

 **ANALYTICAL REPORT****PREPARED FOR**

Attn: Mr. John Davis
Malvern Water Works
506 Overman
Malvern, Arkansas 72104

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JOB DESCRIPTION

Biomonitoring

JOB NUMBER

192-9864-1

Job Notes

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Authorization



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Authorized for release by
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Re: Chronic 7-Day Renewal *Pimephales promelas* (Fathead minnow) and *Ceriodaphnia dubia*
- Outfall 001
NPDES Permit No. AR0034126 AFIN 30-00040
Control No. 274894-1

This report is the analytical results and supporting information for the samples submitted to Eurofins Arkansas. The following results are applicable only to the sample identified by the control number referenced above. Accurate assessment of the data requires access to the entire document. Each section of the report has been reviewed and approved by the Laboratory Manager or qualified designee.

Testing procedures and Quality Assurance were in accordance with "Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms" EPA-821-R-02-013, Fourth Edition, October 2002. The supporting chemistry data included with this report is intended for accessing the basic water quality of the effluent as required by this test method and is not intended to be utilized for discharge monitoring reports. Test results are summarized below:

Method 1000.0 Chronic *Pimephales promelas* (Fathead minnow) Survival and Growth Test: The permit requirement is NOEC not less than 12%. The following were concluded from the test:

Survival:	NOEC	LOEC	Growth:	NOEC	LOEC	IC25
	16	>16		16	>16	>16

The sample therefore PASSED the Fathead minnow test.

Method 1002.0 Chronic *Ceriodaphnia dubia* Survival and Reproduction Test: The permit requirement is NOEC not less than 12%. The following were concluded from the test:

Survival:	NOEC	LOEC	Reproduction:	NOEC	LOEC	IC25
	16	>16		16	>16	>16

The sample therefore PASSED the *Ceriodaphnia dubia* test.

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Ceriodaphnia dubia Survival and Reproduction

Ceriodaphnia dubia Chemical Parameters Chart

Appendix (Summary)

I. Control Acceptance Criteria

Pimephales promelas (Fathead minnow) Method 1000.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	95.0	PASS
Control Growth > or = 0.25 mg per Surviving minnow	0.653	PASS
Control Growth CV < or = 40% *	9.02	PASS
Growth Minimum Significant Difference 12 to 30%	17.8	PASS
Critical Dilution CV < or = 40% *	5.27	PASS

* EPA Region 6 Requirement

Ceriodaphnia dubia Method 1002.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	100	PASS
Control Reproduction > or = 15 per Surviving Female	36.8	PASS
Control CV < or = 40% per Surviving Female *	8.86	PASS
Reproduction Minimum Significant Difference 13 to 47%	17.8	PASS
Critical Dilution CV < or = 40% *	8.08	PASS

* EPA Region 6 Requirement

II. Outlined Report

A. Introduction

1. Permit Number: AR0034126 AFIN 30-00040
2. Test Requirements: Test Methods 1000.0 and 1002.0

B. Source of Effluent/Dilution Water:

1. Effluent Samples:

- a. Sampling Point:
- b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	8.6	9.2	10
pH (standard units)	6.5	7.1	7.0
Alkalinity (mg/l as CaCO ₃)	26	24	50
Hardness (mg/l as CaCO ₃)	19	23	21
Conductivity (umhos/cm)	140	140	140
Residual Chlorine (mg/l)	<0.05	<0.05	<0.05
Ammonia as N (mg/l)	3.7	3.8	2.7

2. Dilution Water Samples:

Analysis	192-9593-A-1	192-9654-A-1
Dissolved oxygen (mg/l)	8.2	8.7
pH (standard units)	6.8	7.6
Alkalinity (mg/l as CaCO ₃)	31	30
Hardness (mg/l as CaCO ₃)	42	46
Conductivity (umhos/cm)	160	160
Residual Chlorine (mg/l)	<0.05	<0.05

C. Test Methods

1. Test methods used:

Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA-821-R-02-013; test Methods 1000.0 and 1002.0, Fathead Minnow Survival and Growth and *Ceriodaphnia dubia* Survival and Reproduction.

2. Endpoint: No Observable Effects Concentration (NOEC)

3. Test Conditions:

Pimephales promelas (Fathead minnow) Survival and Growth Method 1000.0

Date & Time Test Initiated: February 27, 2024 at 1657
Date & Time Test Terminated: March 05, 2024 at 1600
Type & Volume of Test Chamber: 500 ml disposable beaker
Volume of Sample: 250 ml
Number of Organisms per replicate: 8
Number of Replicates per dilution: 5

Ceriodaphnia dubia Survival and Reproduction Method 1002.0

Date & Time Test Initiated: February 27, 2024 at 1450
Date & Time Test Terminated: March 04, 2024 at 1630
Type & Volume of Test Chamber: 30 ml disposable beaker
Volume of Sample: 15 ml
Number of Organisms per replicate: 1
Number of Replicates per dilution: 10

4. Source of test organisms: In-house culture

5. Test Temperature: 25 +/- 1 degree Celsius

D. Test Organisms

1. Scientific Name

a. Test 1000.0 *Pimephales promelas*

b. Test 1002.0 *Ceriodaphnia dubia*

III. Data Analysis

The data was analyzed using EPA method criteria and CETIS statistical software.

IV. Standard Reference Toxicants

Sodium chloride in synthetic moderately hard water.

Pimephales promelas (Fathead minnow)

A chronic reference test was performed on February 21, 2024 at 1150 to February 28, 2024 at 1028
The results were as follows: (Control No. 274869-1.)

Survival LC-50: 3776 mg/l

Growth IC-25: 2314 mg/l

Growth PMSD: 12.3

Ceriodaphnia dubia

A chronic reference test was performed on February 21, 2024 at 1050 to February 27, 2024 at 1231
The results were as follows: (Control No. 274869-2.)

Survival LC-50: 2064 mg/l

Reproduction IC-25: 1066 mg/l

Reproduction PMSD: 17.7

V. Organism History

Pimephales promelas (Fathead minnow)

Date: February 27, 2024

Age: <24 hours

Source: In-house culture

Water: Moderately hard synthetic
Temperature: 25 deg.C

Ceriodaphnia dubia

Date: February 27, 2024

Age: <24 hours

Source: In-house culture

Water: Moderately hard synthetic
Temperature: 25 deg.C

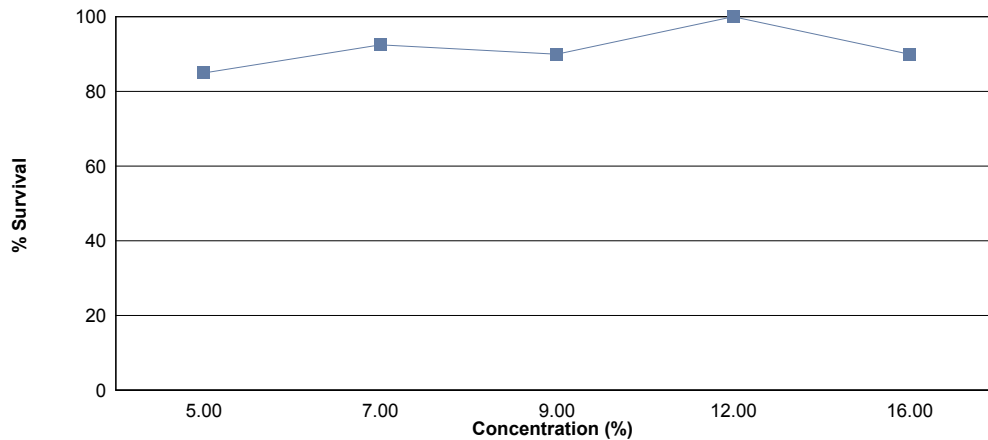
VI. Results Summary *Pimephales promelas*, Fathead minnow Larval Survival and Growth Test -- Method 1000.0

Larvae are exposed in a static renewal system for seven days to different concentrations of effluent with dilution water. Test results are based on the survival and growth (weight) of the larvae.

Effluent concentrations for this test were 5 %, 7 %, 9 %, 12 %, 16 % in accordance with the NPDES permit.

The test was initiated on February 27, 2024 at 1657 and continued through March 05, 2024 at 1600. Statistical analyses were performed on the observed data and the no observable effects concentrations (NOECs) were as follows:

- a.) NOEC survival = 16 % effluent
- b.) NOEC growth = 16 % effluent



Summary of the 7-day Fathead Minnow Survival and Growth		
Concentration	Percent Survival	Mean Growth (mg)
Control	95.0	0.620
5 %	85.0	0.547
7 %	92.5	0.565
9 %	90.0	0.601
12 %	100	0.681
16 %	90.0	0.620

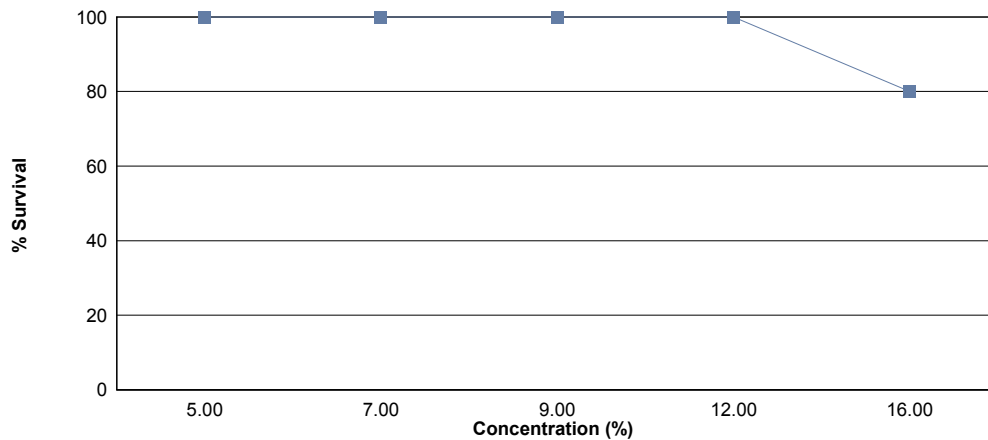
VI. Results Summary *Ceriodaphnia dubia*, Cladoceran Survival and Reproduction Test -- Method 1002.0

Neonates are exposed in a static renewal system to different concentrations of effluent with dilution water until 60% of surviving control organisms have three broods of offspring or a maximum of eight test days.

Effluent concentrations for this test were 5 %, 7 %, 9 %, 12 %, 16 % in accordance with the NPDES permit.

