

Bio-Analytical Laboratories' Executive Summary

Permittee: Magnolia Wastewater System
Columbia Road
Magnolia, AR

Project #: X8634

Outfall: 001 (treated domestic wastewater)

Permit #: AR0043613/ AFIN 14-00059

Contact: Tracie Love

Test Dates: January 24 – 31, 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 – 21.19%.
6. PMSD Reproduction = 26.68%(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 – 16.55%.
6. PMSD Biomass =29.06% (12.0 – 30.0%)- moderate precision, acceptable for passing test

This report contains a total of 57 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 X8634

Test Dates: January 24 – 31, 2023

Report Date: February 20, 2023

Prepared for:

Tracie Love
Magnolia Wastewater System
P.O. Box 666
Magnolia, AR 71753

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ADEQ #88-0630

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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 also raised in-house and were less than 24 hours old at test initiation. 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 January 23, 25 and 27, 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 0.8, 1.3 and 0.8⁰ 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 (biomass) 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 24.0 and 26.0, 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, 95.0 percent survival occurred in the control and 88.0 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 0.610 milligram (mg). The NOEC for survival and growth in this test was 100.0 percent effluent (p=.05). Treating the effluent with UV light did not increase or decrease the toxicity of the effluent.

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		24.0	24.0	
32.0	100.0		28.0	28.0	
42.0	100.0		28.0	28.0	
56.0	100.0		29.0	29.0	
80.0	90.0		29.0	26.0	
100.0	100.0		27.0	27.0	

*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	95.0		0.610	
32.0	95.0		0.620	
42.0	92.0		0.590	
56.0	95.0		0.670	
80.0	98.0		0.710	
100.0	88.0		0.610	
100.0 UV	98.0		0.610	

*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 January 23, 25 and 27, 2023, were not found to be lethally toxic to the *Ceriodaphnia dubia* test organisms nor the *Pimephales promelas* test organisms 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 (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: X8634	
Address: P.O. Box 666, Magnolia, AR 71753		Fax: (870) 234-2203		Temp. upon arrival: 0.8°C Therm #: 29	
Permit #: AR0043613/AFIN 14-00059		Purchase Order:		Color: clear	
Sampler's Signature/Printed Name/Affiliation: <i>Joni Love/Trace Love/MWWS</i>		Lab Control Number: CAU319		Odor: none Tech: gdw	
Date Start Date End	Time Start Time End	C	G	# and type of container	Sample Identification
1/23/23 - 1/23/23	800 - 800	X		8 half gallons	001
Relinquished by/Affiliation: <i>Joni Love/MWWS</i>		Date: 1/23/23 Time: 8:41A		Received by/Affiliation: <i>Joni Love</i>	
Relinquished by/Affiliation: <i>Joni Love</i>		Date: 1/23/23 Time: 9:52A		Received by/Affiliation: <i>Emm...</i>	
Relinquished by/Affiliation:		Date:		Received by/Affiliation:	
Method of Shipment:		Lab	Bus	Fed Ex	DHL
Comments:		UPS	Client	Other	Tracking #
COC Rev.3.1					

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

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 Doyline, LA 71023



Laboratory Use Only:

Company: City of Magnolia		Phone: (870) 234-2955		Project Number: X8634	
Address: P.O. Box 666, Magnolia, AR 71753		Fax: (870) 234-2203		Temp. upon arrival: 1.5 Therm #: 87	
Permit #: AR0043613/AFIN 14-00059		Purchase Order:		Color: 2.000M	
Sampler's Signature/Printed Name/Affiliation: <i>Michelle Trave Love / MWS</i>		Lab Control Number: CA337		Odor: none Tech: SQW	
Date Start Date End 1/24/23 - 1/25/23		Time Start Time End 800 - 800		Preservative: (below) ICE	
Date 1/25/23		G X		Sample Identification 001	
Time 8:54A		# and type of container 8 half gallons			
Received by/Affiliation: <i>Teru Lee</i>		Received by/Affiliation: <i>Teru Lee</i>		Date: 1/25/23 Time: 8:54A	
Relinquished by/Affiliation: <i>Teru Lee</i>		Relinquished by/Affiliation: <i>Teru Lee</i>		Date: 1/25/23 Time: 11:02A	
Relinquished by/Affiliation: 		Relinquished by/Affiliation: 		Date: Time:	
Method of Shipment:		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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Company: City of Magnolia		Phone: (870) 234-2955		Project Number: X8634	
Address: P.O. Box 666, Magnolia, AR 71753		Fax: (870) 234-2203		Temp. upon arrival: 0.8 Therm #: 29	
Permit #: AR0043613/AFIN 14-00059		Purchase Order:		Color: clear Odor: none Tech: gon	
Sampler's Signature/Printed Name/Affiliation: [Signature] / Trace Love / MWWS					
Date Start Date End		C		G	
1/24/23 - 1/27/23		X		8 half gallons	
Time Start Time End		# and type of container		Sample Identification	
8:00 - 8:00		X		001	
Date		Received by/Affiliation:		Date	
1/27/23		[Signature] / Trace Love		1/27/23	
Time		Received by/Affiliation:		Time	
9:13A		[Signature] / Trace Love		9:13A	
Date		Received by/Affiliation:		Date	
1/27/23		[Signature] / Trace Love		1/27/23	
Time		Received by/Affiliation:		Time	
11:04		[Signature] / Trace Love		11:04	
Date		Received by/Affiliation:		Date	
1/27/23		[Signature] / Trace Love		1/27/23	
Time		Received by/Affiliation:		Time	
11:04		[Signature] / Trace Love		11:04	
Method of Shipment: Lab ___ Bus ___ Fed Ex ___ DHL ___ UPS ___ Client ___ Other ___ Tracking # ___					
Comments:					
COC Rev.3.1					

APPENDIX B
RAW DATA SHEETS

BIO-ANALYTICAL LABORATORIES CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST

Project# X8634 Date start: 1/24/23 Date end: 1/31/23

Client/Contact: MAGN/Magnolia Waste Water
 Address: P.O. Box 666 Magnolia AR 71753
 NPDES#: AR0043613
 Sample Description: 001 Dilution Water: Soft Reconstituted
 Test Temperature(°C) 25+1° Technicians: EGB/EDW/AM/PM

Adults isolated: Date 1/23/23 Time: 1900

Neonates collected: Date 1/23/23 Time: 2345 Board: V105
 Dissolved Oxygen Meter: Model YSI550 Serial #02F0741 AH
 pH Meter: Model Orion 230A+ Serial #015253
 Conductivity Meter: Model YSI EC300A Serial# JC02714

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>8.2/99.8%/EDW</u>	0. <u>NO/EDW</u>	0. _____	0. _____
1. <u>9.5/112.5%/AM</u>	1. <u>Y/6/8.2/97.7%/AM</u>	1. _____	1. _____
2. <u>8.6/102.8%/AM</u>	2. <u>Y/6/8.3/98.1%/AM</u>	2. _____	2. _____
3. <u>9.0/106.8%/EDW</u>	3. <u>Y/6/8.3/99.1%/EDW</u>	3. _____	3. _____
4. <u>8.2/99.8%/EDW</u>	4. <u>NO/EDW</u>	4. _____	4. _____
5. <u>8.4/100.2%/EDW</u>	5. <u>NO/EDW</u>	5. _____	5. _____
6. <u>8.3/100.1%/EDW</u>	6. <u>NO/EDW</u>	6. _____	6. _____
7. _____	7. _____	7. _____	7. _____

Total Residual Chlorine (mg/L)/Tech	Dechlorinated? Amount?/Tech	Ammonia (NH3) (mg/L)/Tech	BAL Sample # Date in Use
1. <u><0.5/EDW</u>	1. <u>NO/EDW</u>	1. <u><0.5/EDW</u>	1. <u>C24319 1/24/23</u>
2. <u><0.5/AM</u>	2. <u>NO/AM</u>	2. <u><0.5/AM</u>	2. <u>C24537 1/26/23</u>
3. <u><0.5/EDW</u>	3. <u>NO/EDW</u>	3. <u><0.5/EDW</u>	3. <u>C24351 1/28/23</u>

Comments:

Project# X8634 Client City of Magnolia

Sample ID 001

Test started: Date 1/24/83 Time 1615 Test ended: Date 1/31/83 Time 1532

Date/Tech: Day 0 1/24/83 1 1/25/83 2 1/26/83 3 1/27/83 4 1/28/83 5 1/29/83 6 1/30/83 7 1/31/83 8

Time: Day 0 1615 1 1549 2 1502 3 1315 4 1435 5 1420 6 61515 7 1532 8

Temp. (°C): Day 0 24.0 1 23.8 2 23.1 3 24.7 4 24.8 5 24.9 6 24.8 7 23.7 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	1/7	1/2	1/3	1/1	1/2	1/3	1/4	1/5	1/2	1/3	10
	5	0	0	0	0	0	2/9	0	2/7	0	0	10
	6	2/7	0	2/13	2/12	2/12	0	2/9	3/15	2/5	2/4	10
	7	3/17	2/14	3/13	3/14	3/8	3/14	3/12	0	3/12	3/6	10
	8											
32.0	1	0										10
	2	0										10
	3	0										10
	4	1/1	0	1/2	1/3	1/2	1/2	1/3	1/3	1/2	1/5	10
	5	1/3	1/5	0	0	0	0	2/9	2/10	0	0	10
	6	0	2/17	2/12	2/13	2/14	2/10	0	0	2/13	2/13	10
	7	2/13	3/12	3/17	3/12	3/15	3/11	3/11	3/17	3/17	3/18	10
	8											
42.0	1	0										10
	2	0										10
	3	0										10
	4	1/3	1/2	1/3	1/4	1/3	1/2	1/3	1/2	1/3	1/3	10
	5	0	2/9	0	0	0	2/7	0	0	0	0	10
	6	2/10	0	2/9	2/13	2/12	0	2/12	2/10	2/12	2/10	10
	7	0	3/21	3/16	3/15	3/14	3/14	3/17	3/12	3/22	3/13	10
	8											
56.0	1	0										10
	2	0										10
	3	0										10
	4	1/2	1/3	1/3	1/2	1/3	1/2	1/3	1/2	1/4	1/5	10
	5	2/9	0	0	0	2/9	2/7	2/6	0	0	0	10
	6	3/13	2/13	2/13	2/13	0	0	0	2/10	2/13	2/13	10
	7	0	3/15	3/16	3/11	3/14	3/17	3/19	3/16	3/15	3/17	10
	8											
80.0	1	0										10
	2	0										10
	3	0										10
	4	1/2	1/3	1/4	1/5	1/4	1/3	1/2	1/1	1/2	1/3	10
	5	2/8	2/7	0	0	0	X	2/9	1/3	0	0	9
	6	3/14	0	2/13	2/13	2/13		0	0	2/13	2/13	9
	7	3/14	3/14	3/15	3/14	3/13		3/18	2/13	3/11	3/14	9
	8											
100.0	1	0										10
	2	0										10
	3	0										10
	4	1/4	1/3	1/2	1/5	1/2	1/3	1/2	1/3	1/4	1/3	10
	5	2/9	2/6	0	0	0	0	2/6	2/9	0	0	10
	6	0	0	2/13	2/9	2/13	2/12	0	0	2/12	2/12	10
	7	3/14	3/15	3/17	3/13	3/8	3/16	3/15	3/13	3/15	3/16	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# X8634 Client City of Magnolia Organism C. dubia

