

Arkansas Analytical, Inc.

Toxicity Test Results
City of DeQueen
NPDES PERMIT NUMBER: AR0021733
Fourth Quarter 2016
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 K1611007

Tuesday, November 29, 2016

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> 10/11/16-10/17/16		<i>Pimephales promelas</i> 10/12/16-10/19/16	
NOEC Survival:	250 ppm KCl	NOEC Survival:	500 ppm KCl
LOEC Survival:	500 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	21.8%	%CV Growth Parameter: TQP6C	9.12%
PMSD Reproduction	12.0%	PMSD Growth	10.2%

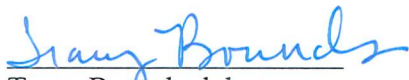
Conclusion

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: Tracy Bounds, Shelby Chappell, Sam Petty, Ken Rood

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%)		1. Cool, 4 Degrees Centigrade									
514 South 9th		P.O. Box 730		Reporting Information		2 Day (50%)		2. Sulfuric Acid (H ₂ SO ₄), pH < 2									
DeQueen, AR 71832		DeQueen, AR 71832		Telephone: 870-642-5231		3 Day (25%)		3. Nitric Acid (HNO ₃), pH < 2									
Atn: Mike Sims		Fax: 870-642-3117		Email: msims@cityofdequeen.com		Routine		TEST PARAMETERS									
Sampler(s) Signature:		Sampler(s) Printed: MS		Preservative Code: P		1		4. Thiosulfate for Dechlorination									
Field Number		SAMPLE COLLECTION		Grab		Number of Bottles		Sample Matrix		IDENTIFICATION/ DESCRIPTION		SAMPLE		Chronic Biomonitoring			
11-13-14-16		8:00 am - 8:00 am		X		4		Water		Final Discharge Outfall		X		5. Hydrochloric Acid(HCl)			
1. Relinquished by: (Signature)		Date/Time		2. Received by: (Signature)		SAMPLE CONDITION UPON RECEIPT IN LAB		REMARKS / SAMPLE COMMENTS		1. CUSTODY SEALS:		Yes ___ No ___		2. CONTAINERS CORRECT:		Yes ___ No ___	
		11-14-16				3. COC/LABELS AGREE:		Yes ___ No ___		4. RECEIVED ON ICE:		Yes ___ No ___		5. TEMPERATURE ON RECEIPT:		1 °C	
3. Relinquished by: (Signature)		Date/Time		4. Received by lab: (Signature)		6. TEMPERATURE GUN ID:		HHT#		FOR COMPLETION BY LAB ONLY		2		Post 13484			
		11-14-16															



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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: <i>[Signature]</i>		Sampler(s) Printed: MS		SAMPLE IDENTIFICATION/ DESCRIPTION		Chronic Biomonitoring		Arkansas Analytical Work Order Number: K1611007	
Field Number	SAMPLE COLLECTION Dates	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	Water	Final Discharge	Outfall
	11-14-15-16	8:00-8:00a		X	4				X
1. Relinquished by: (Signature)		Date/Time		2. Received by: (Signature)		Date/Time		3. Relinquished by: (Signature)	
<i>[Signature]</i>		11-15-16		<i>[Signature]</i>		12:30pm		<i>[Signature]</i>	
3. Relinquished by: (Signature)		Date/Time		4. Received by lab: (Signature)		Date/Time		5. Received by lab: (Signature)	
<i>[Signature]</i>		11/15/16		Sammy Riddle		1630		<i>[Signature]</i>	
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: <input checked="" type="checkbox"/> 1 °C 6. TEMPERATURE GUN ID: HHT# 2 FOR COMPLETION BY LAB ONLY									
REMARKS / SAMPLE COMMENTS									
PO# 73484									



