

Bio-Analytical Laboratories' Executive Summary

Permittee: Magnolia Wastewater System
Columbia Road
Magnolia, AR

Project #: X9083

Outfall: 001 (treated domestic wastewater)

Permit #: AR0043613/ AFIN 14-00059

Contact: Tracie Love

Test Dates: February 6 – 13, 2024

Test Type: Chronic Static Renewal Survival and Reproduction Test using *Ceriodaphnia dubia* (EPA Method 1002.0).
Chronic Static Renewal Survival and Growth Test using *Pimephales promelas* (EPA Method 1000.0).

Results:

For *Ceriodaphnia dubia*:

1. If the NOEC for survival is less than the critical dilution (100.0%), enter a "1"; otherwise, enter a "0" for Parameter TLP3B - 0 (**Pass**).
2. If the NOEC for reproduction is less than the critical dilution (80.0%), enter a "1"; otherwise, enter a "0" for Parameter TGP3B - 0 (**Pass**).
3. Report the NOEC value for survival, Parameter TOP3B - 100.0%.
4. Report the NOEC value for reproduction, Parameter TPP3B - 100.0%.
5. Report the largest % coefficient of variation between the control and the critical dilution, Parameter TQP3B – 18.25%.
6. PMSD Reproduction =46.87%(13.0 – 47.0%)- moderate precision, acceptable for passing test

For *Pimephales promelas*:

1. If the NOEC for survival is less than the critical dilution (100.0%), enter a "1"; otherwise, enter a "0" for Parameter TLP6C - 0 (**Pass**).
2. If the NOEC for growth is less than the critical dilution (80.0%), enter a "1"; otherwise, enter a "0" for Parameter TGP6C- 0 (**Pass**).
3. Report the NOEC value for survival, Parameter TOP6C - 100.0%
4. Report the NOEC value for growth, Parameter TPP6C - 100.0%
5. Report the largest % coefficient of variation between the control and the critical dilution, Parameter TQP6C –19.90%.
6. PMSD Biomass =22.87% (12.0 – 30.0%)- moderate precision, acceptable for passing test

This report contains a total of 59 pages, including this page. The results in the report pertain only to the samples documented in the enclosed chain of custody documents and complies with the TNI (2016) and ADEQ standards. The chemical data in this report is for monitoring purposes only and should not be reported on discharge monitoring reports.



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**THE RESULTS OF TWO CHRONIC
DEFINITIVE TOXICITY TESTS
FOR OUTFALL 001**

AT

**MAGNOLIA WASTEWATER SYSTEM
Magnolia, Arkansas**

**NPDES #AR0043613
AFIN: 14-00059**

EPA Methods 1000.0 and 1002.0

Project X9083

Test Dates: February 6 – 13, 2024

Report Date: March 5, 2024

Prepared for:

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1.0 Introduction

Bio-Analytical Laboratories (BAL), Doyline, Louisiana conducted two chronic definitive toxicity tests for Outfall 001 at the wastewater plant serving the city of Magnolia, Arkansas. The test organisms used were the cladoceran, *Ceriodaphnia dubia*, and the fathead minnow, *Pimephales promelas*. The purpose of this study is to determine if appropriately dilute effluent samples adversely affect the survival, reproduction and/or growth of the test organisms. Toxicity is defined as a statistically significant difference at the 95 percent confidence level between the survival, reproduction and/or growth of the test organism in the critical dilution (the effluent concentration representative of the proportion of effluent in the receiving water during critical low flow or critical mixing conditions) compared to the survival, reproduction and/or growth of the test organism in the control. The test endpoint is the No-Observed-Effect-Concentration (NOEC), the highest effluent concentration that is not significantly different from the control.

2.0 Methods and Materials

2.1 Test Methods

All methods followed were according to the latest edition of “Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms” (EPA-821-R-02-013), “Standard Methods for The Examination of Water and Wastewater” 22nd Edition (APHA 2012) and BAL’s standard operating procedure.

2.2 Test Organisms

The *Ceriodaphnia dubia* test organisms were cultured in-house at test temperature and dilution water hardness and were less than 24 hours old at test initiation. The neonates were released within the same 8-hour period. The fathead minnows were obtained from Aquatic Biosystems, Fort Collins, Colorado (ABS) and were less than 48 hours old at test initiation but hatched within the same 24-hour period. Monthly chronic reference toxicant tests were conducted in order to document organism sensitivity and demonstration of capability.

2.3 Dilution Water

Soft reconstituted water, made per method guidelines, was used as the dilution water and the control for the tests. Conductivity (SM 2510 B) and pH (SM 4500-H+ B) measurements, in umhos/cm and standard units, respectively, were checked on each lot of water prior to use to confirm water hardness.

2.4 Test Concentrations

The test concentrations used in the chronic toxicity tests were 100.0, 80.0, 56.0, 42.0 and 32.0 percent effluent and a control. The lethal and sub-lethal critical dilution was 100.0 and 80.0 percent effluent, respectively. The *Ceriodaphnia* test was conducted using 10 replicates of one animal each for a total of 10 animals per concentration. The fathead minnow test was conducted using five replicates of eight animals each for a total of 40 animals per concentration.

2.5 Sample Collection

Three composite samples of Outfall 001 were collected by city personnel on February 5, 7 and 9, 2024, at 0800 hours. Upon collection and completion of each composite, the samples were packed in ice and delivered the same day to the laboratory by hotshot service. The temperature upon arrival each of the effluent samples was 3.4, 2.1 and 2.2⁰ Celsius, respectively.

2.6 Sample Preparation

Upon arrival, the samples were logged in, given an identification number, and refrigerated unless needed. Prior to use, the samples were warmed to 25±1⁰ Celsius. Total residual chlorine levels were measured in milligrams/Liter (mg/L) with a test strip and recorded if present. Total ammonia levels were measured in mg/L using a test strip. In the minnow test, each sample was treated with an 18-watt ultraviolet light (UV) at a rate of 113 ml/minute, with an extra 100 percent dilution set up with the treated portion. This was to document any toxicity that may be due to pathogen interference. Dissolved oxygen (4500-O G) and pH (4500-H+ B) measurements were measured in mg/L and standard units, respectively, on the control and each concentration at test initiation, at test renewal and at test termination. Conductivity (2510 B) measurements in umhos/cm were also taken at test initiation and at each renewal. Alkalinity (2320 B) and hardness (2340 C) levels were measured in mg/L as CaCO₃ on the control and the undiluted effluent samples.

2.7 Monitoring of the Tests

The cladoceran test was run in a Precision^R dual-programmable, illuminated incubator at a temperature of 25±1⁰ Celsius. The fathead minnow test was run in a circulating waterbath, using a Remcor^R heated liquid circulator to keep a constant temperature of 25±1⁰ Celsius. Data-loggers were used to monitor diurnal test temperature. Test temperatures were recorded at the beginning of the day, after test renewal and at the end of the day. Light cycles and intensities were recorded twice a month.

2.8 Data Analysis

Ceriodaphnia dubia survival data was analyzed using Fisher's Exact Test, an equality test comparing concentration data to control data. Reproduction data was analyzed using Steel's Many-One Rank Test, a non-parametric test comparing concentration data to control data. Fathead minnow survival data was analyzed using Steel's Many-One Rank Test, and growth data was analyzed using Dunnett's Test, a parametric test comparing concentration data to control data. Other test endpoints were obtained by approved EPA methods of analysis.

3.0 Results and Discussion

The results of the *Ceriodaphnia dubia* test can be found in Table 1. One hundred percent survival occurred in the control and 80.0 percent survival occurred in the 100.0 percent critical dilution after seven days of exposure. The average number of neonates per female after three broods in the control and in the 80.0 percent critical dilution was 20.9 and 19.1, respectively. The NOEC for survival and reproduction in this test was 100.0 percent effluent (p=.05).

The fathead minnow test results can be found in Table 2. After seven days of exposure, 97.5 percent survival occurred in the control and 87.5 percent survival occurred in the 100.0 percent critical dilution. The average weight gained per minnow in the control and in the 80.0 percent critical dilution was 0.508 and 0.448 milligram (mg), respectively. The NOEC for survival and growth in this test was 100.0 percent effluent (p=.05).

Table 1: Results of the Chronic Definitive *Ceriodaphnia dubia* Test

Percent Effluent	Percent Survival	Sig.*	Mean # Neonates-Surviving	Mean # Neonates -Total	Sig.*
Control	100.0		20.9	20.9	
32.0	80.0		21.6	17.3	
42.0	80.0		25.4	20.3	
56.0	80.0		24.0	19.2	
80.0	80.0		23.9	19.1	
100.0	80.0		23.3	18.6	

*significant when compared to the control (p=.05). Test validity based on mean number of neonates per surviving female. NOEC value based on total mean number of neonates. +accidental death.

Table 2: Results of the Chronic Definitive Fathead Minnow Test

Percent Effluent	Percent Survival	Sig.*	Mean Dry Weight (mg)	Sig.*
Control	97.5		0.508	
32.0	95.0		0.460	
42.0	85.0		0.453	
56.0	90.0		0.533	
80.0	87.5		0.448	
100.0	87.5		0.423	
100.0 UV	87.5		0.445	

*significant when compared to the control (p=.05). +Test validity based on mean dry weight per surviving larvae in the control. NOEC value based on mean dry weight per the number of larvae at the start of the test.

The monthly chronic reference toxicant tests demonstrated that the *C.dubia* test organisms were within the acceptable sensitivity range, but the minnows were sensitive. The graphs of the results of the chronic reference toxicant tests can be found in Appendix D- Quality Assurance Charts.

4.0 Conclusions

The three composite samples of Outfall 001 collected from the wastewater plant serving the city of Magnolia, Arkansas, on February 5, 7 and 9, 2024, were not found to be lethally toxic to the *Ceriodaphnia dubia* test organisms and *Pimephales promelas* test organisms in the 100.0 percent critical dilution after seven days of exposure (p=.05). (i.e., reproduction or growth) were not noted in the 80.0 percent dilution in either test (p=.05).

5.0 References

- EPA, 2002. Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. EPA-821-R-02-013, Office of Water.
- EPA, 2000. Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the National Pollutant Discharge Elimination System. EPA-833-R-00-003, Office of Wastewater Management.
- EPA, 2000. Method Guidance and Recommendations for Whole Effluent (WET) Testing. EPA-821-B-00-04, Office of Water
- APHA, 2012. Standard Methods for The Examination of Water and Wastewater. 22nd Edition.

APPENDIX A
CHAIN-OF-CUSTODY DOCUMENTS

NELAP/LELAP 01975, ADEQ 88-0630, TCEQ TI104704278

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Company: City of Magnolia		Phone: (870) 234-2955		Fax: (870) 234-2203		Purchase Order:	
Address: P.O. Box 666, Magnolia, AR 71753		Permit #: AR0043613/AFIN 14-00059		Sampler's Signature/Printed Name/Affiliation: <i>Janet Love / Trace Love / MWWS</i>			
Date Start Date End	Time Start Time End	C	G	# and type of container	Sample Identification	Laboratory Use Only:	
02/04/24 - 02/05/24	800 - 800	X		8 half gallons	001	Project Number: X9083	Temp. upon arrival: 3.4 °C Therm #: 29
						Color: <i>clear</i>	
						Odor: <i>none</i>	
						Tech: <i>gove</i> <i>elston</i>	Preservative: (below)
						Lab Control Number: <i>cal6024</i>	ICE
Relinquished by/Affiliation: <i>Janet Love / MWWS</i>		Date: 2/5/24	Time: 8:43A	Received by/Affiliation: <i>Terrell Lee</i>	Date: 2/5/24	Time: 8:43A	
Relinquished by/Affiliation: <i>Terrell Lee</i>		Date: 2/5/24	Time: 11:18A	Received by/Affiliation: <i>Erin Blagg</i>	Date: 2/5/24	Time: 1118	
Relinquished by/Affiliation:		Date:	Time:	Received by/Affiliation:	Date:	Time:	
Method of Shipment: <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Bus <input type="checkbox"/> Fed Ex <input type="checkbox"/> DHL <input type="checkbox"/> UPS <input type="checkbox"/> Client <input type="checkbox"/> Other <input type="checkbox"/> Tracking #		Comments:					
COC Rev.3.1							

NELAP/LELAP 01975, ADEQ 88-0630, TCEQ T104704278

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City of Magnolia		(870) 234-2955			
Address:		Fax:			
P.O. Box 666, Magnolia, AR 71753		(870) 234-2203			
Permit #:		Purchase Order:			
AR0043613/AFIN 14-00059					
Sampler's Signature/Printed Name/Affiliation:					
<i>John Moore / MWS</i>					
Date Start Date End	Time Start Time End	C	G	# and type of container	Sample Identification
2/1/24 - 2/7/24	800 - 800	X		8 half gallons	001
Relinquished by/Affiliation:					
<i>John Moore / MWS</i>					
Relinquished by/Affiliation:					
<i>Gene Lee</i>					
Relinquished by/Affiliation:					
Method of Shipment: <u>Lab</u> <u>Bus</u> <u>Fed Ex</u> <u>DHL</u> <u>UPS</u> <u>Client</u> <u>Other</u> <u>Tracking #</u>					
Comments:					
COC Rev.3.1					

Analysis:		Laboratory Use Only:	
Fecal Coliform		Project Number:	X9083
Acute Ceriodaphnia		Temp. upon arrival:	21.1 °C
Acute Mysid		Therm #: 24	
Acute Daphnia species		Color:	Clear
Acute minnow(fresh/marine)		Odor:	NDA
Chronic minnow	X X	Tech:	EGW AHM
Chronic Ceriodaphnia	X	Preservative:	(below)
		Lab Control Number:	CA2038
		ICE	
Received by/Affiliation:	Date:	Time:	
<i>Gene Lee</i>	2/7/24	8:40A	
Received by/Affiliation:	Date:	Time:	
Received by/Affiliation:	Date:	Time:	
<i>Gene Lee</i>	2/7/24	11:25A	

