 11:50 (p 1 of 2)

Test Code: K1705007FH | 05-0638-2902

Fathead Minnow 7-d Larval Survival and Growth Test

Arkansas Analytical, Inc.

Batch ID: 14-5309-4203 Test Type: Growth-Survival (7d) Analyst: Shelby Chappell
 Start Date: 09 May-17 16:15 Protocol: EPA/821/R-02-013 (2002) Diluent: Mod-Hard Synthetic Water
 Ending Date: 16 May-17 10:10 Species: Pimephales promelas Brine: Not Applicable
 Duration: 6d 18h Source: Aquatox, AR Age: <24

Sample ID: 19-2645-6854 Code: 72D36616 Client: City of DeQueen
 Sample Date: 08 May-17 08:00 Material: POTW Effluent Project: WET Quarterly Compliance Test (2Q)
 Receipt Date: 09 May-17 15:06 Source: City of DeQueen (AR0021733)
 Sample Age: 32h (2 °C) Station:

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	K1705007B	09 May-17 08:00	09 May-17 15:06	11 May-17 00:00	
2	K1705007C	10 May-17 08:00	10 May-17 17:10	12 May-17 00:00	3

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
21-1177-2639	7d Survival Rate	Steel Many-One Rank Sum Test	100	> 100	n/a	1	6.06%
20-5443-4305	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	100	> 100	n/a	1	14.1%

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
21-1177-2639	7d Survival Rate	Control Resp	0.98	0.8	>>	Yes	Passes Criteria

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	0.00%
32		5	0.9400	0.8720	1.0000	0.9000	1.0000	0.0245	0.0548	5.83%	4.08%
42		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	0.00%
56		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-2.04%
75		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	0.00%
100		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-2.04%

Mean Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	5	0.433	0.3966	0.4694	0.4	0.476	0.01312	0.02934	6.78%	0.00%
32		5	0.386	0.3314	0.4406	0.336	0.446	0.01967	0.04397	11.39%	10.85%
42		5	0.3988	0.3768	0.4208	0.373	0.416	0.007907	0.01768	4.43%	7.90%
56		5	0.4612	0.4093	0.5131	0.409	0.517	0.0187	0.04182	9.07%	-6.51%
75		5	0.4392	0.3879	0.4905	0.402	0.491	0.01846	0.04128	9.40%	-1.43%
100		5	0.4684	0.3951	0.5417	0.405	0.537	0.0264	0.05903	12.60%	-8.18%

CETIS Summary Report

Report Date: 24 May-17 11:50 (p 2 of 2)
Test Code: K1705007FH | 05-0638-2902

Fathead Minnow 7-d Larval Survival and Growth Test

Arkansas Analytical, Inc.

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	1.0000	1.0000	0.9000	1.0000	1.0000
32		1.0000	1.0000	0.9000	0.9000	0.9000
42		1.0000	0.9000	1.0000	1.0000	1.0000
56		1.0000	1.0000	1.0000	1.0000	1.0000
75		1.0000	1.0000	1.0000	1.0000	0.9000
100		1.0000	1.0000	1.0000	1.0000	1.0000

Mean Dry Weight-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	0.476	0.412	0.44	0.4	0.437
32		0.336	0.446	0.399	0.399	0.35
42		0.39	0.416	0.402	0.413	0.373
56		0.433	0.517	0.479	0.409	0.468
75		0.475	0.491	0.404	0.424	0.402
100		0.416	0.537	0.466	0.405	0.518

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	10/10	10/10	9/10	10/10	10/10
32		10/10	10/10	9/10	9/10	9/10
42		10/10	9/10	10/10	10/10	10/10
56		10/10	10/10	10/10	10/10	10/10
75		10/10	10/10	10/10	10/10	9/10
100		10/10	10/10	10/10	10/10	10/10

CETIS Summary Report

Report Date: 25 May-17 12:49 (p 1 of 2)
 Test Code: K1705007CD | 03-1916-7948

Cladoceran 7-d Survival and Reproduction Test

Arkansas Analytical, Inc.

