

Bio-Analytical Laboratories' Executive Summary

Permittee: Magnolia Wastewater System
Columbia Road
Magnolia, AR

Project #: X8990

Outfall: 001 (treated domestic wastewater)

Permit #: AR0043613/ AFIN 14-00059

Contact: Tracie Love

Test Dates: October 24 – November 1, 2023

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 – 25.57%.
6. PMSD Reproduction =29.90%(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 - 80.0%
5. Report the largest % coefficient of variation between the control and the critical dilution, Parameter TQP6C –24.20%.
6. PMSD Biomass =20.73% (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 (2009) 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 X8990

Test Dates: October 24 – November 1, 2023

Report Date: November 27, 2023

Prepared for:

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P.O. Box 666
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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 October 23, 25, 27 and 30, 2023, 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 2.3, 2.8, 1.2 and 4.5⁰ 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 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 20.7 and 21.6, 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, 90.0 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 0.485 and 0.393 milligram (mg), respectively. The NOEC for survival and growth in this test was 100.0 and 80.0 percent effluent, respectively (p=.05). The significant difference noted in the 42.0 percent test concentration was determined to be a Type I error and not an indication of a true dose response. Treating the effluent with ultraviolet light did not reduce the sublethal effect in the 100.0 percent test concentration.

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		20.7	20.7	
32.0	90.0		21.1	19.0	
42.0	100.0		21.9	21.9	
56.0	100.0		26.1	26.1	
80.0	90.0		24.0	21.6	
100.0	100.0		26.1	26.1	

*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	90.0		0.485	
32.0	92.5		0.478	
42.0	92.5		0.358	*
56.0	92.0		0.405	
80.0	100.0		0.393	
100.0	87.5		0.303	*
100.0 UV	90.0		0.288	*

*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 test organisms were within the acceptable sensitivity levels. 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 October 23, 25 and 27, 2023, were not found to be lethally toxic to the *Pimephales promelas* test organisms in the 100.0 percent critical dilution after seven days of exposure (p=.05). The three composite samples collected on October 25, 27 and 30, 2023, were not found to be lethally toxic to the *Ceriodaphnia dubia* test organism in the 100.0 percent critical dilution after seven days of exposure (p=.05). Sub-lethal effects (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



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

Laboratory Use Only:

Company: City of Magnolia		Phone: (870) 234-2955		Project Number: X8990	
Address: P.O. Box 666, Magnolia, AR 71753		Fax: (870) 234-2203		Temp. upon arrival: 2.30C Therm #: 29	
Permit #: AR0043613/AFIN 14-00059		Purchase Order:		Color: Green tint Odor: none Tech: EEB	
Sampler's Signature/Printed Name/Affiliation: <i>John Love Trace Love / MWWS</i>		Lab Control Number: EEB 10/23 035790 035789		Preservative: (below) ICE	
Date Start Date End	Time Start Time End	C	G	# and type of container	Sample Identification
10/22/23 - 10/23/23	800 - 800	X		8 half gallons	001
Relinquished by/Affiliation: <i>John Love / MWWS</i>		Received by/Affiliation: <i>Gene Lee</i>		Date: 10/23/23	Date: 10/23/23
Relinquished by/Affiliation: <i>Gene Lee</i>		Received by/Affiliation: <i>Gene Lee</i>		Time: 8:49A	Time: 8:49A
Relinquished by/Affiliation:		Received by/Affiliation: <i>Gene Lee</i>		Date: 10/23/23	Date: 10/23/23
Relinquished by/Affiliation:		Received by/Affiliation:		Time: 12:27P	Time: 12:27
Relinquished by/Affiliation:		Received by/Affiliation:		Date:	Date:
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					



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Laboratory Use Only:

Company: City of Magnolia		Phone: (870) 234-2955		Project Number: X 8990	
Address: P.O. Box 666, Magnolia, AR 71753		Fax: (870) 234-2203		Temp. upon arrival: 20.1 Therm # 29	
Permit #: AR0043613/AFIN 14-00059		Purchase Order:		Color: clear Odor: none Tech: ESN 10/25/23 Preservative: (below)	
Sampler's Signature/Printed Name/Affiliation: Julie Love / MWWS					
Date Start Date End	Time Start Time End	C	G	# and type of container	Sample Identification
10/24/23 - 10/25/23	9:00 - 8:00	X		8 half gallons	001
Relinquished by/Affiliation: Julie Love / MWWS		Received by/Affiliation: Julie Lee		Date: 10/25/23	Time: 9:15A
Relinquished by/Affiliation: Julie Lee		Received by/Affiliation:		Date: 10/25/23	Time:
Relinquished by/Affiliation:		Received by/Affiliation: Julie Lee		Date: 10/25/23	Time: 1:04p
Method of Shipment: <input checked="" type="checkbox"/> Lab		Client		Date: 10/25/23	Time: 1:304
Comments:		Other		Tracking #	
COC Rev.3.1					



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Laboratory Use Only:


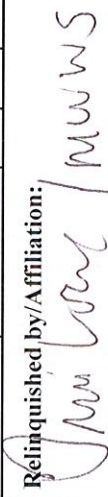


Company: City of Magnolia		Phone: (870) 234-2955		Project Number: X8990	
Address: P.O. Box 666, Magnolia, AR 71753		Fax: (870) 234-2203		Temp. upon arrival: <i>12</i> Therm #: <i>29</i>	
Permit #: AR0043613/AFIN 14-00059		Purchase Order:		Color: <i>clear</i> Odor: <i>none</i>	
Sampler's Signature/Printed Name/Affiliation: <i>Janie Love / Trout Love / MWS</i>		Lab Control Number: ca5827		Tech: <i>SM</i> 10/27/23 Preservative: (below)	
Date Start Date End	Time Start Time End	C	G	# and type of container	Sample Identification
10/26/23 - 10/27/23	800 - 500	X		8 half gallons	001
Relinquished by/Affiliation: <i>Janie Love / MWS</i>		Date: 10/27/23		Time: 8:41A	
Relinquished by/Affiliation: <i>Jewell Lee</i>		Date: 10/27/23		Time: 12:09P	
Relinquished by/Affiliation:		Date:		Time:	
Analysis:		Received by/Affiliation: <i>Jewell Lee</i>		Date: 10/27/23	
Chronic Ceriodaphnia		X		X	
Chronic minnow					
Acute minnow(fresh/marine)					
Acute Daphnia species					
Acute Mysid					
Acute Ceriodaphnia					
Fecal Coliform					
Method of Shipment:		X Lab		Bus	
Comments:		Fed Ex		DHL	
		UPS		Client	
		Other		Tracking #	
COC Rev.3.1					

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: X8990	
Address: P.O. Box 666, Magnolia, AR 71753		Fax: (870) 234-2203		Temp. upon arrival: 4.5°C Therm #: 29	
Permit #: AR0043613/AFIN 14-00059		Purchase Order:		Color: brown tint Odor: none Tech: EBB	
Sampler's Signature/Printed Name/Affiliation: 					
Date Start Date End	Time Start Time End	C	G	# and type of container	Sample Identification
10/29/23 - 10/30/23	800 - 800	X		2 half gallons	001
Relinquished by/Affiliation: 		Date: 10/30/23		Time: 9:10A	
Relinquished by/Affiliation: 		Date: 10/30/23		Time: 11:56A	
Relinquished by/Affiliation:		Date:		Time:	
Analysis:		Received by/Affiliation: 		Date: 10/30/23	
Chronic Ceriodaphnia		Received by/Affiliation:		Date:	
Chronic minnow		Received by/Affiliation:		Date:	
Acute minnow(fresh/marine)		Received by/Affiliation:		Date:	
Acute Daphnia species		Received by/Affiliation:		Date:	
Acute Mysid		Received by/Affiliation:		Date:	
Acute Ceriodaphnia		Received by/Affiliation:		Date:	
Fecal Coliform		Received by/Affiliation:		Date:	
Lab Control Number:		Received by/Affiliation:		Date:	
Preservative: (below)		Received by/Affiliation:		Date:	
ICE		Received by/Affiliation:		Date:	
CAS 835		Received by/Affiliation:		Date:	
Method of Shipment: <input checked="" type="checkbox"/> Lab		Bus		Fed Ex	
Comments:		DHL		UPS	
Client		Other		Tracking #	
COC Rev.3.1					

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST

Project# X8990 Date start: 10/25/23 Date end: 11/1/23

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 10/25/23 Time: 0645

Neonates collected: Date 10/25/23 Time: 1440 Board: X45, mH

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. <u>7.6/91.6%/EON</u>	0. <u>NO/EON</u>	0. <u> </u>	0. <u> </u>
1. <u>8.2/89.9%/PM</u>	1. <u>NO/PM</u>	1. <u> </u>	1. <u> </u>
2. <u>8.4/100.0%/EON</u>	2. <u>NO/EON</u>	2. <u> </u>	2. <u> </u>
3. <u>7.5/94.9%/EON</u>	3. <u>NO/EON</u>	3. <u> </u>	3. <u> </u>
4. <u>7.5/92.3%/EON</u>	4. <u>NO/EON</u>	4. <u> </u>	4. <u> </u>
5. <u>8.4/94.0%/EON</u>	5. <u>NO/EON</u>	5. <u> </u>	5. <u> </u>
6. <u>7.8/92.8%/PM</u>	6. <u>NO/PM</u>	6. <u> </u>	6. <u> </u>
7. <u> </u>	7. <u> </u>	7. <u> </u>	7. <u> </u>

Total Residual Chlorine (mg/L)/Tech

Dechlorinated? Amount?/Tech

Ammonia (NH3) (mg/L)/Tech

BAL Sample # Date in use

1. <u><0.5/EON</u>	1. <u>NO/EON</u>	1. <u>6.0/EON</u>	1. <u>C25813 10/25/23</u>
2. <u><0.5/PM</u>	2. <u>NO/PM</u>	2. <u>6.0/PM</u>	2. <u>C2581 25827 10/28/23</u>
3. <u><0.5/PM</u>	3. <u>NO/PM</u>	3. <u>6.0/PM</u>	3. <u>C25835 10/31/23</u>

Comments:
 OPM 10/26/23

CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST-LIVE NEONATE PRODUCTION- EPA 800/9-0582

Project# X8990 Client Magnolia Sample ID 001
 Test started: Date 10/26/83 Time 1725 Test ended: Date 11/12/83 Time 1630
 Date/Tech: Day0 10/26/83 1 11/2/83 2 11/9/83 3 10/28/83 4 10/29/83 5 10/30/83 6 11/5/83 7 11/12/83 8 11/19/83
 Time: Day0 1725 1 1545 2 1500 3 1340 4 1435 5 1545 6 1600 7 1630 8
 Temp. (°C): Day0 24.1 1 24.4 2 24.0 3 23.6 4 23.8 5 24.0 6 23.9 7 24.5 8