NELAP/LELAP 01975, ADEQ 88-0630, TCEQ T104704278

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Laboratory Use Only:

Company: City of Magnolia		Phone: (870) 234-2955		Project Number: X9083	
Address: P.O. Box 666, Magnolia, AR 71753		Fax: (870) 234-2203		Temp. upon arrival: 2.2 Therm #: 29	
Permit #: AR0043613/AFIN 14-00059		Purchase Order:		Color: clear Odor: None Tech: PM 2/19/24 Preservative: (below)	
Sampler's Signature/Printed Name/Affiliation: Jani Lowe / Trace Love / MWWS					
Date Start 2/19/24		Time Start 8:00		Lab Control Number: CA2234	
Date End 2/19/24		Time End 8:00		ICE	
Relinquished by/Affiliation: Jani Lowe / MWWS		# and type of container 8 half gallons		Sample Identification	
Relinquished by/Affiliation: Jani Lowe / MWWS		C		G	
Relinquished by/Affiliation:		X		001	
Received by/Affiliation: Jani Lowe / MWWS		Date: 2/19/24		Time: 8:30A	
Received by/Affiliation: Jani Lowe / MWWS		Date: 2/19/24		Time: 11:06A	
Received by/Affiliation:		Date:		Time:	
Method of Shipment:		Lab <input checked="" type="checkbox"/>		Bus	
Comments:		Fed Ex		UPS	
COC Rev.3.1		DHL		Client	
		Other		Tracking #	

**APPENDIX B
RAW DATA SHEETS**

Bio-Analytical Laboratories
Total Alkalinity and Total Hardness

Client: City of Magnolia Project #: X9083

Control Water ID#	Total Alkalinity	Date Tested	Total Hardness	Date Tested
5595	32.0	2/1/24	56.0	2/1/24
5597	36.0	2/8/24	52.0	2/8/24
Sample ID#	Total Alkalinity	Date Tested	Total Hardness	Date Tested
C26224	32.0	2/8/24	24.0	2/8/24
C26238	28.0	2/8/24	28.0	2/8/24
C26254	44.0	2/15/24	28.0	2/15/24
Test Blank ID#	Total Alkalinity	Date Tested	Total Hardness	Date Tested

Results are in mg/L CaCO3

BIO-ANALYTICAL LABORATORIES CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST

Project# X9083 Date start: 2/6/24 Date end: 2/13/24

Client/Contact: MAGN/Magnolia Waste Water

Address: P.O. Box 666 Magnolia AR 71753

NPDES#: AR0043613

Sample Description: 001 Dilution Water: Soft Reconstituted

Adults isolated: Date 2/6/24 Time: 0650

Neonates collected: Date 2/6/24 Time: 1430 Board: 27-15 28mH
A15, A1mH

Dissolved Oxygen Meter#: 2
 pH Meter#: 3 Conductivity Meter#: 9
 ORP Meter#: — Salinity Meter#: —

Effluent Initial D.O. (mg/L & %)/Tech	Aerate?/Minutes /Final D.O. (mg/L & %)/Tech	Receiving Water Initial D.O. (mg/L & %)/Tech	Aerate?/Minutes /Final D.O. (mg/L & %)/Tech
0.9 2/110.2% /mv	0.7 2/198.5% /mv	0.	0.
1. 8.2/96.5% /son	1. No /son		
2. 8.5/99.1% /son	2. No /son		
3. 8.5/99.8% /pm	3. No /pm		
4. 10.1/107.2% /pm	4. 1/2/9.6/100.1% /pm		
5. 9.8/100.2% /pm	5. No /pm		
6. 9.5/100.0% /pm	6. No /pm		
7.	7.		

Total Residual Chlorine (mg/L)/Tech	Dechlorinated? Amount?/Tech	Ammonia (NH3) (mg/L)/Tech	BAL Sample # Date in use
1. 40.5 /mv	1. No /mv	1. 40.5 /mv	1. C26224 2/6/24
2. <0.5 /son	2. No /son	2. <0.5 /son	2. C26238 2/8/24
3. 40.5 /pm	3. No /pm	3. 40.5 /pm	3. C26234 2/10/24

Comments:

CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST-LIVE NEONATE PRODUCTION

Project# X9083 Client City of Magnolia Sample ID 001
 Test started: Date 2/6/04 Time 1530 Test ended: Date 2/13/04 Time 1610
 Date/Tech: Day 0 2/6/04 1 2/7/04 2 2/8/04 3 2/9/04 4 2/10/04 5 2/11/04 6 2/12/04 7 2/13/04 8
 Time: Day 0 1530 1 1430 2 1420 3 1433 4 1435 5 1400 6 1415 7 1610 8
 Temp. (°C): Day 0 24.7 1 24.4 2 25.9 3 25.9 4 25.7 5 24.9 6 25.9 7 25.7 8

Conc	Day	1	2	3	4	5	6	7	8	9	10	Number of Live
0.10	1	0										10
	2	0										10
	3	0										10
	4	114	116	114	115	114	114	115	116	115	114	10
	5	218	214	218	0	216	217	216	214	218	0	10
	6	0			218							10
	7	3110	3112	319	3A	3110	3113	3111	3110	3112	317	10
	8											
32.0	1	0										10
	2	X	0						X			10
	3		0									10
	4		113	114	113	113	114	114		114	115	10
	5		0	0	0	216	218	218		218	0	10
	6		215	217	218	0	0	0		0	216	10
	7		3110	318	312	312	318	3110		3112	3113	10
	8											
42.0	1	0										10
	2	0	X		X							10
	3	0										10
	4	114		113		115	116	117	118	116	113	10
	5	218		0		0	0	211	0	0	0	10
	6	0		216		219	219	0	214	216	217	10
	7	3110		3110		3113	3112	3115	3112	3111	3114	10
	8											
56.0	1	0										10
	2	X			X							10
	3	0										10
	4		113	114		114	114	115	116	116	117	10
	5		216	218		218	218	0	0	214	0	10
	6		0	0		0	0	218	219	0	213	10
	7		3113	3112		3114	3113	3119	3114	3113	3119	10
	8											
80.0	1	0										10
	2	X										10
	3	0							X			10
	4		114	114	115	116	114	115		116	115	10
	5		0	0	0	0	0	0		0	219	10
	6		216	216	217	219	2111	216		216	211	10
	7		3112	3110	3119	3112	3113	3114		3113	3110	10
	8											
100.0	1	0										10
	2	0										10
	3	0		X	X							10
	4	113	114			114	113	113	113	115	114	10
	5	0	0			218	0	0	216	0	216	10
	6	217	218			0	219	2110	0	219	0	10
	7	3110	3111			317	3114	3114	3113	317	3110	10
	8											

Key: X=dead adult, Xⁿ=adult had n neonates before death, M=male.
 B/N = Brood count/#neonates

BIO-ANALYTICAL LABORATORIES CHRONIC WATER QUALITY DATA

Project# X9083 Client City of Magnolia Organism C. dubia

Date	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Concentration:	OS 8895								
Temperature (°C)	22.1	24.0 24.5	24.2 24.7	24.3 24.5	24.5 25.3	23.5 24.9	24.2 24.7	24.5	
pH	7.1	7.4 7.3	6.9 7.3	6.9 7.4	7.1 6.8	6.9 7.1	6.9 7.2	7.2	
DO (mg/l)	2.5	7.6 7.5	8.0 7.7	8.2 7.6	8.0 7.5	8.1 7.4	8.2 7.4	8.0	
Cond (umhos/cm)	175	170	175	174	174	176	178		
Concentration:	32.00/0								
Temperature (°C)	22.2	23.9 24.3	24.1 24.9	24.6 24.4	24.4 24.4	23.6 24.5	24.1 24.8	24.4	
pH	7.1	7.2 7.2	7.0 7.4	6.9 7.3	7.0 6.8	7.0 7.0	6.9 7.1	7.3	
DO (mg/l)	2.5	7.4 7.4	8.2 7.7	8.2 7.7	8.1 8.1	8.1 7.9	8.1 8.0	7.4	
Cond (umhos/cm)	187	181	198	198	201	198	199		
Concentration:	42.00/0								
Temperature (°C)	22.6	24.1 24.2	24.1 24.7	24.4 24.3	24.2 24.1	23.6 24.3	24.2 24.8	24.6	
pH	7.0	7.3 7.2	7.0 7.4	6.9 7.3	7.0 6.8	7.1 7.1	6.9 7.0	7.2	
DO (mg/l)	2.6	7.4 7.6	8.3 7.7	8.3 7.8	8.1 8.5	8.1 8.6	8.2 8.3	7.4	
Cond (umhos/cm)	185	185	220	208	222	231	228		
Prerenewal Tech Initials/Time		SMV 1430	1620 PM	1700 PM	1530 PM	1420 PM	1545 PM	EDU 1610	
Postrenewal Tech Initials/Time	1127 MV	2000 1030	2000 1030	1100 PM	0540 PM	1110 PM	1120 PM		

BIO-ANALYTICAL LABORATORIES CHRONIC WATER QUALITY DATA

Project# X9083 client City of Magnolia Organism C. dubia

Date	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Concentration: <u>56.00%</u>									
Temperature (°C)		23.9	24.3	24.6	24.3	23.9	24.4	24.5	
	22.7	23.9	24.6	24.1	23.9	23.9	24.7		
pH		7.3	7.2	7.1	7.0	7.2	7.1	7.4	
	7.1	7.2	7.7	7.7	6.8	7.0	7.1		
DO (mg/l)		7.4	8.3	8.1	8.0	8.1	7.8	7.6	
	8.2	7.5	7.9	8.0	8.1	8.0	8.2		
Cond (umhos/cm)	190	188	233	235	240	241	243		
Concentration: <u>80.00%</u>									
Temperature (°C)		24.1	24.3	24.5	24.3	23.7	24.3	23.9	
	23.0	23.4	24.4	23.9	23.7	23.7	24.5		
pH		7.4	7.2	7.1	7.2	7.4	7.1	7.2	
	7.1	7.2	7.2	7.5	6.9	7.0	7.2		
DO (mg/l)		7.5	8.4	8.2	8.2	8.2	8.0	7.4	
	8.2	7.2	7.9	7.9	8.4	8.4	8.4		
Cond (umhos/cm)	197	195	250	232	236	236	238		
Concentration: <u>100.00%</u>									
Temperature (°C)		24.3	24.4	24.8	24.6	23.9	24.2	24.4	
	23.4	23.2	24.1	23.8	23.7	23.9	24.3		
pH		7.5	7.3	7.2	7.3	7.4	7.2	7.5	
	7.1	7.2	7.1	7.4	6.9	7.2	7.1		
DO (mg/l)		7.4	8.4	8.1	8.0	8.4	8.1	7.4	
	8.2	7.9	8.3	8.4	8.9	9.0	9.1		
Cond (umhos/cm)	225	216	266	268	269	270	268		
Prerenewal Tech Initials/Time		SM 1430	11:20 PM	17:00 PM	15:30 PM	14:20 PM	15:45 PM	SM 16:10	
Postrenewal Tech Initials/Time	11:27 MV	SM 10:30	SM 10:30	11:00 PM	09:40 PM	11:10 PM	11:20 PM		

CETIS Test Data Worksheet

Report Date: 05 Feb-24 08:30 (p 1 of 2)
 Test Code/ID: 74A494D1 / 19-5694-3057

Ceriodaphnia 7-d Survival and Reproduction Test Bio-Analytical Laboratories

Start Date: 06 Feb-24 Species: Ceriodaphnia dubia Sample Code: 715A9E25
 End Date: 13 Feb-24 Protocol: EPA/821/R-02-013 (2002) Sample Source: AR0043613
 Sample Date: 05 Feb-24 Material: POTW Effluent Sample Station: 001

Conc-%	Code	Rep	Pos	# Exposed	1d Surv	2d Surv	3d Surv	4d Surv	5d Surv	6d Surv	7d Surv	8d Surv	2d Neo	3d Neo	4d Neo	5d Neo	6d Neo	7d Neo	8d Neo	Male	Notes	
56		9	1																			
42		8	2																			
42		10	3																			
32		1	4																			
100		7	5																			
100		1	6																			
56		5	7																			
0	D	3	8																			
42		4	9																			
32		10	10																			
32		6	11																			
42		9	12																			
100		8	13																			
80		3	14																			
100		6	15																			
0	D	1	16																			
56		1	17																			
32		3	18																			
80		6	19																			
42		7	20																			
0	D	7	21																			
42		6	22																			
100		2	23																			
32		2	24																			
56		3	25																			
80		7	26																			
80		2	27																			
0	D	4	28																			
0	D	6	29																			
0	D	8	30																			
32		7	31																			
42		3	32																			
100		10	33																			
80		4	34																			
56		2	35																			
100		4	36																			
56		6	37																			
32		9	38																			
42		1	39																			
80		10	40																			
0	D	10	41																			

EAB
 QA 2/5/24

CETIS Test Data Worksheet

Report Date:
 Test Code/ID:

05 Feb-24 08:30 (p 2 of 2)
 74A494D1 / 19-5694-3057

Conc-%	Code	Rep	Pos	# Exposed	1d Surv	2d Surv	3d Surv	4d Surv	5d Surv	6d Surv	7d Surv	8d Surv	2d Neo	3d Neo	4d Neo	5d Neo	6d Neo	7d Neo	8d Neo	Male	Notes	
56		7	42																			
0	D	2	43																			
80		9	44																			
56		8	45																			
56		4	46																			
100		3	47																			
80		1	48																			
80		5	49																			
32		4	50																			
42		5	51																			
100		9	52																			
32		8	53																			
32		5	54																			
0	D	9	55																			
100		5	56																			
56		10	57																			
0	D	5	58																			
80		8	59																			
42		2	60																			

BIO-ANALYTICAL LABORATORIES
CERIODAPHNIA DUBIA CHRONIC TEST
PARENTAL BLOCK ASSIGNMENT RANDOM NUMBER TEMPLATE #1
FOR 8 CONCENTRATION TEST

