

## **Appendix I. Aquatic Toxicity Testing Lab Results**



**AQUATIC BIOASSAY**  
& CONSULTING LABORATORIES, INC.

## **Toxicity Report for Ventura County Watershed Protection District**

**NPDES Stormwater Wet Season (Contract AE20-007)**

PROJECT: 2023/24-1 (Wet)

CONTRACT: AE20-007

CLIENT: Ms. Kelly Hahs  
VCWPD  
800 South Victoria Avenue, L#1670  
Ventura, CA 93003-1670

SAMPLE I.D.: MO-HUE, MO-THO, MO-MPK, MO-SIM, MO-FIL, MO-VEN, ME-OJA,  
MO-CAM, MO-OXN, MO-SPA, ME-CC, ME-SCR

DATE RECEIVED: 11/15/2023 and 11/16/2023

DATE REPORTED: Preliminary Results: 1/5/2024, Final Report: 1/22/2024

ABC LAB NO.: VCF1123.208, .210, .211, .212, .215, .217, .209, .213, .214, .216, 232

29 North Olive Street Ventura, California 93001 (805) 643-5621

## INTRODUCTION

Toxicity tests using fathead (*P. promelas*), *Ceriodaphnia dubia*, Topsmelt (*A. affinis*), *Selenastrum capricornutum*, and purple urchin (*S. purpuratus*) were performed to evaluate the quality of stormwater samples for Ventura County Watershed Protection District. The samples were collected on November 15<sup>th</sup> and 16<sup>th</sup>, 2023 and delivered the same day, respectively. Testing was conducted at Aquatic Bioassay and Consulting Labs, Inc. in Ventura, California from November 15<sup>th</sup>, through November 28<sup>th</sup>, 2023.

## MATERIALS AND METHODS

### Test Material

Test material consisted of 12 grab samples collected by Ventura County Watershed Protection District (VCWPD) outfall sites. Sample collection was performed by VCWPD personnel under the direction of Ms. Kelly Hahs. The samples were collected in 5-gallon low-density polyethylene buckets and were delivered to Aquatic Bioassay immediately after sampling. Sample temperature was recorded upon acceptance at Aquatic Bioassay Laboratories and is included in the report for each station.

Samples were stored at 4°C. Upon arrival at Aquatic Bioassay, an aliquot of each sample was drawn and water quality parameters of pH, dissolved oxygen (DO), conductivity, temperature, salinity, alkalinity, and hardness were measured and recorded.

### Bioassay Testing

The study was performed in accordance with the United States Environmental Protection Agency (USEPA) protocols:

Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, October 2002, US EPA-821-R-02-013.

Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms, Third Edition, October 2002, US EPA-821-R-02-014.

Summary of results for 100% sample concentration:

Sample ID	Test	Endpoint	Control	100% Sample	Statistically Different From Control	TST Result	*Percent Effect
MO-OXN	Chronic Fathead	Survival (%)	91.67	98.33	No	Pass	-7.27
		Biomass (mg)	0.3117	0.3440	No	Pass	-10.37
MO-SPA	Chronic Fathead	Survival (%)	91.67	98.33	No	Pass	-7.27
		Biomass (mg)	0.3117	0.3408	No	Pass	-9.36
MO-CAM	Chronic Fathead	Survival (%)	100	96.67	No	Pass	3.33
		Biomass (mg)	0.3475	0.3470	No	Pass	0.14
MO-OJA	Chronic Fathead	Survival (%)	100	98.33	No	Pass	1.67
		Biomass (mg)	0.3475	0.3518	No	Pass	-1.25
MO-VEN	Chronic Ceriodaphnia	Survival (%)	100	100	No	Pass	0.00
		Reproduction #-Neonates	33.4	39.1	No	Pass	-17.07
MO-FIL	Chronic Ceriodaphnia	Survival (%)	100	100	No	Pass	0.00
		Reproduction #-Neonates	33.4	36.7	No	Pass	-9.88
MO-HUE	Chronic Ceriodaphnia	Survival (%)	100	100	No	Pass	0.00
		Reproduction #-Neonates	32.0	36.0	No	Pass	-12.50
MO-THO	Chronic Ceriodaphnia	Survival (%)	100	100	No	Pass	0.00
		Reproduction #-Neonates	31.5	37.2	No	Pass	-18.10
MO-MPK	Selenastrum	Cell Density (#x10 <sup>6</sup> )	1.711	2.058	No	Pass	-20.33

\*Percent Effect at IWC = (Mean Control Response – Mean IWC Response) \* 100 / Mean Control Response.

Summary of results for 100% sample concentration: (Cont.)

Sample ID	Test	Endpoint	Control	100% Sample	Statistically Different From Control	TST Result	*Percent Effect
MO-SIM	Chronic Ceriodaphnia	Survival (%)	100	100	No	Pass	0.00
		Reproduction #-Neonates	36.4	37.1	No	Pass	-1.92
ME-SCR	Urchin Fertilization	Fertilization (%)	93.75	94.25	No	Pass	-0.53
ME-CC	Chronic Topsmelt	Survival (%)	100	100	No	Pass	0.00
		Biomass (mg)	1.502	1.450	No	Pass	3.46

\*Percent Effect at IWC = (Mean Control Response – Mean IWC Response) \* 100 / Mean Control Response.

### Quality Assurance

All samples were received in good condition at the appropriate temperatures, and all tests were initiated within 72 hours of sample collection. The natural negative controls met the minimum test acceptability criterion of 80 percent mean survival. Variability among replicates was minimal, and the ability to detect a statistical difference was deemed appropriate.

Survival counts were recorded daily to ensure tests were progressing as expected. Counts were conducted daily on the control replicates. The temperatures in samples were within the recommended range for the entire test duration.

### Reference Toxicant Test

A concurrent reference toxicant test using copper chloride was conducted to assess the health of the test organisms. Mean control survival met the test acceptability criterion. The median lethal concentration (LC50) calculated for this test was within two standard deviations of the internal control chart mean, indicating test organism sensitivity was typical. Reference toxicant test results are summarized in the report.

### Results and Discussion

Mean survival and statistical differences from control for the tests, error bars, results summaries including individual replicate data, statistical summaries, and raw datasheets are located in in the appendix. Appropriate chain-of-custody (COC) procedures were followed during all phases of this study, and copies of the COC forms are provided in the appendix.

### Data Analysis and Reporting

The response observed in this test includes survival, biomass, reproduction, and fertilization of the test organism. Two statistical methods were employed to determine whether there was an effect between the control and test sample: 1) A standard t-test approach following the statistical analysis decision tree in EPA 2002; and 2) A more recent EPA-recommended Test of Significant Toxicity (TST) approach (EPA 2010).

References:

*United States Environmental Protection Agency, 1995. Short-Term Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms, EPA/R-95/136.*

*United States Environmental Protection Agency, 2002. Short-Term Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms, EPA/821/R-02-014.*

*United States Environmental Protection Agency, 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms EPA/821/R-02/012.*

*United States Environmental Protection Agency, 2010. National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document. Office of Wastewater Management. EPA 833-R-10-003.*



**AQUATIC BIOASSAY**  
& CONSULTING LABORATORIES, INC.

December 14, 2023

Ms. Kelly Hahs  
Ventura County Watershed Protection District  
800 South Victoria Ave  
Ventura, CA 93009

Dear Ms. Hahs:

We are pleased to present the enclosed revised bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* EPA-821-R-02-013. "All acceptability criteria were met and the concentration-response was normal. This is a valid test." Results were as follows:

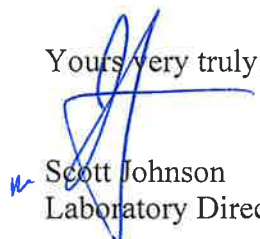
CLIENT:	Ventura County Flood Control
SAMPLE I.D.:	MO-OXN
DATE RECEIVED:	11/15/2023
ABC LAB. NO.:	VCF1123.214

**CHRONIC FATHEAD MINNOW SURVIVAL & GROWTH BIOASSAY**

SURVIVAL	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	EC25 =	>100.00 %
	EC50 =	>100.00 %

BIOMASS	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	IC25 =	>100.00 %
	IC50 =	>100.00 %

Yours very truly,

  
Scott Johnson  
Laboratory Director

# CETIS Summary Report

Report Date: 14 Dec-23 11:33 (p 1 of 2)

Test Code/ID: VCF1123.214fml / 02-4152-5661

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 18-0724-2812	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:32	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:23	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 02-5410-4082	Code: VCF1123.214fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 15:55	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:40	CAS (PC):	Station: MO-OXN
Sample Age: 47h (0.3 °C)	Client: Ventura County Watershed Protection Distri	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	PMSD	TU	S
12-5854-3642	7d Survival Rate	Steel Many-One Rank Sum Test	100	>100	---	10.1%	1	1
13-2756-4187	Mean Dry Biomass-mg	Steel Many-One Rank Sum Test	100	>100	---	11.3%	1	1

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓ Level	%	95% LCL	95% UCL	TU	S
13-8900-2091	7d Survival Rate	Linear Interpolation (ICPIN)	✓ EC15	>100	---	---	<1	1
			✓ EC20	>100	---	---	<1	
			✓ EC25	>100	---	---	<1	
			✓ EC40	>100	---	---	<1	
			✓ EC50	>100	---	---	<1	
05-8256-9746	Mean Dry Biomass-mg	Linear Interpolation (ICPIN)	✓ IC15	>100	---	---	<1	1
			✓ IC20	>100	---	---	<1	
			✓ IC25	>100	---	---	<1	
			✓ IC40	>100	---	---	<1	
			✓ IC50	>100	---	---	<1	

## Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
12-5854-3642	7d Survival Rate	Control Resp	0.9167	0.8	<<	Yes	Passes Criteria
13-8900-2091	7d Survival Rate	Control Resp	0.9167	0.8	<<	Yes	Passes Criteria
05-8256-9746	Mean Dry Biomass-mg	Control Resp	0.3117	0.25	<<	Yes	Passes Criteria
13-2756-4187	Mean Dry Biomass-mg	Control Resp	0.3117	0.25	<<	Yes	Passes Criteria
13-2756-4187	Mean Dry Biomass-mg	PMSD	0.113	0.12	0.3	Yes	Below Criteria

## 7d Survival Rate Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	0.9167	0.7575	1.0760	0.8000	1.0000	0.0500	0.1000	10.91%	0.00%
6.25		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-9.09%
12.5		4	0.9833	0.9303	1.0360	0.9333	1.0000	0.0167	0.0333	3.39%	-7.27%
25		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-9.09%
50		4	0.9500	0.8484	1.0520	0.8667	1.0000	0.0319	0.0638	6.72%	-3.64%
100		4	0.9833	0.9303	1.0360	0.9333	1.0000	0.0167	0.0333	3.39%	-7.27%

## Mean Dry Biomass-mg Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	0.3117	0.2414	0.382	0.2727	0.3587	0.02208	0.04417	14.17%	0.00%
6.25		4	0.3512	0.3252	0.3771	0.3373	0.3733	0.008153	0.01631	4.64%	-12.67%
12.5		4	0.3528	0.3425	0.3631	0.3453	0.3607	0.003236	0.006472	1.83%	-13.21%
25		4	0.3557	0.3414	0.3699	0.348	0.3673	0.004476	0.008953	2.52%	-14.12%
50		4	0.3538	0.3316	0.376	0.34	0.37	0.006973	0.01395	3.94%	-13.53%
100		4	0.344	0.3344	0.3536	0.3387	0.3527	0.003018	0.006037	1.75%	-10.37%

PASS

# CETIS Summary Report

Report Date: 14 Dec-23 11:33 (p 2 of 2)

Test Code/ID: VCF1123.214fml / 02-4152-5661

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

### 7d Survival Rate Detail

MD5: 99001B8ABB92B0A2655F95D273578653

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	0.8000	0.8667	1.0000
6.25		1.0000	1.0000	1.0000	1.0000
12.5		0.9333	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000
50		0.9333	0.8667	1.0000	1.0000
100		1.0000	1.0000	0.9333	1.0000

### Mean Dry Biomass-mg Detail

MD5: 20D60E12E15EA84AF06E69D2CDC5E9AD

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.34	0.2753	0.2727	0.3587
6.25		0.3407	0.3533	0.3373	0.3733
12.5		0.3453	0.3547	0.3507	0.3607
25		0.358	0.3493	0.348	0.3673
50		0.34	0.3447	0.37	0.3607
100		0.3387	0.342	0.3527	0.3427

### 7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	15/15	12/15	13/15	15/15
6.25		15/15	15/15	15/15	15/15
12.5		14/15	15/15	15/15	15/15
25		15/15	15/15	15/15	15/15
50		14/15	13/15	15/15	15/15
100		15/15	15/15	14/15	15/15

# CETIS Analytical Report

Report Date: 14 Dec-23 11:32 (p 1 of 3)  
Test Code/ID: VCF1123.214fml / 02-4152-5661

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 12-5854-3642	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 11:31	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 14 Dec-23 11:30	MD5 Hash: 99001B8ABB92B0A2655F95D273578653	Editor ID: 009-702-627-3
Batch ID: 18-0724-2812	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:32	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:23	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 02-5410-4082	Code: VCF1123.214fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 15:55	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:40	CAS (PC):	Station: MO-ONX
Sample Age: 47h (0.3 °C)	Client: Ventura County Watershed Protection Distri	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	100	>100	---	1	0.09216	10.05%

## Steel Many-One Rank Sum Test

Control	vs	Conc-%	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	6	22	10	2	CDF	0.9908	Non-Significant Effect
		12.5	6	21	10	2	CDF	0.9778	Non-Significant Effect
		25	6	22	10	2	CDF	0.9908	Non-Significant Effect
		50	6	19.5	10	3	CDF	0.9315	Non-Significant Effect
		100	6	21	10	2	CDF	0.9778	Non-Significant Effect

## Test Acceptability Criteria

		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.9167	0.8	<<	Yes	Passes Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0658848	0.013177	5	1.526	0.2312	Non-Significant Effect
Error	0.155416	0.0086342	18			
Total	0.221301		23			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
	Levene Equality of Variance Test	13.35	4.248	1.6E-05	Unequal Variances
	Mod Levene Equality of Variance Test	5.703	4.248	0.0025	Unequal Variances
Distribution	Anderson-Darling A2 Test	1.063	3.878	0.0087	Non-Normal Distribution
	D'Agostino Kurtosis Test	0.6985	2.576	0.4849	Normal Distribution
	D'Agostino Skewness Test	0.9904	2.576	0.3220	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	1.469	9.21	0.4798	Normal Distribution
	Kolmogorov-Smirnov D Test	0.25	0.2056	0.0004	Non-Normal Distribution
	Shapiro-Wilk W Normality Test	0.9229	0.884	0.0677	Normal Distribution

## 7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	0.9167	0.7575	1.0000	0.9556	0.8000	1.0000	0.0500	10.91%	0.00%
6.25		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-9.09%
12.5		4	0.9833	0.9303	1.0000	1.0000	0.9333	1.0000	0.0167	3.39%	-7.27%
25		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-9.09%
50		4	0.9500	0.8484	1.0000	0.9778	0.8667	1.0000	0.0319	6.72%	-3.64%
100		4	0.9833	0.9303	1.0000	1.0000	0.9333	1.0000	0.0167	3.39%	-7.27%

Analyst: 

# CETIS Analytical Report

Report Date: 14 Dec-23 11:32 (p 2 of 3)  
Test Code/ID: VCF1123.214fml / 02-4152-5661

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 12-5854-3642 Endpoint: 7d Survival Rate CETIS Version: CETISv2.1.4  
Analyzed: 14 Dec-23 11:31 Analysis: Nonparametric-Control vs Treatments Status Level: 1  
Edit Date: 14 Dec-23 11:30 MD5 Hash: 99001B8ABB92B0A2655F95D273578653 Editor ID: 009-702-627-3

### Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.2970	1.0250	1.5690	1.3600	1.1070	1.4410	0.0855	13.19%	0.00%
6.25		4	1.4410	1.4410	1.4420	1.4410	1.4410	1.4410	0.0000	0.00%	-11.15%
12.5		4	1.4080	1.3040	1.5130	1.4410	1.3100	1.4410	0.0329	4.68%	-8.61%
25		4	1.4410	1.4410	1.4420	1.4410	1.4410	1.4410	0.0000	0.00%	-11.15%
50		4	1.3470	1.1600	1.5350	1.3970	1.1970	1.4410	0.0589	8.75%	-3.90%
100		4	1.4080	1.3040	1.5130	1.4410	1.3100	1.4410	0.0329	4.68%	-8.61%

### 7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	0.8000	0.8667	1.0000
6.25		1.0000	1.0000	1.0000	1.0000
12.5		0.9333	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000
50		0.9333	0.8667	1.0000	1.0000
100		1.0000	1.0000	0.9333	1.0000

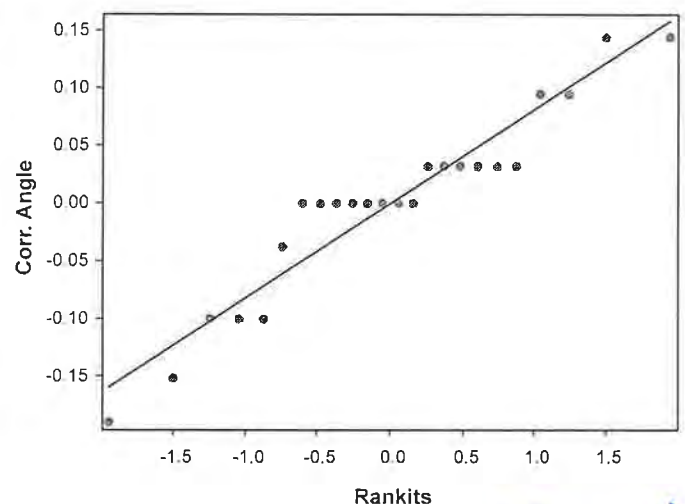
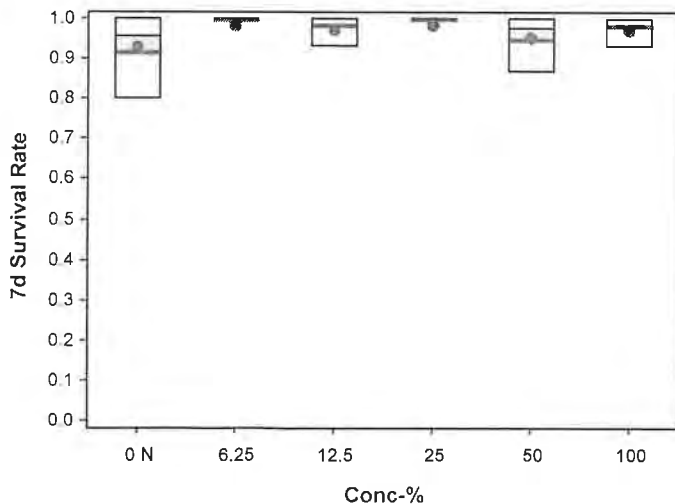
### Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.4410	1.1070	1.1970	1.4410
6.25		1.4410	1.4410	1.4410	1.4410
12.5		1.3100	1.4410	1.4410	1.4410
25		1.4410	1.4410	1.4410	1.4410
50		1.3100	1.1970	1.4410	1.4410
100		1.4410	1.4410	1.3100	1.4410

### 7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	15/15	12/15	13/15	15/15
6.25		15/15	15/15	15/15	15/15
12.5		14/15	15/15	15/15	15/15
25		15/15	15/15	15/15	15/15
50		14/15	13/15	15/15	15/15
100		15/15	15/15	14/15	15/15

### Graphics



# CETIS Analytical Report

Report Date: 14 Dec-23 11:32 (p 3 of 3)  
Test Code/ID: VCF1123.214fml / 02-4152-5661

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 13-2756-4187	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 11:31	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 14 Dec-23 11:30	MD5 Hash: 20D60E12E15EA84AF06E69D2CDC5E9A	Editor ID: 009-702-627-3
Batch ID: 18-0724-2812	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:32	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:23	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 02-5410-4082	Code: VCF1123.214fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 15:55	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:40	CAS (PC):	Station: MO-OXN
Sample Age: 47h (0.3 °C)	Client: Ventura County Watershed Protection Distri	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	0.03523	11.30%

## Steel Many-One Rank Sum Test

Control	vs	Conc-%	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	6	22	10	0	CDF	0.9908	Non-Significant Effect
		12.5	6	23	10	0	CDF	0.9966	Non-Significant Effect
		25	6	23	10	0	CDF	0.9966	Non-Significant Effect
		50	6	23.5	10	1	CDF	0.9981	Non-Significant Effect
		100	6	21	10	0	CDF	0.9778	Non-Significant Effect

## Test Acceptability Criteria

Attribute	Test Stat	TAC Limits			Decision
		Lower	Upper	Overlap	
Control Resp	0.3117	0.25	<<	Yes	Passes Criteria
PMSD	0.113	0.12	0.3	Yes	Below Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0056128	0.0011226	5	2.621	0.0598	Non-Significant Effect
Error	0.0077095	0.0004283	18			
Total	0.0133222		23			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	16.5	15.09	0.0055	Unequal Variances
	Levene Equality of Variance Test	20.71	4.248	<1.0E-05	Unequal Variances
	Mod Levene Equality of Variance Test	15.67	4.248	<1.0E-05	Unequal Variances
Distribution	Anderson-Darling A2 Test	0.5966	3.878	0.1228	Normal Distribution
	D'Agostino Kurtosis Test	1.58	2.576	0.1142	Normal Distribution
	D'Agostino Skewness Test	0.5012	2.576	0.6162	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	2.746	9.21	0.2533	Normal Distribution
	Kolmogorov-Smirnov D Test	0.1416	0.2056	0.2407	Normal Distribution
	Shapiro-Wilk W Normality Test	0.9504	0.884	0.2762	Normal Distribution

## Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	0.3117	0.2414	0.382	0.3077	0.2727	0.3587	0.02208	14.17%	0.00%
6.25		4	0.3512	0.3252	0.3771	0.347	0.3373	0.3733	0.008153	4.64%	-12.67%
12.5		4	0.3528	0.3425	0.3631	0.3527	0.3453	0.3607	0.003236	1.83%	-13.21%
25		4	0.3557	0.3414	0.3699	0.3537	0.348	0.3673	0.004476	2.52%	-14.12%
50		4	0.3538	0.3316	0.376	0.3527	0.34	0.37	0.006973	3.94%	-13.53%
100		4	0.344	0.3344	0.3536	0.3423	0.3387	0.3527	0.003018	1.75%	-10.37%

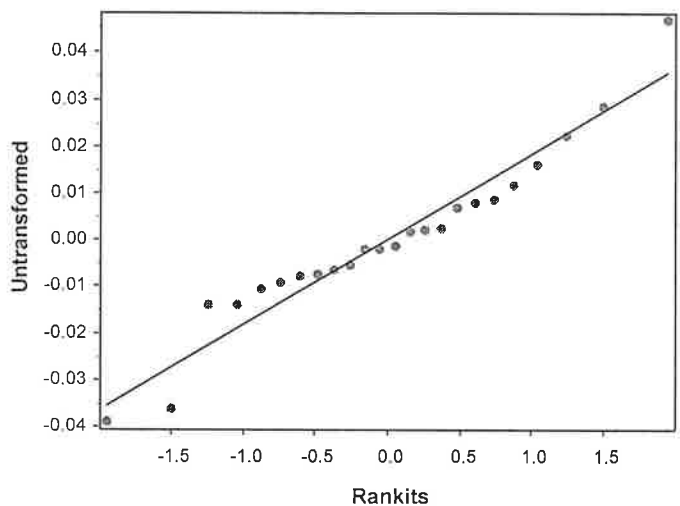
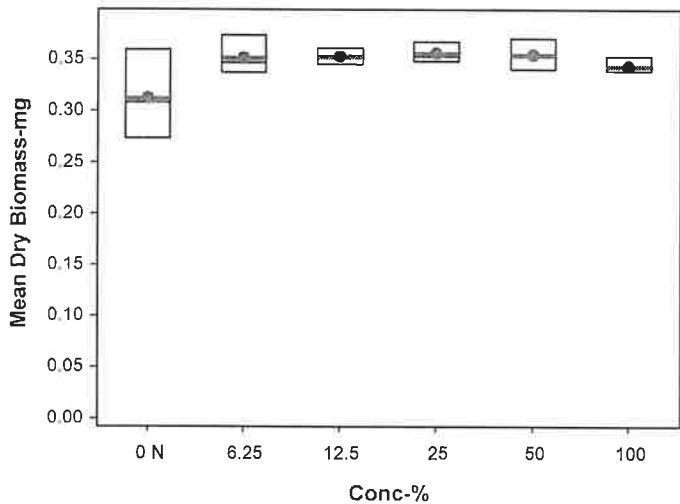
Fathead Minnow 7-d Larval Survival and Growth Test Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	13-2756-4187	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv2.1.4
Analyzed:	14 Dec-23 11:31	Analysis:	Nonparametric-Control vs Treatments	Status Level:	1
Edit Date:	14 Dec-23 11:30	MD5 Hash:	20D60E12E15EA84AF06E69D2CDC5E9A	Editor ID:	009-702-627-3

Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.34	0.2753	0.2727	0.3587
6.25		0.3407	0.3533	0.3373	0.3733
12.5		0.3453	0.3547	0.3507	0.3607
25		0.358	0.3493	0.348	0.3673
50		0.34	0.3447	0.37	0.3607
100		0.3387	0.342	0.3527	0.3427

Graphics



# CETIS Analytical Report

Report Date: 14 Dec-23 11:33 (p 1 of 4)  
Test Code/ID: VCF1123.214fml / 02-4152-5661

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 13-8900-2091	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 11:31	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 14 Dec-23 11:30	MD5 Hash: 99001B8ABB92B0A2655F95D273578653	Editor ID: 009-702-627-3
Batch ID: 18-0724-2812	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:32	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:23	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 02-5410-4082	Code: VCF1123.214fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 15:55	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:40	CAS (PC):	Station: MO-OXN
Sample Age: 47h (0.3 °C)	Client: Ventura County Watershed Protection Distri	

### Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

### Test Acceptability Criteria

		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.9167	0.8	<<	Yes	Passes Criteria

### Point Estimates

Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
EC15	>100	---	---	<1	---	---
EC20	>100	---	---	<1	---	---
EC25	>100	---	---	<1	---	---
EC40	>100	---	---	<1	---	---
EC50	>100	---	---	<1	---	---

### 7d Survival Rate Summary

7d Survival Rate Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	N	4	0.9167	0.9556	0.8000	1.0000	10.91%	0.00%	55/60	0.9750	0.00%
6.25		4	1.0000	1.0000	1.0000	1.0000	0.00%	-9.09%	60/60	0.9750	0.00%
12.5		4	0.9833	1.0000	0.9333	1.0000	3.39%	-7.27%	59/60	0.9750	0.00%
25		4	1.0000	1.0000	1.0000	1.0000	0.00%	-9.09%	60/60	0.9750	0.00%
50		4	0.9500	0.9778	0.8667	1.0000	6.72%	-3.64%	57/60	0.9667	0.85%
100		4	0.9833	1.0000	0.9333	1.0000	3.39%	-7.27%	59/60	0.9667	0.85%

### 7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	0.8000	0.8667	1.0000
6.25		1.0000	1.0000	1.0000	1.0000
12.5		0.9333	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000
50		0.9333	0.8667	1.0000	1.0000
100		1.0000	1.0000	0.9333	1.0000

### 7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	15/15	12/15	13/15	15/15
6.25		15/15	15/15	15/15	15/15
12.5		14/15	15/15	15/15	15/15
25		15/15	15/15	15/15	15/15
50		14/15	13/15	15/15	15/15
100		15/15	15/15	14/15	15/15

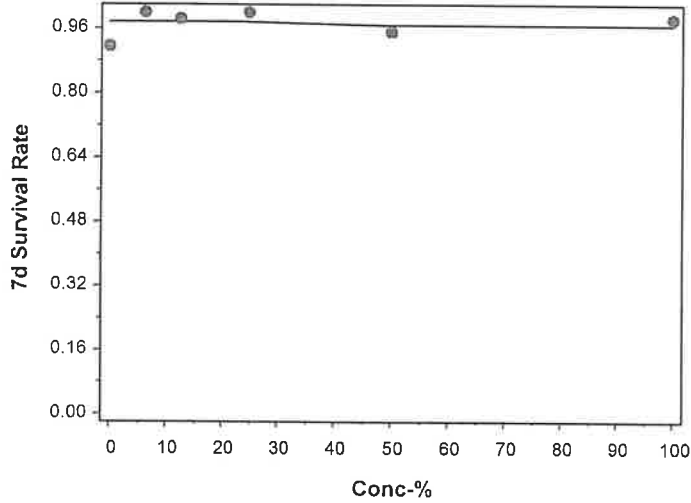
# CETIS Analytical Report

Report Date: 14 Dec-23 11:33 (p 2 of 4)  
Test Code/ID: VCF1123.214fml / 02-4152-5661

Fathead Minnow 7-d Larval Survival and Growth Test Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 13-8900-2091	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 11:31	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 14 Dec-23 11:30	MD5 Hash: 99001B8ABB92B0A2655F95D273578653	Editor ID: 009-702-627-3

## Graphics



# CETIS Analytical Report

Report Date: 14 Dec-23 11:33 (p 3 of 4)  
Test Code/ID: VCF1123.214fml / 02-4152-5661

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 05-8256-9746	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 11:31	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 14 Dec-23 11:30	MD5 Hash: 20D60E12E15EA84AF06E69D2CDC5E9A	Editor ID: 009-702-627-3
Batch ID: 18-0724-2812	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:32	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:23	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 02-5410-4082	Code: VCF1123.214fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 15:55	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:40	CAS (PC):	Station: MO-OXN
Sample Age: 47h (0.3 °C)	Client: Ventura County Watershed Protection Distri	

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	628925	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.3117	0.25	<<	Yes	Passes Criteria

## Point Estimates

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

## Mean Dry Biomass-mg Summary

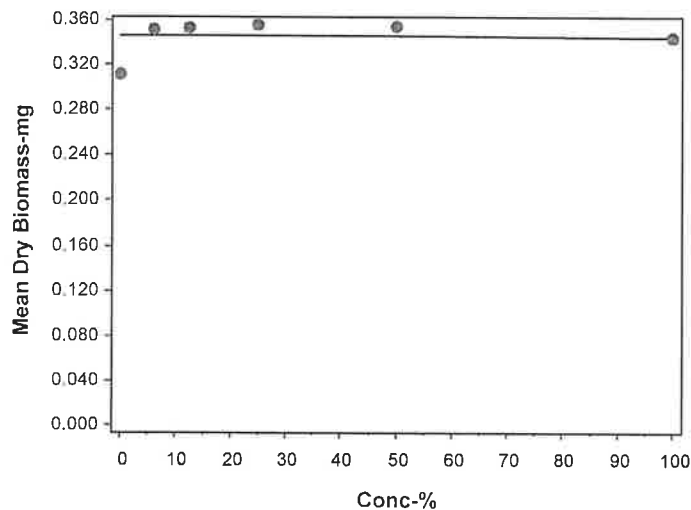
			Calculated Variate						Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	N	4	0.3117	0.3077	0.2727	0.3587	14.17%	0.00%	0.345	0.00%
6.25		4	0.3512	0.347	0.3373	0.3733	4.64%	-12.67%	0.345	0.00%
12.5		4	0.3528	0.3527	0.3453	0.3607	1.83%	-13.21%	0.345	0.00%
25		4	0.3557	0.3537	0.348	0.3673	2.52%	-14.12%	0.345	0.00%
50		4	0.3538	0.3527	0.34	0.37	3.94%	-13.53%	0.345	0.00%
100		4	0.344	0.3423	0.3387	0.3527	1.75%	-10.37%	0.344	0.29%

## Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.34	0.2753	0.2727	0.3587
6.25		0.3407	0.3533	0.3373	0.3733
12.5		0.3453	0.3547	0.3507	0.3607
25		0.358	0.3493	0.348	0.3673
50		0.34	0.3447	0.37	0.3607
100		0.3387	0.342	0.3527	0.3427

Fathead Minnow 7-d Larval Survival and Growth Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID: 05-8256-9746	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4		
Analyzed: 14 Dec-23 11:31	Analysis: Linear Interpolation (ICPIN)	Status Level: 1		
Edit Date: 14 Dec-23 11:30	MD5 Hash: 20D60E12E15EA84AF06E69D2CDC5E9A	Editor ID: 009-702-627-3		

Graphics



# CETIS Measurement Report

Report Date: 14 Dec-23 11:33 (p 1 of 2)  
Test Code/ID: VCF1123.214fml / 02-4152-5661

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 18-0724-2812	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:32	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:23	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 02-5410-4082	Code: VCF1123.214fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 15:55	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:40	CAS (PC):	Station: MO-OXN
Sample Age: 47h (0.3 °C)	Client: Ventura County Watershed Protection Distri	

### Alkalinity (CaCO3)-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	60	60	60	60	60	0	0	0.00%	0
100		8	55	55	55	55	55	0	0	0.00%	0
Overall		16	57.5	56.12	58.88	55	60	0.6455	2.582	4.49%	0 (0%)

### Conductivity-µmhos

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	376.4	372.4	380.4	369	383	0.5974	4.779	1.27%	0
6.25		8	382.4	380	384.7	377	385	0.3532	2.825	0.74%	0
12.5		8	386.2	383.2	389.3	380	391	0.4519	3.615	0.94%	0
25		8	392.5	387.8	397.2	382	399	0.6976	5.581	1.42%	0
50		8	405.9	397.7	414	383	415	1.22	9.761	2.40%	0
100		8	414.6	403.2	426	386	425	1.703	13.63	3.29%	0
Overall		48	393	388.5	397.5	369	425	2.212	15.33	3.90%	0 (0%)

### Dissolved Oxygen-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	7.887	7.58	8.195	7	8.2	0.04602	0.3682	4.67%	0
6.25		8	7.688	7.318	8.057	7	8.1	0.05527	0.4422	5.75%	0
12.5		8	7.663	7.311	8.014	7	8	0.05258	0.4207	5.49%	0
25		8	7.7	7.369	8.031	7	8.1	0.04955	0.3964	5.15%	0
50		8	7.675	7.393	7.957	7.1	8	0.04213	0.337	4.39%	0
100		8	7.688	7.39	7.985	7	8	0.04454	0.3563	4.64%	0
Overall		48	7.717	7.608	7.826	7	8.2	0.0542	0.3755	4.87%	0 (0%)

### Hardness (CaCO3)-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	97.62	96.74	98.51	95	98	0.1326	1.061	1.09%	0
100		8	100	100	100	100	100	0	0	0.00%	0
Overall		16	98.81	98.05	99.57	95	100	0.3561	1.424	1.44%	0 (0%)

### pH-Units

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	8.088	8.018	8.157	8	8.2	0.01043	0.08346	1.03%	0
6.25		8	7.863	7.595	8.13	7.2	8.2	0.04005	0.3204	4.08%	0
12.5		8	7.787	7.525	8.05	7.2	8.2	0.03921	0.3137	4.03%	0
25		8	7.725	7.521	7.929	7.4	8.1	0.03044	0.2435	3.15%	0
50		8	7.7	7.49	7.91	7.4	8.1	0.03134	0.2507	3.26%	0
100		8	7.675	7.467	7.883	7.4	8.1	0.03116	0.2493	3.25%	0
Overall		48	7.806	7.725	7.888	7.2	8.2	0.04043	0.2801	3.59%	0 (0%)

# CETIS Measurement Report

Report Date: 14 Dec-23 11:33 (p 2 of 2)

Test Code/ID: VCF1123.214fml / 02-4152-5661

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

### Temperature-°C

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	24	24	24	24	24	0	0	0.00%	0
6.25		8	24.03	23.97	24.08	24	24.2	0.008836	0.07069	0.29%	0
12.5		8	24.05	23.99	24.11	24	24.2	0.009442	0.07553	0.31%	0
25		8	24.08	23.98	24.17	24	24.3	0.01456	0.1165	0.48%	0
50		8	24.09	23.98	24.19	24	24.3	0.01558	0.1246	0.52%	0
100		8	24.1	23.98	24.22	24	24.3	0.01768	0.1414	0.59%	0
Overall		48	24.06	24.03	24.09	24	24.3	0.01456	0.1009	0.42%	0 (0%)



**AQUATIC BIOASSAY**  
& CONSULTING LABORATORIES, INC.

December 14, 2023

Ms. Kelly Hahs  
Ventura County Watershed Protection District  
800 South Victoria Ave  
Ventura, CA 93009

Dear Ms. Hahs:

We are pleased to present the enclosed revised bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* EPA-821-R-02-013. "All acceptability criteria were met and the concentration-response was normal. This is a valid test." Results were as follows:

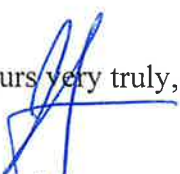
CLIENT:	Ventura County Flood Control
SAMPLE I.D.:	MO-SPA
DATE RECEIVED:	11/15/2023
ABC LAB. NO.:	VCF1123.216

**CHRONIC FATHEAD MINNOW SURVIVAL & GROWTH BIOASSAY**

SURVIVAL	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	EC25 =	>100.00 %
	EC50 =	>100.00 %

BIOMASS	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	IC25 =	>100.00 %
	IC50 =	>100.00 %

Yours very truly,

  
✓ Scott Johnson  
Laboratory Director

# CETIS Summary Report

Report Date: 14 Dec-23 11:41 (p 1 of 2)  
Test Code/ID: VCF1123.216fml / 03-3548-4509

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 06-5200-0245	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:39	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:45	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d 0h	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 10-9275-7097	Code: VCF1123.216fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 18:50	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:40	CAS (PC):	Station: MO-SPA
Sample Age: 44h (3.3 °C)	Client: Ventura County Watershed Protection Distri	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	TU	S
18-2671-2570	7d Survival Rate	Steel Many-One Rank Sum Test	100	>100	---	15.1%	1	1	
04-5047-6500	Mean Dry Biomass-mg	Steel Many-One Rank Sum Test	100	>100	---	19.1%	1	1	

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓	Level	%	95% LCL	95% UCL	TU	S
04-0060-2490	7d Survival Rate	Linear Interpolation (ICPIN)	✓	EC15	>100	---	---	<1	1
			✓	EC20	>100	---	---	<1	
			✓	EC25	>100	---	---	<1	
			✓	EC40	>100	---	---	<1	
			✓	EC50	>100	---	---	<1	
20-3394-6589	Mean Dry Biomass-mg	Linear Interpolation (ICPIN)	✓	IC15	>100	---	---	<1	1
			✓	IC20	>100	---	---	<1	
			✓	IC25	>100	---	---	<1	
			✓	IC40	>100	---	---	<1	
			✓	IC50	>100	---	---	<1	

## Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
04-0060-2490	7d Survival Rate	Control Resp	0.9167	0.8	<<	Yes	Passes Criteria
18-2671-2570	7d Survival Rate	Control Resp	0.9167	0.8	<<	Yes	Passes Criteria
04-5047-6500	Mean Dry Biomass-mg	Control Resp	0.3117	0.25	<<	Yes	Passes Criteria
20-3394-6589	Mean Dry Biomass-mg	Control Resp	0.3117	0.25	<<	Yes	Passes Criteria
04-5047-6500	Mean Dry Biomass-mg	PMSD	0.1906	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	N	4	0.9167	0.7575	1.0760	0.8000	1.0000	0.0500	0.1000	10.91%	0.00%
6.25		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-9.09%
12.5		4	0.9833	0.9303	1.0360	0.9333	1.0000	0.0167	0.0333	3.39%	-7.27%
25		4	0.8667	0.5794	1.1540	0.6000	1.0000	0.0903	0.1805	20.83%	5.45%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-9.09%
100		4	0.9833	0.9303	1.0360	0.9333	1.0000	0.0167	0.0333	3.39%	-7.27%

## Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	0.3117	0.2414	0.382	0.2727	0.3587	0.02208	0.04417	14.17%	0.00%
6.25		4	0.3455	0.337	0.354	0.338	0.3507	0.002686	0.005371	1.55%	-10.86%
12.5		4	0.3487	0.3263	0.3711	0.3353	0.3633	0.007034	0.01407	4.03%	-11.87%
25		4	0.3092	0.1972	0.4212	0.204	0.3487	0.0352	0.07039	22.77%	0.80%
50		4	0.35	0.331	0.369	0.3387	0.3667	0.005975	0.01195	3.41%	-12.30%
100		4	0.3408	0.3317	0.35	0.3347	0.3467	0.002872	0.005745	1.69%	-9.36%

30% PASS

# CETIS Summary Report

Report Date: 14 Dec-23 11:41 (p 2 of 2)  
Test Code/ID: VCF1123.216fml / 03-3548-4509

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

### 7d Survival Rate Detail

MD5: 5F4C8368C7B28AF8A8E315FCFA11EC17

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	0.8000	0.8667	1.0000
6.25		1.0000	1.0000	1.0000	1.0000
12.5		0.9333	1.0000	1.0000	1.0000
25		0.9333	1.0000	0.6000	0.9333
50		1.0000	1.0000	1.0000	1.0000
100		0.9333	1.0000	1.0000	1.0000

### Mean Dry Biomass-mg Detail

MD5: 7457384FECC77C39F7949EF43D7DF20C

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.34	0.2753	0.2727	0.3587
6.25		0.3473	0.3507	0.346	0.338
12.5		0.338	0.3353	0.3633	0.358
25		0.3487	0.3487	0.204	0.3353
50		0.3387	0.3453	0.3667	0.3493
100		0.3467	0.3447	0.3347	0.3373

### 7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	15/15	12/15	13/15	15/15
6.25		15/15	15/15	15/15	15/15
12.5		14/15	15/15	15/15	15/15
25		14/15	15/15	9/15	14/15
50		15/15	15/15	15/15	15/15
100		14/15	15/15	15/15	15/15

# CETIS Analytical Report

Report Date: 14 Dec-23 11:41 (p 1 of 3)  
Test Code/ID: VCF1123.216fml / 03-3548-4509

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 18-2671-2570	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 11:34	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 14 Dec-23 11:33	MD5 Hash: 5F4C8368C7B28AF8A8E315FCFA11EC17	Editor ID: 009-702-627-3
Batch ID: 06-5200-0245	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:39	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:45	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d 0h	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 10-9275-7097	Code: VCF1123.216fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 18:50	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:40	CAS (PC):	Station: MO-SPA
Sample Age: 44h (3.3 °C)	Client: Ventura County Watershed Protection Distri	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	100	>100	---	1	0.138	15.06%

## Steel Many-One Rank Sum Test

Control	vs	Conc-%	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	6	22	10	2	CDF	0.9908	Non-Significant Effect
		12.5	6	21	10	2	CDF	0.9778	Non-Significant Effect
		25	6	17	10	2	CDF	0.7334	Non-Significant Effect
		50	6	22	10	2	CDF	0.9908	Non-Significant Effect
		100	6	21	10	2	CDF	0.9778	Non-Significant Effect

## Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	0.9167	0.8	<<	Yes	Passes Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.144996	0.0289992	5	1.805	0.1626	Non-Significant Effect
Error	0.289176	0.0160653	18			
Total	0.434172		23			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
	Levene Equality of Variance Test	6.234	4.248	0.0016	Unequal Variances
	Mod Levene Equality of Variance Test	2.09	4.248	0.1140	Equal Variances
Distribution	Anderson-Darling A2 Test	1.519	3.878	0.0001	Non-Normal Distribution
	D'Agostino Kurtosis Test	2.461	2.576	0.0139	Normal Distribution
	D'Agostino Skewness Test	2.495	2.576	0.0126	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	12.28	9.21	0.0022	Non-Normal Distribution
	Kolmogorov-Smirnov D Test	0.2917	0.2056	1.2E-05	Non-Normal Distribution
	Shapiro-Wilk W Normality Test	0.8677	0.884	0.0048	Non-Normal Distribution

## 7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	0.9167	0.7575	1.0000	0.9556	0.8000	1.0000	0.0500	10.91%	0.00%
6.25		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-9.09%
12.5		4	0.9833	0.9303	1.0000	1.0000	0.9333	1.0000	0.0167	3.39%	-7.27%
25		4	0.8667	0.5794	1.0000	0.9333	0.6000	1.0000	0.0903	20.83%	5.45%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-9.09%
100		4	0.9833	0.9303	1.0000	1.0000	0.9333	1.0000	0.0167	3.39%	-7.27%

# CETIS Analytical Report

Report Date: 14 Dec-23 11:41 (p 2 of 3)  
Test Code/ID: VCF1123.216fml / 03-3548-4509

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 18-2671-2570 Endpoint: 7d Survival Rate CETIS Version: CETISv2.1.4  
Analyzed: 14 Dec-23 11:34 Analysis: Nonparametric-Control vs Treatments Status Level: 1  
Edit Date: 14 Dec-23 11:33 MD5 Hash: 5F4C8368C7B28AF8A8E315FCFA11EC17 Editor ID: 009-702-627-3

### Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.2970	1.0250	1.5690	1.3600	1.1070	1.4410	0.0855	13.19%	0.00%
6.25		4	1.4410	1.4410	1.4420	1.4410	1.4410	1.4410	0.0000	0.00%	-11.15%
12.5		4	1.4080	1.3040	1.5130	1.4410	1.3100	1.4410	0.0329	4.68%	-8.61%
25		4	1.2370	0.8519	1.6210	1.3100	0.8861	1.4410	0.1209	19.56%	4.63%
50		4	1.4410	1.4410	1.4420	1.4410	1.4410	1.4410	0.0000	0.00%	-11.15%
100		4	1.4080	1.3040	1.5130	1.4410	1.3100	1.4410	0.0329	4.68%	-8.61%

### 7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	0.8000	0.8667	1.0000
6.25		1.0000	1.0000	1.0000	1.0000
12.5		0.9333	1.0000	1.0000	1.0000
25		0.9333	1.0000	0.6000	0.9333
50		1.0000	1.0000	1.0000	1.0000
100		0.9333	1.0000	1.0000	1.0000

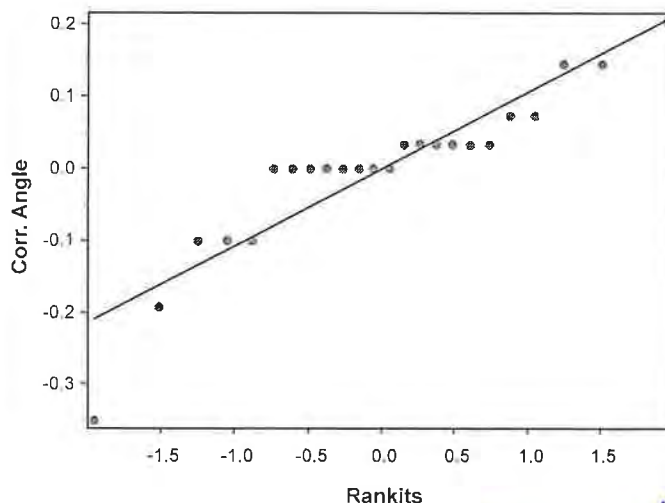
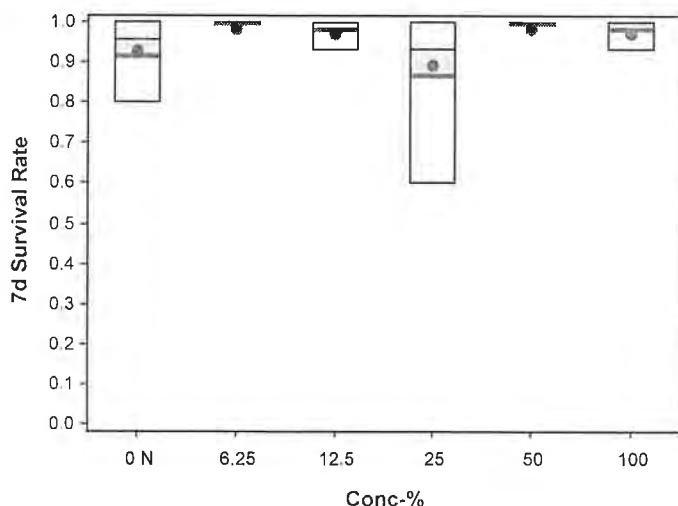
### Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.4410	1.1070	1.1970	1.4410
6.25		1.4410	1.4410	1.4410	1.4410
12.5		1.3100	1.4410	1.4410	1.4410
25		1.3100	1.4410	0.8861	1.3100
50		1.4410	1.4410	1.4410	1.4410
100		1.3100	1.4410	1.4410	1.4410

### 7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	15/15	12/15	13/15	15/15
6.25		15/15	15/15	15/15	15/15
12.5		14/15	15/15	15/15	15/15
25		14/15	15/15	9/15	14/15
50		15/15	15/15	15/15	15/15
100		14/15	15/15	15/15	15/15

### Graphics



# CETIS Analytical Report

Report Date: 14 Dec-23 11:41 (p 3 of 3)  
Test Code/ID: VCF1123.216fml / 03-3548-4509

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 04-5047-6500	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 11:34	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 14 Dec-23 11:33	MD5 Hash: 7457384FECC77C39F7949EF43D7DF20C	Editor ID: 009-702-627-3
Batch ID: 06-5200-0245	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:39	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:45	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d 0h	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 10-9275-7097	Code: VCF1123.216fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 18:50	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:40	CAS (PC):	Station: MO-SPA
Sample Age: 44h (3.3 °C)	Client: Ventura County Watershed Protection Distri	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	0.05941	19.06%

## Steel Many-One Rank Sum Test

Control	vs	Conc-%	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	6	21	10	0	CDF	0.9778	Non-Significant Effect
		12.5	6	21	10	0	CDF	0.9778	Non-Significant Effect
		25	6	18	10	0	CDF	0.8333	Non-Significant Effect
		50	6	22	10	0	CDF	0.9908	Non-Significant Effect
		100	6	20	10	0	CDF	0.9516	Non-Significant Effect

## Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	0.3117	0.25	<<	Yes	Passes Criteria
PMSD	0.1906	0.12	0.3	Yes	Passes Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0070599	0.001412	5	1.159	0.3667	Non-Significant Effect
Error	0.0219259	0.0012181	18			
Total	0.0289858		23			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	25.06	15.09	0.0001	Unequal Variances
	Levene Equality of Variance Test	7.111	4.248	0.0008	Unequal Variances
	Mod Levene Equality of Variance Test	1.464	4.248	0.2500	Equal Variances
Distribution	Anderson-Darling A2 Test	1.049	3.878	0.0095	Non-Normal Distribution
	D'Agostino Kurtosis Test	2.96	2.576	0.0031	Non-Normal Distribution
	D'Agostino Skewness Test	3.035	2.576	0.0024	Non-Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	17.97	9.21	0.0001	Non-Normal Distribution
	Kolmogorov-Smirnov D Test	0.2079	0.2056	0.0087	Non-Normal Distribution
	Shapiro-Wilk W Normality Test	0.8632	0.884	0.0039	Non-Normal Distribution

## Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	0.3117	0.2414	0.382	0.3077	0.2727	0.3587	0.02208	14.17%	0.00%
6.25		4	0.3455	0.337	0.354	0.3467	0.338	0.3507	0.002686	1.55%	-10.86%
12.5		4	0.3487	0.3263	0.3711	0.348	0.3353	0.3633	0.007034	4.04%	-11.87%
25		4	0.3092	0.1972	0.4212	0.3442	0.204	0.3487	0.0352	22.77%	0.80%
50		4	0.35	0.331	0.369	0.3473	0.3387	0.3667	0.005975	3.41%	-12.30%
100		4	0.3408	0.3317	0.35	0.341	0.3347	0.3467	0.002872	1.69%	-9.36%

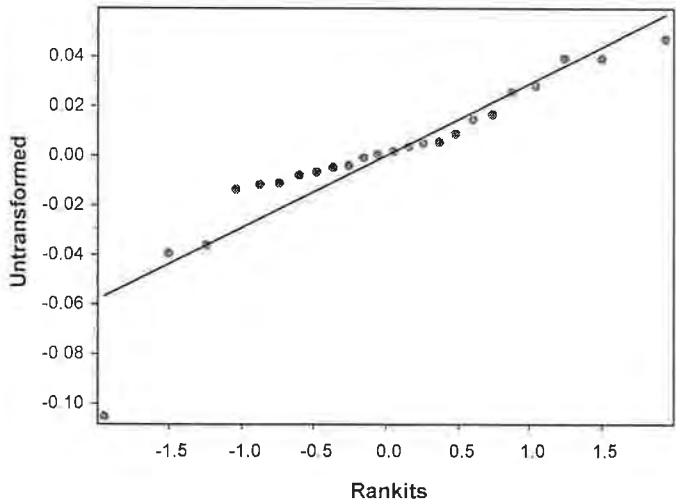
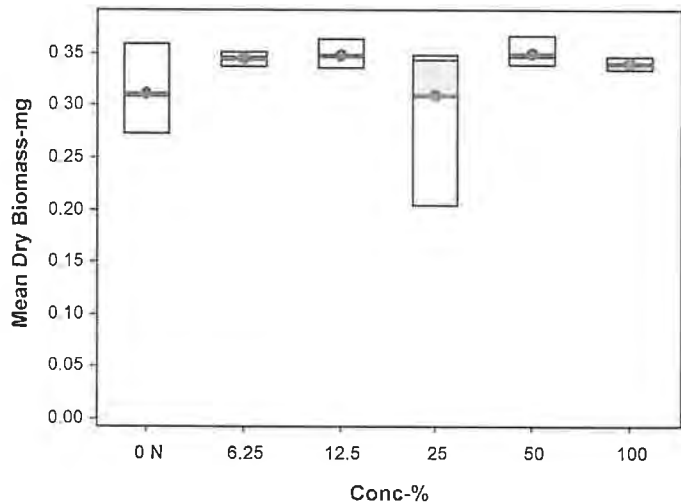
Fathead Minnow 7-d Larval Survival and Growth Test Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 04-5047-6500 Endpoint: Mean Dry Biomass-mg CETIS Version: CETISv2.1.4  
Analyzed: 14 Dec-23 11:34 Analysis: Nonparametric-Control vs Treatments Status Level: 1  
Edit Date: 14 Dec-23 11:33 MD5 Hash: 7457384FECC77C39F7949EF43D7DF20C Editor ID: 009-702-627-3

Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.34	0.2753	0.2727	0.3587
6.25		0.3473	0.3507	0.346	0.338
12.5		0.338	0.3353	0.3633	0.358
25		0.3487	0.3487	0.204	0.3353
50		0.3387	0.3453	0.3667	0.3493
100		0.3467	0.3447	0.3347	0.3373

Graphics



# CETIS Analytical Report

Report Date: 14 Dec-23 11:41 (p 1 of 4)  
Test Code/ID: VCF1123.216fml / 03-3548-4509

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 04-0060-2490	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 11:34	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 14 Dec-23 11:33	MD5 Hash: 5F4C8368C7B28AF8A8E315FCFA11EC17	Editor ID: 009-702-627-3
Batch ID: 06-5200-0245	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:39	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:45	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d 0h	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 10-9275-7097	Code: VCF1123.216fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 18:50	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:40	CAS (PC):	Station: MO-SPA
Sample Age: 44h (3.3 °C)	Client: Ventura County Watershed Protection Distri	

### Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

### Test Acceptability Criteria

		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.9167	0.8	<<	Yes	Passes Criteria

### Point Estimates

Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
EC15	>100	---	---	<1	---	---
EC20	>100	---	---	<1	---	---
EC25	>100	---	---	<1	---	---
EC40	>100	---	---	<1	---	---
EC50	>100	---	---	<1	---	---

### 7d Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	N	4	0.9167	0.9556	0.8000	1.0000	10.91%	0.00%	55/60	0.9667	0.00%
6.25		4	1.0000	1.0000	1.0000	1.0000	0.00%	-9.09%	60/60	0.9667	0.00%
12.5		4	0.9833	1.0000	0.9333	1.0000	3.39%	-7.27%	59/60	0.9667	0.00%
25		4	0.8667	0.9333	0.6000	1.0000	20.83%	5.45%	52/60	0.9500	1.73%
50		4	1.0000	1.0000	1.0000	1.0000	0.00%	-9.09%	60/60	0.9500	1.73%
100		4	0.9833	1.0000	0.9333	1.0000	3.39%	-7.27%	59/60	0.9500	1.73%

### 7d Survival Rate Detail

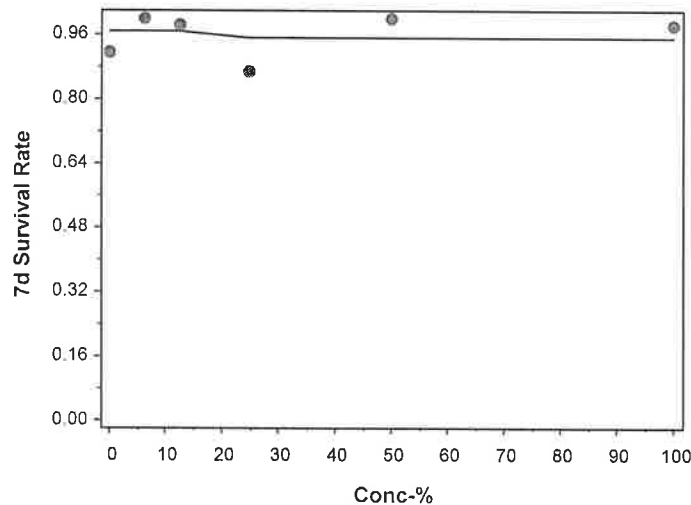
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	0.8000	0.8667	1.0000
6.25		1.0000	1.0000	1.0000	1.0000
12.5		0.9333	1.0000	1.0000	1.0000
25		0.9333	1.0000	0.6000	0.9333
50		1.0000	1.0000	1.0000	1.0000
100		0.9333	1.0000	1.0000	1.0000

### 7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	15/15	12/15	13/15	15/15
6.25		15/15	15/15	15/15	15/15
12.5		14/15	15/15	15/15	15/15
25		14/15	15/15	9/15	14/15
50		15/15	15/15	15/15	15/15
100		14/15	15/15	15/15	15/15

Fathead Minnow 7-d Larval Survival and Growth Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID:	04-0060-2490	Endpoint:	7d Survival Rate	CETIS Version:
Analyzed:	14 Dec-23 11:34	Analysis:	Linear Interpolation (ICPIN)	CETISv2.1.4
Edit Date:	14 Dec-23 11:33	MD5 Hash:	5F4C8368C7B28AF8A8E315FCFA11EC17	Status Level:
				1
				Editor ID:
				009-702-627-3

Graphics



# CETIS Analytical Report

Report Date: 14 Dec-23 11:41 (p 3 of 4)  
Test Code/ID: VCF1123.216fml / 03-3548-4509

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 20-3394-6589	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 11:34	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 14 Dec-23 11:33	MD5 Hash: 7457384FECC77C39F7949EF43D7DF20C	Editor ID: 009-702-627-3
Batch ID: 06-5200-0245	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:39	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:45	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d 0h	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 10-9275-7097	Code: VCF1123.216fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 18:50	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:40	CAS (PC):	Station: MO-SPA
Sample Age: 44h (3.3 °C)	Client: Ventura County Watershed Protection Distri	

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1199425	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

### TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.3117	0.25	<<	Yes	Passes Criteria

## Point Estimates

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

## Mean Dry Biomass-mg Summary

### Calculated Variate

### Isotonic Variate

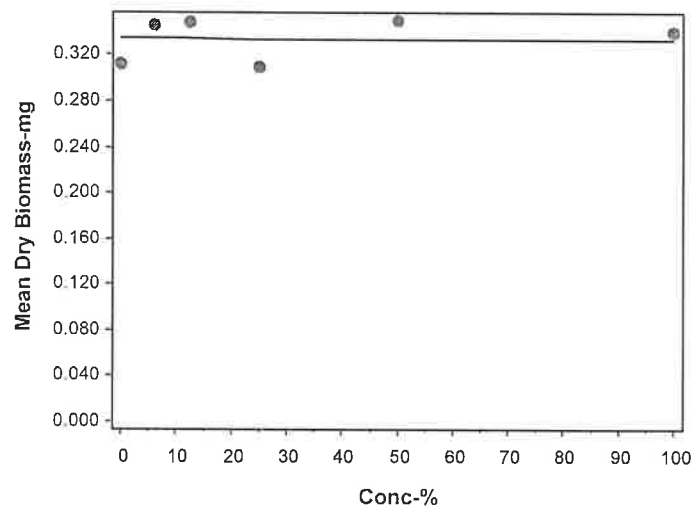
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	N	4	0.3117	0.3077	0.2727	0.3587	14.17%	0.00%	0.3353	0.00%
6.25		4	0.3455	0.3467	0.338	0.3507	1.55%	-10.86%	0.3353	0.00%
12.5		4	0.3487	0.348	0.3353	0.3633	4.04%	-11.87%	0.3353	0.00%
25		4	0.3092	0.3442	0.204	0.3487	22.77%	0.80%	0.3333	0.60%
50		4	0.35	0.3473	0.3387	0.3667	3.41%	-12.30%	0.3333	0.60%
100		4	0.3408	0.341	0.3347	0.3467	1.69%	-9.36%	0.3333	0.60%

## Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.34	0.2753	0.2727	0.3587
6.25		0.3473	0.3507	0.346	0.338
12.5		0.338	0.3353	0.3633	0.358
25		0.3487	0.3487	0.204	0.3353
50		0.3387	0.3453	0.3667	0.3493
100		0.3467	0.3447	0.3347	0.3373

Fathead Minnow 7-d Larval Survival and Growth Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID:	20-3394-6589	Endpoint:	Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed:	14 Dec-23 11:34	Analysis:	Linear Interpolation (ICPIN)	Status Level: 1
Edit Date:	14 Dec-23 11:33	MD5 Hash:	7457384FECC77C39F7949EF43D7DF20C	Editor ID: 009-702-627-3

Graphics



# CETIS Measurement Report

Report Date: 14 Dec-23 11:41 (p 1 of 2)  
Test Code/ID: VCF1123.216fml / 03-3548-4509

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 06-5200-0245	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:39	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:45	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d 0h	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 10-9275-7097	Code: VCF1123.216fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 18:50	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:40	CAS (PC):	Station: MO-SPA
Sample Age: 44h (3.3 °C)	Client: Ventura County Watershed Protection Distri	

### Alkalinity (CaCO3)-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	60	60	60	60	60	0	0	0.00%	0
100		8	27	27	27	27	27	0	0	0.00%	0
Overall		16	43.5	34.42	52.58	27	60	4.26	17.04	39.18%	0 (0%)

### Conductivity-µmhos

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	376.4	372.4	380.4	369	383	0.5974	4.779	1.27%	0
6.25		8	383.4	380.8	385.9	380	388	0.3776	3.021	0.79%	0
12.5		8	378.5	376.9	380.1	376	382	0.2409	1.927	0.51%	0
25		8	364.6	361.5	367.8	358	369	0.4674	3.739	1.03%	0
50		8	335.9	332.3	339.4	329	340	0.528	4.224	1.26%	0
100		8	284.8	279.4	290.1	270	289	0.8011	6.409	2.25%	0
Overall		48	353.9	343.7	364.1	270	388	5.086	35.24	9.96%	0 (0%)

### Dissolved Oxygen-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	7.887	7.58	8.195	7	8.2	0.04602	0.3682	4.67%	0
6.25		8	7.75	7.404	8.096	7	8.1	0.05175	0.414	5.34%	0
12.5		8	7.7	7.384	8.016	7	8	0.04725	0.378	4.91%	0
25		8	7.7	7.404	7.996	7	8	0.04432	0.3546	4.60%	0
50		8	7.725	7.465	7.985	7.1	8	0.03882	0.3105	4.02%	0
100		8	7.725	7.465	7.985	7.1	8	0.03882	0.3105	4.02%	0
Overall		48	7.748	7.648	7.848	7	8.2	0.04973	0.3446	4.45%	0 (0%)

### Hardness (CaCO3)-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	97.62	96.74	98.51	95	98	0.1326	1.061	1.09%	0
100		8	81	81	81	81	81	0	0	0.00%	0
Overall		16	89.31	84.72	93.9	81	98	2.154	8.616	9.65%	0 (0%)

### pH-Units

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	8.088	8.018	8.157	8	8.2	0.01043	0.08346	1.03%	0
6.25		8	7.775	7.567	7.983	7.3	8	0.03116	0.2493	3.21%	0
12.5		8	7.738	7.559	7.916	7.4	7.9	0.02667	0.2134	2.76%	0
25		8	7.713	7.537	7.888	7.4	7.9	0.02625	0.21	2.72%	0
50		8	7.713	7.549	7.876	7.4	7.9	0.02449	0.1959	2.54%	0
100		8	7.7	7.533	7.867	7.4	7.9	0.025	0.2	2.60%	0
Overall		48	7.788	7.72	7.855	7.3	8.2	0.03364	0.233	2.99%	0 (0%)

# CETIS Measurement Report

Report Date: 14 Dec-23 11:41 (p 2 of 2)

Test Code/ID: VCF1123.216fml / 03-3548-4509

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

### Temperature-°C

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	24	24	24	24	24	0	0	0.00%	0
6.25		8	24.04	23.95	24.13	24	24.3	0.01326	0.1061	0.44%	0
12.5		8	24.08	23.98	24.17	24	24.3	0.01456	0.1165	0.48%	0
25		8	24.1	23.98	24.22	24	24.4	0.01767	0.1414	0.59%	0
50		8	24.14	23.99	24.29	24	24.5	0.02209	0.1767	0.73%	0
100		8	24.18	24	24.35	24	24.6	0.02566	0.2053	0.85%	0
Overall		48	24.09	24.05	24.13	24	24.6	0.02097	0.1453	0.60%	0 (0%)



**AQUATIC BIOASSAY**  
& CONSULTING LABORATORIES, INC.

December 14, 2023

Ms. Kelly Hahs  
Ventura County Watershed Protection District  
800 South Victoria Ave  
Ventura, CA 93009

Dear Ms. Hahs:

We are pleased to present the enclosed revised bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* EPA-821-R-02-013. "All acceptability criteria were met and the concentration-response was normal. This is a valid test." Results were as follows:

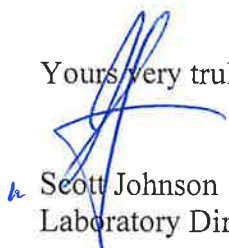
CLIENT:	Ventura County Flood Control
SAMPLE I.D.:	MO-CAM
DATE RECEIVED:	11/15/2023
ABC LAB. NO.:	VCF1123.213

**CHRONIC FATHEAD MINNOW SURVIVAL & GROWTH BIOASSAY**

SURVIVAL	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	EC25 =	>100.00 %
	EC50 =	>100.00 %

BIOMASS	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	IC25 =	>100.00 %
	IC50 =	>100.00 %

Yours very truly,

  
Scott Johnson  
Laboratory Director

# CETIS Summary Report

Report Date: 14 Dec-23 10:20 (p 1 of 2)  
Test Code/ID: VCF1123.213fml / 17-4540-3459

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 06-3207-6298	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:16	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:12	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 14-1150-6293	Code: VCF1123.213fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 15:30	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:00	CAS (PC):	Station: MO-CAM
Sample Age: 47h (10.3 °C)	Client: Ventura County Watershed Protection Distri	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	PMSD	TU	S
00-0671-9701	7d Survival Rate	Steel Many-One Rank Sum Test	100	>100	---	5.52%	1	1
05-6243-3988	Mean Dry Biomass-mg	Steel Many-One Rank Sum Test	100	>100	---	8.34%	1	1

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓ Level	%	95% LCL	95% UCL	TU	S
03-8720-8295	7d Survival Rate	Linear Interpolation (ICPIN)	✓ EC15	>100	---	---	<1	1
			✓ EC20	>100	---	---	<1	
			✓ EC25	>100	---	---	<1	
			✓ EC40	>100	---	---	<1	
			✓ EC50	>100	---	---	<1	
06-9292-4480	Mean Dry Biomass-mg	Linear Interpolation (ICPIN)	✓ IC15	>100	---	---	<1	1
			✓ IC20	>100	---	---	<1	
			✓ IC25	>100	---	---	<1	
			✓ IC40	>100	---	---	<1	
			✓ IC50	>100	---	---	<1	

## Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
00-0671-9701	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
03-8720-8295	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
05-6243-3988	Mean Dry Biomass-mg	Control Resp	0.3475	0.25	<<	Yes	Passes Criteria
06-9292-4480	Mean Dry Biomass-mg	Control Resp	0.3475	0.25	<<	Yes	Passes Criteria
05-6243-3988	Mean Dry Biomass-mg	PMSD	0.08339	0.12	0.3	Yes	Below Criteria

## 7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
6.25		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
12.5		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
25		4	0.9500	0.8484	1.0520	0.8667	1.0000	0.0319	0.0638	6.72%	5.00%
50		4	0.9833	0.9303	1.0360	0.9333	1.0000	0.0167	0.0333	3.39%	1.67%
100		4	0.9667	0.9054	1.0280	0.9333	1.0000	0.0193	0.0385	3.98%	3.33%

## Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	0.3475	0.3357	0.3593	0.3393	0.3573	0.003706	0.007411	2.13%	0.00%
6.25		4	0.3542	0.3352	0.3731	0.3447	0.3693	0.005953	0.01191	3.36%	-1.92%
12.5		4	0.352	0.3416	0.3624	0.344	0.3593	0.003277	0.006555	1.86%	-1.29%
25		4	0.3462	0.2901	0.4022	0.3147	0.3967	0.01762	0.03523	10.18%	0.38%
50		4	0.3577	0.3333	0.382	0.346	0.3787	0.007642	0.01528	4.27%	-2.93%
100		4	0.347	0.3391	0.3549	0.3427	0.354	0.002472	0.004944	1.42%	0.14%

*Handwritten signatures and initials: "PMS" and "PASS" with a checkmark.*

# CETIS Summary Report

Report Date: 14 Dec-23 10:20 (p 2 of 2)  
 Test Code/ID: VCF1123.213fml / 17-4540-3459

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

### 7d Survival Rate Detail

MD5: 107E668C3D48C74AFF957C877A54F57B

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	0.9333	0.8667
50		0.9333	1.0000	1.0000	1.0000
100		1.0000	0.9333	0.9333	1.0000

### Mean Dry Biomass-mg Detail

MD5: 67C9DB6AC601C78A6F381590DBCCEAAB

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.3467	0.3467	0.3393	0.3573
6.25		0.358	0.3447	0.3693	0.3447
12.5		0.3593	0.35	0.3547	0.344
25		0.336	0.3967	0.3373	0.3147
50		0.3787	0.346	0.3593	0.3467
100		0.3447	0.354	0.3427	0.3467

### 7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	15/15	15/15	15/15	15/15
6.25		15/15	15/15	15/15	15/15
12.5		15/15	15/15	15/15	15/15
25		15/15	15/15	14/15	13/15
50		14/15	15/15	15/15	15/15
100		15/15	14/15	14/15	15/15

# CETIS Analytical Report

Report Date: 14 Dec-23 10:20 (p 1 of 3)  
Test Code/ID: VCF1123.213fml / 17-4540-3459

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 00-0671-9701	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 10:19	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 14 Dec-23 10:17	MD5 Hash: 107E668C3D48C74AFF957C877A54F57B	Editor ID: 009-702-627-3
Batch ID: 06-3207-6298	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:16	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:12	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 14-1150-6293	Code: VCF1123.213fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 15:30	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:00	CAS (PC):	Station: MO-CAM
Sample Age: 47h (10.3 °C)	Client: Ventura County Watershed Protection Distri	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	100	>100	---	1	0.05519	5.52%

## Steel Many-One Rank Sum Test

Control	vs	Conc-%	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	6	18	10	1	CDF	0.8333	Non-Significant Effect
		12.5	6	18	10	1	CDF	0.8333	Non-Significant Effect
		25	6	14	10	1	CDF	0.3451	Non-Significant Effect
		50	6	16	10	1	CDF	0.6105	Non-Significant Effect
		100	6	14	10	1	CDF	0.3451	Non-Significant Effect

## Test Acceptability Criteria

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.8	<<	Yes	Passes Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0322533	0.0064507	5	1.612	0.2075	Non-Significant Effect
Error	0.0720446	0.0040025	18			
Total	0.104298		23			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
	Levene Equality of Variance Test	12.48	4.248	2.5E-05	Unequal Variances
	Mod Levene Equality of Variance Test	5.155	4.248	0.0041	Unequal Variances
Distribution	Anderson-Darling A2 Test	1.484	3.878	0.0002	Non-Normal Distribution
	D'Agostino Kurtosis Test	1.463	2.576	0.1435	Normal Distribution
	D'Agostino Skewness Test	1.538	2.576	0.1242	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	4.504	9.21	0.1052	Normal Distribution
	Kolmogorov-Smirnov D Test	0.2917	0.2056	1.2E-05	Non-Normal Distribution
	Shapiro-Wilk W Normality Test	0.8907	0.884	0.0138	Normal Distribution

## 7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
6.25		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
12.5		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
25		4	0.9500	0.8484	1.0000	0.9778	0.8667	1.0000	0.0319	6.72%	5.00%
50		4	0.9833	0.9303	1.0000	1.0000	0.9333	1.0000	0.0167	3.39%	1.67%
100		4	0.9667	0.9054	1.0000	0.9667	0.9333	1.0000	0.0192	3.98%	3.33%

# CETIS Analytical Report

Report Date: 14 Dec-23 10:20 (p 2 of 3)  
Test Code/ID: VCF1123.213fml / 17-4540-3459

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 00-0671-9701 Endpoint: 7d Survival Rate CETIS Version: CETISv2.1.4  
Analyzed: 14 Dec-23 10:19 Analysis: Nonparametric-Control vs Treatments Status Level: 1  
Edit Date: 14 Dec-23 10:17 MD5 Hash: 107E668C3D48C74AFF957C877A54F57B Editor ID: 009-702-627-3

### Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.4410	1.4410	1.4420	1.4410	1.4410	1.4410	0.0000	0.00%	0.00%
6.25		4	1.4410	1.4410	1.4420	1.4410	1.4410	1.4410	0.0000	0.00%	0.00%
12.5		4	1.4410	1.4410	1.4420	1.4410	1.4410	1.4410	0.0000	0.00%	0.00%
25		4	1.3470	1.1600	1.5350	1.3970	1.1970	1.4410	0.0589	8.75%	6.52%
50		4	1.4080	1.3040	1.5130	1.4410	1.3100	1.4410	0.0329	4.68%	2.28%
100		4	1.3750	1.2540	1.4960	1.3750	1.3100	1.4410	0.0380	5.53%	4.57%

### 7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	0.9333	0.8667
50		0.9333	1.0000	1.0000	1.0000
100		1.0000	0.9333	0.9333	1.0000

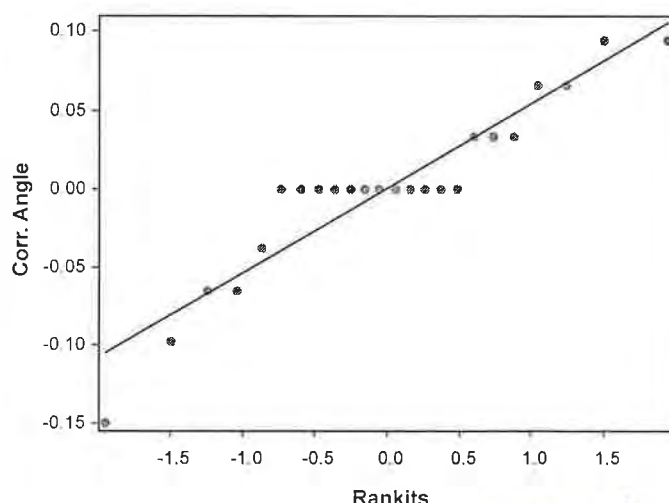
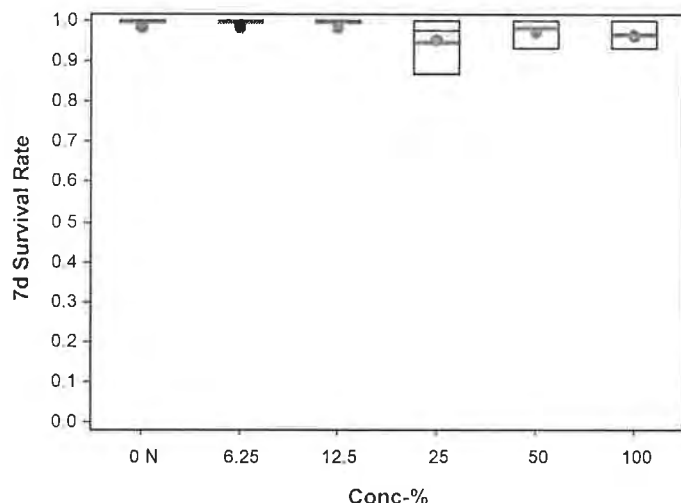
### Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.4410	1.4410	1.4410	1.4410
6.25		1.4410	1.4410	1.4410	1.4410
12.5		1.4410	1.4410	1.4410	1.4410
25		1.4410	1.4410	1.3100	1.1970
50		1.3100	1.4410	1.4410	1.4410
100		1.4410	1.3100	1.3100	1.4410

### 7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	15/15	15/15	15/15	15/15
6.25		15/15	15/15	15/15	15/15
12.5		15/15	15/15	15/15	15/15
25		15/15	15/15	14/15	13/15
50		14/15	15/15	15/15	15/15
100		15/15	14/15	14/15	15/15

### Graphics



# CETIS Analytical Report

Report Date: 14 Dec-23 10:20 (p 3 of 3)  
Test Code/ID: VCF1123.213fml / 17-4540-3459

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 05-6243-3988	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 10:19	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 14 Dec-23 10:17	MD5 Hash: 67C9DB6AC601C78A6F381590DBCCEAA	Editor ID: 009-702-627-3
Batch ID: 06-3207-6298	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:16	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:12	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 14-1150-6293	Code: VCF1123.213fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 15:30	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:00	CAS (PC):	Station: MO-CAM
Sample Age: 47h (10.3 °C)	Client: Ventura County Watershed Protection Distri	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	0.02898	8.34%

## Steel Many-One Rank Sum Test

Control	vs	Conc.-%	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	6	20	10	0	CDF	0.9516	Non-Significant Effect
		12.5	6	21	10	0	CDF	0.9778	Non-Significant Effect
		25	6	14	10	0	CDF	0.3451	Non-Significant Effect
		50	6	21	10	1	CDF	0.9778	Non-Significant Effect
		100	6	17	10	1	CDF	0.7334	Non-Significant Effect

## Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	0.3475	0.25	<<	Yes	Passes Criteria
PMSD	0.08339	0.12	0.3	Yes	Below Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0004268	8.537E-05	5	0.2945	0.9097	Non-Significant Effect
Error	0.005217	0.0002898	18			
Total	0.0056438		23			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	14.66	15.09	0.0119	Equal Variances
	Levene Equality of Variance Test	3.051	4.248	0.0362	Equal Variances
	Mod Levene Equality of Variance Test	1.073	4.248	0.4076	Equal Variances
Distribution	Anderson-Darling A2 Test	1.199	3.878	0.0038	Non-Normal Distribution
	D'Agostino Kurtosis Test	2.973	2.576	0.0029	Non-Normal Distribution
	D'Agostino Skewness Test	2.804	2.576	0.0050	Non-Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	16.7	9.21	0.0002	Non-Normal Distribution
	Kolmogorov-Smirnov D Test	0.1776	0.2056	0.0486	Normal Distribution
	Shapiro-Wilk W Normality Test	0.8627	0.884	0.0038	Non-Normal Distribution

## Mean Dry Biomass-mg Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	0.3475	0.3357	0.3593	0.3467	0.3393	0.3573	0.003706	2.13%	0.00%
6.25		4	0.3542	0.3352	0.3731	0.3491	0.3447	0.3693	0.005953	3.36%	-1.92%
12.5		4	0.352	0.3416	0.3624	0.3523	0.344	0.3593	0.003277	1.86%	-1.29%
25		4	0.3462	0.2901	0.4022	0.3367	0.3147	0.3967	0.01762	10.18%	0.38%
50		4	0.3577	0.3333	0.382	0.353	0.346	0.3787	0.007642	4.27%	-2.93%
100		4	0.347	0.3391	0.3549	0.3457	0.3427	0.354	0.002472	1.42%	0.14%

# CETIS Analytical Report

Report Date: 14 Dec-23 10:20 (p 4 of 3)  
Test Code/ID: VCF1123.213fml / 17-4540-3459

## Fathead Minnow 7-d Larval Survival and Growth Test

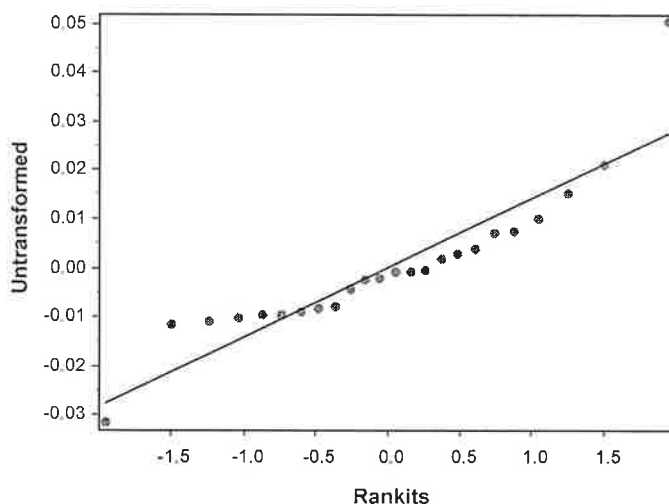
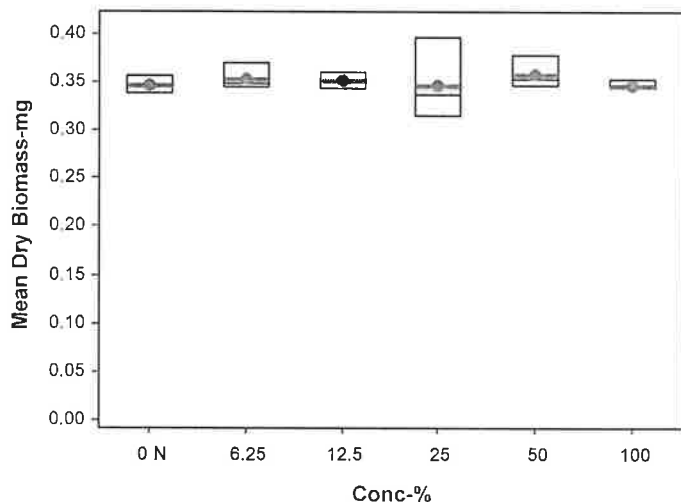
Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 05-6243-3988 Endpoint: Mean Dry Biomass-mg CETIS Version: CETISv2.1.4  
Analyzed: 14 Dec-23 10:19 Analysis: Nonparametric-Control vs Treatments Status Level: 1  
Edit Date: 14 Dec-23 10:17 MD5 Hash: 67C9DB6AC601C78A6F381590DBCCEAA Editor ID: 009-702-627-3

### Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.3467	0.3467	0.3393	0.3573
6.25		0.358	0.3447	0.3693	0.3447
12.5		0.3593	0.35	0.3547	0.344
25		0.336	0.3967	0.3373	0.3147
50		0.3787	0.346	0.3593	0.3467
100		0.3447	0.354	0.3427	0.3467

### Graphics



## CETIS Analytical Report

Report Date: 14 Dec-23 10:20 (p 1 of 4)  
Test Code/ID: VCF1123.213fml / 17-4540-3459

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay &amp; Consulting Labs, Inc.