Date	Day 0 <u>1/24/23</u> 5322	Day 1 <u>1/25/23</u>	Day 2 <u>1/26/23</u>	Day 3 <u>1/27/23</u>	Day 4 <u>1/28/23</u>	Day 5 <u>1/29/23</u>	Day 6 <u>1/30/23</u>	Day 7 <u>1/31/23</u>	Day 8
Concentration:	0 Soft				5330				
Temperature (°C)	24.7	23.7	22.4	23.1	24.1	23.7	22.9	24.1	
pH	7.4	6.7	6.8	7.1	7.2	7.4	7.1	6.7	
DO (mg/L)	7.5	8.4	8.1	7.4	7.3	7.6	8.1	8.0	
Cond (umhos/cm)	165	163	165	154	158	176	160		
Concentration:	32.0%								
Temperature (°C)	24.6	23.7	22.4	23.1	23.7	24.1	23.1	24.1	
pH	7.1	6.8	6.8	7.0	7.2	7.4	7.3	6.9	
DO (mg/L)	7.6	8.2	8.1	7.0	7.1	7.3	7.1	8.2	
Cond (umhos/cm)	198	208	211	194	168	173	166		
Concentration:	42.0%								
Temperature (°C)	24.4	23.4	22.2	23.1	24.1	23.9	23.1	24.3	
pH	6.9	6.9	6.8	7.1	7.2	7.3	7.2	7.1	
DO (mg/L)	7.1	8.0	8.1	7.2	7.1	7.2	7.1	8.0	
Cond (umhos/cm)	213	222	227	209	169	173	166		
Prerenewal Tech Initials/Time		AM 1552	AM 1705	EDU 1315	EDU 1435	EDU 1420	EDU 1515	AM 1535	
Postrenewal Tech Initials/Time	EDU 1100	AM 1216	AM 1239	EDU 0940	EDU 1630	EDU 1030	EDU 1000		

Control Alkalinity (mg/L as CaCO₃)

Control Hardness (mg/L as CaCO₃)

ID# 5322 Result 24.0 Date Tested 1/16/23 ID# 5322 Result 40.0 Date Tested 1/19/23
 ID# 5330 Result 44.0 Date Tested 2/2/23 ID# 5330 Result 68.0 Date Tested 2/2/23
 ID# _____ Result _____ Date Tested _____ ID# _____ Result _____ Date Tested _____

Sample Alkalinity (mg/L as CaCO₃)

Sample Hardness (mg/L as CaCO₃)

ID# 24319 Result 52.0 Date Tested 1/16/23 ID# 24319 Result 28.0 Date Tested 1/26/23
 ID# 24337 Result 40.0 Date Tested 1/26/23 ID# 24337 Result 36.0 Date Tested 1/26/23
 ID# 24351 Result 28.0 Date Tested 2/2/23 ID# 24351 Result 24.0 Date Tested 2/2/23

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

Project# X8634 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>56.0%</u>									
Temperature (°C)	<u>24.2</u>	<u>23.7</u> <u>25.4</u>	<u>24.1</u> <u>24.9</u>	<u>23.7</u> <u>22.1</u>	<u>24.1</u> <u>23.7</u>	<u>24.1</u> <u>24.9</u>	<u>23.1</u> <u>24.4</u>	<u>24.3</u>	
pH	<u>6.7</u>	<u>7.0</u> <u>7.4</u>	<u>6.8</u> <u>7.4</u>	<u>7.0</u> <u>7.1</u>	<u>7.1</u> <u>7.0</u>	<u>7.2</u> <u>7.3</u>	<u>7.4</u> <u>7.1</u>	<u>7.0</u>	
DO (mg/l)	<u>7.2</u>	<u>7.6</u> <u>7.7</u>	<u>8.1</u> <u>7.8</u>	<u>7.6</u> <u>7.8</u>	<u>7.5</u> <u>7.7</u>	<u>7.3</u> <u>7.4</u>	<u>7.3</u> <u>7.3</u>	<u>8.1</u>	
Cond (umhos/cm)	<u>228</u>	<u>245</u>	<u>238</u>	<u>229</u>	<u>174</u>	<u>174</u>	<u>168</u>		
Concentration: <u>80.0%</u>									
Temperature (°C)	<u>24.1</u>	<u>23.7</u> <u>25.3</u>	<u>22.1</u> <u>24.9</u>	<u>23.1</u> <u>22.2</u>	<u>23.9</u> <u>23.1</u>	<u>23.9</u> <u>24.9</u>	<u>24.1</u> <u>24.0</u>	<u>24.2</u>	
pH	<u>6.7</u>	<u>7.1</u> <u>7.3</u>	<u>6.6</u> <u>7.4</u>	<u>7.0</u> <u>6.7</u>	<u>7.1</u> <u>6.7</u>	<u>7.1</u> <u>7.3</u>	<u>7.2</u> <u>7.1</u>	<u>7.2</u>	
DO (mg/l)	<u>7.9</u>	<u>7.5</u> <u>8.0</u>	<u>8.1</u> <u>7.8</u>	<u>7.6</u> <u>8.0</u>	<u>7.4</u> <u>7.9</u>	<u>7.2</u> <u>6.9</u>	<u>7.5</u> <u>7.9</u>	<u>8.1</u>	
Cond (umhos/cm)	<u>256</u>	<u>265</u>	<u>255</u>	<u>260</u>	<u>179</u>	<u>184</u>	<u>173</u>		
Concentration: <u>100.0%</u>									
Temperature (°C)	<u>23.9</u>	<u>23.8</u> <u>24.7</u>	<u>22.1</u> <u>24.9</u>	<u>23.1</u> <u>22.3</u>	<u>24.1</u> <u>23.1</u>	<u>24.1</u> <u>24.7</u>	<u>24.2</u> <u>23.1</u>	<u>24.4</u>	
pH	<u>6.9</u>	<u>7.1</u> <u>7.2</u>	<u>6.8</u> <u>7.03</u>	<u>7.0</u> <u>7.1</u>	<u>7.2</u> <u>7.1</u>	<u>7.3</u> <u>7.1</u>	<u>7.3</u> <u>7.1</u>	<u>7.2</u>	
DO (mg/l)	<u>8.2</u>	<u>7.5</u> <u>8.2</u>	<u>8.0</u> <u>7.9</u>	<u>7.6</u> <u>8.1</u>	<u>7.4</u> <u>7.2</u>	<u>7.3</u> <u>7.3</u>	<u>7.3</u> <u>7.6</u>	<u>8.1</u>	
Cond (umhos/cm)	<u>277</u>	<u>287</u>	<u>274</u>	<u>288</u>	<u>185</u>	<u>189</u>	<u>189</u>		
Prerenewal Tech Initials/Time		<u>1552</u> <u>AY</u>	<u>1705</u> <u>AY</u>	<u>EDU</u> <u>1315</u>	<u>EDU</u> <u>1435</u>	<u>EDU</u> <u>1420</u>	<u>EDU</u> <u>1515</u>	<u>1535</u> <u>AY</u>	
Postrenewal Tech Initials/Time	<u>EDU</u> <u>1100</u>	<u>1216</u> <u>AY</u>	<u>1239</u> <u>AY</u>	<u>EDU</u> <u>1040</u>	<u>EDU</u> <u>1030</u>	<u>EDU</u> <u>1030</u>	<u>EDU</u> <u>1000</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 Jan-23 15:14 (p 1 of 2)
 Test Code/ID: 352B7A8 / 00-5575-2616

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

Start Date: 24 Jan-23 15:20 Species: Ceriodaphnia dubia Sample Code: 372ADD53
 End Date: 31 Jan-23 13:50 Protocol: EPA/821/R-02-013 (2002) Sample Source: AR0043613
 Sample Date: 23 Jan-23 08:00 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
0	D	9	1	1									0
80		5	2	1									0
32		2	3	1									0
80		8	4	1									0
80		10	5	1									0
32		1	6	1									0
42		10	7	1									0
42		2	8	1									0
80		2	9	1									0
100	•	5	10	1									0
0	D	4	11	1									0
80		6	12	1									0
56		6	13	1									0
0	D	3	14	1									0
100		6	15	1									0
32		4	16	1									0
56		5	17	1									0
32		3	18	1									0
56		3	19	1									0
56	•	2	20	1									0
42		4	21	1									0
100		4	22	1									0
32		7	23	1									0
80		4	24	1									0
42	—	5	25	1									0
32		8	26	1									0
100		7	27	1									0
0	D	2	28	1									0
32		10	29	1									0
56	•	10	30	1									0
42		1	31	1									0
56		4	32	1									0
32		5	33	1									0
100		8	34	1									0
42		3	35	1									0
42		9	36	1									0
0	D	7	37	1									0
0	D	6	38	1									0
100		3	39	1									0
100	•	9	40	1									0
0	D	8	41	1									0
100		10	42	1									0

CETIS Test Data Worksheet

Report Date: 23 Jan-23 15:14 (p 2 of 2)
 Test Code/ID: 352B7A8 / 00-5575-2616

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

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# 4E
- Set #2
4,6,2,3,5,1 Parent# 4H
- Set #3
3,2,1,5,6,4 Parent# 5B
- Set #4
6,4,3,5,1,2 Parent# 5D
- Set #5
5,2,1,3,6,4 Parent# 5C
- Set #6
1,2,3,4,6,5 Parent# 3C
- Set #7
4,1,5,3,6,2 Parent# 4I
- Set #8
6,5,4,2,1,3 Parent# 4G
- Set #9
4,6,5,1,2,3 Parent# 7C
- Set #10
3,5,2,6,1,4 Parent# 7H

EDC
1/24/23

BIO-ANALYTICAL LABORATORIES
PIMEPHALES PROMELAS SURVIVAL AND GROWTH DATA SHEET

Project# X8634 Date started: 1/24/23 Date ended 1/31/23

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 Temperature (°C) 25+1° Celsius Technicians EGB/EDW/AM/PM
Test organism age <24 hours Vendor/ID# BAL 012323

Feeding Times

Day	Technician/Time/Amount (per replicate)		
	AM	NOON	PM
0			EDW/1800/0.20mL
1	AM/0920/0.1mL	AM/1145/0.1mL	PM/1115/0.1mL
2	AM/1085/0.1mL	PM/1240/0.1mL	PM/2000/0.1mL
3	AM/1083/0.1mL	EDW/1140/0.10mL	EDW/1730/0.10mL
4	EDW/0920/0.20mL		EDW/1630/0.20mL
5	EDW/0900/0.20mL		EDW/1645/0.20mL
6	PM/0905/0.1mL	PM/1315/0.1mL	PM/1910/0.1mL

Dissolved Oxygen Meter: Model YSI550 Serial #02F0741 AH
pH Meter: Model Orion 230A+ Serial #015253
Conductivity Meter: Model YSI EC300A Serial #JC02714

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. 8.2/99.8%/EDW	0. NO/EDW	0. _____	0. _____
1. 9.5/112.5%/AM	1. y/6/8.2/97.7%/AM	1. _____	1. _____
2. 8.6/102.8%/AM	2. y/6/8.3/98.1%/AM	2. _____	2. _____
3. 9.0/106.8%/EDW	3. x/6/8.3/99.1%/EDW	3. _____	3. _____
4. 8.2/99.8%/EDW	4. NO/EDW	4. _____	4. _____
5. 8.4/100.2%/EDW	5. NO/EDW	5. _____	5. _____
6. 8.3/100.1%/EDW	6. NO/EDW	6. _____	6. _____

Total Residual Chlorine (mg/L)/Tech	Dechlorinated? Amount?/Tech	Ammonia (NH3) (mg/L)/Tech	BAL Sample # Date in use
1. <0.5/EDW	1. NO/EDW	1. <0.5/EDW	1. C24319 1/24/23
2. <0.5/AM	2. NO/AM	2. <0.5/AM	2. C24337 1/26/23
3. <0.5/EDW	3. NO/EDW	3. <0.5/EDW	3. C24351 1/28/23

Comments:

08/12/23

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

Project# X8634 Test started: Date 11/13/23 Time 1540

Client (+) of magnolia Sample ID 001 Test ended: Date 11/31/23 Time 1418

Date/Tech: Day 0 11/23/23 1 11/25/23 2 11/26/23 3 11/27/23 4 11/28/23 5 11/29/23 6 11/30/23 7 11/31/23

Time: Day 0 1540 1 1249 2 1510 3 1020 4 1205 5 1107 6 1100 7 1418

Temp (°C) Day 0 24.4 1 25.7 2 26.0 3 24.5 4 24.4 5 24.3 6 24.4 7 24.4

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	8	7	7
	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	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	7	7
	4	8	8	8	8	7	7	7	7
	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	7	7	6	6
	3	8	8	8	8	8	8	8	8
	4	8	8	8	8	8	8	8	8
	5	8	8	8	8	7	7	7	7
56.0	1	8	8	8	8	8	8	8	8
	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	7	7
	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	7	7	7	7	7
100.0	1	8	8	8	8	8	8	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	7	7
	5	8	8	8	8	8	8	8	7

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

Project# X8634 Test started: Date 11/22/23 Time 1540

Client City of Magnolia Sample ID 001 Test ended: Date 11/31/23 Time 1415

Date/Tech: Day 0 1/24/23/6001 1 1/25/23/602 2 1/26/23/603 3 1/27/23/604 4 1/28/23/605 5 1/29/23/606 6 1/30/23/607 7 1/31/23/608

Time: Day 0 1540 1 1249 2 1510 3 1220 4 1205 5 1107 6 1100 7 1218

Temp (°C) Day 0 24.4 1 24.6 2 25.0 3 24.5 4 24.4 5 24.3 6 24.4 7 24.4

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

Project#/Client: X8634 Magnolia Temp Start (°C): 101.9 Tech: AM Date: 1/31/23 Time: 1420
Temp End (°C): 109 Tech: gan Date: 2/1/23 Time: 0920

Conc. %	Replicate/ Pan number	Wt. of pan(g)/ Date: <u>1/26/23</u> weighed: Tech: <u>AM</u>	Wt. of pan + larvae(g)/ Date: <u>2/1/23</u> weighed: Tech: <u>gan</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*
0	1 61	2.1976	2.2030				
	2 62	2.1914	2.1970				
	3 63	2.1886	2.1940				
	4 64	2.1985	2.2025				
	5 65	2.1895	2.1935				
32%	1 66	2.1816	2.1889				
	2 67	2.1927	2.1979				
	3 68	2.1891	2.1942				
	4 69	2.1880	2.1913				
	5 70	2.1823	2.1863				
42%	1 71	2.1796	2.1854				
	2 72	2.1783	2.1828				
	3 73	2.1830	2.1866				
	4 74	2.1783	2.1828				
	5 75	2.1763	2.1816				
56%	1 76	2.1932	2.1983				
	2 77	2.1643	2.1707				
	3 78	2.1925	2.1973				
	4 79	2.1801	2.1849				
	5 80	2.1761	2.1817				
80%	1 81	2.1779	2.1835				
	2 82	2.1816	2.1874				
	3 83	2.1998	2.2051				
	4 84	2.1779	2.1833				
	5 85	2.1913	2.1976				
100%	1 86	2.1806	2.1847				
	2 87	2.1840	2.1887				
	3 88	2.1904	2.1961				
	4 89	2.1657	2.1705				
	5 90	2.1880	2.1932				

* Test acceptance of control weight based on surviving larvae at end of test.
Calculated by: CETIS Calculations checked by: EUR 2/13/23

BIO-ANALYTICAL LABORATORIES MINNOW LARVAL GROWTH DATA SHEET (Minnow3 Rev 2)

Project#/Client X 8634
Magnolia

Temp Start (°C) 10.9
Temp End (°C) 10.9

Tech AM
Tech EM

Date: 1/31/23 Time: 1420
Date: 2/1/23 Time: 0930

Conc.	Replicate/ Pan number	Wt. of pan(g)/ Date <u>1/26/23</u> Tech: <u>AM</u>	Wt. of pan + larvae(g)/ Date <u>2/1/23</u> Tech: <u>EM</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*
<u>2</u> <u>10</u>	1	<u>91</u>	<u>2.1969</u>	<u>2.2032</u>			
	2	<u>92</u>	<u>2.1902</u>	<u>2.1937</u>			
	3	<u>93</u>	<u>2.1898</u>	<u>2.1946</u>			
	4	<u>94</u>	<u>2.1860</u>	<u>2.1918</u>			
	5	<u>95</u>	<u>2.2029</u>	<u>2.2068</u>			
<u>100%</u> <u>UV</u>	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: EBB 2/13/23

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

Project# 88634 Client City of Magnolia Organism P. promelas

Date	Day 0 1/24/23 5324	Day 1 1/25/23	Day 2 1/26/23	Day 3 1/27/23	Day 4 1/28/23	Day 5 1/29/23	Day 6 1/30/23	Day 7 1/31/23	Day 8
Concentration:	0 soft								
Temperature (°C)	25.0	24.3	25.0	23.1	24.1	23.1	24.1	24.4	
pH	7.1	6.5	6.3	7.1	7.2	7.4	7.5	6.4	
DO (mg/l)	7.6	7.2	6.0	7.0	7.1	7.6	7.3	6.7	
Cond (umhos/cm)	158	171	169	159	177	176	154		
Concentration:	32.0%								
Temperature (°C)	24.8	24.3	24.8	23	23.9	24.1	23.9	24.5	
pH	7.1	6.6	6.6	7.1	7.2	7.4	7.4	6.4	
DO (mg/l)	7.7	7.0	6.3	7.4	7.1	7.6	7.5	6.3	
Cond (umhos/cm)	200	209	214	195	167	170	157		
Concentration:	42.0%								
Temperature (°C)	24.8	24.3	24.8	23.6	23.1	23.9	24.1	24.6	
pH	7.9	6.9	6.7	7.0	7.1	7.1	7.2	6.4	
DO (mg/l)	7.8	6.9	6.3	6.9	7.4	7.3	7.1	6.0	
Cond (umhos/cm)	214	222	228	211	167	173	162		
Prerenewal Tech Initials/Time		1303 AM	1513 AM	EDW 1050	EDW 1205	EDW 1107	EDW 1100	1425 AM	
Postrenewal Tech Initials/Time	EDW 1050	1223 AM	1225 AM	EDW 0940	EDW 1030	EDW 1035	EDW 0950		

Control Alkalinity (mg/L as CaCO₃)

Control Hardness (mg/L as CaCO₃)

ID# 5324 Result 40.0 Date Tested 1/26/23 ID# 5324 Result 48.0 Date Tested 1/26/23
 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# 24319 Result 52.0 Date Tested 1/26/23 ID# 24319 Result 28.0 Date Tested 1/26/23
 ID# 24337 Result 40.0 Date Tested 1/26/23 ID# 24337 Result 36.0 Date Tested 1/26/23
 ID# 24351 Result 28.0 Date Tested 2/2/23 ID# 24351 Result 24.0 Date Tested 2/2/23

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

Project# X8634 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>56.0%</u>									
Temperature (°C)	<u>24.5</u>	<u>24.2</u>	<u>24.7</u>	<u>23.6</u>	<u>24.1</u>	<u>23.9</u>	<u>23.7</u>	<u>24.7</u>	
pH	<u>7.0</u>	<u>6.9</u>	<u>6.8</u>	<u>7.0</u>	<u>7.1</u>	<u>7.2</u>	<u>7.5</u>	<u>6.3</u>	
DO (mg/l)	<u>7.5</u>	<u>6.6</u>	<u>5.9</u>	<u>6.5</u>	<u>7.0</u>	<u>7.1</u>	<u>7.4</u>	<u>5.7</u>	
Cond (umhos/cm)	<u>230</u>	<u>239</u>	<u>250</u>	<u>231</u>	<u>171</u>	<u>180</u>	<u>165</u>		
Concentration: <u>80.0%</u>									
Temperature (°C)	<u>24.8</u>	<u>24.3</u>	<u>24.7</u>	<u>24.1</u>	<u>23.9</u>	<u>24.1</u>	<u>24.1</u>	<u>24.7</u>	
pH	<u>6.9</u>	<u>6.9</u>	<u>6.8</u>	<u>7.0</u>	<u>7.1</u>	<u>7.2</u>	<u>7.3</u>	<u>6.3</u>	
DO (mg/l)	<u>7.2</u>	<u>6.5</u>	<u>5.4</u>	<u>6.1</u>	<u>7.0</u>	<u>7.3</u>	<u>7.0</u>	<u>5.4</u>	
Cond (umhos/cm)	<u>261</u>	<u>263</u>	<u>282</u>	<u>262</u>	<u>179</u>	<u>184</u>	<u>180</u>		
Concentration: <u>100.0%</u>									
Temperature (°C)	<u>26.0</u>	<u>24.5</u>	<u>24.7</u>	<u>23.9</u>	<u>24.1</u>	<u>23.9</u>	<u>23.9</u>	<u>24.6</u>	
pH	<u>7.2</u>	<u>6.9</u>	<u>6.9</u>	<u>7.0</u>	<u>7.2</u>	<u>7.3</u>	<u>7.2</u>	<u>6.4</u>	
DO (mg/l)	<u>7.2</u>	<u>6.3</u>	<u>5.5</u>	<u>6.1</u>	<u>7.0</u>	<u>7.1</u>	<u>7.0</u>	<u>5.2</u>	
Cond (umhos/cm)	<u>298</u>	<u>290</u>	<u>310</u>	<u>292</u>	<u>196</u>	<u>200</u>	<u>185</u>		
Prerenewal Tech Initials/Time		<u>1303</u> <u>AM</u>	<u>1531</u> <u>AM</u>	<u>EDW</u> <u>1020</u>	<u>EDW</u> <u>1205</u>	<u>EDW</u> <u>1107</u>	<u>EDW</u> <u>1100</u>	<u>1425</u> <u>AM</u>	
Postrenewal Tech Initials/Time	<u>EDW</u> <u>1050</u>	<u>1223</u> <u>AM</u>	<u>1225</u> <u>AM</u>	<u>EDW</u> <u>0840</u>	<u>EDW</u> <u>1030</u>	<u>EDW</u> <u>1035</u>	<u>EDW</u> <u>098</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 _____

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

Project# X8634 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>100.0% UV</u>									
Temperature (°C)	<u>26.0</u>	<u>24.5</u> <u>25.7</u>	<u>24.7</u> <u>25.2</u>	<u>23.4</u> <u>22.9</u>	<u>24.1</u> <u>25.2</u>	<u>23.9</u> <u>25.1</u>	<u>23.9</u> <u>24.6</u>	<u>24.6</u>	
pH	<u>7.4</u>	<u>7.0</u> <u>7.4</u>	<u>6.9</u> <u>7.6</u>	<u>7.0</u> <u>7.1</u>	<u>7.1</u> <u>7.0</u>	<u>7.3</u> <u>7.3</u>	<u>7.2</u> <u>7.4</u>	<u>6.4</u>	
DO (mg/l)	<u>7.7</u>	<u>6.7</u> <u>7.8</u>	<u>8.4</u> <u>7.9</u>	<u>6.3</u> <u>7.1</u>	<u>7.0</u> <u>8.1</u>	<u>7.2</u> <u>7.6</u>	<u>7.0</u> <u>8.0</u>	<u>4.9</u>	
Cond (umhos/cm)	<u>295</u>	<u>293</u>	<u>313</u>	<u>293</u>	<u>183</u>	<u>201</u>	<u>190</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>1303 AM</u>	<u>1513 AM</u>	<u>EDW 1120</u>	<u>EDW 1205</u>	<u>EDW 1107</u>	<u>EDW 1100</u>	<u>1425 AM</u>	
Postrenewal Tech Initials/Time	<u>EDW 1050</u>	<u>1223 AM</u>	<u>1225 AM</u>	<u>EDW 0940</u>	<u>EDW 1030</u>	<u>EDW 1035</u>	<u>EDW 0950</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 Jan-23 15:14 (p 1 of 1)
 Test Code/ID: 52A26292 / 13-8637-3778