Set #1

3,5,2,1,4,6

Parent# 1E27-15

Set #2

1,6,3,5,2,4

Parent# 2C27-15

Set #3

5,1,6,2,4,3

Parent# 3C27-15

Set #4

5,2,1,4,3,6

Parent# 3F27-15

Set #5

4,1,5,2,3,6

Parent# 4E27-15

Set #6

1,2,3,5,6,4

Parent# 1BA15

Set #7

6,1,3,4,2,5

Parent# 13A15

Set #8

5,1,4,6,2,3

Parent# 50A15

Set #9

1,4,6,2,3,5

Parent# 3FA15

Set #10

4,2,6,5,1,3

Parent# 1D285

EDW
2/6/24

BIO-ANALYTICAL LABORATORIES
 PIMEPHALES PROMELAS SURVIVAL AND GROWTH DATA SHEET

Project# X9083 Date started: 2/6/24 Date ended 2/13/24

Client/Contact: MAGN/Magnolia Waste Water

Address P.O. Box 666 Magnolia AR 71753

NPDES# AR0043613 AFIN14-00059

Sample Description: 001 Dilution Water: Soft Reconstituted
 Test organism age: < 48 hours Vendor/ID# ABS1270

Feeding Times

Day	Technician/Time/Amount (per replicate)		
	AM	NOON	PM
0			
1	ESW/0915/0.10ml	ESW/1205/0.10ml	ESW/1850/0.20ml
2	PM/0940/0.1ml	ESW/1200/0.10ml	mv/1749/0.10ml
3	PM/0945/0.1ml	PM/1115/0.1ml	mv/1740/0.10ml
4	PM/0920/0.2ml		PM/1950/0.1ml
5	PM/1104/0.2ml		PM/1545/0.2ml
6	PM/0935/0.1ml	PM/1108/0.1ml	PM/1815/0.2ml
			ESW/1810/0.10ml

Dissolved Oxygen Meter #: 2
 pH Meter#: 3 Conductivity Meter#: 9
 ORP Meter#: _____ Salinity Meter #: _____

Effluent Initial DO (mg/L & %)/Tech	Aerate?/Minutes /Final DO (mg/L & %)/Tech	Receiving Water Initial DO (mg/L & %)/Tech	Aerate?/Minutes /Final DO (mg/L & %)/Tech
0.9.2/116.2%/mv	416 0.8.2/98.5%/mv	0. _____	0. _____
1.8.2/96.5%/ESW	1. NO/ESW	1. _____	1. _____
2.8.5/99.1%/ESW	2. NO/ESW	2. _____	2. _____
3.8.5/99.8%/PM	3. NO/PM	3. _____	3. _____
4.10.1/107.2%/PM	4. YES/9.6/100.1%/PM	4. _____	4. _____
5.9.8/100.2%/PM	5. NO/PM	5. _____	5. _____
6.9.5/100.0%/PM	6. NO/PM	6. _____	6. _____

Total Residual Chlorine (mg/L)/Tech	Dechlorinated? Amount?/Tech	Ammonia (NH3) (mg/L)/Tech	BAL Sample # Date in use
1.40.5/mv	1. NO/mv	1.40.5/mv	1.C26224 2/6/24
2.40.5/ESW	2. NO/ESW	2.40.5/ESW	2.C26238 2/8/24
3.40.5/PM	3. NO/PM	3.40.5/PM	3.C26254 2/10/24

Comments:

BIO-ANALYTICAL LABORATORIES 7-DAY CHRONIC MINNOW SURVIVAL DATA - EPA 1000, OECD 210

Project# X9083

Test started: Date 2/6/24 Time 1850

Client City of Macomb Sample ID 001 Test ended: Date 2/13/24 Time 1745

Date/Tech: Day 0 2/6/24 1 2/7/24 2 2/8/24 3 2/9/24 4 2/10/24 5 2/11/24 6 2/12/24 7 2/13/24

Time: Day 0 1850 1 1135 2 1525 3 1452 4 1020 5 1205 6 1810 7 1745

Temp (°C) Day 0 24.8 1 24.7 2 24.7 3 24.8 4 24.1 5 24.6 6 24.8 7 24.8

Conc.	Rep.	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
0.0	1	8	8	8	8	8	8	8	8
	2	8	8	8	8	8	8	8	8
	3	8	8	8	8	8	8	8	8
	4	8	8	7	7	6	7	7	7
	5	8	8	8	8	8	8	8	8
32.0	1	8	8	8	8	8	8	8	8
	2	8	8	8	8	8	8	8	8
	3	8	8	8	8	8	8	8	8
	4	8	8	8	8	8	8	8	8
	5	8	8	8	8	8	8	6	6
42.0	1	8	8	8	8	8	8	7	7
	2	8	8	8	8	8	8	6	6
	3	8	8	8	8	8	8	8	8
	4	8	8	8	8	8	7	6	5
	5	8	8	8	8	8	8	8	8
56.0	1	8	8	8	7	7	7	7	7
	2	8	8	7	6	6	6	6	7
	3	8	8	8	8	8	8	8	8
	4	8	8	8	8	8	8	8	8
	5	8	8	8	7	7	7	7	7
80.0	1	8	8	8	7	7	7	7	7
	2	8	8	8	8	8	8	7	7
	3	8	8	8	8	8	8	8	7
	4	8	8	8	8	8	8	8	7
	5	8	8	8	8	8	8	8	7
100.0	1	8	8	8	8	8	8	8	8
	2	8	8	8	8	8	8	5	5
	3	8	8	8	8	8	8	7	7
	4	8	8	8	8	8	8	7	7
	5	8	8	8	8	8	8	8	8

6/8
2/22/24

BIO-ANALYTICAL LABORATORIES 7-DAY CHRONIC MINNOW SURVIVAL DATA- EPA 1000, OECD 210

Project# X9083 Test started: Date 2/6/24 Time 1850
 Client City of Magnolia Sample ID 001 Test ended: Date 2/13/24 Time 1745
 Date/Tech: Day 0 2/6/24/son 1 2/7/24/son 2 2/8/24/son 3 2/9/24/son 4 2/11/24/son 5 2/12/24/son 6 2/13/24/son 7 2/13/24
 Time: Day 0 1850 1 1135 2 1525 3 1455 4 1205 5 1210 6 1745 7 1745
 Temp (°C) Day 0 24.8 1 24.7 2 24.7 3 24.8 4 24.4 5 24.8 6 24.8 7 24.8

0/0 Conc.	Rep.	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
100 UV	1	8	8	7	5	5	5	5	5
	2	8	7	7	7	7	7	7	7
	3	8	8	8	8	8	8	7	7
	4	8	8	8	8	8	8	8	8
	5	8	8	8	8	8	8	8	8
	1								
	2								
	3								
	4								
	5								
	1								
	2								
	3								
	4								
	5								
	1								
	2								
	3								
	4								
	5								

Project#/Client: X9083 magnolia Temp Start (°C): 81.5 Tech: fm Date: 2/13/24 Time: 1745
Temp End (°C): 106.8 Tech: fm Date: 2/14/24 Time: 0850

Conc.	Replicate/ Pan number	Wt. of pan(g)/ Date weighed: Tech:	Wt. of pan + larvae(g)/ Date weighed: Tech:	Total wt. of larvae (g)	Original # of larvae at test initiation	Mean Dry wt. of larvae (mg)	Mean Dry wt. - surviving larvae (mg) Control Only*
0	1	960.9870	0.9908				
	2	970.9657	0.9688				
	3	980.9695	0.9740				
	4	990.9751	0.9788				
	5	1000.9757	0.9803				
32	1	1010.9641	0.9679				
	2	1020.9729	0.9760				
	3	1030.9667	0.9711				
	4	1040.9741	0.9779				
	5	1050.9834	0.9867				
42	1	1060.9787	0.9822				
	2	1070.9752	0.9791				
	3	1080.9767	0.9805				
	4	1090.9774	0.9798				
	5	1100.9608	0.9659				
56	1	1110.9557	0.9598				
	2	1120.9740	0.9780				
	3	1130.9646	0.9695				
	4	1140.9829	0.9874				
	5	1150.9806	0.9844				
80	1	1160.9682	0.9720				
	2	1170.9765	0.9798				
	3	1180.9652	0.9682				
	4	1190.9681	0.9720				
	5	1200.9792	0.9831				
100	1	1210.9706	0.9740				
	2	1220.9643	0.9673				
	3	1230.9749	0.9781				
	4	1240.9801	0.9836				
	5	1250.9655	0.9693				

* Test acceptance of control weight based on surviving larvae at end of test.

Calculated by: CETIS Calculations checked by: EBB 2/26/24

Project#/Client X9083
Magnolia

Temp Start (°C) 81.5
Temp End (°C) 106.8

Tech Pr
Tech PM

Date: 2/13/04 Time: 1745
Date: 2/19/04 Time: 0850

Conc. /	Replicate/ Pan number	Wt. of pan(g)/ Date <u>2/12/04</u> weighed: Tech: <u>mv</u>	Wt. of pan + larvae(g)/ Date weighed: <u>2/14/04</u> Tech: <u>29W</u>	Total wt. of larvae (g)	Original # of larvae at test initiation	Mean Dry wt. of larvae (mg)	Mean Dry wt. - surviving larvae (mg) Control Only*
100 UV	1	126	0.9671	0.9693			
	2	127	0.9768	0.9804			
	3	128	0.9668	0.9698			
	4	129	0.9763	0.9803			
	5	130	0.9808	0.9858			
	1						
	2						
	3						
	4						
	5						
	1						
	2						
	3						
	4						
	5						
	1						
	2						
	3						
	4						
	5						
	1						
	2						
	3						
	4						
	5						

* Test acceptance of control weight based on surviving larvae at end of test.

Calculated by: CETIS Calculations checked by: EPB 2/20/04

BIO-ANALYTICAL LABORATORIES CHRONIC WATER QUALITY DATA

Project# X9083 client City of Magnolia Organism P. promelas

Date	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Concentration:	0.9 5597								
Temperature (°C)	22.9	24.1	23.3	24.2	23.9	24.3	23.9	23.8	
pH	6.7	7.4	7.2	6.7	6.9	6.9	6.7	6.8	
DO (mg/l)	7.9	7.6	7.4	6.6	6.8	7.0	6.1	6.0	
Cond (umhos/cm)	184	172	175	175	176	178	183		
Concentration:	32.00/10								
Temperature (°C)	25.9	23.8	23.9	24.2	23.9	24.0	23.9	23.7	
pH	6.8	7.2	7.4	6.6	6.9	6.4	6.6	6.8	
DO (mg/l)	7.8	7.4	7.5	6.5	6.7	7.5	6.2	6.5	
Cond (umhos/cm)	194	183	215	222	248	222	221		
Concentration:	42.00/10								
Temperature (°C)	25.5	24.1	24.1	24.2	23.8	24.3	23.9	23.5	
pH	6.9	7.2	7.4	6.6	6.6	6.9	6.6	6.8	
DO (mg/l)	7.9	7.4	7.5	6.6	6.8	7.6	6.7	6.1	
Cond (umhos/cm)	193	187	222	220	220	236	232		
Prerenewal Tech Initials/Time		SPV 1135	SPV 1525	HPB PM	1020 PM	1205 PM	1220 PM	1745 PM	
Postrenewal Tech Initials/Time	1123 MV	SPV 1030	SPV 1035	1125 PM	0940 PM	1110 PM	1035 PM		

Day #4: 32% D.O. @ 2.2° Cond 218
 42% Cond 232 PM 2/10/24

BIO-ANALYTICAL LABORATORIES CHRONIC WATER QUALITY DATA

Project# X9083 client City of Magnolia Organism P. promelas

Date	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Concentration: 56.00%									
Temperature (°C)		24.1	23.9	24.2	23.8	24.3	23.9	23.3	
	25.3	24.4	24.9	23.9	22.6	23.2	23.3		
pH		7.2	7.3	6.6	6.8	7.1	6.6	6.8	
	6.9	7.4	7.2	7.4	6.6	6.9	7.5		
DO (mg/l)		7.4	7.4	6.4	6.7	6.9	6.4	6.7	
	7.9	7.6	7.8	8.5	8.5	8.5	8.6		
Cond (umhos/cm)		196	190	234	239	238	241	246	
Concentration: 80.00%									
Temperature (°C)		23.9	24.1	24.3	24.0	24.3	24.0	23.3	
	25.1	24.0	24.7	24.1	22.2	23.6	22.8		
pH		7.2	7.3	6.6	6.8	6.9	6.6	6.8	
	6.9	7.4	7.1	7.3	6.7	7.1	7.4		
DO (mg/l)		7.4	7.5	6.3	6.5	6.8	6.3	6.1	
	8.0	7.7	8.2	8.7	8.9	9.0	9.0		
Cond (umhos/cm)		224	198	252	254	245	251	271	
Concentration: 100.00%									
Temperature (°C)		24.1	24.1	24.3	24.0	24.3	24.0	23.5	
	24.7	23.5	24.3	23.8	22.1	23.7	22.1		
pH		7.2	7.3	6.6	6.7	6.5	6.6	6.8	
	6.9	7.0	7.0	7.1	6.6	7.0	7.2		
DO (mg/l)		7.1	7.2	6.3	6.5	7.6	6.2	5.8	
	8.1	8.1	8.4	8.9	9.1	9.0	9.3		
Cond (umhos/cm)		223	218	268	265	272	278	282	
Prerenewal Tech Initials/Time		EMV	EMV	1455	1029	1203	1220	1745	
		1135	1525	PM	PM	PM	PM	PM	
Postrenewal Tech Initials/Time	1123	EMV	EMV	1125	0940	1110	1055		
	PMV	1030	1035	PM	PM	PM	PM		