Conc %	Day	1	2	3	4	5	6	7	8	9	10	Number of Live
0	1	0										10
	2	0										10
	3	0										10
	4	1/2	1/3	1/3	0	1/4	0	1/4	0	0	0	10
	5	2/10	2/5	0	1/6	0	1/6	0	1/4	1/3	1/5	10
	6	0	0	2/6	2/6	2/3	2/1	2/3	0	2/6	2/6	10
	7	3/11	3/15	3/16	3/12	2/8	2/3/15	2/4	2/10	3/15	3/15	10
	8											
32.0	1	0										10
	2	0										9
	3	0					X					9
	4	1/4	1/3	1/2	1/3	1/5		1/4	1/3	0	1/3	9
	5	0	0	0	0	0		0	2/6	1/3	0	9
	6	2/7	2/6	2/4	2/6	2/5		2/5	0	0	1/6	9
	7	3/11	3/16	3/12	3/15	3/16		3/15	3/14	2/9	2/7	9
	8											
42.0	1	0										10
	2	0										10
	3	0										10
	4	1/3	1/4	1/2	1/3	0	1/3	1/2	1/2	1/3	1/4	10
	5	0	0	0	0	1/5	0	2/8	0	2/9	0	10
	6	2/6	2/5	2/5	2/6	0	2/6	0	2/3	0	2/4	10
	7	3/16	3/14	3/15	3/16	2/9	3/7	3/13	3/15	3/15	3/14	10
	8											
56.0	1	0										10
	2	0										10
	3	0										10
	4	1/3	1/2	1/5	1/4	1/4	1/3	1/6	1/5	1/3	1/2	10
	5	0	0	0	0	2/9	2/10	0	0	2/9	0	10
	6	2/6	2/9	2/6	2/9	0	0	0	2/8	0	2/7	10
	7	3/16	3/14	3/14	3/16	3/16	3/14	2/12	3/16	3/16	3/17	10
	8											
80.0	1	0										9
	2	0										9
	3	0										9
	4	1/4	1/3	1/2	1/3	1/4	1/2		1/5	1/5	0	9
	5	0	0	0	0	0	0		2/11	0	0	9
	6	2/8	2/6	2/5	2/6	2/7	2/4		0	2/7	1/5	9
	7	3/15	3/14	3/17	3/16	3/16	3/13		3/15	3/14	2/9	9
	8											
100.0	1	0										10
	2	0										10
	3	0										10
	4	1/4	1/6	1/5	1/5	1/4	1/3	1/2	1/3	1/4	1/3	10
	5	0	0	0	0	2/10	2/11	2/6	0	2/7	0	10
	6	2/8	2/7	2/7	2/4	0	0	0	2/6	0	0	10
	7	3/20	3/10	3/15	3/16	3/14	3/16	3/6	3/18	3/18	2/13	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 (CHR CHEM Rev.4.0)

Project# X8990 Client Magnolia Organism C. dubia

Date	Day 0 10/25/23 5533	Day 1 10/26/23	Day 2 10/27/23	Day 3 10/28/23 5533	Day 4 10/29/23	Day 5 10/30/23	Day 6 10/31/23	Day 7 11/1/23	Day 8
Concentration:	0 soft								
Temperature (°C)	24.7	24.1	23.8	23.2	24.0	24.3	24.2	24.1	
pH	7.4	7.4	7.0	7.1	7.6	7.9	7.1	7.4	
DO (mg/l)	7.7	8.2	8.0	8.1	7.9	7.9	7.8	7.5	
Cond (umhos/cm)	166	170	169	165	166	170	162		
Concentration:	32.0%								
Temperature (°C)	24.8	24.0	23.9	23.4	23.9	24.3	24.1	24.5	
pH	6.7	7.0	7.3	7.2	7.3	7.9	6.9	7.2	
DO (mg/l)	7.4	8.2	8.0	8.1	7.9	7.6	8.0	7.6	
Cond (umhos/cm)	282	284	281	276	278	265	256		
Concentration:	42.0%								
Temperature (°C)	24.7	24.1	24.0	23.5	23.8	24.6	24.3	24.5	
pH	6.8	7.7	7.4	7.2	7.0	7.3	7.6	7.4	
DO (mg/l)	7.4	8.3	7.6	7.3	7.4	7.3	8.1	7.2	
Cond (umhos/cm)	308	303	309	309	296	295	285		
Prerenewal Tech Initials/Time		SPW PM 1555	SPW 1500	SPW 1340	SPW 1435	SPW 1545	1600 PM	SPW 1630	
Postrenewal Tech Initials/Time	SPW 1700	1120 PM	SPW 1030	SPW 1115	SPW 0935	SPW 1016	1210 PM		

Control Alkalinity (mg/L as CaCO₃)

Control Hardness (mg/L as CaCO₃)

ID# 5533 Result 32.0 Date Tested 10/27/23 ID# 5533 Result 56.0 Date Tested 10/27/23
 ID# _____ Result _____ Date Tested _____ ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____ ID# _____ Result _____ Date Tested _____

Sample Alkalinity (mg/L as CaCO₃)

Sample Hardness (mg/L as CaCO₃)

ID# C25813 Result 180.0 Date Tested 11/2/23 ID# C25813 Result 24.0 Date Tested 11/2/23
 ID# C25827 Result 168.0 Date Tested 11/9/23 ID# C25827 Result 37.0 Date Tested 11/9/23
 ID# C25825 Result 156.0 Date Tested ↓ ID# C25825 Result 24.0 Date Tested ↓

BIO-ANALYTICAL LABORATORIES CHRONIC WATER QUALITY DATA (CHR CHEM Rev.4.0)

Project# X8990 Client Magnolia Organism C. Subia

Date	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Concentration: <u>56.0%</u>									
Temperature (°C)	<u>24.8</u>	<u>24.3</u> <u>24.2</u>	<u>23.9</u> <u>24.3</u>	<u>23.5</u> <u>24.3</u>	<u>23.6</u> <u>24.2</u>	<u>23.9</u> <u>24.7</u>	<u>24.4</u> <u>23.9</u>	<u>23.2</u>	
pH	<u>7.2</u>	<u>7.9</u> <u>7.3</u>	<u>7.4</u> <u>7.4</u>	<u>7.3</u> <u>7.6</u>	<u>7.4</u> <u>7.6</u>	<u>7.0</u> <u>7.3</u>	<u>7.7</u> <u>7.1</u>	<u>7.1</u>	
DO (mg/l)	<u>7.1</u>	<u>8.2</u> <u>7.5</u>	<u>7.9</u> <u>7.4</u>	<u>7.2</u> <u>7.7</u>	<u>7.6</u> <u>7.5</u>	<u>7.4</u> <u>7.4</u>	<u>8.0</u> <u>7.7</u>	<u>7.9</u>	
Cond (umhos/cm)	<u>374</u>	<u>373</u>	<u>369</u>	<u>356</u>	<u>341</u>	<u>344</u>	<u>333</u>		
Concentration: <u>80.0%</u>									
Temperature (°C)	<u>24.7</u>	<u>24.5</u> <u>23.9</u>	<u>24.0</u> <u>24.3</u>	<u>23.2</u> <u>24.0</u>	<u>23.7</u> <u>24.1</u>	<u>24.6</u> <u>24.4</u>	<u>24.6</u> <u>24.2</u>	<u>23.9</u>	
pH	<u>7.3</u>	<u>7.9</u> <u>7.2</u>	<u>7.0</u> <u>7.1</u>	<u>7.4</u> <u>7.6</u>	<u>7.2</u> <u>7.6</u>	<u>7.4</u> <u>7.3</u>	<u>7.8</u> <u>7.1</u>	<u>7.6</u>	
DO (mg/l)	<u>7.4</u>	<u>8.2</u> <u>7.5</u>	<u>8.6</u> <u>7.4</u>	<u>7.9</u> <u>7.4</u>	<u>7.6</u> <u>7.5</u>	<u>7.5</u> <u>7.7</u>	<u>8.1</u> <u>7.5</u>	<u>7.4</u>	
Cond (umhos/cm)	<u>450</u>	<u>454</u>	<u>445</u>	<u>438</u>	<u>437</u>	<u>444</u>	<u>401</u>		
Concentration: <u>100.0%</u>									
Temperature (°C)	<u>24.7</u>	<u>24.4</u> <u>23.5</u>	<u>24.0</u> <u>24.0</u>	<u>23.5</u> <u>23.9</u>	<u>23.4</u> <u>24.3</u>	<u>23.9</u> <u>24.0</u>	<u>24.6</u> <u>24.6</u>	<u>24.1</u>	
pH	<u>7.2</u>	<u>8.0</u> <u>7.1</u>	<u>7.5</u> <u>7.1</u>	<u>7.6</u> <u>7.6</u>	<u>7.5</u> <u>7.7</u>	<u>7.1</u> <u>7.4</u>	<u>7.8</u> <u>7.1</u>	<u>7.2</u>	
DO (mg/l)	<u>7.3</u>	<u>8.2</u> <u>7.4</u>	<u>7.9</u> <u>7.4</u>	<u>7.8</u> <u>7.4</u>	<u>7.6</u> <u>7.5</u>	<u>7.1</u> <u>7.6</u>	<u>8.1</u> <u>7.1</u>	<u>7.6</u>	
Cond (umhos/cm)	<u>527</u>	<u>521</u>	<u>519</u>	<u>510</u>	<u>511</u>	<u>493</u>	<u>468</u>		
Prerenewal Tech Initials/Time		<u>SDW</u> <u>1535</u> <u>PM</u>	<u>SDW</u> <u>1500</u>	<u>SDW</u> <u>1340</u>	<u>SDW</u> <u>1435</u>	<u>SDW</u> <u>1545</u>	<u>1600</u> <u>PM</u>	<u>SDW</u> <u>1630</u>	
Postrenewal Tech Initials/Time	<u>SDW</u> <u>1700</u>	<u>1120</u> <u>PM</u>	<u>SDW</u> <u>1030</u>	<u>SDW</u> <u>1115</u>	<u>SDW</u> <u>0935</u>	<u>SDW</u> <u>1016</u>	<u>1210</u> <u>PM</u>		

Control Alkalinity (mg/L as CaCO₃)

Control Hardness (mg/L as CaCO₃)

ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____

ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____

Sample Alkalinity (mg/L as CaCO₃)

Sample Hardness (mg/L as CaCO₃)

ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____

ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____

CETIS Test Data Worksheet

Report Date: 23 Oct-23 10:09 (p 1 of 2)
 Test Code/ID: 2C23428F / 07-4050-8303

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

Start Date: 24 Oct-23 14:06 Species: Ceriodaphnia dubia Sample Code: 5C1478D2
 End Date: 31 Oct-23 16:35 Protocol: EPA/821/R-02-013 (2002) Sample Source: AR0043613
 Sample Date: 23 Oct-23 09:08 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		6	1																			
56		3	2																			
32		6	3																			
42		3	4																			
42		9	5																			
42		8	6																			
100		3	7																			
100		2	8																			
56		9	9																			
80		6	10																			
32		5	11																			
42		1	12																			
0	D	10	13																			
80		7	14																			
100		7	15																			
80		9	16																			
42		7	17																			
0	D	8	18																			
100		1	19																			
32		9	20																			
32		10	21																			
80		5	22																			
0	D	6	23																			
80		1	24																			
32		3	25																			
0	D	4	26																			
56		7	27																			
56		5	28																			
42		4	29																			
0	D	9	30																			
0	D	7	31																			
0	D	3	32																			
56		4	33																			
100		8	34																			
56		2	35																			
80		4	36																			
100		6	37																			
56		8	38																			
100		10	39																			
32		7	40																			
56		10	41																			

CETIS Test Data Worksheet

Report Date: 23 Oct-23 10:09 (p 2 of 2)
 Test Code/ID: 2C23428F / 07-4050-8303

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	
0	D	5	42																			
0	D	2	43																			
80		10	44																			
42		2	45																			
0	D	1	46																			
32		1	47																			
42		6	48																			
32		8	49																			
80		8	50																			
100		4	51																			
100		5	52																			
42		5	53																			
32		2	54																			
100		9	55																			
32		4	56																			
56		1	57																			
80		3	58																			
42		10	59																			
80		2	60																			

Analyst: *EDC*
 QA: *EB* 11/21/23

BIO-ANALYTICAL LABORATORIES
CERIODAPHNIA DUBIA CHRONIC TEST
PARENTAL BLOCK ASSIGNMENT RANDOM NUMBER TEMPLATE #2
FOR 6 CONCENTRATION TEST