The test was initiated on February 27, 2024 at 1450 and continued through March 04, 2024 at 1630. Statistical analyses were performed on the observed data and the no observable effects concentrations (NOECs) were as follows:

- a.) NOEC survival = 16 % effluent
- b.) NOEC reproduction = 16 % effluent



Summary of the 6-day <i>Ceriodaphnia dubia</i> Survival and Reproduction Data		
Concentration	Percent Survival	Mean Reproduction
Control	100	36.8
5 %	100	37.7
7 %	100	38.1
9 %	100	36.7
12 %	100	38.3
16 %	80.0	30.1

Appendix (Data): Test 1000.0

Pimephales promelas (Fathead Minnow) 7-Day Survival

Date and Time Test Initiated: February 27, 2024 at 1657

Date and Time Test Terminated: March 05, 2024 at 1600

Concentration Replicate		Number of Survivors						
		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Control	A	8	8	8	8	8	8	8
	B	8	7	7	7	7	7	7
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8
	E	8	8	8	7	7	7	7
5 %	A	7	7	7	6	6	6	6
	B	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8
	D	8	6	6	6	6	6	5
	E	8	8	8	8	8	7	7
7 %	A	8	7	7	6	6	6	6
	B	8	8	8	8	8	8	8
	C	7	7	7	7	7	7	7
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8
9 %	A	8	8	8	8	8	8	8
	B	8	7	7	7	7	7	7
	C	8	7	7	7	7	7	7
	D	8	8	7	6	6	6	6
	E	8	8	8	8	8	8	8
12 %	A	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8
16 %	A	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8
	C	7	7	7	7	7	7	7
	D	8	8	8	7	7	7	7
	E	8	7	7	6	6	6	6

Appendix (Data): Test 1000.0

Pimephales promelas (Fathead Minnow) 7-Day Growth

Test Initiated: February 27, 2024 at 1657
 Test Terminated: March 05, 2024 at 1600

Concentration	Replicate	Weight of pan	Weight of pan + fish	Total weight of fish (g)	Original # of fish	Mean dry weight (mg)
Control	A	.70182	.70755	0.00573	8	0.716
	B	.70227	.70723	0.00496	8	0.620
	C	.70102	.70575	0.00473	8	0.591
	D	.70618	.71099	0.00481	8	0.601
	E	.72269	.72728	0.00459	8	0.574
5 %	A	.71323	.71691	0.00368	8	0.460
	B	.70478	.70919	0.00441	8	0.551
	C	.69461	.70006	0.00545	8	0.681
	D	.70513	.70869	0.00356	8	0.445
	E	.70059	.70536	0.00477	8	0.596
7 %	A	.69183	.69654	0.00471	8	0.589
	B	.70578	.71119	0.00541	8	0.676
	C	.70677	.71051	0.00374	8	0.468
	D	.70441	.70886	0.00445	8	0.556
	E	.69977	.70407	0.00430	8	0.538
9 %	A	.70355	.70834	0.00479	8	0.599
	B	.71477	.72060	0.00583	8	0.729
	C	.69661	.70078	0.00417	8	0.521
	D	.71347	.71800	0.00453	8	0.566
	E	.71014	.71488	0.00474	8	0.592
12 %	A	.70561	.71127	0.00566	8	0.708
	B	.71288	.71830	0.00542	8	0.678
	C	.71418	.71968	0.00550	8	0.688
	D	.70516	.71014	0.00498	8	0.622
	E	.71363	.71932	0.00569	8	0.711
16 %	A	.69929	.70453	0.00524	8	0.655
	B	.69753	.70307	0.00554	8	0.692
	C	.70487	.71032	0.00545	8	0.681
	D	.70400	.70793	0.00393	8	0.491
	E	.70790	.71255	0.00465	8	0.581

Appendix (Data): Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

Date and Time Test Initiated: February 27, 2024 at 1450

Date and Time Test Terminated: March 04, 2024 at 1630

Concentration: Control														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
2	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
3	5	4	3	5	3	5	6	6	7	3	47	10	4.70	
4	0	0	0	0	0	0	0	0	10	11	21	10	2.10	
5	12	11	9	12	13	10	9	10	0	0	86	10	8.60	
6	21	22	21	17	25	20	19	25	24	20	214	10	21.4	
7														
8														
TOTAL	38	37	33	34	41	35	34	41	41	34	368	10	36.8	

Concentration: 5 %														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
3	4	6	5	7	7	7	5	5	6	7	59	10	5.90	
4	0	0	0	0	0	0	11	10	11	0	32	10	3.20	
5	11	10	10	11	12	10	0	0	0	13	77	10	7.70	
6	19	20	22	20	19	23	18	22	23	23	209	10	20.9	
7														
8														
TOTAL	34	36	37	38	38	40	34	37	40	43	377	10	37.7	

Concentration: 7 %														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
3	5	5	7	6	6	5	6	6	6	6	58	10	5.80	
4	0	0	0	10	0	11	10	0	12	11	54	10	5.40	
5	11	10	12	0	11	0	0	12	0	0	56	10	5.60	
6	24	20	21	16	25	20	21	23	23	20	213	10	21.3	
7														
8														
TOTAL	40	35	40	32	42	36	37	41	41	37	381	10	38.1	

Appendix (Data): Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

Date and Time Test Initiated: February 27, 2024 at 1450

Date and Time Test Terminated: March 04, 2024 at 1630

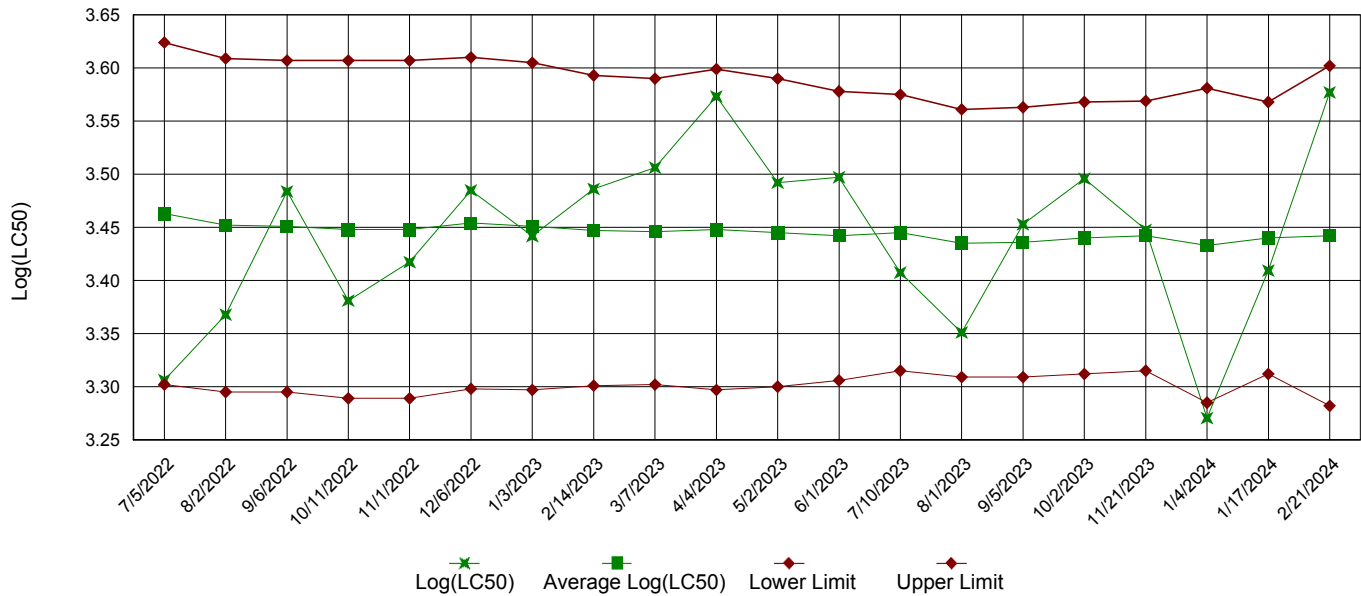
Concentration: 9 %														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
2	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
3	4	4	3	5	7	7	8	6	5	6	55	10	5.50	
4	0	0	0	10	0	0	11	9	0	0	30	10	3.00	
5	10	7	13	0	13	9	0	0	8	11	71	10	7.10	
6	19	18	23	24	23	17	23	20	25	19	211	10	21.1	
7														
8														
TOTAL	33	29	39	39	43	33	42	35	38	36	367	10	36.7	

Concentration: 12 %														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
3	4	3	6	5	7	6	6	6	6	6	55	10	5.50	
4	0	0	0	0	0	0	10	0	12	9	31	10	3.10	
5	12	10	13	10	13	10	0	10	0	0	78	10	7.80	
6	23	21	24	20	21	20	24	23	23	20	219	10	21.9	
7														
8														
TOTAL	39	34	43	35	41	36	40	39	41	35	383	10	38.3	

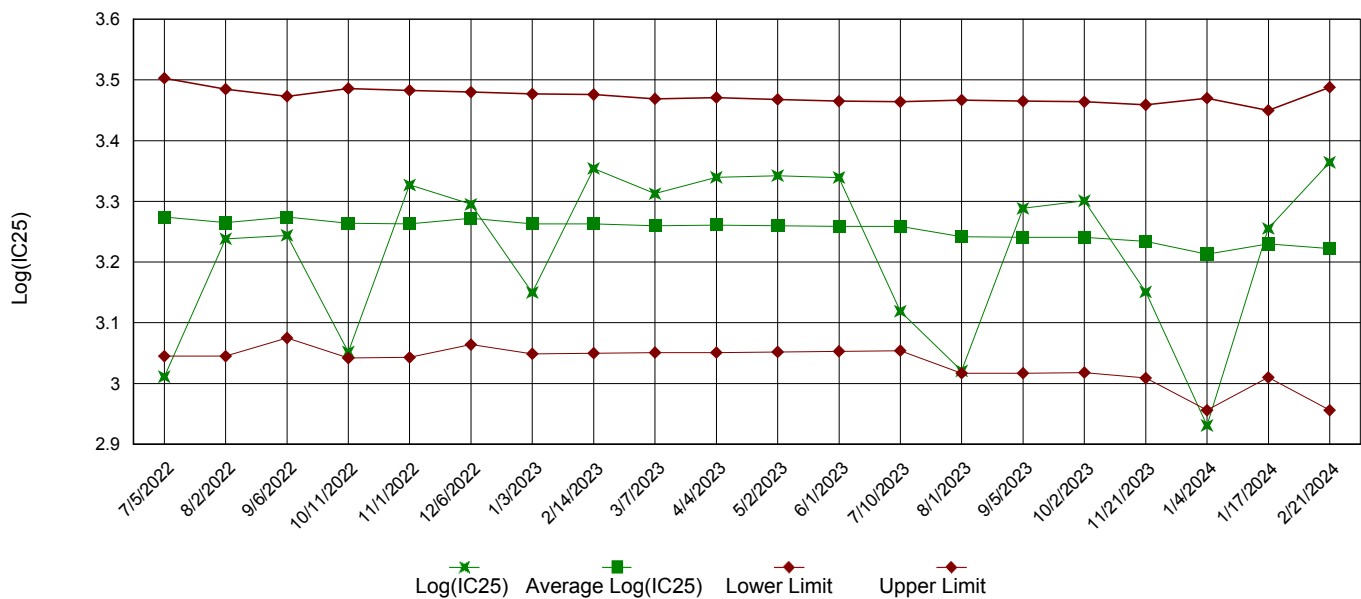
Concentration: 16 %														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
3	6	5	4X	5	5	7	6	6	5	2	51	9	5.67	
4	0	0	X	8	0	0	10	0	8	10	36	9	4.00	
5	11	9	X	0	0	13	0	10	0	0	43	9	4.78	
6	21	20	X	20	X	20	23	22	24	21	171	8	21.4	
7														
8														
TOTAL	38	34	4	33	5	40	39	38	37	33	301	10	30.1	