BIO-ANALYTICAL LABORATORIES CHRONIC WATER QUALITY DATA

Project# X9083 Client City of Magnolia Organism P. promelas

Date	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Concentration: <u>100% UV</u>									
Temperature (°C)		<u>24.1</u>	<u>24.2</u>	<u>24.4</u>	<u>24.1</u>	<u>24.3</u>	<u>24.1</u>	<u>23.5</u>	
	<u>25.0</u>	<u>23.5</u>	<u>24.7</u>	<u>23.4</u>	<u>23.2</u>	<u>24.6</u>	<u>22.2</u>		
pH		<u>7.3</u>	<u>7.4</u>	<u>6.6</u>	<u>6.7</u>	<u>6.3</u>	<u>7.0</u>	<u>6.9</u>	
	<u>6.9</u>	<u>7.1</u>	<u>7.0</u>	<u>7.1</u>	<u>6.7</u>	<u>6.9</u>	<u>7.1</u>		
DO (mg/l)		<u>7.4</u>	<u>7.5</u>	<u>6.1</u>	<u>6.6</u>	<u>8.5</u>	<u>6.1</u>	<u>5.8</u>	
	<u>7.6</u>	<u>8.2</u>	<u>8.4</u>	<u>9.0</u>	<u>9.5</u>	<u>9.4</u>	<u>9.1</u>		
Cond (umhos/cm)		<u>22.8</u>	<u>217</u>	<u>300</u>	<u>270</u>	<u>271</u>	<u>273</u>	<u>284</u>	
Concentration:									
Temperature (°C)									
pH									
DO (mg/l)									
Cond (umhos/cm)									
Concentration:									
Temperature (°C)									
pH									
DO (mg/l)									
Cond (umhos/cm)									
Prerenewal Tech Initials/Time		<u>EDW</u> <u>1135</u>	<u>EDW</u> <u>1525</u>	<u>MSS</u> <u>PM</u>	<u>1020</u> <u>PM</u>	<u>1205</u> <u>PM</u>	<u>1220</u> <u>PM</u>	<u>1745</u> <u>PM</u>	
Postrenewal Tech Initials/Time	<u>1123</u> <u>MV</u>	<u>2000</u> <u>1030</u>	<u>2000</u> <u>1035</u>	<u>1125</u> <u>PM</u>	<u>0840</u> <u>PM</u>	<u>1110</u> <u>PM</u>	<u>1055</u> <u>PM</u>		

CETIS Test Data Worksheet

Report Date: 05 Feb-24 08:30 (p 1 of 1)
 Test Code/ID: 2EBDF2B4 / 07-8420-0372

Fathead Minnow 7-d Larval Survival and Growth Test **Bio-Analytical Laboratories**

Start Date: 06 Feb-24 Species: Pimephales promelas Sample Code: 2BBECF9
 End Date: 13 Feb-24 Protocol: EPA/821/R-02-013 (2002) Sample Source: AR0043613
 Sample Date: 05 Feb-24 Material: POTW Effluent Sample Station: 001

Conc-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Weight-mg Total	Weight-mg Tare	Pan Count	Notes
42		2	1												
0	D	5	2												
UV 100		2	3												
100		4	4												
56		3	5												
32		3	6												
80		2	7												
42		3	8												
100		1	9												
32		4	10												
56		4	11												
42		5	12												
56		2	13												
32		2	14												
UV 100		4	15												
80		3	16												
UV 100		3	17												
80		4	18												
UV 100		5	19												
0	D	2	20												
56		5	21												
100		3	22												
80		1	23												
42		1	24												
32		5	25												
32		1	26												
UV 100		1	27												
0	D	1	28												
42		4	29												
100		5	30												
0	D	3	31												
56		1	32												
100		2	33												
0	D	4	34												
80		5	35												

ELB
 QA 2/5/24

APPENDIX C
STATISTICAL ANALYSIS

CETIS Analytical Report

Report Date: 22 Feb-24 13:50 (p 1 of 2)
Test Code/ID: 74A494D1 / 19-5694-3057

Ceriodaphnia 7-d Survival and Reproduction Test

Bio-Analytical Laboratories

Analysis ID: 06-3938-3260	Endpoint: 7d Survival Rate	CETIS Version: CETIS v2.1.5
Analyzed: 22 Feb-24 13:50	Analysis: STP 2xK Contingency Tables	Status Level: 1
Edit Date: 22 Feb-24 13:33	MD5 Hash: 2631BC2E007ED0EF4BA0C7C8FAFA9928	Editor ID: 008-522-314-5
Batch ID: 07-7414-6489	Test Type: Reproduction-Survival (2-8d)	Analyst:
Start Date: 06 Feb-24 15:30	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Ending Date: 13 Feb-24 16:10	Species: Ceriodaphnia dubia	Brine:
Test Length: 7d 1h	Taxon: Branchiopoda	Source: In-House Culture Age: <24
Sample ID: 19-0176-4133	Code: X9083	Project: WET Quarterly Compliance Test (1Q)
Sample Date: 05 Feb-24 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 05 Feb-24 11:18	CAS (PC):	Station: 001
Sample Age: 32h (3.4 °C)	Client: Magnolia Wastewater System	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units
Untransformed	C > T	100	>100	--	1

Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Type	P-Value	Decision(α:5%)
Dilution Water		32	0.2368	Exact	1.0000	Non-Significant Effect
		42	0.2368	Exact	1.0000	Non-Significant Effect
		56	0.2368	Exact	1.0000	Non-Significant Effect
		80	0.2368	Exact	1.0000	Non-Significant Effect
		100	0.2368	Exact	1.0000	Non-Significant Effect

7d Survival Rate Frequencies

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	D	10	0	10	1.0000	0.0000	0.00%
32		8	2	10	0.8000	0.2000	20.00%
42		8	2	10	0.8000	0.2000	20.00%
56		8	2	10	0.8000	0.2000	20.00%
80		8	2	10	0.8000	0.2000	20.00%
100		8	2	10	0.8000	0.2000	20.00%

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
32		10	0.8000	0.4984	1.0000	1.0000	0.0000	1.0000	0.1333	52.70%	20.00%
42		10	0.8000	0.4984	1.0000	1.0000	0.0000	1.0000	0.1333	52.70%	20.00%
56		10	0.8000	0.4984	1.0000	1.0000	0.0000	1.0000	0.1333	52.70%	20.00%
80		10	0.8000	0.4984	1.0000	1.0000	0.0000	1.0000	0.1333	52.70%	20.00%
100		10	0.8000	0.4984	1.0000	1.0000	0.0000	1.0000	0.1333	52.70%	20.00%

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	1.0000	1.0000
32		0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
42		1.0000	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
56		0.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
80		0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
100		1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

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CETIS Analytical Report

Report Date: 22 Feb-24 13:50 (p 2 of 2)
 Test Code/ID: 74A494D1 / 19-5694-3057

Ceriodaphnia 7-d Survival and Reproduction Test

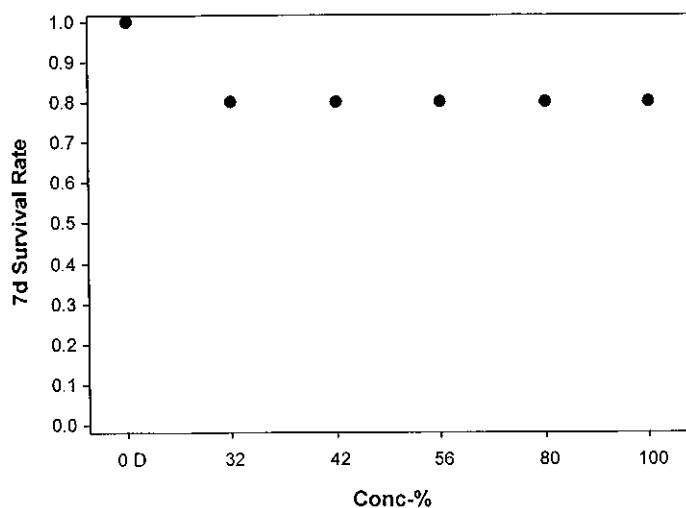
Bio-Analytical Laboratories

Analysis ID: 06-3938-3260 Endpoint: 7d Survival Rate CETIS Version: CETIS v2.1.5
 Analyzed: 22 Feb-24 13:50 Analysis: STP 2xK Contingency Tables Status Level: 1
 Edit Date: 22 Feb-24 13:33 MD5 Hash: 2631BC2E007ED0EF4BA0C7C8FAFA9928 Editor ID: 008-522-314-5

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	1/1	1/1
32		0/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1
42		1/1	0/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1
56		0/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1
80		0/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1
100		1/1	1/1	0/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1

Graphics



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CETIS Analytical Report

Report Date: 22 Feb-24 13:51 (p 1 of 2)
Test Code/ID: 74A494D1 / 19-5694-3057

Ceriodaphnia 7-d Survival and Reproduction Test **SURVIVING** Bio-Analytical Laboratories

Analysis ID: 01-2308-6366	Endpoint: Reproduction	CETIS Version: CETIS v2.1.5
Analyzed: 22 Feb-24 13:50	Analysis: Parametric-Multiple Comparison	Status Level: 1
Edit Date: 22 Feb-24 13:33	MD5 Hash: 804CAFEF7960725899238870B3EA7030	Editor ID: 008-522-314-5
Batch ID: 07-7414-6489	Test Type: Reproduction-Survival (2-8d)	Analyst:
Start Date: 06 Feb-24 15:30	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Ending Date: 13 Feb-24 16:10	Species: Ceriodaphnia dubia	Brine:
Test Length: 7d 1h	Taxon: Branchiopoda	Source: In-House Culture Age: <24
Sample ID: 19-0176-4133	Code: X9083	Project: WET Quarterly Compliance Test (1Q)
Sample Date: 05 Feb-24 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 05 Feb-24 11:18	CAS (PC):	Station: 001
Sample Age: 32h (3.4 °C)	Client: Magnolia Wastewater System	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	100	>100	--	1	3.731	17.85%

Bonferroni Adj t Test

Control	vs	Conc-%	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Dilution Water		32	16	-0.4691	2.414	3.731	CDF	1.0000	Non-Significant Effect
		42	16	-2.896	2.414	3.731	CDF	1.0000	Non-Significant Effect
		56	16	-2.006	2.414	3.731	CDF	1.0000	Non-Significant Effect
		80	16	-1.925	2.414	3.731	CDF	1.0000	Non-Significant Effect
		100	16	-1.521	2.414	3.731	CDF	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	118.655	23.731	5	2.236	0.0674	Non-Significant Effect
Error	467.025	10.6142	44			
Total	585.68		49			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	4.033	15.09	0.5447	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9791	0.9367	0.5145	Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	20.9	18.17	23.63	22	11	25	1.206	18.25%	0.00%
32		8	21.62	20.02	23.23	21.5	19	24	0.6797	8.89%	-3.47%
42		8	25.38	22.19	28.56	25	21	33	1.349	15.03%	-21.41%
56		8	24	21.55	26.45	24	19	29	1.035	12.20%	-14.83%
80		8	23.88	21.49	26.26	24	20	28	1.008	11.94%	-14.23%
100		8	23.25	20.23	26.27	22.5	19	29	1.278	15.55%	-11.24%

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	22	22	21	22	20	24	22	20	25	11
32		20	19	23	21	20	22	24	24		
42		22	21	27	27	33	24	23	26		
56		24	24	26	25	22	29	23	19		
80		22	20	21	27	28	25	25	23		
100		24	23	19	28	29	22	21	20		

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CETIS Analytical Report

Report Date: 22 Feb-24 13:53 (p 1 of 2)
Test Code/ID: 74A494D1 / 19-5694-3057

Ceriodaphnia 7-d Survival and Reproduction Test

Bio-Analytical Laboratories

Analysis ID: 00-6309-9883	Endpoint: Reproduction	CETIS Version: CETIS v2.1.5
Analyzed: 22 Feb-24 13:51	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 22 Feb-24 13:33	MD5 Hash: F29676FBDDE9C5D91A86ED380E248A48	Editor ID: 008-522-314-5
Batch ID: 07-7414-6489	Test Type: Reproduction-Survival (2-8d)	Analyst:
Start Date: 06 Feb-24 15:30	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Ending Date: 13 Feb-24 16:10	Species: Ceriodaphnia dubia	Brine:
Test Length: 7d 1h	Taxon: Branchiopoda	Source: In-House Culture Age: <24
Sample ID: 19-0176-4133	Code: X9083	Project: WET Quarterly Compliance Test (1Q)
Sample Date: 05 Feb-24 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 05 Feb-24 11:18	CAS (PC):	Station: 001
Sample Age: 32h (3.4 °C)	Client: Magnolia Wastewater System	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	9.796	46.87%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Dilution Water		32	18	94.5	75	4	CDF	0.5100	Non-Significant Effect
		42	18	121	75	3	CDF	0.9924	Non-Significant Effect
		56	18	116.5	75	3	CDF	0.9780	Non-Significant Effect
		80	18	113.5	75	4	CDF	0.9590	Non-Significant Effect
		100	18	104	75	4	CDF	0.8098	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	80.7333	16.1467	5	0.1764	0.9703	Non-Significant Effect
Error	4944	91.5556	54			
Total	5024.73		59			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	9.477	15.09	0.0915	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.7662	0.9459	<1.0E-05	Non-Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	20.9	18.17	23.63	22	11	25	1.206	18.25%	0.00%
32		10	17.3	10.67	23.93	20.5	0	24	2.933	53.61%	17.22%
42		10	20.3	12.28	28.32	23.5	0	33	3.547	55.25%	2.87%
56		10	19.2	11.73	26.67	23.5	0	29	3.303	54.39%	8.13%
80		10	19.1	11.68	26.52	22.5	0	28	3.281	54.32%	8.61%
100		10	18.6	11.23	25.97	21.5	0	29	3.26	55.42%	11.00%

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	22	22	21	22	20	24	22	20	25	11
32		0	20	19	23	21	20	22	0	24	24
42		22	0	21	0	27	27	33	24	23	26
56		0	24	24	0	26	25	22	29	23	19
80		0	22	20	21	27	28	25	0	25	23
100		24	23	0	0	19	28	29	22	21	20