Set #1

5, 3, 6, 2, 1, 4 Parent# 2C mH

Set #2

4, 6, 2, 3, 5, 1 Parent# 6ES

Set #3

3, 2, 1, 5, 6, 4 Parent# 2D S

Set #4

6, 4, 3, 5, 1, 2 Parent# 2H S

Set #5

5, 2, 1, 3, 6, 4 Parent# 5H mH

Set #6

1, 2, 3, 4, 6, 5 Parent# 1ES

Set #7

4, 1, 5, 3, 6, 2 Parent# 2CS

Set #8

6, 5, 4, 2, 1, 3 Parent# 2HS

Set #9

4, 6, 5, 1, 2, 3 Parent# 5BS

Set #10

3, 5, 2, 6, 1, 4 Parent# 1CS

EDW
10/25/23

BIO-ANALYTICAL LABORATORIES
PIMEPHALES PROMELAS SURVIVAL AND GROWTH DATA SHEET

Project# X8990 Date started: 10/1/23 Date ended 10/31/23

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 hrs Vendor/ID# ABS 124

Feeding Times

Day	Technician/Time/Amount (per replicate)		
	AM	NOON	PM
0			
1	PM/0845/0.1mL	SDW/1105/0.10mL	mv/1500/0.10mL
2	PM/0845/0.1mL	PM/1200/0.1mL	SDW/1800/0.10mL
3		SDW/1130/0.10mL	PM/1820/0.1mL
4	SDW/0925/0.20mL		PM/1810/0.1mL
5	SDW/0800/0.20mL		SDW/1650/0.20mL
6	PM/0915/0.1mL	SDW/1140/0.10mL	SDW/1445/0.20mL MV/1811/0.10mL

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. <u>8.4/99.1% / SDW</u>	0. <u>NO / SDW</u>	0. _____	0. _____
1. <u>7.2/91.5% / SDW</u>	1. <u>NO / SDW</u>	1. _____	1. _____
2. <u>8.2/89.9% / PM</u>	2. <u>NO / PM</u>	2. _____	2. _____
3. <u>8.4/100.0% / SDW</u>	3. <u>NO / SDW</u>	3. _____	3. _____
4. <u>7.5/99.9% / SDW</u>	4. <u>NO / SDW</u>	4. _____	4. _____
5. <u>7.5/97.3% / SDW</u>	5. <u>NO / SDW</u>	5. _____	5. _____
6. <u>8.4/99.0% / SDW</u>	6. <u>NO / SDW</u>	6. _____	6. _____

Total Residual Chlorine (mg/L)/Tech	Dechlorinated? Amount?/Tech	Ammonia (NH3) (mg/L)/Tech	BAL Sample # Date in use
1. <u><0.5 / SDW</u>	1. <u>NO / SDW</u>	1. <u>6.0 / SDW</u>	1. <u>C25790 10/24/23</u>
2. <u>0.5 / PM</u>	2. <u>NO / PM</u>	2. <u>6.0 / PM</u>	2. <u>C25813 10/26/23</u>
3. <u>0.5 / SDW</u>	3. <u>NO / SDW</u>	3. <u>6.0 / SDW</u>	3. <u>C25827 10/28/23</u>

Comments:

* 10124123

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

Project# X8790

Test started: Date 10/24/23 Time 1853

Client Magnolia

Sample ID 001

Test ended: Date 10/31/23 Time 1850

Date/Tech: Day 0 10/24/23 1 10/25/23 2 10/26/23 3 10/27/23 4 10/28/23 5 10/29/23 6 10/30/23 7 10/31/23

Time: Day 0 1853 1 1050 2 1150 3 1130 4 1331 5 1118 6 1120 7 1850

Temp (°C) Day 0 25.2 1 25.0 2 23.8 3 23.5 4 23.0 5 23.8 6 24.0 7 24.7

Conc %	Rep.	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
0	1	8	8	8	8	8	7	7	7
	2	8	8	7	7	7	7	7	6
	3	8	8	8	8	8	8	8	8
	4	8	8	8	8	8	7	7	7
	5	8	8	8	8	8	8	8	8
20.0	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	7
	4	8	8	8	7	7	7	7	6
	5	8	8	8	8	8	8	8	8
42.0	1	8	8	8	8	8	8	8	8
	2	8	8	8	8	8	8	8	8
	3	8	8	8	8	8	7	7	7
	4	8	7	7	7	7	6	6	6
	5	8	8	8	8	8	8	8	8
56.0	1	8	8	8	8	8	7	7	7
	2	8	8	7	7	7	7	7	7
	3	8	8	8	7	7	7	7	7
	4	8	8	8	8	8	8	8	8
	5	8	8	8	8	8	8	8	8
80.0	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	8	8
100.0	1	8	6	6	5	5	5	5	5
	2	8	8	8	7	7	7	7	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

* 10/24/23

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

Project# X8770 Test started: Date 10/24/23 Time 1852

Client Magnolia Sample ID 001 Test ended: Date 10/31/23 Time 1850

Date/Tech: Day0 10/24/23/SM 1 10/25/23/SM 2 10/26/23/SM 3 10/27/23/SM 4 10/28/23/SM 5 10/29/23/SM 6 10/30/23/SM 7 10/31/23/SM

Time: Day0 1853 1 1050 2 1105 3 1130 4 1321 5 1118 6 1120 7 1850

Temp (°C) Day0 25.4 1 25.0 2 23.8 3 23.8 4 25.0 5 23.8 6 24.0 7 24.7

Conc.	Rep.	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
100.0 w	1	8	8	7	7	7	7	7	6
	2	8	8	8	8	8	8	8	8
	3	8	8	7	7	7	7	7	7
	4	8	8	8	8	8	8	8	8
	5	8	8	7	7	7	7	7	7
	1								
	2								
	3								
	4								
	5								
	1								
	2								
	3								
	4								
	5								
	1								
	2								
	3								
	4								
	5								
	1								
	2								
	3								
	4								
	5								

BIO-ANALYTICAL LABORATORIES MINNOW LARVAL GROWTH DATA SHEET (Minnow3 Rev 2.1)

Project#/Client: X8990 Magnolia Temp Start (°C) 23.0 Tech SD Date: 10/26/23 Time: 18:55
Temp End (°C) 109.2 Tech SD Date: 11/01/23 Time: 09:15

Conc.	Replicate/ Pan number	Wt. of pan(g)/ Date <u>10/24/23</u> weighed: Tech: <u>MU</u>	Wt. of pan + larvae(g)/ Date <u>11/1/23</u> weighed: Tech: <u>MU</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*
50A	1	126	1.0846	1.0885			
	2	127	1.0797	1.0833			
	3	128	1.0878	1.0911			
	4	129	1.0881	1.0914			
	5	130	1.0924	1.0979			
32	1	131	1.1113	1.1150			
	2	132	1.1062	1.1095			
	3	133	1.0871	1.0917			
	4	134	1.0862	1.0894			
	5	135	1.0869	1.0852			
42	1	136	1.0888	1.0914			
	2	137	1.0934	1.0965			
	3	138	1.0839	1.0865			
	4	139	1.0941	1.0966			
	5	140	1.0925	1.0960			
56	1	141	1.0922	1.0953			
	2	142	1.0932	1.1022			
	3	143	1.1016	1.1048			
	4	144	1.1071	1.1109			
	5	145	1.0804	1.0835			
80	1	146	1.0795	1.0828			
	2	147	1.0815	1.0849			
	3	148	1.0752	1.0786			
	4	149	1.0984	1.1012			
	5	150	1.0936	1.0964			
100	1	151	1.0941	1.0961			
	2	152	1.1019	1.1046			
	3	153	1.0984	1.1011			
	4	154	1.0752	1.0777			
	5	155	1.1036	1.1058			

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

Calculated by: CETIS Calculations checked by: SD 11/8/23

BIO-ANALYTICAL LABORATORIES MINNOW LARVAL GROWTH DATA SHEET (Minnow3 Rev Page 26 of 59)

Project#/Client X-2990 Temp Start (°C) 73.0 Tech EC Date: 10/3/23 Time: 1855
magnolia Temp End (°C) 109.2 Tech SON Date: 10/3/23 Time: 0915

Conc	Replicate/ Pan number	Wt. of pan(g)/ Date <u>10/24/23</u> weighed: Tech: <u>MV</u>	Wt. of pan + larvae(g)/ Date <u>11/1/23</u> weighed: Tech: <u>MV</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	1.0903	1.0923				
	2	1.0852	1.0879				
	3	1.1066	1.1084				
	4	1.1015	1.1038				
	5	1.0956	1.0983				
	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: ECB 11/8/23 Calculations checked by: CETIS

BIO-ANALYTICAL LABORATORIES CHRONIC WATER QUALITY DATA (CHR CHEM Rev. 4.0)

Project# X8790 Client Magnolia

Organism P. Promelas

Date	Day 0 10/24/23 5532	Day 1 10/25/23	Day 2 10/26/23	Day 3 10/27/23	Day 4 10/28/23 5537	Day 5 10/29/23	Day 6 10/30/23	Day 7 10/31/23	Day 8
Concentration:	0 Soft								
Temperature (°C)	26.9	23.1 26.8	23.8 24.6	24.1 26.2	24.8 26.2	24.1 26.0	23.5 26.0	23.3	
pH	7.1	7.0 7.5	6.6 6.9	7.0 7.1	7.3 8.0	7.3 7.5	7.3 7.4	7.4	
DO (mg/l)	7.3	7.2 7.4	6.8 7.5	6.9 7.5	7.2 7.5	7.1 7.4	7.2 7.5	7.6	
Cond (umhos/cm)	171	171	167	170	169	169	170		
Concentration:	32.0%								
Temperature (°C)	26.9	23.8 26.8	23.8 24.5	23.5 25.0	24.9 26.1	24.8 25.9	23.6 26.1	23.3	
pH	7.1	7.5 7.5	6.9 6.9	7.0 7.0	7.3 7.7	7.3 7.5	7.2 7.4	7.1	
DO (mg/l)	7.4	7.6 7.4	6.5 7.5	6.5 7.5	6.5 7.3	6.2 7.4	6.0 7.4	7.7	
Cond (umhos/cm)	281	289	288	286	284	280	269		
Concentration:	42.0%								
Temperature (°C)	25.8	23.9 25.9	23.9 24.4	23.8 25.3	24.9 25.9	23.9 25.9	23.5 25.5	23.7	
pH	7.2	7.4 7.6	7.0 7.0	7.2 7.0	7.4 7.3	7.3 7.5	7.4 7.3	7.1	
DO (mg/l)	7.4	7.2 7.4	6.3 7.5	6.4 7.5	6.2 7.4	7.0 7.4	7.1 7.5	7.7	
Cond (umhos/cm)	315	313	309	315	299	308	299		
Prerenewal Tech Initials/Time		SDW 1055	PM 1055	SDW 1130	SDW 1321	SDW 1118	SDW 1120	SDW 1900	
Postrenewal Tech Initials/Time	SDW 1105	SDW 1010	PM 1120	SDW 1025	SDW 1110	SDW 0930	SDW 1016		

Control Alkalinity (mg/L as CaCO₃) Control Hardness (mg/L as CaCO₃)

ID# 5532 Result 36.0 Date Tested 10/27/23 ID# 5532 Result 50.0 Date Tested 10/27/23
 ID# 5537 Result 36.0 Date Tested 11/2/23 ID# 5537 Result 50.0 Date Tested 11/2/23
 ID# _____ Result _____ Date Tested _____ ID# _____ Result _____ Date Tested _____

Sample Alkalinity (mg/L as CaCO₃) Sample Hardness (mg/L as CaCO₃)

ID# C25790 Result 148.0 Date Tested 10/27/23 ID# C25790 Result 24.0 Date Tested 10/27/23
 ID# C25813 Result 160.0 Date Tested 11/2/23 ID# C25813 Result 24.0 Date Tested 11/2/23
 ID# C25827 Result 168.0 Date Tested 11/9/23 ID# C25827 Result 32.0 Date Tested 11/9/23

BIO-ANALYTICAL LABORATORIES CHRONIC WATER QUALITY DATA (CHR CHEM Rev.4.0)