Batch ID: 09-9389-8721	Test Type: Reproduction-Survival (7d)	Analyst: Melissa Bird
Start Date: 09 May-17 16:00	Protocol: EPA/600/4-91/002 (1994)	Diluent: Mod-Hard Synthetic Water
Ending Date: 16 May-17 14:05	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 22h	Source: In-House Culture	Age: <24
Sample ID: 01-6256-3785	Code: 9B086C9	Client: City of DeQueen
Sample Date: 08 May-17 08:00	Material: POTW Effluent	Project: WET Quarterly Compliance Test (2Q)
Receipt Date: 09 May-17 15:06	Source: City of DeQueen (AR0021733)	
Sample Age: 32h (2 °C)	Station:	

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	K1705007B	09 May-17 08:00	09 May-17 15:06	11 May-17 00:00	
2	K1705007C	10 May-17 08:00	10 May-17 17:10	12 May-17 00:00	3

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
02-2040-9053	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a
09-1131-6569	Reproduction	Dunnett Multiple Comparison Test	100	> 100	n/a	1	46.1%

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
02-2040-9053	7d Survival Rate	Control Resp	0.9	0.8	>>	Yes	Passes Criteria
09-1131-6569	Reproduction	Control Resp	16.3	15	>>	Yes	Passes Criteria

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	10	0.9000	0.6738	1.0000	0.0000	1.0000	0.1000	0.3162	35.14%	0.00%
32		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-11.11%
42		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-11.11%
56		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-11.11%
75		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-11.11%
100		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-11.11%

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV% ^{30.5%}	%Effect
0	D	10	16.3	10.76	21.84	0	26	2.45	7.747	47.53%	0.00%
32		10	20.6	16.15	25.05	8	28	1.968	6.222	30.20%	-26.38%
42		10	19	14.56	23.44	10	28	1.961	6.2	32.63%	-16.56%
56		10	21.9	16.57	27.23	10	35	2.354	7.445	34.00%	-34.36%
75		10	22.4	16.34	28.46	7	35	2.68	8.475	37.83%	-37.42%
100		10	23.6	18.13	29.07	9	34	2.418	7.648	32.41%	-44.79%

*CV calculation based on # of neonates from surviving females
 -mb
 5-25-17*

CETIS Summary Report

Report Date: 25 May-17 12:49 (p 2 of 2)

Test Code: K1705007CD | 03-1916-7948

Cladoceran 7-d Survival and Reproduction Test

Arkansas Analytical, Inc.

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	D	0.0000	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
75		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	D	0	17	17	22	26	16	25	15	17	8
32		17	24	21	26	24	21	28	24	13	8
42		10	20	25	28	21	18	23	22	13	10
56		14	20	27	29	35	17	25	23	19	10
75		18	23	26	26	32	24	35	21	12	7
100		9	26	29	29	34	26	28	23	16	16

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	D	0/1	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
75		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 K1705007