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CETIS Analytical Report

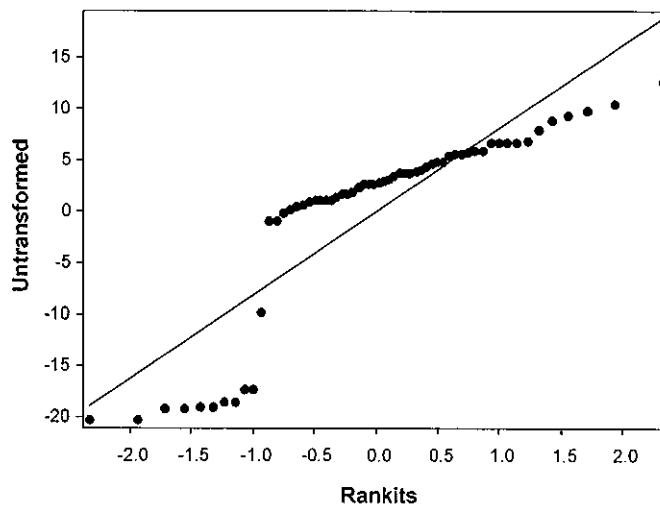
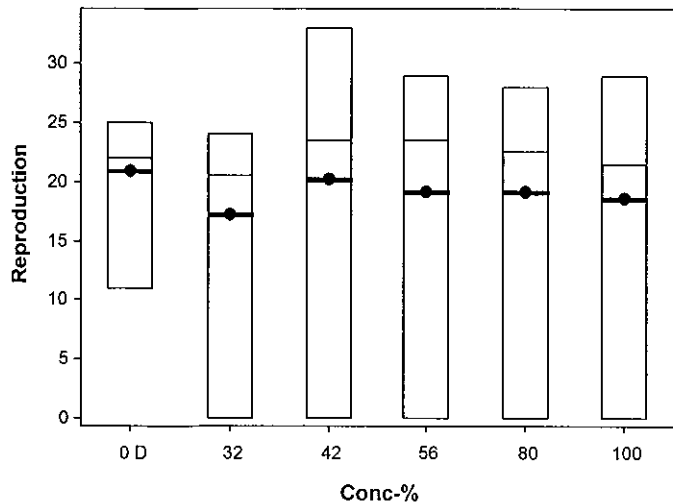
Report Date: 22 Feb-24 13:53 (p 2 of 2)
Test Code/ID: 74A494D1 / 19-5694-3057

Ceriodaphnia 7-d Survival and Reproduction Test

Bio-Analytical Laboratories

Analysis ID: 00-6309-9883	Endpoint: Reproduction	CETIS Version: CETIS v2.1.5
Analyzed: 22 Feb-24 13:51	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 22 Feb-24 13:33	MD5 Hash: F29676FBDDE9C5D91A86ED380E248A48	Editor ID: 008-522-314-5

Graphics



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CETIS Analytical Report

Report Date: 22 Feb-24 14:08 (p 1 of 2)
Test Code/ID: 74A494D1 / 19-5694-3057

Ceriodaphnia 7-d Survival and Reproduction Test

Bio-Analytical Laboratories

Analysis ID: 00-0587-3473	Endpoint: Reproduction	CETIS Version: CETIS v2.1.5
Analyzed: 22 Feb-24 14:08	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 22 Feb-24 13:33	MD5 Hash: F29676FBDDE9C5D91A86ED380E248A48	Editor ID: 008-522-314-5
Batch ID: 07-7414-6489	Test Type: Reproduction-Survival (2-8d)	Analyst:
Start Date: 06 Feb-24 15:30	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Ending Date: 13 Feb-24 16:10	Species: Ceriodaphnia dubia	Brine:
Test Length: 7d 1h	Taxon: Branchiopoda	Source: In-House Culture Age: <24
Sample ID: 19-0176-4133	Code: X9083	Project: WET Quarterly Compliance Test (1Q)
Sample Date: 05 Feb-24 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 05 Feb-24 11:18	CAS (PC):	Station: 001
Sample Age: 32h (3.4 °C)	Client: Magnolia Wastewater System	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1857828	1000	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
IC15	>100	---	---	<1	---	---
IC20	>100	---	---	<1	---	---
IC25	>100	---	---	<1	---	---
IC40	>100	---	---	<1	---	---
IC50	>100	---	---	<1	---	---

Reproduction Summary

Conc-%	Code	Count	Calculated Variate						Isotonic Variate	
			Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	D	10	20.9	22	11	25	18.25%	0.00%	20.9	0.00%
32		10	17.3	20.5	0	24	53.61%	17.22%	18.98	9.21%
42		10	20.3	23.5	0	33	55.25%	2.87%	18.98	9.21%
56		10	19.2	23.5	0	29	54.39%	8.13%	18.98	9.21%
80		10	19.1	22.5	0	28	54.32%	8.61%	18.98	9.21%
100		10	18.6	21.5	0	29	55.42%	11.00%	18.6	11.00%

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	22	22	21	22	20	24	22	20	25	11
32		0	20	19	23	21	20	22	0	24	24
42		22	0	21	0	27	27	33	24	23	26
56		0	24	24	0	26	25	22	29	23	19
80		0	22	20	21	27	28	25	0	25	23
100		24	23	0	0	19	28	29	22	21	20

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CETIS Analytical Report

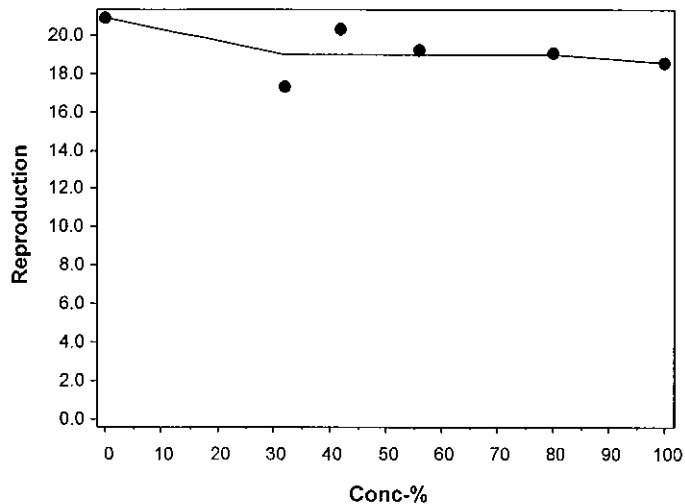
Report Date: 22 Feb-24 14:08 (p 2 of 2)
Test Code/ID: 74A494D1 / 19-5694-3057

Ceriodaphnia 7-d Survival and Reproduction Test

Bio-Analytical Laboratories

Analysis ID: 00-0587-3473	Endpoint: Reproduction	CETIS Version: CETIS v2.1.5
Analyzed: 22 Feb-24 14:08	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 22 Feb-24 13:33	MD5 Hash: F29676FBDDE9C5D91A86ED380E248A48	Editor ID: 008-522-314-5

Graphics



EVB
2/26/24

CETIS Analytical Report

Report Date: 22 Feb-24 14:53 (p 1 of 2)
Test Code/ID: 2EBDF2B4 / 07-8420-0372

Fathead Minnow 7-d Larval Survival and Growth Test Bio-Analytical Laboratories

Analysis ID: 14-1336-1168	Endpoint: 7d Survival Rate	CETIS Version: CETIS v2.1.5
Analyzed: 22 Feb-24 14:53	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 22 Feb-24 14:45	MD5 Hash: 18E3B4E4645B6A90A440F6EE3575015F	Editor ID: 008-522-314-5
Batch ID: 09-8016-1540	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 06 Feb-24 18:50	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Ending Date: 13 Feb-24 17:45	Species: Pimephales promelas	Brine:
Test Length: 6d 23h	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <48
Sample ID: 00-4587-0329	Code: X9083	Project: WET Quarterly Compliance Test (1Q)
Sample Date: 05 Feb-24 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 05 Feb-24 11:18	CAS (PC):	Station: 001
Sample Age: 35h (3.4 °C)	Client: Magnolia Wastewater System	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	100	>100	---	1	0.1559	15.99%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Dilution Water		32	8	27	16	1	CDF	0.8003	Non-Significant Effect
		42	8	21.5	16	2	CDF	0.3036	Non-Significant Effect
		56	8	22	16	2	CDF	0.3476	Non-Significant Effect
		80	8	17.5	16	1	CDF	0.0695	Non-Significant Effect
		100	8	22	16	2	CDF	0.3476	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	0.975	0.8	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.110643	0.0221286	5	0.9765	0.4521	Non-Significant Effect
Error	0.543854	0.0226606	24			
Total	0.654498		29			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test	0.9142	0.9031	0.0190	Normal Distribution

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	5	0.9750	0.9056	1.0000	1.0000	0.8750	1.0000	0.0250	5.73%	0.00%
32		5	0.9500	0.8112	1.0000	1.0000	0.7500	1.0000	0.0500	11.77%	2.56%
42		5	0.8500	0.6476	1.0000	0.8750	0.6250	1.0000	0.0729	19.17%	12.82%
56		5	0.9000	0.7701	1.0000	0.8750	0.7500	1.0000	0.0468	11.62%	7.69%
80		5	0.8750	0.8750	0.8750	0.8750	0.8750	0.8750	0.0000	0.00%	10.26%
100		5	0.8750	0.6849	1.0000	0.8750	0.6250	1.0000	0.0685	17.50%	10.26%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	5	1.3560	1.2540	1.4580	1.3930	1.2090	1.3930	0.0367	6.06%	0.00%
32		5	1.3240	1.1320	1.5160	1.3930	1.0470	1.3930	0.0692	11.68%	2.39%
42		5	1.1910	0.9270	1.4550	1.2090	0.9117	1.3930	0.0951	17.85%	12.20%
56		5	1.2500	1.0690	1.4320	1.2090	1.0470	1.3930	0.0653	11.68%	7.81%
80		5	1.2090	1.2090	1.2090	1.2090	1.2090	1.2090	0.0000	0.00%	10.83%
100		5	1.2230	0.9788	1.4680	1.2090	0.9117	1.3930	0.0881	16.10%	9.81%

EWB
2/26/24

CETIS Analytical Report

Report Date: 22 Feb-24 14:53 (p 2 of 2)
 Test Code/ID: 2EBDF2B4 / 07-8420-0372

Fathead Minnow 7-d Larval Survival and Growth Test

Bio-Analytical Laboratories

Analysis ID: 14-1336-1168 Endpoint: 7d Survival Rate CETIS Version: CETIS v2.1.5
 Analyzed: 22 Feb-24 14:53 Analysis: Nonparametric-Control vs Treatments Status Level: 1
 Edit Date: 22 Feb-24 14:45 MD5 Hash: 18E3B4E4645B6A90A440F6EE3575015F Editor ID: 008-522-314-5

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	1.0000	1.0000	1.0000	0.8750	1.0000
32		1.0000	1.0000	1.0000	1.0000	0.7500
42		0.8750	0.7500	1.0000	0.6250	1.0000
56		0.8750	0.7500	1.0000	1.0000	0.8750
80		0.8750	0.8750	0.8750	0.8750	0.8750
100		1.0000	0.6250	0.8750	0.8750	1.0000

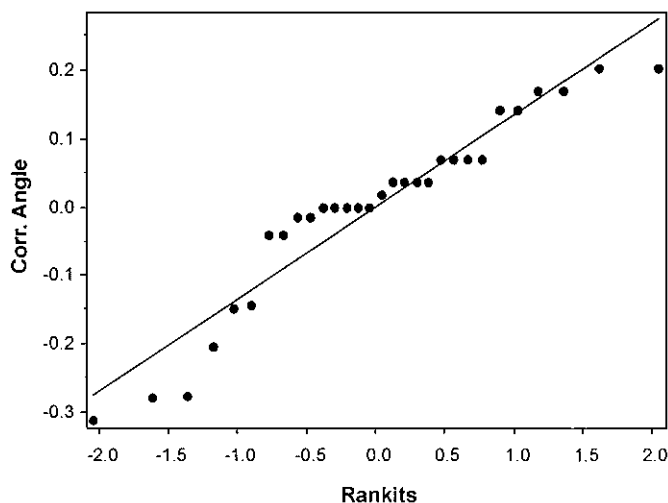
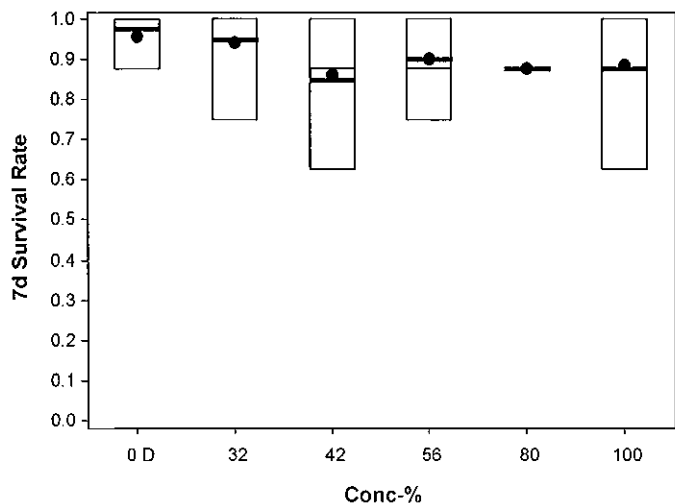
Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	1.3930	1.3930	1.3930	1.2090	1.3930
32		1.3930	1.3930	1.3930	1.3930	1.0470
42		1.2090	1.0470	1.3930	0.9117	1.3930
56		1.2090	1.0470	1.3930	1.3930	1.2090
80		1.2090	1.2090	1.2090	1.2090	1.2090
100		1.3930	0.9117	1.2090	1.2090	1.3930