Project# X8990 Client 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>56.0%</u>									
Temperature (°C)	24.8	24.1 25.5	23.9 24.4	23.7 24.9	25.0 25.3	23.4 25.9	23.5 25.4	24.1	
pH	7.4	7.4 7.7	7.2 7.3	7.3 7.0	7.4 7.5	7.2 7.5	7.0 7.3	7.1	
DO (mg/l)	7.1	7.3 7.0	6.0 7.5	6.5 7.4	6.9 7.7	6.5 7.3	6.8 7.4	7.4	
Cond (umhos/cm)	366	369	364	375	365	354	347		
Concentration: <u>80.0%</u>									
Temperature (°C)	24.2	24.5 24.1	23.7 23.8	23.7 24.5	24.8 25.0	23.5 25.8	23.9 24.9	23.9	
pH	7.4	7.3 7.6	7.3 7.3	7.5 7.1	7.4 7.5	7.3 7.5	7.0 7.3	7.1	
DO (mg/l)	7.7	7.4 7.4	5.2 7.7	6.2 7.4	6.5 7.4	7.0 7.4	6.9 7.5	7.7	
Cond (umhos/cm)	438	444	444	450	450	455	420		
Concentration: <u>100.0%</u>									
Temperature (°C)	23.9	24.2 24.3	23.7 23.5	23.8 24.4	25.1 24.9	24.2 26.0	24.1 24.5	23.9	
pH	7.5	7.4 7.7	7.4 7.3	7.5 7.1	7.2 7.4	7.0 7.5	7.2 7.3	7.4	
DO (mg/l)	7.3	7.6 7.4	5.1 7.0	6.3 7.4	6.3 7.4	6.0 7.7	6.2 7.4	7.7	
Cond (umhos/cm)	522	513	516	522	524	530	495		
Prerenewal Tech Initials/Time		SPW 1055	1055 PM	SPW 1130	SPW 1321	SPW 1118	SPW 1620	SPW 1900	
Postrenewal Tech Initials/Time	SPW 1105	SPW 1010	1120 PM	SPW 1025	SPW 1110	SPW 0930	SPW 1016		

Control Alkalinity (mg/L as CaCO₃)

Control Hardness (mg/L as CaCO₃)

ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____

ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____

Sample Alkalinity (mg/L as CaCO₃)

Sample Hardness (mg/L as CaCO₃)

ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____

ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____

BIO-ANALYTICAL LABORATORIES CHRONIC WATER QUALITY DATA (CHR CHEM Rev. 4.0)

Project# X8990 Client 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>100.0% UV</u>									
Temperature (°C)		<u>24.1</u>	<u>23.8</u>	<u>23.5</u>	<u>24.9</u>	<u>24.2</u>	<u>23.9</u>	<u>23.6</u>	
pH	<u>23.2</u>	<u>21.3</u>	<u>24.1</u>	<u>24.3</u>	<u>24.7</u>	<u>26.2</u>	<u>24.5</u>		
DO (mg/l)	<u>7.5</u>	<u>7.3</u>	<u>7.4</u>	<u>7.2</u>	<u>7.4</u>	<u>7.0</u>	<u>7.2</u>	<u>7.0</u>	
Cond (umhos/cm)	<u>7.4</u>	<u>7.4</u>	<u>7.7</u>	<u>7.1</u>	<u>7.1</u>	<u>7.5</u>	<u>7.3</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 1055</u>	<u>1055 PM</u>	<u>EDW 1130</u>	<u>EDW 1321</u>	<u>EDW 1118</u>	<u>EDW 1120</u>	<u>EDW 1190C</u>	
Postrenewal Tech Initials/Time	<u>EDW 1105</u>	<u>EDW 1010</u>	<u>1120 PM</u>	<u>EDW 1055</u>	<u>EDW 1110</u>	<u>EDW 0930</u>	<u>EDW 1046</u>		

Control Alkalinity (mg/L as CaCO₃)

Control Hardness (mg/L as CaCO₃)

ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____

ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____

Sample Alkalinity (mg/L as CaCO₃)

Sample Hardness (mg/L as CaCO₃)

ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____

ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____
 ID# _____ Result _____ Date Tested _____

CETIS Test Data Worksheet

Report Date: 23 Oct-23 10:09 (p 1 of 1)
 Test Code/ID: 5D3D15FA / 15-6428-4410

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

Start Date: 24 Oct-23 13:50 Species: Pimephales promelas Sample Code: 5A86CB88
 End Date: 31 Oct-23 11:06 Protocol: EPA/821/R-02-013 (2002) Sample Source: AR0043613
 Sample Date: 23 Oct-23 08:07 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
32		5	1												
100		1	2												
0	D	4	3												
56		3	4												
100		5	5												
32		2	6												
42		3	7												
80		4	8												
UV 101		3	9												
• 32		1	10												
56		1	11												
42		1	12												
0	D	1	13												
UV 101		5	14												
56		2	15												
42		5	16												
80		1	17												
80		5	18												
• 100		2	19												
80		2	20												
• 0	D	2	21												
42		2	22												
0	D	5	23												
• 56		4	24												
UV 101		2	25												
0	D	3	26												
56		5	27												
• 32		4	28												
• 32		3	29												
• 100		3	30												
• 42		4	31												
UV 101		1	32												
• 80		3	33												
• 100		4	34												
UV 101		4	35												

APPENDIX C
STATISTICAL ANALYSIS

CETIS Analytical Report

Report Date: 09 Nov-23 13:06 (p 1 of 2)
Test Code/ID: 2C23428F / 07-4050-8303

Ceriodaphnia 7-d Survival and Reproduction Test

Bio-Analytical Laboratories

Analysis ID: 02-7626-2371	Endpoint: 7d Survival Rate	CETIS Version: CETIS v2.1.5
Analyzed: 09 Nov-23 13:05	Analysis: STP 2xK Contingency Tables	Status Level: 1
Edit Date: 09 Nov-23 12:58	MD5 Hash: 3346DD07DC3E554BE35C0DAD509C54E	Editor ID: 008-522-314-5
Batch ID: 01-4280-6427	Test Type: Reproduction-Survival (2-8d)	Analyst:
Start Date: 25 Oct-23 17:25	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Ending Date: 01 Nov-23 16:30	Species: Ceriodaphnia dubia	Brine:
Test Length: 6d 23h	Taxon: Branchiopoda	Source: In-House Culture Age: <24
Sample ID: 15-4484-5522	Code: X8990	Project: WET Quarterly Compliance Test (4Q)
Sample Date: 23 Oct-23 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 23 Oct-23 12:27	CAS (PC):	Station: 001
Sample Age: 57h (2.3 °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	0.5000	Exact	1.0000	Non-Significant Effect
		42	1.0000	Exact	1.0000	Non-Significant Effect
		56	1.0000	Exact	1.0000	Non-Significant Effect
		80	0.5000	Exact	1.0000	Non-Significant Effect
		100	1.0000	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		9	1	10	0.9000	0.1000	10.00%
42		10	0	10	1.0000	0.0000	0.00%
56		10	0	10	1.0000	0.0000	0.00%
80		9	1	10	0.9000	0.1000	10.00%
100		10	0	10	1.0000	0.0000	0.00%

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	0.9000	0.6738	1.0000	1.0000	0.0000	1.0000	0.1000	35.14%	10.00%
42		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
56		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
80		10	0.9000	0.6738	1.0000	1.0000	0.0000	1.0000	0.1000	35.14%	10.00%
100		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%

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		1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000
42		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
56		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
80		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	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

SJB
11/21/23

CETIS Analytical Report

Report Date: 09 Nov-23 13:06 (p 2 of 2)
 Test Code/ID: 2C23428F / 07-4050-8303

Ceriodaphnia 7-d Survival and Reproduction Test

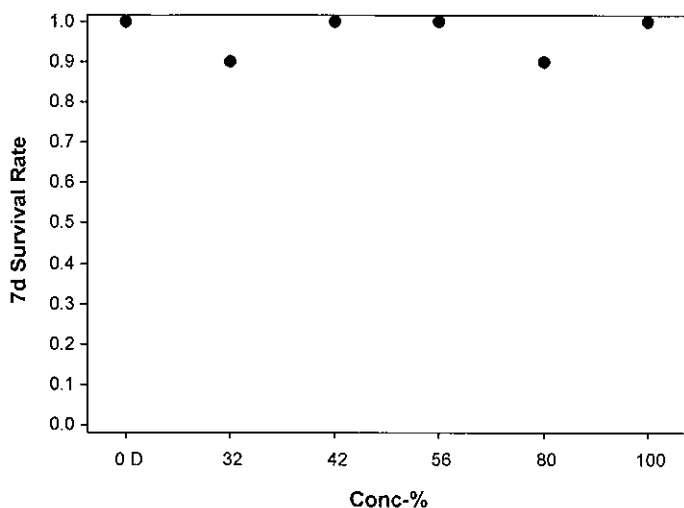
Bio-Analytical Laboratories

Analysis ID: 02-7626-2371 Endpoint: 7d Survival Rate CETIS Version: CETIS v2.1.5
 Analyzed: 09 Nov-23 13:05 Analysis: STP 2xK Contingency Tables Status Level: 1
 Edit Date: 09 Nov-23 12:58 MD5 Hash: 3346DD07DC3E554BE35C0DAD509C54E 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		1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1
42		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
56		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
80		1/1	1/1	1/1	1/1	1/1	1/1	0/1	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

Graphics



EB
 11/21/23

CETIS Analytical Report

Report Date: 09 Nov-23 13:11 (p 1 of 2)
Test Code/ID: 2C23428F / 07-4050-8303

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

Analysis ID: 17-5129-0044 Endpoint: Reproduction CETIS Version: CETIS v2.1.5
 Analyzed: 09 Nov-23 13:09 Analysis: Nonparametric-Multiple Comparison Status Level: 1
 Edit Date: 09 Nov-23 12:58 MD5 Hash: B719E01F52F4E146F0746B97DBB998FE Editor ID: 008-522-314-5

Batch ID: 01-4280-6427 Test Type: Reproduction-Survival (2-8d) Analyst:
 Start Date: 25 Oct-23 17:25 Protocol: EPA/821/R-02-013 (2002) Diluent: Reconstituted Water
 Ending Date: 01 Nov-23 16:30 Species: Ceriodaphnia dubia Brine:
 Test Length: 6d 23h Taxon: Branchiopoda Source: In-House Culture Age: <24

Sample ID: 15-4484-5522 Code: X8990 Project: WET Quarterly Compliance Test (4Q)
 Sample Date: 23 Oct-23 08:00 Material: POTW Effluent Source: AR0043613
 Receipt Date: 23 Oct-23 12:27 CAS (PC): Station: 001
 Sample Age: 57h (2.3 °C) Client: Magnolia Wastewater System

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	4.832	23.34%

Wilcoxon/Bonferroni Adj Test

Control	vs	Conc-%	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Dilution Water		32	17	92.5	---	5	Exact	1.0000	Non-Significant Effect
		42	18	107	---	4	Exact	1.0000	Non-Significant Effect
		56	18	143	---	2	Exact	1.0000	Non-Significant Effect
		80	17	109.5	---	5	Exact	1.0000	Non-Significant Effect
		100	18	138.5	---	3	Exact	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	291.415	58.2829	5	2.876	0.0229	Significant Effect
Error	1053.69	20.2632	52			
Total	1345.1		57			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	2.247	15.09	0.8141	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.899	0.9443	0.0002	Non-Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	20.7	16.91	24.49	23	11	26	1.674	25.57%	0.00%
32		9	21.11	17.48	24.75	23	12	26	1.576	22.40%	-1.99%
42		10	21.9	19.03	24.77	22.5	14	27	1.269	18.32%	-5.80%
56		10	26.1	23.73	28.47	26.5	18	29	1.048	12.70%	-26.09%
80		9	24	20.18	27.82	25	14	31	1.658	20.73%	-15.94%
100		10	26.1	22.89	29.31	27	16	32	1.418	17.18%	-26.09%

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	23	23	25	24	15	22	11	14	24	26
32		22	25	18	24	26	24	23	12	16	
42		25	23	22	25	14	16	23	22	27	22
56		25	25	25	29	29	27	18	29	28	26
80		27	23	24	25	27	19	31	26	14	
100		32	23	27	25	28	30	24	27	29	16