Appendix (Reference Toxicant): Test 1000.0
Chronic Reference Toxicant, *Pimephales promelas* (Fathead Minnow)

LC50 Survival Data

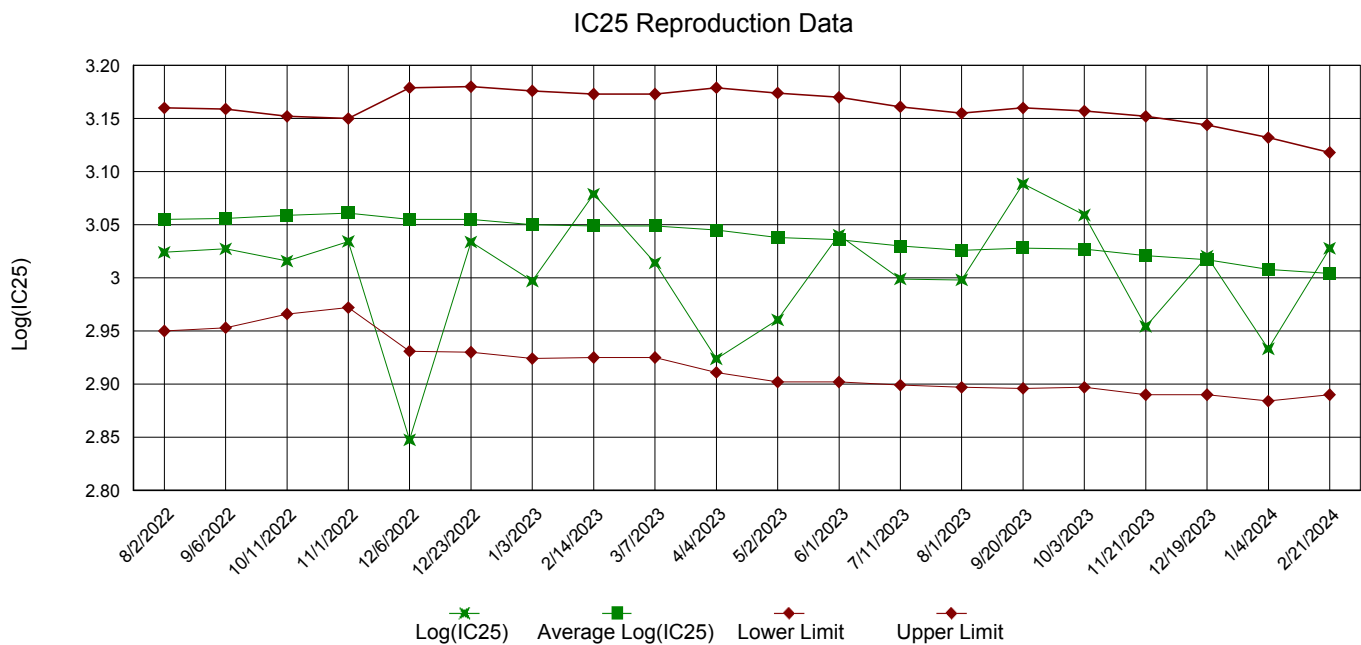
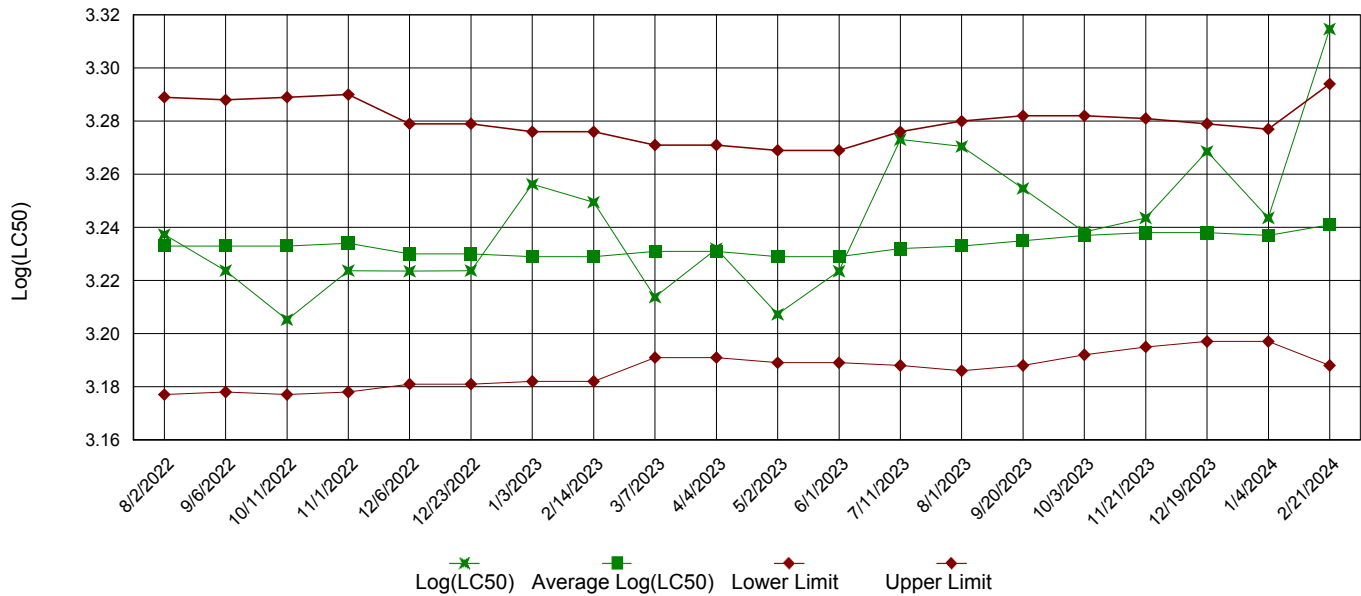


IC25 Growth Data



Appendix (Reference Toxicant): Test 1002.0
Chronic Reference Toxicant, *Ceriodaphnia dubia*

LC50 Survival Data



Appendix (Summary): Test 1000.0
 SUMMARY REPORTING FORMS
 CHRONIC BIOMONITORING
Pimephales promelas (Fathead Minnow)
 SURVIVAL AND GROWTH

Permittee: Malvern Water Works

NPDES No.: AR0034126 AFIN 30-00040

Date and Time Test Initiated: February 27, 2024 at 1657

Date and Time Test Terminated: March 05, 2024 at 1600

Dilution water used:

DATA TABLE FOR SURVIVAL

Effluent Conc. %	Percent Survival in replicate chambers					Mean percent survival			CV%
	A	B	C	D	E	24 hr	48 hr	7 days	
Control	100	87.5	100	100	87.5	100	97.5	95.0	7.21
5 %	75.0	100	100	62.5	87.5	97.5	92.5	85.0	19.2
7 %	75.0	100	87.5	100	100	97.5	95.0	92.5	12.1
9 %	100	87.5	87.5	75.0	100	100	95.0	90.0	11.6
12 %	100	100	100	100	100	100	100	100	0.00
16 %	100	100	87.5	87.5	75.0	97.5	95.0	90.0	11.6

DATA TABLE FOR GROWTH

Effluent Conc. %	Average dry weight, mg replicate chambers					Mean dry weight, mg	CV%
	A	B	C	D	E		
Control	0.716	0.620	0.591	0.601	0.574	0.620	9.02
5 %	0.460	0.551	0.681	0.445	0.596	0.547	17.9
7 %	0.589	0.676	0.468	0.556	0.538	0.565	13.4
9 %	0.599	0.729	0.521	0.566	0.592	0.601	12.9
12 %	0.708	0.678	0.688	0.622	0.711	0.681	5.27
16 %	0.655	0.692	0.681	0.491	0.581	0.620	13.6

CV = Coefficient of variation = standard deviation * 100 / mean

Appendix (Summary): Test 1000.0
 CHRONIC TOXICITY SUMMARY FORM
Pimephales promelas (Fathead minnow)
 CHEMICAL PARAMETERS CHART

PERMITTEE: Malvern Water Works
 NPDES NO.: AR0034126 AFIN 30-00040
 CONTACT: Mr. John Davis
 ANALYST: GCX6, V6YL, B6YF, QGL9, WK7B

Test Initiated: DATE: February 27, 2024 TIME: 1657
 Test Terminated: DATE: March 05, 2024 TIME: 1600

DILUTION Control	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.2	8.4	8.7	8.3	8.1	8.4	8.6
Final	7.4	6.3	7.3	7.2	7.0	6.0	7.4
pH Initial	6.8	6.8	7.6	7.8	7.5	7.5	7.4
Final	7.2	7.1	7.7	7.4	7.2	6.9	7.2

DILUTION 5 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.1	8.4	8.6	8.6	8.2	8.4	8.4
Final	7.2	6.6	7.4	7.2	6.8	5.9	7.5
pH Initial	6.8	7.0	7.5	7.8	7.5	7.5	7.5
Final	7.1	7.1	7.7	7.3	7.1	6.8	7.1

DILUTION 7 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.2	8.5	8.7	8.6	8.2	8.3	8.5
Final	7.2	6.7	7.0	7.2	6.8	7.1	7.6
pH Initial	6.9	7.1	7.5	7.8	7.5	7.4	7.4
Final	7.1	7.1	7.6	7.3	7.1	7.0	7.2

DILUTION 9 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.9	8.4	8.6	8.8	8.2	8.5	8.5
Final	7.1	6.5	7.3	7.7	7.1	6.0	7.4
pH Initial	6.7	7.1	7.5	7.8	7.5	7.4	7.5
Final	7.1	7.1	7.7	7.3	7.1	6.8	7.0

DILUTION 12 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.3	8.7	8.9	8.8	8.2	8.5	8.4
Final	6.8	6.4	7.0	7.1	6.6	6.0	7.1
pH Initial	6.9	7.1	7.5	7.7	7.5	7.4	7.4
Final	7.0	7.1	7.6	7.2	7.1	6.8	7.0

DILUTION 16 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.3	8.5	8.8	8.4	8.2	8.3	8.4
Final	6.6	6.5	7.2	6.9	6.6	6.3	7.2
pH Initial	6.9	7.1	7.5	7.7	7.5	7.4	7.4
Final	7.0	7.1	7.7	7.3	7.1	6.8	7.0

Alkalinity	Hardness	Conductivity	Chlorine	Sample ID
26	19	140	<0.05	Malvern Wastewater 27-FEB-24
24	23	140	<0.05	Malvern Wastewater 28-FEB-24
50	21	140	<0.05	Malvern Wastewater 01-MAR-24

Alkalinity	Hardness	Conductivity	Chlorine	Sample ID
31	42	160	<0.05	192-9593-A-1
30	46	160	<0.05	192-9654-A-1

Appendix (Summary): Test 1002.0
 SUMMARY REPORTING FORMS
 CHRONIC BIOMONITORING
Ceriodaphnia dubia
 SURVIVAL AND REPRODUCTION

Permittee: Malvern Water Works

NPDES No.: AR0034126 AFIN 30-00040

Date and Time Test Initiated: February 27, 2024 at 1450

Date and Time Test Terminated: March 04, 2024 at 1630

Dilution water used:

PERCENT SURVIVAL

Time of Reading	Control	Percent Effluent				
		5 %	7 %	9 %	12 %	16 %
24 hour	100	100	100	100	100	100
48 hour	100	100	100	100	100	100
6 day	100	100	100	100	100	80.0

NUMBER OF YOUNG PRODUCED PER FEMALE @ 6 DAYS

Replicates	Control	Percent Effluent				
		5 %	7 %	9 %	12 %	16 %
A	38	34	40	33	39	38
B	37	36	35	29	34	34
C	33	37	40	39	43	4
D	34	38	32	39	35	33
E	41	38	42	43	41	5
F	35	40	36	33	36	40
G	34	34	37	42	40	39
H	41	37	41	35	39	38
I	41	40	41	38	41	37
J	34	43	37	36	35	33
Mean per Adult	36.8	37.7	38.1	36.7	38.3	30.1
Mean per Surviving Adult	36.8	37.7	38.1	36.7	38.3	36.5
CV %	8.86	7.40	8.43	11.8	8.08	7.61

CV = Coefficient of variation = standard deviation * 100 / mean
 (calculated based on young produced by surviving females)

Appendix (Summary): Test 1002.0
 CHRONIC TOXICITY SUMMARY FORM
Ceriodaphnia dubia
 CHEMICAL PARAMETERS CHART

PERMITTEE: Malvern Water Works
 NPDES NO.: AR0034126 AFIN 30-00040
 CONTACT: Mr. John Davis
 ANALYST: GCX6, V6YL, B6YF, QGL9, WK7B

Test Initiated: DATE: February 27, 2024 TIME: 1450
 Test Terminated: DATE: March 04, 2024 TIME: 1630

DILUTION Control	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.2	8.4	8.7	8.3	8.1	8.4	8.6
Final	8.3	8.7	8.6	8.4	8.5	8.3	--
pH Initial	6.8	6.8	7.6	7.8	7.5	7.5	7.4
Final	7.0	7.7	8.2	8.1	8.0	6.5	--

DILUTION 5 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.1	8.4	8.6	8.6	8.2	8.4	8.4
Final	8.5	8.4	8.4	8.5	8.5	8.4	--
pH Initial	6.8	7.0	7.5	7.8	7.5	7.5	7.5
Final	7.4	7.6	8.1	8.0	8.0	6.5	--

DILUTION 7 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.2	8.5	8.7	8.6	8.2	8.3	8.5
Final	8.7	8.3	8.6	8.5	8.8	8.1	--
pH Initial	6.9	7.1	7.5	7.8	7.5	7.4	7.4
Final	7.5	7.6	8.1	8.0	8.0	6.5	--

DILUTION 9 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.9	8.4	8.6	8.8	8.2	8.5	8.5
Final	8.2	8.4	8.5	8.4	8.6	8.3	--
pH Initial	6.7	7.1	7.5	7.8	7.5	7.4	7.5
Final	7.5	7.6	8.1	8.0	8.0	6.6	--

DILUTION 12 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.3	8.7	8.9	8.8	8.2	8.5	8.4
Final	8.6	8.3	8.7	8.6	8.6	8.2	--
pH Initial	6.9	7.1	7.5	7.7	7.5	7.4	7.4
Final	7.5	7.6	8.1	8.0	8.0	6.6	--

DILUTION 16 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	8.3	8.5	8.8	8.4	8.2	8.3	8.4
Final	8.7	8.2	8.4	8.3	8.6	8.4	--
pH Initial	6.9	7.1	7.5	7.7	7.5	7.4	7.4
Final	7.5	7.6	8.1	8.0	8.0	6.6	--

Alkalinity	Hardness	Conductivity	Chlorine	Sample ID
26	19	140	<0.05	Malvern Wastewater 27-FEB-24
24	23	140	<0.05	Malvern Wastewater 28-FEB-24
50	21	140	<0.05	Malvern Wastewater 01-MAR-24

Alkalinity	Hardness	Conductivity	Chlorine	Sample ID
31	42	160	<0.05	192-9593-A-1
30	46	160	<0.05	192-9654-A-1

CETIS Summary Report

Report Date: 08 Mar-24 14:25 (p 1 of 2)
 Test Code/ID: 274894_CD / 20-9436-2075

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Ceriodaphnia 7-d Survival and Reproduction Test

Eurofins Arkansas

Batch ID: 00-7117-0670 Test Type: Reproduction-Survival (7d) Analyst:
 Start Date: 27 Feb-24 14:50 Protocol: EPA/821/R-02-013 (2002) Diluent: Soft Synthetic Water
 Ending Date: 04 Mar-24 16:30 Species: Ceriodaphnia dubia Brine:
 Test Length: 6d 2h Taxon: Branchiopoda Source: In-House Culture Age: <24

Sample ID: 09-6026-8550 Code: 274894 Project:
 Sample Date: 27 Feb-24 07:00 Material: POTW Effluent Source: Malvern Water Works (AR0034126)
 Receipt Date: 27 Feb-24 10:50 CAS (PC): Station: Malvern Wastewater
 Sample Age: 8h Client:

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	PMSD	TU
04-3425-0953	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	16	>16	---	---	6.2
03-9040-4061	Reproduction	Steel Many-One Rank Sum Test	16	>16	---	17.8%	6.2

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU
08-4543-1547	6d Survival Rate	Linear Interpolation (ICPIN)	LC50	>16	---	---	<6.2
20-0855-9714	Reproduction	Linear Interpolation (ICPIN)	IC25	>16	---	---	<6.2

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits			Overlap	Decision
				Lower	Upper			
03-9040-4061	Reproduction	Control Resp	36.8	15	>>	Yes	Passes Criteria	
20-0855-9714	Reproduction	Control Resp	36.8	15	>>	Yes	Passes Criteria	
03-9040-4061	Reproduction	PMSD	0.1779	0.13	0.47	Yes	Passes Criteria	

6d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
5		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
7		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
9		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
12		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
16		10	0.8000	0.4984	1.1020	0.0000	1.0000	0.1333	0.4216	52.70%	20.00%

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	10	36.8	34.47	39.13	33	41	1.031	3.259	8.86%	0.00%
5		10	37.7	35.7	39.7	34	43	0.8825	2.791	7.40%	-2.45%
7		10	38.1	35.8	40.4	32	42	1.016	3.213	8.43%	-3.53%
9		10	36.7	33.59	39.81	29	43	1.375	4.347	11.85%	0.27%
12		10	38.3	36.09	40.51	34	43	0.9781	3.093	8.08%	-4.08%
16		10	30.1	20.29	39.91	4	40	4.337	13.71	45.56%	18.21%

CETIS Summary Report

Report Date: 08 Mar-24 14:25 (p 2 of 2)
Test Code/ID: 274894_CD / 20-9436-2075

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Ceriodaphnia 7-d Survival and Reproduction Test

Eurofins Arkansas

6d Survival Rate Detail

MD5: D49EFB06EF8B9A282DCCFB07977DD24

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
5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
7		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
9		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
16		1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Reproduction Detail

MD5: 553529C61F14AE56989AA4306E8F93E8

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	38	37	33	34	41	35	34	41	41	34
5		34	36	37	38	38	40	34	37	40	43
7		40	35	40	32	42	36	37	41	41	37
9		33	29	39	39	43	33	42	35	38	36
12		39	34	43	35	41	36	40	39	41	35
16		38	34	4	33	5	40	39	38	37	33

6d 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
5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
7		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
9		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
16		1/1	1/1	0/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 08 Mar-24 14:24 (p 1 of 2)
Test Code/ID: 274894_CD / 20-9436-2075

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Ceriodaphnia 7-d Survival and Reproduction Test **Eurofins Arkansas**

Analysis ID: 03-9040-4061	Endpoint: Reproduction	CETIS Version: CETIS v2.1.5
Analyzed: 08 Mar-24 14:23	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 08 Mar-24 0:00	MD5 Hash: 553529C61F14AE56989AA4306E8F93E8	Editor ID: 009-809-445-9
Batch ID: 00-7117-0670	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 27 Feb-24 14:50	Protocol: EPA/821/R-02-013 (2002)	Diluent: Soft Synthetic Water
Ending Date: 04 Mar-24 16:30	Species: Ceriodaphnia dubia	Brine:
Test Length: 6d 2h	Taxon: Branchiopoda	Source: In-House Culture Age: <24
Sample ID: 09-6026-8550	Code: 274894	Project:
Sample Date: 27 Feb-24 07:00	Material: POTW Effluent	Source: Malvern Water Works (AR0034126)
Receipt Date: 27 Feb-24 10:50	CAS (PC):	Station: Malvern Wastewater
Sample Age: 8h	Client:	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	16	>16	---	6.2	6.546	17.79%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Dilution Water		5	18	113	75	3	CDF	0.9548	Non-Significant Effect
		7	18	116.5	75	3	CDF	0.9780	Non-Significant Effect
		9	18	106	75	3	CDF	0.8549	Non-Significant Effect
		12	18	119.5	75	3	CDF	0.9889	Non-Significant Effect
		16	18	91	75	4	CDF	0.3875	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	36.8	15	>>	Yes	Passes Criteria
PMSD	0.1779	0.13	0.47	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	480.483	96.0967	5	2.351	0.0530	Non-Significant Effect
Error	2207.7	40.8833	54			
Total	2688.18		59			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	43.83	15.09	<1.0E-05	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.7881	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	36.8	34.47	39.13	36	33	41	1.031	8.86%	0.00%
5		10	37.7	35.7	39.7	37.5	34	43	0.8825	7.40%	-2.45%
7		10	38.1	35.8	40.4	38.5	32	42	1.016	8.43%	-3.53%
9		10	36.7	33.59	39.81	37	29	43	1.375	11.85%	0.27%
12		10	38.3	36.09	40.51	39	34	43	0.9781	8.08%	-4.08%
16		10	30.1	20.29	39.91	35.5	4	40	4.337	45.56%	18.21%