Fathead Minnow 7-d Larval Survival and Growth Test						Bio-Analytical Laboratories					
Start Date: 24 Jan-23 15:30		Species: Pimephales promelas				Sample Code: 449710C1					
End Date: 31 Jan-23 15:15		Protocol: EPA/821/R-02-013 (2002)				Sample Source: AR0043613					
Sample Date: 23 Jan-23 08:00		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	Td Weig
0	D	1	1									
56		3	2									
100		5	3									
42		4	4									
32		2	5									
101		1	6									
56		1	7									
32		1	8									
32		3	9									
32		4	10									
32	●	5	11									
42		5	12									
56	●	5	13									
0	D	2	14									
101		3	15									
56		2	16									
101	●	5	17									
56		4	18									
100		1	19									
80		2	20									
0	D	5	21									
80		3	22									
42		2	23									
100		3	24									
80		4	25									
42	●	1	26									
101		2	27									
● 0	D	4	28									
101		4	29									
42		3	30									
100		4	31									
0	D	3	32									
80		5	33									
100		2	34									
80		1	35									

EUB
 Analyst: 1/23/23
 QA: 2/13/23

APPENDIX C
STATISTICAL ANALYSIS

CETIS Analytical Report

Report Date: 01 Feb-23 16:14 (p 1 of 2)
Test Code/ID: 352B7A8 / 00-5575-2616

Ceriodaphnia 7-d Survival and Reproduction Test

Bio-Analytical Laboratories

Analysis ID: 00-3522-4900	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.9.7
Analyzed: 01 Feb-23 16:14	Analysis: STP 2xK Contingency Tables	Status Level: 1
Edit Date: 01 Feb-23 16:05	MD5 Hash: D35157F87C03110AD78843F1C42CF28A	Editor ID: 008-522-314-5
Batch ID: 11-6074-7077	Test Type: Reproduction-Survival (2-8d)	Analyst:
Start Date: 24 Jan-23 16:15	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Ending Date: 31 Jan-23 15:32	Species: Ceriodaphnia dubia	Brine:
Test Length: 6d 23h	Taxon: Branchiopoda	Source: In-House Culture Age: <24
Sample ID: 09-2555-6051	Code: X8634	Project: WET Monthly Compliance Test (JAN)
Sample Date: 23 Jan-23 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 23 Jan-23 09:52	CAS (PC):	Station: 001
Sample Age: 32h (0.8 °C)	Client: Magnolia Wastewater System	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
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	1.00	Exact	1.0000	Non-Significant Effect
		42	1.00	Exact	1.0000	Non-Significant Effect
		56	1.00	Exact	1.0000	Non-Significant Effect
		80	0.50	Exact	1.0000	Non-Significant Effect
		100	1.00	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	1.00	0.00	0.00%
32		10	0	10	1.00	0.00	0.00%
42		10	0	10	1.00	0.00	0.00%
56		10	0	10	1.00	0.00	0.00%
80		9	1	10	0.90	0.10	10.00%
100		10	0	10	1.00	0.00	0.00%

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00%	0.00%
32		10	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00%	0.00%
42		10	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00%	0.00%
56		10	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00%	0.00%
80		10	0.90	0.67	1.00	1.00	0.00	1.00	0.10	35.14%	10.00%
100		10	1.00	1.00	1.00	1.00	1.00	1.00	0.00	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
32		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
42		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
56		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
80		1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
100		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

CETIS Analytical Report

Report Date: 01 Feb-23 16:14 (p 2 of 2)
 Test Code/ID: 352B7A8 / 00-5575-2616

Ceriodaphnia 7-d Survival and Reproduction Test

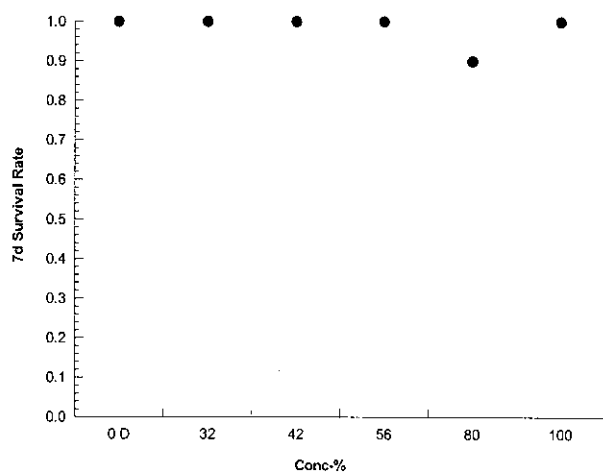
Bio-Analytical Laboratories

Analysis ID: 00-3522-4900	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.9.7
Analyzed: 01 Feb-23 16:14	Analysis: STP 2xK Contingency Tables	Status Level: 1
Edit Date: 01 Feb-23 16:05	MD5 Hash: D35157F87C03110AD78843F1C42CF28A	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	1/1	1/1	1/1	1/1	1/1
42		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
56		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
80		1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Graphics



CETIS Analytical Report

Report Date: 01 Feb-23 16:14 (p 1 of 2)
Test Code/ID: 352B7A8 / 00-5575-2616

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

Analysis ID: 09-1074-1912 Endpoint: Reproduction CETIS Version: CETISv1.9.7
 Analyzed: 01 Feb-23 16:14 Analysis: Parametric-Multiple Comparison Status Level: 1
 Edit Date: 01 Feb-23 16:05 MD5 Hash: 5ED72CF740DC3F43BE586222E1D2637C Editor ID: 008-522-314-5

Batch ID: 11-6074-7077 Test Type: Reproduction-Survival (2-8d) Analyst:
 Start Date: 24 Jan-23 16:15 Protocol: EPA/821/R-02-013 (2002) Diluent: Reconstituted Water
 Ending Date: 31 Jan-23 15:32 Species: Ceriodaphnia dubia Brine:
 Test Length: 6d 23h Taxon: Branchiopoda Source: In-House Culture Age: <24

Sample ID: 09-2555-6051 Code: X8634 Project: WET Monthly Compliance Test (JAN)
 Sample Date: 23 Jan-23 08:00 Material: POTW Effluent Source: AR0043613
 Receipt Date: 23 Jan-23 09:52 CAS (PC): Station: 001
 Sample Age: 32h (0.8 °C) Client: Magnolia Wastewater System

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	5.6	23.65%

Bonferroni Adj t Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		32	-1.9	2.4	5.6	18	CDF	1.0000	Non-Significant Effect
		42	-1.7	2.4	5.6	18	CDF	1.0000	Non-Significant Effect
		56	-2.2	2.4	5.6	18	CDF	1.0000	Non-Significant Effect
		80	-2.3	2.4	5.7	17	CDF	1.0000	Non-Significant Effect
		100	-1.5	2.4	5.6	18	CDF	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	192.625	38.5251	5	1.4	0.2312	Non-Significant Effect
Error	1434.9	27.0736	53			
Total	1627.53		58			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	5.5	15	0.3531	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.97	0.95	0.1197	Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	24	20	27	24	16	31	1.6	21.16%	0.00%
32		10	28	24	32	30	17	36	1.8	19.74%	-19.07%
42		10	28	23	32	28	13	37	2.1	24.11%	-16.95%
56		10	29	26	31	28	24	35	1.1	12.23%	-22.03%
80		9	29	24	34	30	17	37	2	21.19%	-22.88%
100		10	27	25	30	26	23	32	1.2	13.51%	-15.25%

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	31	16	29	27	22	22	25	27	19	18
32		17	30	31	28	31	23	23	30	32	36
42		13	32	28	32	29	23	32	24	37	26
56		24	31	32	26	26	26	28	28	32	35
80		24	26	37	32	30	29	17	36	30	
100		27	24	32	25	23	31	23	25	31	31

CETIS Analytical Report

Report Date: 01 Feb-23 16:14 (p 1 of 2)
Test Code/ID: 352B7A8 / 00-5575-2616

Ceriodaphnia 7-d Survival and Reproduction Test

Bio-Analytical Laboratories

Analysis ID: 05-6308-0486	Endpoint: Reproduction	CETIS Version: CETISv1.9.7
Analyzed: 01 Feb-23 16:14	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 01 Feb-23 16:05	MD5 Hash: F2C30A85DE7D86162477AE7F82FF3224	Editor ID: 008-522-314-5
Batch ID: 11-6074-7077	Test Type: Reproduction-Survival (2-8d)	Analyst:
Start Date: 24 Jan-23 16:15	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Ending Date: 31 Jan-23 15:32	Species: Ceriodaphnia dubia	Brine:
Test Length: 6d 23h	Taxon: Branchiopoda	Source: In-House Culture Age: <24
Sample ID: 09-2555-6051	Code: X8634	Project: WET Monthly Compliance Test (JAN)
Sample Date: 23 Jan-23 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 23 Jan-23 09:52	CAS (PC):	Station: 001
Sample Age: 32h (0.8 °C)	Client: Magnolia Wastewater System	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDU	PMSD
Untransformed	C > T	100	>100	---	1	6.3	26.68%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		32	130	75	1	18	CDF	0.9996	Non-Significant Effect
		42	130	75	1	18	CDF	0.9988	Non-Significant Effect
		56	130	75	1	18	CDF	0.9998	Non-Significant Effect
		80	120	75	1	18	CDF	0.9960	Non-Significant Effect
		100	130	75	3	18	CDF	0.9983	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	167.55	33.51	5	0.89	0.4972	Non-Significant Effect
Error	2043.3	37.8389	54			
Total	2210.85		59			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	14	15	0.0153	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.92	0.95	0.0011	Non-Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	24	20	27	24	16	31	1.6	21.16%	0.00%
32		10	28	24	32	30	17	36	1.8	19.74%	-19.07%
42		10	28	23	32	28	13	37	2.1	24.11%	-16.95%
56		10	29	26	31	28	24	35	1.1	12.23%	-22.03%
80		10	26	19	34	30	3	37	3.2	38.10%	-11.86%
100		10	27	25	30	26	23	32	1.2	13.51%	-15.25%

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	31	16	29	27	22	22	25	27	19	18
32		17	30	31	28	31	23	23	30	32	36
42		13	32	28	32	29	23	32	24	37	26
56		24	31	32	26	26	26	28	28	32	35
80		24	26	37	32	30	3	29	17	36	30
100		27	24	32	25	23	31	23	25	31	31