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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: 870-642-6231 Fax: 870-642-3117		Preservative Code: 1		Bottle Type Code			
Attn: Mike Sims		Email: msims@cityofdequeen.com		Bottle Type: P		G = Glass; P = Plastic V = Septum; A = Amber					
Sampler(s) Signature: <i>[Signature]</i>		Sampler(s) Printed: <i>MS</i>		SAMPLE IDENTIFICATION/ DESCRIPTION		Chronic Biomonitoring		Arkansas Analytical Work Order Number: K1611007			
Field Number	SAMPLE COLLECTION Dates	Times	Grab	Number of Comp Bottles	Sample Matrix	Water	Final Discharge Outfall	SAMPLE CONDITION UPON RECEIPT IN LAB		REMARKS / SAMPLE COMMENTS	
	11-15-16-16	8:20am - 8:40am		X	4			1. CUSTODY SEALS: <input checked="" type="checkbox"/> Yes ___ No		P# 73484	
								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: 2 °C			
								6. TEMPERATURE GUN ID: HHT# 2			
FOR COMPLETION BY LAB ONLY											
1. Relinquished by: (Signature) <i>[Signature]</i>		Date/Time 11-16-16		2. Received by: (Signature) <i>[Signature]</i>		Date/Time 12:30pm		3. Relinquished by: (Signature) <i>[Signature]</i>		Date/Time 11-16-16 1530	
3. Relinquished by: (Signature) <i>[Signature]</i>		Date/Time 1530		4. Received by lab: (Signature) <i>[Signature]</i>		Date/Time 1530		4. RECEIVED BY LAB: (Signature) <i>[Signature]</i>		Date/Time 1530	

CETIS Summary Report

Report Date: 29 Nov-16 14:53 (p 1 of 2)
 Test Code: K1611007FH | 09-7679-9705

Fathead Minnow 7-d Larval Survival and Growth Test

Arkansas Analytical, Inc.

Batch ID: 00-4644-2968	Test Type: Growth-Survival (7d)	Analyst: Sheby Chappell
Start Date: 15 Nov-16 11:10	Protocol: EPA/821/R-02-013 (2002)	Diluent: Mod-Hard Synthetic Water
Ending Date: 22 Nov-16 11:30	Species: Pimephales promelas	Brine: Not Applicable
Duration: 7d 0h	Source: Aquatox, AR	Age: <48
Sample ID: 06-6612-0813	Code: 27B4326D	Client: City of DeQueen
Sample Date: 14 Nov-16 08:00	Material: POTW Effluent	Project: WET Quarterly Compliance Test (4Q)
Receipt Date: 14 Nov-16 16:25	Source: City of DeQueen (AR0021733)	
Sample Age: 27h (1 °C)	Station:	

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	K1611007B	15 Nov-16 08:00	15 Nov-16 16:30	17 Nov-16 00:00	1
2	K1611007C	16 Nov-16 08:00	16 Nov-16 15:30	19 Nov-16 00:00	2

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
08-9400-7803	7d Survival Rate	Steel Many-One Rank Sum Test	100	> 100	n/a	1	4.83%
01-1853-8835	Mean Dry Biomass-mg	Dunnett Multiple Comparison Test	100	> 100	n/a	1	10.2%

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
08-9400-7803	7d Survival Rate	Control Resp	1	0.8	>>	Yes	Passes Criteria
01-1853-8835	Mean Dry Biomass-mg	Control Resp	0.9728	0.25	>>	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	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
32		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	2.00%
42		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
56		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	2.00%
75		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
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	D	5	0.9728	0.9179	1.028	0.92	1.042	0.01978	0.04423	4.55%	0.00%
32		5	0.9868	0.894	1.08	0.889	1.089	0.03343	0.07474	7.57%	-1.44%
42		5	1.004	0.9791	1.03	0.975	1.027	0.009109	0.02037	2.03%	-3.25%
56		5	1.005	0.926	1.084	0.965	1.117	0.02854	0.06382	6.35%	-3.33%
75		5	0.974	0.8856	1.062	0.855	1.047	0.03182	0.07116	7.31%	-0.12%
100		5	1.058	0.9382	1.178	0.945	1.195	0.04317	0.09652	9.12%	-8.76%

CETIS Summary Report

Report Date: 29 Nov-16 14:53 (p 2 of 2)
Test Code: K1611007FH | 09-7679-9705

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	1.0000	1.0000	1.0000
32		1.0000	1.0000	1.0000	0.9000	1.0000
42		1.0000	1.0000	1.0000	1.0000	1.0000
56		1.0000	1.0000	1.0000	0.9000	1.0000
75		1.0000	1.0000	1.0000	1.0000	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	D	0.973	0.957	0.972	1.042	0.92
32		1.089	0.946	1.003	0.889	1.007
42		1.027	0.999	1.001	0.975	1.02
56		0.998	0.978	0.968	1.117	0.965
75		0.992	0.983	0.855	1.047	0.993
100		0.945	1.109	1.033	1.008	1.195

7d Survival Rate Binomials

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

CETIS Summary Report

Report Date: 29 Nov-16 15:30 (p 1 of 2)
 Test Code: K1611007CD | 13-6720-6428

Cladoceran 7-d Survival and Reproduction Test Arkansas Analytical, Inc.