Reproduction Detail

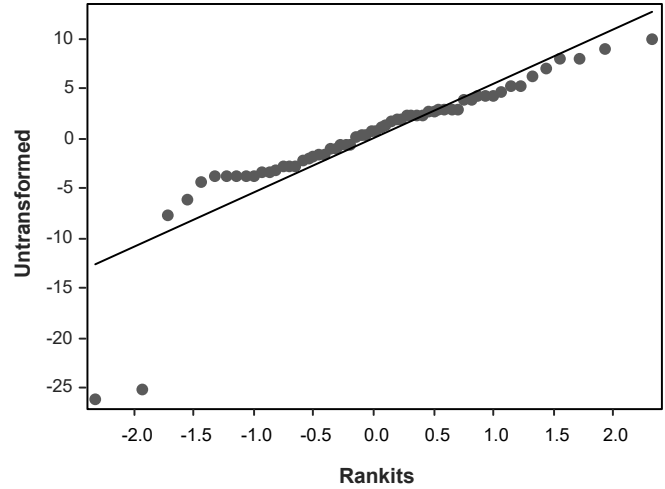
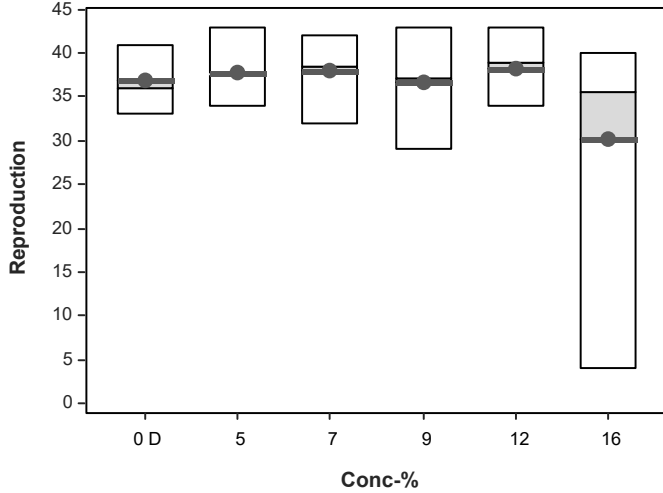
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	38	37	33	34	41	35	34	41	41	34
5		34	36	37	38	38	40	34	37	40	43
7		40	35	40	32	42	36	37	41	41	37
9		33	29	39	39	43	33	42	35	38	36
12		39	34	43	35	41	36	40	39	41	35
16		38	34	4	33	5	40	39	38	37	33

Ceriodaphnia 7-d Survival and Reproduction Test

Eurofins Arkansas

Analysis ID: 03-9040-4061 Endpoint: Reproduction CETIS Version: CETIS v2.1.5
Analyzed: 08 Mar-24 14:23 Analysis: Nonparametric-Control vs Treatments Status Level: 1
Edit Date: 08 Mar-24 0:00 MD5 Hash: 553529C61F14AE56989AA4306E8F93E8 Editor ID: 009-809-445-9

Graphics



CETIS Analytical Report

Report Date: 08 Mar-24 14:24 (p 1 of 3)
Test Code/ID: 274894_CD / 20-9436-2075

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Ceriodaphnia 7-d Survival and Reproduction Test

Eurofins Arkansas

Analysis ID: 08-4543-1547	Endpoint: 6d Survival Rate	CETIS Version: CETIS v2.1.5
Analyzed: 08 Mar-24 14:22	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 08 Mar-24 0:00	MD5 Hash: D49EFB06EF8B9A282DCCFBB07977DD2	Editor ID: 009-809-445-9
Batch ID: 00-7117-0670	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 27 Feb-24 14:50	Protocol: EPA/821/R-02-013 (2002)	Diluent: Soft Synthetic Water
Ending Date: 04 Mar-24 16:30	Species: Ceriodaphnia dubia	Brine:
Test Length: 6d 2h	Taxon: Branchiopoda	Source: In-House Culture Age: <24
Sample ID: 09-6026-8550	Code: 274894	Project:
Sample Date: 27 Feb-24 07:00	Material: POTW Effluent	Source: Malvern Water Works (AR0034126)
Receipt Date: 27 Feb-24 10:50	CAS (PC):	Station: Malvern Wastewater
Sample Age: 8h	Client:	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	744952	1000	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
LC50	>16	---	---	<6.2	---	---

6d Survival Rate Summary

Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate	
			Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	D	10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
5		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
7		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
9		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
12		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
16		10	0.8000	1.0000	0.0000	1.0000	52.70%	20.00%	8/10	0.8000	20.00%

6d 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
5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
7		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
9		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
16		1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000

6d Survival Rate Binomials

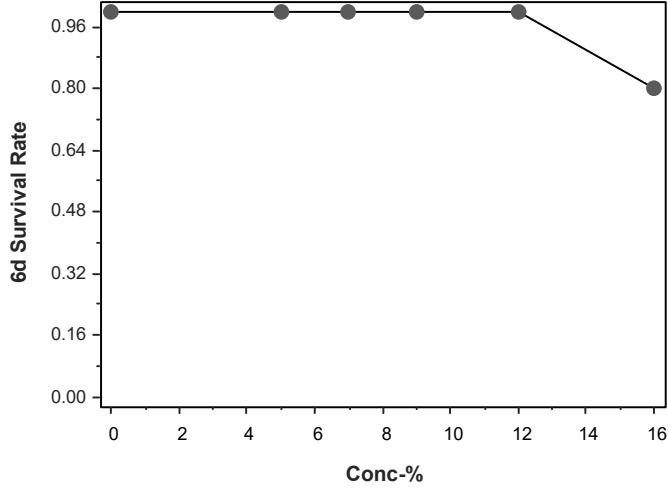
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
7		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
9		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
16		1/1	1/1	0/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test

Eurofins Arkansas

Analysis ID: 08-4543-1547 Endpoint: 6d Survival Rate CETIS Version: CETIS v2.1.5
Analyzed: 08 Mar-24 14:22 Analysis: Linear Interpolation (ICPIN) Status Level: 1
Edit Date: 08 Mar-24 0:00 MD5 Hash: D49EFB06EF8B9A282DCCFBB07977DD2 Editor ID: 009-809-445-9

Graphics



CETIS Analytical Report

Report Date: 08 Mar-24 14:24 (p 3 of 3)
Test Code/ID: 274894_CD / 20-9436-2075

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Ceriodaphnia 7-d Survival and Reproduction Test				Eurofins Arkansas			
Analysis ID: 20-0855-9714	Endpoint: Reproduction	CETIS Version: CETIS v2.1.5		Analyzed: 08 Mar-24 14:22	Analysis: Linear Interpolation (ICPIN)	Status Level: 1	
Edit Date: 08 Mar-24 0:00	MD5 Hash: 553529C61F14AE56989AA4306E8F93E8	Editor ID: 009-809-445-9					
Batch ID: 00-7117-0670	Test Type: Reproduction-Survival (7d)	Analyst:					
Start Date: 27 Feb-24 14:50	Protocol: EPA/821/R-02-013 (2002)	Diluent: Soft Synthetic Water					
Ending Date: 04 Mar-24 16:30	Species: Ceriodaphnia dubia	Brine:					
Test Length: 6d 2h	Taxon: Branchiopoda	Source: In-House Culture		Age: <24			
Sample ID: 09-6026-8550	Code: 274894	Project:					
Sample Date: 27 Feb-24 07:00	Material: POTW Effluent	Source: Malvern Water Works (AR0034126)					
Receipt Date: 27 Feb-24 10:50	CAS (PC):	Station: Malvern Wastewater					
Sample Age: 8h	Client:						

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	705147	1000	Yes	Two-Point Interpolation

Test Acceptability Criteria		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	36.8	15	>>	Yes	Passes Criteria

Point Estimates						
Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
IC25	>16	---	---	<6.2	---	---

Reproduction Summary			Calculated Variate						Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	D	10	36.8	36	33	41	8.86%	0.00%	37.53	0.00%
5		10	37.7	37.5	34	43	7.40%	-2.45%	37.53	0.00%
7		10	38.1	38.5	32	42	8.43%	-3.53%	37.53	0.00%
9		10	36.7	37	29	43	11.85%	0.27%	37.5	0.09%
12		10	38.3	39	34	43	8.08%	-4.08%	37.5	0.09%
16		10	30.1	35.5	4	40	45.56%	18.21%	30.1	19.80%

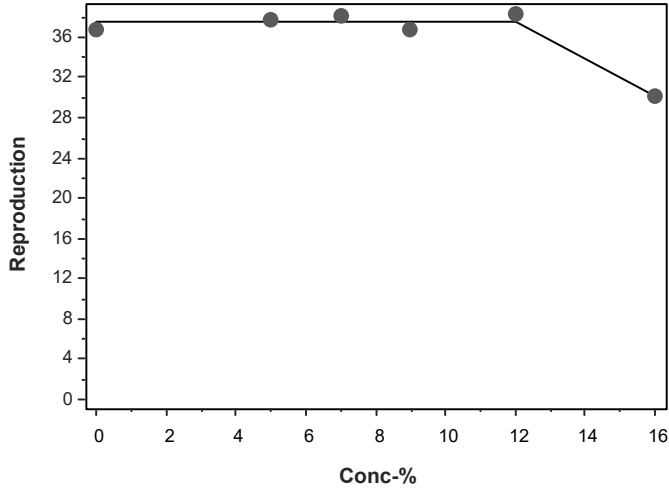
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	38	37	33	34	41	35	34	41	41	34
5		34	36	37	38	38	40	34	37	40	43
7		40	35	40	32	42	36	37	41	41	37
9		33	29	39	39	43	33	42	35	38	36
12		39	34	43	35	41	36	40	39	41	35
16		38	34	4	33	5	40	39	38	37	33

Ceriodaphnia 7-d Survival and Reproduction Test

Eurofins Arkansas

Analysis ID: 20-0855-9714 Endpoint: Reproduction CETIS Version: CETIS v2.1.5
Analyzed: 08 Mar-24 14:22 Analysis: Linear Interpolation (ICPIN) Status Level: 1
Edit Date: 08 Mar-24 0:00 MD5 Hash: 553529C61F14AE56989AA4306E8F93E8 Editor ID: 009-809-445-9

Graphics



CETIS Summary Report

Report Date: 08 Mar-24 14:42 (p 1 of 2)
 Test Code/ID: 274894_FH / 09-1288-1394

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Fathead Minnow 7-d Larval Survival and Growth Test

Eurofins Arkansas

Batch ID: 08-2362-3388 Test Type: Growth-Survival (7d) Analyst:
 Start Date: 27 Feb-24 16:57 Protocol: EPA/821/R-02-013 (2002) Diluent: Soft Synthetic Water
 Ending Date: 05 Mar-24 16:00 Species: Pimephales promelas Brine:
 Test Length: 6d 23h Taxon: Actinopterygii Source: Aquatox, AR Age: <24

Sample ID: 03-4634-0130 Code: 274894 Project:
 Sample Date: 27 Feb-24 07:00 Material: POTW Effluent Source: Malvern Water Works (AR0034126)
 Receipt Date: 27 Feb-24 10:50 CAS (PC): Station: Malvern Wastewater
 Sample Age: 10h Client:

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	PMSD	TU
08-4599-9179	7d Survival Rate	Steel Many-One Rank Sum Test	16	>16	---	15.9%	6.2
03-6078-8931	Mean Dry Biomass-mg	Dunnett Multiple Comparison Test	16	>16	---	17.8%	6.2

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU
02-4227-1983	7d Survival Rate	Linear Interpolation (ICPIN)	LC50	>16	---	---	<6.2
20-4983-8978	Mean Dry Biomass-mg	Linear Interpolation (ICPIN)	IC25	>16	---	---	<6.2

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits			Overlap	Decision
				Lower	Upper			
02-4227-1983	7d Survival Rate	Control Resp	0.95	0.8	>>	Yes	Passes Criteria	
08-4599-9179	7d Survival Rate	Control Resp	0.95	0.8	>>	Yes	Passes Criteria	
03-6078-8931	Mean Dry Biomass-mg	Control Resp	0.6205	0.25	>>	Yes	Passes Criteria	
20-4983-8978	Mean Dry Biomass-mg	Control Resp	0.6205	0.25	>>	Yes	Passes Criteria	
03-6078-8931	Mean Dry Biomass-mg	PMSD	0.1783	0.12	0.3	Yes	Passes Criteria	