CETIS Analytical Report

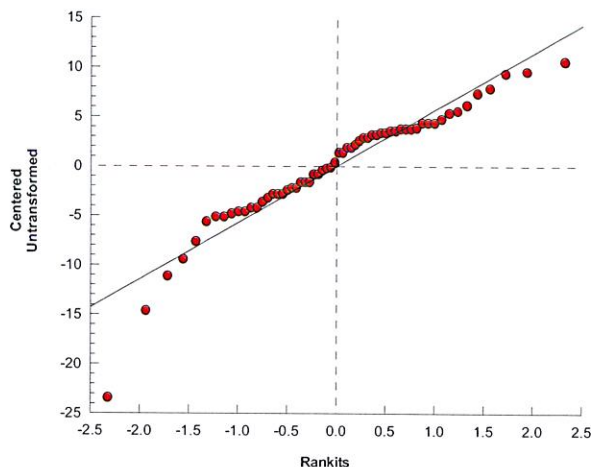
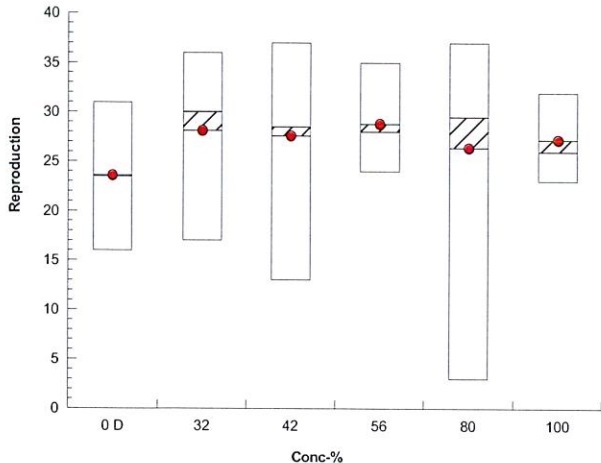
Report Date: 01 Feb-23 16:14 (p 2 of 2)
Test Code/ID: 352B7A8 / 00-5575-2616

Ceriodaphnia 7-d Survival and Reproduction Test

Bio-Analytical Laboratories

Analysis ID: 05-6308-0486	Endpoint: Reproduction	CETIS Version: CETISv1.9.7
Analyzed: 01 Feb-23 16:14	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 01 Feb-23 16:05	MD5 Hash: F2C30A85DE7D86162477AE7F82FF3224	Editor ID: 008-522-314-5

Graphics



CETIS Analytical Report

Report Date: 01 Feb-23 16:15 (p 1 of 2)
Test Code/ID: 352B7A8 / 00-5575-2616

Ceriodaphnia 7-d Survival and Reproduction Test

Bio-Analytical Laboratories

Analysis ID: 15-3195-8703	Endpoint: Reproduction	CETIS Version: CETISv1.9.7
Analyzed: 01 Feb-23 16:14	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 01 Feb-23 16:05	MD5 Hash: F2C30A85DE7D86162477AE7F82FF3224	Editor ID: 008-522-314-5
Batch ID: 11-6074-7077	Test Type: Reproduction-Survival (2-8d)	Analyst:
Start Date: 24 Jan-23 16:15	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Ending Date: 31 Jan-23 15:32	Species: Ceriodaphnia dubia	Brine:
Test Length: 6d 23h	Taxon: Branchiopoda	Source: In-House Culture Age: <24
Sample ID: 09-2555-6051	Code: X8634	Project: WET Monthly Compliance Test (JAN)
Sample Date: 23 Jan-23 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 23 Jan-23 09:52	CAS (PC):	Station: 001
Sample Age: 32h (0.8 °C)	Client: Magnolia Wastewater System	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1774869	1000	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC10	>100	---	---	<1	---	---
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	24	24	16	31	21.16%	0.00%	27	0.00%
32		10	28	30	17	36	19.74%	-19.07%	27	0.00%
42		10	28	28	13	37	24.11%	-16.95%	27	0.00%
56		10	29	28	24	35	12.23%	-22.03%	27	0.00%
80		10	26	30	3	37	38.10%	-11.86%	27	0.83%
100		10	27	26	23	32	13.51%	-15.25%	27	0.83%

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	31	16	29	27	22	22	25	27	19	18
32		17	30	31	28	31	23	23	30	32	36
42		13	32	28	32	29	23	32	24	37	26
56		24	31	32	26	26	26	28	28	32	35
80		24	26	37	32	30	3	29	17	36	30
100		27	24	32	25	23	31	23	25	31	31

EDW
Analyst: *2/1/23*
EJB
2/13/23

CETIS Analytical Report

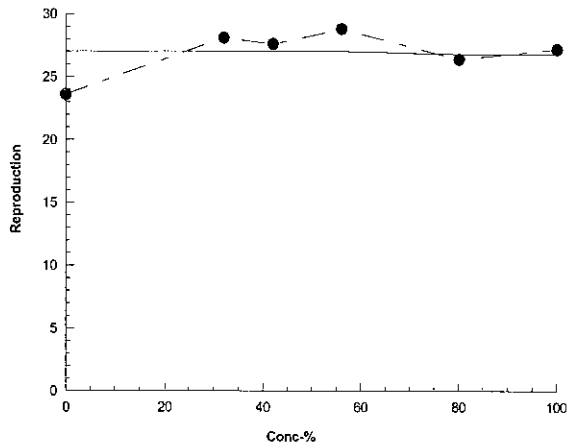
Report Date: 01 Feb-23 16:15 (p 2 of 2)
Test Code/ID: 352B7A8 / 00-5575-2616

Ceriodaphnia 7-d Survival and Reproduction Test

Bio-Analytical Laboratories

Analysis ID: 15-3195-8703	Endpoint: Reproduction	CETIS Version: CETISv1.9.7
Analyzed: 01 Feb-23 16:14	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 01 Feb-23 16:05	MD5 Hash: F2C30A85DE7D86162477AE7F82FF3224	Editor ID: 008-522-314-5

Graphics



Analyst: *EDW* *EVB*
2/13/23 *2/13/23*

CETIS Analytical Report

Report Date: 02 Feb-23 16:04 (p 1 of 2)
Test Code/ID: 52A26292 / 13-8637-3778

Fathead Minnow 7-d Larval Survival and Growth Test

Bio-Analytical Laboratories

Analysis ID: 20-4719-2019	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.9.7
Analyzed: 02 Feb-23 16:04	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 02 Feb-23 15:55	MD5 Hash: F9FB5322231ED6DA1EAE7B945D8A7E5F	Editor ID: 008-522-314-5
Batch ID: 16-5709-7439	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 24 Jan-23 15:40	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Ending Date: 31 Jan-23 14:18	Species: Pimephales promelas	Brine:
Test Length: 6d 23h	Taxon: Actinopterygii	Source: In-House Culture Age: <24
Sample ID: 11-5075-0913	Code: X8634	Project: WET Monthly Compliance Test (JAN)
Sample Date: 23 Jan-23 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 23 Jan-23 09:52	CAS (PC):	Station: 001
Sample Age: 32h (0.8 °C)	Client: Magnolia Wastewater System	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Angular (Corrected)	C > T	101	101	---	0.9901	0.1	10.81%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		32	28	16	2	8	CDF	0.8571	Non-Significant Effect
		42	26	16	2	8	CDF	0.7925	Non-Significant Effect
		56	28	16	2	8	CDF	0.8571	Non-Significant Effect
		80	30	16	2	8	CDF	0.9557	Non-Significant Effect
		100	20	16	1	8	CDF	0.2114	Non-Significant Effect
		101	30	16	2	8	CDF	0.9557	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	0.95	0.8	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.076051	0.0126752	6	1.3	0.2889	Non-Significant Effect
Error	0.272679	0.0097386	28			
Total	0.34873		34			

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	0.86	0.91	0.0005	Non-Normal Distribution

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	5	0.95	0.86	1.00	1.00	0.88	1.00	0.03	7.21%	0.00%
32		5	0.95	0.86	1.00	1.00	0.88	1.00	0.03	7.21%	0.00%
42		5	0.92	0.79	1.00	1.00	0.75	1.00	0.05	12.09%	2.63%
56		5	0.95	0.86	1.00	1.00	0.88	1.00	0.03	7.21%	0.00%
80		5	0.98	0.91	1.00	1.00	0.88	1.00	0.03	5.73%	-2.63%
100		5	0.88	0.88	0.88	0.88	0.88	0.88	0.00	0.00%	7.89%
101		5	0.98	0.91	1.00	1.00	0.88	1.00	0.03	5.73%	-2.63%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	5	1.30	1.20	1.40	1.40	1.20	1.40	0.05	7.62%	0.00%
32		5	1.30	1.20	1.40	1.40	1.20	1.40	0.05	7.62%	0.00%
42		5	1.30	1.10	1.50	1.40	1.00	1.40	0.07	12.12%	2.46%
56		5	1.30	1.20	1.40	1.40	1.20	1.40	0.05	7.62%	0.00%
80		5	1.40	1.30	1.50	1.40	1.20	1.40	0.04	6.06%	-2.78%
100		5	1.20	1.20	1.20	1.20	1.20	1.20	0.00	0.00%	8.35%
101		5	1.40	1.30	1.50	1.40	1.20	1.40	0.04	6.06%	-2.78%

CETIS Analytical Report

Report Date: 02 Feb-23 16:04 (p 2 of 2)
 Test Code/ID: 52A26292 / 13-8637-3778

Fathead Minnow 7-d Larval Survival and Growth Test

Bio-Analytical Laboratories

Analysis ID: 20-4719-2019 Endpoint: 7d Survival Rate CETIS Version: CETISv1.9.7
 Analyzed: 02 Feb-23 16:04 Analysis: Nonparametric-Control vs Treatments Status Level: 1
 Edit Date: 02 Feb-23 15:55 MD5 Hash: F9FB5322231ED6DA1EAE7B945D8A7E5F Editor ID: 008-522-314-5

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	0.88	1.00	1.00	0.88	1.00
32		1.00	1.00	0.88	0.88	1.00
42		1.00	0.75	1.00	1.00	0.88
56		1.00	0.88	1.00	0.88	1.00
80		1.00	1.00	1.00	1.00	0.88
100		0.88	0.88	0.88	0.88	0.88
101 100UV		1.00	1.00	1.00	1.00	0.88

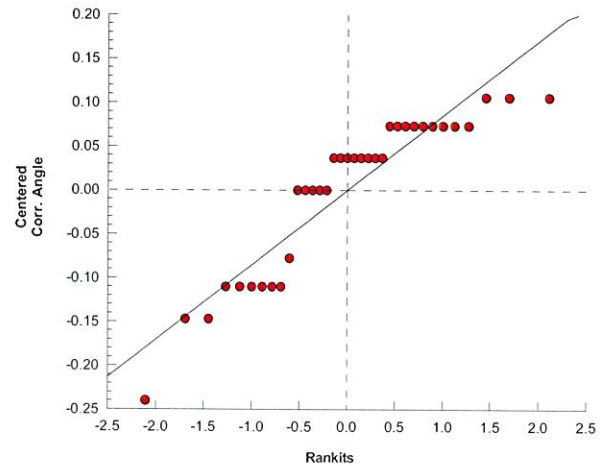
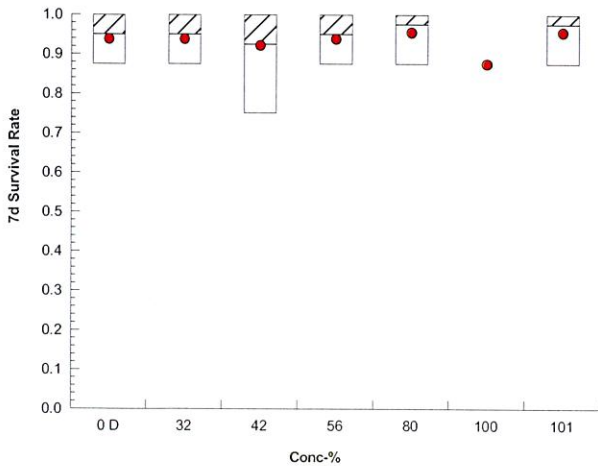
Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	1.20	1.40	1.40	1.20	1.40
32		1.40	1.40	1.20	1.20	1.40
42		1.40	1.00	1.40	1.40	1.20
56		1.40	1.20	1.40	1.20	1.40
80		1.40	1.40	1.40	1.40	1.20
100		1.20	1.20	1.20	1.20	1.20
101 100UV		1.40	1.40	1.40	1.40	1.20