Analysis ID:	03-8720-8295	Endpoint:	7d Survival Rate	CETIS Version:	CETISv2.1.4
Analyzed:	14 Dec-23 10:19	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1
Edit Date:	14 Dec-23 10:17	MD5 Hash:	107E668C3D48C74AFF957C877A54F57B	Editor ID:	009-702-627-3

Batch ID:	06-3207-6298	Test Type:	Growth-Survival (7d)	Analyst:	
Start Date:	17 Nov-23 14:16	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water
Ending Date:	24 Nov-23 14:12	Species:	Pimephales promelas	Brine:	Not Applicable
Test Length:	7d	Taxon:	Actinopterygii	Source:	Aquatic Biosystems, CO
				Age:	<24

Sample ID:	14-1150-6293	Code:	VCF1123.213fml	Project:	2023/24-1 (Wet)
Sample Date:	15 Nov-23 15:30	Material:	Sample Water	Source:	Bioassay Report
Receipt Date:	15 Nov-23 21:00	CAS (PC):		Station:	MO-CAM
Sample Age:	47h (10.3 °C)	Client:	Ventura County Watershed Protection Distri		

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

## TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.8	<<	Yes	Passes Criteria

## Point Estimates

Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
EC15	>100	---	---	<1	---	---
EC20	>100	---	---	<1	---	---
EC25	>100	---	---	<1	---	---
EC40	>100	---	---	<1	---	---
EC50	>100	---	---	<1	---	---

## 7d Survival Rate Summary

## Calculated Variate(A/B)

## Isotonic Variate

Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	N	4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	60/60	1.0000	0.00%
6.25		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	60/60	1.0000	0.00%
12.5		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	60/60	1.0000	0.00%
25		4	0.9500	0.9778	0.8667	1.0000	6.72%	5.00%	57/60	0.9667	3.33%
50		4	0.9833	1.0000	0.9333	1.0000	3.39%	1.67%	59/60	0.9667	3.33%
100		4	0.9667	0.9667	0.9333	1.0000	3.98%	3.33%	58/60	0.9667	3.33%

## 7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	0.9333	0.8667
50		0.9333	1.0000	1.0000	1.0000
100		1.0000	0.9333	0.9333	1.0000

## 7d Survival Rate Binomials

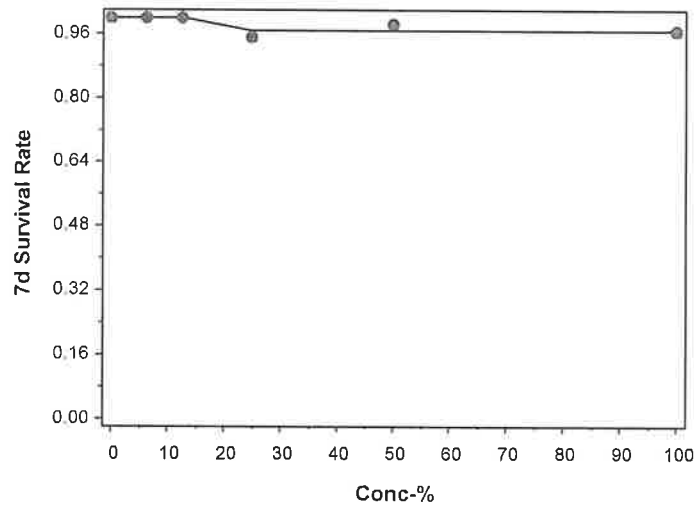
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	15/15	15/15	15/15	15/15
6.25		15/15	15/15	15/15	15/15
12.5		15/15	15/15	15/15	15/15
25		15/15	15/15	14/15	13/15
50		14/15	15/15	15/15	15/15
100		15/15	14/15	14/15	15/15

CETIS Analytical Report

Report Date: 14 Dec-23 10:20 (p 2 of 4)  
Test Code/ID: VCF1123.213fml / 17-4540-3459

Fathead Minnow 7-d Larval Survival and Growth Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID: 03-8720-8295	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4		
Analyzed: 14 Dec-23 10:19	Analysis: Linear Interpolation (ICPIN)	Status Level: 1		
Edit Date: 14 Dec-23 10:17	MD5 Hash: 107E668C3D48C74AFF957C877A54F57B	Editor ID: 009-702-627-3		

Graphics



# CETIS Analytical Report

Report Date: 14 Dec-23 10:20 (p 3 of 4)  
Test Code/ID: VCF1123.213fml / 17-4540-3459

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 06-9292-4480	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 10:19	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 14 Dec-23 10:17	MD5 Hash: 67C9DB6AC601C78A6F381590DBCCEAA	Editor ID: 009-702-627-3
Batch ID: 06-3207-6298	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:16	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:12	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 14-1150-6293	Code: VCF1123.213fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 15:30	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:00	CAS (PC):	Station: MO-CAM
Sample Age: 47h (10.3 °C)	Client: Ventura County Watershed Protection Distri	

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	94643	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

### TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.3475	0.25	<<	Yes	Passes Criteria

## Point Estimates

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

## Mean Dry Biomass-mg Summary

### Calculated Variate

### Isotonic Variate

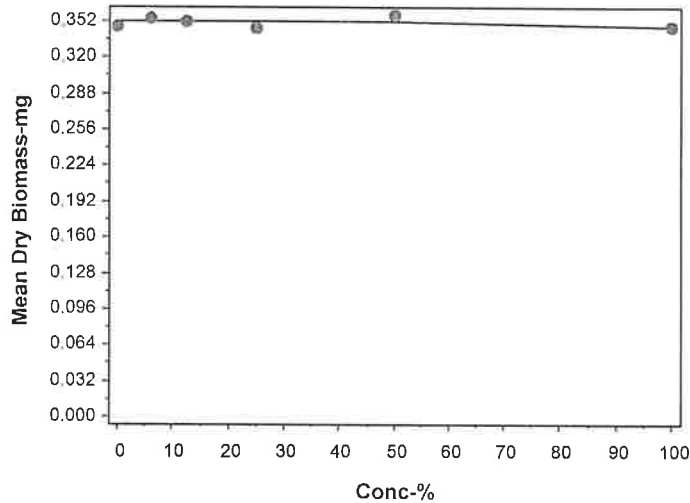
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	N	4	0.3475	0.3467	0.3393	0.3573	2.13%	0.00%	0.3515	0.00%
6.25		4	0.3542	0.3491	0.3447	0.3693	3.36%	-1.92%	0.3515	0.00%
12.5		4	0.352	0.3523	0.344	0.3593	1.86%	-1.29%	0.3515	0.00%
25		4	0.3462	0.3367	0.3147	0.3967	10.18%	0.38%	0.3515	0.00%
50		4	0.3577	0.353	0.346	0.3787	4.27%	-2.93%	0.3515	0.00%
100		4	0.347	0.3457	0.3427	0.354	1.42%	0.14%	0.347	1.28%

## Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.3467	0.3467	0.3393	0.3573
6.25		0.358	0.3447	0.3693	0.3447
12.5		0.3593	0.35	0.3547	0.344
25		0.336	0.3967	0.3373	0.3147
50		0.3787	0.346	0.3593	0.3467
100		0.3447	0.354	0.3427	0.3467

Fathead Minnow 7-d Larval Survival and Growth Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID: 06-9292-4480	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4		
Analyzed: 14 Dec-23 10:19	Analysis: Linear Interpolation (ICPIN)	Status Level: 1		
Edit Date: 14 Dec-23 10:17	MD5 Hash: 67C9DB6AC601C78A6F381590DBCCEAA	Editor ID: 009-702-627-3		

Graphics



# CETIS Measurement Report

Report Date: 14 Dec-23 10:20 (p 1 of 2)  
Test Code/ID: VCF1123.213fml / 17-4540-3459

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 06-3207-6298	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:16	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:12	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 14-1150-6293	Code: VCF1123.213fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 15:30	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:00	CAS (PC):	Station: MO-CAM
Sample Age: 47h (10.3 °C)	Client: Ventura County Watershed Protection Distri	

### Alkalinity (CaCO3)-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	60	60	60	60	60	0	0	0.00%	0
100		8	30	30	30	30	30	0	0	0.00%	0
Overall		16	45	36.74	53.26	30	60	3.873	15.49	34.43%	0 (0%)

### Conductivity-µmhos

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	376.4	372.4	380.4	369	383	0.5974	4.779	1.27%	0
6.25		8	408.9	405.7	412	402	415	0.4698	3.758	0.92%	0
12.5		8	376.4	371.8	380.9	370	387	0.6779	5.423	1.44%	0
25		8	339.4	335.1	343.6	332	350	0.6336	5.069	1.49%	0
50		8	297.9	295.8	299.9	292	300	0.3094	2.475	0.83%	0
100		8	194.4	192.1	196.7	190	198	0.3468	2.774	1.43%	0
Overall		48	332.2	311.4	353	190	415	10.33	71.58	21.55%	0 (0%)

### Dissolved Oxygen-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	7.887	7.58	8.195	7	8.2	0.04602	0.3682	4.67%	0
6.25		8	7.775	7.523	8.027	7.1	8	0.03765	0.3012	3.87%	0
12.5		8	7.738	7.47	8.005	7	8	0.04005	0.3204	4.14%	0
25		8	7.75	7.497	8.003	7.1	8	0.0378	0.3024	3.90%	0
50		8	7.713	7.474	7.951	7.1	7.9	0.03563	0.285	3.70%	0
100		8	7.688	7.445	7.93	7.1	7.9	0.03625	0.29	3.77%	0
Overall		48	7.758	7.671	7.846	7	8.2	0.04364	0.3024	3.90%	0 (0%)

### Hardness (CaCO3)-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	97.62	96.74	98.51	95	98	0.1326	1.061	1.09%	0
100		8	53	53	53	53	53	0	0	0.00%	0
Overall		16	75.31	63.03	87.6	53	98	5.764	23.06	30.61%	0 (0%)

### pH-Units

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	8.088	8.018	8.157	8	8.2	0.01043	0.08346	1.03%	0
6.25		8	7.887	7.73	8.045	7.5	8	0.02356	0.1885	2.39%	0
12.5		8	7.825	7.665	7.985	7.5	8	0.02386	0.1909	2.44%	0
25		8	7.8	7.674	7.926	7.6	8	0.0189	0.1512	1.94%	0
50		8	7.75	7.609	7.891	7.5	8	0.02113	0.169	2.18%	0
100		8	7.738	7.597	7.878	7.5	8	0.02106	0.1685	2.18%	0
Overall		48	7.848	7.791	7.904	7.5	8.2	0.02809	0.1946	2.48%	0 (0%)

# CETIS Measurement Report

Report Date: 14 Dec-23 10:20 (p 2 of 2)  
Test Code/ID: VCF1123.213fml / 17-4540-3459

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

### Temperature-°C

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	24	24	24	24	24	0	0	0.00%	0
6.25		8	24.05	23.97	24.13	24	24.2	0.01157	0.09255	0.38%	0
12.5		8	24.08	23.98	24.17	24	24.3	0.01456	0.1165	0.48%	0
25		8	24.08	23.99	24.16	24	24.3	0.01294	0.1035	0.43%	0
50		8	24.1	23.98	24.22	24	24.4	0.01767	0.1414	0.59%	0
100		8	24.1	23.98	24.22	24	24.4	0.01767	0.1414	0.59%	0
Overall		48	24.07	24.03	24.1	24	24.4	0.01585	0.1098	0.46%	0 (0%)



**AQUATIC BIOASSAY**  
& CONSULTING LABORATORIES, INC.

December 14, 2023

Ms. Kelly Hahs  
Ventura County Watershed Protection District  
800 South Victoria Ave  
Ventura, CA 93009

Dear Ms. Hahs:

We are pleased to present the enclosed revised bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* EPA-821-R-02-013. "All acceptability criteria were met and the concentration-response was normal. This is a valid test." Results were as follows:

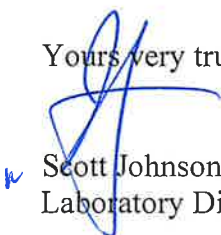
CLIENT:	Ventura County Flood Control
SAMPLE I.D.:	ME-OJA
DATE RECEIVED:	11/15/2023
ABC LAB. NO.:	VCF1123.209

**CHRONIC FATHEAD MINNOW SURVIVAL & GROWTH BIOASSAY**

SURVIVAL	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	EC25 =	>100.00 %
	EC50 =	>100.00 %

BIOMASS	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	IC25 =	>100.00 %
	IC50 =	>100.00 %

Yours very truly,

  
Scott Johnson  
Laboratory Director

# CETIS Summary Report

Report Date: 14 Dec-23 10:14 (p 1 of 2)  
Test Code/ID: VCF1123.209fml / 10-1039-1565

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 04-3273-3261	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:06	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:02	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 10-5756-8576	Code: VCF1123.209fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 16:00	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 19:35	CAS (PC):	Station: MO-OJA
Sample Age: 46h (7.3 °C)	Client: Ventura County Watershed Protection Distri	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	PMSD	TU	S
03-6134-5795	7d Survival Rate	Steel Many-One Rank Sum Test	100	>100	---	6.5%	1	1
15-4248-8509	Mean Dry Biomass-mg	Steel Many-One Rank Sum Test	100	>100	---	7.63%	1	1

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓ Level	%	95% LCL	95% UCL	TU	S
01-5089-9815	7d Survival Rate	Linear Interpolation (ICPIN)	✓ EC15	>100	---	---	<1	1
			✓ EC20	>100	---	---	<1	
			✓ EC25	>100	---	---	<1	
			✓ EC40	>100	---	---	<1	
			✓ EC50	>100	---	---	<1	
04-5662-7600	Mean Dry Biomass-mg	Linear Interpolation (ICPIN)	✓ IC15	>100	---	---	<1	1
			✓ IC20	>100	---	---	<1	
			✓ IC25	>100	---	---	<1	
			✓ IC40	>100	---	---	<1	
			✓ IC50	>100	---	---	<1	

## Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
01-5089-9815	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
03-6134-5795	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
04-5662-7600	Mean Dry Biomass-mg	Control Resp	0.3475	0.25	<<	Yes	Passes Criteria
15-4248-8509	Mean Dry Biomass-mg	Control Resp	0.3475	0.25	<<	Yes	Passes Criteria
15-4248-8509	Mean Dry Biomass-mg	PMSD	0.07631	0.12	0.3	Yes	Below Criteria

## 7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
6.25		4	0.9667	0.9054	1.0280	0.9333	1.0000	0.0193	0.0385	3.98%	3.33%
12.5		4	0.9833	0.9303	1.0360	0.9333	1.0000	0.0167	0.0333	3.39%	1.67%
25		4	0.9667	0.9054	1.0280	0.9333	1.0000	0.0193	0.0385	3.98%	3.33%
50		4	0.9500	0.8484	1.0520	0.8667	1.0000	0.0319	0.0638	6.72%	5.00%
100		4	0.9833	0.9303	1.0360	0.9333	1.0000	0.0167	0.0333	3.39%	1.67%

## Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	0.3475	0.3357	0.3593	0.3393	0.3573	0.003706	0.007411	2.13%	0.00%
6.25		4	0.3555	0.3485	0.3625	0.3507	0.3613	0.002201	0.004401	1.24%	-2.30%
12.5		4	0.3452	0.3332	0.3572	0.3387	0.356	0.003775	0.00755	2.19%	0.67%
25		4	0.345	0.3399	0.3501	0.342	0.3493	0.001599	0.003197	0.93%	0.72%
50		4	0.327	0.2736	0.3804	0.278	0.354	0.01677	0.03354	10.26%	5.90%
100		4	0.3518	0.3299	0.3738	0.336	0.3667	0.006887	0.01377	3.92%	-1.25%

*Handwritten signature and "PASS" stamp*

CETIS Summary Report

Report Date: 14 Dec-23 10:14 (p 2 of 2)  
Test Code/ID: VCF1123.209fml / 10-1039-1565

Fathead Minnow 7-d Larval Survival and Growth Test Aquatic Bioassay & Consulting Labs, Inc.

7d Survival Rate Detail MD5: 26C772C81DA38DCBF729C7D4B450D6A4

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	0.9333	0.9333
12.5		1.0000	0.9333	1.0000	1.0000
25		0.9333	0.9333	1.0000	1.0000
50		1.0000	0.8667	1.0000	0.9333
100		1.0000	0.9333	1.0000	1.0000

Mean Dry Biomass-mg Detail MD5: F6F5538AC8BC28E0837CE17FA7D745FE

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.3467	0.3467	0.3393	0.3573
6.25		0.3507	0.3547	0.3553	0.3613
12.5		0.356	0.344	0.342	0.3387
25		0.3433	0.342	0.3493	0.3453
50		0.354	0.278	0.3393	0.3367
100		0.3453	0.336	0.3593	0.3667

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	15/15	15/15	15/15	15/15
6.25		15/15	15/15	14/15	14/15
12.5		15/15	14/15	15/15	15/15
25		14/15	14/15	15/15	15/15
50		15/15	13/15	15/15	14/15
100		15/15	14/15	15/15	15/15

# CETIS Analytical Report

Report Date: 14 Dec-23 10:14 (p 1 of 3)  
Test Code/ID: VCF1123.209fml / 10-1039-1565

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 03-6134-5795	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 10:09	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 14 Dec-23 10:07	MD5 Hash: 26C772C81DA38DCBF729C7D4B450D6A	Editor ID: 009-702-627-3
Batch ID: 04-3273-3261	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:06	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:02	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 10-5756-8576	Code: VCF1123.209fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 16:00	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 19:35	CAS (PC):	Station: MO-OJA
Sample Age: 46h (7.3 °C)	Client: Ventura County Watershed Protection Distri	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	100	>100	---	1	0.06502	6.50%

## Steel Many-One Rank Sum Test

Control	vs	Conc-%	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	6	14	10	1	CDF	0.3451	Non-Significant Effect
		12.5	6	16	10	1	CDF	0.6105	Non-Significant Effect
		25	6	14	10	1	CDF	0.3451	Non-Significant Effect
		50	6	14	10	1	CDF	0.3451	Non-Significant Effect
		100	6	16	10	1	CDF	0.6105	Non-Significant Effect

## Test Acceptability Criteria

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.8	<<	Yes	Passes Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0220409	0.0044082	5	0.7749	0.5803	Non-Significant Effect
Error	0.102397	0.0056887	18			
Total	0.124438		23			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
	Levene Equality of Variance Test	5.425	4.248	0.0032	Unequal Variances
	Mod Levene Equality of Variance Test	2.233	4.248	0.0955	Equal Variances
Distribution	Anderson-Darling A2 Test	0.7858	3.878	0.0412	Normal Distribution
	D'Agostino Kurtosis Test	0.519	2.576	0.6038	Normal Distribution
	D'Agostino Skewness Test	1.222	2.576	0.2217	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	1.763	9.21	0.4142	Normal Distribution
	Kolmogorov-Smirnov D Test	0.1891	0.2056	0.0263	Normal Distribution
	Shapiro-Wilk W Normality Test	0.9301	0.884	0.0982	Normal Distribution

## 7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
6.25		4	0.9667	0.9054	1.0000	0.9667	0.9333	1.0000	0.0192	3.98%	3.33%
12.5		4	0.9833	0.9303	1.0000	1.0000	0.9333	1.0000	0.0167	3.39%	1.67%
25		4	0.9667	0.9054	1.0000	0.9667	0.9333	1.0000	0.0192	3.98%	3.33%
50		4	0.9500	0.8484	1.0000	0.9778	0.8667	1.0000	0.0319	6.72%	5.00%
100		4	0.9833	0.9303	1.0000	1.0000	0.9333	1.0000	0.0167	3.39%	1.67%

# CETIS Analytical Report

Report Date: 14 Dec-23 10:14 (p 2 of 3)  
Test Code/ID: VCF1123.209fmi / 10-1039-1565

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 03-6134-5795 Endpoint: 7d Survival Rate CETIS Version: CETISv2.1.4  
Analyzed: 14 Dec-23 10:09 Analysis: Nonparametric-Control vs Treatments Status Level: 1  
Edit Date: 14 Dec-23 10:07 MD5 Hash: 26C772C81DA38DCBF729C7D4B450D6A Editor ID: 009-702-627-3

### Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.4410	1.4410	1.4420	1.4410	1.4410	1.4410	0.0000	0.00%	0.00%
6.25		4	1.3750	1.2540	1.4960	1.3750	1.3100	1.4410	0.0380	5.53%	4.57%
12.5		4	1.4080	1.3040	1.5130	1.4410	1.3100	1.4410	0.0329	4.68%	2.28%
25		4	1.3750	1.2540	1.4960	1.3750	1.3100	1.4410	0.0380	5.53%	4.57%
50		4	1.3470	1.1600	1.5350	1.3970	1.1970	1.4410	0.0589	8.75%	6.52%
100		4	1.4080	1.3040	1.5130	1.4410	1.3100	1.4410	0.0329	4.68%	2.28%

### 7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	0.9333	0.9333
12.5		1.0000	0.9333	1.0000	1.0000
25		0.9333	0.9333	1.0000	1.0000
50		1.0000	0.8667	1.0000	0.9333
100		1.0000	0.9333	1.0000	1.0000

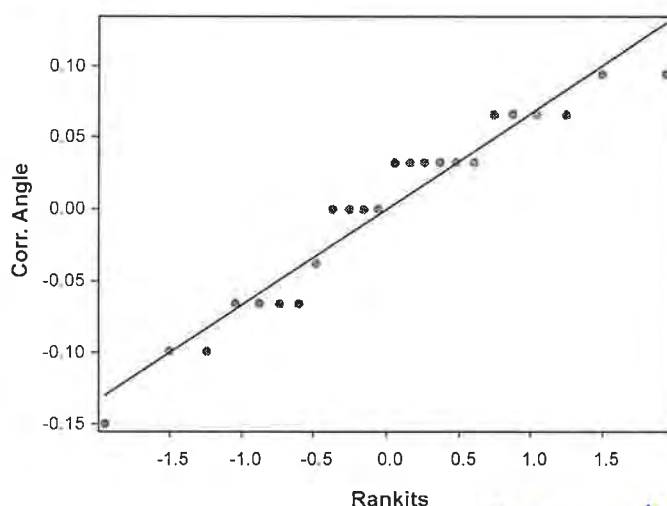
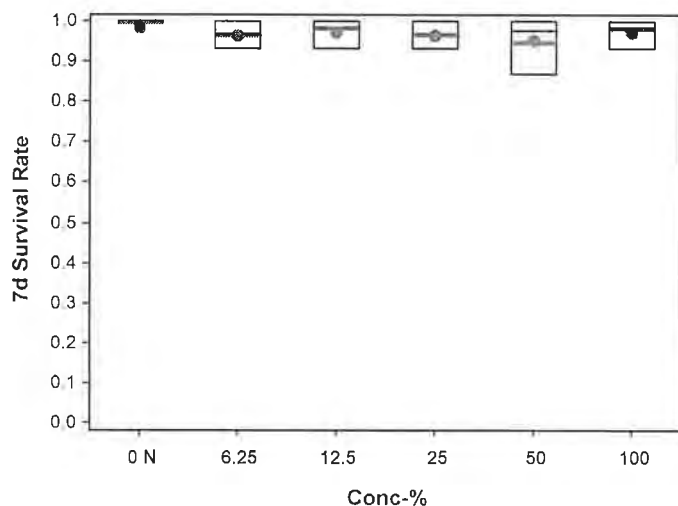
### Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.4410	1.4410	1.4410	1.4410
6.25		1.4410	1.4410	1.3100	1.3100
12.5		1.4410	1.3100	1.4410	1.4410
25		1.3100	1.3100	1.4410	1.4410
50		1.4410	1.1970	1.4410	1.3100
100		1.4410	1.3100	1.4410	1.4410

### 7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	15/15	15/15	15/15	15/15
6.25		15/15	15/15	14/15	14/15
12.5		15/15	14/15	15/15	15/15
25		14/15	14/15	15/15	15/15
50		15/15	13/15	15/15	14/15
100		15/15	14/15	15/15	15/15

### Graphics



# CETIS Analytical Report

Report Date: 14 Dec-23 10:14 (p 3 of 3)  
Test Code/ID: VCF1123.209fml / 10-1039-1565

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 15-4248-8509	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 10:09	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 14 Dec-23 10:07	MD5 Hash: F6F5538AC8BC28E0837CE17FA7D745FE	Editor ID: 009-702-627-3
Batch ID: 04-3273-3261	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:06	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:02	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 10-5756-8576	Code: VCF1123.209fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 16:00	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 19:35	CAS (PC):	Station: MO-OJA
Sample Age: 46h (7.3 °C)	Client: Ventura County Watershed Protection Distri	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	0.02652	7.63%

## Steel Many-One Rank Sum Test

Control	vs	Conc-%	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	6	23	10	0	CDF	0.9966	Non-Significant Effect
		12.5	6	15	10	0	CDF	0.4761	Non-Significant Effect
		25	6	16	10	0	CDF	0.6105	Non-Significant Effect
		50	6	13.5	10	1	CDF	0.2853	Non-Significant Effect
		100	6	19	10	0	CDF	0.9055	Non-Significant Effect

## Test Acceptability Criteria

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.3475	0.25	<<	Yes	Passes Criteria
PMSD	0.07631	0.12	0.3	Yes	Below Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0019462	0.0003892	5	1.604	0.2097	Non-Significant Effect
Error	0.0043693	0.0002427	18			
Total	0.0063156		23			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	19.5	15.09	0.0015	Unequal Variances
	Levene Equality of Variance Test	4.257	4.248	0.0099	Unequal Variances
	Mod Levene Equality of Variance Test	1.25	4.248	0.3276	Equal Variances
Distribution	Anderson-Darling A2 Test	1.311	3.878	0.0017	Non-Normal Distribution
	D'Agostino Kurtosis Test	3.33	2.576	0.0009	Non-Normal Distribution
	D'Agostino Skewness Test	3.167	2.576	0.0015	Non-Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	21.12	9.21	2.6E-05	Non-Normal Distribution
	Kolmogorov-Smirnov D Test	0.1936	0.2056	0.0204	Normal Distribution
	Shapiro-Wilk W Normality Test	0.8367	0.884	0.0013	Non-Normal Distribution

## Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	0.3475	0.3357	0.3593	0.3467	0.3393	0.3573	0.003706	2.13%	0.00%
6.25		4	0.3555	0.3485	0.3625	0.355	0.3507	0.3613	0.002201	1.24%	-2.30%
12.5		4	0.3452	0.3332	0.3572	0.343	0.3387	0.356	0.003775	2.19%	0.67%
25		4	0.345	0.3399	0.3501	0.3443	0.342	0.3493	0.001599	0.93%	0.72%
50		4	0.327	0.2736	0.3804	0.338	0.278	0.354	0.01677	10.26%	5.90%
100		4	0.3518	0.3299	0.3738	0.3523	0.336	0.3667	0.006887	3.92%	-1.25%

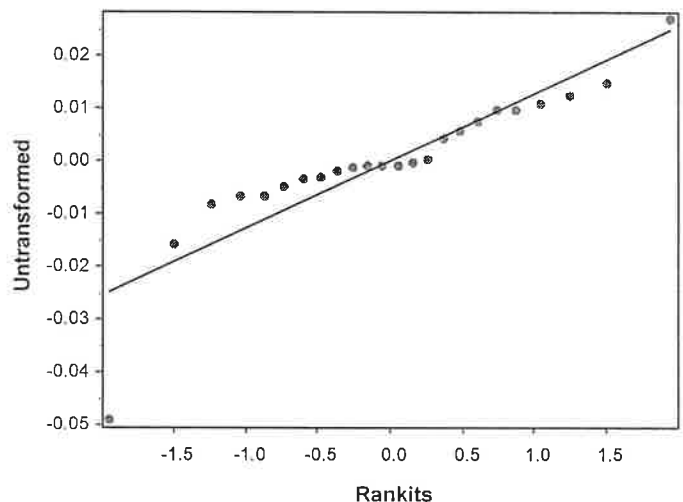
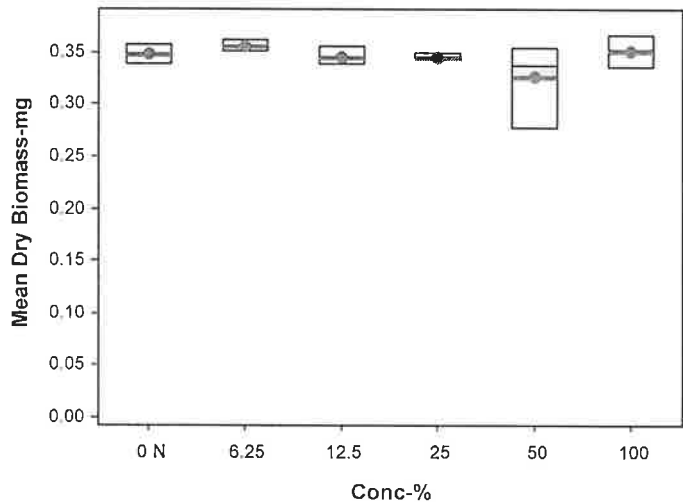
Fathead Minnow 7-d Larval Survival and Growth Test Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	15-4248-8509	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv2.1.4
Analyzed:	14 Dec-23 10:09	Analysis:	Nonparametric-Control vs Treatments	Status Level:	1
Edit Date:	14 Dec-23 10:07	MD5 Hash:	F6F5538AC8BC28E0837CE17FA7D745FE	Editor ID:	009-702-627-3

Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.3467	0.3467	0.3393	0.3573
6.25		0.3507	0.3547	0.3553	0.3613
12.5		0.356	0.344	0.342	0.3387
25		0.3433	0.342	0.3493	0.3453
50		0.354	0.278	0.3393	0.3367
100		0.3453	0.336	0.3593	0.3667

Graphics



# CETIS Analytical Report

Report Date: 14 Dec-23 10:14 (p 1 of 4)  
 Test Code/ID: VCF1123.209fml / 10-1039-1565

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 01-5089-9815	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 10:09	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 14 Dec-23 10:07	MD5 Hash: 26C772C81DA38DCBF729C7D4B450D6A	Editor ID: 009-702-627-3
Batch ID: 04-3273-3261	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:06	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:02	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 10-5756-8576	Code: VCF1123.209fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 16:00	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 19:35	CAS (PC):	Station: MO-OJA
Sample Age: 46h (7.3 °C)	Client: Ventura County Watershed Protection Distri	

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.8	<<	Yes	Passes Criteria

## Point Estimates

Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
EC15	>100	---	---	<1	---	---
EC20	>100	---	---	<1	---	---
EC25	>100	---	---	<1	---	---
EC40	>100	---	---	<1	---	---
EC50	>100	---	---	<1	---	---

## 7d Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	N	4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	60/60	1.0000	0.00%
6.25		4	0.9667	0.9667	0.9333	1.0000	3.98%	3.33%	58/60	0.9750	2.50%
12.5		4	0.9833	1.0000	0.9333	1.0000	3.39%	1.67%	59/60	0.9750	2.50%
25		4	0.9667	0.9667	0.9333	1.0000	3.98%	3.33%	58/60	0.9667	3.33%
50		4	0.9500	0.9778	0.8667	1.0000	6.72%	5.00%	57/60	0.9667	3.33%
100		4	0.9833	1.0000	0.9333	1.0000	3.39%	1.67%	59/60	0.9667	3.33%

## 7d Survival Rate Detail

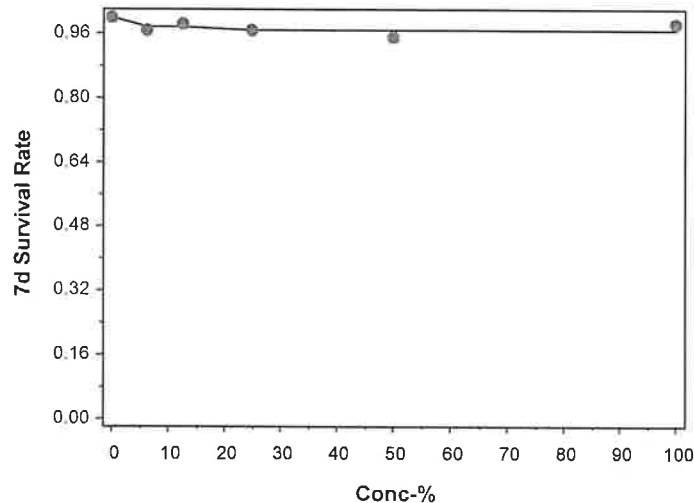
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	0.9333	0.9333
12.5		1.0000	0.9333	1.0000	1.0000
25		0.9333	0.9333	1.0000	1.0000
50		1.0000	0.8667	1.0000	0.9333
100		1.0000	0.9333	1.0000	1.0000

## 7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	15/15	15/15	15/15	15/15
6.25		15/15	15/15	14/15	14/15
12.5		15/15	14/15	15/15	15/15
25		14/15	14/15	15/15	15/15
50		15/15	13/15	15/15	14/15
100		15/15	14/15	15/15	15/15

Fathead Minnow 7-d Larval Survival and Growth Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID: 01-5089-9815	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4		
Analyzed: 14 Dec-23 10:09	Analysis: Linear Interpolation (ICPIN)	Status Level: 1		
Edit Date: 14 Dec-23 10:07	MD5 Hash: 26C772C81DA38DCBF729C7D4B450D6A	Editor ID: 009-702-627-3		

Graphics



# CETIS Analytical Report

Report Date: 14 Dec-23 10:14 (p 3 of 4)  
 Test Code/ID: VCF1123.209fml / 10-1039-1565

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 04-5662-7600	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 10:09	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 14 Dec-23 10:07	MD5 Hash: F6F5538AC8BC28E0837CE17FA7D745FE	Editor ID: 009-702-627-3
Batch ID: 04-3273-3261	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:06	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:02	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 10-5756-8576	Code: VCF1123.209fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 16:00	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 19:35	CAS (PC):	Station: MO-OJA
Sample Age: 46h (7.3 °C)	Client: Ventura County Watershed Protection Distri	

### Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1442545	280	Yes	Two-Point Interpolation

### Test Acceptability Criteria

#### TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.3475	0.25	<<	Yes	Passes Criteria

### Point Estimates

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

### Mean Dry Biomass-mg Summary

#### Calculated Variate

#### Isotonic Variate

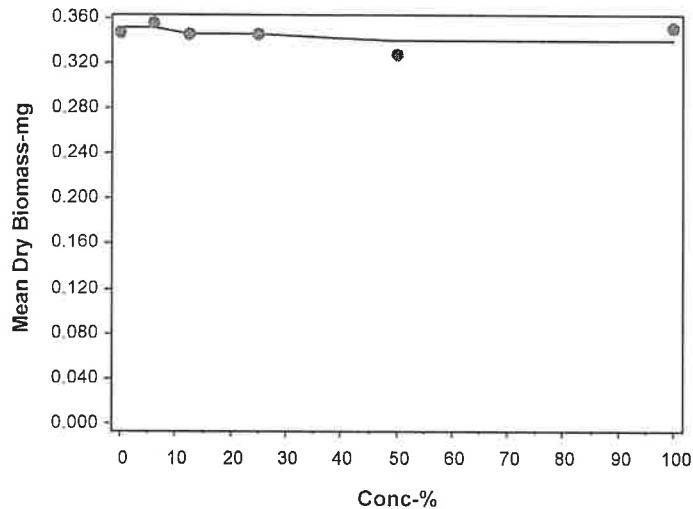
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	N	4	0.3475	0.3467	0.3393	0.3573	2.13%	0.00%	0.3515	0.00%
6.25		4	0.3555	0.355	0.3507	0.3613	1.24%	-2.30%	0.3515	0.00%
12.5		4	0.3452	0.343	0.3387	0.356	2.19%	0.67%	0.3452	1.79%
25		4	0.345	0.3443	0.342	0.3493	0.93%	0.72%	0.345	1.85%
50		4	0.327	0.338	0.278	0.354	10.26%	5.90%	0.3394	3.44%
100		4	0.3518	0.3523	0.336	0.3667	3.92%	-1.25%	0.3394	3.44%

### Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.3467	0.3467	0.3393	0.3573
6.25		0.3507	0.3547	0.3553	0.3613
12.5		0.356	0.344	0.342	0.3387
25		0.3433	0.342	0.3493	0.3453
50		0.354	0.278	0.3393	0.3367
100		0.3453	0.336	0.3593	0.3667

Fathead Minnow 7-d Larval Survival and Growth Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID:	04-5662-7600	Endpoint:	Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed:	14 Dec-23 10:09	Analysis:	Linear Interpolation (ICPIN)	Status Level: 1
Edit Date:	14 Dec-23 10:07	MD5 Hash:	F6F5538AC8BC28E0837CE17FA7D745FE	Editor ID: 009-702-627-3

Graphics



# CETIS Measurement Report

Report Date: 14 Dec-23 10:14 (p 1 of 2)  
 Test Code/ID: VCF1123.209fml / 10-1039-1565

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 04-3273-3261	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:06	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 14:02	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 10-5756-8576	Code: VCF1123.209fml	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 16:00	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 19:35	CAS (PC):	Station: MO-OJA
Sample Age: 46h (7.3 °C)	Client: Ventura County Watershed Protection Distri	

### Alkalinity (CaCO3)-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	60	60	60	60	60	0	0	0.00%	0
100		8	180	180	180	180	180	0	0	0.00%	0
Overall		16	120	86.98	153	60	180	15.49	61.97	51.64%	0 (0%)

### Conductivity-µmhos

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	376.4	372.4	380.4	369	383	0.5974	4.779	1.27%	0
6.25		8	432.5	429.9	435.1	429	438	0.3953	3.162	0.73%	0
12.5		8	520.5	511.1	529.9	502	536	1.408	11.26	2.16%	0
25		8	598.5	598.1	598.9	598	599	0.06682	0.5345	0.09%	0
50		8	765	761.8	768.2	760	769	0.4818	3.854	0.50%	0
100		8	1137	1131	1142	1124	1145	0.8503	6.802	0.60%	0
Overall		48	638.2	563.3	713.2	369	1145	37.24	258	40.42%	0 (0%)

### Dissolved Oxygen-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	7.887	7.58	8.195	7	8.2	0.04602	0.3682	4.67%	0
6.25		8	7.813	7.511	8.114	7	8.1	0.04504	0.3603	4.61%	0
12.5		8	7.763	7.473	8.052	7	8	0.04327	0.3462	4.46%	0
25		8	7.713	7.458	7.967	7.1	8	0.03805	0.3044	3.95%	0
50		8	7.688	7.429	7.946	7.1	7.9	0.03864	0.3091	4.02%	0
100		8	7.663	7.414	7.911	7.1	7.9	0.03716	0.2973	3.88%	0
Overall		48	7.754	7.66	7.848	7	8.2	0.0467	0.3235	4.17%	0 (0%)

### Hardness (CaCO3)-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	97.62	96.74	98.51	95	98	0.1326	1.061	1.09%	0
100		8	420	420	420	420	420	0	0	0.00%	0
Overall		16	258.8	170.1	347.5	95	420	41.62	166.5	64.32%	0 (0%)

### pH-Units

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	8.088	8.018	8.157	8	8.2	0.01043	0.08346	1.03%	0
6.25		8	7.988	7.958	8.017	7.9	8	0.004419	0.03535	0.44%	0
12.5		8	7.925	7.801	8.049	7.6	8	0.0186	0.1488	1.88%	0
25		8	7.887	7.758	8.017	7.6	8	0.01941	0.1553	1.97%	0
50		8	7.875	7.743	8.007	7.6	8	0.01976	0.1581	2.01%	0
100		8	7.838	7.671	8.004	7.5	8	0.02494	0.1996	2.55%	0
Overall		48	7.933	7.888	7.979	7.5	8.2	0.02274	0.1576	1.99%	0 (0%)

CETIS Measurement Report

Report Date: 14 Dec-23 10:14 (p 2 of 2)  
Test Code/ID: VCF1123.209fml / 10-1039-1565

Fathead Minnow 7-d Larval Survival and Growth Test Aquatic Bioassay & Consulting Labs, Inc.