7d Survival Rate Binomials

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

Graphics



EUB
2/26/24

CETIS Analytical Report

Report Date: 22 Feb-24 14:54 (p 1 of 2)
Test Code/ID: 2EBDF2B4 / 07-8420-0372

Fathead Minnow 7-d Larval Survival and Growth Test

Bio-Analytical Laboratories

Analysis ID: 12-8915-0968	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETIS v2.1.5
Analyzed: 22 Feb-24 14:53	Analysis: Parametric-Control vs Treatments	Status Level: 1
Edit Date: 22 Feb-24 14:45	MD5 Hash: 46EBD5424EBDB7B435A36D78E0B4514D	Editor ID: 008-522-314-5
Batch ID: 09-8016-1540	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 06 Feb-24 18:50	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Ending Date: 13 Feb-24 17:45	Species: Pimephales promelas	Brine:
Test Length: 6d 23h	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <48
Sample ID: 00-4587-0329	Code: X9083	Project: WET Quarterly Compliance Test (1Q)
Sample Date: 05 Feb-24 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 05 Feb-24 11:18	CAS (PC):	Station: 001
Sample Age: 35h (3.4 °C)	Client: Magnolia Wastewater System	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	0.1161	22.87%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Dilution Water		32	8	0.9664	2.362	0.1161	CDF	0.4349	Non-Significant Effect
		42	8	1.119	2.362	0.1161	CDF	0.3680	Non-Significant Effect
		56	8	-0.5087	2.362	0.1161	CDF	0.9413	Non-Significant Effect
		80	8	1.221	2.362	0.1161	CDF	0.3259	Non-Significant Effect
		100	8	1.729	2.362	0.1161	CDF	0.1576	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits			Decision
		Lower	Upper	Overlap	
Control Resp	0.5075	0.25	>>	Yes	Passes Criteria
PMSD	0.2287	0.12	0.3	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0424024	0.0084805	5	1.404	0.2583	Non-Significant Effect
Error	0.144942	0.0060392	24			
Total	0.187344		29			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	7.094	15.09	0.2137	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9721	0.9031	0.5994	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	5	0.5075	0.3821	0.6329	0.475	0.3875	0.65	0.04517	19.90%	0.00%
32		5	0.46	0.3813	0.5387	0.475	0.3875	0.55	0.02834	13.78%	9.36%
42		5	0.4525	0.3007	0.6043	0.4375	0.3	0.6375	0.05469	27.02%	10.84%
56		5	0.5325	0.4643	0.6007	0.5125	0.475	0.6125	0.02456	10.31%	-4.93%
80		5	0.4475	0.3841	0.5109	0.475	0.375	0.4875	0.02284	11.41%	11.82%
100		5	0.4225	0.3754	0.4696	0.425	0.375	0.475	0.01696	8.97%	16.75%

Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	0.475	0.3875	0.5625	0.4625	0.65
32		0.475	0.3875	0.55	0.475	0.4125
42		0.4375	0.4125	0.475	0.3	0.6375
56		0.5125	0.5	0.6125	0.5625	0.475
80		0.475	0.4125	0.375	0.4875	0.4875
100		0.425	0.375	0.4	0.4375	0.475

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2/26/24

CETIS Analytical Report

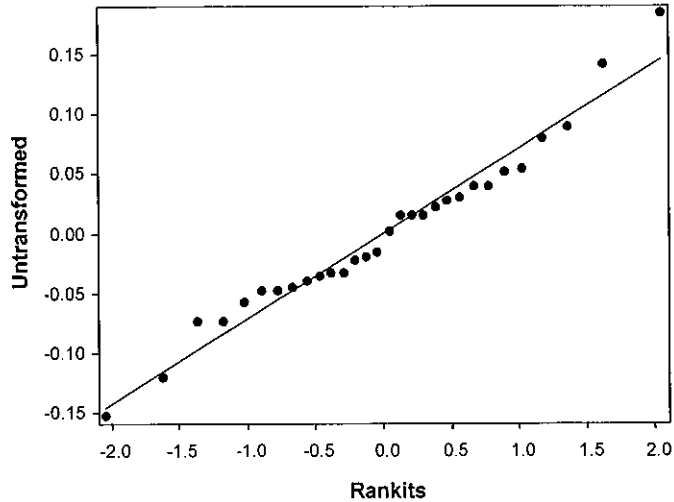
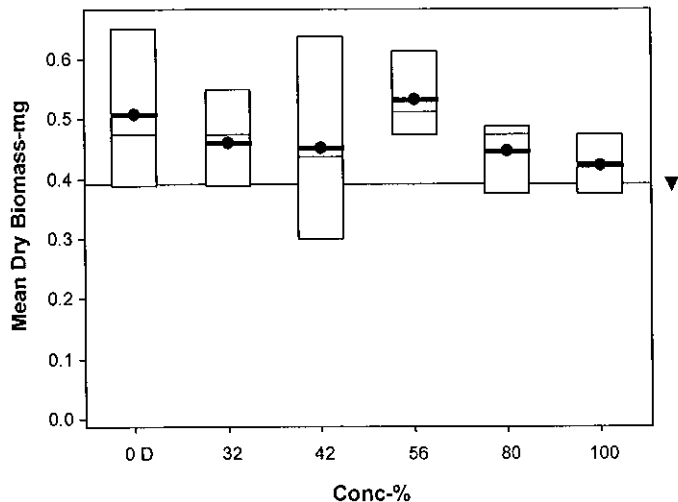
Report Date: 22 Feb-24 14:54 (p 2 of 2)
Test Code/ID: 2EBDF2B4 / 07-8420-0372

Fathead Minnow 7-d Larval Survival and Growth Test

Bio-Analytical Laboratories

Analysis ID: 12-8915-0968	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETIS v2.1.5
Analyzed: 22 Feb-24 14:53	Analysis: Parametric-Control vs Treatments	Status Level: 1
Edit Date: 22 Feb-24 14:45	MD5 Hash: 46EBD5424EBDB7B435A36D78E0B4514D	Editor ID: 008-522-314-5

Graphics



EB
2/24/24

CETIS Analytical Report

Report Date: 22 Feb-24 14:54 (p 1 of 2)
Test Code/ID: 2EBDF2B4 / 07-8420-0372

Fathead Minnow 7-d Larval Survival and Growth Test

Bio-Analytical Laboratories

Analysis ID: 05-7049-0498	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETIS v2.1.5
Analyzed: 22 Feb-24 14:54	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 22 Feb-24 14:45	MD5 Hash: 46EBD5424EBDB7B435A36D78E0B4514D	Editor ID: 008-522-314-5
Batch ID: 09-8016-1540	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 06 Feb-24 18:50	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Ending Date: 13 Feb-24 17:45	Species: Pimephales promelas	Brine:
Test Length: 6d 23h	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <48
Sample ID: 00-4587-0329	Code: X9083	Project: WET Quarterly Compliance Test (1Q)
Sample Date: 05 Feb-24 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 05 Feb-24 11:18	CAS (PC):	Station: 001
Sample Age: 35h (3.4 °C)	Client: Magnolia Wastewater System	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	2058522	1000	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	0.5075	0.25	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
IC15	92.9	---	---	1.1	---	---
IC20	>100	---	---	<1	---	---
IC25	>100	---	---	<1	---	---
IC40	>100	---	---	<1	---	---
IC50	>100	---	---	<1	---	---

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Calculated Variate						Isotonic Variate	
			Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	D	5	0.5075	0.475	0.3875	0.65	19.90%	0.00%	0.5075	0.00%
32		5	0.46	0.475	0.3875	0.55	13.78%	9.36%	0.4817	5.09%
42		5	0.4525	0.4375	0.3	0.6375	27.02%	10.84%	0.4817	5.09%
56		5	0.5325	0.5125	0.475	0.6125	10.31%	-4.93%	0.4817	5.09%
80		5	0.4475	0.475	0.375	0.4875	11.41%	11.82%	0.4475	11.82%
100		5	0.4225	0.425	0.375	0.475	8.97%	16.75%	0.4225	16.75%

Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	0.475	0.3875	0.5625	0.4625	0.65
32		0.475	0.3875	0.55	0.475	0.4125
42		0.4375	0.4125	0.475	0.3	0.6375
56		0.5125	0.5	0.6125	0.5625	0.475
80		0.475	0.4125	0.375	0.4875	0.4875
100		0.425	0.375	0.4	0.4375	0.475

EUB
2/24/24

CETIS Analytical Report

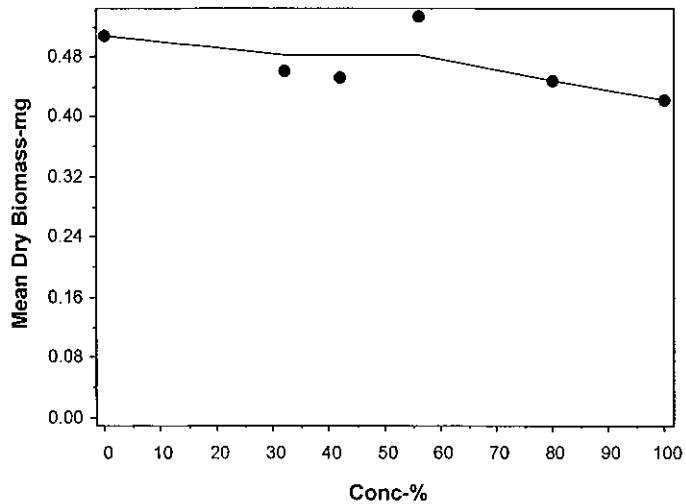
Report Date: 22 Feb-24 14:54 (p 2 of 2)
Test Code/ID: 2EBDF2B4 / 07-8420-0372

Fathead Minnow 7-d Larval Survival and Growth Test

Bio-Analytical Laboratories

Analysis ID: 05-7049-0498	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETIS v2.1.5
Analyzed: 22 Feb-24 14:54	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 22 Feb-24 14:45	MD5 Hash: 46EBD5424EBDB7B435A36D78E0B4514D	Editor ID: 008-522-314-5

Graphics



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2/24/24

CETIS Analytical Report

Report Date: 22 Feb-24 14:55 (p 1 of 2)
Test Code/ID: 2EBDF2B4 / 07-8420-0372

Fathead Minnow 7-d Larval Survival and Growth Test

Bio-Analytical Laboratories

Analysis ID: 12-4969-8563 Endpoint: 7d Survival Rate CETIS Version: CETIS v2.1.5
Analyzed: 22 Feb-24 14:54 Analysis: Parametric-Control vs Treatments Status Level: 1
Edit Date: 22 Feb-24 14:45 MD5 Hash: 8DE6748359F3517E364AC19FB51DB1B8 Editor ID: 008-522-314-5

Batch ID: 09-8016-1540 Test Type: Growth-Survival (7d) Analyst:
Start Date: 06 Feb-24 18:50 Protocol: EPA/821/R-02-013 (2002) Diluent: Reconstituted Water
Ending Date: 13 Feb-24 17:45 Species: Pimephales promelas Brine:
Test Length: 6d 23h Taxon: Actinopterygii Source: Aquatic Biosystems, CO Age: <48

Sample ID: 00-4587-0329 Code: X9083 Project: WET Quarterly Compliance Test (1Q)
Sample Date: 05 Feb-24 08:00 Material: POTW Effluent Source: AR0043613
Receipt Date: 05 Feb-24 11:18 CAS (PC): Station: 001
Sample Age: 35h (3.4 °C) Client: Magnolia Wastewater System

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	101	>101	---	1	0.1548	15.88%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Dilution Water		100	8	1.254	2.108	0.2235	CDF	0.1911	Non-Significant Effect
		101	8	1.254	2.108	0.2235	CDF	0.1911	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	0.975	0.8	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.058964	0.029482	2	1.049	0.3803	Non-Significant Effect
Error	0.337204	0.0281003	12			
Total	0.396168		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	2.818	9.21	0.2444	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8458	0.8328	0.0151	Normal Distribution

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	5	0.9750	0.9056	1.0000	1.0000	0.8750	1.0000	0.0250	5.73%	0.00%
100		5	0.8750	0.6849	1.0000	0.8750	0.6250	1.0000	0.0685	17.50%	10.26%
101		5	0.8750	0.6849	1.0000	0.8750	0.6250	1.0000	0.0685	17.50%	10.26%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	5	1.3560	1.2540	1.4580	1.3930	1.2090	1.3930	0.0367	6.06%	0.00%
100		5	1.2230	0.9788	1.4680	1.2090	0.9117	1.3930	0.0881	16.10%	9.81%
101		5	1.2230	0.9788	1.4680	1.2090	0.9117	1.3930	0.0881	16.10%	9.81%

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	1.0000	1.0000	1.0000	0.8750	1.0000
100		1.0000	0.6250	0.8750	0.8750	1.0000
101		0.6250	0.8750	0.8750	1.0000	1.0000

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2/26/24

CETIS Analytical Report

Report Date: 22 Feb-24 14:55 (p 1 of 2)
Test Code/ID: 2EBDF2B4 / 07-8420-0372

Fathead Minnow 7-d Larval Survival and Growth Test			Bio-Analytical Laboratories		
Analysis ID: 06-5996-2013	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETIS v2.1.5	Batch ID: 09-8016-1540	Test Type: Growth-Survival (7d)	Analyst:
Analyzed: 22 Feb-24 14:55	Analysis: Parametric-Control vs Treatments	Status Level: 1	Start Date: 06 Feb-24 18:50	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Edit Date: 22 Feb-24 14:45	MD5 Hash: E8AB66F6BED5BA4A704C4427C9C7BD1	Editor ID: 008-522-314-5	Ending Date: 13 Feb-24 17:45	Species: Pimephales promelas	Brine:
			Test Length: 6d 23h	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <48
Sample ID: 00-4587-0329	Code: X9083	Project: WET Quarterly Compliance Test (1Q)	Sample Date: 05 Feb-24 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 05 Feb-24 11:18	CAS (PC):	Station: 001	Sample Age: 35h (3.4 °C)	Client: Magnolia Wastewater System	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	101	>101	---	1	0.131	25.81%