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	7/8	8/8	8/8	7/8	8/8
32		8/8	8/8	7/8	7/8	8/8
42		8/8	6/8	8/8	8/8	7/8
56		8/8	7/8	8/8	7/8	8/8
80		8/8	8/8	8/8	8/8	7/8
100		7/8	7/8	7/8	7/8	7/8
101 100UV		8/8	8/8	8/8	8/8	7/8

Graphics



CETIS Analytical Report

Report Date: 02 Feb-23 16:04 (p 1 of 2)
Test Code/ID: 52A26292 / 13-8637-3778

Fathead Minnow 7-d Larval Survival and Growth Test

Bio-Analytical Laboratories

Analysis ID: 19-4297-9689	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv1.9.7
Analyzed: 02 Feb-23 16:04	Analysis: Parametric-Control vs Treatments	Status Level: 1
Edit Date: 02 Feb-23 15:55	MD5 Hash: 1ECF1D0BB2F00BA793795A4EC79A0F43	Editor ID: 008-522-314-5
Batch ID: 16-5709-7439	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 24 Jan-23 15:40	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Ending Date: 31 Jan-23 14:18	Species: Pimephales promelas	Brine:
Test Length: 6d 23h	Taxon: Actinopterygii	Source: In-House Culture Age: <24
Sample ID: 11-5075-0913	Code: X8634	Project: WET Monthly Compliance Test (JAN)
Sample Date: 23 Jan-23 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 23 Jan-23 09:52	CAS (PC):	Station: 001
Sample Age: 32h (0.8 °C)	Client: Magnolia Wastewater System	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Untransformed	C > T	101	>101	---	0.9901	0.18	29.06%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		32	-0.17	2.4	0.18	8	CDF	0.8981	Non-Significant Effect
		42	0.24	2.4	0.18	8	CDF	0.7830	Non-Significant Effect
		56	-0.78	2.4	0.18	8	CDF	0.9769	Non-Significant Effect
		80	-1.4	2.4	0.18	8	CDF	0.9960	Non-Significant Effect
		100	-0.034	2.4	0.18	8	CDF	0.8661	Non-Significant Effect
		101	0.034	2.4	0.18	8	CDF	0.8478	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	0.61	0.25	>>	Yes	Passes Criteria
PMSD	0.29	0.12	0.3	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0522949	0.0087158	6	0.64	0.6952	Non-Significant Effect
Error	0.379663	0.0135594	28			
Total	0.431958		34			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	8.2	17	0.2236	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.99	0.91	0.9068	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	0.61	0.48	0.74	0.67	0.5	0.7	0.045	16.55%	0.00%
32		5	0.62	0.39	0.86	0.64	0.41	0.91	0.085	30.50%	-2.05%
42		5	0.59	0.46	0.72	0.56	0.45	0.72	0.047	17.81%	2.87%
56		5	0.67	0.56	0.77	0.64	0.6	0.8	0.038	12.67%	-9.43%
80		5	0.71	0.65	0.77	0.7	0.66	0.79	0.022	6.98%	-16.39%
100		5	0.61	0.52	0.7	0.6	0.51	0.71	0.033	12.16%	-0.41%
101		5	0.61	0.42	0.79	0.6	0.44	0.79	0.067	24.63%	0.41%

2663
02/13/23

CETIS Analytical Report

Report Date: 02 Feb-23 16:04 (p 2 of 2)
 Test Code/ID: 52A26292 / 13-8637-3778

Fathead Minnow 7-d Larval Survival and Growth Test

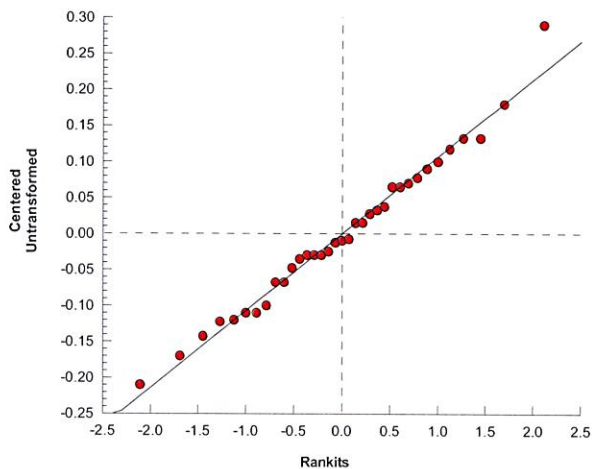
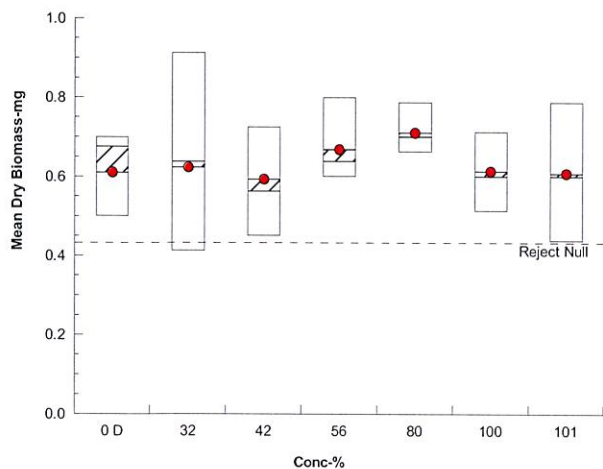
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Analysis ID: 19-4297-9689 Endpoint: Mean Dry Biomass-mg CETIS Version: CETISv1.9.7
 Analyzed: 02 Feb-23 16:04 Analysis: Parametric-Control vs Treatments Status Level: 1
 Edit Date: 02 Feb-23 15:55 MD5 Hash: 1ECF1D0BB2F00BA793795A4EC79A0F43 Editor ID: 008-522-314-5

Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	0.67	0.7	0.67	0.5	0.5
32		0.91	0.65	0.64	0.41	0.5
42		0.72	0.56	0.45	0.56	0.66
56		0.64	0.8	0.6	0.6	0.7
80		0.7	0.72	0.66	0.68	0.79
100		0.51	0.59	0.71	0.6	0.65
101		0.79	0.44	0.6	0.73	0.49

Graphics



CETIS Analytical Report

Report Date: 02 Feb-23 16:05 (p 1 of 2)
Test Code/ID: 52A26292 / 13-8637-3778

Fathead Minnow 7-d Larval Survival and Growth Test

Bio-Analytical Laboratories

Analysis ID: 21-0116-4684	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv1.9.7
Analyzed: 02 Feb-23 16:05	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 02 Feb-23 15:55	MD5 Hash: 1ECF1D0BB2F00BA793795A4EC79A0F43	Editor ID: 008-522-314-5
Batch ID: 16-5709-7439	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 24 Jan-23 15:40	Protocol: EPA/821/R-02-013 (2002)	Diluent: Reconstituted Water
Ending Date: 31 Jan-23 14:18	Species: Pimephales promelas	Brine:
Test Length: 6d 23h	Taxon: Actinopterygii	Source: In-House Culture Age: <24
Sample ID: 11-5075-0913	Code: X8634	Project: WET Monthly Compliance Test (JAN)
Sample Date: 23 Jan-23 08:00	Material: POTW Effluent	Source: AR0043613
Receipt Date: 23 Jan-23 09:52	CAS (PC):	Station: 001
Sample Age: 32h (0.8 °C)	Client: Magnolia Wastewater System	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	819246	1000	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	0.61	0.25	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC10	>100	---	---	<0.9901	---	---
IC15	>100	---	---	<0.9901	---	---
IC20	>100	---	---	<0.9901	---	---
IC25	>100	---	---	<0.9901	---	---
IC40	>100	---	---	<0.9901	---	---
IC50	>100	---	---	<0.9901	---	---

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Calculated Variate						Isotonic Variate	
			Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	D	5	0.61	0.67	0.5	0.7	16.55%	0.00%	0.64	0.00%
32		5	0.62	0.64	0.41	0.91	30.50%	-2.05%	0.64	0.00%
42		5	0.59	0.56	0.45	0.72	17.81%	2.87%	0.64	0.00%
56		5	0.67	0.64	0.6	0.8	12.67%	-9.43%	0.64	0.00%
80		5	0.71	0.7	0.66	0.79	6.98%	-16.39%	0.64	0.00%
100		5	0.61	0.6	0.51	0.71	12.16%	-0.41%	0.61	4.37%
101 100UV		5	0.61	0.6	0.44	0.79	24.63%	0.41%	0.61	5.15%

Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	0.67	0.7	0.67	0.5	0.5
32		0.91	0.65	0.64	0.41	0.5
42		0.72	0.56	0.45	0.56	0.66
56		0.64	0.8	0.6	0.6	0.7
80		0.7	0.72	0.66	0.68	0.79
100		0.51	0.59	0.71	0.6	0.65
101 100UV		0.79	0.44	0.6	0.73	0.49

CETIS Analytical Report

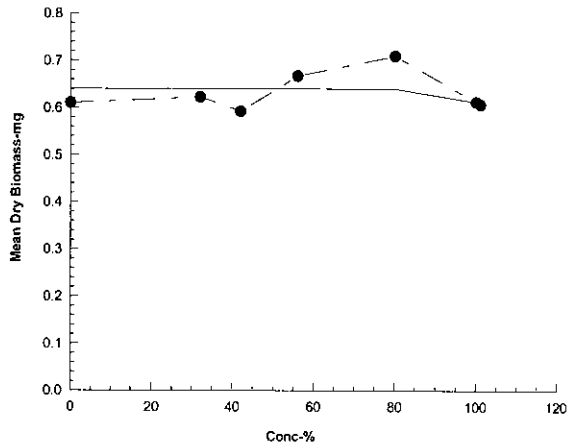
Report Date: 02 Feb-23 16:05 (p 2 of 2)
Test Code/ID: 52A26292 / 13-8637-3778

Fathead Minnow 7-d Larval Survival and Growth Test

Bio-Analytical Laboratories

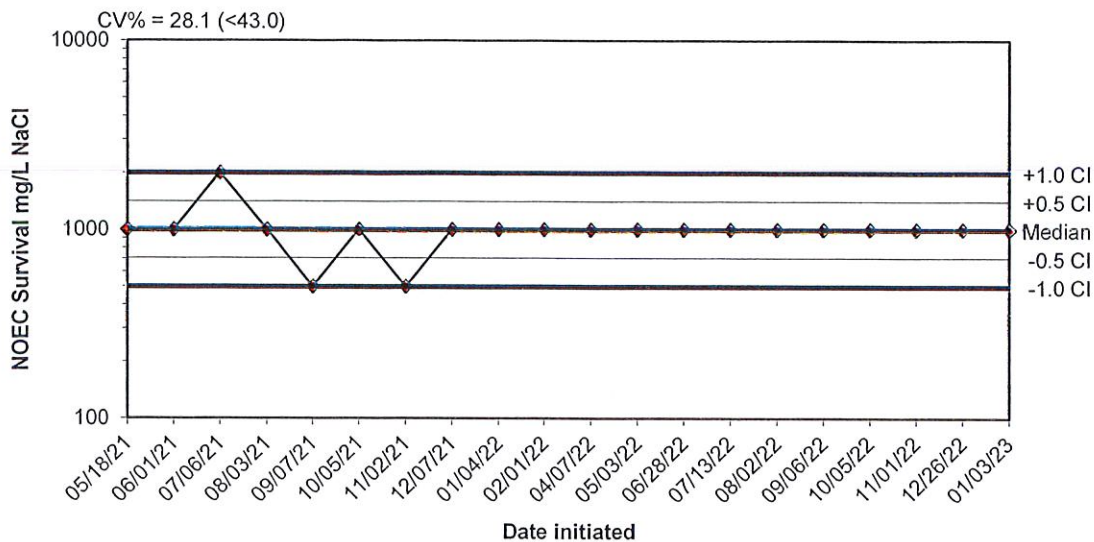
Analysis ID: 21-0116-4684	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv1.9.7
Analyzed: 02 Feb-23 16:05	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 02 Feb-23 15:55	MD5 Hash: 1ECF1D0BB2F00BA793795A4EC79A0F43	Editor ID: 008-522-314-5