Temperature-°C											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	24	24	24	24	24	0	0	0.00%	0
6.25		8	24.01	23.98	24.04	24	24.1	0.004414	0.03531	0.15%	0
12.5		8	24.01	23.98	24.04	24	24.1	0.004414	0.03531	0.15%	0
25		8	24.03	23.97	24.08	24	24.2	0.008836	0.07069	0.29%	0
50		8	24.05	23.99	24.11	24	24.2	0.009442	0.07553	0.31%	0
100		8	24.08	23.99	24.16	24	24.2	0.01293	0.1035	0.43%	0
Overall		48	24.03	24.01	24.05	24	24.2	0.009396	0.0651	0.27%	0 (0%)



**AQUATIC BIOASSAY**  
& CONSULTING LABORATORIES, INC.

December 14, 2023

Ms. Kelly Hahs  
Ventura County Watershed Protection District  
800 South Victoria Ave  
Ventura, CA 93009

Dear Ms. Hahs:

We are pleased to present the enclosed revised bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* EPA-821-R-02-013. Results were as follows:

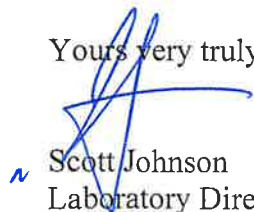
CLIENT:	Ventura County Flood Control
SAMPLE I.D.:	MO-VEN
DATE RECEIVED:	11/15/2023
ABC LAB. NO.:	VCF1123.217

**CHRONIC CERIODAPHNIA SURVIVAL & REPRODUCTION BIOASSAY**

SURVIVAL	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	EC25 =	>100.00 %
	EC50 =	>100.00 %

REPRODUCTION	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	IC25 =	>100.00 %
	IC50 =	>100.00 %

Yours very truly,

  
Scott Johnson  
Laboratory Director

# CETIS Summary Report

Report Date: 12 Dec-23 13:08 (p 1 of 2)  
Test Code/ID: VCF1123.217cer / 03-0045-2094

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 03-8093-4466	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 16 Nov-23 15:10	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 23 Nov-23 15:07	Species: Ceriodaphnia dubia	Brine: Not Applicable
Test Length: 7d	Taxon: Branchiopoda	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 21-3251-4718	Code: VCF1123.217cer	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 17:00	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:40	CAS (PC):	Station: MO-VEN
Sample Age: 22h (1.3 °C)	Client: Ventura County Watershed Protection Distri	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	TU	S
07-2040-4512	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	100	>100	---	---	---	1	1
17-0715-2610	Reproduction	Dunnett Multiple Comparison Test	100	>100	---	7.92%	---	1	1

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓	Level	%	95% LCL	95% UCL	TU	S
09-9734-0960	7d Survival Rate	Linear Interpolation (ICPIN)	✓	EC15	>100	---	---	<1	1
			✓	EC20	>100	---	---	<1	
			✓	EC25	>100	---	---	<1	
			✓	EC40	>100	---	---	<1	
			✓	EC50	>100	---	---	<1	
15-1856-0487	Reproduction	Linear Interpolation (ICPIN)	✓	IC15	>100	---	---	<1	1
			✓	IC20	>100	---	---	<1	
			✓	IC25	>100	---	---	<1	
			✓	IC40	>100	---	---	<1	
			✓	IC50	>100	---	---	<1	

## Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
07-2040-4512	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
09-9734-0960	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
15-1856-0487	Reproduction	Control Resp	33.4	15	<<	Yes	Passes Criteria
17-0715-2610	Reproduction	Control Resp	33.4	15	<<	Yes	Passes Criteria
17-0715-2610	Reproduction	PMSD	0.07922	0.13	0.47	Yes	Below Criteria

## 7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
6.25		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
12.5		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
25		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
50		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
100		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%

## Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	10	33.4	31.06	35.74	28	38	1.035	3.273	9.80%	0.00%
6.25		10	34.2	32.78	35.62	30	37	0.6289	1.989	5.82%	-2.40%
12.5		10	38.8	36.99	40.61	36	43	0.8	2.53	6.52%	-16.17%
25		10	37.3	36.18	38.42	35	40	0.4955	1.567	4.20%	-11.68%
50		10	37.3	35.3	39.3	33	41	0.8825	2.791	7.48%	-11.68%
100		10	39.1	36.98	41.22	35	45	0.9363	2.961	7.57%	-17.07%

# CETIS Summary Report

Report Date: 12 Dec-23 13:08 (p 2 of 2)

Test Code/ID: VCF1123.217cer / 03-0045-2094

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

### 7d Survival Rate Detail

MD5: 521A0DF2AE1E59D72392DBABE0C7AEFC

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

### Reproduction Detail

MD5: 6C69AAB6E6EE0366C63E3E8BE34BEB40

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	38	32	30	31	34	33	37	28	37	34
6.25		36	34	33	35	33	30	34	34	37	36
12.5		38	36	38	37	38	36	43	40	39	43
25		40	39	37	38	36	36	38	35	36	38
50		39	33	34	40	39	37	34	37	39	41
100		39	38	37	43	35	38	40	45	39	37

### 7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

# CETIS Analytical Report

Report Date: 12 Dec-23 13:08 (p 1 of 2)  
Test Code/ID: VCF1123.217cer / 03-0045-2094

Ceriodaphnia 7-d Survival and Reproduction Test				Aquatic Bioassay & Consulting Labs, Inc.			
Analysis ID:	17-0715-2610	Endpoint:	Reproduction	CETIS Version:	CETISv2.1.4		
Analyzed:	06 Dec-23 11:41	Analysis:	Parametric-Control vs Treatments	Status Level:	1		
Edit Date:	06 Dec-23 11:40	MD5 Hash:	6C69AAB6E6EE0366C63E3E8BE34BEB4	Editor ID:	002-375-739-9		
Batch ID:	03-8093-4466	Test Type:	Reproduction-Survival (7d)	Analyst:			
Start Date:	16 Nov-23 15:10	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water		
Ending Date:	23 Nov-23 15:07	Species:	Ceriodaphnia dubia	Brine:	Not Applicable		
Test Length:	7d	Taxon:	Branchiopoda	Source:	Aquatic Biosystems, CO	Age:	<24
Sample ID:	21-3251-4718	Code:	VCF1123.217cer	Project:	2023/24-1 (Wet)		
Sample Date:	15 Nov-23 17:00	Material:	Sample Water	Source:	Bioassay Report		
Receipt Date:	15 Nov-23 21:40	CAS (PC):		Station:	MO-VEN		
Sample Age:	22h (1.3 °C)	Client:	Ventura County Watershed Protection Distri				

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	2.646	7.92%

Dunnett Multiple Comparison Test									
Control	vs	Conc-%	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	18	-0.6921	2.289	2.646	CDF	0.9632	Non-Significant Effect
		12.5	18	-4.672	2.289	2.646	CDF	1.0000	Non-Significant Effect
		25	18	-3.374	2.289	2.646	CDF	1.0000	Non-Significant Effect
		50	18	-3.374	2.289	2.646	CDF	1.0000	Non-Significant Effect
		100	18	-4.932	2.289	2.646	CDF	1.0000	Non-Significant Effect

Test Acceptability Criteria					
TAC Limits					
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	33.4	15	<<	Yes	Passes Criteria
PMSD	0.07922	0.13	0.47	Yes	Below Criteria

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	280.283	56.0567	5	8.392	<1.0E-05	Significant Effect
Error	360.7	6.67963	54			
Total	640.983		59			

ANOVA Assumptions Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variance	Bartlett Equality of Variance Test	5.777	15.09	0.3285	Equal Variances	
	Levene Equality of Variance Test	1.153	3.377	0.3442	Equal Variances	
	Mod Levene Equality of Variance Test	0.9881	3.377	0.4337	Equal Variances	
Distribution	Anderson-Darling A2 Test	0.3031	3.878	0.6028	Normal Distribution	
	D'Agostino Kurtosis Test	0.4069	2.576	0.6841	Normal Distribution	
	D'Agostino Skewness Test	0.5815	2.576	0.5609	Normal Distribution	
	D'Agostino-Pearson K2 Omnibus Test	0.5037	9.21	0.7774	Normal Distribution	
	Kolmogorov-Smirnov D Test	0.0828	0.1331	0.3602	Normal Distribution	
	Shapiro-Wilk W Normality Test	0.9871	0.9459	0.7790	Normal Distribution	

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	10	33.4	31.06	35.74	33.67	28	38	1.035	9.80%	0.00%
6.25		10	34.2	32.78	35.62	34	30	37	0.6289	5.82%	-2.40%
12.5		10	38.8	36.99	40.61	38	36	43	0.8	6.52%	-16.17%
25		10	37.3	36.18	38.42	37.75	35	40	0.4955	4.20%	-11.68%
50		10	37.3	35.3	39.3	38.2	33	41	0.8825	7.48%	-11.68%
100		10	39.1	36.98	41.22	38.5	35	45	0.9363	7.57%	-17.07%

# CETIS Analytical Report

Report Date: 12 Dec-23 13:08 (p 2 of 2)  
Test Code/ID: VCF1123.217cer / 03-0045-2094

## Ceriodaphnia 7-d Survival and Reproduction Test

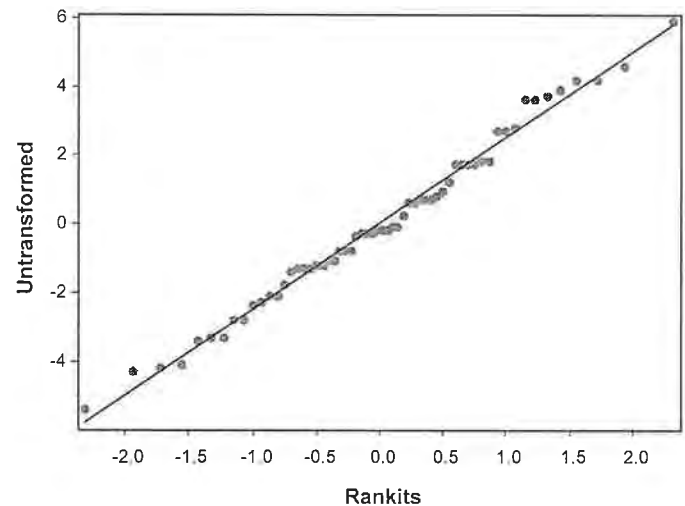
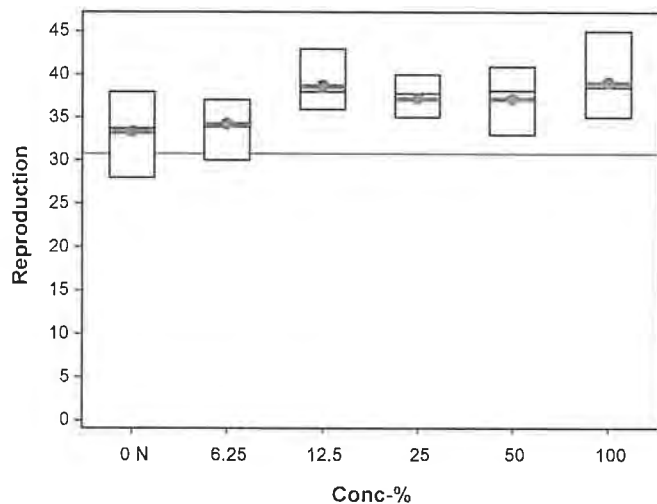
Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 17-0715-2610 Endpoint: Reproduction CETIS Version: CETISv2.1.4  
Analyzed: 06 Dec-23 11:41 Analysis: Parametric-Control vs Treatments Status Level: 1  
Edit Date: 06 Dec-23 11:40 MD5 Hash: 6C69AAB6E6EE0366C63E3E8BE34BEB4 Editor ID: 002-375-739-9

### 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	N	38	32	30	31	34	33	37	28	37	34
6.25		36	34	33	35	33	30	34	34	37	36
12.5		38	36	38	37	38	36	43	40	39	43
25		40	39	37	38	36	36	38	35	36	38
50		39	33	34	40	39	37	34	37	39	41
100		39	38	37	43	35	38	40	45	39	37

### Graphics



## CETIS Analytical Report

Report Date: 12 Dec-23 13:08 (p 1 of 4)  
Test Code/ID: VCF1123.217cer / 03-0045-2094

Ceriodaphnia 7-d Survival and Reproduction Test				Aquatic Bioassay & Consulting Labs, Inc.		
Analysis ID:	09-9734-0960	Endpoint:	7d Survival Rate	CETIS Version:	CETISv2.1.4	
Analyzed:	06 Dec-23 11:41	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1	
Edit Date:	06 Dec-23 11:40	MD5 Hash:	521A0DF2AE1E59D72392DBABE0C7AEF	Editor ID:	002-375-739-9	
Batch ID:	03-8093-4466	Test Type:	Reproduction-Survival (7d)	Analyst:		
Start Date:	16 Nov-23 15:10	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water	
Ending Date:	23 Nov-23 15:07	Species:	Ceriodaphnia dubia	Brine:	Not Applicable	
Test Length:	7d	Taxon:	Branchiopoda	Source:	Aquatic Biosystems, CO	Age: <24
Sample ID:	21-3251-4718	Code:	VCF1123.217cer	Project:	2023/24-1 (Wet)	
Sample Date:	15 Nov-23 17:00	Material:	Sample Water	Source:	Bioassay Report	
Receipt Date:	15 Nov-23 21:40	CAS (PC):		Station:	MO-VEN	
Sample Age:	22h (1.3 °C)	Client:	Ventura County Watershed Protection Distri			

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.8	<<	Yes	Passes Criteria

## Point Estimates

Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
EC15	>100	---	---	<1	---	---
EC20	>100	---	---	<1	---	---
EC25	>100	---	---	<1	---	---
EC40	>100	---	---	<1	---	---
EC50	>100	---	---	<1	---	---

## 7d Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	N	10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
6.25		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
12.5		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
25		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
50		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
100		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	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	N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

## 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	N	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

## CETIS Analytical Report

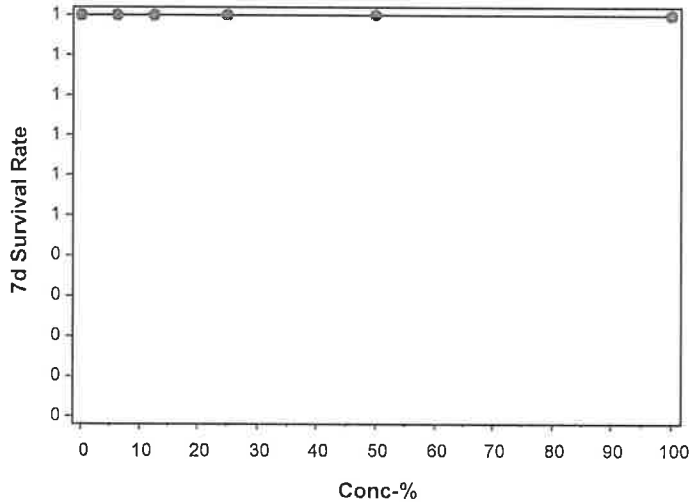
Report Date: 12 Dec-23 13:08 (p 2 of 4)  
Test Code/ID: VCF1123.217cer / 03-0045-2094

### Ceriodaphnia 7-d Survival and Reproduction Test

**Aquatic Bioassay & Consulting Labs, Inc.**

<b>Analysis ID:</b>	09-9734-0960	<b>Endpoint:</b>	7d Survival Rate	<b>CETIS Version:</b>	CETISv2.1.4
<b>Analyzed:</b>	06 Dec-23 11:41	<b>Analysis:</b>	Linear Interpolation (ICPIN)	<b>Status Level:</b>	1
<b>Edit Date:</b>	06 Dec-23 11:40	<b>MD5 Hash:</b>	521A0DF2AE1E59D72392DBABE0C7AEF	<b>Editor ID:</b>	002-375-739-9

## Graphics



## CETIS Analytical Report

Report Date: 12 Dec-23 13:08 (p 3 of 4)  
Test Code/ID: VCF1123.217cer / 03-0045-2094

Ceriodaphnia 7-d Survival and Reproduction Test				Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID:	15-1856-0487	Endpoint:	Reproduction	CETIS Version:	CETISv2.1.4
Analyzed:	06 Dec-23 11:41	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1
Edit Date:	06 Dec-23 11:40	MD5 Hash:	6C69AAB6E6EE0366C63E3E8BE34BEB4	Editor ID:	002-375-739-9
Batch ID:	03-8093-4466	Test Type:	Reproduction-Survival (7d)	Analyst:	
Start Date:	16 Nov-23 15:10	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water
Ending Date:	23 Nov-23 15:07	Species:	Ceriodaphnia dubia	Brine:	Not Applicable
Test Length:	7d	Taxon:	Branchiopoda	Source:	Aquatic Biosystems, CO      Age: <24
Sample ID:	21-3251-4718	Code:	VCF1123.217cer	Project:	2023/24-1 (Wet)
Sample Date:	15 Nov-23 17:00	Material:	Sample Water	Source:	Bioassay Report
Receipt Date:	15 Nov-23 21:40	CAS (PC):		Station:	MO-VEN
Sample Age:	22h (1.3 °C)	Client:	Ventura County Watershed Protection Distri		

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	917503	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	33.4	15	<<	Yes	Passes Criteria

## Point Estimates

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

## Reproduction Summary

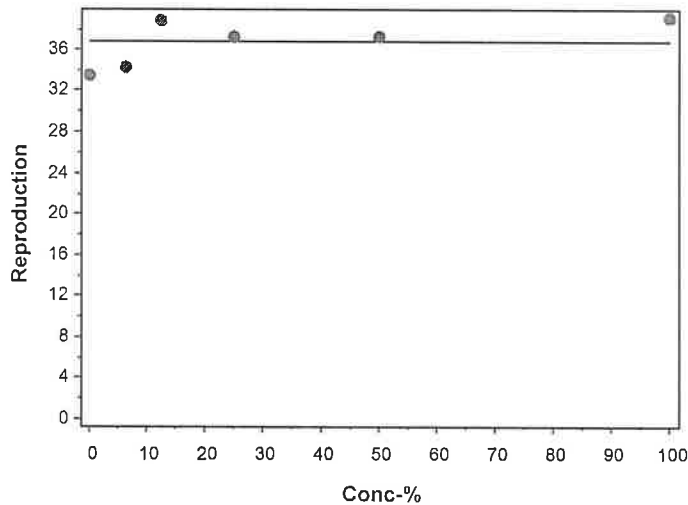
			Calculated Variate						Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	N	10	33.4	33.67	28	38	9.80%	0.00%	36.68	0.00%
6.25		10	34.2	34	30	37	5.82%	-2.40%	36.68	0.00%
12.5		10	38.8	38	36	43	6.52%	-16.17%	36.68	0.00%
25		10	37.3	37.75	35	40	4.20%	-11.68%	36.68	0.00%
50		10	37.3	38.2	33	41	7.48%	-11.68%	36.68	0.00%
100		10	39.1	38.5	35	45	7.57%	-17.07%	36.68	0.00%

## Reproduction Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	38	32	30	31	34	33	37	28	37	34
6.25		36	34	33	35	33	30	34	34	37	36
12.5		38	36	38	37	38	36	43	40	39	43
25		40	39	37	38	36	36	38	35	36	38
50		39	33	34	40	39	37	34	37	39	41
100		39	38	37	43	35	38	40	45	39	37

Ceriodaphnia 7-d Survival and Reproduction Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID:	15-1856-0487	Endpoint:	Reproduction	CETIS Version:
Analyzed:	06 Dec-23 11:41	Analysis:	Linear Interpolation (ICPIN)	CETISv2.1.4
Edit Date:	06 Dec-23 11:40	MD5 Hash:	6C69AAB6E6EE0366C63E3E8BE34BEB4	Status Level:
				1
			Editor ID:	002-375-739-9

Graphics



## CETIS Analytical Report

Report Date: 12 Dec-23 13:08 (p 1 of 2)  
 Test Code/ID: VCF1123.217cer / 03-0045-2094

Ceriodaphnia 7-d Survival and Reproduction Test Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 07-2040-4512	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed: 06 Dec-23 11:41	Analysis: STP 2xK Contingency Tables	Status Level: 1
Edit Date: 06 Dec-23 11:40	MD5 Hash: 521A0DF2AE1E59D72392DBABE0C7AEF	Editor ID: 002-375-739-9
Batch ID: 03-8093-4466	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 16 Nov-23 15:10	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 23 Nov-23 15:07	Species: Ceriodaphnia dubia	Brine: Not Applicable
Test Length: 7d	Taxon: Branchiopoda	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 21-3251-4718	Code: VCF1123.217cer	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 17:00	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:40	CAS (PC):	Station: MO-VEN
Sample Age: 22h (1.3 °C)	Client: Ventura County Watershed Protection Distri	

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

## Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	1.0000	Exact	1.0000	Non-Significant Effect
		12.5	1.0000	Exact	1.0000	Non-Significant Effect
		25	1.0000	Exact	1.0000	Non-Significant Effect
		50	1.0000	Exact	1.0000	Non-Significant Effect
		100	1.0000	Exact	1.0000	Non-Significant Effect

## Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	1	0.8	<<	Yes	Passes Criteria

## 7d Survival Rate Frequencies

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	N	10	0	10	1.0000	0.0000	0.00%
6.25		10	0	10	1.0000	0.0000	0.00%
12.5		10	0	10	1.0000	0.0000	0.00%
25		10	0	10	1.0000	0.0000	0.00%
50		10	0	10	1.0000	0.0000	0.00%
100		10	0	10	1.0000	0.0000	0.00%

## 7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
6.25		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
12.5		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
25		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
50		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
100		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%

## 7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

## CETIS Analytical Report

Report Date: 12 Dec-23 13:08 (p 2 of 2)  
Test Code/ID: VCF1123.217cer / 03-0045-2094

### Ceriodaphnia 7-d Survival and Reproduction Test

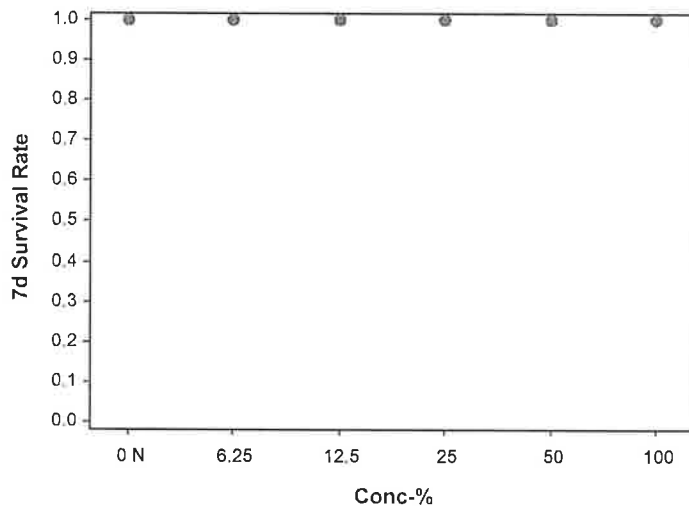
**Aquatic Bioassay & Consulting Labs, Inc.**

<b>Analysis ID:</b>	07-2040-4512	<b>Endpoint:</b>	7d Survival Rate	<b>CETIS Version:</b>	CETISv2.1.4
<b>Analyzed:</b>	06 Dec-23 11:41	<b>Analysis:</b>	STP 2xK Contingency Tables	<b>Status Level:</b>	1
<b>Edit Date:</b>	06 Dec-23 11:40	<b>MD5 Hash:</b>	521A0DF2AE1E59D72392DBABE0C7AEF	<b>Editor ID:</b>	002-375-739-9

### 7d Survival Rate Binomials

[illegible]

## Graphics



# CETIS Measurement Report

Report Date: 12 Dec-23 13:08 (p 1 of 2)  
Test Code/ID: VCF1123.217cer / 03-0045-2094

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 03-8093-4466	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 16 Nov-23 15:10	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 23 Nov-23 15:07	Species: Ceriodaphnia dubia	Brine: Not Applicable
Test Length: 7d	Taxon: Branchiopoda	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 21-3251-4718	Code: VCF1123.217cer	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 17:00	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:40	CAS (PC):	Station: MO-VEN
Sample Age: 22h (1.3 °C)	Client: Ventura County Watershed Protection Distri	

### Alkalinity (CaCO3)-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	60	60	60	60	60	0	0	0.00%	0
100		8	53	53	53	53	53	0	0	0.00%	0
Overall		16	56.5	54.57	58.43	53	60	0.9037	3.615	6.40%	0 (0%)

### Conductivity-µmhos

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	375.2	372.2	378.3	369	379	0.4617	3.694	0.98%	0
6.25		8	397.2	395.2	399.3	392	399	0.3116	2.493	0.63%	0
12.5		8	444.1	442.1	446.1	440	447	0.3021	2.416	0.54%	0
25		8	457.5	451.4	463.6	449	469	0.9137	7.309	1.60%	0
50		8	515.8	510.4	521.1	507	525	0.8011	6.409	1.24%	0
100		8	642.6	634.1	651.1	626	653	1.269	10.16	1.58%	0
Overall		48	472.1	446.1	498.1	369	653	12.93	89.59	18.98%	0 (0%)

### Dissolved Oxygen-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	7.887	7.61	8.165	7.1	8.2	0.04142	0.3314	4.20%	0
6.25		8	7.838	7.606	8.069	7.2	8.1	0.03468	0.2774	3.54%	0
12.5		8	7.825	7.642	8.008	7.3	8	0.02734	0.2188	2.80%	0
25		8	7.813	7.592	8.033	7.2	8	0.03303	0.2642	3.38%	0
50		8	7.763	7.558	7.967	7.2	8	0.03057	0.2446	3.15%	0
100		8	7.738	7.528	7.947	7.2	8	0.03129	0.2504	3.24%	0
Overall		48	7.81	7.736	7.885	7.1	8.2	0.0371	0.257	3.29%	0 (0%)

### Hardness (CaCO3)-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	97.62	96.74	98.51	95	98	0.1326	1.061	1.09%	0
100		8	184	184	184	184	184	0	0	0.00%	0
Overall		16	140.8	117	164.6	95	184	11.15	44.61	31.68%	0 (0%)

### pH-Units

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	8.088	8.018	8.157	8	8.2	0.01043	0.08346	1.03%	0
6.25		8	8.025	7.928	8.122	7.8	8.2	0.01456	0.1165	1.45%	0
12.5		8	8	7.911	8.089	7.8	8.2	0.01336	0.1069	1.34%	0
25		8	7.988	7.883	8.092	7.8	8.2	0.01558	0.1246	1.56%	0
50		8	7.963	7.854	8.071	7.8	8.2	0.01628	0.1302	1.64%	0
100		8	7.95	7.824	8.076	7.7	8.2	0.0189	0.1512	1.90%	0
Overall		48	8.002	7.966	8.038	7.7	8.2	0.01774	0.1229	1.54%	0 (0%)

# CETIS Measurement Report

Report Date: 12 Dec-23 13:08 (p 2 of 2)  
 Test Code/ID: VCF1123.217cer / 03-0045-2094

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

Temperature-°C											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	24	24	24	24	24	0	0	0.00%	0
6.25		8	24.08	23.99	24.16	24	24.2	0.01293	0.1035	0.43%	0
12.5		8	24.08	23.99	24.16	24	24.2	0.01293	0.1035	0.43%	0
25		8	24.1	23.99	24.21	24	24.3	0.01637	0.1309	0.54%	0
50		8	24.09	23.99	24.18	24	24.3	0.01407	0.1126	0.47%	0
100		8	24.1	24	24.2	24	24.3	0.01494	0.1195	0.50%	0
Overall		48	24.07	24.04	24.1	24	24.3	0.01511	0.1047	0.43%	0 (0%)

P



**AQUATIC BIOASSAY**  
& CONSULTING LABORATORIES, INC.

December 14, 2023

Ms. Kelly Hahs  
Ventura County Watershed Protection District  
800 South Victoria Ave  
Ventura, CA 93009

Dear Ms. Hahs:

We are pleased to present the enclosed revised bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* EPA-821-R-02-013. Results were as follows:

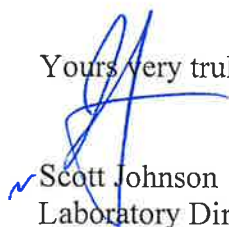
CLIENT:	Ventura County Flood Control
SAMPLE I.D.:	MO-FIL
DATE RECEIVED:	11/15/2023
ABC LAB. NO.:	VCF1123.215

**CHRONIC CERIODAPHNIA SURVIVAL & REPRODUCTION BIOASSAY**

SURVIVAL	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	EC25 =	>100.00 %
	EC50 =	>100.00 %

REPRODUCTION	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	IC25 =	>100.00 %
	IC50 =	>100.00 %

Yours very truly,

  
Scott Johnson  
Laboratory Director

# CETIS Summary Report

Report Date: 12 Dec-23 13:04 (p 1 of 2)

Test Code/ID: VCF1123.215cer / 07-3695-3943

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 07-1436-7018	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 16 Nov-23 15:06	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 23 Nov-23 15:01	Species: Ceriodaphnia dubia	Brine: Not Applicable
Test Length: 7d	Taxon: Branchiopoda	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 12-8354-8734	Code: VCF1123.215cer	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 20:00	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:40	CAS (PC):	Station: MO-FIL
Sample Age: 19h (10.3 °C)	Client: Ventura County Watershed Protection Distri	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	PMSD	TU	S
02-3045-9273	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	100	>100	---	---	1	1
10-2282-5721	Reproduction	Dunnett Multiple Comparison Test	100	>100	---	11.2%	1	1

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓ Level	%	95% LCL	95% UCL	TU	S
19-4497-3711	7d Survival Rate	Linear Interpolation (ICPIN)	✓ EC15	>100	---	---	<1	1
			✓ EC20	>100	---	---	<1	
			✓ EC25	>100	---	---	<1	
			✓ EC40	>100	---	---	<1	
			✓ EC50	>100	---	---	<1	
08-6740-8068	Reproduction	Linear Interpolation (ICPIN)	✓ IC15	>100	---	---	<1	1
			✓ IC20	>100	---	---	<1	
			✓ IC25	>100	---	---	<1	
			✓ IC40	>100	---	---	<1	
			✓ IC50	>100	---	---	<1	

## Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
02-3045-9273	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
19-4497-3711	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
08-6740-8068	Reproduction	Control Resp	33.4	15	<<	Yes	Passes Criteria
10-2282-5721	Reproduction	Control Resp	33.4	15	<<	Yes	Passes Criteria
10-2282-5721	Reproduction	PMSD	0.1118	0.13	0.47	Yes	Below Criteria

## 7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
6.25		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
12.5		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
25		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
50		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
100		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%

## Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	10	33.4	31.06	35.74	28	38	1.035	3.273	9.80%	0.00%
6.25		10	33	31	35	28	37	0.8819	2.789	8.45%	1.20%
12.5		10	33	29.93	36.07	28	40	1.358	4.295	13.01%	1.20%
25		10	35.7	34.12	37.28	32	40	0.7	2.214	6.20%	-6.89%
50		10	34.3	31	37.6	28	43	1.461	4.62	13.47%	-2.69%
100		10	36.7	33.78	39.62	29	42	1.291	4.084	11.13%	-9.88%

# CETIS Summary Report

Report Date: 12 Dec-23 13:04 (p 2 of 2)

Test Code/ID: VCF1123.215cer / 07-3695-3943

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

### 7d Survival Rate Detail

MD5: 521A0DF2AE1E59D72392DBABE0C7AEFC

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

### Reproduction Detail

MD5: F7E5FF2CF460EC38243E2D0914DB411B

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	38	32	30	31	34	33	37	28	37	34
6.25		33	30	28	31	32	36	34	34	37	35
12.5		28	28	38	33	33	31	30	38	40	31
25		40	35	36	35	35	38	37	34	32	35
50		38	43	34	37	33	34	28	29	30	37
100		38	37	29	33	36	36	42	40	34	42

### 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	N	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

# CETIS Analytical Report

Report Date: 12 Dec-23 13:04 (p 1 of 2)  
Test Code/ID: VCF1123.215cer / 07-3695-3943

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 10-2282-5721	Endpoint: Reproduction	CETIS Version: CETISv2.1.4
Analyzed: 05 Dec-23 17:07	Analysis: Parametric-Control vs Treatments	Status Level: 1
Edit Date: 05 Dec-23 17:02	MD5 Hash: F7E5FF2CF460EC38243E2D0914DB411B	Editor ID:
Batch ID: 07-1436-7018	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 16 Nov-23 15:06	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 23 Nov-23 15:01	Species: Ceriodaphnia dubia	Brine: Not Applicable
Test Length: 7d	Taxon: Branchiopoda	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 12-8354-8734	Code: VCF1123.215cer	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 20:00	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:40	CAS (PC):	Station: MO-FIL
Sample Age: 19h (10.3 °C)	Client: Ventura County Watershed Protection Distri	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	3.735	11.18%

## Dunnett Multiple Comparison Test

Control	vs	Conc-%	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	18	0.2452	2.289	3.735	CDF	0.7505	Non-Significant Effect
		12.5	18	0.2452	2.289	3.735	CDF	0.7505	Non-Significant Effect
		25	18	-1.41	2.289	3.735	CDF	0.9957	Non-Significant Effect
		50	18	-0.5516	2.289	3.735	CDF	0.9477	Non-Significant Effect
		100	18	-2.023	2.289	3.735	CDF	0.9995	Non-Significant Effect

## Test Acceptability Criteria

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	33.4	15	<<	Yes	Passes Criteria
PMSD	0.1118	0.13	0.47	Yes	Below Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	118.95	23.79	5	1.787	0.1310	Non-Significant Effect
Error	718.7	13.3093	54			
Total	837.65		59			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	6.292	15.09	0.2788	Equal Variances
	Levene Equality of Variance Test	1.255	3.377	0.2968	Equal Variances
	Mod Levene Equality of Variance Test	1.219	3.377	0.3130	Equal Variances
Distribution	Anderson-Darling A2 Test	0.2679	3.878	0.7121	Normal Distribution
	D'Agostino Kurtosis Test	0.3704	2.576	0.7111	Normal Distribution
	D'Agostino Skewness Test	0.4609	2.576	0.6449	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	0.3496	9.21	0.8396	Normal Distribution
	Kolmogorov-Smirnov D Test	0.06667	0.1331	0.7100	Normal Distribution
	Shapiro-Wilk W Normality Test	0.9896	0.9459	0.8924	Normal Distribution

## Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	10	33.4	31.06	35.74	33.67	28	38	1.035	9.80%	0.00%
6.25		10	33	31	35	33.67	28	37	0.8819	8.45%	1.20%
12.5		10	33	29.93	36.07	32	28	40	1.358	13.01%	1.20%
25		10	35.7	34.12	37.28	35	32	40	0.7	6.20%	-6.89%
50		10	34.3	31	37.6	34	28	43	1.461	13.47%	-2.69%
100		10	36.7	33.78	39.62	36.33	29	42	1.291	11.13%	-9.88%

# CETIS Analytical Report

Report Date: 12 Dec-23 13:04 (p 2 of 2)  
 Test Code/ID: VCF1123.215cer / 07-3695-3943

## Ceriodaphnia 7-d Survival and Reproduction Test

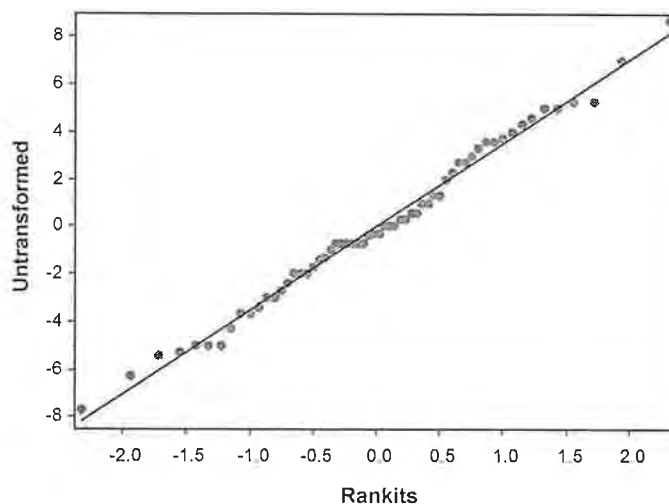
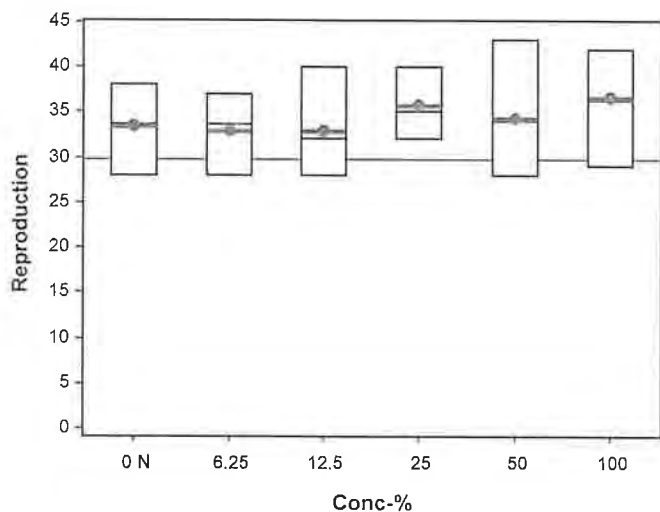
Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 10-2282-5721      Endpoint: Reproduction      CETIS Version: CETISv2.1.4  
 Analyzed: 05 Dec-23 17:07      Analysis: Parametric-Control vs Treatments      Status Level: 1  
 Edit Date: 05 Dec-23 17:02      MD5 Hash: F7E5FF2CF460EC38243E2D0914DB411B      Editor ID:

### 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	N	38	32	30	31	34	33	37	28	37	34
6.25		33	30	28	31	32	36	34	34	37	35
12.5		28	28	38	33	33	31	30	38	40	31
25		40	35	36	35	35	38	37	34	32	35
50		38	43	34	37	33	34	28	29	30	37
100		38	37	29	33	36	36	42	40	34	42

### Graphics



## CETIS Analytical Report

Report Date: 12 Dec-23 13:04 (p 1 of 4)  
Test Code/ID: VCF1123.215cer / 07-3695-3943

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay &amp; Consulting Labs, Inc.