Batch ID: 19-2261-8438	Test Type: Reproduction-Survival (7d)	Analyst: Tracy Bounds
Start Date: 15 Nov-16 09:15	Protocol: EPA/600/4-91/002 (1994)	Diluent: Mod-Hard Synthetic Water
Ending Date: 21 Nov-16 15:20	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 6h	Source: In-House Culture	Age: <24
Sample ID: 21-3781-6936	Code: 7F6C7F68	Client: City of DeQueen
Sample Date: 14 Nov-16 08:00	Material: POTW Effluent	Project: WET Quarterly Compliance Test (4Q)
Receipt Date: 14 Nov-16 16:25	Source: City of DeQueen (AR0021733)	
Sample Age: 25h (1 °C)	Station:	

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	K1611007B	15 Nov-16 08:00	15 Nov-16 16:30	17 Nov-16 00:00	1
2	K1611007C	16 Nov-16 08:00	16 Nov-16 15:30	19 Nov-16 00:00	2

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
15-6469-9301	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	100	> 100	n/a	1	n/a
09-3700-9223	Reproduction	Steel Many-One Rank Sum Test	100	> 100	n/a	1	12.0%

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
15-6469-9301	7d Survival Rate	Control Resp	0.9	0.8	>>	Yes	Passes Criteria
09-3700-9223	Reproduction	Control Resp	36	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%	%Effect
0	D	10	36	30.38	41.62	15	42	2.486	7.86	21.83%	0.00%
32		10	37.8	34.98	40.62	31	43	1.245	3.938	10.42%	-5.00%
42		10	38.3	35.75	40.85	32	44	1.126	3.561	9.30%	-6.39%
56		10	38.3	36.28	40.32	33	44	0.895	2.83	7.39%	-6.39%
75		10	39	37.53	40.47	35	42	0.6498	2.055	5.27%	-8.33%
100		10	37.9	36.34	39.46	34	41	0.6904	2.183	5.76%	-5.28%

CETIS Summary Report

Report Date: 29 Nov-16 15:30 (p 2 of 2)
 Test Code: K1611007CD | 13-6720-6428

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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	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	36	37	41	35	42	40	42	36	15	36
32		35	40	41	40	31	43	40	34	40	34
42		38	44	40	42	39	34	40	37	32	37
56		36	38	40	44	39	39	33	39	38	37
75		40	38	41	38	42	39	41	38	38	35
100		37	34	41	39	37	39	41	38	36	37

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	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	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 K1611007