Graphics



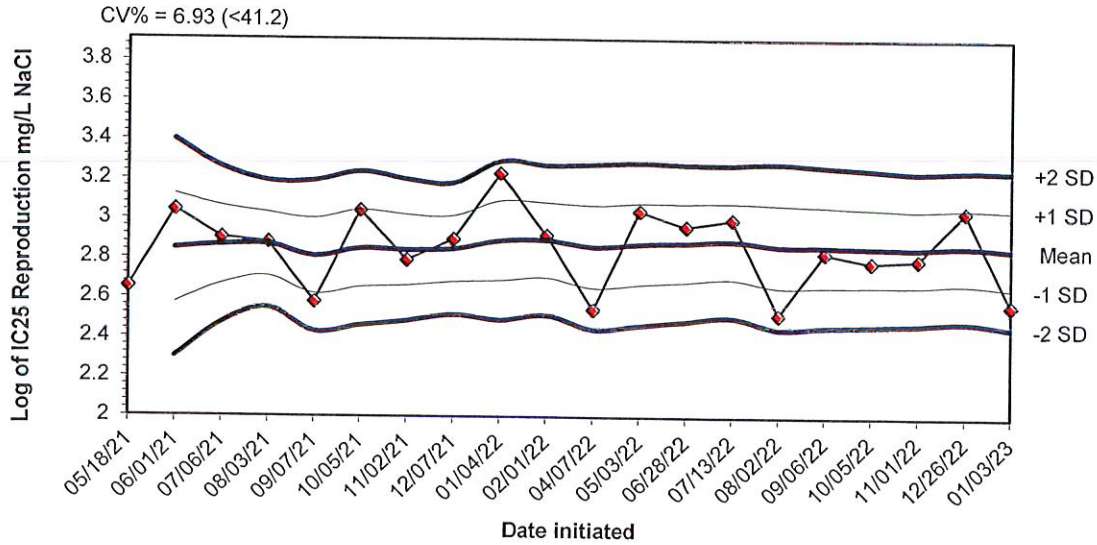
APPENDIX D
QUALITY ASSURANCE CHARTS

CHRONIC REFERENCE TOXICANT TEST RESULTS FOR CERIODAPHНИЯ DUBIA IN SOFT WATER



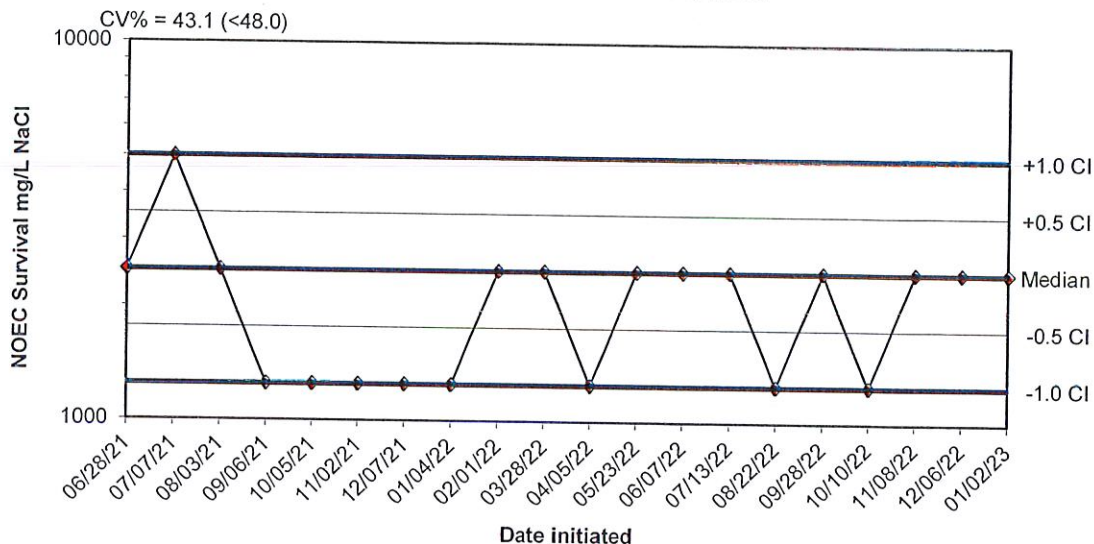
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06/01/21	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
07/06/21	2000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
08/03/21	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
09/07/21	500.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
10/05/21	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
11/02/21	500.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
12/07/21	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
01/04/22	1000.0000	1000.0000	707.1068	500.0000	1414.2136	2000.0000
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

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



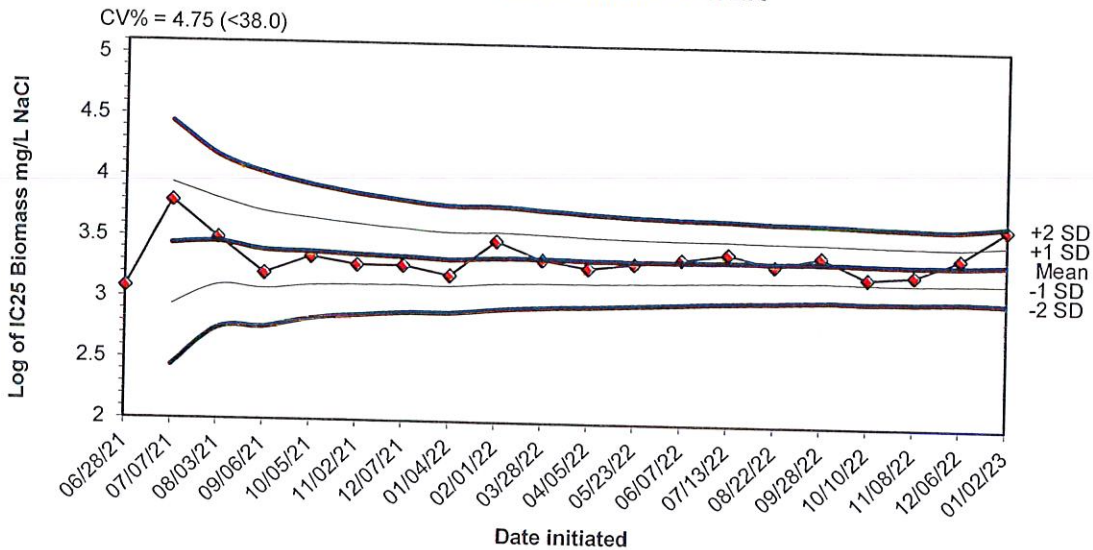
Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
05/18/21	2.6557					
06/01/21	3.0439	2.8498	2.5753	2.3008	3.1243	3.3987
07/06/21	2.9031	2.8676	2.6710	2.4745	3.0641	3.2606
08/03/21	2.8808	2.8709	2.7103	2.5497	3.0315	3.1920
09/07/21	2.5798	2.8127	2.6222	2.4317	3.0031	3.1936
10/05/21	3.0414	2.8508	2.6565	2.4622	3.0451	3.2394
11/02/21	2.7924	2.8424	2.6637	2.4850	3.0212	3.1999
12/07/21	2.8976	2.8493	2.6827	2.5161	3.0160	3.1826
01/04/22	3.2304	2.8917	2.6906	2.4895	3.0928	3.2938
02/01/22	2.9191	2.8944	2.7046	2.5149	3.0842	3.2740
04/07/22	2.5441	2.8626	2.6538	2.4451	3.0713	3.2800
05/03/22	3.0414	2.8775	2.6719	2.4663	3.0831	3.2887
06/28/22	2.9638	2.8841	2.6858	2.4875	3.0824	3.2807
07/13/22	3.0000	2.8924	2.6994	2.5063	3.0854	3.2784
08/02/22	2.5185	2.8675	2.6579	2.4483	3.0770	3.2866
09/06/22	2.8325	2.8653	2.6626	2.4600	3.0679	3.2706
10/05/22	2.7853	2.8606	2.6634	2.4662	3.0577	3.2549
11/01/22	2.7993	2.8572	2.6654	2.4735	3.0490	3.2408
12/26/22	3.0414	2.8669	2.6757	2.4846	3.0580	3.2492
01/03/23	2.5682	2.8519	2.6543	2.4566	3.0496	3.2473

CHRONIC REFERENCE TOXICANT TEST RESULTS FOR PIMEPHALES PROMELAS IN MH WATER



Dates	Values	Median	-0.5 CI	-1.0 CI	+0.5 CI	+1.0 CI
06/28/21	2500.0000	2500.0000	1767.7670	1250.0000	3535.5339	5000.0000
07/07/21	5000.0000	2500.0000	1767.7670	1250.0000	3535.5339	5000.0000
08/03/21	2500.0000	2500.0000	1767.7670	1250.0000	3535.5339	5000.0000
09/06/21	1250.0000	2500.0000	1767.7670	1250.0000	3535.5339	5000.0000
10/05/21	1250.0000	2500.0000	1767.7670	1250.0000	3535.5339	5000.0000
11/02/21	1250.0000	2500.0000	1767.7670	1250.0000	3535.5339	5000.0000
12/07/21	1250.0000	2500.0000	1767.7670	1250.0000	3535.5339	5000.0000
01/04/22	1250.0000	2500.0000	1767.7670	1250.0000	3535.5339	5000.0000
02/01/22	2500.0000	2500.0000	1767.7670	1250.0000	3535.5339	5000.0000
03/28/22	2500.0000	2500.0000	1767.7670	1250.0000	3535.5339	5000.0000
04/05/22	1250.0000	2500.0000	1767.7670	1250.0000	3535.5339	5000.0000
05/23/22	2500.0000	2500.0000	1767.7670	1250.0000	3535.5339	5000.0000
06/07/22	2500.0000	2500.0000	1767.7670	1250.0000	3535.5339	5000.0000
07/13/22	2500.0000	2500.0000	1767.7670	1250.0000	3535.5339	5000.0000
08/22/22	1250.0000	2500.0000	1767.7670	1250.0000	3535.5339	5000.0000
09/28/22	2500.0000	2500.0000	1767.7670	1250.0000	3535.5339	5000.0000
10/10/22	1250.0000	2500.0000	1767.7670	1250.0000	3535.5339	5000.0000
11/08/22	2500.0000	2500.0000	1767.7670	1250.0000	3535.5339	5000.0000
12/06/22	2500.0000	2500.0000	1767.7670	1250.0000	3535.5339	5000.0000
01/02/23	2500.0000	2500.0000	1767.7670	1250.0000	3535.5339	5000.0000