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	5	0.9500	0.8650	1.0350	0.8750	1.0000	0.0306	0.0685	7.21%	0.00%
5		5	0.8500	0.6476	1.0520	0.6250	1.0000	0.0729	0.1630	19.17%	10.53%
7		5	0.9250	0.7862	1.0640	0.7500	1.0000	0.0500	0.1118	12.09%	2.63%
9		5	0.9000	0.7701	1.0300	0.7500	1.0000	0.0468	0.1046	11.62%	5.26%
12		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-5.26%
16		5	0.9000	0.7701	1.0300	0.7500	1.0000	0.0468	0.1046	11.62%	5.26%

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	5	0.6205	0.5509	0.6901	0.5738	0.7162	0.02508	0.05608	9.04%	0.00%
5		5	0.5467	0.425	0.6685	0.445	0.6813	0.04384	0.09803	17.93%	11.89%
7		5	0.5652	0.4705	0.66	0.4675	0.6762	0.03412	0.07629	13.50%	8.90%
9		5	0.6015	0.5054	0.6976	0.5213	0.7287	0.03461	0.0774	12.87%	3.06%
12		5	0.6813	0.6369	0.7256	0.6225	0.7113	0.01596	0.03568	5.24%	-9.79%
16		5	0.6202	0.5158	0.7247	0.4912	0.6925	0.03762	0.08413	13.56%	0.04%

CETIS Summary Report

Report Date: 08 Mar-24 14:42 (p 2 of 2)
Test Code/ID: 274894_FH / 09-1288-1394

Fathead Minnow 7-d Larval Survival and Growth Test

Eurofins Arkansas

7d Survival Rate Detail

MD5: C10086E7D64049EA95E0234FE9E06707

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	1.0000	0.8750	1.0000	1.0000	0.8750
5		0.7500	1.0000	1.0000	0.6250	0.8750
7		0.7500	1.0000	0.8750	1.0000	1.0000
9		1.0000	0.8750	0.8750	0.7500	1.0000
12		1.0000	1.0000	1.0000	1.0000	1.0000
16		1.0000	1.0000	0.8750	0.8750	0.7500

Mean Dry Biomass-mg Detail

MD5: 69A7E2BFA1945C760890DFC19B8AFCE5

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	0.7162	0.62	0.5912	0.6012	0.5738
5		0.46	0.5512	0.6813	0.445	0.5962
7		0.5887	0.6762	0.4675	0.5563	0.5375
9		0.5988	0.7287	0.5213	0.5663	0.5925
12		0.7075	0.6775	0.6875	0.6225	0.7113
16		0.655	0.6925	0.6813	0.4912	0.5812

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	8/8	7/8	8/8	8/8	7/8
5		6/8	8/8	8/8	5/8	7/8
7		6/8	8/8	7/8	8/8	8/8
9		8/8	7/8	7/8	6/8	8/8
12		8/8	8/8	8/8	8/8	8/8
16		8/8	8/8	7/8	7/8	6/8

CETIS Analytical Report

Report Date: 08 Mar-24 14:24 (p 1 of 2)
Test Code/ID: 274894_CD / 20-9436-2075

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Ceriodaphnia 7-d Survival and Reproduction Test

Eurofins Arkansas

Analysis ID: 04-3425-0953	Endpoint: 6d Survival Rate	CETIS Version: CETIS v2.1.5
Analyzed: 08 Mar-24 14:21	Analysis: STP 2xK Contingency Tables	Status Level: 1
Edit Date: 08 Mar-24 0:00	MD5 Hash: D49EFB06EF8B9A282DCCFBB07977DD2	Editor ID: 009-809-445-9
Batch ID: 00-7117-0670	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 27 Feb-24 14:50	Protocol: EPA/821/R-02-013 (2002)	Diluent: Soft Synthetic Water
Ending Date: 04 Mar-24 16:30	Species: Ceriodaphnia dubia	Brine:
Test Length: 6d 2h	Taxon: Branchiopoda	Source: In-House Culture Age: <24
Sample ID: 09-6026-8550	Code: 274894	Project:
Sample Date: 27 Feb-24 07:00	Material: POTW Effluent	Source: Malvern Water Works (AR0034126)
Receipt Date: 27 Feb-24 10:50	CAS (PC):	Station: Malvern Wastewater
Sample Age: 8h	Client:	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units
Untransformed	C > T	16	>16	---	6.2

Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Type	P-Value	Decision(α:5%)
Dilution Water		5	1.0000	Exact	1.0000	Non-Significant Effect
		7	1.0000	Exact	1.0000	Non-Significant Effect
		9	1.0000	Exact	1.0000	Non-Significant Effect
		12	1.0000	Exact	1.0000	Non-Significant Effect
		16	0.2368	Exact	1.0000	Non-Significant Effect

6d 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%
5		10	0	10	1.0000	0.0000	0.00%
7		10	0	10	1.0000	0.0000	0.00%
9		10	0	10	1.0000	0.0000	0.00%
12		10	0	10	1.0000	0.0000	0.00%
16		8	2	10	0.8000	0.2000	20.00%

6d 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%
5		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
7		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
9		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
12		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
16		10	0.8000	0.4984	1.0000	1.0000	0.0000	1.0000	0.1333	52.70%	20.00%

6d 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
5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
7		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
9		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
16		1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Ceriodaphnia 7-d Survival and Reproduction Test

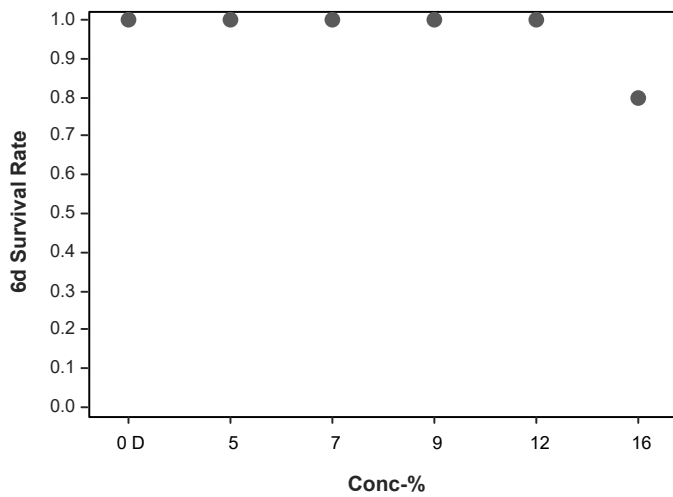
Eurofins Arkansas

Analysis ID: 04-3425-0953 Endpoint: 6d Survival Rate CETIS Version: CETIS v2.1.5
 Analyzed: 08 Mar-24 14:21 Analysis: STP 2xK Contingency Tables Status Level: 1
 Edit Date: 08 Mar-24 0:00 MD5 Hash: D49EFB06EF8B9A282DCCFBB07977DD2 Editor ID: 009-809-445-9

6d 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
5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
7		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
9		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
16		1/1	1/1	0/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1

Graphics



CETIS Analytical Report

Report Date: 08 Mar-24 14:41 (p 1 of 4)
 Test Code/ID: 274894_FH / 09-1288-1394

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Fathead Minnow 7-d Larval Survival and Growth Test

Eurofins Arkansas

Analysis ID: 08-4599-9179	Endpoint: 7d Survival Rate	CETIS Version: CETIS v2.1.5
Analyzed: 08 Mar-24 14:39	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 08 Mar-24 0:00	MD5 Hash: C10086E7D64049EA95E0234FE9E06707	Editor ID: 009-809-445-9
Batch ID: 08-2362-3388	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 27 Feb-24 16:57	Protocol: EPA/821/R-02-013 (2002)	Diluent: Soft Synthetic Water
Ending Date: 05 Mar-24 16:00	Species: Pimephales promelas	Brine:
Test Length: 6d 23h	Taxon: Actinopterygii	Source: Aquatox, AR Age: <24
Sample ID: 03-4634-0130	Code: 274894	Project:
Sample Date: 27 Feb-24 07:00	Material: POTW Effluent	Source: Malvern Water Works (AR0034126)
Receipt Date: 27 Feb-24 10:50	CAS (PC):	Station: Malvern Wastewater
Sample Age: 10h	Client:	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	16	>16	---	6.2	0.1506	15.85%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Dilution Water		5	8	23	16	2	CDF	0.4416	Non-Significant Effect
		7	8	26.5	16	2	CDF	0.7637	Non-Significant Effect
		9	8	24	16	2	CDF	0.5394	Non-Significant Effect
		12	8	32.5	16	1	CDF	0.9870	Non-Significant Effect
		16	8	24	16	2	CDF	0.5394	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	0.120358	0.0240716	5	1.181	0.3476	Non-Significant Effect
Error	0.489177	0.0203824	24			
Total	0.609535		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	0.9569	0.9031	0.2583	Normal Distribution

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	5	0.9500	0.8650	1.0000	1.0000	0.8750	1.0000	0.0306	7.21%	0.00%
5		5	0.8500	0.6476	1.0000	0.8750	0.6250	1.0000	0.0729	19.17%	10.53%
7		5	0.9250	0.7862	1.0000	1.0000	0.7500	1.0000	0.0500	12.09%	2.63%
9		5	0.9000	0.7701	1.0000	0.8750	0.7500	1.0000	0.0468	11.62%	5.26%
12		5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-5.26%
16		5	0.9000	0.7701	1.0000	0.8750	0.7500	1.0000	0.0468	11.62%	5.26%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	5	1.3200	1.1950	1.4450	1.3930	1.2090	1.3930	0.0450	7.62%	0.00%
5		5	1.1910	0.9270	1.4550	1.2090	0.9117	1.3930	0.0951	17.85%	9.75%
7		5	1.2870	1.0940	1.4810	1.3930	1.0470	1.3930	0.0697	12.12%	2.46%
9		5	1.2500	1.0690	1.4320	1.2090	1.0470	1.3930	0.0653	11.68%	5.24%
12		5	1.3930	1.3930	1.3930	1.3930	1.3930	1.3930	0.0000	0.00%	-5.57%
16		5	1.2500	1.0690	1.4320	1.2090	1.0470	1.3930	0.0653	11.68%	5.24%

Fathead Minnow 7-d Larval Survival and Growth Test

Eurofins Arkansas

Analysis ID: 08-4599-9179 Endpoint: 7d Survival Rate CETIS Version: CETIS v2.1.5
 Analyzed: 08 Mar-24 14:39 Analysis: Nonparametric-Control vs Treatments Status Level: 1
 Edit Date: 08 Mar-24 0:00 MD5 Hash: C10086E7D64049EA95E0234FE9E06707 Editor ID: 009-809-445-9

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	1.0000	0.8750	1.0000	1.0000	0.8750
5		0.7500	1.0000	1.0000	0.6250	0.8750
7		0.7500	1.0000	0.8750	1.0000	1.0000
9		1.0000	0.8750	0.8750	0.7500	1.0000
12		1.0000	1.0000	1.0000	1.0000	1.0000
16		1.0000	1.0000	0.8750	0.8750	0.7500