Test Start (Date/Time) 11-15-2016 / 1110

Client DeQueen

Test End (Date/Time) 11-22-2016 / 1130

		Day of Test							
		1	2	3	4	5	6	7	notes
Control	MMS 372	11/15	11/16	11/17	11/18	11-19	11-20	11-21	
D.O. (mg/L)	INITIAL	8.8	8.5	8.6	8.4	8.7	9.2	9.0	
	FINAL	7.3	7.6	7.0	8.7	8.5	6.7	7.4	
pH (s.u.)	INITIAL	8.2	8.1	8.0	8.0	8.2	8.2	8.2	
	FINAL	7.6	7.5	7.5	6.7	6.7	7.4	7.6	
temp (C)	INITIAL	22	23	22	22	21	19	19	
	FINAL	25	25	25	20	20	25	25	
ALKALINITY (mg/L)		42							
HARDNESS (mg/L)		82							
CONDUCTIVITY (umhc)		258							
CHLORINE (mg/L)		<0.05							
CONC:	32%								
D.O. (mg/L)	INITIAL	8.8	8.8	8.8	8.7	8.9	9.6	8.9	
	FINAL	7.5	7.1	7.1	8.4	8.1	6.9	7.3	
pH (s.u.)	INITIAL	8.1	8.0	7.9	7.9	8.0	8.0	8.0	
	FINAL	7.5	7.4	7.5	7.0	7.0	7.3	7.5	
temp (C)	INITIAL	22	23	22	22	20	19	20	
	FINAL	25	25	25	19	20	25	25	
CONC:	42%								
D.O. (mg/L)	INITIAL	8.9	9.0	8.9	8.9	9.2	10.0	8.9	
	FINAL	7.3	7.2	7.2	8.0	7.4	6.9	7.3	
pH (mg/L)	INITIAL	8.0	8.0	7.8	7.8	7.9	7.9	7.9	
	FINAL	7.2	7.5	7.5	7.2	7.2	7.4	7.5	
temp (C)	INITIAL	22	24	22	23	20	19	21	
	FINAL	25	25	25	20	20	25	25	
CONC:	56%								
D.O. (mg/L)	INITIAL	9.0	9.1	8.9	8.8	9.5	10.4	8.9	
	FINAL	7.5	7.2	7.3	8.0	7.9	6.9	7.3	
pH (s.u.)	INITIAL	8.0	7.9	7.7	7.7	7.8	7.8	7.8	
	FINAL	7.6	7.5	7.6	7.4	7.3	7.4	7.6	
temp (C)	INITIAL	23	24	23	24	20	19	21	
	FINAL	25	25	25	20	20	25	25	
CONC:	75%								
D.O. (mg/L)	INITIAL	9.0	9.1	9.0	8.8	9.8	10.4	8.8	
	FINAL	7.4	6.9	7.2	8.1	7.7	6.8	7.3	
pH (s.u.)	INITIAL	7.9	7.9	7.7	7.7	7.7	7.7	7.7	
	FINAL	7.6	7.5	7.6	7.5	7.4	7.4	7.6	
temp (C)	INITIAL	23	25	23	25	20	19	22	
	FINAL	25	25	25	20	20	25	25	
CONC:	100%								
D.O. (mg/L)	INITIAL	9.1	9.3	9.3	8.7	10.5	12.1	8.8	
	FINAL	7.6	6.9	7.2	8.0	7.8	6.9	7.3	
pH (s.u.)	INITIAL	7.9	7.8	7.6	7.6	7.6	7.5	7.6	
	FINAL	7.7	7.6	7.6	7.5	7.5	7.4	7.6	
temp (C)	INITIAL	23	25	23	26	20	19	23	
	FINAL	25	25	25	21	20	25	25	
CONC:	100%	A	A	B	B	C	C	C	
ALKALINITY (mg/L)		864	864	66	→	62	→	→	
HARDNESS (mg/L)		30	→	46	→	44	→	→	
CONDUCTIVITY (umhc)		988	→	916	→	971	→	→	
CHLORINE (mg/L)		<0.05	→	<0.05	→	<0.05	→	→	