Analysis ID: 19-4497-3711	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed: 05 Dec-23 17:07	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 05 Dec-23 17:02	MD5 Hash: 521A0DF2AE1E59D72392DBABE0C7AEF	Editor ID:
Batch ID: 07-1436-7018	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 16 Nov-23 15:06	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 23 Nov-23 15:01	Species: Ceriodaphnia dubia	Brine: Not Applicable
Test Length: 7d	Taxon: Branchiopoda	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 12-8354-8734	Code: VCF1123.215cer	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 20:00	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:40	CAS (PC):	Station: MO-FIL
Sample Age: 19h (10.3 °C)	Client: Ventura County Watershed Protection Distri	

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

## TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.8	<<	Yes	Passes Criteria

## Point Estimates

Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
EC15	>100	---	---	<1	---	---
EC20	>100	---	---	<1	---	---
EC25	>100	---	---	<1	---	---
EC40	>100	---	---	<1	---	---
EC50	>100	---	---	<1	---	---

## 7d Survival Rate Summary

## Calculated Variate(A/B)

## Isotonic Variate

Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	N	10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
6.25		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
12.5		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
25		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
50		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
100		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	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	N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

## 7d Survival Rate Binomials

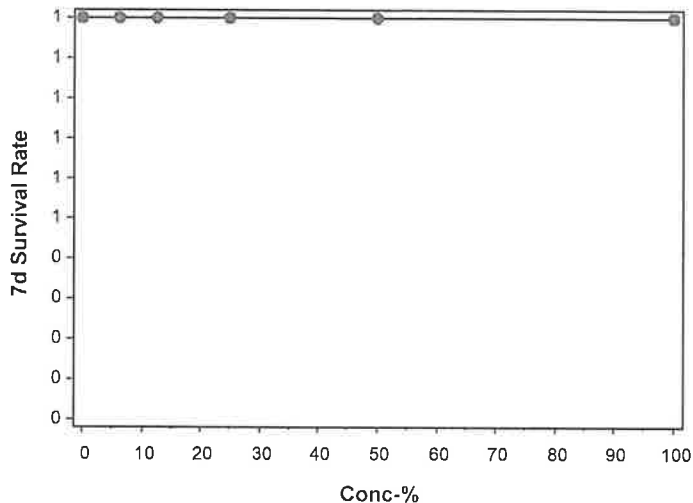
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

# CETIS Analytical Report

Report Date: 12 Dec-23 13:04 (p 2 of 4)  
Test Code/ID: VCF1123.215cer / 07-3695-3943

Ceriodaphnia 7-d Survival and Reproduction Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID: 19-4497-3711	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4		
Analyzed: 05 Dec-23 17:07	Analysis: Linear Interpolation (ICPIN)	Status Level: 1		
Edit Date: 05 Dec-23 17:02	MD5 Hash: 521A0DF2AE1E59D72392DBABE0C7AEF	Editor ID:		

## Graphics



## CETIS Analytical Report

Report Date: 12 Dec-23 13:04 (p 3 of 4)  
Test Code/ID: VCF1123.215cer / 07-3695-3943

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay &amp; Consulting Labs, Inc.

Analysis ID: 08-6740-8068	Endpoint: Reproduction	CETIS Version: CETISv2.1.4
Analyzed: 05 Dec-23 17:07	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 05 Dec-23 17:02	MD5 Hash: F7E5FF2CF460EC38243E2D0914DB411B	Editor ID:
Batch ID: 07-1436-7018	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 16 Nov-23 15:06	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 23 Nov-23 15:01	Species: Ceriodaphnia dubia	Brine: Not Applicable
Test Length: 7d	Taxon: Branchiopoda	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 12-8354-8734	Code: VCF1123.215cer	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 20:00	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:40	CAS (PC):	Station: MO-FIL
Sample Age: 19h (10.3 °C)	Client: Ventura County Watershed Protection Distri	

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1544241	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

## TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	33.4	15	<<	Yes	Passes Criteria

## Point Estimates

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

## Reproduction Summary

## Calculated Variate

## Isotonic Variate

Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	N	10	33.4	33.67	28	38	9.80%	0.00%	34.35	0.00%
6.25		10	33	33.67	28	37	8.45%	1.20%	34.35	0.00%
12.5		10	33	32	28	40	13.01%	1.20%	34.35	0.00%
25		10	35.7	35	32	40	6.20%	-6.89%	34.35	0.00%
50		10	34.3	34	28	43	13.47%	-2.69%	34.35	0.00%
100		10	36.7	36.33	29	42	11.13%	-9.88%	34.35	0.00%

## Reproduction Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	38	32	30	31	34	33	37	28	37	34
6.25		33	30	28	31	32	36	34	34	37	35
12.5		28	28	38	33	33	31	30	38	40	31
25		40	35	36	35	35	38	37	34	32	35
50		38	43	34	37	33	34	28	29	30	37
100		38	37	29	33	36	36	42	40	34	42

# CETIS Analytical Report

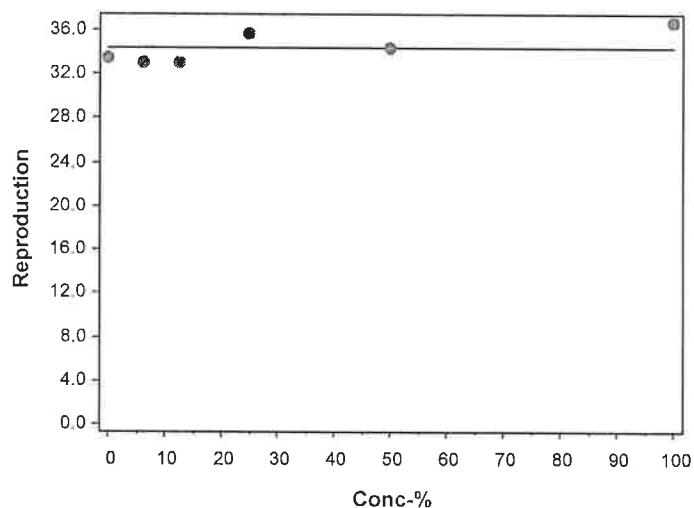
Report Date: 12 Dec-23 13:04 (p 4 of 4)  
Test Code/ID: VCF1123.215cer / 07-3695-3943

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 08-6740-8068	Endpoint: Reproduction	CETIS Version: CETISv2.1.4
Analyzed: 05 Dec-23 17:07	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 05 Dec-23 17:02	MD5 Hash: F7E5FF2CF460EC38243E2D0914DB411B	Editor ID:

### Graphics



## CETIS Analytical Report

Report Date: 12 Dec-23 13:04 (p 1 of 2)  
Test Code/ID: VCF1123.215cer / 07-3695-3943

## Ceriodaphnia 7-d Survival and Reproduction Test Aquatic Bioassay &amp; Consulting Labs, Inc.

Analysis ID: 02-3045-9273	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed: 05 Dec-23 17:07	Analysis: STP 2xK Contingency Tables	Status Level: 1
Edit Date: 05 Dec-23 17:02	MD5 Hash: 521A0DF2AE1E59D72392DBABE0C7AEF	Editor ID:
Batch ID: 07-1436-7018	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 16 Nov-23 15:06	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 23 Nov-23 15:01	Species: Ceriodaphnia dubia	Brine: Not Applicable
Test Length: 7d	Taxon: Branchiopoda	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 12-8354-8734	Code: VCF1123.215cer	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 20:00	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:40	CAS (PC):	Station: MO-FIL
Sample Age: 19h (10.3 °C)	Client: Ventura County Watershed Protection Distri	

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

## Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	1.0000	Exact	1.0000	Non-Significant Effect
		12.5	1.0000	Exact	1.0000	Non-Significant Effect
		25	1.0000	Exact	1.0000	Non-Significant Effect
		50	1.0000	Exact	1.0000	Non-Significant Effect
		100	1.0000	Exact	1.0000	Non-Significant Effect

## Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	1	0.8	<<	Yes	Passes Criteria

## 7d Survival Rate Frequencies

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	N	10	0	10	1.0000	0.0000	0.00%
6.25		10	0	10	1.0000	0.0000	0.00%
12.5		10	0	10	1.0000	0.0000	0.00%
25		10	0	10	1.0000	0.0000	0.00%
50		10	0	10	1.0000	0.0000	0.00%
100		10	0	10	1.0000	0.0000	0.00%

## 7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
6.25		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
12.5		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
25		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
50		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
100		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%

## 7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

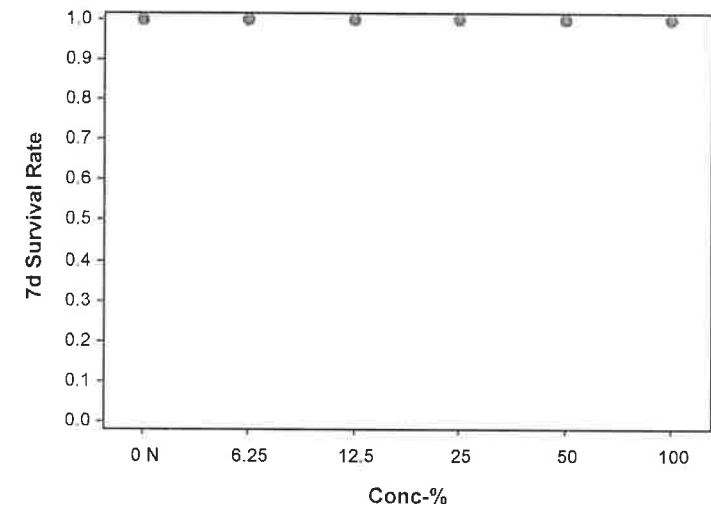
Ceriodaphnia 7-d Survival and Reproduction Test Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 02-3045-9273 Endpoint: 7d Survival Rate CETIS Version: CETISv2.1.4  
Analyzed: 05 Dec-23 17:07 Analysis: STP 2xK Contingency Tables Status Level: 1  
Edit Date: 05 Dec-23 17:02 MD5 Hash: 521A0DF2AE1E59D72392DBABE0C7AEF Editor ID:

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	N	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Graphics



# CETIS Measurement Report

Report Date: 12 Dec-23 13:04 (p 1 of 2)  
Test Code/ID: VCF1123.215cer / 07-3695-3943

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 07-1436-7018	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 16 Nov-23 15:06	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 23 Nov-23 15:01	Species: Ceriodaphnia dubia	Brine: Not Applicable
Test Length: 7d	Taxon: Branchiopoda	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 12-8354-8734	Code: VCF1123.215cer	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 20:00	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:40	CAS (PC):	Station: MO-FIL
Sample Age: 19h (10.3 °C)	Client: Ventura County Watershed Protection Distri	

## Alkalinity (CaCO3)-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	60	60	60	60	60	0	0	0.00%	0
100		8	36	36	36	36	36	0	0	0.00%	0
Overall		16	48	41.4	54.6	36	60	3.098	12.39	25.82%	0 (0%)

## Conductivity-µmhos

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	375.2	372.2	378.3	369	379	0.4617	3.694	0.98%	0
6.25		8	428.8	423.9	433.6	422	440	0.7219	5.776	1.35%	0
12.5		8	388.2	382.7	393.8	377	397	0.8339	6.671	1.72%	0
25		8	369.6	365.6	373.6	360	375	0.5974	4.779	1.29%	0
50		8	336.6	333.7	339.6	331	340	0.4429	3.543	1.05%	0
100		8	267.9	266.6	269.2	266	270	0.1941	1.553	0.58%	0
Overall		48	361.1	346.4	375.7	266	440	7.291	50.51	13.99%	0 (0%)

## Dissolved Oxygen-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	7.887	7.61	8.165	7.1	8.2	0.04142	0.3314	4.20%	0
6.25		8	7.85	7.622	8.078	7.2	8	0.03407	0.2726	3.47%	0
12.5		8	7.85	7.622	8.078	7.2	8	0.03407	0.2726	3.47%	0
25		8	7.788	7.541	8.034	7.1	8	0.03686	0.2949	3.79%	0
50		8	7.8	7.577	8.023	7.2	8.1	0.03341	0.2673	3.43%	0
100		8	7.812	7.57	8.055	7.2	8.2	0.03625	0.29	3.71%	0
Overall		48	7.831	7.751	7.911	7.1	8.2	0.03974	0.2753	3.52%	0 (0%)

## Hardness (CaCO3)-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	97.62	96.74	98.51	95	98	0.1326	1.061	1.09%	0
100		8	100	100	100	100	100	0	0	0.00%	0
Overall		16	98.81	98.05	99.57	95	100	0.3561	1.424	1.44%	0 (0%)

## pH-Units

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	8.088	8.018	8.157	8	8.2	0.01043	0.08346	1.03%	0
6.25		8	8.1	8.011	8.189	8	8.3	0.01336	0.1069	1.32%	0
12.5		8	8.063	7.974	8.151	7.9	8.2	0.01326	0.1061	1.32%	0
25		8	8.038	7.975	8.1	7.9	8.1	0.009301	0.07441	0.93%	0
50		8	8.038	7.975	8.1	7.9	8.1	0.009301	0.07441	0.93%	0
100		8	8.025	7.966	8.084	7.9	8.1	0.008839	0.07072	0.88%	0
Overall		48	8.058	8.033	8.084	7.9	8.3	0.01257	0.08711	1.08%	0 (0%)

## CETIS Measurement Report

**Report Date:** 12 Dec-23 13:04 (p 2 of 2)

**Test Code/ID:** VCF1123.215cer / 07-3695-3943

### Ceriodaphnia 7-d Survival and Reproduction Test

**Aquatic Bioassay & Consulting Labs, Inc.**

## Temperature-°C

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	24	24	24	24	24	0	0	0.00%	0
6.25		8	24.14	24.04	24.24	24	24.3	0.01484	0.1187	0.49%	0
12.5		8	24.16	24.04	24.28	24	24.3	0.0176	0.1408	0.58%	0
25		8	24.12	24.02	24.23	24	24.3	0.01602	0.1282	0.53%	0
50		8	24.16	24.01	24.31	24	24.4	0.0221	0.1768	0.73%	0
100		8	24.17	24.03	24.32	24	24.4	0.02191	0.1753	0.72%	0
Overall		48	24.13	24.09	24.17	24	24.4	0.02057	0.1425	0.59%	0 (0%)



**AQUATIC BIOASSAY**  
& CONSULTING LABORATORIES, INC.

December 14, 2023

Ms. Kelly Hahs  
Ventura County Watershed Protection District  
800 South Victoria Ave  
Ventura, CA 93009

Dear Ms. Hahs:

We are pleased to present the enclosed revised bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* EPA-821-R-02-013. Results were as follows:

CLIENT:	Ventura County Flood Control
SAMPLE I.D.:	MO-HUE
DATE RECEIVED:	11/15/2023
ABC LAB. NO.:	VCF1123.208

**CHRONIC CERIODAPHNIA SURVIVAL & REPRODUCTION BIOASSAY**

SURVIVAL	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	EC25 =	>100.00 %
	EC50 =	>100.00 %

REPRODUCTION	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	IC25 =	>100.00 %
	IC50 =	>100.00 %

Yours very truly,

Scott Johnson  
Laboratory Director

# CETIS Summary Report

Report Date: 12 Dec-23 12:38 (p 1 of 2)  
Test Code/ID: VCF1123.208cer / 06-9932-0536

Ceriodaphnia 7-d Survival and Reproduction Test				Aquatic Bioassay & Consulting Labs, Inc.		
Batch ID:	19-7450-3432	Test Type:	Reproduction-Survival (7d)	Analyst:		
Start Date:	16 Nov-23 15:00	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water	
Ending Date:	23 Nov-23 14:45	Species:	Ceriodaphnia dubia	Brine:	Not Applicable	
Test Length:	7d	Taxon:	Branchiopoda	Source:	Aquatic Biosystems, CO	Age: <24
Sample ID:	00-2276-1632	Code:	VCF1123.208cer	Project:	2023/24-1 (Wet)	
Sample Date:	15 Nov-23 18:00	Material:	Sample Water	Source:	Bioassay Report	
Receipt Date:	15 Nov-23 19:35	CAS (PC):		Station:	MO-HUE	
Sample Age:	21h (11.8 °C)	Client:	Ventura County Watershed Protection Distri			

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	PMSD	TU	S
10-6091-4043	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	100	>100	---	---	1	1
04-7003-8944	Reproduction	Dunnett Multiple Comparison Test	100	>100	---	9.41%	1	1

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓ Level	%	95% LCL	95% UCL	TU	S
15-7911-2116	7d Survival Rate	Linear Interpolation (ICPIN)	✓ EC15	>100	---	---	<1	1
			✓ EC20	>100	---	---	<1	
			✓ EC25	>100	---	---	<1	
			✓ EC40	>100	---	---	<1	
			✓ EC50	>100	---	---	<1	
21-0028-4685	Reproduction	Linear Interpolation (ICPIN)	✓ IC15	>100	---	---	<1	1
			✓ IC20	>100	---	---	<1	
			✓ IC25	>100	---	---	<1	
			✓ IC40	>100	---	---	<1	
			✓ IC50	>100	---	---	<1	

## Test Acceptability

			TAC Limits						
Analysis ID	Endpoint	Attribute	Test Stat	Lower	Upper	Overlap	Decision		
10-6091-4043	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria		
15-7911-2116	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria		
04-7003-8944	Reproduction	Control Resp	32	15	<<	Yes	Passes Criteria		
21-0028-4685	Reproduction	Control Resp	32	15	<<	Yes	Passes Criteria		
04-7003-8944	Reproduction	PMSD	0.09406	0.13	0.47	Yes	Below Criteria		

## 7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
6.25		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
12.5		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
25		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
50		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
100		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%

## Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	10	32	29.92	34.08	29	38	0.9189	2.906	9.08%	0.00%
6.25		10	33.4	32.04	34.76	31	37	0.6	1.897	5.68%	-4.38%
12.5		10	33	31.49	34.51	30	37	0.6667	2.108	6.39%	-3.13%
25		10	32	29.71	34.29	27	37	1.011	3.197	9.99%	0.00%
50		10	33.6	31.41	35.79	29	38	0.9684	3.062	9.11%	-5.00%
100		10	36	33.16	38.84	30	42	1.256	3.972	11.03%	-12.50%

PASS

# CETIS Summary Report

Report Date: 12 Dec-23 12:38 (p 2 of 2)  
Test Code/ID: VCF1123.208cer / 06-9932-0536

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

### 7d Survival Rate Detail

MD5: 521A0DF2AE1E59D72392DBABE0C7AEFC

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

### Reproduction Detail

MD5: 0C95B2BFFFEF777FB6A04CC7D5783E937

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	31	36	32	29	33	30	30	30	31	38
6.25		37	36	32	33	33	34	32	31	32	34
12.5		34	37	31	30	32	31	33	34	35	33
25		33	32	30	27	35	34	34	28	30	37
50		38	35	33	32	29	31	38	36	31	33
100		31	30	33	36	42	39	36	35	37	41

### 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	N	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

# CETIS Analytical Report

Report Date: 12 Dec-23 12:38 (p 1 of 2)  
Test Code/ID: VCF1123.208cer / 06-9932-0536

## Ceriodaphnia 7-d Survival and Reproduction Test Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 04-7003-8944	Endpoint: Reproduction	CETIS Version: CETISv2.1.4
Analyzed: 05 Dec-23 16:23	Analysis: Parametric-Control vs Treatments	Status Level: 1
Edit Date: 05 Dec-23 16:21	MD5 Hash: 0C95B2BFFFEF777FB6A04CC7D5783E937	Editor ID: 006-853-889-6
Batch ID: 19-7450-3432	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 16 Nov-23 15:00	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 23 Nov-23 14:45	Species: Ceriodaphnia dubia	Brine: Not Applicable
Test Length: 7d	Taxon: Branchiopoda	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 00-2276-1632	Code: VCF1123.208cer	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 18:00	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 19:35	CAS (PC):	Station: MO-HUE
Sample Age: 21h (11.8 °C)	Client: Ventura County Watershed Protection Distri	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	3.01	9.41%

### Dunnett Multiple Comparison Test

Control	vs	Conc-%	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	18	-1.065	2.289	3.01	CDF	0.9870	Non-Significant Effect
		12.5	18	-0.7605	2.289	3.01	CDF	0.9693	Non-Significant Effect
		25	18	0	2.289	3.01	CDF	0.8333	Non-Significant Effect
		50	18	-1.217	2.289	3.01	CDF	0.9919	Non-Significant Effect
		100	18	-3.042	2.289	3.01	CDF	1.0000	Non-Significant Effect

### Test Acceptability Criteria

		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	32	15	<<	Yes	Passes Criteria
PMSD	0.09406	0.13	0.47	Yes	Below Criteria

### ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	108.533	21.7067	5	2.511	0.0408	Significant Effect
Error	466.8	8.64444	54			
Total	575.333		59			

### ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	6.159	15.09	0.2911	Equal Variances
	Levene Equality of Variance Test	1.279	3.377	0.2864	Equal Variances
	Mod Levene Equality of Variance Test	1.099	3.377	0.3718	Equal Variances
Distribution	Anderson-Darling A2 Test	0.474	3.878	0.2456	Normal Distribution
	D'Agostino Kurtosis Test	0.5328	2.576	0.5942	Normal Distribution
	D'Agostino Skewness Test	0.8308	2.576	0.4061	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	0.9742	9.21	0.6144	Normal Distribution
	Kolmogorov-Smirnov D Test	0.1	0.1331	0.1357	Normal Distribution
	Shapiro-Wilk W Normality Test	0.9786	0.9459	0.3713	Normal Distribution

### Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	10	32	29.92	34.08	31	29	38	0.9189	9.08%	0.00%
6.25		10	33.4	32.04	34.76	33	31	37	0.6	5.68%	-4.38%
12.5		10	33	31.49	34.51	33	30	37	0.6667	6.39%	-3.13%
25		10	32	29.71	34.29	32.5	27	37	1.011	9.99%	0.00%
50		10	33.6	31.41	35.79	33	29	38	0.9684	9.11%	-5.00%
100		10	36	33.16	38.84	36	30	42	1.256	11.03%	-12.50%

# CETIS Analytical Report

Report Date: 12 Dec-23 12:38 (p 2 of 2)  
Test Code/ID: VCF1123.208cer / 06-9932-0536

## Ceriodaphnia 7-d Survival and Reproduction Test

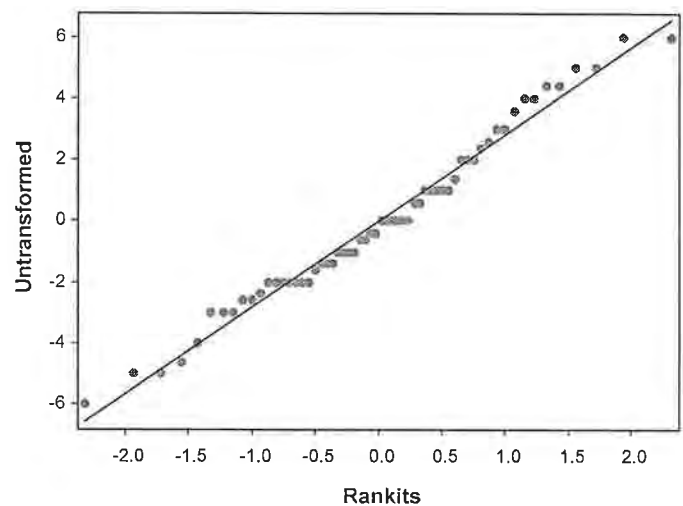
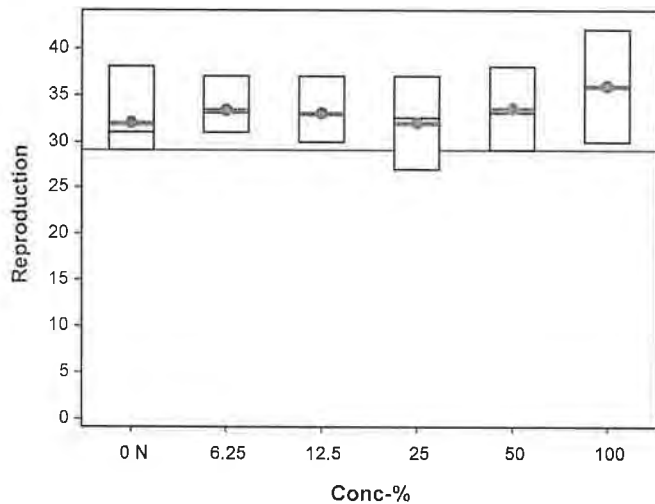
Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 04-7003-8944 Endpoint: Reproduction CETIS Version: CETISv2.1.4  
Analyzed: 05 Dec-23 16:23 Analysis: Parametric-Control vs Treatments Status Level: 1  
Edit Date: 05 Dec-23 16:21 MD5 Hash: 0C95B2BFFEF777FB6A04CC7D5783E937 Editor ID: 006-853-889-6

### 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	N	31	36	32	29	33	30	30	30	31	38
6.25		37	36	32	33	33	34	32	31	32	34
12.5		34	37	31	30	32	31	33	34	35	33
25		33	32	30	27	35	34	34	28	30	37
50		38	35	33	32	29	31	38	36	31	33
100		31	30	33	36	42	39	36	35	37	41

### Graphics



## CETIS Analytical Report

Report Date: 12 Dec-23 12:38 (p 1 of 4)  
Test Code/ID: VCF1123.208cer / 06-9932-0536

Ceriodaphnia 7-d Survival and Reproduction Test				Aquatic Bioassay & Consulting Labs, Inc.			
Analysis ID:	15-7911-2116	Endpoint:	7d Survival Rate	CETIS Version:	CETISv2.1.4		
Analyzed:	05 Dec-23 16:23	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1		
Edit Date:	05 Dec-23 16:21	MD5 Hash:	521A0DF2AE1E59D72392DBABE0C7AEF	Editor ID:	006-853-889-6		
Batch ID:	19-7450-3432	Test Type:	Reproduction-Survival (7d)	Analyst:			
Start Date:	16 Nov-23 15:00	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water		
Ending Date:	23 Nov-23 14:45	Species:	Ceriodaphnia dubia	Brine:	Not Applicable		
Test Length:	7d	Taxon:	Branchiopoda	Source:	Aquatic Biosystems, CO	Age:	<24
Sample ID:	00-2276-1632	Code:	VCF1123.208cer	Project:	2023/24-1 (Wet)		
Sample Date:	15 Nov-23 18:00	Material:	Sample Water	Source:	Bioassay Report		
Receipt Date:	15 Nov-23 19:35	CAS (PC):		Station:	MO-HUE		
Sample Age:	21h (11.8 °C)	Client:	Ventura County Watershed Protection Distri				

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

		TAC Limits		Overlap	Decision
Attribute	Test Stat	Lower	Upper		
Control Resp	1	0.8	<<	Yes	Passes Criteria

## Point Estimates

Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
EC15	>100	---	---	<1	---	---
EC20	>100	---	---	<1	---	---
EC25	>100	---	---	<1	---	---
EC40	>100	---	---	<1	---	---
EC50	>100	---	---	<1	---	---

## 7d Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	N	10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
6.25		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
12.5		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
25		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
50		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
100		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	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	N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

## 7d Survival Rate Binomials

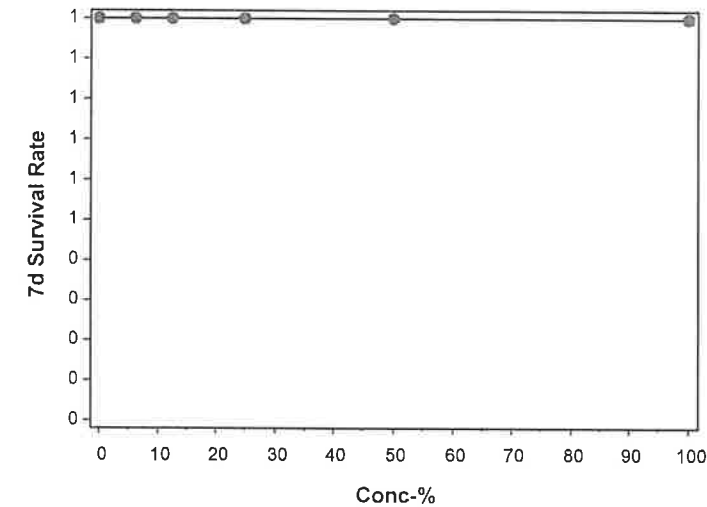
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 12 Dec-23 12:38 (p 2 of 4)  
Test Code/ID: VCF1123.208cer / 06-9932-0536

Ceriodaphnia 7-d Survival and Reproduction Test			Aquatic Bioassay & Consulting Labs, Inc.		
Analysis ID:	15-7911-2116	Endpoint:	7d Survival Rate	CETIS Version:	CETISv2.1.4
Analyzed:	05 Dec-23 16:23	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1
Edit Date:	05 Dec-23 16:21	MD5 Hash:	521A0DF2AE1E59D72392DBABE0C7AEF	Editor ID:	006-853-889-6

Graphics



# CETIS Analytical Report

Report Date: 12 Dec-23 12:38 (p 3 of 4)  
Test Code/ID: VCF1123.208cer / 06-9932-0536

Ceriodaphnia 7-d Survival and Reproduction Test				Aquatic Bioassay & Consulting Labs, Inc.			
Analysis ID:	21-0028-4685	Endpoint:	Reproduction	CETIS Version:	CETISv2.1.4		
Analyzed:	05 Dec-23 16:23	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1		
Edit Date:	05 Dec-23 16:21	MD5 Hash:	0C95B2BFFFEF777FB6A04CC7D5783E937	Editor ID:	006-853-889-6		
Batch ID:	19-7450-3432	Test Type:	Reproduction-Survival (7d)	Analyst:			
Start Date:	16 Nov-23 15:00	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water		
Ending Date:	23 Nov-23 14:45	Species:	Ceriodaphnia dubia	Brine:	Not Applicable		
Test Length:	7d	Taxon:	Branchiopoda	Source:	Aquatic Biosystems, CO	Age:	<24
Sample ID:	00-2276-1632	Code:	VCF1123.208cer	Project:	2023/24-1 (Wet)		
Sample Date:	15 Nov-23 18:00	Material:	Sample Water	Source:	Bioassay Report		
Receipt Date:	15 Nov-23 19:35	CAS (PC):		Station:	MO-HUE		
Sample Age:	21h (11.8 °C)	Client:	Ventura County Watershed Protection Distri				

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1998996	280	Yes	Two-Point Interpolation

Test Acceptability Criteria		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	32	15	<<	Yes	Passes Criteria

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

Reproduction Summary			Calculated Variate						Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	N	10	32	31	29	38	9.08%	0.00%	33.33	0.00%
6.25		10	33.4	33	31	37	5.68%	-4.38%	33.33	0.00%
12.5		10	33	33	30	37	6.39%	-3.13%	33.33	0.00%
25		10	32	32.5	27	37	9.99%	0.00%	33.33	0.00%
50		10	33.6	33	29	38	9.11%	-5.00%	33.33	0.00%
100		10	36	36	30	42	11.03%	-12.50%	33.33	0.00%

Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	31	36	32	29	33	30	30	30	31	38
6.25		37	36	32	33	33	34	32	31	32	34
12.5		34	37	31	30	32	31	33	34	35	33
25		33	32	30	27	35	34	34	28	30	37
50		38	35	33	32	29	31	38	36	31	33
100		31	30	33	36	42	39	36	35	37	41

# CETIS Analytical Report

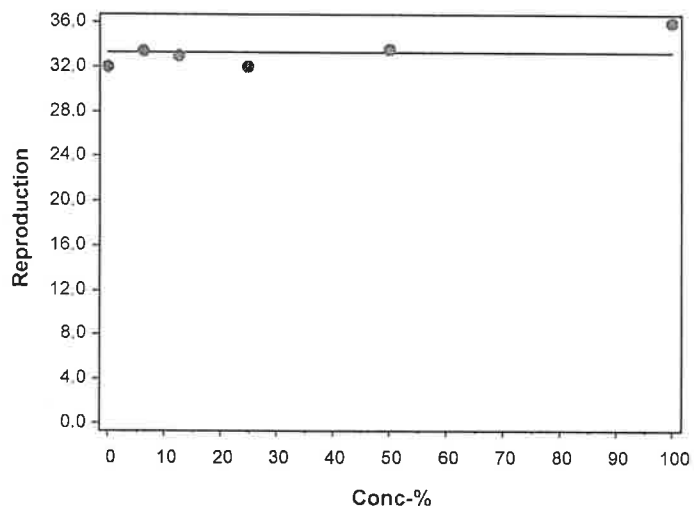
Report Date: 12 Dec-23 12:38 (p 4 of 4)  
Test Code/ID: VCF1123.208cer / 06-9932-0536

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 21-0028-4685	Endpoint: Reproduction	CETIS Version: CETISv2.1.4
Analyzed: 05 Dec-23 16:23	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 05 Dec-23 16:21	MD5 Hash: 0C95B2BFFEF777FB6A04CC7D5783E937	Editor ID: 006-853-889-6

### Graphics



## CETIS Analytical Report

Report Date: 12 Dec-23 12:38 (p 1 of 2)

Test Code/ID: VCF1123.208cer / 06-9932-0536

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay &amp; Consulting Labs, Inc.