Dunnnett Multiple Comparison Test									
Control	vs	Conc-%	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Dilution Water		100	8	1.368	2.108	0.131	CDF	0.1627	Non-Significant Effect
		101	8	1.006	2.108	0.131	CDF	0.2650	Non-Significant Effect

Test Acceptability Criteria					
Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	0.5075	0.25	>>	Yes	Passes Criteria
PMSD	0.2581	0.12	0.3	Yes	Passes Criteria

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0193958	0.0096979	2	1.005	0.3949	Non-Significant Effect
Error	0.115813	0.0096511	12			
Total	0.135209		14			

ANOVA Assumptions Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variance	Bartlett Equality of Variance Test	4.551	9.21	0.1027	Equal Variances	
Distribution	Shapiro-Wilk W Normality Test	0.9753	0.8328	0.9270	Normal Distribution	

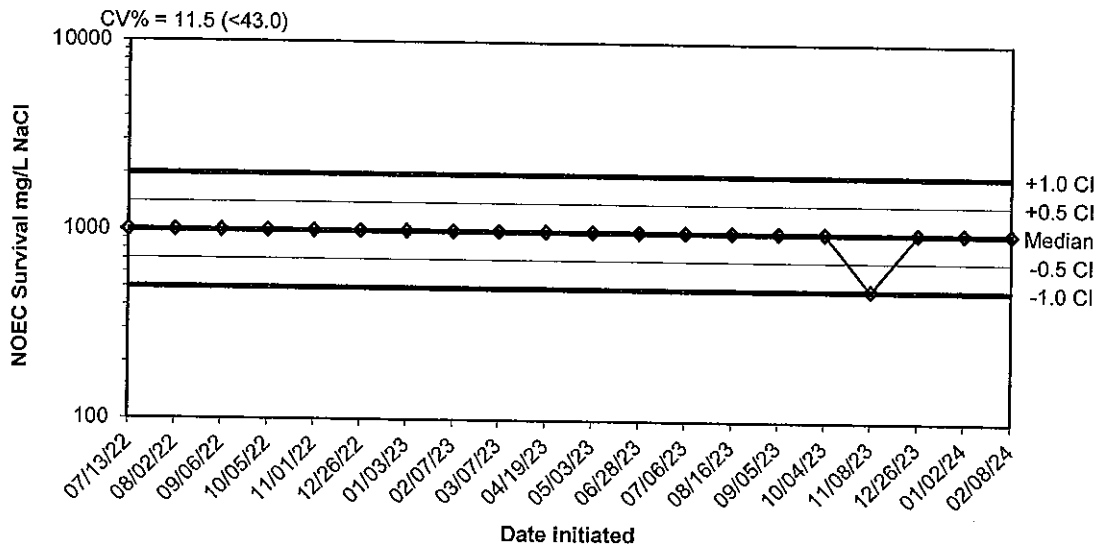
Mean Dry Biomass-mg Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	5	0.5075	0.3821	0.6329	0.475	0.3875	0.65	0.04517	19.90%	0.00%
100		5	0.4225	0.3754	0.4696	0.425	0.375	0.475	0.01696	8.97%	16.75%
101		5	0.445	0.2816	0.6084	0.45	0.275	0.625	0.05884	29.57%	12.31%

Mean Dry Biomass-mg Detail							
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	D	0.475	0.3875	0.5625	0.4625	0.65	
100		0.425	0.375	0.4	0.4375	0.475	
101		0.275	0.45	0.375	0.5	0.625	

Handwritten signature and date: 2/26/24

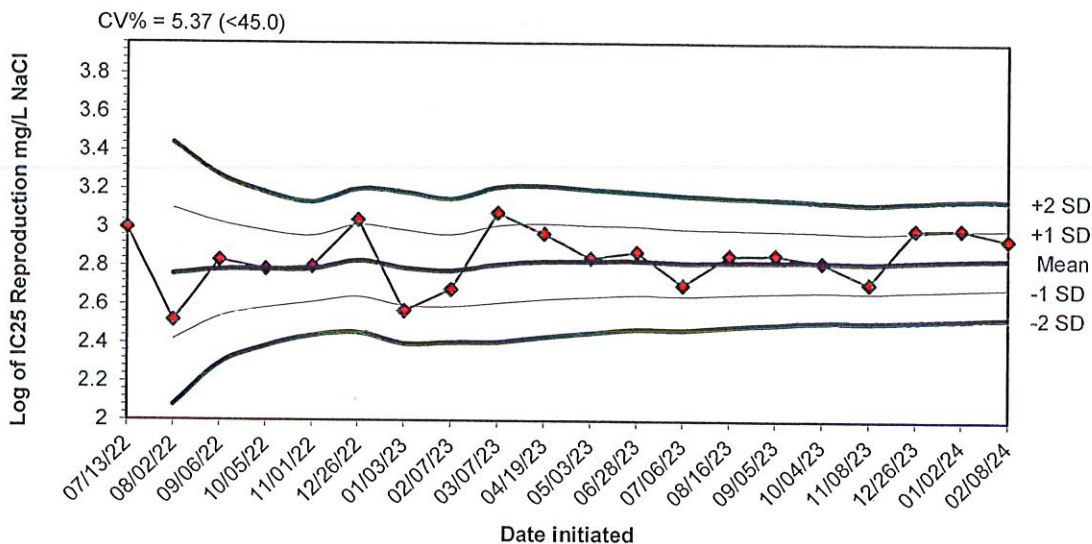
APPENDIX D
QUALITY ASSURANCE CHARTS

CHRONIC REFERENCE TOXICANT TEST RESULTS FOR CERIODAPHNIA DUBIA IN SOFT WATER



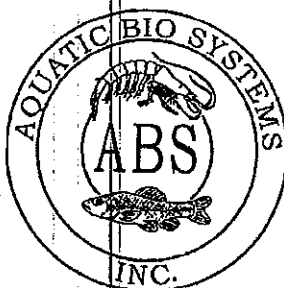
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08/02/22	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
09/06/22	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
10/05/22	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
11/01/22	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
12/26/22	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
01/03/23	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
02/07/23	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
03/07/23	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
04/19/23	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
05/03/23	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
06/28/23	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
07/06/23	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
08/16/23	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
09/05/23	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
10/04/23	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
11/08/23	500.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
12/26/23	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
01/02/24	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
02/08/24	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000

CHRONIC REFERENCE TOXICANT TEST RESULTS FOR CERIODAPHNIA DUBIA IN SOFT WATER



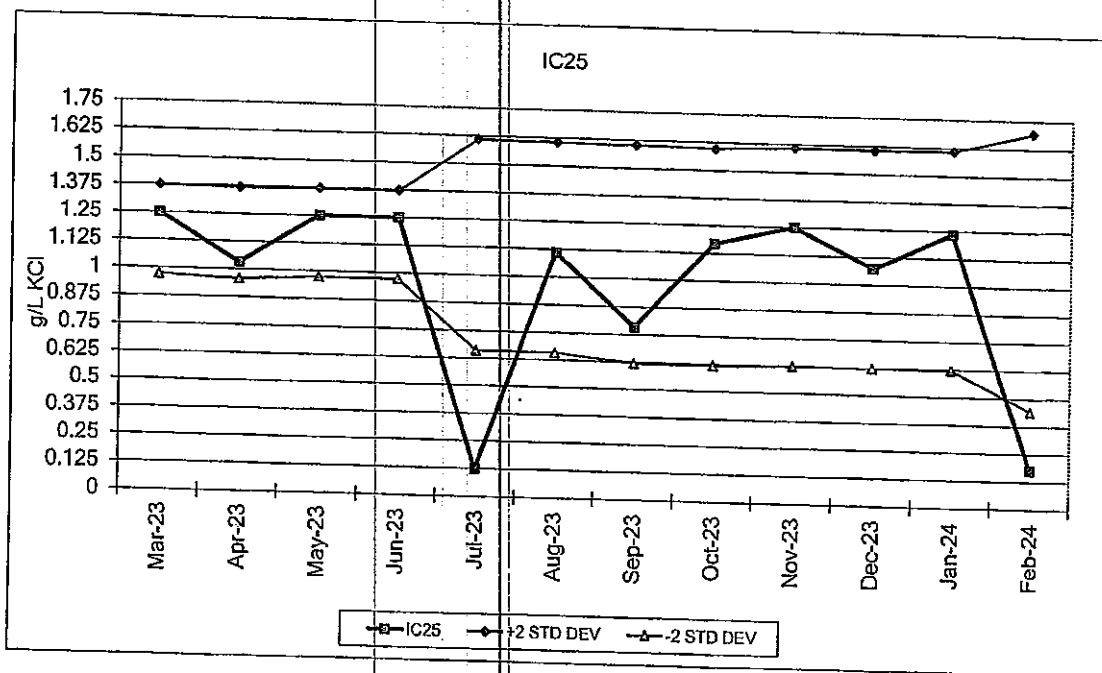
Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
07/13/22	3.0000					
08/02/22	2.5185	2.7593	2.4188	2.0783	3.0997	3.4402
09/06/22	2.8325	2.7837	2.5392	2.2948	3.0281	3.2725
10/05/22	2.7853	2.7841	2.5845	2.3849	2.9837	3.1832
11/01/22	2.7993	2.7871	2.6142	2.4412	2.9601	3.1331
12/26/22	3.0414	2.8295	2.6432	2.4569	3.0158	3.2021
01/03/23	2.5682	2.7922	2.5955	2.3988	2.9889	3.1855
02/07/23	2.6812	2.7783	2.5921	2.4058	2.9646	3.1508
03/07/23	3.0792	2.8117	2.6107	2.4097	3.0128	3.2138
04/19/23	2.9703	2.8276	2.6315	2.4355	3.0236	3.2197
05/03/23	2.8441	2.8291	2.6430	2.4570	3.0152	3.2012
06/28/23	2.8774	2.8331	2.6552	2.4772	3.0111	3.1890
07/06/23	2.7054	2.8233	2.6493	2.4753	2.9973	3.1713
08/16/23	2.8582	2.8258	2.6583	2.4909	2.9932	3.1607
09/05/23	2.8618	2.8282	2.6666	2.5050	2.9898	3.1514
10/04/23	2.8239	2.8279	2.6718	2.5156	2.9841	3.1402
11/08/23	2.7145	2.8213	2.6676	2.5139	2.9749	3.1286
12/26/23	2.9952	2.8309	2.6763	2.5217	2.9855	3.1402
01/02/24	2.9980	2.8397	2.6846	2.5296	2.9948	3.1499
02/08/24	2.9434	2.8449	2.6922	2.5395	2.9976	3.1503

1300 Blue Spruce Drive, Suite C
 Fort Collins, Colorado 80524



Toll Free: 800/331-5916
 Tel:970/484-5091 Fax:970/484-2514

Pimephales promelas



Chronic 7 Day Survival Test Data

Date	NOEC (g/L KCl)	LOEC (g/L KCl)
Sep-23	0.50	1.0
Oct-23	0.50	1.0
Nov-23	0.50	1.0
Dec-23	0.50	1.0
Jan-24	0.50	1.0
Feb-24	0.50	1.0

IC 25 for Growth Test

Date	IC25 g/L KCl	95% Confidence (upper)	95% Confidence (lower)	Avg. IC25 g/L KCl	+2 STD DEV	-2 STD DEV
Sep-23	0.785	0.868	0.709	1.110	1.603	0.618
Oct-23	1.169	1.287	0.796	1.107	1.596	0.617
Nov-23	1.250	1.250	1.142	1.116	1.608	0.624
Dec-23	1.074	1.244	-0.446	1.113	1.605	0.621
Jan-24	1.235	1.259	1.048	1.117	1.611	0.622
Feb-24	0.177	0.288	0.070	1.068	1.694	0.441

**Current Test Dates: 1/30-2/6/2024

Aquatic BioSystems, Inc • Quality Research Organisms

APPENDIX E
AGENCY FORMS

**SUMMARY REPORTING FORMS
 CHRONIC BIOMONITORING
Ceriodaphnia dubia Survival and Reproduction**

Permittee: Magnolia Wastewater System NPDES No.: AR0043613
 AFIN: 14-00059

	Time	Date	To	Time	Date
Composite 1 Collected From:	0800	02/04/24		0800	02/05/24
Composite 2 Collected From:	0800	02/06/24		0800	02/07/24
Composite 3 Collected From:	0800	02/08/24		0800	02/09/24
Test initiated:	1530 am/pm			02/06/24	Date
Test terminated:	1610 am/pm			02/13/24	Date
Dilution water used:	Receiving			X Reconstituted	

PERCENT SURVIVAL

Time of Reading	Percent Effluent					
	0	32.0	42.0	56.0	80.0	100.0
24h	100.0	100.0	100.0	100.0	100.0	100.0
48h	100.0	80.0	80.0	90.0	90.0	100.0
End of test	100.0	80.0	80.0	80.0	80.0	80.0

NUMBER OF YOUNG PRODUCED PER FEMALE @ END OF TEST

Rep	0	32.0	42.0	56.0	80.0	100.0
1	22	D	22	D	D	24
2	22	20	D	24	22	23
3	21	19	21	24	20	D
4	22	23	D	D	21	D
5	20	21	27	26	27	19
6	24	20	27	25	28	28
7	22	22	33	22	25	29
8	20	D	24	29	D	22
9	25	24	23	23	25	21
10	11	24	26	19	23	20
Surv. Mean	20.9	21.6	25.4	24.0	23.9	23.3
Total Mean	20.9	17.3	20.3	19.2	19.1	18.6
CV%*	18.25	8.89	15.03	12.20	11.94	15.55

*coefficient of variation = standard deviation x 100/mean. D=dead adult

PMSD = 46.87%

Ceriodaphnia dubia
Survival and Reproduction (continued)

1. Fisher's Exact Test:

Is the mean survival at the end of the test significantly different ($p=.05$) than the control survival for the % effluent corresponding to (lethality):