EOB
11/21/23

CETIS Analytical Report

Report Date: 09 Nov-23 13:15 (p 1 of 2)
Test Code/ID: 2C23428F / 07-4050-8303

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

Analysis ID: 08-4170-1750	Endpoint: Reproduction	CETIS Version: CETIS v2.1.5
Analyzed: 09 Nov-23 13:13	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 09 Nov-23 12:58	MD5 Hash: 8352B686E12A4A403788F574252B4C19	Editor ID: 008-522-314-5
Batch ID: 01-4280-6427	Test Type: Reproduction-Survival (2-8d)	Analyst:
Start Date: 25 Oct-23 17:25	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Ending Date: 01 Nov-23 16:30	Species: Ceriodaphnia dubia	Brine:
Test Length: 6d 23h	Taxon: Branchiopoda	Source: In-House Culture Age: <24
Sample ID: 15-4484-5522	Code: X8990	Project: WET Quarterly Compliance Test (4Q)
Sample Date: 23 Oct-23 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 23 Oct-23 12:27	CAS (PC):	Station: 001
Sample Age: 57h (2.3 °C)	Client: Magnolia Wastewater System	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	100	>100	--	1	6.189	29.90%

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	102.5	75	5	CDF	0.7709	Non-Significant Effect
		42	18	107	75	4	CDF	0.8746	Non-Significant Effect
		56	18	143	75	2	CDF	1.0000	Non-Significant Effect
		80	18	119.5	75	5	CDF	0.9889	Non-Significant Effect
		100	18	138.5	75	3	CDF	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	425.533	85.1067	5	2.329	0.0548	Non-Significant Effect
Error	1973.2	36.5407	54			
Total	2398.73		59			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	13.27	15.09	0.0209	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8597	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	20.7	16.91	24.49	23	11	26	1.674	25.57%	0.00%
32		10	19	13.26	24.74	22.5	0	26	2.539	42.25%	8.21%
42		10	21.9	19.03	24.77	22.5	14	27	1.269	18.32%	-5.80%
56		10	26.1	23.73	28.47	26.5	18	29	1.048	12.70%	-26.09%
80		10	21.6	15.22	27.98	24.5	0	31	2.821	41.31%	-4.35%
100		10	26.1	22.89	29.31	27	16	32	1.418	17.18%	-26.09%

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	23	23	25	24	15	22	11	14	24	26
32		22	25	18	24	26	0	24	23	12	16
42		25	23	22	25	14	16	23	22	27	22
56		25	25	25	29	29	27	18	29	28	26
80		27	23	24	25	27	19	0	31	26	14
100		32	23	27	25	28	30	24	27	29	16

EWB
11/21/23

CETIS Analytical Report

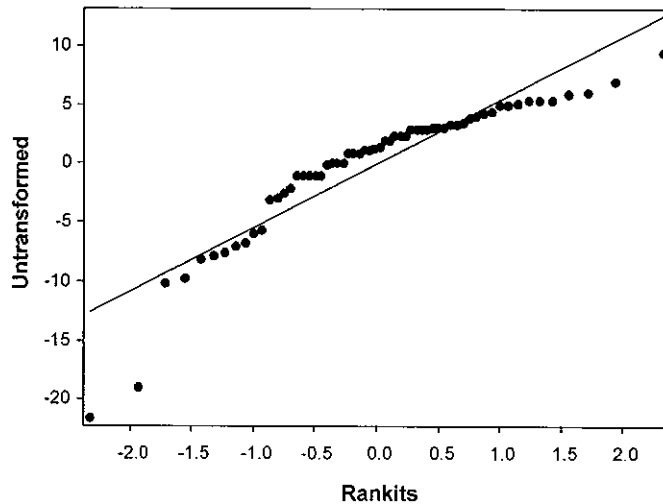
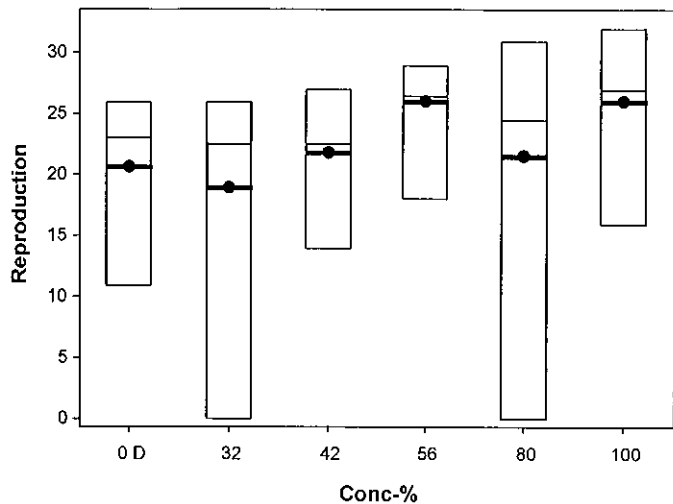
Report Date: 09 Nov-23 13:15 (p 2 of 2)
Test Code/ID: 2C23428F / 07-4050-8303

Ceriodaphnia 7-d Survival and Reproduction Test

Bio-Analytical Laboratories

Analysis ID: 08-4170-1750	Endpoint: Reproduction	CETIS Version: CETIS v2.1.5
Analyzed: 09 Nov-23 13:13	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 09 Nov-23 12:58	MD5 Hash: 8352B686E12A4A403788F574252B4C19	Editor ID: 008-522-314-5

Graphics



EUB
11/21/23

CETIS Analytical Report

Report Date: 09 Nov-23 13:44 (p 1 of 2)
Test Code/ID: 2C23428F / 07-4050-8303

Ceriodaphnia 7-d Survival and Reproduction Test

Bio-Analytical Laboratories

Analysis ID: 15-0337-8007	Endpoint: Reproduction	CETIS Version: CETIS v2.1.5
Analyzed: 09 Nov-23 13:44	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 09 Nov-23 12:58	MD5 Hash: 8352B686E12A4A403788F574252B4C19	Editor ID: 008-522-314-5
Batch ID: 01-4280-6427	Test Type: Reproduction-Survival (2-8d)	Analyst:
Start Date: 25 Oct-23 17:25	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Ending Date: 01 Nov-23 16:30	Species: Ceriodaphnia dubia	Brine:
Test Length: 6d 23h	Taxon: Branchiopoda	Source: In-House Culture Age: <24
Sample ID: 15-4484-5522	Code: X8990	Project: WET Quarterly Compliance Test (4Q)
Sample Date: 23 Oct-23 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 23 Oct-23 12:27	CAS (PC):	Station: 001
Sample Age: 57h (2.3 °C)	Client: Magnolia Wastewater System	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	894665	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

Calculated Variate

Isotonic Variate

Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	D	10	20.7	23	11	26	25.57%	0.00%	22.57	0.00%
32		10	19	22.5	0	26	42.25%	8.21%	22.57	0.00%
42		10	21.9	22.5	14	27	18.32%	-5.80%	22.57	0.00%
56		10	26.1	26.5	18	29	12.70%	-26.09%	22.57	0.00%
80		10	21.6	24.5	0	31	41.31%	-4.35%	22.57	0.00%
100		10	26.1	27	16	32	17.18%	-26.09%	22.57	0.00%

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	23	23	25	24	15	22	11	14	24	26
32		22	25	18	24	26	0	24	23	12	16
42		25	23	22	25	14	16	23	22	27	22
56		25	25	25	29	29	27	18	29	28	26
80		27	23	24	25	27	19	0	31	26	14
100		32	23	27	25	28	30	24	27	29	16

Handwritten signature and date:
11/21/23

CETIS Analytical Report

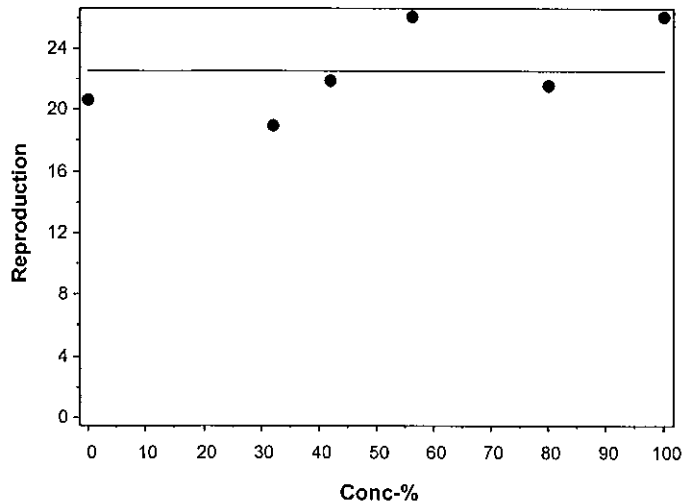
Report Date: 09 Nov-23 13:44 (p 2 of 2)
Test Code/ID: 2C23428F / 07-4050-8303

Ceriodaphnia 7-d Survival and Reproduction Test

Bio-Analytical Laboratories

Analysis ID: 15-0337-8007	Endpoint: Reproduction	CETIS Version: CETIS v2.1.5
Analyzed: 09 Nov-23 13:44	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 09 Nov-23 12:58	MD5 Hash: 8352B686E12A4A403788F574252B4C19	Editor ID: 008-522-314-5

Graphics



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CETIS Analytical Report

Report Date: 09 Nov-23 13:57 (p 1 of 2)
Test Code/ID: 5D3D15FA / 15-6428-4410

Fathead Minnow 7-d Larval Survival and Growth Test

Bio-Analytical Laboratories

Analysis ID: 07-2441-5213	Endpoint: 7d Survival Rate	CETIS Version: CETIS v2.1.5
Analyzed: 09 Nov-23 13:56	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 09 Nov-23 13:46	MD5 Hash: E3B94E275654C31E1CAB76E5C59B5A4D	Editor ID: 008-522-314-5
Batch ID: 07-2949-6214	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 24 Oct-23 18:53	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Ending Date: 31 Oct-23 18:50	Species: Pimephales promelas	Brine:
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <48
Sample ID: 15-1878-3368	Code: X8990	Project: WET Quarterly Compliance Test (4Q)
Sample Date: 23 Oct-23 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 23 Oct-23 12:27	CAS (PC):	Station: 001
Sample Age: 35h (2.3 °C)	Client: Magnolia Wastewater System	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	100	>100	---	1	0.1561	17.34%

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	29.5	16	4	CDF	0.9290	Non-Significant Effect
		42	8	29.5	16	4	CDF	0.9290	Non-Significant Effect
		56	8	29	16	3	CDF	0.9104	Non-Significant Effect
		80	8	35	16	2	CDF	0.9979	Non-Significant Effect
		100	8	27	16	3	CDF	0.8003	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	0.9	0.8	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0832873	0.0166575	5	0.8407	0.5341	Non-Significant Effect
Error	0.475522	0.0198134	24			
Total	0.558809		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	0.9085	0.9031	0.0136	Normal Distribution

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	5	0.9000	0.7701	1.0000	0.8750	0.7500	1.0000	0.0468	11.62%	0.00%
32		5	0.9250	0.7862	1.0000	1.0000	0.7500	1.0000	0.0500	12.09%	-2.78%
42		5	0.9250	0.7862	1.0000	1.0000	0.7500	1.0000	0.0500	12.09%	-2.78%
56		5	0.9250	0.8400	1.0000	0.8750	0.8750	1.0000	0.0306	7.40%	-2.78%
80		5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-11.11%
100		5	0.8750	0.6849	1.0000	0.8750	0.6250	1.0000	0.0685	17.50%	2.78%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	5	1.2500	1.0690	1.4320	1.2090	1.0470	1.3930	0.0653	11.68%	0.00%
32		5	1.2870	1.0940	1.4810	1.3930	1.0470	1.3930	0.0697	12.12%	-2.94%
42		5	1.2870	1.0940	1.4810	1.3930	1.0470	1.3930	0.0697	12.12%	-2.94%
56		5	1.2830	1.1580	1.4080	1.2090	1.2090	1.3930	0.0450	7.84%	-2.59%
80		5	1.3930	1.3930	1.3930	1.3930	1.3930	1.3930	0.0000	0.00%	-11.41%
100		5	1.2230	0.9788	1.4680	1.2090	0.9117	1.3930	0.0881	16.10%	2.17%