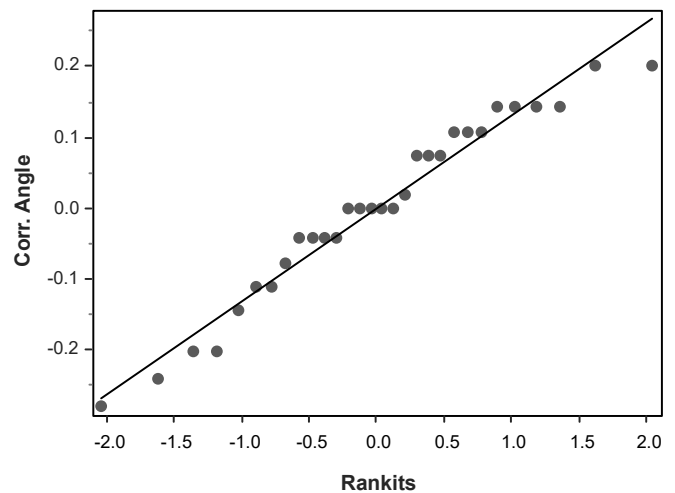
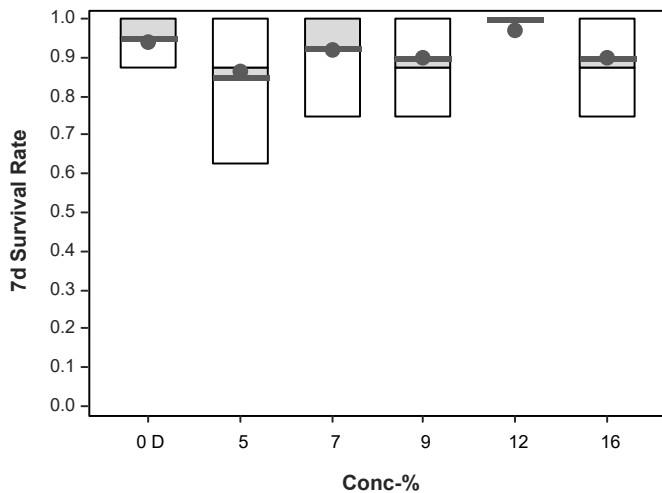
Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	1.3930	1.2090	1.3930	1.3930	1.2090
5		1.0470	1.3930	1.3930	0.9117	1.2090
7		1.0470	1.3930	1.2090	1.3930	1.3930
9		1.3930	1.2090	1.2090	1.0470	1.3930
12		1.3930	1.3930	1.3930	1.3930	1.3930
16		1.3930	1.3930	1.2090	1.2090	1.0470

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	8/8	7/8	8/8	8/8	7/8
5		6/8	8/8	8/8	5/8	7/8
7		6/8	8/8	7/8	8/8	8/8
9		8/8	7/8	7/8	6/8	8/8
12		8/8	8/8	8/8	8/8	8/8
16		8/8	8/8	7/8	7/8	6/8

Graphics



CETIS Analytical Report

Report Date: 08 Mar-24 14:41 (p 3 of 4)
Test Code/ID: 274894_FH / 09-1288-1394

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Fathead Minnow 7-d Larval Survival and Growth Test

Eurofins Arkansas

Analysis ID: 03-6078-8931	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETIS v2.1.5
Analyzed: 08 Mar-24 14:40	Analysis: Parametric-Control vs Treatments	Status Level: 1
Edit Date: 08 Mar-24 0:00	MD5 Hash: 69A7E2BFA1945C760890DFC19B8AFCE5	Editor ID: 009-809-445-9
Batch ID: 08-2362-3388	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 27 Feb-24 16:57	Protocol: EPA/821/R-02-013 (2002)	Diluent: Soft Synthetic Water
Ending Date: 05 Mar-24 16:00	Species: Pimephales promelas	Brine:
Test Length: 6d 23h	Taxon: Actinopterygii	Source: Aquatox, AR Age: <24
Sample ID: 03-4634-0130	Code: 274894	Project:
Sample Date: 27 Feb-24 07:00	Material: POTW Effluent	Source: Malvern Water Works (AR0034126)
Receipt Date: 27 Feb-24 10:50	CAS (PC):	Station: Malvern Wastewater
Sample Age: 10h	Client:	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	16	>16	---	6.2	0.1106	17.83%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Dilution Water		5	8	1.574	2.362	0.1106	CDF	0.2007	Non-Significant Effect
		7	8	1.179	2.362	0.1106	CDF	0.3427	Non-Significant Effect
		9	8	0.4055	2.362	0.1106	CDF	0.6873	Non-Significant Effect
		12	8	-1.297	2.362	0.1106	CDF	0.9930	Non-Significant Effect
		16	8	0.005309	2.362	0.1106	CDF	0.8318	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	0.6205	0.25	>>	Yes	Passes Criteria
PMSD	0.1783	0.12	0.3	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0563387	0.0112677	5	2.054	0.1069	Non-Significant Effect
Error	0.131664	0.005486	24			
Total	0.188002		29			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	3.845	15.09	0.5720	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9788	0.9031	0.7933	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	0.6205	0.5509	0.6901	0.6012	0.5738	0.7162	0.02508	9.04%	0.00%
5		5	0.5467	0.425	0.6685	0.5512	0.445	0.6813	0.04384	17.93%	11.89%
7		5	0.5652	0.4705	0.66	0.5563	0.4675	0.6762	0.03412	13.50%	8.90%
9		5	0.6015	0.5054	0.6976	0.5925	0.5213	0.7287	0.03461	12.87%	3.06%
12		5	0.6813	0.6369	0.7256	0.6875	0.6225	0.7113	0.01596	5.24%	-9.79%
16		5	0.6202	0.5158	0.7247	0.655	0.4912	0.6925	0.03762	13.56%	0.04%

Mean Dry Biomass-mg Detail

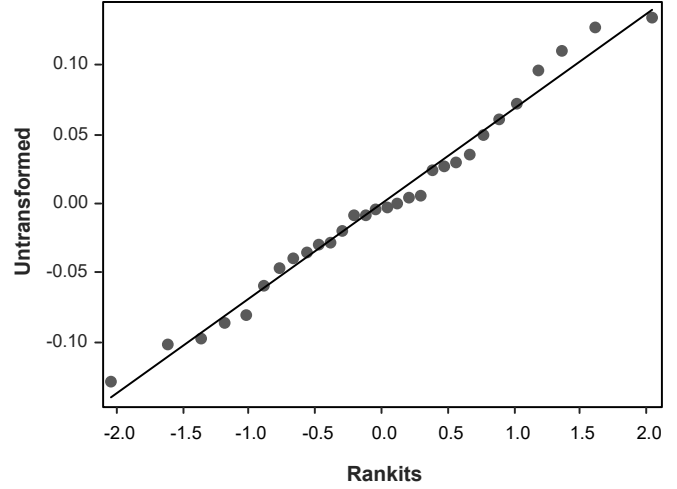
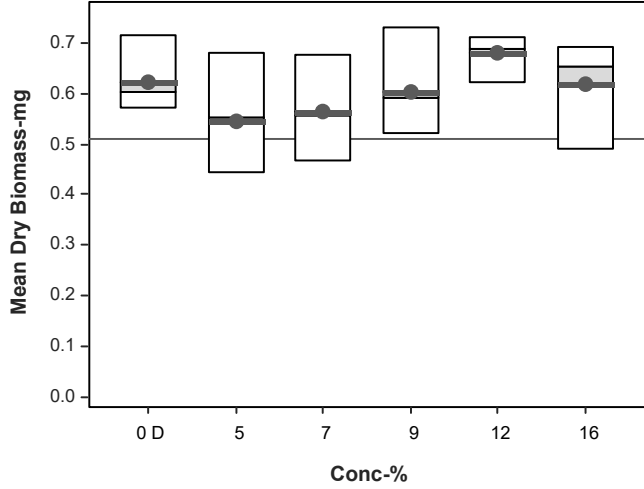
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	0.7162	0.62	0.5912	0.6012	0.5738
5		0.46	0.5512	0.6813	0.445	0.5962
7		0.5887	0.6762	0.4675	0.5563	0.5375
9		0.5988	0.7287	0.5213	0.5663	0.5925
12		0.7075	0.6775	0.6875	0.6225	0.7113
16		0.655	0.6925	0.6813	0.4912	0.5812

Fathead Minnow 7-d Larval Survival and Growth Test

Eurofins Arkansas

Analysis ID: 03-6078-8931 Endpoint: Mean Dry Biomass-mg CETIS Version: CETIS v2.1.5
Analyzed: 08 Mar-24 14:40 Analysis: Parametric-Control vs Treatments Status Level: 1
Edit Date: 08 Mar-24 0:00 MD5 Hash: 69A7E2BFA1945C760890DFC19B8AFCE5 Editor ID: 009-809-445-9

Graphics



CETIS Analytical Report

Report Date: 08 Mar-24 14:41 (p 1 of 3)
 Test Code/ID: 274894_FH / 09-1288-1394

1
2
3

Fathead Minnow 7-d Larval Survival and Growth Test

Eurofins Arkansas

Analysis ID: 02-4227-1983	Endpoint: 7d Survival Rate	CETIS Version: CETIS v2.1.5
Analyzed: 08 Mar-24 14:39	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 08 Mar-24 0:00	MD5 Hash: C10086E7D64049EA95E0234FE9E06707	Editor ID: 009-809-445-9
Batch ID: 08-2362-3388	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 27 Feb-24 16:57	Protocol: EPA/821/R-02-013 (2002)	Diluent: Soft Synthetic Water
Ending Date: 05 Mar-24 16:00	Species: Pimephales promelas	Brine:
Test Length: 6d 23h	Taxon: Actinopterygii	Source: Aquatox, AR Age: <24
Sample ID: 03-4634-0130	Code: 274894	Project:
Sample Date: 27 Feb-24 07:00	Material: POTW Effluent	Source: Malvern Water Works (AR0034126)
Receipt Date: 27 Feb-24 10:50	CAS (PC):	Station: Malvern Wastewater
Sample Age: 10h	Client:	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	597724	1000	Yes	Two-Point Interpolation

Test Acceptability Criteria

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

Point Estimates

Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
LC50	>16	---	---	<6.2	---	---

7d Survival Rate Summary

Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate	
			Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	D	5	0.9500	1.0000	0.8750	1.0000	7.21%	0.00%	38/40	0.9500	0.00%
5		5	0.8500	0.8750	0.6250	1.0000	19.17%	10.53%	34/40	0.9188	3.29%
7		5	0.9250	1.0000	0.7500	1.0000	12.09%	2.63%	37/40	0.9188	3.29%
9		5	0.9000	0.8750	0.7500	1.0000	11.62%	5.26%	36/40	0.9188	3.29%
12		5	1.0000	1.0000	1.0000	1.0000	0.00%	-5.26%	40/40	0.9188	3.29%
16		5	0.9000	0.8750	0.7500	1.0000	11.62%	5.26%	36/40	0.9000	5.26%