CHEMICAL DATA SHEET FOR CHRONIC TOXICITY TESTING

Ceriodaphnia Dubia

Lab # / Sample ID R1611007

Test Start (Date/Time) 11-15-2016/0915

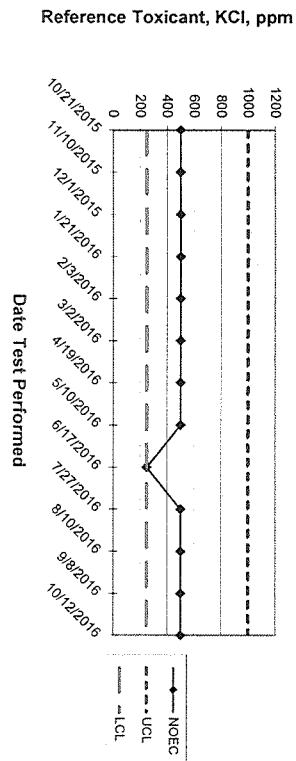
Client: DeQueen

Test End (Date/Time) 11-21-2016/1520

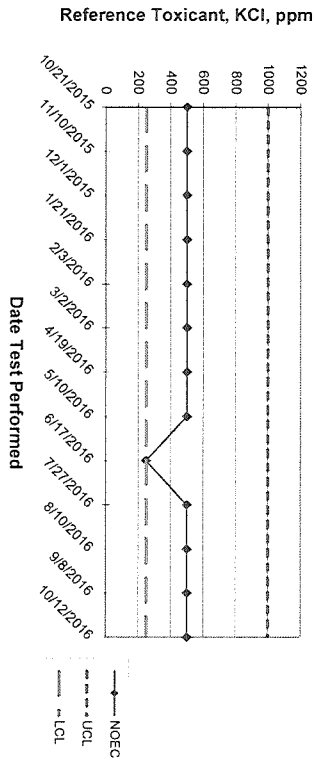
Day of Test

		1	2	3	4	5	6	7	notes
Control	MHS 842	11/15	11/16	11/17	11/18	11-19	11-20		
D.O. (mg/L)	INITIAL	8.8	8.5	8.6	8.4	8.7	9.2		
	FINAL	8.5	8.7	9.1	9.0	9.2	9.3		
pH (s.u.)	INITIAL	8.2	8.1	8.0	8.0	8.2	8.2		
	FINAL	8.0	8.2	8.1	8.1	8.0	8.6		
temp (C)	INITIAL	22	23	22	22	21	19		
	FINAL	25	25	25	25	25	25		
ALKALINITY (mg/L)		42	→	→	→	→	→		
HARDNESS (mg/L)		82	→	→	→	→	→		
CONDUCTIVITY (umhc)		258	→	→	→	→	→		
CHLORINE (mg/L)		<0.05	→	→	→	→	→		
CONC:	32/								
D.O. (mg/L)	INITIAL	8.8	8.8	8.8	8.7	8.9	9.6		
	FINAL	8.5	8.6	9.0	9.1	9.2	9.3		
pH (s.u.)	INITIAL	8.1	8.0	7.9	7.9	8.0	8.6		
	FINAL	8.0	8.2	8.0	8.0	8.0	8.6		
temp (C)	INITIAL	22	23	22	22	20	19		
	FINAL	25	25	25	25	25	25		
CONC:	42/								
D.O. (mg/L)	INITIAL	8.9	9.0	8.9	8.9	9.2	10.0		
	FINAL	8.5	8.6	9.0	9.1	9.2	9.5		
pH (mg/L)	INITIAL	8.0	8.0	7.8	7.8	7.9	7.9		
	FINAL	8.1	8.2	8.1	8.0	8.0	8.6		
temp (C)	INITIAL	22	24	22	23	20	19		
	FINAL	25	25	25	25	25	25		
CONC:	50/								
D.O. (mg/L)	INITIAL	9.0	9.1	8.9	8.8	8.5	10.4		
	FINAL	8.5	8.6	9.1	9.1	9.1	9.0		
pH (s.u.)	INITIAL	8.0	7.9	7.7	7.7	7.8	7.8		
	FINAL	8.1	8.2	8.1	8.0	8.0	8.5		
temp (C)	INITIAL	23	24	23	24	20	19		
	FINAL	25	25	25	25	25	25		
CONC:	75/								
D.O. (mg/L)	INITIAL	9.0	9.1	9.0	8.8	8.8	10.9		
	FINAL	8.5	8.6	9.2	9.1	9.6	9.0		
pH (s.u.)	INITIAL	7.9	7.9	7.7	7.7	7.7	7.7		
	FINAL	8.1	8.2	8.1	8.0	8.0	8.4		
temp (C)	INITIAL	23	25	23	25	20	19		
	FINAL	25	25	25	25	25	25		
CONC:	100/								
D.O. (mg/L)	INITIAL	9.1	9.3	9.3	8.7	10.5	12.1		
	FINAL	8.5	8.6	9.2	9.1	9.2	9.2		
pH (s.u.)	INITIAL	7.9	7.8	7.6	7.6	7.6	7.5		
	FINAL	8.1	8.2	8.1	8.0	8.0	8.5		
temp (C)	INITIAL	23	25	23	26	20	19		
	FINAL	25	25	25	25	25	25		
CONC: 100 %		A	A	D	B	C	C		
ALKALINITY (mg/L)		64	→	66	→	62	→		
HARDNESS (mg/L)		36	→	46	→	44	→		
CONDUCTIVITY (umhc)		988	→	916	→	971	→		
CHLORINE (mg/L)		<0.05	→	<0.05	→	<0.05	→		

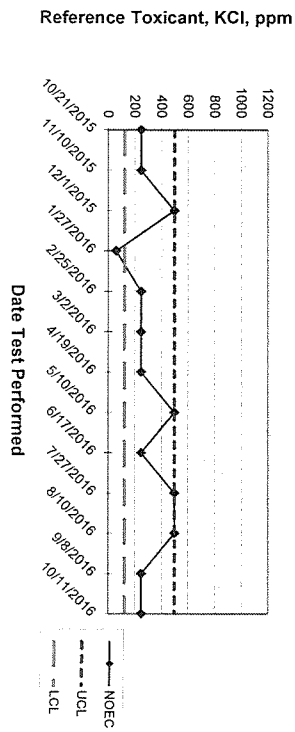
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