Test Start (Date/Time) 5-9-17, 1015

Client: Dr Queen

Test End (Date/Time) 5-16-17, 1010

Day of Test

		1	2	3	4	5	6 *	7	notes
Control	MHS 8459	5/9	5/10	5/11	5/12	5/13	5/14	5/15	MHS 8459
D.O. (mg/L)	INITIAL	8.0	8.1	8.4	8.8	8.6	8.7	8.9	
	FINAL	7.2	8.1	7.8	8.5	8.2	7.5	8.1	
pH (s.u.)	INITIAL	8.0	8.0	7.8	7.6	8.2	8.2	8.1	
	FINAL	7.9	7.1	7.8	8.2	8.1	7.6	7.1	
temp (C)	INITIAL	21	21	22	20	21	21	20	
	FINAL	25	25	25	25	25	25	25	
ALKALINITY (mg/L)		52	→	→	→	→	68	→	
HARDNESS (mg/L)		120	→	→	→	→	116	→	
CONDUCTIVITY (umhc)		296	→	→	→	→	237	→	
CHLORINE (mg/L)		<0.05	→	→	→	→	<0.05	→	
CONC:	32%								
D.O. (mg/L)	INITIAL	8.2	8.2	8.8	9.1	8.7	8.8	9.0	
	FINAL	7.2	8.0	7.9	8.2	8.4	7.5	7.8	
pH (s.u.)	INITIAL	7.9	8.0	7.7	7.4	8.1	8.0	8.1	
	FINAL	7.8	7.4	7.8	8.2	8.1	7.7	7.1	
temp (C)	INITIAL	21	22	23	22	22	22	21	
	FINAL	25	25	25	25	25	25	25	
CONC:	42%								
D.O. (mg/L)	INITIAL	8.6	8.4	8.9	9.0	8.4	8.7	9.1	
	FINAL	7.2	7.8	7.9	8.0	8.0	7.5	7.8	
pH (mg/L)	INITIAL	7.9	7.9	7.7	7.4	8.1	7.9	8.0	
	FINAL	7.8	7.6	7.9	8.2	8.1	7.7	7.1	
temp (C)	INITIAL	21	22	24	22	24	22	22	
	FINAL	25	25	25	25	25	25	25	
CONC:	50%								
D.O. (mg/L)	INITIAL	9.0	8.6	9.3	9.2	8.6	8.8	9.0	
	FINAL	7.2	7.8	7.9	8.1	8.2	7.5	7.8	
pH (s.u.)	INITIAL	7.9	7.9	7.6	7.3	8.0	7.9	7.9	
	FINAL	7.8	7.8	7.9	8.2	8.1	7.7	7.3	
temp (C)	INITIAL	21	23	24	23	24	23	22	
	FINAL	25	25	25	25	25	25	25	
CONC:	75%								
D.O. (mg/L)	INITIAL	9.0	8.7	9.2	9.2	8.3	8.4	9.1	
	FINAL	7.2	7.8	7.9	8.1	8.1	7.5	7.8	
pH (s.u.)	INITIAL	7.9	7.9	7.6	7.2	8.0	7.8	7.9	
	FINAL	7.8	7.8	8.0	8.3	8.2	7.7	7.3	
temp (C)	INITIAL	21	23	26	24	25	24	22	
	FINAL	25	25	25	25	25	25	25	
CONC:	100%								
D.O. (mg/L)	INITIAL	9.2	8.9	9.4	9.7	8.3	8.5	9.1	
	FINAL	7.2	7.8	8.0	8.1	8.0	7.5	7.6	
pH (s.u.)	INITIAL	7.9	7.9	7.5	7.1	7.9	7.8	7.8	
	FINAL	7.9	7.9	8.0	8.2	8.2	7.8	7.5	
temp (C)	INITIAL	22	23	26	24	24	24	23	
	FINAL	25	25	25	25	25	25	25	
CONC:	100 %	A	A	B	C	B	C	C	
ALKALINITY (mg/L)		78	→	82	64	82	64	→	
HARDNESS (mg/L)		68	→	58	72	58	72	→	
CONDUCTIVITY (umhc)		618	→	565	635	565	635	→	
CHLORINE (mg/L)		0.07	→	0.07	<0.05	0.07	<0.05	→	