- | | | | |
|--|-----|---|----|
| a) LOW FLOW OR CRITICAL DILUTION (100%): | YES | X | NO |
| b) 1/2 LOW FLOW DILUTION (NA%): | YES | | NO |

2. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate:

Is the mean number of young produced per female significantly different ($p=.05$) than the control's number of young per female for the % effluent corresponding to (significant non-lethal effects):

- | | | | |
|--|-----|---|----|
| a) LOW FLOW OR CRITICAL DILUTION (100%): | YES | X | NO |
| b) 1/2 LOW FLOW DILUTION (NA%): | YES | | NO |

3. If you answered NO to 1. a) and 2. a) enter (0) otherwise enter (1): 0
4. If you answered NO to 1. b) and 2. b) enter (0) otherwise enter (1):
5. Enter response to item 3 on DMR Form, parameter #TEP3B.
6. Enter response to item 4 on DMR Form, parameter #TFP3B.
7. Enter percent effluent corresponding to each NOEC below and circle lowest number:
 - a) NOEC survival: 100.0 % effluent
 - b) NOEC reproduction: 100.0 % effluent

Biomonitoring Form
Chronic Toxicity Summary Form for *Ceriodaphnia dubia*
Chemical Parameters Chart

Permittee: Magnolia Wastewater System
 NPDES#: AR0043613/AFIN 14-00059
 Contact: Russell Thomas
 Analysts: Ware, Miller, Valle

Sample #1 Collected: Date: 2/5/2024 Time: 800
 Sample #2 Collected: Date: 2/7/2024 Time: 800
 Sample #3 Collected: Date: 2/9/2024 Time: 800
 Test Begin: Date: 2/6/2024 Time: 1530
 Test End: Date: 2/13/2024 Time: 1610

Dilution:	0%							Dilution:	56.0%						
Day:	1	2	3	4	5	6	7	Day:	1	2	3	4	5	6	7
T (°C)	24.4	25.9	25.9	25.7	24.9	25.9	25.7	T (°C)	24.4	25.9	25.9	25.7	24.9	25.9	25.7
DO Initial	7.6	8.0	8.2	8.0	8.1	8.2	8.0	DO Initial	7.4	8.3	8.1	8.0	8.1	7.8	7.6
DO Final	7.5	7.7	7.6	7.5	7.4	7.4	7.4	DO Final	7.5	7.9	8.0	8.1	8.0	8.2	7.5
pH Initial	7.4	6.9	6.9	7.1	6.9	6.9	7.2	pH Initial	7.3	7.2	7.1	7.0	7.2	7.1	7.4
pH Final	7.3	7.3	7.4	6.8	7.1	7.2	7.2	pH Final	7.2	7.7	7.7	6.8	7.0	7.1	7.1
Conductivity	170.0	175.0	174.0	174.0	176.0	178.0		Conductivity	188.0	233.0	235.0	240.0	241.0	243.0	
Alkalinity	32.0							Alkalinity							
Hardness	56.0							Hardness							
Chlorine	<0.5							Chlorine							
Dilution:	32.0%							Dilution:	80.0%						
Day:	1	2	3	4	5	6	7	Day:	1	2	3	4	5	6	7
T (°C)	24.4	25.9	25.9	25.7	24.9	25.9	25.7	T (°C)	24.4	25.9	25.9	25.7	24.9	25.9	25.7
DO Initial	7.4	8.2	8.2	8.1	8.1	8.1	7.4	DO Initial	7.5	8.4	8.2	8.2	8.2	8.0	7.4
DO Final	7.4	7.7	7.7	8.1	7.9	8.0	7.3	DO Final	7.2	7.9	7.9	8.4	8.4	8.4	
pH Initial	7.2	7.0	6.9	7.0	7.0	6.9	7.3	pH Initial	7.4	7.2	7.1	7.2	7.4	7.1	7.2
pH Final	7.2	7.4	7.3	6.8	7.0	7.1	7.1	pH Final	7.2	7.2	7.5	6.9	7.0	7.2	
Conductivity	181.0	198.0	198.0	201.0	198.0	199.0		Conductivity	195.0	250.0	232.0	236.0	236.0	238.0	
Alkalinity								Alkalinity							
Hardness								Hardness							
Chlorine								Chlorine							
Dilution:	42.0%							Dilution:	100.0%						
Day:	1	2	3	4	5	6	7	Day:	1	2	3	4	5	6	7
T (°C)	24.4	25.9	25.9	25.7	24.9	25.9	25.7	T (°C)	24.4	25.9	25.9	25.7	24.9	25.9	25.7
DO Initial	7.4	8.3	8.3	8.1	8.1	8.2	7.4	DO Initial	7.4	8.4	8.1	8.0	8.4	8.1	7.4
DO Final	7.6	7.7	7.8	8.5	8.6	8.3	7.4	DO Final	7.9	8.3	8.4	8.9	9.0	9.1	7.4
pH Initial	7.3	7.0	6.9	7.0	7.1	6.9	7.2	pH Initial	7.5	7.3	7.2	7.3	7.4	7.2	7.5
pH Final	7.2	7.4	7.3	6.8	7.1	7.0	7.2	pH Final	7.2	7.1	7.4	6.9	7.2	7.1	7.1
Conductivity	185.0	220.0	208.0	222.0	231.0	228.0		Conductivity	216.0	265.0	268.0	269.0	270.0	268.0	
Alkalinity								Alkalinity	32.0	28.0		44.0			
Hardness								Hardness	24.0	28.0		28.0			
Chlorine								Chlorine	<0.5	<0.5		<0.5			

Comments:

**SUMMARY REPORTING FORMS CHRONIC BIOMONITORING
 FATHEAD MINNOW LARVAE GROWTH AND SURVIVAL
 (*Pimephales promelas*)**

Permittee: Magnolia Wastewater System

NPDES No.: AR0043613

AFIN: 14-00059

	Time	Date		Time	Date
Composite 1 Collected from:	0800	02/04/24	To	0800	02/05/24
Composite 2 Collected from:	0800	02/06/24	To	0800	02/07/24
Composite 3 Collected from:	0800	02/08/24	To	0800	02/09/24

Test initiated:	1850	am/pm		02/06/24	Date
Test terminated:	1745	am/pm		02/13/24	Date
Dilution water used:		Receiving	X	Reconstituted	

DATA TABLE FOR SURVIVAL

Effluent Conc. %	Percent Survival in Replicate Chambers					Mean Percent Survival			CV%*
	A	B	C	D	E	24h	48h	7 days	
0	100.0	100.0	100.0	87.5	100.0	100.0	97.5	97.5	6.06
32.0	100.0	100.0	100.0	100.0	75.0	100.0	100.0	95.0	11.68
42.0	87.5	75.0	100.0	62.5	100.0	100.0	100.0	85.0	17.85
56.0	87.5	75.0	100.0	100.0	87.5	100.0	97.5	90.0	11.68
80.0	87.5	87.5	87.5	87.5	87.5	100.0	100.0	87.5	0.00
100.0	100.0	62.5	87.5	87.5	100.0	100.0	100.0	87.5	16.10

DATA TABLE FOR GROWTH

Effluent Conc. %	Average Dry Weight in milligrams in replicate chambers					Mean Dry Weight mg	CV*
	A	B	C	D	E		
0	0.475	0.388	0.563	0.463	0.650	0.508	19.90
32.0	0.475	0.388	0.550	0.475	0.413	0.460	13.78
42.0	0.438	0.413	0.475	0.300	0.638	0.453	27.02
56.0	0.513	0.500	0.613	0.563	0.475	0.533	10.31
80.0	0.475	0.413	0.375	0.488	0.488	0.448	11.41
100.0	0.425	0.375	0.400	0.438	0.475	0.423	8.97

*coefficient of variation = standard deviation x 100/mean.

PMSD = 22.87%

FATHEAD MINNOW LARVAE GROWTH AND SURVIVAL (cont)
(Pimephales promelas)

1. Dunnett's Procedure or Steels Many-One Rank Test as appropriate:

Is the mean survival at 7 days significantly different ($p=.05$) than the control survival for the % effluent corresponding to:

- | | | | |
|---|-----|---|----|
| a) LOW FLOW OR CRITICAL DILUTION (100.0%) | YES | X | NO |
| b) ½ LOW FLOW DILUTION (NA%) | YES | | NO |

2. Dunnett's Procedure (or appropriate test):

Is the mean dry weight (growth) at 7 days significantly different ($p=.05$) than the control's dry weight for the % effluent corresponding to (significant non-lethal effects):

- | | | | |
|---|-----|---|----|
| a) LOW FLOW OR CRITICAL DILUTION (100.0%) | YES | X | NO |
| b) ½ LOW FLOW DILUTION (NA%) | YES | | NO |

3. If you answered NO to 1. a) and 2. a) enter (0) otherwise enter (1): 0

4. If you answered NO to 1. b) and 2. b) enter (0) otherwise enter (1):

5. Enter response to item 3 on DMR Form, parameter #TEP6C.

6. Enter response to item 4 on DMR Form, parameter #TFP6C.

7. Enter percent effluent corresponding to each NOEC below and circle lowest number:

- | | |
|-------------------|-----------------|
| a.) NOEC survival | 100.0% effluent |
| b.) NOEC growth | 100.0% effluent |

Biomonitoring Form
Chronic Toxicity Summary Form for *Pimephales promelas*
Chemical Parameters Chart

Permittee: Magnolia Wastewater System
NPDES#: AR0043613/AFIN 14-00059
Contact: Tracie Love
Analysts: Ware, Miller, Valle

Sample #1 Collected: 2/5/2024 Time: 800
Sample #2 Collected: 2/7/2024 Time: 800
Sample #3 Collected: 2/9/2024 Time: 800
Test Begin: 2/6/2024 Time: 1850
Test End: 2/13/2024 Time: 1745

Dilution:	0%							56.0%						
Day:	1	2	3	4	5	6	7	1	2	3	4	5	6	7
T (°C)	24.7	24.7	24.8	24.9	24.6	24.8	24.8	24.7	24.7	24.8	24.9	24.6	24.8	24.8
DO Initial	7.6	7.4	6.6	6.8	7.0	6.1	6.0	7.4	7.4	6.4	6.7	6.9	6.4	6.7
DO Final	7.5	7.7	7.2	7.5	7.6	8.0		7.6	7.8	8.5	8.5	8.5	8.6	
pH Initial	7.4	7.2	6.7	6.9	6.9	6.7	6.8	7.2	7.3	6.6	6.8	7.1	6.6	6.8
pH Final	7.0	7.4	7.9	6.7	7.0	7.5		7.4	7.2	7.4	6.6	6.9	7.5	
Conductivity	172.0	175.0	175.0	176.0	178.0	183.0		190.0	234.0	239.0	238.0	241.0	246.0	
Alkalinity	36.0													
Hardness	52.0													
Chlorine	<0.5													
Dilution:	32.0%							80.0%						
Day:	1	2	3	4	5	6	7	1	2	3	4	5	6	7
T (°C)	24.7	24.7	24.8	24.9	24.6	24.8	24.8	24.7	24.7	24.8	24.9	24.6	24.8	24.8
DO Initial	7.4	7.5	6.5	6.7	7.5	6.2	6.5	7.4	7.5	6.3	6.5	6.8	6.3	6.1
DO Final	7.4	7.7	8.4	8.2	8.3	8.2		7.7	8.2	8.7	8.9	9.0	9.0	
pH Initial	7.2	7.4	6.6	6.9	6.4	6.6	6.8	7.2	7.3	6.6	6.8	6.9	6.6	6.8
pH Final	7.2	7.1	7.6	6.7	6.8	7.5		7.4	7.1	7.3	6.7	7.1	7.4	
Conductivity	183.0	215.0	222.0	218.0	222.0	221.0		198.0	252.0	254.0	245.0	251.0	271.0	
Alkalinity														
Hardness														
Chlorine														
Dilution:	42.0%							100.0%						
Day:	1	2	3	4	5	6	7	1	2	3	4	5	6	7
T (°C)	24.7	24.7	24.8	24.9	24.6	24.8	24.8	24.7	24.7	24.8	24.9	24.6	24.8	24.8
DO Initial	7.4	7.5	6.6	6.8	7.6	6.7	6.1	7.1	7.2	6.3	6.5	7.6	6.2	5.8
DO Final	7.5	7.7	8.2	8.6	8.4	8.4		8.1	8.4	8.9	9.1	9.0	9.3	
pH Initial	7.2	7.4	6.6	6.6	6.9	6.6	6.8	7.2	7.3	6.6	6.7	6.5	6.6	6.8
pH Final	7.1	7.2	7.5	6.6	7.1	7.4		7.0	7.0	7.1	6.6	7.0	7.2	
Conductivity	187.0	222.0	220.0	232.0	236.0	232.0		218.0	268.0	265.0	272.0	278.0	282.0	
Alkalinity								32.0	28.0		44.0			
Hardness								24.0	28.0		28.0			
Chlorine								<0.5	<0.5		<0.5			

Comments:

APPENDIX F
REPORT QUALITY ASSURANCE FORM



Bio-Analytical Laboratories

3240 Spurgin Road
Post Office Box 527
Doyline, LA 71023

(318) 745-2772
1-800-259-1246
Fax: (318) 745-2773

REPORT QUALITY ASSURANCE FORM

Client: City of Magnolia

Project#: X9083

Chain of Custody Documents Checked by: EOB 2/19/24
Technician/Date

Raw Data Documents Checked by: EOB 2/26/24
Technician/Date

Statistical Analysis Package Checked by: EOB 2/26/24
Quality Manager/Date

Quality Control Data Checked by: EOB 3/5/24
Quality Manager/Date

Report Checked by: EOB 3/5/24
Quality Manager/Date

I certify that this document was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. The information contained in this document, to the best of my knowledge, is true, accurate and complete.

Quinn L. Bragg, BS
Quality Manager

3/5/24
Date

No part of this work may be altered in any form or by any means without written permission from Bio-Analytical Laboratories.