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CETIS Analytical Report

Report Date: 09 Nov-23 13:57 (p 2 of 2)
Test Code/ID: 5D3D15FA / 15-6428-4410

Fathead Minnow 7-d Larval Survival and Growth Test

Bio-Analytical Laboratories

Analysis ID: 07-2441-5213 Endpoint: 7d Survival Rate CETIS Version: CETIS v2.1.5
Analyzed: 09 Nov-23 13:56 Analysis: Nonparametric-Control vs Treatments Status Level: 1
Edit Date: 09 Nov-23 13:46 MD5 Hash: E3B94E275654C31E1CAB76E5C59B5A4D Editor ID: 008-522-314-5

7d Survival Rate Detail

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

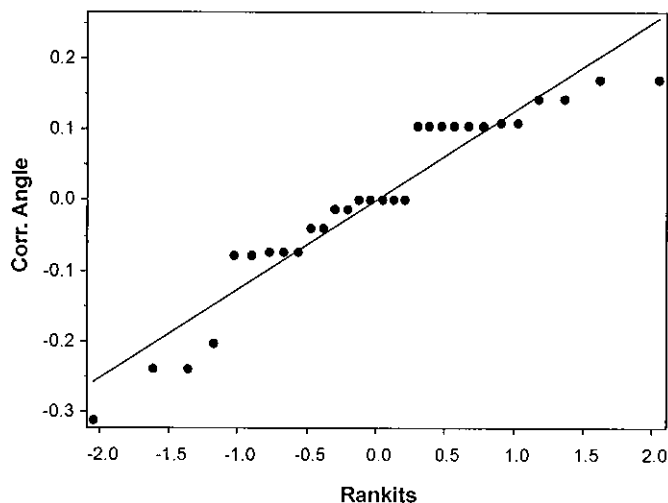
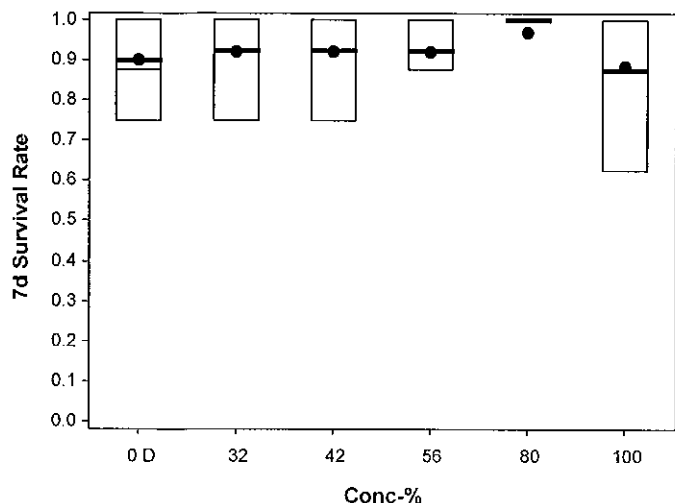
Angular (Corrected) Transformed Detail

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

7d Survival Rate Binomials

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

Graphics



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CETIS Analytical Report

Report Date: 09 Nov-23 13:59 (p 1 of 2)
Test Code/ID: 5D3D15FA / 15-6428-4410

Fathead Minnow 7-d Larval Survival and Growth Test

Bio-Analytical Laboratories

Analysis ID: 01-4351-4903	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETIS v2.1.5
Analyzed: 09 Nov-23 13:58	Analysis: Parametric-Control vs Treatments	Status Level: 1
Edit Date: 09 Nov-23 13:46	MD5 Hash: EAABCF27DEE7DA8411746F8EE7C99981	Editor ID: 008-522-314-5
Batch ID: 07-2949-6214	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 24 Oct-23 18:53	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Ending Date: 31 Oct-23 18:50	Species: Pimephales promelas	Brine:
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <48
Sample ID: 15-1878-3368	Code: X8990	Project: WET Quarterly Compliance Test (4Q)
Sample Date: 23 Oct-23 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 23 Oct-23 12:27	CAS (PC):	Station: 001
Sample Age: 35h (2.3 °C)	Client: Magnolia Wastewater System	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSD _p	PMSD
Untransformed	C > T	80	100	89.44	1.2	0.1005	20.73%

Dunnnett Multiple Comparison Test

Control	vs	Conc-%	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Dilution Water		32	8	0.1762	2.362	0.1005	CDF	0.7760	Non-Significant Effect
		42*	8	2.995	2.362	0.1005	CDF	0.0129	Significant Effect
		56	8	1.879	2.362	0.1005	CDF	0.1228	Non-Significant Effect
		80	8	2.173	2.362	0.1005	CDF	0.0722	Non-Significant Effect
		100*	8	4.287	2.362	0.1005	CDF	0.0006	Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	0.485	0.25	>>	Yes	Passes Criteria
PMSD	0.2073	0.12	0.3	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.122793	0.0245586	5	5.42	0.0018	Significant Effect
Error	0.108747	0.0045311	24			
Total	0.23154		29			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	8.388	15.09	0.1361	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9033	0.9031	0.0101	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	0.485	0.3392	0.6308	0.425	0.4125	0.6875	0.0525	24.20%	0.00%
32		5	0.4775	0.3822	0.5728	0.4625	0.4	0.575	0.03432	16.07%	1.55%
42		5	0.3575	0.2911	0.4239	0.325	0.3125	0.4375	0.02391	14.96%	26.29%
56		5	0.405	0.3552	0.4548	0.3875	0.375	0.475	0.01794	9.91%	16.49%
80		5	0.3925	0.3439	0.4411	0.4125	0.35	0.425	0.0175	9.97%	19.07%
100		5	0.3025	0.2542	0.3508	0.3125	0.25	0.3375	0.01741	12.87%	37.63%

Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	0.4875	0.425	0.4125	0.4125	0.6875
32		0.4625	0.4125	0.575	0.4	0.5375
42		0.325	0.3875	0.325	0.3125	0.4375
56		0.3875	0.375	0.4	0.475	0.3875
80		0.4125	0.425	0.425	0.35	0.35
100		0.25	0.3375	0.3375	0.3125	0.275

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CETIS Analytical Report

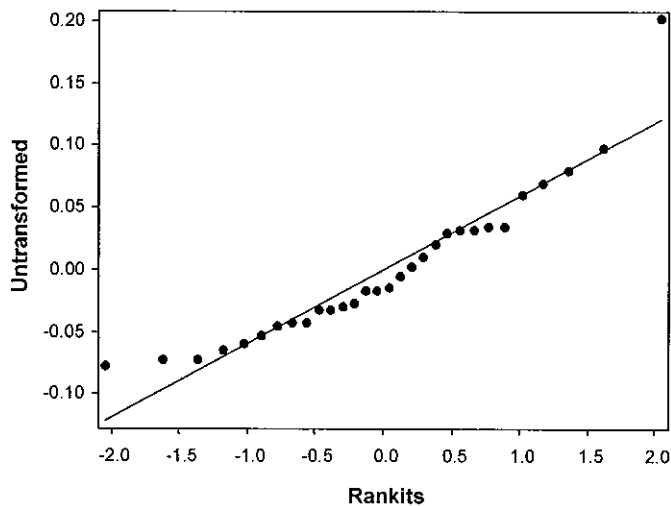
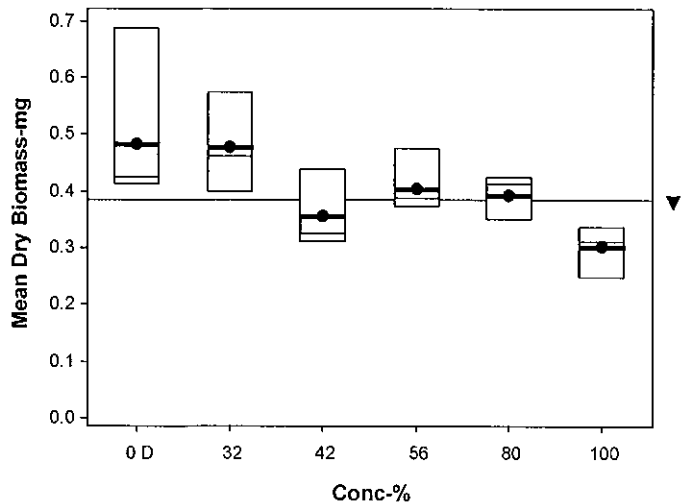
Report Date: 09 Nov-23 13:59 (p 2 of 2)
Test Code/ID: 5D3D15FA / 15-6428-4410

Fathead Minnow 7-d Larval Survival and Growth Test

Bio-Analytical Laboratories

Analysis ID: 01-4351-4903	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETIS v2.1.5
Analyzed: 09 Nov-23 13:58	Analysis: Parametric-Control vs Treatments	Status Level: 1
Edit Date: 09 Nov-23 13:46	MD5 Hash: EAABCF27DEE7DA8411746F8EE7C99981	Editor ID: 008-522-314-5

Graphics



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CETIS Analytical Report

Report Date: 09 Nov-23 14:01 (p 1 of 2)
Test Code/ID: 5D3D15FA / 15-6428-4410

Fathead Minnow 7-d Larval Survival and Growth Test

Bio-Analytical Laboratories

Analysis ID: 13-9309-4366	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETIS v2.1.5
Analyzed: 09 Nov-23 14:00	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 09 Nov-23 13:46	MD5 Hash: EAABCF27DEE7DA8411746F8EE7C99981	Editor ID: 008-522-314-5
Batch ID: 07-2949-6214	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 24 Oct-23 18:53	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Ending Date: 31 Oct-23 18:50	Species: Pimephales promelas	Brine:
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <48
Sample ID: 15-1878-3368	Code: X8990	Project: WET Quarterly Compliance Test (4Q)
Sample Date: 23 Oct-23 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 23 Oct-23 12:27	CAS (PC):	Station: 001
Sample Age: 35h (2.3 °C)	Client: Magnolia Wastewater System	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1797274	1000	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	0.485	0.25	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
IC15	39.05	16.01	108.1	2.6	0.9	6.2
IC20	41.68	26.55	114.9	2.4	0.9	3.8
IC25	85.15	11.11	102.9	1.2	1	9
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	0.485	0.425	0.4125	0.6875	24.20%	0.00%	0.485	0.00%
32		5	0.4775	0.4625	0.4	0.575	16.07%	1.55%	0.4775	1.55%
42		5	0.3575	0.325	0.3125	0.4375	14.96%	26.29%	0.385	20.62%
56		5	0.405	0.3875	0.375	0.475	9.91%	16.49%	0.385	20.62%
80		5	0.3925	0.4125	0.35	0.425	9.97%	19.07%	0.385	20.62%
100		5	0.3025	0.3125	0.25	0.3375	12.87%	37.63%	0.3025	37.63%

Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	0.4875	0.425	0.4125	0.4125	0.6875
32		0.4625	0.4125	0.575	0.4	0.5375
42		0.325	0.3875	0.325	0.3125	0.4375
56		0.3875	0.375	0.4	0.475	0.3875
80		0.4125	0.425	0.425	0.35	0.35
100		0.25	0.3375	0.3375	0.3125	0.275

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CETIS Analytical Report

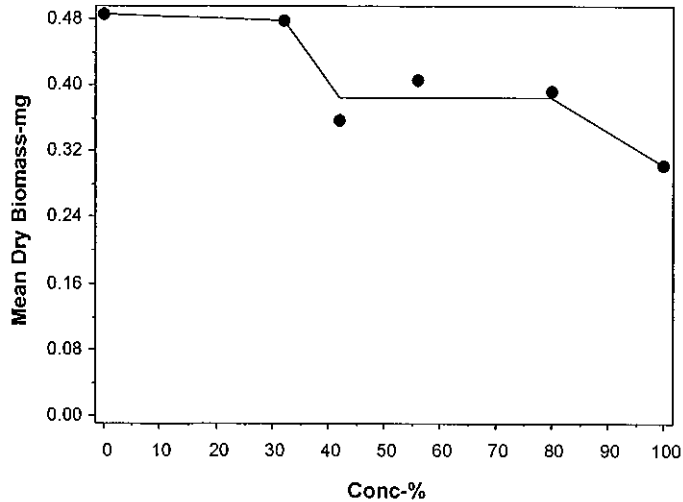
Report Date: 09 Nov-23 14:01 (p 2 of 2)
Test Code/ID: 5D3D15FA / 15-6428-4410