CHEMICAL DATA SHEET FOR CHRONIC TOXICITY TESTING

Ceriodaphnia Dubia

Lab # / Sample ID K1705007

Test Start (Date/Time) 5-9-17, 11000

Client: Dr. Queen

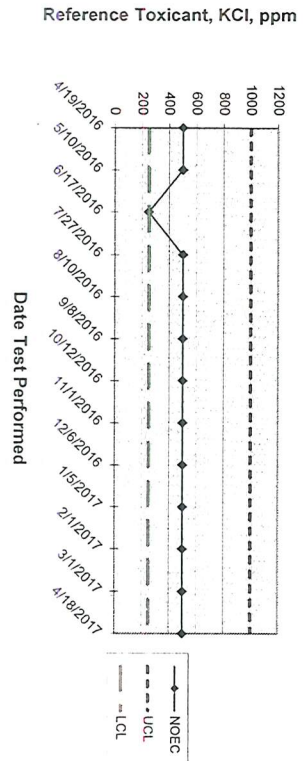
Test End (Date/Time) 5-16-17, 1405

Day of Test

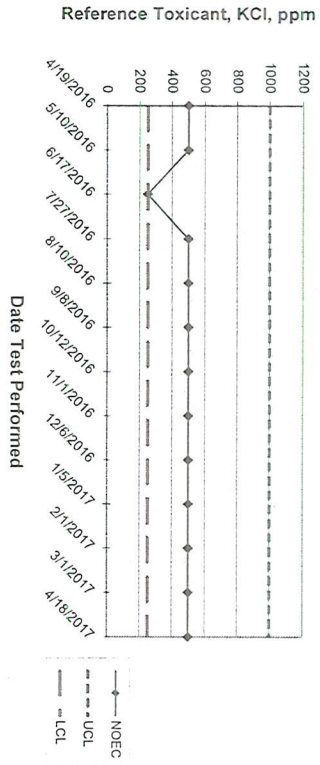
		1	2	3	4	5	6*	7	notes
Control	859	5/9	5/10	5/11	5/12	5/13	5/14	5/15	*MHS
D.O. (mg/L)	INITIAL	8.0	8.1	8.4	8.8	8.6	8.7	8.9	859
	FINAL	7.8	8.4	8.1	8.4	8.7	7.8	8.5	
pH (s.u.)	INITIAL	8.0	8.0	7.8	7.6	8.2	8.2	8.1	
	FINAL	7.8	7.5	8.0	7.6	7.8	7.7	7.3	
temp (C)	INITIAL	21	21	22	20	21	21	20	
	FINAL	25	25	25	25	25	25	25	
ALKALINITY (mg/L)		*6852	→	→	→	→	68	→	
HARDNESS (mg/L)		*116120	→	→	→	→	116	→	
CONDUCTIVITY (umho)		*22700	→	→	→	→	337	→	
CHLORINE (mg/L)		<0.05	→	→	→	→	<0.05	→	
CONC:	321.								
D.O. (mg/L)	INITIAL	8.2	8.2	8.8	9.1	8.7	8.8	9.0	
	FINAL	7.8	8.5	8.0	8.5	8.7	8.1	8.4	
pH (s.u.)	INITIAL	7.9	8.0	7.7	7.4	8.1	8.0	8.1	
	FINAL	7.8	7.7	8.0	7.7	7.9	7.7	7.4	
temp (C)	INITIAL	21	22	23	22	22	22	21	
	FINAL	25	25	25	25	25	25	25	
CONC:	421.								
D.O. (mg/L)	INITIAL	8.6	8.4	8.9	9.0	8.4	8.7	9.1	
	FINAL	7.9	8.4	8.4	8.5	8.9	8.3	8.4	
pH (mg/L)	INITIAL	7.9	7.9	7.7	7.4	8.1	7.9	8.0	
	FINAL	7.8	7.8	8.1	7.7	7.9	7.8	7.4	
temp (C)	INITIAL	21	22	24	22	24	22	22	
	FINAL	25	25	25	25	25	25	25	
CONC:	501.								
D.O. (mg/L)	INITIAL	9.0	8.6	9.3	9.2	8.6	8.8	9.0	
	FINAL	8.1	8.6	8.4	8.5	8.1	8.4	8.4	
pH (s.u.)	INITIAL	7.9	7.9	7.6	7.3	8.0	7.9	7.9	
	FINAL	7.7	8.1	8.0	7.8	7.9	7.8	7.4	
temp (C)	INITIAL	21	23	24	23	24	23	22	
	FINAL	25	25	25	25	25	25	25	
CONC:	751.								
D.O. (mg/L)	INITIAL	9.0	8.7	9.2	9.2	8.3	8.4	9.1	
	FINAL	8.1	8.7	8.5	8.2	9.2	8.4	8.3	
pH (s.u.)	INITIAL	7.9	7.9	7.6	7.2	8.0	7.8	7.9	
	FINAL	7.8	8.1	8.1	7.8	7.9	7.8	7.5	
temp (C)	INITIAL	21	23	24	24	25	24	22	
	FINAL	25	25	25	25	25	25	25	
CONC:	1001.								
D.O. (mg/L)	INITIAL	9.2	8.9	9.4	9.7	8.3	8.6	9.1	
	FINAL	8.2	8.7	8.6	8.3	9.0	8.4	8.2	
pH (s.u.)	INITIAL	7.9	7.9	7.5	7.1	7.9	7.8	7.8	
	FINAL	7.7	8.2	8.1	7.8	7.9	7.8	7.6	
temp (C)	INITIAL	22	23	24	24	26	24	23	
	FINAL	25	25	25	25	25	25	25	
CONC:	100 %	A	A	B	C	B	C	C	
ALKALINITY (mg/L)		78	→	82	64	82	64	→	
HARDNESS (mg/L)		68	→	58	72	58	72	→	
CONDUCTIVITY (umho)		618	→	565	635	665	635	→	
CHLORINE (mg/L)		0.07	→	0.07	<0.05	0.07	<0.05	→	

SC
* 5-16-17

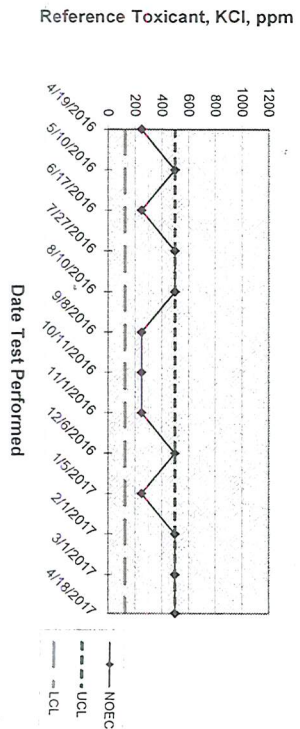
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