Analysis ID:	10-6091-4043	Endpoint:	7d Survival Rate	CETIS Version:	CETISv2.1.4
Analyzed:	05 Dec-23 16:23	Analysis:	STP 2xK Contingency Tables	Status Level:	1
Edit Date:	05 Dec-23 16:21	MD5 Hash:	521A0DF2AE1E59D72392DBABE0C7AEF	Editor ID:	006-853-889-6

Batch ID:	19-7450-3432	Test Type:	Reproduction-Survival (7d)	Analyst:	
Start Date:	16 Nov-23 15:00	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water
Ending Date:	23 Nov-23 14:45	Species:	Ceriodaphnia dubia	Brine:	Not Applicable
Test Length:	7d	Taxon:	Branchiopoda	Source:	Aquatic Biosystems, CO
				Age:	<24

Sample ID:	00-2276-1632	Code:	VCF1123.208cer	Project:	2023/24-1 (Wet)
Sample Date:	15 Nov-23 18:00	Material:	Sample Water	Source:	Bioassay Report
Receipt Date:	15 Nov-23 19:35	CAS (PC):		Station:	MO-HUE
Sample Age:	21h (11.8 °C)	Client:	Ventura County Watershed Protection Distri		

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

## Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	1.0000	Exact	1.0000	Non-Significant Effect
		12.5	1.0000	Exact	1.0000	Non-Significant Effect
		25	1.0000	Exact	1.0000	Non-Significant Effect
		50	1.0000	Exact	1.0000	Non-Significant Effect
		100	1.0000	Exact	1.0000	Non-Significant Effect

## Test Acceptability Criteria

## TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.8	<<	Yes	Passes Criteria

## 7d Survival Rate Frequencies

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	N	10	0	10	1.0000	0.0000	0.00%
6.25		10	0	10	1.0000	0.0000	0.00%
12.5		10	0	10	1.0000	0.0000	0.00%
25		10	0	10	1.0000	0.0000	0.00%
50		10	0	10	1.0000	0.0000	0.00%
100		10	0	10	1.0000	0.0000	0.00%

## 7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
6.25		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
12.5		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
25		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
50		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
100		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%

## 7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

CETIS Analytical Report

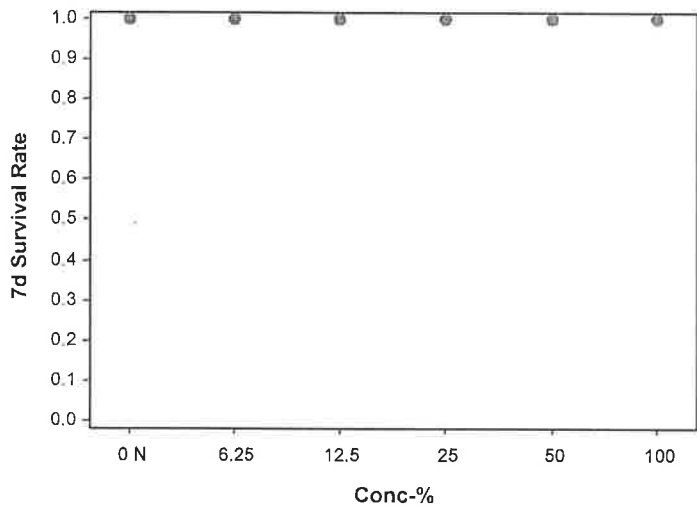
Report Date: 12 Dec-23 12:38 (p 2 of 2)  
Test Code/ID: VCF1123.208cer / 06-9932-0536

Ceriodaphnia 7-d Survival and Reproduction Test Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 10-6091-4043 Endpoint: 7d Survival Rate CETIS Version: CETISv2.1.4  
Analyzed: 05 Dec-23 16:23 Analysis: STP 2xK Contingency Tables Status Level: 1  
Edit Date: 05 Dec-23 16:21 MD5 Hash: 521A0DF2AE1E59D72392DBABE0C7AEF Editor ID: 006-853-889-6

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	N	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Graphics



# CETIS Measurement Report

Report Date: 12 Dec-23 12:38 (p 1 of 2)  
Test Code/ID: VCF1123.208cer / 06-9932-0536

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 19-7450-3432	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 16 Nov-23 15:00	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 23 Nov-23 14:45	Species: Ceriodaphnia dubia	Brine: Not Applicable
Test Length: 7d	Taxon: Branchiopoda	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 00-2276-1632	Code: VCF1123.208cer	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 18:00	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 19:35	CAS (PC):	Station: MO-HUE
Sample Age: 21h (11.8 °C)	Client: Ventura County Watershed Protection Distri	

### Alkalinity (CaCO3)-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	60	60	60	60	60	0	0	0.00%	0
100		8	278	278	278	278	278	0	0	0.00%	0
Overall		16	169	109	229	60	278	28.14	112.6	66.61%	0 (0%)

### Conductivity-µmhos

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	375.2	372.2	378.3	369	379	0.4617	3.694	0.98%	0
6.25		8	781.9	777.9	785.9	772	788	0.5992	4.794	0.61%	0
12.5		8	1240	1233	1246	1226	1250	1.018	8.142	0.66%	0
25		8	1992	1990	1995	1989	1998	0.3882	3.105	0.16%	0
50		8	3530	3524	3536	3519	3538	0.9682	7.746	0.22%	0
100		8	6542	6528	6555	6519	6570	2.007	16.05	0.25%	0
Overall		48	2410	1792	3029	369	6570	307.5	2130	88.39%	0 (0%)

### Dissolved Oxygen-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	7.887	7.61	8.165	7.1	8.2	0.04142	0.3314	4.20%	0
6.25		8	7.813	7.525	8.1	7	8.1	0.04301	0.3441	4.40%	0
12.5		8	7.788	7.514	8.061	7	8	0.04088	0.3271	4.20%	0
25		8	7.775	7.504	8.046	7	8	0.0405	0.324	4.17%	0
50		8	7.8	7.521	8.079	7	8	0.04173	0.3338	4.28%	0
100		8	7.8	7.521	8.079	7	8	0.04173	0.3338	4.28%	0
Overall		48	7.81	7.719	7.902	7	8.2	0.04567	0.3164	4.05%	0 (0%)

### Hardness (CaCO3)-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	97.62	96.74	98.51	95	98	0.1326	1.061	1.09%	0
100		8	1035	1035	1035	1035	1035	0	0	0.00%	0
Overall		16	566.3	308.4	824.2	95	1035	121	484.1	85.48%	0 (0%)

### pH-Units

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	8.088	8.018	8.157	8	8.2	0.01043	0.08346	1.03%	0
6.25		8	8	7.923	8.077	7.9	8.1	0.01157	0.09258	1.16%	0
12.5		8	7.975	7.901	8.049	7.9	8.1	0.01108	0.08864	1.11%	0
25		8	7.925	7.818	8.032	7.8	8.1	0.01602	0.1282	1.62%	0
50		8	7.875	7.778	7.972	7.7	8	0.01456	0.1165	1.48%	0
100		8	7.863	7.774	7.951	7.7	8	0.01326	0.1061	1.35%	0
Overall		48	7.954	7.918	7.991	7.7	8.2	0.0181	0.1254	1.58%	0 (0%)

# CETIS Measurement Report

Report Date: 12 Dec-23 12:38 (p 2 of 2)  
 Test Code/ID: VCF1123.208cer / 06-9932-0536

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

### Temperature-°C

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	24	24	24	24	24	0	0	0.00%	0
6.25		8	24.09	24	24.17	24	24.2	0.01238	0.09904	0.41%	0
12.5		8	24.06	23.99	24.14	24	24.2	0.01145	0.09156	0.38%	0
25		8	24.09	24	24.17	24	24.2	0.01238	0.09904	0.41%	0
50		8	24.1	24.02	24.18	24	24.2	0.01156	0.0925	0.38%	0
100		8	24.1	24	24.2	24	24.3	0.01494	0.1195	0.50%	0
Overall		48	24.07	24.05	24.1	24	24.3	0.01356	0.09394	0.39%	0 (0%)



**AQUATIC BIOASSAY**  
& CONSULTING LABORATORIES, INC.

December 14, 2023

Ms. Kelly Hahs  
Ventura County Watershed Protection District  
800 South Victoria Ave  
Ventura, CA 93009

Dear Ms. Hahs:

We are pleased to present the enclosed revised bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* EPA-821-R-02-013. Results were as follows:

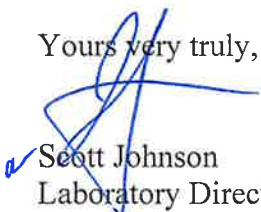
CLIENT:	Ventura County Flood Control
SAMPLE I.D.:	MO-THO
DATE RECEIVED:	11/15/2023
ABC LAB. NO.:	VCF1123.210

**CHRONIC CERIODAPHNIA SURVIVAL & REPRODUCTION BIOASSAY**

SURVIVAL	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	EC25 =	>100.00 %
	EC50 =	>100.00 %

REPRODUCTION	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	IC25 =	>100.00 %
	IC50 =	>100.00 %

Yours very truly,

  
Scott Johnson  
Laboratory Director

# CETIS Summary Report

Report Date: 12 Dec-23 12:55 (p 1 of 2)  
Test Code/ID: VCF1123.210cer / 02-4899-9452

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 15-5814-7293	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 16 Nov-23 15:02	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 23 Nov-23 14:50	Species: Ceriodaphnia dubia	Brine: Not Applicable
Test Length: 7d	Taxon: Branchiopoda	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 13-4499-0855	Code: VCF1123.210cer	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 19:45	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:00	CAS (PC):	Station: MO-THO
Sample Age: 19h (10.8 °C)	Client: Ventura County Watershed Protection Distri	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	TU	S
04-2046-3753	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	100	>100	---	---	---	1	1
00-2394-5047	Reproduction	Steel Many-One Rank Sum Test	100	>100	---	10.9%	---	1	1

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓	Level	%	95% LCL	95% UCL	TU	S
03-1820-8104	7d Survival Rate	Linear Interpolation (ICPIN)	✓	EC15	>100	---	---	<1	1
			✓	EC20	>100	---	---	<1	
			✓	EC25	>100	---	---	<1	
			✓	EC40	>100	---	---	<1	
			✓	EC50	>100	---	---	<1	
07-6270-2605	Reproduction	Linear Interpolation (ICPIN)	✓	IC15	>100	---	---	<1	1
			✓	IC20	>100	---	---	<1	
			✓	IC25	>100	---	---	<1	
			✓	IC40	>100	---	---	<1	
			✓	IC50	>100	---	---	<1	

## Test Acceptability

Test Acceptability				TAC Limits			
Analysis ID	Endpoint	Attribute	Test Stat	Lower	Upper	Overlap	Decision
03-1820-8104	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
04-2046-3753	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
00-2394-5047	Reproduction	Control Resp	31.5	15	<<	Yes	Passes Criteria
07-6270-2605	Reproduction	Control Resp	31.5	15	<<	Yes	Passes Criteria
00-2394-5047	Reproduction	PMSD	0.1092	0.13	0.47	Yes	Below Criteria

## 7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
6.25		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
12.5		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
25		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
50		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
100		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%

## Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	10	31.5	29.47	33.53	28	37	0.8975	2.838	9.01%	0.00%
6.25		10	34.8	32.62	36.98	31	41	0.9638	3.048	8.76%	-10.48%
12.5		10	35	33.49	36.51	33	39	0.6667	2.108	6.02%	-11.11%
25		10	34.1	31.41	36.79	31	43	1.187	3.755	11.01%	-8.25%
50		10	34.5	31.07	37.93	29	44	1.515	4.79	13.88%	-9.52%
100		10	37.2	35.07	39.33	33	42	0.9404	2.974	7.99%	-18.10%

am PASS

## CETIS Summary Report

Report Date: 12 Dec-23 12:55 (p 2 of 2)  
Test Code/ID: VCF1123.210cer / 02-4899-9452

### Ceriodaphnia 7-d Survival and Reproduction Test

**Aquatic Bioassay & Consulting Labs, Inc.**

### 7d Survival Rate Detail

MD5: 521A0DF2AE1E59D72392DBABE0C7AEFC

[illegible]

### Reproduction Detail

MD5: 8024659ED6A4C0B698D2A2D8B2E3E5B7

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	33	32	34	29	28	33	37	31	29	29
6.25		38	31	32	33	37	34	34	33	41	35
12.5		36	34	33	39	34	33	34	37	33	37
25		43	38	34	31	31	34	31	33	33	33
50		30	30	35	33	34	34	29	41	44	35
100		40	35	33	38	37	40	33	37	37	42

### 7d Survival Rate Binomials

[illegible]

# CETIS Analytical Report

Report Date: 12 Dec-23 12:55 (p 1 of 2)  
Test Code/ID: VCF1123.210cer / 02-4899-9452

Ceriodaphnia 7-d Survival and Reproduction Test				Aquatic Bioassay & Consulting Labs, Inc.			
Analysis ID:	00-2394-5047	Endpoint:	Reproduction	CETIS Version:	CETISv2.1.4		
Analyzed:	05 Dec-23 16:29	Analysis:	Nonparametric-Control vs Treatments	Status Level:	1		
Edit Date:	05 Dec-23 16:25	MD5 Hash:	8024659ED6A4C0B698D2A2D8B2E3E5B7	Editor ID:			
Batch ID:	15-5814-7293	Test Type:	Reproduction-Survival (7d)	Analyst:			
Start Date:	16 Nov-23 15:02	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water		
Ending Date:	23 Nov-23 14:50	Species:	Ceriodaphnia dubia	Brine:	Not Applicable		
Test Length:	7d	Taxon:	Branchiopoda	Source:	Aquatic Biosystems, CO	Age:	<24
Sample ID:	13-4499-0855	Code:	VCF1123.210cer	Project:	2023/24-1 (Wet)		
Sample Date:	15 Nov-23 19:45	Material:	Sample Water	Source:	Bioassay Report		
Receipt Date:	15 Nov-23 21:00	CAS (PC):		Station:	MO-THO		
Sample Age:	19h (10.8 °C)	Client:	Ventura County Watershed Protection Distri				

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	3.438	10.92%

Steel Many-One Rank Sum Test									
Control	vs	Conc-%	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	18	134.5	75	5	CDF	0.9999	Non-Significant Effect
		12.5	18	139.5	75	3	CDF	1.0000	Non-Significant Effect
		25	18	126.5	75	3	CDF	0.9983	Non-Significant Effect
		50	18	127.5	75	3	CDF	0.9988	Non-Significant Effect
		100	18	146.5	75	2	CDF	1.0000	Non-Significant Effect

Test Acceptability Criteria						TAC Limits	
Attribute	Test Stat	Lower	Upper	Overlap	Decision		
Control Resp	31.5	15	<<	Yes	Passes Criteria		
PMSD	0.1092	0.13	0.47	Yes	Below Criteria		

ANOVA Table							
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)	
Between	167.883	33.5767	5	2.977	0.0191	Significant Effect	
Error	609.1	11.2796	54				
Total	776.983		59				

ANOVA Assumptions Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variance	Bartlett Equality of Variance Test	6.661	15.09	0.2471	Equal Variances	
	Levene Equality of Variance Test	0.6438	3.377	0.6673	Equal Variances	
	Mod Levene Equality of Variance Test	0.5369	3.377	0.7474	Equal Variances	
Distribution	Anderson-Darling A2 Test	1.048	3.878	0.0095	Non-Normal Distribution	
	D'Agostino Kurtosis Test	1.447	2.576	0.1478	Normal Distribution	
	D'Agostino Skewness Test	2.854	2.576	0.0043	Non-Normal Distribution	
	D'Agostino-Pearson K2 Omnibus Test	10.24	9.21	0.0060	Non-Normal Distribution	
	Kolmogorov-Smirnov D Test	0.1291	0.1331	0.0144	Normal Distribution	
	Shapiro-Wilk W Normality Test	0.9423	0.9459	0.0069	Non-Normal Distribution	

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	10	31.5	29.47	33.53	31.5	28	37	0.8975	9.01%	0.00%
6.25		10	34.8	32.62	36.98	34	31	41	0.9638	8.76%	-10.48%
12.5		10	35	33.49	36.51	34	33	39	0.6667	6.02%	-11.11%
25		10	34.1	31.41	36.79	33	31	43	1.187	11.01%	-8.25%
50		10	34.5	31.07	37.93	34	29	44	1.515	13.88%	-9.52%
100		10	37.2	35.07	39.33	37	33	42	0.9404	7.99%	-18.10%

# CETIS Analytical Report

Report Date: 12 Dec-23 12:55 (p 2 of 2)  
Test Code/ID: VCF1123.210cer / 02-4899-9452

## Ceriodaphnia 7-d Survival and Reproduction Test

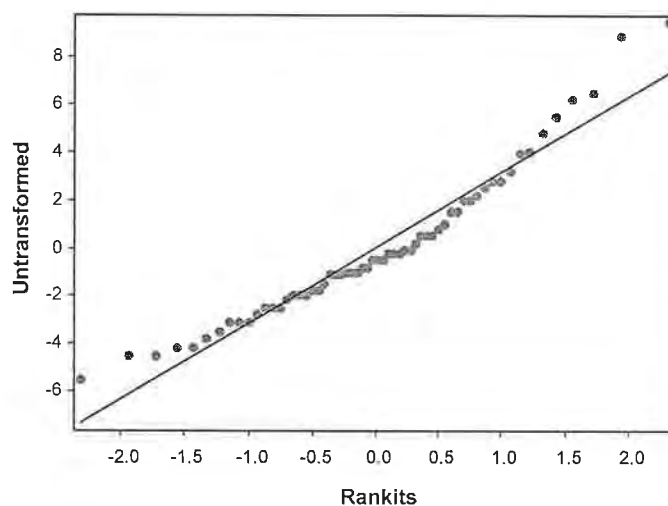
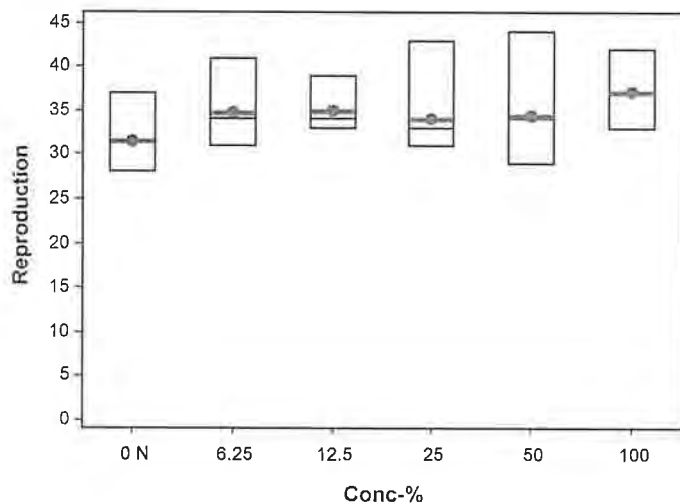
Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 00-2394-5047      Endpoint: Reproduction      CETIS Version: CETISv2.1.4  
Analyzed: 05 Dec-23 16:29      Analysis: Nonparametric-Control vs Treatments      Status Level: 1  
Edit Date: 05 Dec-23 16:25      MD5 Hash: 8024659ED6A4C0B698D2A2D8B2E3E5B7      Editor ID:

### 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	N	33	32	34	29	28	33	37	31	29	29
6.25		38	31	32	33	37	34	34	33	41	35
12.5		36	34	33	39	34	33	34	37	33	37
25		43	38	34	31	31	34	31	33	33	33
50		30	30	35	33	34	34	29	41	44	35
100		40	35	33	38	37	40	33	37	37	42

### Graphics



## CETIS Analytical Report

Report Date: 12 Dec-23 12:55 (p 1 of 4)  
Test Code/ID: VCF1123.210cer / 02-4899-9452

## Ceriodaphnia 7-d Survival and Reproduction Test Aquatic Bioassay &amp; Consulting Labs, Inc.

Analysis ID: 03-1820-8104	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed: 05 Dec-23 16:30	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 05 Dec-23 16:25	MD5 Hash: 521A0DF2AE1E59D72392DBABE0C7AEF	Editor ID:
Batch ID: 15-5814-7293	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 16 Nov-23 15:02	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 23 Nov-23 14:50	Species: Ceriodaphnia dubia	Brine: Not Applicable
Test Length: 7d	Taxon: Branchiopoda	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 13-4499-0855	Code: VCF1123.210cer	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 19:45	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:00	CAS (PC):	Station: MO-THO
Sample Age: 19h (10.8 °C)	Client: Ventura County Watershed Protection Distri	

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.8	<<	Yes	Passes Criteria

## Point Estimates

Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
EC15	>100	---	---	<1	---	---
EC20	>100	---	---	<1	---	---
EC25	>100	---	---	<1	---	---
EC40	>100	---	---	<1	---	---
EC50	>100	---	---	<1	---	---

## 7d Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	N	10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
6.25		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
12.5		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
25		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
50		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
100		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%

## 7d Survival Rate Detail

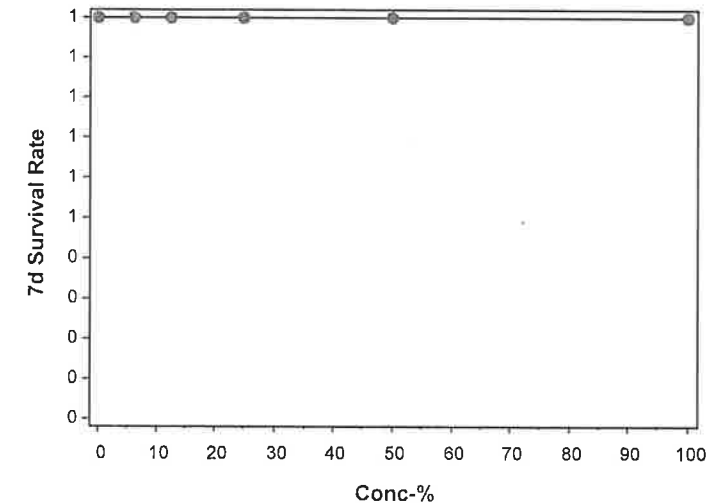
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

## 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	N	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID:	03-1820-8104	Endpoint:	7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed:	05 Dec-23 16:30	Analysis:	Linear Interpolation (ICPIN)	Status Level: 1
Edit Date:	05 Dec-23 16:25	MD5 Hash:	521A0DF2AE1E59D72392DBABE0C7AEF	Editor ID:

Graphics



# CETIS Analytical Report

Report Date: 12 Dec-23 12:55 (p 3 of 4)  
Test Code/ID: VCF1123.210cer / 02-4899-9452

Ceriodaphnia 7-d Survival and Reproduction Test				Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID:	07-6270-2605	Endpoint:	Reproduction	CETIS Version:	CETISv2.1.4
Analyzed:	05 Dec-23 16:30	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1
Edit Date:	05 Dec-23 16:25	MD5 Hash:	8024659ED6A4C0B698D2A2D8B2E3E5B7	Editor ID:	
Batch ID:	15-5814-7293	Test Type:	Reproduction-Survival (7d)	Analyst:	
Start Date:	16 Nov-23 15:02	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water
Ending Date:	23 Nov-23 14:50	Species:	Ceriodaphnia dubia	Brine:	Not Applicable
Test Length:	7d	Taxon:	Branchiopoda	Source:	Aquatic Biosystems, CO
Sample ID:	13-4499-0855	Code:	VCF1123.210cer	Project:	2023/24-1 (Wet)
Sample Date:	15 Nov-23 19:45	Material:	Sample Water	Source:	Bioassay Report
Receipt Date:	15 Nov-23 21:00	CAS (PC):		Station:	MO-THO
Sample Age:	19h (10.8 °C)	Client:	Ventura County Watershed Protection Distri		

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	402435	280	Yes	Two-Point Interpolation

Test Acceptability Criteria		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	31.5	15	<<	Yes	Passes Criteria

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

Reproduction Summary			Calculated Variate						Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	N	10	31.5	31.5	28	37	9.01%	0.00%	34.52	0.00%
6.25		10	34.8	34	31	41	8.76%	-10.48%	34.52	0.00%
12.5		10	35	34	33	39	6.02%	-11.11%	34.52	0.00%
25		10	34.1	33	31	43	11.01%	-8.25%	34.52	0.00%
50		10	34.5	34	29	44	13.88%	-9.52%	34.52	0.00%
100		10	37.2	37	33	42	7.99%	-18.10%	34.52	0.00%

Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	33	32	34	29	28	33	37	31	29	29
6.25		38	31	32	33	37	34	34	33	41	35
12.5		36	34	33	39	34	33	34	37	33	37
25		43	38	34	31	31	34	31	33	33	33
50		30	30	35	33	34	34	29	41	44	35
100		40	35	33	38	37	40	33	37	37	42

# CETIS Analytical Report

Report Date: 12 Dec-23 12:55 (p 4 of 4)

Test Code/ID: VCF1123.210cer / 02-4899-9452

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 07-6270-2605

Endpoint: Reproduction

CETIS Version: CETISv2.1.4

Analyzed: 05 Dec-23 16:30

Analysis: Linear Interpolation (ICPIN)

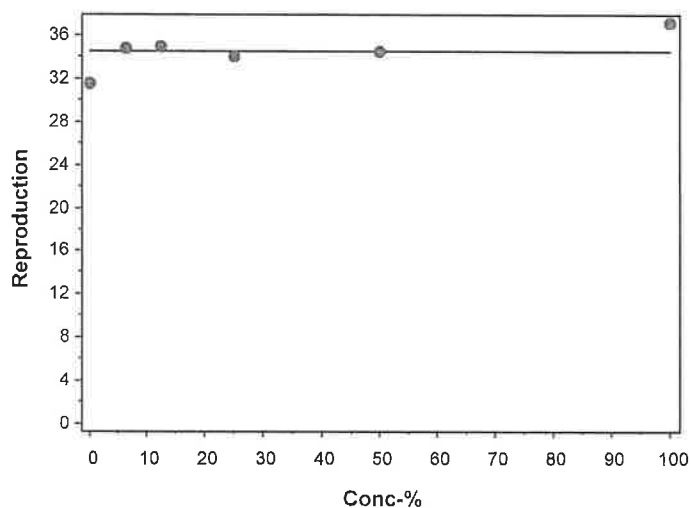
Status Level: 1

Edit Date: 05 Dec-23 16:25

MD5 Hash: 8024659ED6A4C0B698D2A2D8B2E3E5B7

Editor ID:

### Graphics



## CETIS Analytical Report

Report Date: 12 Dec-23 12:55 (p 1 of 2)

Test Code/ID: VCF1123.210cer / 02-4899-9452

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay &amp; Consulting Labs, Inc.

Analysis ID: 04-2046-3753	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed: 05 Dec-23 16:29	Analysis: STP 2xK Contingency Tables	Status Level: 1
Edit Date: 05 Dec-23 16:25	MD5 Hash: 521A0DF2AE1E59D72392DBABE0C7AEF	Editor ID:
Batch ID: 15-5814-7293	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 16 Nov-23 15:02	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 23 Nov-23 14:50	Species: Ceriodaphnia dubia	Brine: Not Applicable
Test Length: 7d	Taxon: Branchiopoda	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 13-4499-0855	Code: VCF1123.210cer	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 19:45	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:00	CAS (PC):	Station: MO-THO
Sample Age: 19h (10.8 °C)	Client: Ventura County Watershed Protection Distri	

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

## Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	1.0000	Exact	1.0000	Non-Significant Effect
		12.5	1.0000	Exact	1.0000	Non-Significant Effect
		25	1.0000	Exact	1.0000	Non-Significant Effect
		50	1.0000	Exact	1.0000	Non-Significant Effect
		100	1.0000	Exact	1.0000	Non-Significant Effect

## Test Acceptability Criteria

## TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.8	<<	Yes	Passes Criteria

## 7d Survival Rate Frequencies

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	N	10	0	10	1.0000	0.0000	0.00%
6.25		10	0	10	1.0000	0.0000	0.00%
12.5		10	0	10	1.0000	0.0000	0.00%
25		10	0	10	1.0000	0.0000	0.00%
50		10	0	10	1.0000	0.0000	0.00%
100		10	0	10	1.0000	0.0000	0.00%

## 7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
6.25		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
12.5		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
25		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
50		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
100		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%

## 7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

# CETIS Analytical Report

Report Date: 12 Dec-23 12:55 (p 2 of 2)

Test Code/ID: VCF1123.210cer / 02-4899-9452

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 04-2046-3753

Endpoint: 7d Survival Rate

CETIS Version: CETISv2.1.4

Analyzed: 05 Dec-23 16:29

Analysis: STP 2xK Contingency Tables

Status Level: 1

Edit Date: 05 Dec-23 16:25

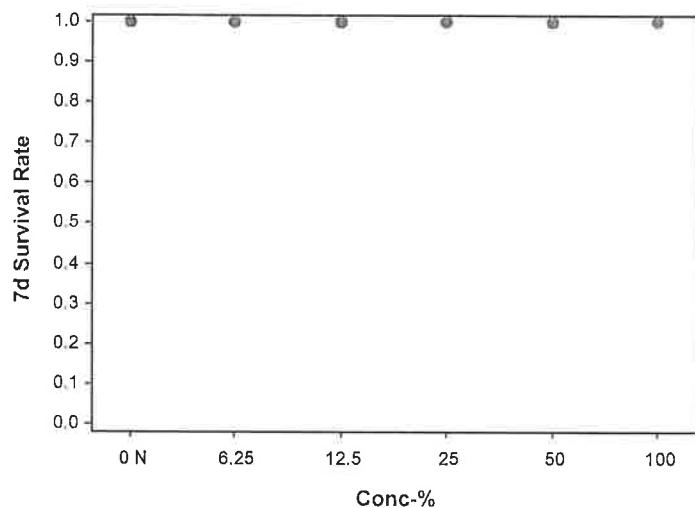
MD5 Hash: 521A0DF2AE1E59D72392DBABE0C7AEF

Editor ID:

### 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	N	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

### Graphics



# CETIS Measurement Report

Report Date: 12 Dec-23 12:55 (p 1 of 2)

Test Code/ID: VCF1123.210cer / 02-4899-9452

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 15-5814-7293	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 16 Nov-23 15:02	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 23 Nov-23 14:50	Species: Ceriodaphnia dubia	Brine: Not Applicable
Test Length: 7d	Taxon: Branchiopoda	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 13-4499-0855	Code: VCF1123.210cer	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 19:45	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:00	CAS (PC):	Station: MO-THO
Sample Age: 19h (10.8 °C)	Client: Ventura County Watershed Protection Distri	

### Alkalinity (CaCO3)-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	60	60	60	60	60	0	0	0.00%	0
100		8	148	148	148	148	148	0	0	0.00%	0
Overall		16	104	79.79	128.2	60	148	11.36	45.44	43.70%	0 (0%)

### Conductivity-µmhos

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	375.2	372.2	378.3	369	379	0.4617	3.694	0.98%	0
6.25		8	608.9	604.7	613.1	602	615	0.6248	4.998	0.82%	0
12.5		8	569.4	532.6	606.2	498	599	5.501	44.01	7.73%	0
25		8	611.4	602.8	619.9	592	620	1.282	10.25	1.68%	0
50		8	789.5	782.6	796.4	776	799	1.033	8.264	1.05%	0
100		8	789.5	782.6	796.4	776	799	1.033	8.264	1.05%	0
Overall		48	624	582.1	665.8	369	799	20.8	144.1	23.09%	0 (0%)

### Dissolved Oxygen-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	7.887	7.61	8.165	7.1	8.2	0.04142	0.3314	4.20%	0
6.25		8	7.838	7.577	8.098	7.1	8.1	0.03892	0.3114	3.97%	0
12.5		8	7.813	7.596	8.029	7.2	8	0.03235	0.2588	3.31%	0
25		8	7.813	7.596	8.029	7.2	8	0.03235	0.2588	3.31%	0
50		8	7.788	7.545	8.03	7.1	8	0.03625	0.29	3.72%	0
100		8	7.75	7.518	7.982	7.1	8	0.03472	0.2777	3.58%	0
Overall		48	7.815	7.734	7.895	7.1	8.2	0.03995	0.2768	3.54%	0 (0%)

### Hardness (CaCO3)-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	97.62	96.74	98.51	95	98	0.1326	1.061	1.09%	0
100		8	400	400	400	400	400	0	0	0.00%	0
Overall		16	248.8	165.6	332	95	400	39.04	156.1	62.76%	0 (0%)

### pH-Units

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	8.088	8.018	8.157	8	8.2	0.01043	0.08346	1.03%	0
6.25		8	8.05	7.961	8.139	7.9	8.2	0.01336	0.1069	1.33%	0
12.5		8	8.063	7.954	8.171	7.9	8.3	0.01628	0.1302	1.62%	0
25		8	8.038	7.949	8.126	7.9	8.2	0.01326	0.1061	1.32%	0
50		8	8.038	7.949	8.126	7.9	8.2	0.01326	0.1061	1.32%	0
100		8	8.025	7.928	8.122	7.9	8.2	0.01456	0.1165	1.45%	0
Overall		48	8.05	8.019	8.081	7.9	8.3	0.01518	0.1052	1.31%	0 (0%)

# CETIS Measurement Report

Report Date: 12 Dec-23 12:55 (p 2 of 2)  
 Test Code/ID: VCF1123.210cer / 02-4899-9452

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

### Temperature-°C

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	24	24	24	24	24	0	0	0.00%	0
6.25		8	24.08	23.98	24.17	24	24.3	0.01456	0.1165	0.48%	0
12.5		8	24.1	24.01	24.19	24	24.3	0.01336	0.1069	0.44%	0
25		8	24.13	24.01	24.24	24	24.4	0.01735	0.1388	0.58%	0
50		8	24.18	24.01	24.34	24	24.6	0.02477	0.1982	0.82%	0
100		8	24.18	24.01	24.34	24	24.6	0.02477	0.1982	0.82%	0
Overall		48	24.11	24.07	24.15	24	24.6	0.02144	0.1485	0.62%	0 (0%)



**AQUATIC BIOASSAY**  
& CONSULTING LABORATORIES, INC.

December 14, 2023

Ms. Kelly Hahs  
Ventura County Watershed Protection District  
800 South Victoria Ave  
Ventura, CA 93009

Dear Ms. Hahs:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms EPA-821-R-02-013*. Results were as follows:

CLIENT:	Ventura County Flood Control
SAMPLE I.D.:	MO-MPK
DATE RECEIVED:	11/15/2023
ABC LAB. NO.:	VCF1123.211

#### **CHRONIC SELENASTRUM ALGAE GROWTH BIOASSAY**

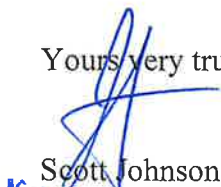
NOEC = 100.00 %

TU<sub>c</sub> = 1.00

IC<sub>25</sub> = >100.00 %

IC<sub>50</sub> = >100.00 %

Yours very truly,

  
Scott Johnson  
Laboratory Director

# CETIS Summary Report

Report Date: 12 Dec-23 12:56 (p 1 of 1)  
Test Code/ID: VCF1123.211sel / 17-1674-4492

Selenastrum Growth Test				Aquatic Bioassay & Consulting Labs, Inc.			
Batch ID: 20-9728-4417	Test Type: Cell Growth	Analyst:					
Start Date: 16 Nov-23 15:00	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water					
Ending Date: 20 Nov-23 13:00	Species: Selenastrum capricornutum	Brine: Not Applicable					
Test Length: 94h	Taxon: Chlorophyta	Source: Aquatic Biosystems, CO	Age: 7d				
Sample ID: 11-8432-1822	Code: VCF1123.211sel	Project: 2023/24-1 (Wet)					
Sample Date: 15 Nov-23 17:25	Material: Sample Water	Source: Bioassay Report					
Receipt Date: 15 Nov-23 21:00	CAS (PC):	Station: MO-MPK					
Sample Age: 22h (6.3 °C)	Client: Ventura County Watershed Protection Distri						

Multiple Comparison Summary									
Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	TU	S
04-9572-5586	Cell Density	Dunnett Multiple Comparison Test		100	>100	---	12.0%	1	1

Point Estimate Summary									
Analysis ID	Endpoint	Point Estimate Method	✓	Level	%	95% LCL	95% UCL	TU	S
14-1146-6224	Cell Density	Linear Interpolation (ICPIN)		IC15	>100	---	---	<1	1
				IC20	>100	---	---	<1	
				IC25	>100	---	---	<1	
				IC40	>100	---	---	<1	
				IC50	>100	---	---	<1	

Test Acceptability							
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
04-9572-5586	Cell Density	Control CV	0.05471	<<	0.2	Yes	Passes Criteria
14-1146-6224	Cell Density	Control CV	0.05471	<<	0.2	Yes	Passes Criteria
04-9572-5586	Cell Density	Control Resp	1.71E+6	1.00E+6	<<	Yes	Passes Criteria
14-1146-6224	Cell Density	Control Resp	1.71E+6	1.00E+6	<<	Yes	Passes Criteria

Cell Density Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	1.711E+6	1.562E+6	1.860E+6	1.629E+6	1.807E+6	4.679E+4	9.359E+4	5.47%	0.00%
6.25		4	2.002E+6	1.797E+6	2.208E+6	1.821E+6	2.111E+6	6.463E+4	1.293E+5	6.46%	-17.04%
12.5		4	1.965E+6	1.825E+6	2.105E+6	1.879E+6	2.051E+6	4.401E+4	8.802E+4	4.48%	-14.86%
25		4	2.039E+6	1.883E+6	2.196E+6	1.941E+6	2.153E+6	4.924E+4	9.848E+4	4.83%	-19.20%
50		4	2.034E+6	1.815E+6	2.253E+6	1.941E+6	2.235E+6	6.873E+4	1.375E+5	6.76%	-18.90%
100		4	2.058E+6	1.802E+6	2.315E+6	1.838E+6	2.184E+6	8.069E+4	1.614E+5	7.84%	-20.33%

Cell Density Detail						MD5: 2563217C3DC299356AFD84BD123B0FC4					
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4						
0	N	1.629E+6	1.807E+6	1.632E+6	1.775E+6						
6.25		2.076E+6	1.821E+6	2.111E+6	2.001E+6						
12.5		2.030E+6	2.051E+6	1.879E+6	1.900E+6						
25		2.153E+6	1.975E+6	1.941E+6	2.088E+6						
50		2.010E+6	1.941E+6	2.235E+6	1.950E+6						
100		2.184E+6	2.174E+6	2.038E+6	1.838E+6						

2m PASS

# CETIS Analytical Report

Report Date: 12 Dec-23 12:56 (p 1 of 2)  
Test Code/ID: VCF1123.211sel / 17-1674-4492

Selenastrum Growth Test	Aquatic Bioassay & Consulting Labs, Inc.
-------------------------	--

Analysis ID: 04-9572-5586	Endpoint: Cell Density	CETIS Version: CETISv2.1.4
Analyzed: 05 Dec-23 16:47	Analysis: Parametric-Control vs Treatments	Status Level: 1
Edit Date: 05 Dec-23 16:45	MD5 Hash: 2563217C3DC299356AFD84BD123B0FC4	Editor ID:
Batch ID: 20-9728-4417	Test Type: Cell Growth	Analyst:
Start Date: 16 Nov-23 15:00	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 20 Nov-23 13:00	Species: Selenastrum capricornutum	Brine: Not Applicable
Test Length: 94h	Taxon: Chlorophyta	Source: Aquatic Biosystems, CO Age: 7d
Sample ID: 11-8432-1822	Code: VCF1123.211sel	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 17:25	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:00	CAS (PC):	Station: MO-MPK
Sample Age: 22h (6.3 °C)	Client: Ventura County Watershed Protection Distri	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	206000	12.04%

Control	vs	Conc-%	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	6	-3.407	2.407	206000	CDF	1.0000	Non-Significant Effect
		12.5	6	-2.972	2.407	206000	CDF	1.0000	Non-Significant Effect
		25	6	-3.839	2.407	206000	CDF	1.0000	Non-Significant Effect
		50	6	-3.778	2.407	206000	CDF	1.0000	Non-Significant Effect
		100	6	-4.064	2.407	206000	CDF	1.0000	Non-Significant Effect

Test Acceptability Criteria		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control CV	0.05471	<<	0.2	Yes	Passes Criteria
Control Resp	1.71E+6	1.00E+6	<<	Yes	Passes Criteria

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.399E+11	6.799E+10	5	4.643	0.0068	Significant Effect
Error	2.635E+11	1.464E+10	18			
Total	6.035E+11		23			

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	1.592	15.09	0.9023	Equal Variances
	Levene Equality of Variance Test	0.3574	4.248	0.8707	Equal Variances
	Mod Levene Equality of Variance Test	0.2052	4.248	0.9560	Equal Variances
Distribution	Anderson-Darling A2 Test	0.6155	3.878	0.1102	Normal Distribution
	D'Agostino Kurtosis Test	0.7617	2.576	0.4462	Normal Distribution
	D'Agostino Skewness Test	0.371	2.576	0.7107	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	0.7179	9.21	0.6984	Normal Distribution
	Kolmogorov-Smirnov D Test	0.1425	0.2056	0.2330	Normal Distribution
	Shapiro-Wilk W Normality Test	0.9538	0.884	0.3267	Normal Distribution

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.711E+6	1.562E+6	1.860E+6	1.704E+6	1.629E+6	1.807E+6	4.679E+4	5.47%	0.00%
6.25		4	2.002E+6	1.797E+6	2.208E+6	2.038E+6	1.821E+6	2.111E+6	6.463E+4	6.46%	-17.04%
12.5		4	1.965E+6	1.825E+6	2.105E+6	1.965E+6	1.879E+6	2.051E+6	4.401E+4	4.48%	-14.86%
25		4	2.039E+6	1.883E+6	2.196E+6	2.032E+6	1.941E+6	2.153E+6	4.924E+4	4.83%	-19.20%
50		4	2.034E+6	1.815E+6	2.253E+6	1.980E+6	1.941E+6	2.235E+6	6.873E+4	6.76%	-18.90%
100		4	2.058E+6	1.802E+6	2.315E+6	2.106E+6	1.838E+6	2.184E+6	8.069E+4	7.84%	-20.33%

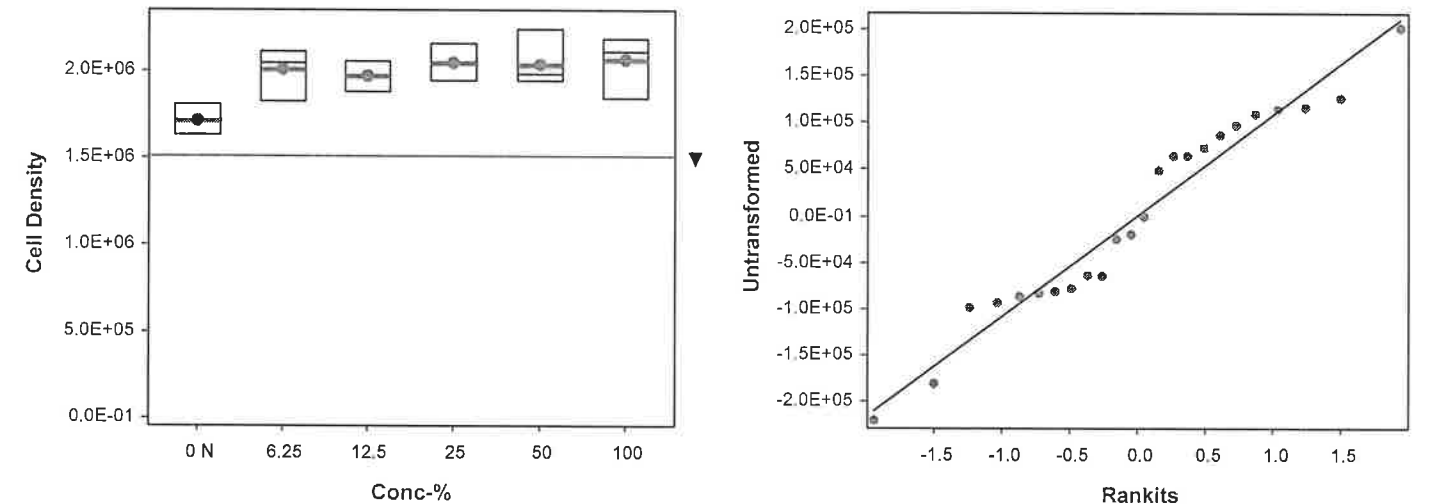
Selenastrum Growth Test Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 04-9572-5586 Endpoint: Cell Density CETIS Version: CETISv2.1.4  
Analyzed: 05 Dec-23 16:47 Analysis: Parametric-Control vs Treatments Status Level: 1  
Edit Date: 05 Dec-23 16:45 MD5 Hash: 2563217C3DC299356AFD84BD123B0FC4 Editor ID:

Cell Density Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.629E+6	1.807E+6	1.632E+6	1.775E+6
6.25		2.076E+6	1.821E+6	2.111E+6	2.001E+6
12.5		2.030E+6	2.051E+6	1.879E+6	1.900E+6
25		2.153E+6	1.975E+6	1.941E+6	2.088E+6
50		2.010E+6	1.941E+6	2.235E+6	1.950E+6
100		2.184E+6	2.174E+6	2.038E+6	1.838E+6

Graphics



## CETIS Analytical Report

Report Date: 12 Dec-23 12:56 (p 1 of 2)  
Test Code/ID: VCF1123.211sel / 17-1674-4492

Selenastrum Growth Test			Aquatic Bioassay & Consulting Labs, Inc.		
Analysis ID:	14-1146-6224	Endpoint:	Cell Density	CETIS Version:	CETISv2.1.4
Analyzed:	05 Dec-23 16:47	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1
Edit Date:	05 Dec-23 16:45	MD5 Hash:	2563217C3DC299356AFD84BD123B0FC4	Editor ID:	
Batch ID:	20-9728-4417	Test Type:	Cell Growth	Analyst:	
Start Date:	16 Nov-23 15:00	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water
Ending Date:	20 Nov-23 13:00	Species:	Selenastrum capricornutum	Brine:	Not Applicable
Test Length:	94h	Taxon:	Chlorophyta	Source:	Aquatic Biosystems, CO
				Age:	7d
Sample ID:	11-8432-1822	Code:	VCF1123.211sel	Project:	2023/24-1 (Wet)
Sample Date:	15 Nov-23 17:25	Material:	Sample Water	Source:	Bioassay Report
Receipt Date:	15 Nov-23 21:00	CAS (PC):		Station:	MO-MPK
Sample Age:	22h (6.3 °C)	Client:	Ventura County Watershed Protection Distri		

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control CV	0.05471	<<	0.2	Yes	Passes Criteria
Control Resp	1.71E+6	1.00E+6	<<	Yes	Passes Criteria

## Point Estimates

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

## Cell Density Summary

			Calculated Variate						Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	N	4	1.711E+6	1.704E+6	1.629E+6	1.807E+6	5.47%	0.00%	1.968E+6	0.00%
6.25		4	2.002E+6	2.038E+6	1.821E+6	2.111E+6	6.46%	-17.04%	1.968E+6	0.00%
12.5		4	1.965E+6	1.965E+6	1.879E+6	2.051E+6	4.48%	-14.86%	1.968E+6	0.00%
25		4	2.039E+6	2.032E+6	1.941E+6	2.153E+6	4.83%	-19.20%	1.968E+6	0.00%
50		4	2.034E+6	1.980E+6	1.941E+6	2.235E+6	6.76%	-18.90%	1.968E+6	0.00%
100		4	2.058E+6	2.106E+6	1.838E+6	2.184E+6	7.84%	-20.33%	1.968E+6	0.00%

## Cell Density Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.629E+6	1.807E+6	1.632E+6	1.775E+6
6.25		2.076E+6	1.821E+6	2.111E+6	2.001E+6
12.5		2.030E+6	2.051E+6	1.879E+6	1.900E+6
25		2.153E+6	1.975E+6	1.941E+6	2.088E+6
50		2.010E+6	1.941E+6	2.235E+6	1.950E+6
100		2.184E+6	2.174E+6	2.038E+6	1.838E+6

# CETIS Analytical Report

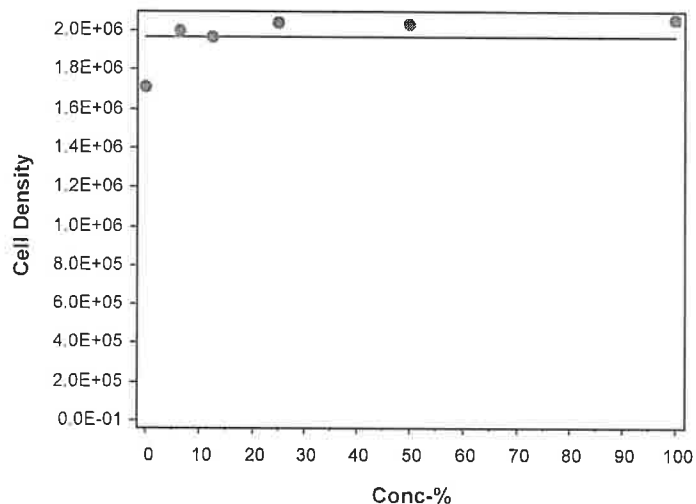
Report Date: 12 Dec-23 12:56 (p 2 of 2)  
 Test Code/ID: VCF1123.211sel / 17-1674-4492

## Selenastrum Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

<b>Analysis ID:</b> 14-1146-6224	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv2.1.4
<b>Analyzed:</b> 05 Dec-23 16:47	<b>Analysis:</b> Linear Interpolation (ICPIN)	<b>Status Level:</b> 1
<b>Edit Date:</b> 05 Dec-23 16:45	<b>MD5 Hash:</b> 2563217C3DC299356AFD84BD123B0FC4	<b>Editor ID:</b>

### Graphics



# CETIS Measurement Report

Report Date: 12 Dec-23 12:56 (p 1 of 2)  
Test Code/ID: VCF1123.211sel / 17-1674-4492

Selenastrum Growth Test			Aquatic Bioassay & Consulting Labs, Inc.		
Batch ID:	20-9728-4417	Test Type:	Cell Growth	Analyst:	
Start Date:	16 Nov-23 15:00	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water
Ending Date:	20 Nov-23 13:00	Species:	Selenastrum capricornutum	Brine:	Not Applicable
Test Length:	94h	Taxon:	Chlorophyta	Source:	Aquatic Biosystems, CO      Age: 7d
Sample ID:	11-8432-1822	Code:	VCF1123.211sel	Project:	2023/24-1 (Wet)
Sample Date:	15 Nov-23 17:25	Material:	Sample Water	Source:	Bioassay Report
Receipt Date:	15 Nov-23 21:00	CAS (PC):		Station:	MO-MPK
Sample Age:	22h (6.3 °C)	Client:	Ventura County Watershed Protection Distri		

Alkalinity (CaCO3)-mg/L											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	1	51	---	---	51	51	---	---	---	0
6.25		1	68	---	---	68	68	---	---	---	0
12.5		1	71	---	---	71	71	---	---	---	0
25		1	74	---	---	74	74	---	---	---	0
50		1	76	---	---	76	76	---	---	---	0
100		1	89	---	---	89	89	---	---	---	0
Overall		6	71.5	58.51	84.49	51	89	5.051	12.37	17.31%	0 (0%)

Conductivity-µmhos											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	5	544.6	541.9	547.3	541	547	0.4382	2.191	0.40%	0
6.25		5	516.8	515	518.6	515	519	0.2966	1.483	0.29%	0
12.5		5	530	523.3	536.7	525	539	1.077	5.385	1.02%	0
25		5	539.6	537.2	542	538	543	0.3899	1.949	0.36%	0
50		5	553.2	550.2	556.2	550	556	0.4775	2.387	0.43%	0
100		5	598.6	596.7	600.5	597	601	0.3033	1.517	0.25%	0
Overall		30	547.1	537.3	556.9	515	601	4.795	26.26	4.80%	0 (0%)

Hardness (CaCO3)-mg/L											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	1	133	---	---	133	133	---	---	---	0
6.25		1	128	---	---	128	128	---	---	---	0
12.5		1	133	---	---	133	133	---	---	---	0
25		1	136	---	---	136	136	---	---	---	0
50		1	139	---	---	139	139	---	---	---	0
100		1	147	---	---	147	147	---	---	---	0
Overall		6	136	129.2	142.8	128	147	2.658	6.512	4.79%	0 (0%)

pH-Units											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	5	8.02	7.964	8.076	8	8.1	0.008945	0.04473	0.56%	0
6.25		5	8	7.912	8.088	7.9	8.1	0.01414	0.07071	0.88%	0
12.5		5	8.02	7.884	8.156	7.9	8.2	0.02191	0.1095	1.37%	0
25		5	8.02	7.884	8.156	7.9	8.2	0.02191	0.1095	1.37%	0
50		5	8.02	7.884	8.156	7.9	8.2	0.02191	0.1095	1.37%	0
100		5	8	7.912	8.088	7.9	8.1	0.01414	0.07071	0.88%	0
Overall		30	8.013	7.983	8.044	7.9	8.2	0.01496	0.08193	1.02%	0 (0%)

Temperature-°C											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	5	25.56	25.39	25.73	25.5	25.8	0.02683	0.1342	0.52%	0
6.25		5	25.56	25.39	25.73	25.5	25.8	0.02683	0.1342	0.52%	0
12.5		5	25.56	25.39	25.73	25.5	25.8	0.02683	0.1342	0.52%	0
25		5	25.56	25.39	25.73	25.5	25.8	0.02683	0.1342	0.52%	0
50		5	25.56	25.39	25.73	25.5	25.8	0.02683	0.1342	0.52%	0
100		5	25.56	25.39	25.73	25.5	25.8	0.02683	0.1342	0.52%	0
Overall		30	25.56	25.51	25.61	25.5	25.8	0.02228	0.1221	0.48%	0 (0%)

Selenastrum Growth Test

Aquatic Bioassay & Consulting Labs, Inc.



**AQUATIC BIOASSAY**  
& CONSULTING LABORATORIES, INC.

December 14, 2023

Ms. Kelly Hahs  
Ventura County Watershed Protection District  
800 South Victoria Ave  
Ventura, CA 93009

Dear Ms. Hahs:

We are pleased to present the enclosed revised bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* EPA-821-R-02-013. Results were as follows:

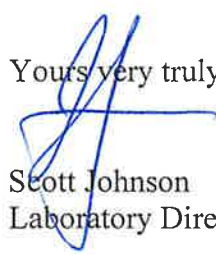
CLIENT:	Ventura County Flood Control
SAMPLE I.D.:	MO-SIM
DATE RECEIVED:	11/15/2023
ABC LAB. NO.:	VCF1123.212

**CHRONIC CERIODAPHNIA SURVIVAL & REPRODUCTION BIOASSAY**

SURVIVAL	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	EC25 =	>100.00 %
	EC50 =	>100.00 %

REPRODUCTION	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	IC25 =	>100.00 %
	IC50 =	>100.00 %

Yours very truly,

  
Scott Johnson  
Laboratory Director

# CETIS Summary Report

Report Date: 12 Dec-23 12:59 (p 1 of 2)

Test Code/ID: VCF1123.212cer / 07-6259-9610

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 11-6492-2535	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 16 Nov-23 15:04	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 23 Nov-23 14:55	Species: Ceriodaphnia dubia	Brine: Not Applicable
Test Length: 7d	Taxon: Branchiopoda	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 20-3395-5882	Code: VCF1123.212cer	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 18:45	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:00	CAS (PC):	Station: MO-SIM
Sample Age: 20h (6.3 °C)	Client: Ventura County Watershed Protection Distri	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	PMSD	TU	S
05-8902-9151	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	100	>100	---	---	1	1
07-3491-4827	Reproduction	Dunnett Multiple Comparison Test	100	>100	---	8.05%	1	1

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓ Level	%	95% LCL	95% UCL	TU	S
10-9486-3974	7d Survival Rate	Linear Interpolation (ICPIN)	✓ EC15	>100	---	---	<1	1
			✓ EC20	>100	---	---	<1	
			✓ EC25	>100	---	---	<1	
			✓ EC40	>100	---	---	<1	
			✓ EC50	>100	---	---	<1	
11-8505-3013	Reproduction	Linear Interpolation (ICPIN)	✓ IC15	>100	---	---	<1	1
			✓ IC20	>100	---	---	<1	
			✓ IC25	>100	---	---	<1	
			✓ IC40	>100	---	---	<1	
			✓ IC50	>100	---	---	<1	

## Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
05-8902-9151	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
10-9486-3974	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
07-3491-4827	Reproduction	Control Resp	36.4	15	<<	Yes	Passes Criteria
11-8505-3013	Reproduction	Control Resp	36.4	15	<<	Yes	Passes Criteria
07-3491-4827	Reproduction	PMSD	0.08048	0.13	0.47	Yes	Below Criteria

## 7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
6.25		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
12.5		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
25		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
50		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
100		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%

## Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	10	36.4	33.92	38.88	31	41	1.097	3.471	9.53%	0.00%
6.25		10	36.6	35.01	38.19	34	40	0.7024	2.221	6.07%	-0.55%
12.5		10	35.3	33.58	37.02	33	40	0.7608	2.406	6.82%	3.02%
25		10	35	33.15	36.85	30	38	0.8165	2.582	7.38%	3.85%
50		10	38.4	36.26	40.54	35	44	0.9452	2.989	7.78%	-5.49%
100		10	37.1	34.75	39.45	33	43	1.038	3.281	8.84%	-1.92%

AM PAS

# CETIS Summary Report

Report Date: 12 Dec-23 12:59 (p 2 of 2)  
 Test Code/ID: VCF1123.212cer / 07-6259-9610

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

### 7d Survival Rate Detail

MD5: 521A0DF2AE1E59D72392DBABE0C7AEFC

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

### Reproduction Detail

MD5: 23E267A5EE1ED88B6511B940ADCA30B8

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	36	38	34	35	31	32	41	37	39	41
6.25		40	36	35	40	39	35	34	36	35	36
12.5		33	37	33	34	38	40	34	35	36	33
25		34	36	35	33	30	34	38	38	34	38
50		36	37	37	40	39	35	35	42	44	39
100		43	40	39	36	36	35	33	33	36	40

### 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	N	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

# CETIS Analytical Report

Report Date: 12 Dec-23 12:59 (p 1 of 2)  
Test Code/ID: VCF1123.212cer / 07-6259-9610

Ceriodaphnia 7-d Survival and Reproduction Test				Aquatic Bioassay & Consulting Labs, Inc.		
Analysis ID:	07-3491-4827	Endpoint:	Reproduction	CETIS Version:	CETISv2.1.4	
Analyzed:	06 Dec-23 11:31	Analysis:	Parametric-Control vs Treatments	Status Level:	1	
Edit Date:	06 Dec-23 11:29	MD5 Hash:	23E267A5EE1ED88B6511B940ADCA30B8	Editor ID:	002-375-739-9	
Batch ID:	11-6492-2535	Test Type:	Reproduction-Survival (7d)	Analyst:		
Start Date:	16 Nov-23 15:04	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water	
Ending Date:	23 Nov-23 14:55	Species:	Ceriodaphnia dubia	Brine:	Not Applicable	
Test Length:	7d	Taxon:	Branchiopoda	Source:	Aquatic Biosystems, CO	Age: <24
Sample ID:	20-3395-5882	Code:	VCF1123.212cer	Project:	2023/24-1 (Wet)	
Sample Date:	15 Nov-23 18:45	Material:	Sample Water	Source:	Bioassay Report	
Receipt Date:	15 Nov-23 21:00	CAS (PC):		Station:	MO-SIM	
Sample Age:	20h (6.3 °C)	Client:	Ventura County Watershed Protection Distri			

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	2.93	8.05%

Dunnett Multiple Comparison Test									
Control	vs	Conc-%	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	18	-0.1563	2.289	2.93	CDF	0.8756	Non-Significant Effect
		12.5	18	0.8595	2.289	2.93	CDF	0.4811	Non-Significant Effect
		25	18	1.094	2.289	2.93	CDF	0.3748	Non-Significant Effect
		50	18	-1.563	2.289	2.93	CDF	0.9975	Non-Significant Effect
		100	18	-0.547	2.289	2.93	CDF	0.9471	Non-Significant Effect

Test Acceptability Criteria						TAC Limits	
Attribute	Test Stat	Lower	Upper	Overlap	Decision		
Control Resp	36.4	15	<<	Yes	Passes Criteria		
PMSD	0.08048	0.13	0.47	Yes	Below Criteria		

ANOVA Table							
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)	
Between	76.7333	15.3467	5	1.874	0.1142	Non-Significant Effect	
Error	442.2	8.18889	54				
Total	518.933		59				

ANOVA Assumptions Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variance	Bartlett Equality of Variance Test	2.698	15.09	0.7464	Equal Variances	
	Levene Equality of Variance Test	0.7676	3.377	0.5772	Equal Variances	
	Mod Levene Equality of Variance Test	0.6289	3.377	0.6784	Equal Variances	
Distribution	Anderson-Darling A2 Test	0.7828	3.878	0.0419	Normal Distribution	
	D'Agostino Kurtosis Test	1.3	2.576	0.1938	Normal Distribution	
	D'Agostino Skewness Test	0.8364	2.576	0.4030	Normal Distribution	
	D'Agostino-Pearson K2 Omnibus Test	2.388	9.21	0.3030	Normal Distribution	
	Kolmogorov-Smirnov D Test	0.1259	0.1331	0.0191	Normal Distribution	
	Shapiro-Wilk W Normality Test	0.9703	0.9459	0.1509	Normal Distribution	

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	10	36.4	33.92	38.88	36.5	31	41	1.097	9.53%	0.00%
6.25		10	36.6	35.01	38.19	36	34	40	0.7024	6.07%	-0.55%
12.5		10	35.3	33.58	37.02	34.33	33	40	0.7608	6.82%	3.02%
25		10	35	33.15	36.85	34.25	30	38	0.8165	7.38%	3.85%
50		10	38.4	36.26	40.54	38	35	44	0.9452	7.78%	-5.49%
100		10	37.1	34.75	39.45	36	33	43	1.038	8.84%	-1.92%

# CETIS Analytical Report

Report Date: 12 Dec-23 12:59 (p 2 of 2)  
Test Code/ID: VCF1123.212cer / 07-6259-9610

## Ceriodaphnia 7-d Survival and Reproduction Test

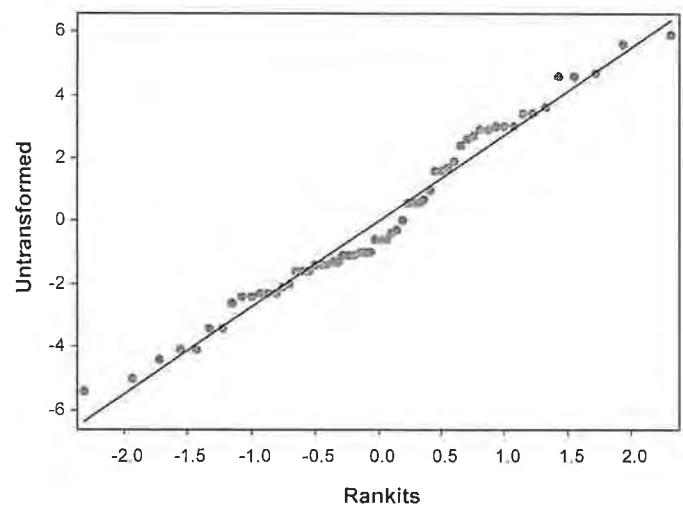
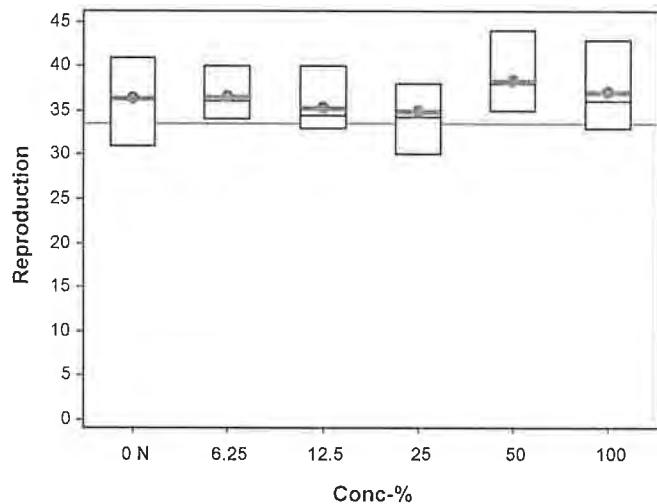
Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 07-3491-4827 Endpoint: Reproduction CETIS Version: CETISv2.1.4  
Analyzed: 06 Dec-23 11:31 Analysis: Parametric-Control vs Treatments Status Level: 1  
Edit Date: 06 Dec-23 11:29 MD5 Hash: 23E267A5EE1ED88B6511B940ADCA30B8 Editor ID: 002-375-739-9

### 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	N	36	38	34	35	31	32	41	37	39	41
6.25		40	36	35	40	39	35	34	36	35	36
12.5		33	37	33	34	38	40	34	35	36	33
25		34	36	35	33	30	34	38	38	34	38
50		36	37	37	40	39	35	35	42	44	39
100		43	40	39	36	36	35	33	33	36	40

### Graphics



## CETIS Analytical Report

Report Date: 12 Dec-23 12:59 (p 1 of 4)  
Test Code/ID: VCF1123.212cer / 07-6259-9610

Ceriodaphnia 7-d Survival and Reproduction Test				Aquatic Bioassay & Consulting Labs, Inc.		
Analysis ID:	10-9486-3974	Endpoint:	7d Survival Rate	CETIS Version:	CETISv2.1.4	
Analyzed:	06 Dec-23 11:31	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1	
Edit Date:	06 Dec-23 11:29	MD5 Hash:	521A0DF2AE1E59D72392DBABE0C7AEF	Editor ID:	002-375-739-9	
Batch ID:	11-6492-2535	Test Type:	Reproduction-Survival (7d)	Analyst:		
Start Date:	16 Nov-23 15:04	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water	
Ending Date:	23 Nov-23 14:55	Species:	Ceriodaphnia dubia	Brine:	Not Applicable	
Test Length:	7d	Taxon:	Branchiopoda	Source:	Aquatic Biosystems, CO	Age: <24
Sample ID:	20-3395-5882	Code:	VCF1123.212cer	Project:	2023/24-1 (Wet)	
Sample Date:	15 Nov-23 18:45	Material:	Sample Water	Source:	Bioassay Report	
Receipt Date:	15 Nov-23 21:00	CAS (PC):		Station:	MO-SIM	
Sample Age:	20h (6.3 °C)	Client:	Ventura County Watershed Protection Distri			

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Test Acceptability Criteria		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.8	<<	Yes	Passes Criteria

Point Estimates						
Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
EC15	>100	---	---	<1	---	---
EC20	>100	---	---	<1	---	---
EC25	>100	---	---	<1	---	---
EC40	>100	---	---	<1	---	---
EC50	>100	---	---	<1	---	---

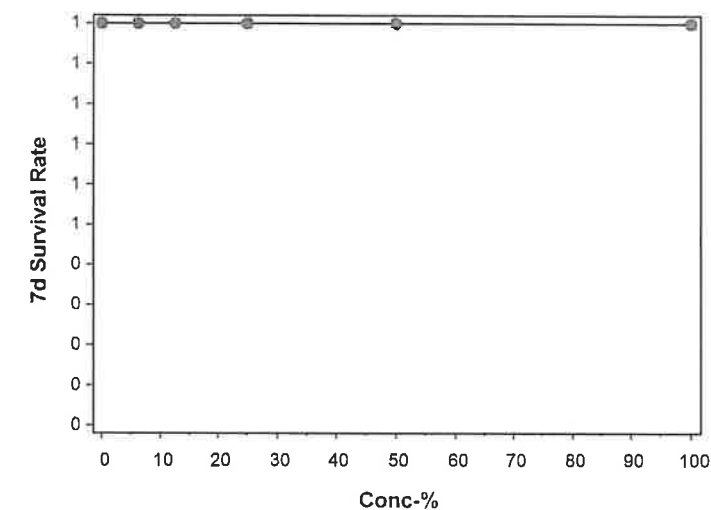
7d Survival Rate Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	N	10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
6.25		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
12.5		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
25		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
50		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	0.00%
100		10	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	10/10	1.0000	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	N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

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	N	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID: 10-9486-3974	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4		
Analyzed: 06 Dec-23 11:31	Analysis: Linear Interpolation (ICPIN)	Status Level: 1		
Edit Date: 06 Dec-23 11:29	MD5 Hash: 521A0DF2AE1E59D72392DBABE0C7AEF	Editor ID: 002-375-739-9		

Graphics



# CETIS Analytical Report

Report Date: 12 Dec-23 12:59 (p 3 of 4)  
Test Code/ID: VCF1123.212cer / 07-6259-9610

Ceriodaphnia 7-d Survival and Reproduction Test				Aquatic Bioassay & Consulting Labs, Inc.			
Analysis ID:	11-8505-3013	Endpoint:	Reproduction	CETIS Version:	CETISv2.1.4		
Analyzed:	06 Dec-23 11:31	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1		
Edit Date:	06 Dec-23 11:29	MD5 Hash:	23E267A5EE1ED88B6511B940ADCA30B8	Editor ID:	002-375-739-9		
Batch ID:	11-6492-2535	Test Type:	Reproduction-Survival (7d)	Analyst:			
Start Date:	16 Nov-23 15:04	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water		
Ending Date:	23 Nov-23 14:55	Species:	Ceriodaphnia dubia	Brine:	Not Applicable		
Test Length:	7d	Taxon:	Branchiopoda	Source:	Aquatic Biosystems, CO	Age:	<24
Sample ID:	20-3395-5882	Code:	VCF1123.212cer	Project:	2023/24-1 (Wet)		
Sample Date:	15 Nov-23 18:45	Material:	Sample Water	Source:	Bioassay Report		
Receipt Date:	15 Nov-23 21:00	CAS (PC):		Station:	MO-SIM		
Sample Age:	20h (6.3 °C)	Client:	Ventura County Watershed Protection Distri				

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	305666	280	Yes	Two-Point Interpolation

Test Acceptability Criteria					
		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	36.4	15	<<	Yes	Passes Criteria

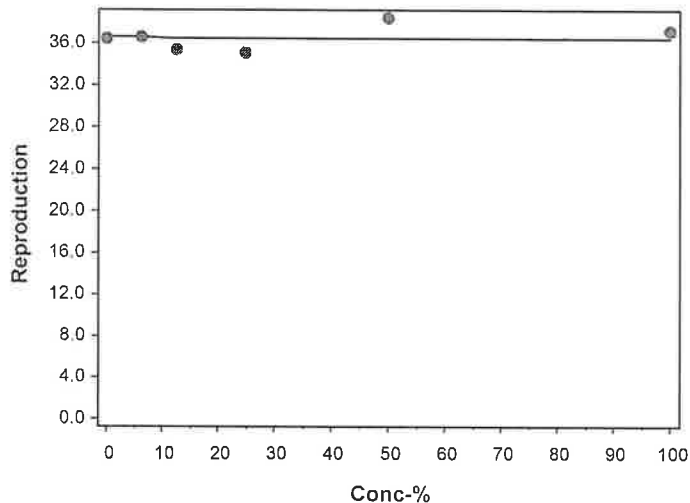
Point Estimates						
Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
IC15	>100	---	---	<1	---	---
IC20	>100	---	---	<1	---	---
IC25	>100	---	---	<1	---	---
IC40	>100	---	---	<1	---	---
IC50	>100	---	---	<1	---	---

Reproduction Summary			Calculated Variate						Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	N	10	36.4	36.5	31	41	9.53%	0.00%	36.5	0.00%
6.25		10	36.6	36	34	40	6.07%	-0.55%	36.5	0.00%
12.5		10	35.3	34.33	33	40	6.82%	3.02%	36.45	0.14%
25		10	35	34.25	30	38	7.38%	3.85%	36.45	0.14%
50		10	38.4	38	35	44	7.78%	-5.49%	36.45	0.14%
100		10	37.1	36	33	43	8.84%	-1.92%	36.45	0.14%

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	N	36	38	34	35	31	32	41	37	39	41
6.25		40	36	35	40	39	35	34	36	35	36
12.5		33	37	33	34	38	40	34	35	36	33
25		34	36	35	33	30	34	38	38	34	38
50		36	37	37	40	39	35	35	42	44	39
100		43	40	39	36	36	35	33	33	36	40

Ceriodaphnia 7-d Survival and Reproduction Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID: 11-8505-3013	Endpoint: Reproduction	CETIS Version: CETISv2.1.4		
Analyzed: 06 Dec-23 11:31	Analysis: Linear Interpolation (ICPIN)	Status Level: 1		
Edit Date: 06 Dec-23 11:29	MD5 Hash: 23E267A5EE1ED88B6511B940ADCA30B8	Editor ID: 002-375-739-9		

Graphics



## CETIS Analytical Report

Report Date: 12 Dec-23 12:59 (p 1 of 2)  
Test Code/ID: VCF1123.212cer / 07-6259-9610

Ceriodaphnia 7-d Survival and Reproduction Test						Aquatic Bioassay & Consulting Labs, Inc.					
Analysis ID: 05-8902-9151		Endpoint: 7d Survival Rate		CETIS Version: CETISv2.1.4							
Analyzed: 06 Dec-23 11:31		Analysis: STP 2xK Contingency Tables		Status Level: 1							
Edit Date: 06 Dec-23 11:29		MD5 Hash: 521A0DF2AE1E59D72392DBABE0C7AEF		Editor ID: 002-375-739-9							
Batch ID: 11-6492-2535		Test Type: Reproduction-Survival (7d)		Analyst:							
Start Date: 16 Nov-23 15:04		Protocol: EPA/821/R-02-013 (2002)		Diluent: Laboratory Water							
Ending Date: 23 Nov-23 14:55		Species: Ceriodaphnia dubia		Brine: Not Applicable							
Test Length: 7d		Taxon: Branchiopoda		Source: Aquatic Biosystems, CO Age: <24							
Sample ID: 20-3395-5882		Code: VCF1123.212cer		Project: 2023/24-1 (Wet)							
Sample Date: 15 Nov-23 18:45		Material: Sample Water		Source: Bioassay Report							
Receipt Date: 15 Nov-23 21:00		CAS (PC):		Station: MO-SIM							
Sample Age: 20h (6.3 °C)		Client: Ventura County Watershed Protection Distri									
Data Transform		Alt Hyp		NOEL	LOEL	TOEL	Tox Units				
Untransformed		C > T		100	>100	---	1				
Fisher Exact/Bonferroni-Holm Test											
Control	vs	Conc-%	Test Stat	P-Type	P-Value	Decision(α:5%)					
Negative Control		6.25	1.0000	Exact	1.0000	Non-Significant Effect					
		12.5	1.0000	Exact	1.0000	Non-Significant Effect					
		25	1.0000	Exact	1.0000	Non-Significant Effect					
		50	1.0000	Exact	1.0000	Non-Significant Effect					
		100	1.0000	Exact	1.0000	Non-Significant Effect					
Test Acceptability Criteria											
Attribute		Test Stat	TAC Limits		Decision						
Control Resp		1	0.8	<<	Yes	Passes Criteria					
7d Survival Rate Frequencies											
Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect				
0	N	10	0	10	1.0000	0.0000	0.00%				
6.25		10	0	10	1.0000	0.0000	0.00%				
12.5		10	0	10	1.0000	0.0000	0.00%				
25		10	0	10	1.0000	0.0000	0.00%				
50		10	0	10	1.0000	0.0000	0.00%				
100		10	0	10	1.0000	0.0000	0.00%				
7d Survival Rate Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
6.25		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
12.5		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
25		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
50		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
100		10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
7d Survival Rate Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Convergent Stormwater Quality Management Program 2023/24 Annual Monitoring Report

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002-375-739-9

Attachment A Appendix I

Analyst: [Signature] QA: [Signature]

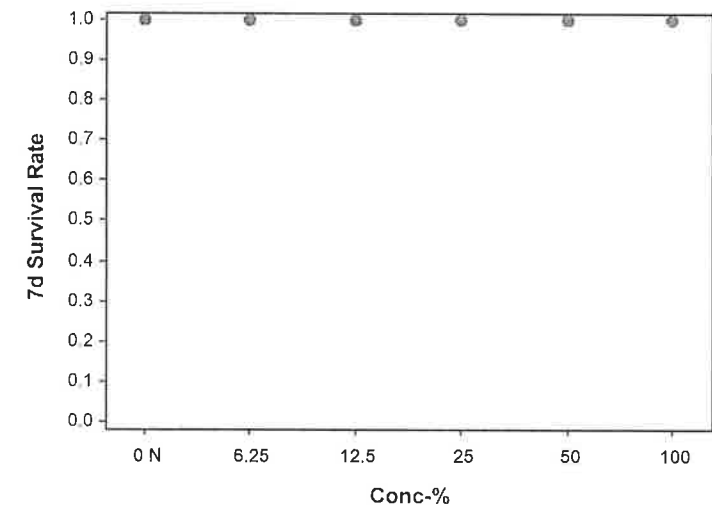
Ceriodaphnia 7-d Survival and Reproduction Test Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	05-8902-9151	Endpoint:	7d Survival Rate	CETIS Version:	CETISv2.1.4
Analyzed:	06 Dec-23 11:31	Analysis:	STP 2xK Contingency Tables	Status Level:	1
Edit Date:	06 Dec-23 11:29	MD5 Hash:	521A0DF2AE1E59D72392DBABE0C7AEF	Editor ID:	002-375-739-9

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	N	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Graphics



# CETIS Measurement Report

Report Date: 12 Dec-23 12:59 (p 1 of 2)  
Test Code/ID: VCF1123.212cer / 07-6259-9610

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 11-6492-2535	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 16 Nov-23 15:04	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 23 Nov-23 14:55	Species: Ceriodaphnia dubia	Brine: Not Applicable
Test Length: 7d	Taxon: Branchiopoda	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 20-3395-5882	Code: VCF1123.212cer	Project: 2023/24-1 (Wet)
Sample Date: 15 Nov-23 18:45	Material: Sample Water	Source: Bioassay Report
Receipt Date: 15 Nov-23 21:00	CAS (PC):	Station: MO-SIM
Sample Age: 20h (6.3 °C)	Client: Ventura County Watershed Protection Distri	

### Alkalinity (CaCO3)-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	60	60	60	60	60	0	0	0.00%	0
100		8	111	111	111	111	111	0	0	0.00%	0
Overall		16	85.5	71.47	99.53	60	111	6.584	26.34	30.80%	0 (0%)

### Conductivity-µmhos

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	375.2	372.2	378.3	369	379	0.4617	3.694	0.98%	0
6.25		8	547	545.3	548.7	544	550	0.25	2	0.37%	0
12.5		8	536.2	507.1	565.4	510	619	4.355	34.84	6.50%	0
25		8	636.2	624	648.5	613	651	1.832	14.66	2.30%	0
50		8	870	863.7	876.3	857	879	0.9473	7.578	0.87%	0
100		8	1253	1250	1256	1249	1256	0.3896	3.117	0.25%	0
Overall		48	703	618.6	787.3	369	1256	41.93	290.5	41.32%	0 (0%)

### Dissolved Oxygen-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	7.887	7.61	8.165	7.1	8.2	0.04142	0.3314	4.20%	0
6.25		8	7.863	7.626	8.099	7.2	8.1	0.03532	0.2825	3.59%	0
12.5		8	7.8	7.555	8.045	7.1	8	0.0366	0.2928	3.75%	0
25		8	7.8	7.559	8.041	7.1	8	0.03598	0.2878	3.69%	0
50		8	7.8	7.559	8.041	7.1	8	0.03598	0.2878	3.69%	0
100		8	7.8	7.559	8.041	7.1	8	0.03598	0.2878	3.69%	0
Overall		48	7.825	7.743	7.907	7.1	8.2	0.04066	0.2817	3.60%	0 (0%)

### Hardness (CaCO3)-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	97.62	96.74	98.51	95	98	0.1326	1.061	1.09%	0
100		8	460	460	460	460	460	0	0	0.00%	0
Overall		16	278.8	179.1	378.5	95	460	46.78	187.1	67.12%	0 (0%)

### pH-Units

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	8.088	8.018	8.157	8	8.2	0.01043	0.08346	1.03%	0
6.25		8	8.063	8	8.125	8	8.2	0.009301	0.07441	0.92%	0
12.5		8	8.063	8	8.125	8	8.2	0.009301	0.07441	0.92%	0
25		8	8.05	7.987	8.113	7.9	8.1	0.00945	0.0756	0.94%	0
50		8	8	7.911	8.089	7.8	8.1	0.01336	0.1069	1.34%	0
100		8	8	7.891	8.109	7.8	8.2	0.01637	0.1309	1.64%	0
Overall		48	8.044	8.016	8.071	7.8	8.2	0.01361	0.09432	1.17%	0 (0%)

# CETIS Measurement Report

Report Date: 12 Dec-23 12:59 (p 2 of 2)  
 Test Code/ID: VCF1123.212cer / 07-6259-9610

## Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

Temperature-°C

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	24	24	24	24	24	0	0	0.00%	0
6.25		8	24.09	24	24.17	24	24.2	0.01238	0.09904	0.41%	0
12.5		8	24.1	24	24.2	24	24.3	0.01494	0.1195	0.50%	0
25		8	24.12	24.02	24.23	24	24.3	0.01602	0.1282	0.53%	0
50		8	24.16	24.04	24.28	24	24.4	0.0176	0.1408	0.58%	0
100		8	24.2	24.07	24.33	24	24.4	0.02004	0.1603	0.66%	0
Overall		48	24.11	24.07	24.15	24	24.4	0.01874	0.1299	0.54%	0 (0%)



December 14, 2023

Ms. Kelly Hahs  
Ventura County Watershed Protection District  
800 South Victoria Ave  
Ventura, CA 93009

Dear Ms. Hahs:

We are pleased to present the enclosed revised bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms*, EPA-600/R95/136, 1995. Results were as follows:

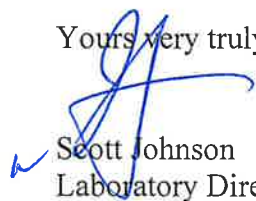
CLIENT:	Ventura County Watershed Protection District
SAMPLE I.D.:	ME-SCR
DATE RECEIVED:	11/16/2023
ABC LAB. NO.:	VCF1123.231

#### CHRONIC SEA URCHIN FERTILIZATION BIOASSAY

NOEC	=	100.00 %
TU <sub>c</sub>	=	1.00

IC <sub>25</sub>	=	>100.00 %
IC <sub>50</sub>	=	>100.00 %

Yours very truly,

  
Scott Johnson  
Laboratory Director

# CETIS Summary Report

Report Date: 14 Dec-23 13:36 (p 1 of 1)

Test Code/ID: VCF1123.231urc / 04-7758-5322

Purple Sea Urchin Sperm Cell Fertilization Test				Aquatic Bioassay & Consulting Labs, Inc.			
Batch ID:	12-0554-0666	Test Type:	Fertilization	Analyst:			
Start Date:	16 Nov-23 14:26	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater		
Ending Date:	16 Nov-23 15:06	Species:	Strongylocentrotus purpuratus	Brine:	Not Applicable		
Test Length:	40m	Taxon:	Echinoidea	Source:	David Gutoff	Age:	
Sample ID:	03-8595-7360	Code:	VCF1123.231urc	Project:	2023/24-1(Wet)		
Sample Date:	16 Nov-23 08:30	Material:	Sample Water	Source:	Bioassay Report		
Receipt Date:	16 Nov-23 11:32	CAS (PC):		Station:	ME-SCR		
Sample Age:	6h (9.3 °C)	Client:	VCWPD				

Multiple Comparison Summary									
Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	TU	S
10-4457-2624	Fertilization Rate	Dunnett Multiple Comparison Test		100	>100	---	3.76%	1	1

Point Estimate Summary									
Analysis ID	Endpoint	Point Estimate Method	✓	Level	%	95% LCL	95% UCL	TU	S
20-1595-5638	Fertilization Rate	Linear Interpolation (ICPIN)		EC15	>100	---	---	<1	1
				EC20	>100	---	---	<1	
				EC25	>100	---	---	<1	
				EC40	>100	---	---	<1	
				EC50	>100	---	---	<1	

Test Acceptability							
				TAC Limits			
Analysis ID	Endpoint	Attribute	Test Stat	Lower	Upper	Overlap	Decision
10-4457-2624	Fertilization Rate	Control Resp	0.9375	0.7	<<	Yes	Passes Criteria
20-1595-5638	Fertilization Rate	Control Resp	0.9375	0.7	<<	Yes	Passes Criteria
10-4457-2624	Fertilization Rate	PMSD	0.03763	<<	0.25	No	Passes Criteria

Fertilization Rate Summary											
Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	0.9375	0.9223	0.9527	0.9300	0.9500	0.0048	0.0096	1.02%	0.00%
6.25		4	0.9375	0.9136	0.9614	0.9300	0.9600	0.0075	0.0150	1.60%	0.00%
12.5		4	0.9325	0.9053	0.9597	0.9100	0.9500	0.0085	0.0171	1.83%	0.53%
25		4	0.9350	0.9019	0.9681	0.9100	0.9600	0.0104	0.0208	2.23%	0.27%
50		4	0.9375	0.9022	0.9728	0.9100	0.9600	0.0111	0.0222	2.37%	0.00%
100		4	0.9425	0.9049	0.9801	0.9100	0.9600	0.0118	0.0236	2.51%	-0.53%

Fertilization Rate Detail						MD5: E49861C937F774B98F7F4FFCA66111FE					
Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4						
0	N	0.9300	0.9300	0.9400	0.9500						
6.25		0.9300	0.9600	0.9300	0.9300						
12.5		0.9100	0.9400	0.9300	0.9500						
25		0.9600	0.9100	0.9400	0.9300						
50		0.9500	0.9600	0.9100	0.9300						
100		0.9600	0.9100	0.9600	0.9400						

Fertilization Rate Binomials					
Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	93/100	93/100	94/100	95/100
6.25		93/100	96/100	93/100	93/100
12.5		91/100	94/100	93/100	95/100
25		96/100	91/100	94/100	93/100
50		95/100	96/100	91/100	93/100
100		96/100	91/100	96/100	94/100

MS

## CETIS Analytical Report

Report Date: 14 Dec-23 13:36 (p 1 of 3)  
Test Code/ID: VCF1123.231urc / 04-7758-5322

## Purple Sea Urchin Sperm Cell Fertilization Test

Aquatic Bioassay &amp; Consulting Labs, Inc.