Fathead Minnow 7-d Larval Survival and Growth Test

Bio-Analytical Laboratories

Analysis ID: 13-9309-4366	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETIS v2.1.5
Analyzed: 09 Nov-23 14:00	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 09 Nov-23 13:46	MD5 Hash: EAABCF27DEE7DA8411746F8EE7C99981	Editor ID: 008-522-314-5

Graphics



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CETIS Analytical Report

Report Date: 09 Nov-23 14:03 (p 1 of 2)
Test Code/ID: 5D3D15FA / 15-6428-4410

Fathead Minnow 7-d Larval Survival and Growth Test

Bio-Analytical Laboratories

Analysis ID: 04-7612-8057	Endpoint: 7d Survival Rate	CETIS Version: CETIS v2.1.5
Analyzed: 09 Nov-23 14:01	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 09 Nov-23 13:46	MD5 Hash: 649865920DAA8B3E4CC4747480A33A7B	Editor ID: 008-522-314-5
Batch ID: 07-2949-6214	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 24 Oct-23 18:53	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Ending Date: 31 Oct-23 18:50	Species: Pimephales promelas	Brine:
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <48
Sample ID: 15-1878-3368	Code: X8990	Project: WET Quarterly Compliance Test (4Q)
Sample Date: 23 Oct-23 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 23 Oct-23 12:27	CAS (PC):	Station: 001
Sample Age: 35h (2.3 °C)	Client: Magnolia Wastewater System	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	101% passed 7d survival rate endpoint	13.70%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Dilution Water		101% 100UV	8	0	1.86	0.1718	CDF	0.5000	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	0.9	0.8	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	1	0	1.0000	Non-Significant Effect
Error	0.170734	0.0213417	8			
Total	0.170734		9			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1	23.15	1.0000	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8199	0.7411	0.0253	Normal Distribution

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	5	0.9000	0.7701	1.0000	0.8750	0.7500	1.0000	0.0468	11.62%	0.00%
101% 100UV		5	0.9000	0.7701	1.0000	0.8750	0.7500	1.0000	0.0468	11.62%	0.00%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	5	1.2500	1.0690	1.4320	1.2090	1.0470	1.3930	0.0653	11.68%	0.00%
101% 100UV		5	1.2500	1.0690	1.4320	1.2090	1.0470	1.3930	0.0653	11.68%	0.00%

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	0.8750	0.7500	1.0000	0.8750	1.0000
101% 100UV		0.7500	1.0000	0.8750	1.0000	0.8750

Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	1.2090	1.0470	1.3930	1.2090	1.3930
101% 100UV		1.0470	1.3930	1.2090	1.3930	1.2090

0808
11/21/23

CETIS Analytical Report

Report Date: 09 Nov-23 14:04 (p 1 of 2)
Test Code/ID: 5D3D15FA / 15-6428-4410

Fathead Minnow 7-d Larval Survival and Growth Test

Bio-Analytical Laboratories

Analysis ID: 12-8190-3495	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETIS v2.1.5
Analyzed: 09 Nov-23 14:01	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 09 Nov-23 13:46	MD5 Hash: 7093B37DC0C580FBC7A05D8004E48644	Editor ID: 008-522-314-5
Batch ID: 07-2949-6214	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 24 Oct-23 18:53	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Ending Date: 31 Oct-23 18:50	Species: Pimephales promelas	Brine:
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <48
Sample ID: 15-1878-3368	Code: X8990	Project: WET Quarterly Compliance Test (4Q)
Sample Date: 23 Oct-23 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 23 Oct-23 12:27	CAS (PC):	Station: 001
Sample Age: 35h (2.3 °C)	Client: Magnolia Wastewater System	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	101% failed mean dry biomass-mg endpoint	21.93%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Dilution Water		101* 100UV	8	3.453	1.86	0.1064	CDF	0.0043	Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	0.485	0.25	>>	Yes	Passes Criteria
PMSD	0.2193	0.12	0.3	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0975102	0.0975102	1	11.92	0.0087	Significant Effect
Error	0.0654387	0.0081798	8			
Total	0.162949		9			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	5.345	23.15	0.1334	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.818	0.7411	0.0240	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	0.485	0.3392	0.6308	0.425	0.4125	0.6875	0.0525	24.20%	0.00%
101		5	0.2875	0.2245	0.3506	0.2875	0.225	0.3375	0.02271	17.66%	40.72%

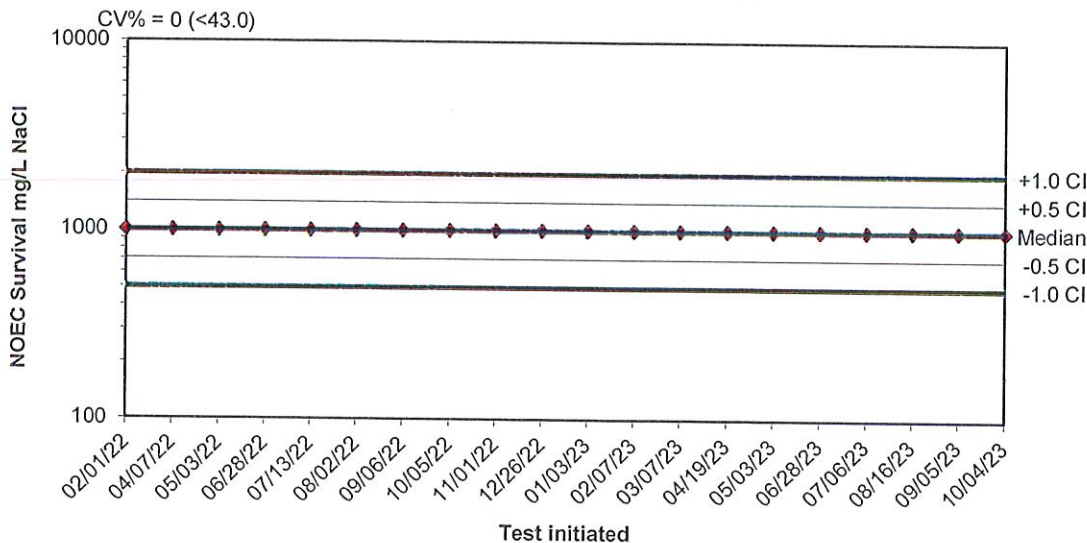
Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	0.4875	0.425	0.4125	0.4125	0.6875
101		0.25	0.3375	0.225	0.2875	0.3375

0.818
11/21/23

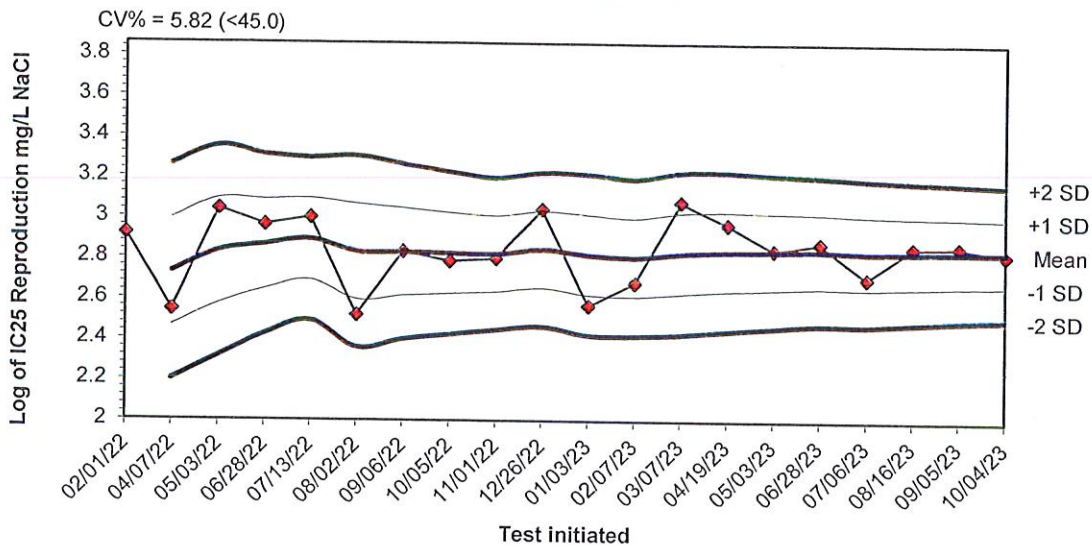
APPENDIX D
QUALITY ASSURANCE CHARTS

**CHRONIC REFERENCE TOXICANT TEST RESULTS FOR
 CERIODAPHНИЯ DUBIA IN SOFT WATER**

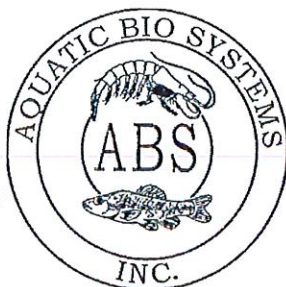


Dates	Values	Median	-0.5 CI	-1.0 CI	+0.5 CI	+1.0 CI
02/01/22	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
04/07/22	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
05/03/22	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
06/28/22	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
07/13/22	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
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

**CHRONIC REFERENCE TOXICANT TEST RESULTS FOR
 CERIODAPHНИЯ DUBIA IN SOFT WATER**



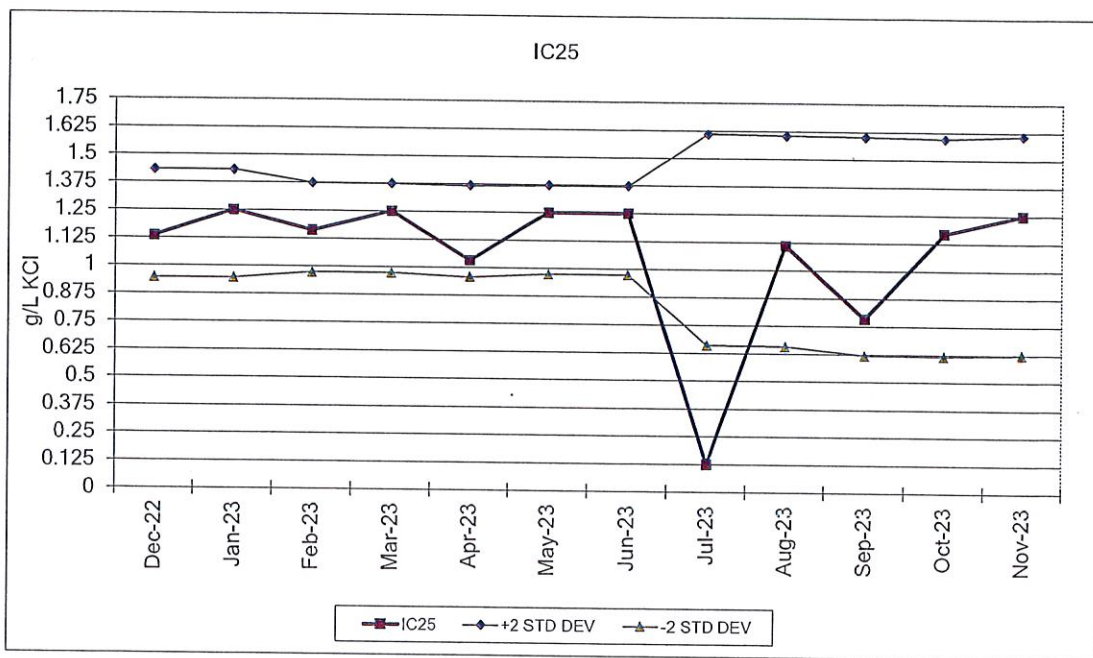
Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
02/01/22	2.9191					
04/07/22	2.5441	2.7316	2.4664	2.2012	2.9967	3.2619
05/03/22	3.0414	2.8348	2.5757	2.3166	3.0940	3.3531
06/28/22	2.9638	2.8671	2.6459	2.4247	3.0883	3.3095
07/13/22	3.0000	2.8937	2.6931	2.4925	3.0942	3.2948
08/02/22	2.5185	2.8311	2.5953	2.3594	3.0670	3.3029
09/06/22	2.8325	2.8313	2.6160	2.4007	3.0467	3.2620
10/05/22	2.7853	2.8256	2.6256	2.4256	3.0256	3.2256
11/01/22	2.7993	2.8227	2.6354	2.4481	3.0100	3.1973
12/26/22	3.0414	2.8445	2.6549	2.4652	3.0342	3.2238
01/03/23	2.5682	2.8194	2.6211	2.4229	3.0177	3.2160
02/07/23	2.6812	2.8079	2.6147	2.4215	3.0011	3.1943
03/07/23	3.0792	2.8288	2.6291	2.4294	3.0285	3.2282
04/19/23	2.9703	2.8389	2.6433	2.4478	3.0344	3.2300
05/03/23	2.8441	2.8392	2.6508	2.4623	3.0277	3.2161
06/28/23	2.8774	2.8416	2.6593	2.4770	3.0239	3.2062
07/06/23	2.7054	2.8336	2.6540	2.4744	3.0132	3.1928
08/16/23	2.8582	2.8350	2.6607	2.4863	3.0093	3.1836
09/05/23	2.8618	2.8364	2.6669	2.4973	3.0059	3.1754
10/04/23	2.8239	2.8358	2.6707	2.5057	3.0008	3.1658