**CHRONIC REFERENCE TOXICANT TEST RESULTS FOR PIMEPHALES
 PROMELAS IN MH WATER**



Dates	Values	Mean	-1 SD	-2 SD	+1 SD	+2 SD
06/28/21	3.0854					
07/07/21	3.7924	3.4389	2.9390	2.4391	3.9388	4.4387
08/03/21	3.4914	3.4564	3.1016	2.7468	3.8112	4.1659
09/06/21	3.2041	3.3933	3.0774	2.7614	3.7093	4.0252
10/05/21	3.3424	3.3831	3.1086	2.8340	3.6577	3.9323
11/02/21	3.2788	3.3657	3.1165	2.8673	3.6150	3.8642
12/07/21	3.2788	3.3533	3.1234	2.8935	3.5832	3.8131
01/04/22	3.2041	3.3347	3.1154	2.8961	3.5539	3.7732
02/01/22	3.4914	3.3521	3.1404	2.9288	3.5637	3.7754
03/28/22	3.3424	3.3511	3.1515	2.9520	3.5507	3.7503
04/05/22	3.2788	3.3445	3.1539	2.9634	3.5351	3.7257
05/23/22	3.3222	3.3427	3.1608	2.9790	3.5245	3.7063
06/07/22	3.3617	3.3441	3.1700	2.9958	3.5183	3.6925
07/13/22	3.4150	3.3492	3.1808	3.0124	3.5176	3.6860
08/22/22	3.3222	3.3474	3.1850	3.0225	3.5098	3.6723
09/28/22	3.3979	3.3506	3.1931	3.0357	3.5080	3.6654
10/10/22	3.2304	3.3435	3.1883	3.0331	3.4987	3.6539
11/08/22	3.2553	3.3386	3.1866	3.0346	3.4906	3.6426
12/06/22	3.3979	3.3417	3.1934	3.0451	3.4900	3.6384
01/02/23	3.6435	3.3568	3.1974	3.0381	3.5162	3.6755

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		Time	Date
Composite 1 Collected From:	0800	01/22/23	To	0800	01/23/23
Composite 2 Collected From:	0800	01/24/23	To	0800	01/25/23
Composite 3 Collected From:	0800	01/26/23	To	0800	01/27/23
Test initiated:	1615 am/pm			01/24/23	Date
Test terminated:	1532 am/pm			01/31/23	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	100.0	100.0
48h	100.0	100.0	100.0	100.0	100.0	100.0
End of test	100.0	100.0	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	31	17	13	24	24	27
2	16	30	32	31	26	24
3	29	31	28	32	37	32
4	27	28	32	26	32	25
5	22	31	29	26	30	23
6	22	23	23	26	D3	31
7	25	23	32	28	29	23
8	27	30	24	28	17	25
9	19	32	37	32	36	31
10	18	36	26	35	30	31
Surv. Mean	24.0	28.0	28.0	29.0	29.0	27.0
Total Mean	24.0	28.0	28.0	29.0	26.0	27.0
CV%*	21.16	19.74	24.11	12.23	21.19	13.51

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

PMSD = 26.68

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	Sample #1 Collected: 1/23/2023	Time: 800
NPDES#: AR0043613/AFIN 14-00059	Sample #2 Collected: 1/25/2023	Time: 800
Contact: Russell Thomas	Sample #3 Collected: 1/27/2023	Time: 800
Analysts: Ware, Mitchell	Test Begin: 1/24/2023	Time: 1615
	Test End: 1/31/2023	Time: 1532

Dilution:	1	2	3	4	5	6	7
Day:	1	2	3	4	5	6	7
T (°C)	23.8	23.1	24.7	24.8	24.9	24.8	23.7
DO Initial	8.4	8.1	7.4	7.3	7.6	8.1	8.0
DO Final	8.1	7.7	8.1	8.2	7.6	7.4	
pH Initial	6.7	6.8	7.1	7.2	7.4	7.1	6.7
pH Final	7.5	7.4	7.1	7.1	7.4	7.3	
Conductivity	163.0	165.0	154.0	158.0	176.0	160.0	
Alkalinity	24.0			44.0			
Hardness	44.0			68.0			
Chlorine	<0.5			<0.5			
Dilution:	32.0%						
Day:	1	2	3	4	5	6	7
T (°C)	23.8	23.1	24.7	24.8	24.9	24.8	23.7
DO Initial	8.2	8.1	7.0	7.1	7.3	7.1	8.2
DO Final	7.7	7.7	8.0	8.2	7.9	7.5	
pH Initial	6.8	6.8	7.0	7.2	7.4	7.3	6.9
pH Final	7.4	7.4	7.1	7.1	7.6	7.1	
Conductivity	208.0	211.0	194.0	168.0	173.0	166.0	
Alkalinity							
Hardness							
Chlorine							
Dilution:	42.0%						
Day:	1	2	3	4	5	6	7
T (°C)	23.8	23.1	24.7	24.8	24.9	24.8	23.7
DO Initial	8.0	8.1	7.2	7.1	7.2	7.1	8.0
DO Final	7.8	7.8	8.1	8.2	7.4	7.2	
pH Initial	6.9	6.8	7.1	7.2	7.3	7.2	7.1
pH Final	7.4	7.4	7.4	7.0	7.3	7.1	
Alkalinity							
Hardness							
Conductivity	222.0	227.0	209.0	169.0	173.0	166.0	
Chlorine							
Comments:							

Dilution:	1	2	3	4	5	6	7
Day:	1	2	3	4	5	6	7
T (°C)	23.8	23.1	24.7	24.8	24.9	24.8	23.7
DO Initial	7.5	8.0	7.6	7.4	7.3	7.3	8.1
DO Final	8.2	7.9	8.1	7.2	7.3	7.5	
pH Initial	7.1	6.8	7.0	7.2	7.3	7.3	7.2
pH Final	7.2	7.3	7.1	7.1	7.1	7.1	
Alkalinity	52.0	40.0		28.0			
Hardness	28.0	36.0		24.0			
Conductivity	287.0	274.0	288.0	185.0	189.0	189.0	
Chlorine	<0.5	<0.5		<0.5			
Dilution:	100.0%						
Day:	1	2	3	4	5	6	7
T (°C)	23.8	23.1	24.7	24.8	24.9	24.8	23.7
DO Initial	7.5	8.0	7.6	7.4	7.3	7.3	8.1
DO Final	8.2	7.9	8.1	7.2	7.3	7.5	
pH Initial	7.1	6.8	7.0	7.2	7.3	7.3	7.2
pH Final	7.2	7.3	7.1	7.1	7.1	7.1	
Alkalinity	52.0	40.0		28.0			
Hardness	28.0	36.0		24.0			
Conductivity	287.0	274.0	288.0	185.0	189.0	189.0	
Chlorine	<0.5	<0.5		<0.5			

**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	01/22/23	To	0800	01/23/23
Composite 2 Collected from:	0800	01/24/23	To	0800	01/25/23
Composite 3 Collected from:	0800	01/26/23	To	0800	01/27/23

Test initiated:	1615	am/pm		01/24/23	Date
Test terminated:	1532	am/pm		01/31/23	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	88.0	100.0	100.0	88.0	100.0	100.0	100.0	95.0	7.62
32.0	100.0	100.0	88.0	88.0	100.0	100.0	100.0	95.0	7.62
42.0	100.0	75.0	100.0	100.0	88.0	100.0	100.0	92.0	12.12
56.0	100.0	88.0	100.0	88.0	100.0	100.0	100.0	95.0	7.62
80.0	100.0	100.0	100.0	100.0	88.0	100.0	100.0	98.0	6.06
100.0	88.0	88.0	88.0	88.0	88.0	100.0	100.0	88.0	0.00

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	0.670	0.700	0.670	0.500	0.500	0.610	16.55
32.0	0.910	0.650	0.640	0.410	0.500	0.620	30.50
42.0	0.720	0.560	0.450	0.560	0.660	0.590	17.81
56.0	0.640	0.800	0.600	0.600	0.700	0.670	12.67
80.0	0.700	0.720	0.660	0.680	0.790	0.710	6.98
100.0	0.510	0.590	0.710	0.600	0.650	0.610	12.16

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

PMSD =29.06 %

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 Plimepiales promelas
Chemical Parameters Chart

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

Sample #1 Collected: 1/23/2023 Time: 800
 Sample #2 Collected: 1/25/2023 Time: 800
 Sample #3 Collected: 1/27/2023 Time: 800
 Test Begin: 1/24/2023 Time: 1615
 Test End: 1/31/2023 Time: 1532

Dilution:	0%						
Day:	1	2	3	4	5	6	7
T (°C)	25.7	26.0	24.5	24.4	24.3	24.4	24.4
DO Initial	7.2	6.0	7.0	7.1	7.6	7.3	6.7
DO Final	7.7	7.4	8.1	7.6	7.5	7.7	
pH Initial	6.5	6.5	7.1	7.2	7.4	7.5	6.4
pH Final	7.5	7.4	7.5	8.2	7.6	7.1	
Conductivity	171.0	169.0	159.0	177.0	176.0	154.0	
Alkalinity	40.0						
Hardness	48.0						
Chlorine	<0.5						
Dilution:	32.0%						
Day:	1	2	3	4	5	6	7
T (°C)	25.7	26.0	24.5	24.4	24.3	24.4	24.4
DO Initial	7.0	6.3	7.4	7.1	7.6	7.5	6.3
DO Final	7.8	7.5	8.1	7.6	7.5	8.0	
pH Initial	6.6	6.6	7.1	7.2	7.4	7.4	6.4
pH Final	7.5	7.2	7.1	7.8	7.6	7.0	
Conductivity	209.0	214.0	795.0	167.0	170.0	157.0	
Alkalinity							
Hardness							
Chlorine							
Dilution:	42.0%						
Day:	1	2	3	4	5	6	7
T (°C)	25.7	26.0	24.5	24.4	24.3	24.4	24.4
DO Initial	6.9	6.3	6.9	7.4	7.3	7.1	6.0
DO Final	7.9	7.7	8.1	7.2	7.4	7.6	
pH Initial	6.9	6.7	7.0	7.1	7.1	7.2	6.4
pH Final	7.4	7.2	6.9	7.0	7.3	7.1	
Alkalinity							
Hardness							
Conductivity	222.0	228.0	211.0	167.0	173.0	162.0	
Chlorine							
Dilution:	56.0%						
Day:	1	2	3	4	5	6	7
T (°C)	25.7	26.0	24.5	24.4	24.3	24.4	24.4
DO Initial	6.6	5.9	6.5	7.0	7.1	7.4	5.7
DO Final	7.8	7.8	8.1	7.1	7.3	7.6	
pH Initial	6.9	6.8	7.0	7.1	7.2	7.5	6.3
pH Final	7.4	7.2	7.1	7.2	7.4	7.0	
Conductivity	239.0	250.0	231.0	171.0	180.0	165.0	
Alkalinity							
Hardness							
Chlorine							
Dilution:	80.0%						
Day:	1	2	3	4	5	6	7
T (°C)	25.7	26.0	24.5	24.4	24.3	24.4	24.4
DO Initial	6.5	5.6	6.1	7.0	7.3	7.0	5.4
DO Final	8.1	7.9	8.3	7.8	7.9	7.9	
pH Initial	6.9	6.8	7.0	7.1	7.2	7.3	6.3
pH Final	7.4	7.2	7.1	7.2	7.3	7.1	
Conductivity	263.0	282.0	262.0	179.0	184.0	180.0	
Alkalinity							
Hardness							
Chlorine							
Dilution:	100.0%						
Day:	1	2	3	4	5	6	7
T (°C)	25.7	26.0	24.5	24.4	24.3	24.4	24.4
DO Initial	6.3	5.5	6.1	7.0	7.1	7.0	5.2
DO Final	8.2	8.1	8.4	7.3	7.4	7.9	
pH Initial	6.9	6.9	7.0	7.2	7.3	7.2	6.4
pH Final	7.4	7.2	6.9	6.9	7.4	7.0	
Alkalinity	52.0	40.0		28.0			
Hardness	28.0	36.0		24.0			
Conductivity	290.0	310.0	292.0	196.0	200.0	185.0	
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#: X 8634

Chain of Custody Documents Checked by: Emil Mon 2/2/23
Technician/Date

Raw Data Documents Checked by: Emil Mon 2/2/23
Technician/Date

Statistical Analysis Package Checked by: EBB 2/13/23
Quality Manager/Date

Quality Control Data Checked by: EBB 2/21/23
Quality Manager/Date

Report Checked by: EBB 2/21/23
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.

Ernest P. Briggs, BS
Quality Manager

2/21/23
Date

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