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	1.0000	0.8750	1.0000	1.0000	0.8750
5		0.7500	1.0000	1.0000	0.6250	0.8750
7		0.7500	1.0000	0.8750	1.0000	1.0000
9		1.0000	0.8750	0.8750	0.7500	1.0000
12		1.0000	1.0000	1.0000	1.0000	1.0000
16		1.0000	1.0000	0.8750	0.8750	0.7500

7d Survival Rate Binomials

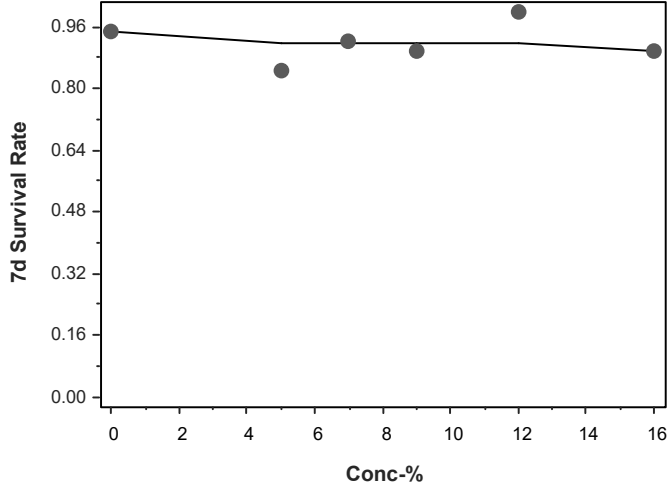
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	8/8	7/8	8/8	8/8	7/8
5		6/8	8/8	8/8	5/8	7/8
7		6/8	8/8	7/8	8/8	8/8
9		8/8	7/8	7/8	6/8	8/8
12		8/8	8/8	8/8	8/8	8/8
16		8/8	8/8	7/8	7/8	6/8

Fathead Minnow 7-d Larval Survival and Growth Test

Eurofins Arkansas

Analysis ID: 02-4227-1983 Endpoint: 7d Survival Rate CETIS Version: CETIS v2.1.5
Analyzed: 08 Mar-24 14:39 Analysis: Linear Interpolation (ICPIN) Status Level: 1
Edit Date: 08 Mar-24 0:00 MD5 Hash: C10086E7D64049EA95E0234FE9E06707 Editor ID: 009-809-445-9

Graphics



CETIS Analytical Report

Report Date: 08 Mar-24 14:41 (p 3 of 3)
Test Code/ID: 274894_FH / 09-1288-1394

1
2
3

Fathead Minnow 7-d Larval Survival and Growth Test

Eurofins Arkansas

Analysis ID: 20-4983-8978	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETIS v2.1.5
Analyzed: 08 Mar-24 14:40	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 08 Mar-24 0:00	MD5 Hash: 69A7E2BFA1945C760890DFC19B8AFCE5	Editor ID: 009-809-445-9
Batch ID: 08-2362-3388	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 27 Feb-24 16:57	Protocol: EPA/821/R-02-013 (2002)	Diluent: Soft Synthetic Water
Ending Date: 05 Mar-24 16:00	Species: Pimephales promelas	Brine:
Test Length: 6d 23h	Taxon: Actinopterygii	Source: Aquatox, AR Age: <24
Sample ID: 03-4634-0130	Code: 274894	Project:
Sample Date: 27 Feb-24 07:00	Material: POTW Effluent	Source: Malvern Water Works (AR0034126)
Receipt Date: 27 Feb-24 10:50	CAS (PC):	Station: Malvern Wastewater
Sample Age: 10h	Client:	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1312439	1000	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	0.6205	0.25	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
IC25	>16	---	---	<6.2	---	---

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Calculated Variate						Isotonic Variate	
			Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	D	5	0.6205	0.6012	0.5738	0.7162	9.04%	0.00%	0.6205	0.00%
5		5	0.5467	0.5512	0.445	0.6813	17.93%	11.89%	0.603	2.82%
7		5	0.5652	0.5563	0.4675	0.6762	13.50%	8.90%	0.603	2.82%
9		5	0.6015	0.5925	0.5213	0.7287	12.87%	3.06%	0.603	2.82%
12		5	0.6813	0.6875	0.6225	0.7113	5.24%	-9.79%	0.603	2.82%
16		5	0.6202	0.655	0.4912	0.6925	13.56%	0.04%	0.603	2.82%

Mean Dry Biomass-mg Detail

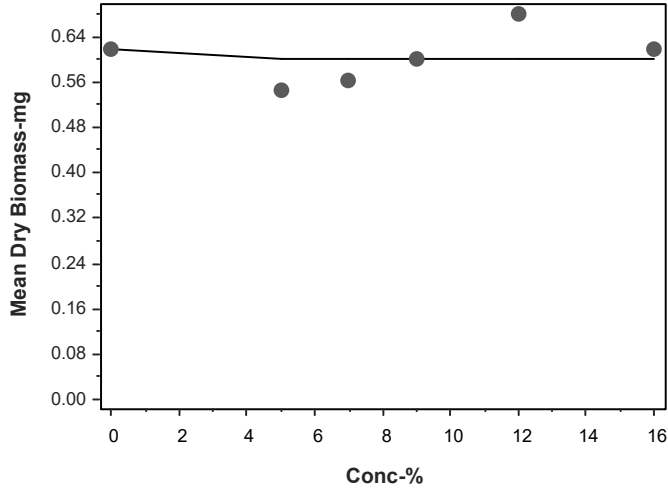
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	0.7162	0.62	0.5912	0.6012	0.5738
5		0.46	0.5512	0.6813	0.445	0.5962
7		0.5887	0.6762	0.4675	0.5563	0.5375
9		0.5988	0.7287	0.5213	0.5663	0.5925
12		0.7075	0.6775	0.6875	0.6225	0.7113
16		0.655	0.6925	0.6813	0.4912	0.5812

Fathead Minnow 7-d Larval Survival and Growth Test

Eurofins Arkansas

Analysis ID: 20-4983-8978 Endpoint: Mean Dry Biomass-mg CETIS Version: CETIS v2.1.5
Analyzed: 08 Mar-24 14:40 Analysis: Linear Interpolation (ICPIN) Status Level: 1
Edit Date: 08 Mar-24 0:00 MD5 Hash: 69A7E2BFA1945C760890DFC19B8AFCE5 Editor ID: 009-809-445-9

Graphics



Chain of Custody Record



COC No: 192-9864 COC

Page: _____

Carrier Tracking No(s): _____

State of Origin: _____

Lab Pkt: _____

Sampler: Devan Bough

Client Information
 Client Contact: _____

Company: Malvern Waste Water

PWSID: _____

Due Date Requested: _____

Address
 City: _____
 State, Zip: _____
 Phone: _____
 Email: _____
 Project Name: _____
 Site: _____

TAT Requested (days): _____

Compliance Project: Yes No

PO #: _____

WO #: _____

Project #: _____

SSOW#: _____

Sample Identification
Biomonitoring

Sample Date: 2-26-24
2-27-24

Sample Time: 8:00am
7:00am

Sample Type (C=Comp, G=grab)
C

Matrix (W=water, S=solid, O=organic/dil)

Field Filtered Sample (Yes or No) Yes No

Performance (MS/MSD Yes or No) Yes No

Analysis Requested

Preservation Codes:
 M - Hexane
 N - None
 O - AsNaO2
 P - Na2O4S
 Q - Na2SO3
 R - Na2S2O3
 S - H2SO4
 T - TSP Dodecahydrate
 U - Acetone
 V - MCAA
 W - pH 4-5
 X - EDTA
 Y - Trizma
 Z - other (specify)

Other: _____

Total Number of containers: L: 274894
T: 9864

Special Instructions/Note:
ID AS: MALVERN WASTEWATER

Return To Client Disposal By Lab Archive For _____ Months

Special Instructions/QC Requirements:

Method of Shipment:

Received by: _____
 Date/Time: 2-27-24 10:50am

Received by: _____
 Date/Time: _____

Received by: V. Brown
 Date/Time: 2-27-24/1050

Cooler Temperature(s) °C and Other Remarks: 0.5

Empty Kit Relinquished by: _____
 Relinquished by: Devan Bough
 Relinquished by: _____

Custody Seals Intact: Yes No
 Custody Seal No.:

Possible Hazard Identification
 Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological

Deliverable Requested I, II, III, IV, Other (specify)

Ver: 01/16/2019

Page 40 of 42

3/14/2024



8600 Karnis Road
Little Rock, AR 72204-2322
(501) 224-5060
FAX (501) 224-5072

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

PAGE 2 OF 3

Client: <u>Malvern Waste Water</u>		AIC CONTROL NO:	
Project Reference:		AIC PROPOSAL NO:	
Project Manager:		Carrier:	
Sampled By: <u>Devan Baym</u>		Received on ice (4°C)? <u>YES</u> NO	
AIC No. <u>2</u>		Remarks <u>TDAS: MALVERN WASTEWATER</u>	
Date/Time Collected <u>2-28-24 8:10 AM</u>			
Bio # <u>2</u>			
Container Type Preservative		Field pH calibration on @	
Buffer:		Buffer:	
T = Sodium Thiosulfate Z = Zinc acetate		T = Sodium Thiosulfate Z = Zinc acetate	
H = HCl to pH2 B = NaOH to pH12		H = HCl to pH2 B = NaOH to pH12	
V = VOA vials N = Nitric acid pH2		V = VOA vials N = Nitric acid pH2	
Relinquished By: <u>[Signature]</u>		Relinquished By: <u>[Signature]</u>	
Date/Time <u>2/28/24 11:01 AM</u>		Date/Time <u>2-28-24 11:01</u>	
Received By: <u>[Signature]</u>		Received in Lab By: <u>[Signature]</u>	
Date/Time		Date/Time	
Comments:		Comments:	

8600 Kanis Rd
 Little Rock, AR 72204
 Phone (501) 224-5060 Phone (501) 224-5075

Client Information Client Contact: <u>Devan Bough</u> Company: <u>Malvern Waste Water</u>		Lab P/N: Carrier Tracking No(s): State of Origin:	COC No: Page: Job #:
Due Date Requested: TAT Requested (days): Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No PO #: WO #: Project #: SSO#:		Analysis Requested	
Address: City: State, Zip: Phone: Email:		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:	
Sample Identification Sample Date: <u>2-24-24</u> Sample Time: <u>3:00 PM</u> Sample Type (C=Comp, G=grab): <u>C</u> Matrix (W=water, S=solid, O=wastefluid, BT=tissue, AA=air) Preservation Code: <u>C</u>		Total Number of Containers: <u>X</u> Special Instructions/Note: <u>IPAS: MALVERN WASTEWATER</u>	
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months	
Deliverable Requested: I, II, III, IV, Other (specify)		Special Instructions/QC Requirements:	
Empty Kit Relinquished by:		Method of Shipment:	
Relinquished by: <u>Devan Bough</u> Date/Time: <u>3-1-24 10:25AM</u>		Received by: <u>Jaysa Hagan</u> Date/Time: <u>3-1-24 10:25</u>	
Relinquished by:		Received by:	
Relinquished by:		Received by:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Cooler Temperature(s) °C and Other Remarks: <u>0.3°C</u>	