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

IC 25 for Growth Test

Date	NOEC (g/L KCl)	LOEC (g/L KCl)
Jun-23	0.50	1.0
Jul-23	0.50	1.0
Aug-23	0.50	1.0
Sep-23	0.50	1.0
Oct-23	0.50	1.0
Nov-23	0.50	1.0

Date	IC25 g/L KCl	95% Confidence (upper)	(lower)	Avg. IC25 g/L KCl	+2 STD DEV	-2 STD DEV
Jun-23	1.250	1.250	1.250	1.173	1.374	0.973
Jul-23	0.125	1.705	0.074	1.136	1.611	0.660
Aug-23	1.110	1.316	0.320	1.131	1.606	0.657
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

**Current Test Dates: 11/1-8/2023

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	10/22/23		0800	10/23/23
Composite 2 Collected From:	0800	10/24/23		0800	10/25/23
Composite 3 Collected From:	0800	10/26/23		0800	10/27/23
Test initiated:	1725 am/pm			10/25/23	Date
Test terminated:	1630 am/pm			11/01/23	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	90.0	100.0
48h	100.0	90.0	100.0	100.0	90.0	100.0
End of test	100.0	90.0	100.0	100.0	90.0	100.0

NUMBER OF YOUNG PRODUCED PER FEMALE @ END OF TEST

Rep	0	32.0	42.0	56.0	80.0	100.0
1	23	22	25	25	27	32
2	23	25	23	25	23	23
3	25	18	22	25	24	27
4	24	24	25	29	25	25
5	15	26	14	29	27	28
6	22	D	16	27	19	30
7	11	24	23	18	D	24
8	14	23	22	29	31	27
9	24	12	27	28	26	29
10	26	16	22	26	14	16
Surv. Mean	20.7	21.1	21.9	26.1	24.0	26.1
Total Mean	20.7	19.0	21.9	26.1	21.6	26.1
CV%*	25.57	22.40	18.32	12.70	20.73	17.18

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

PMSD = 29.90%

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) ½ 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) 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 #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

Sample #1 Collected: Date: 10/23/2023 Time: 800
Sample #2 Collected: Date: 10/25/2023 Time: 800
Sample #3 Collected: Date: 10/27/2023 Time: 800
Test Begin: Date: 10/25/2023 Time: 1725
Test End: Date: 11/1/2023 Time: 1630

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	24.0	23.6	23.8	24.0	23.9	24.5	T (°C)	24.4	24.0	23.6	23.8	24.0	23.9	24.5
DO Initial	8.2	8.0	8.1	7.9	7.9	7.8	7.5	DO Initial	8.2	7.9	7.2	7.6	7.4	8.0	7.9
DO Final	7.5	7.5	7.3	7.7	7.7	8.0	7.7	DO Final	7.4	7.4	7.7	7.5	7.4	7.7	7.7
pH Initial	6.7	7.0	7.1	7.6	7.4	7.0	7.4	pH Initial	7.9	7.4	7.3	7.4	7.0	7.7	7.1
pH Final	7.3	7.4	7.4	7.9	7.4	7.1	7.4	pH Final	7.3	7.4	7.6	7.6	7.3	7.1	7.1
Conductivity	170.0	169.0	165.0	160.0	170.0	162.0		Conductivity	373.0	369.0	356.0	341.0	344.0	333.0	
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	24.0	23.6	23.8	24.0	23.9	24.5	T (°C)	24.4	24.0	23.6	23.8	24.0	23.9	24.5
DO Initial	8.2	8.0	8.1	7.9	7.6	8.0	7.6	DO Initial	8.2	8.0	7.9	7.6	7.5	8.1	7.4
DO Final	7.5	7.5	7.4	7.6	7.7	7.8	7.8	DO Final	7.5	7.4	7.4	7.5	7.7	7.5	7.4
pH Initial	7.0	7.3	7.2	7.3	7.4	6.9	7.2	pH Initial	7.9	7.0	7.4	7.2	7.4	7.8	7.6
pH Final	6.9	7.4	7.6	7.7	7.4	7.1	7.1	pH Final	7.2	7.1	7.6	7.6	7.3	7.1	7.1
Conductivity	284.0	281.0	276.0	278.0	265.0	256.0		Conductivity	454.0	445.0	438.0	437.0	414.0	401.0	
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	24.0	23.6	23.8	24.0	23.9	24.5	T (°C)	24.4	24.0	23.6	23.8	24.0	23.9	24.5
DO Initial	8.3	7.0	7.3	7.4	7.3	8.1	7.2	DO Initial	8.2	7.9	7.8	7.6	7.1	8.1	7.6
DO Final	7.4	7.4	7.7	7.6	7.7	8.2	7.4	DO Final	7.4	7.4	7.4	7.5	7.6	7.1	7.1
pH Initial	7.7	7.4	7.2	7.2	7.3	7.6	7.4	pH Initial	8.0	7.5	7.6	7.5	7.1	7.8	7.2
pH Final	6.9	7.0	7.6	7.7	7.1	7.1	7.1	pH Final	7.1	7.1	7.6	7.7	7.4	7.1	7.1
Alkalinity								Alkalinity	180.0		168.0			156.0	
Hardness								Hardness	24.0		32.0			24.0	
Conductivity	303.0	309.0	309.0	296.0	295.0	285.0		Conductivity	521.0	519.0	510.0	511.0	493.0	468.0	
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	To	Time	Date
Composite 1 Collected from:	0800	10/22/23		0800	10/23/23
Composite 2 Collected from:	0800	10/24/23		0800	10/25/23
Composite 3 Collected from:	0800	10/26/23		0800	10/27/23

Test initiated:	1853	am/pm	10/24/23	Date
Test terminated:	1850	am/pm	10/31/23	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	87.5	75.0	100.0	87.5	100.0	100.0	97.5	90.0	11.68
32.0	100.0	100.0	87.5	75.0	100.0	100.0	100.0	92.5	12.12
42.0	100.0	100.0	87.5	75.0	100.0	97.5	97.5	92.5	12.12
56.0	87.5	87.5	87.5	100.0	100.0	100.0	97.5	92.5	7.84
80.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.00
100.0	62.5	87.5	100.0	100.0	87.5	100.0	87.5	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	0.488	0.425	0.413	0.413	0.688	0.485	24.20
32.0	0.463	0.413	0.575	0.400	0.538	0.478	16.07
42.0	0.325	0.388	0.325	0.313	0.438	0.358	14.96
56.0	0.388	0.375	0.400	0.475	0.388	0.405	9.91
80.0	0.413	0.425	0.425	0.350	0.350	0.393	9.97
100.0	0.250	0.338	0.338	0.313	0.275	0.303	12.87

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

PMSD = 20.73%

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	80.0% effluent

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

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

Sample #1 Collected: 10/23/2023 Time: 800
Sample #2 Collected: 10/25/2023 Time: 800
Sample #3 Collected: 10/27/2023 Time: 800
Test Begin: 10/24/2023 Time: 1853
Test End: 10/31/2023 Time: 1850

Dilution: 0%							Dilution: 56.0%								
Day:	1	2	3	4	5	6	7	Day:	1	2	3	4	5	6	7
T (°C)	25.0	23.8	23.5	25.0	23.8	24.0	24.7	T (°C)	25.0	23.8	23.5	25.0	23.8	24.0	24.7
DO Initial	7.2	6.8	6.9	7.2	7.1	7.2	7.6	DO Initial	7.3	6.0	6.5	6.9	6.5	6.8	7.4
DO Final	7.4	7.5	7.5	7.5	7.4	7.5	7.4	DO Final	7.0	7.5	7.4	7.7	7.3	7.4	7.1
pH Initial	7.0	7.6	7.0	7.3	7.3	7.3	7.4	pH Initial	7.4	7.2	7.3	7.4	7.2	7.0	7.1
pH Final	7.5	6.9	7.0	8.0	7.5	7.4	7.4	pH Final	7.7	7.3	7.0	7.5	7.5	7.3	7.3
Conductivity	171.0	167.0	170.0	169.0	169.0	170.0		Conductivity	369.0	366.0	375.0	365.0	354.0	347.0	
Alkalinity	36.0			36.0				Alkalinity							
Hardness	52.0			56.0				Hardness							
Chlorine	<0.5			<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)	25.0	23.8	23.5	25.0	23.8	24.0	24.7	T (°C)	25.0	23.8	23.5	25.0	23.8	24.0	24.7
DO Initial	7.6	6.5	6.5	6.5	6.2	6.0	7.7	DO Initial	7.4	5.2	6.2	6.5	7.0	6.9	7.7
DO Final	7.4	7.5	7.5	7.3	7.4	7.4	7.1	DO Final	7.4	7.7	7.4	7.4	7.4	7.5	7.1
pH Initial	7.5	6.9	7.0	7.3	7.3	7.2	7.1	pH Initial	7.3	7.3	7.5	7.4	7.3	7.0	7.1
pH Final	7.5	6.9	7.0	7.7	7.5	7.4	7.4	pH Final	7.6	7.3	7.1	7.5	7.5	7.3	7.3
Conductivity	289.0	288.0	286.0	284.0	280.0	269.0		Conductivity	444.0	444.0	450.0	450.0	455.0	420.0	
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)	25.0	23.8	23.5	25.0	23.8	24.0	24.7	T (°C)	25.0	23.8	23.5	25.0	23.8	24.0	24.7
DO Initial	7.2	6.3	6.4	6.2	7.0	7.1	7.7	DO Initial	7.6	5.1	6.3	6.3	6.0	6.2	7.7
DO Final	7.4	7.5	7.5	7.4	7.4	7.5	7.1	DO Final	7.4	7.0	7.4	7.4	7.7	7.4	7.4
pH Initial	7.4	7.0	7.2	7.4	7.2	7.4	7.1	pH Initial	7.4	7.4	7.5	7.2	7.0	7.2	7.4
pH Final	7.6	7.0	7.0	7.3	7.5	7.3	7.3	pH Final	7.7	7.3	7.1	7.4	7.5	7.3	7.3
Conductivity	313.0	309.0	315.0	299.0	308.0	299.0		Conductivity	513.0	516.0	522.0	524.0	530.0	495.0	
Alkalinity								Alkalinity	168.0	180.0		168.0			
Hardness								Hardness	24.0	24.0		32.0			
Chlorine								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#: X8990

Chain of Custody Documents Checked by: ECB 11/21/23
Technician/Date

Raw Data Documents Checked by: ECB 11/21/23
Technician/Date

Statistical Analysis Package Checked by: ECB 11/21/23
Quality Manager/Date

Quality Control Data Checked by: ECB 11/21/23
Quality Manager/Date

Report Checked by: ECB 11/27/23
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.

David L. Beupp, BS
Quality Manager

11/27/23
Date

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