Analysis ID:	10-4457-2624	Endpoint:	Fertilization Rate	CETIS Version:	CETISv2.1.4
Analyzed:	12 Dec-23 13:24	Analysis:	Parametric-Control vs Treatments	Status Level:	1
Edit Date:	12 Dec-23 13:22	MD5 Hash:	E49861C937F774B98F7F4FFCA66111FE	Editor ID:	006-853-889-6

Batch ID:	12-0554-0666	Test Type:	Fertilization	Analyst:	
Start Date:	16 Nov-23 14:26	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	16 Nov-23 15:06	Species:	Strongylocentrotus purpuratus	Brine:	Not Applicable
Test Length:	40m	Taxon:	Echinoidea	Source:	David Gutoff
				Age:	

Sample ID:	03-8595-7360	Code:	VCF1123.231urc	Project:	2023/24-1(Wet)
Sample Date:	16 Nov-23 08:30	Material:	Sample Water	Source:	Bioassay Report
Receipt Date:	16 Nov-23 11:32	CAS (PC):		Station:	ME-SCR
Sample Age:	6h (9.3 °C)	Client:	VCWPD		

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	100	>100	---	1	0.03528	3.76%

## Dunnett Multiple Comparison Test

Control	vs	Conc-%	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	6	-0.03524	2.407	0.0659	CDF	0.8435	Non-Significant Effect
		12.5	6	0.3372	2.407	0.0659	CDF	0.7156	Non-Significant Effect
		25	6	0.1166	2.407	0.0659	CDF	0.7967	Non-Significant Effect
		50	6	-0.08383	2.407	0.0659	CDF	0.8568	Non-Significant Effect
		100	6	-0.4897	2.407	0.0659	CDF	0.9382	Non-Significant Effect

## Test Acceptability Criteria

## TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.9375	0.7	<<	Yes	Passes Criteria
PMSD	0.03763	<<	0.25	No	Passes Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0011136	0.0002227	5	0.1486	0.9779	Non-Significant Effect
Error	0.0269821	0.001499	18			
Total	0.0280957		23			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	2.32	15.09	0.8033	Equal Variances
	Levene Equality of Variance Test	0.7672	4.248	0.5854	Equal Variances
	Mod Levene Equality of Variance Test	0.6595	4.248	0.6585	Equal Variances
Distribution	Anderson-Darling A2 Test	0.5056	3.878	0.2060	Normal Distribution
	D'Agostino Kurtosis Test	0.9689	2.576	0.3326	Normal Distribution
	D'Agostino Skewness Test	0.2722	2.576	0.7855	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	1.013	9.21	0.6026	Normal Distribution
	Kolmogorov-Smirnov D Test	0.1336	0.2056	0.3214	Normal Distribution
	Shapiro-Wilk W Normality Test	0.9506	0.884	0.2787	Normal Distribution

## Fertilization Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	0.9375	0.9223	0.9527	0.9333	0.9300	0.9500	0.0048	1.02%	0.00%
6.25		4	0.9375	0.9136	0.9614	0.9300	0.9300	0.9600	0.0075	1.60%	0.00%
12.5		4	0.9325	0.9053	0.9597	0.9350	0.9100	0.9500	0.0085	1.83%	0.53%
25		4	0.9350	0.9019	0.9681	0.9350	0.9100	0.9600	0.0104	2.23%	0.27%
50		4	0.9375	0.9022	0.9728	0.9400	0.9100	0.9600	0.0111	2.37%	0.00%
100		4	0.9425	0.9049	0.9801	0.9533	0.9100	0.9600	0.0118	2.51%	-0.53%

# CETIS Analytical Report

Report Date: 14 Dec-23 13:36 (p 2 of 3)  
Test Code/ID: VCF1123.231urc / 04-7758-5322

## Purple Sea Urchin Sperm Cell Fertilization Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 10-4457-2624      Endpoint: Fertilization Rate      CETIS Version: CETISv2.1.4  
Analyzed: 12 Dec-23 13:24      Analysis: Parametric-Control vs Treatments      Status Level: 1  
Edit Date: 12 Dec-23 13:22      MD5 Hash: E49861C937F774B98F7F4FFCA66111FE      Editor ID: 006-853-889-6

### Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.3190	1.2870	1.3510	1.3100	1.3030	1.3450	0.0101	1.53%	0.00%
6.25		4	1.3200	1.2670	1.3720	1.3030	1.3030	1.3690	0.0166	2.52%	-0.07%
12.5		4	1.3090	1.2560	1.3630	1.3130	1.2660	1.3450	0.0168	2.57%	0.70%
25		4	1.3150	1.2470	1.3840	1.3130	1.2660	1.3690	0.0215	3.27%	0.24%
50		4	1.3210	1.2480	1.3940	1.3240	1.2660	1.3690	0.0229	3.46%	-0.17%
100		4	1.3320	1.2540	1.4100	1.3540	1.2660	1.3690	0.0245	3.68%	-1.02%

### Fertilization Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.9300	0.9300	0.9400	0.9500
6.25		0.9300	0.9600	0.9300	0.9300
12.5		0.9100	0.9400	0.9300	0.9500
25		0.9600	0.9100	0.9400	0.9300
50		0.9500	0.9600	0.9100	0.9300
100		0.9600	0.9100	0.9600	0.9400

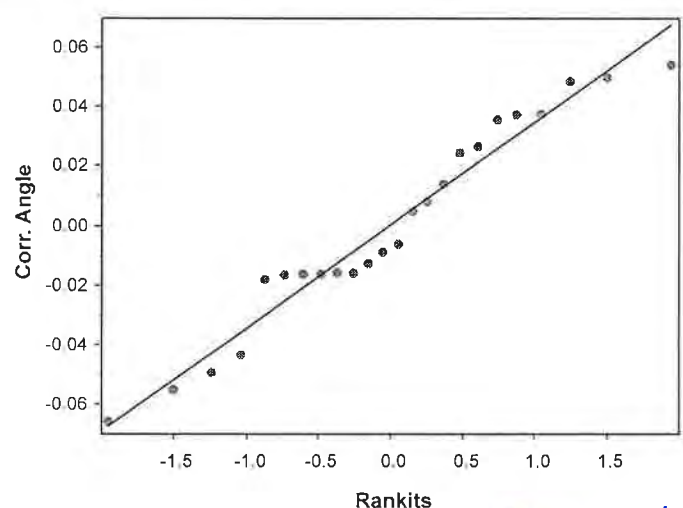
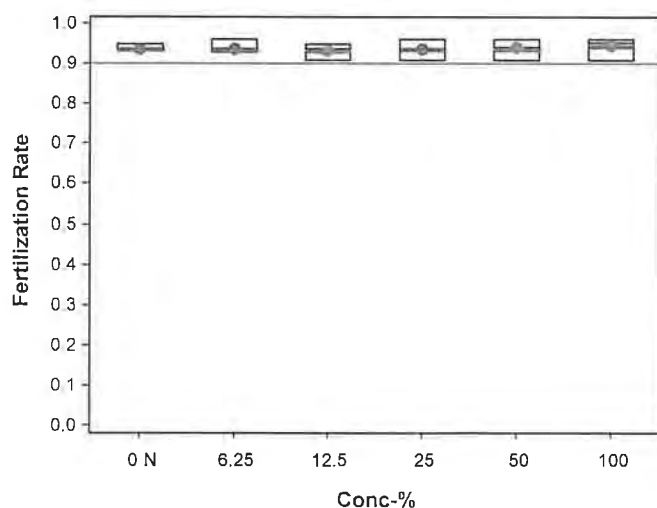
### Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.3030	1.3030	1.3230	1.3450
6.25		1.3030	1.3690	1.3030	1.3030
12.5		1.2660	1.3230	1.3030	1.3450
25		1.3690	1.2660	1.3230	1.3030
50		1.3450	1.3690	1.2660	1.3030
100		1.3690	1.2660	1.3690	1.3230

### Fertilization Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	93/100	93/100	94/100	95/100
6.25		93/100	96/100	93/100	93/100
12.5		91/100	94/100	93/100	95/100
25		96/100	91/100	94/100	93/100
50		95/100	96/100	91/100	93/100
100		96/100	91/100	96/100	94/100

### Graphics



P

# CETIS Analytical Report

Report Date: 14 Dec-23 13:36 (p 1 of 2)  
Test Code/ID: VCF1123.231urc / 04-7758-5322

Purple Sea Urchin Sperm Cell Fertilization Test				Aquatic Bioassay & Consulting Labs, Inc.			
Analysis ID:	20-1595-5638	Endpoint:	Fertilization Rate	CETIS Version:	CETISv2.1.4		
Analyzed:	12 Dec-23 13:24	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1		
Edit Date:	12 Dec-23 13:22	MD5 Hash:	E49861C937F774B98F7F4FFCA66111FE	Editor ID:	006-853-889-6		
Batch ID:	12-0554-0666	Test Type:	Fertilization	Analyst:			
Start Date:	16 Nov-23 14:26	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater		
Ending Date:	16 Nov-23 15:06	Species:	Strongylocentrotus purpuratus	Brine:	Not Applicable		
Test Length:	40m	Taxon:	Echinoidea	Source:	David Gutoff	Age:	
Sample ID:	03-8595-7360	Code:	VCF1123.231urc	Project:	2023/24-1(Wet)		
Sample Date:	16 Nov-23 08:30	Material:	Sample Water	Source:	Bioassay Report		
Receipt Date:	16 Nov-23 11:32	CAS (PC):		Station:	ME-SCR		
Sample Age:	6h (9.3 °C)	Client:	VCWPD				

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Test Acceptability Criteria		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.9375	0.7	<<	Yes	Passes Criteria

Point Estimates						
Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
EC15	>100	---	---	<1	---	---
EC20	>100	---	---	<1	---	---
EC25	>100	---	---	<1	---	---
EC40	>100	---	---	<1	---	---
EC50	>100	---	---	<1	---	---

Fertilization Rate Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	N	4	0.9375	0.9333	0.9300	0.9500	1.02%	0.00%	375/400	0.9375	0.00%
6.25		4	0.9375	0.9300	0.9300	0.9600	1.60%	0.00%	375/400	0.9375	0.00%
12.5		4	0.9325	0.9350	0.9100	0.9500	1.83%	0.53%	373/400	0.9369	0.06%
25		4	0.9350	0.9350	0.9100	0.9600	2.23%	0.27%	374/400	0.9369	0.06%
50		4	0.9375	0.9400	0.9100	0.9600	2.37%	0.00%	375/400	0.9369	0.06%
100		4	0.9425	0.9533	0.9100	0.9600	2.51%	-0.53%	377/400	0.9369	0.06%

Fertilization Rate Detail					
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.9300	0.9300	0.9400	0.9500
6.25		0.9300	0.9600	0.9300	0.9300
12.5		0.9100	0.9400	0.9300	0.9500
25		0.9600	0.9100	0.9400	0.9300
50		0.9500	0.9600	0.9100	0.9300
100		0.9600	0.9100	0.9600	0.9400

Fertilization Rate Binomials					
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	93/100	93/100	94/100	95/100
6.25		93/100	96/100	93/100	93/100
12.5		91/100	94/100	93/100	95/100
25		96/100	91/100	94/100	93/100
50		95/100	96/100	91/100	93/100
100		96/100	91/100	96/100	94/100

# CETIS Analytical Report

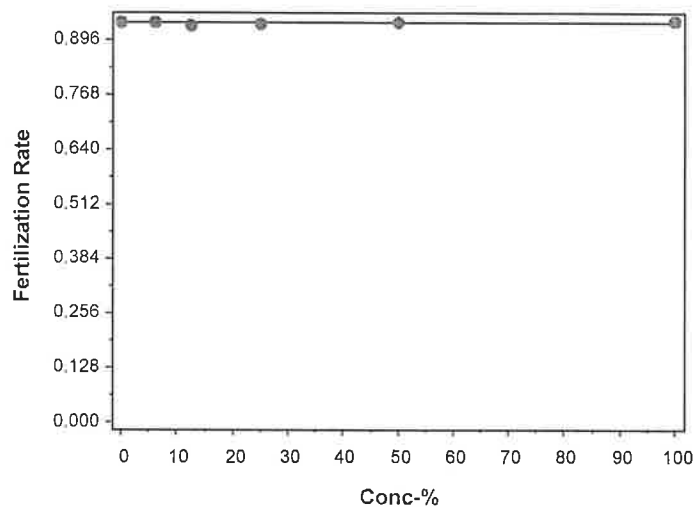
Report Date: 14 Dec-23 13:36 (p 2 of 2)  
Test Code/ID: VCF1123.231urc / 04-7758-5322

## Purple Sea Urchin Sperm Cell Fertilization Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	20-1595-5638	Endpoint:	Fertilization Rate	CETIS Version:	CETISv2.1.4
Analyzed:	12 Dec-23 13:24	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1
Edit Date:	12 Dec-23 13:22	MD5 Hash:	E49861C937F774B98F7F4FFCA66111FE	Editor ID:	006-853-889-6

### Graphics



# CETIS Measurement Report

Report Date: 14 Dec-23 13:36 (p 1 of 1)

Test Code/ID: VCF1123.231urc / 04-7758-5322

## Purple Sea Urchin Sperm Cell Fertilization Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 12-0554-0666	Test Type: Fertilization	Analyst:
Start Date: 16 Nov-23 14:26	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 16 Nov-23 15:06	Species: Strongylocentrotus purpuratus	Brine: Not Applicable
Test Length: 40m	Taxon: Echinoidea	Source: David Gutoff
		Age:
Sample ID: 03-8595-7360	Code: VCF1123.231urc	Project: 2023/24-1(Wet)
Sample Date: 16 Nov-23 08:30	Material: Sample Water	Source: Bioassay Report
Receipt Date: 16 Nov-23 11:32	CAS (PC):	Station: ME-SCR
Sample Age: 6h (9.3 °C)	Client: VCWPD	

### Parameter Acceptability Criteria

Parameter	TAC Limits				Overlap	Decision
	Min	Max	Lower	Upper		
Salinity	34	34	32	36	Yes	Passes Criteria
Temperature	15.7	15.7	11	13	Yes	Above Criteria

### Dissolved Oxygen-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	7.1	7.086	7.114	7.1	7.1	0	0	0.00%	0
6.25		2	7.2	7.188	7.212	7.2	7.2	0	0	0.00%	0
12.5		2	7.3	7.283	7.317	7.3	7.3	0	0	0.00%	0
25		2	7.3	7.283	7.317	7.3	7.3	0	0	0.00%	0
50		2	7.7	7.698	7.702	7.7	7.7	0	0	0.00%	0
100		2	8	8	8	8	8	0	0	0.00%	0
Overall		12	7.433	7.225	7.642	7.1	8	0.09482	0.3284	4.42%	0 (0%)

### pH-Units

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
6.25		2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
12.5		2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
25		2	8	8	8	8	8	0	0	0.00%	0
50		2	8	8	8	8	8	0	0	0.00%	0
100		2	8	8	8	8	8	0	0	0.00%	0
Overall		12	7.95	7.917	7.983	7.9	8	0.01508	0.05222	0.66%	0 (0%)

### Salinity-ppt

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	34	34	34	34	34	0	0	0.00%	0
6.25		2	34	34	34	34	34	0	0	0.00%	0
12.5		2	34	34	34	34	34	0	0	0.00%	0
25		2	34	34	34	34	34	0	0	0.00%	0
50		2	34	34	34	34	34	0	0	0.00%	0
100		2	34	34	34	34	34	0	0	0.00%	0
Overall		12	34	34	34	34	34	0	0	0.00%	0 (0%)

### Temperature-°C

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	15.7	15.68	15.72	15.7	15.7	0	0	0.00%	0
6.25		2	15.7	15.68	15.72	15.7	15.7	0	0	0.00%	0
12.5		2	15.7	15.68	15.72	15.7	15.7	0	0	0.00%	0
25		2	15.7	15.68	15.72	15.7	15.7	0	0	0.00%	0
50		2	15.7	15.68	15.72	15.7	15.7	0	0	0.00%	0
100		2	15.7	15.68	15.72	15.7	15.7	0	0	0.00%	0
Overall		12	15.7	15.7	15.7	15.7	15.7	0	0	0.00%	0 (0%)



**AQUATIC BIOASSAY**  
& CONSULTING LABORATORIES, INC.

December 14, 2023

Ms. Kelly Hahs  
Ventura County Watershed Protection District  
800 South Victoria Ave  
Ventura, CA 93009

Dear Ms. Hahs:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to West Coast Estuarine Organisms, EPA/821/R-02-014*. Results were as follows:

CLIENT:	Ventura County Flood Control
SAMPLE I.D.:	ME-CC
DATE RECEIVED:	11/16/2023
ABC LAB. NO.:	VCF1123.232

**CHRONIC TOPSMELT SURVIVAL AND GROWTH BIOASSAY**

Survival	NOEC =	100.00
	TU <sub>c</sub> =	1.00
	EC25 =	>100.00 %
	EC50 =	>100.00 %

Biomass	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	IC25 =	>100.00 %
	IC50 =	>100.00 %

Yours very truly,

  
Scott Johnson  
Laboratory Director

# CETIS Summary Report

Report Date: 14 Dec-23 11:56 (p 1 of 2)

Test Code/ID: VCF1123.232tops / 14-8588-5597

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 14-8093-9047	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 15:42	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 24 Nov-23 15:20	Species: Atherinops affinis	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: 11d
Sample ID: 20-0185-6835	Code: VCF1123.232tops	Project: 2023/24-1 (Wet)
Sample Date: 16 Nov-23 08:50	Material: Sample Water	Source: Bioassay Report
Receipt Date: 16 Nov-23 12:35	CAS (PC):	Station: ME-CC
Sample Age: 31h (5.8 °C)	Client: Ventura County Watershed Protection Distri	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	PMSD	TU	S
19-8882-3074	7d Survival Rate	Steel Many-One Rank Sum Test	100	>100	---	---	1	1
12-9368-0666	Mean Dry Biomass-mg	Dunnett Multiple Comparison Test	100	>100	---	4.14%	1	1

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓ Level	%	95% LCL	95% UCL	TU	S
14-9384-8183	7d Survival Rate	Linear Interpolation (ICPIN)	✓ EC15	>100	---	---	<1	1
			✓ EC20	>100	---	---	<1	
			✓ EC25	>100	---	---	<1	
			✓ EC40	>100	---	---	<1	
			✓ EC50	>100	---	---	<1	
02-7747-5181	Mean Dry Biomass-mg	Linear Interpolation (ICPIN)	✓ IC15	>100	---	---	<1	1
			✓ IC20	>100	---	---	<1	
			✓ IC25	>100	---	---	<1	
			✓ IC40	>100	---	---	<1	
			✓ IC50	>100	---	---	<1	

## Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
14-9384-8183	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
19-8882-3074	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
02-7747-5181	Mean Dry Biomass-mg	Control Resp	1.502	0.85	<<	Yes	Passes Criteria
12-9368-0666	Mean Dry Biomass-mg	Control Resp	1.502	0.85	<<	Yes	Passes Criteria

## 7d Survival Rate Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
6.25		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
12.5		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
25		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
50		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
100		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%

## Mean Dry Biomass-mg Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	1.502	1.436	1.567	1.436	1.564	0.02352	0.0526	3.50%	0.00%
6.25		5	1.464	1.396	1.533	1.408	1.548	0.02456	0.05493	3.75%	2.48%
12.5		5	1.443	1.413	1.473	1.424	1.48	0.01086	0.02427	1.68%	3.89%
25		5	1.44	1.421	1.459	1.426	1.462	0.00687	0.01536	1.07%	4.10%
50		5	1.46	1.41	1.509	1.424	1.528	0.01794	0.04011	2.75%	2.80%
100		5	1.45	1.392	1.507	1.41	1.522	0.02079	0.04648	3.21%	3.46%

# CETIS Summary Report

Report Date: 14 Dec-23 11:56 (p 2 of 2)

Test Code/ID: VCF1123.232tops / 14-8588-5597

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

### 7d Survival Rate Detail

MD5: 0DC5ABA07818A6ABCDE75EC39DEAA80

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

### Mean Dry Biomass-mg Detail

MD5: 3366DB088AC44C7BFC52941EA855060C

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.436	1.546	1.486	1.564	1.476
6.25		1.548	1.408	1.488	1.444	1.434
12.5		1.43	1.456	1.426	1.424	1.48
25		1.45	1.432	1.426	1.462	1.43
50		1.44	1.424	1.456	1.45	1.528
100		1.424	1.422	1.41	1.522	1.47

### 7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	5/5	5/5	5/5	5/5	5/5
6.25		5/5	5/5	5/5	5/5	5/5
12.5		5/5	5/5	5/5	5/5	5/5
25		5/5	5/5	5/5	5/5	5/5
50		5/5	5/5	5/5	5/5	5/5
100		5/5	5/5	5/5	5/5	5/5

## CETIS Analytical Report

Report Date: 14 Dec-23 11:56 (p 1 of 4)

Test Code/ID: VCF1123.232tops / 14-8588-5597

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay &amp; Consulting Labs, Inc.

Analysis ID:	19-8882-3074	Endpoint:	7d Survival Rate	CETIS Version:	CETISv2.1.4
Analyzed:	14 Dec-23 11:54	Analysis:	Nonparametric-Control vs Treatments	Status Level:	1
Edit Date:	14 Dec-23 11:53	MD5 Hash:	0DC5ABA07818A6ABCDE75EC39DEAA80	Editor ID:	009-702-627-3
Batch ID:	14-8093-9047	Test Type:	Growth-Survival (7d)	Analyst:	
Start Date:	17 Nov-23 15:42	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	24 Nov-23 15:20	Species:	Atherinops affinis	Brine:	Not Applicable
Test Length:	7d	Taxon:	Actinopterygii	Source:	Aquatic Biosystems, CO Age: 11d
Sample ID:	20-0185-6835	Code:	VCF1123.232tops	Project:	2023/24-1 (Wet)
Sample Date:	16 Nov-23 08:50	Material:	Sample Water	Source:	Bioassay Report
Receipt Date:	16 Nov-23 12:35	CAS (PC):		Station:	ME-CC
Sample Age:	31h (5.8 °C)	Client:	Ventura County Watershed Protection Distri		

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units
Angular (Corrected)	C > T	100	>100	---	1

## Steel Many-One Rank Sum Test

Control	vs	Conc-%	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	8	27.5	16	1	CDF	0.8333	Non-Significant Effect
		12.5	8	27.5	16	1	CDF	0.8333	Non-Significant Effect
		25	8	27.5	16	1	CDF	0.8333	Non-Significant Effect
		50	8	27.5	16	1	CDF	0.8333	Non-Significant Effect
		100	8	27.5	16	1	CDF	0.8333	Non-Significant Effect

## Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	1	0.8	<<	Yes	Passes Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	5			Indeterminate
Error	0	0	24			
Total	0		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				Indeterminate

## 7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
6.25		5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
12.5		5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
25		5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
50		5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
100		5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%

## Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
6.25		5	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
12.5		5	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
25		5	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
50		5	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
100		5	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%

# CETIS Analytical Report

Report Date: 14 Dec-23 11:56 (p 2 of 4)  
Test Code/ID: VCF1123.232tops / 14-8588-5597

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 19-8882-3074 Endpoint: 7d Survival Rate CETIS Version: CETISv2.1.4  
Analyzed: 14 Dec-23 11:54 Analysis: Nonparametric-Control vs Treatments Status Level: 1  
Edit Date: 14 Dec-23 11:53 MD5 Hash: 0DC5ABA07818A6ABCDE75EC39DEAA80 Editor ID: 009-702-627-3

### 7d Survival Rate Detail

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

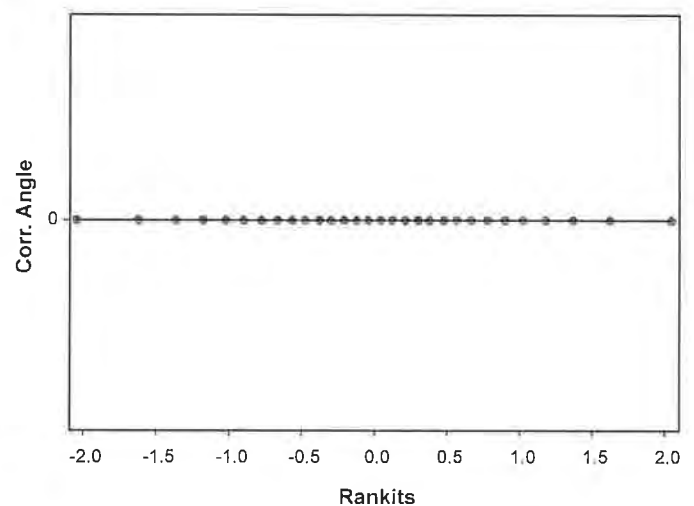
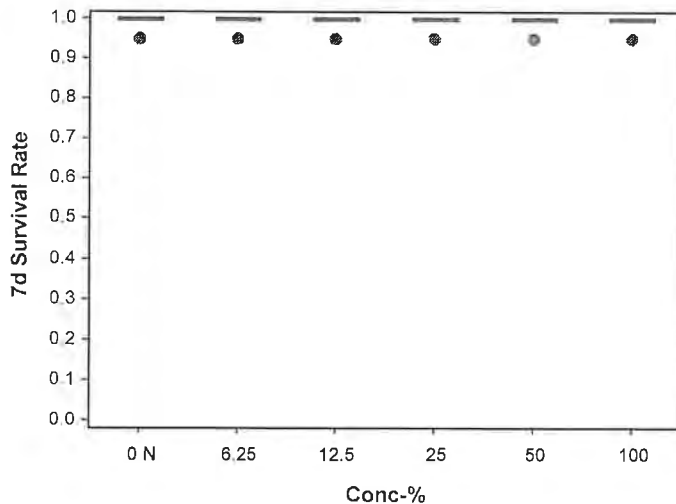
### Angular (Corrected) Transformed Detail

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.3450	1.3450	1.3450	1.3450	1.3450
6.25		1.3450	1.3450	1.3450	1.3450	1.3450
12.5		1.3450	1.3450	1.3450	1.3450	1.3450
25		1.3450	1.3450	1.3450	1.3450	1.3450
50		1.3450	1.3450	1.3450	1.3450	1.3450
100		1.3450	1.3450	1.3450	1.3450	1.3450

### 7d Survival Rate Binomials

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	5/5	5/5	5/5	5/5	5/5
6.25		5/5	5/5	5/5	5/5	5/5
12.5		5/5	5/5	5/5	5/5	5/5
25		5/5	5/5	5/5	5/5	5/5
50		5/5	5/5	5/5	5/5	5/5
100		5/5	5/5	5/5	5/5	5/5

### Graphics



## CETIS Analytical Report

Report Date: 14 Dec-23 11:56 (p 3 of 4)  
 Test Code/ID: VCF1123.232tops / 14-8588-5597

Pacific Topsmelt 7-d Survival and Growth Test				Aquatic Bioassay & Consulting Labs, Inc.		
Analysis ID:	12-9368-0666	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv2.1.4	
Analyzed:	14 Dec-23 11:54	Analysis:	Parametric-Control vs Treatments	Status Level:	1	
Edit Date:	14 Dec-23 11:53	MD5 Hash:	3366DB088AC44C7BFC52941EA855060C	Editor ID:	009-702-627-3	
Batch ID:	14-8093-9047	Test Type:	Growth-Survival (7d)	Analyst:		
Start Date:	17 Nov-23 15:42	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater	
Ending Date:	24 Nov-23 15:20	Species:	Atherinops affinis	Brine:	Not Applicable	
Test Length:	7d	Taxon:	Actinopterygii	Source:	Aquatic Biosystems, CO	Age: 11d
Sample ID:	20-0185-6835	Code:	VCF1123.232tops	Project:	2023/24-1 (Wet)	
Sample Date:	16 Nov-23 08:50	Material:	Sample Water	Source:	Bioassay Report	
Receipt Date:	16 Nov-23 12:35	CAS (PC):		Station:	ME-CC	
Sample Age:	31h (5.8 °C)	Client:	Ventura County Watershed Protection Distri			

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	0.06212	4.14%

## Dunnett Multiple Comparison Test

Control	vs	Conc-%	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	8	1.414	2.362	0.06212	CDF	0.2529	Non-Significant Effect
		12.5	8	2.22	2.362	0.06212	CDF	0.0660	Non-Significant Effect
		25	8	2.342	2.362	0.06212	CDF	0.0520	Non-Significant Effect
		50	8	1.597	2.362	0.06212	CDF	0.1940	Non-Significant Effect
		100	8	1.977	2.362	0.06212	CDF	0.1035	Non-Significant Effect

## Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	1.502	0.85	<<	Yes	Passes Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0127002	0.0025401	5	1.468	0.2369	Non-Significant Effect
Error	0.0415136	0.0017297	24			
Total	0.0542139		29			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	6.901	15.09	0.2281	Equal Variances
	Levene Equality of Variance Test	1.923	3.895	0.1277	Equal Variances
	Mod Levene Equality of Variance Test	0.8518	4.248	0.5314	Equal Variances
Distribution	Anderson-Darling A2 Test	0.9478	3.878	0.0166	Normal Distribution
	D'Agostino Kurtosis Test	0.07304	2.576	0.9418	Normal Distribution
	D'Agostino Skewness Test	1.625	2.576	0.1041	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	2.647	9.21	0.2662	Normal Distribution
	Kolmogorov-Smirnov D Test	0.1837	0.1853	0.0111	Normal Distribution
	Shapiro-Wilk W Normality Test	0.9347	0.9031	0.0657	Normal Distribution

## Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.502	1.436	1.567	1.486	1.436	1.564	0.02352	3.50%	0.00%
6.25		5	1.464	1.396	1.533	1.444	1.408	1.548	0.02456	3.75%	2.48%
12.5		5	1.443	1.413	1.473	1.43	1.424	1.48	0.01086	1.68%	3.89%
25		5	1.44	1.421	1.459	1.432	1.426	1.462	0.006871	1.07%	4.10%
50		5	1.46	1.41	1.509	1.45	1.424	1.528	0.01794	2.75%	2.80%
100		5	1.45	1.392	1.507	1.424	1.41	1.522	0.02079	3.21%	3.46%

# CETIS Analytical Report

Report Date: 14 Dec-23 11:56 (p 4 of 4)  
Test Code/ID: VCF1123.232tops / 14-8588-5597

## Pacific Topsmelt 7-d Survival and Growth Test

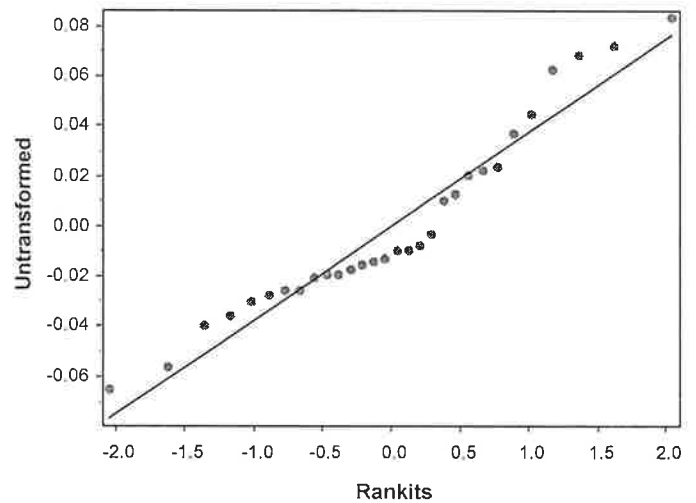
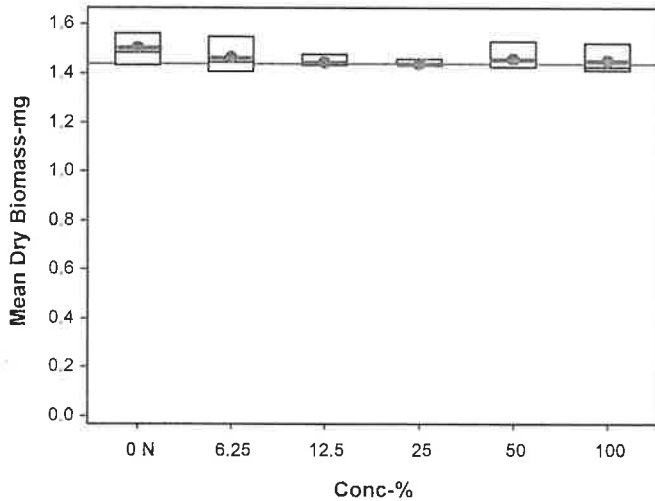
Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 12-9368-0666 Endpoint: Mean Dry Biomass-mg CETIS Version: CETISv2.1.4  
Analyzed: 14 Dec-23 11:54 Analysis: Parametric-Control vs Treatments Status Level: 1  
Edit Date: 14 Dec-23 11:53 MD5 Hash: 3366DB088AC44C7BFC52941EA855060C Editor ID: 009-702-627-3

### Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.436	1.546	1.486	1.564	1.476
6.25		1.548	1.408	1.488	1.444	1.434
12.5		1.43	1.456	1.426	1.424	1.48
25		1.45	1.432	1.426	1.462	1.43
50		1.44	1.424	1.456	1.45	1.528
100		1.424	1.422	1.41	1.522	1.47

### Graphics



## CETIS Analytical Report

Report Date: 14 Dec-23 11:56 (p 1 of 4)

Test Code/ID: VCF1123.232tops / 14-8588-5597

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay &amp; Consulting Labs, Inc.

Analysis ID:	14-9384-8183	Endpoint:	7d Survival Rate	CETIS Version:	CETISv2.1.4
Analyzed:	14 Dec-23 11:54	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1
Edit Date:	14 Dec-23 11:53	MD5 Hash:	0DC5ABA07818A6ABCDE75EC39DEAA80	Editor ID:	009-702-627-3

Batch ID:	14-8093-9047	Test Type:	Growth-Survival (7d)	Analyst:	
Start Date:	17 Nov-23 15:42	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	24 Nov-23 15:20	Species:	Atherinops affinis	Brine:	Not Applicable
Test Length:	7d	Taxon:	Actinopterygii	Source:	Aquatic Biosystems, CO
				Age:	11d

Sample ID:	20-0185-6835	Code:	VCF1123.232tops	Project:	2023/24-1 (Wet)
Sample Date:	16 Nov-23 08:50	Material:	Sample Water	Source:	Bioassay Report
Receipt Date:	16 Nov-23 12:35	CAS (PC):		Station:	ME-CC
Sample Age:	31h (5.8 °C)	Client:	Ventura County Watershed Protection Distri		

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

## TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.8	<<	Yes	Passes Criteria

## Point Estimates

Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
EC15	>100	---	---	<1	---	---
EC20	>100	---	---	<1	---	---
EC25	>100	---	---	<1	---	---
EC40	>100	---	---	<1	---	---
EC50	>100	---	---	<1	---	---

## 7d Survival Rate Summary

## Calculated Variate(A/B)

## Isotonic Variate

Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	N	5	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	25/25	1.0000	0.00%
6.25		5	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	25/25	1.0000	0.00%
12.5		5	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	25/25	1.0000	0.00%
25		5	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	25/25	1.0000	0.00%
50		5	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	25/25	1.0000	0.00%
100		5	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	25/25	1.0000	0.00%

## 7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

## 7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	5/5	5/5	5/5	5/5	5/5
6.25		5/5	5/5	5/5	5/5	5/5
12.5		5/5	5/5	5/5	5/5	5/5
25		5/5	5/5	5/5	5/5	5/5
50		5/5	5/5	5/5	5/5	5/5
100		5/5	5/5	5/5	5/5	5/5

# CETIS Analytical Report

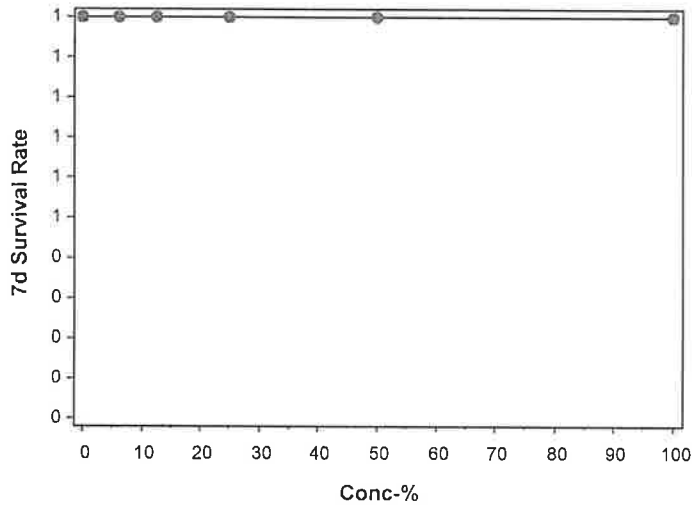
Report Date: 14 Dec-23 11:56 (p 2 of 4)  
Test Code/ID: VCF1123.232tops / 14-8588-5597

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	14-9384-8183	Endpoint:	7d Survival Rate	CETIS Version:	CETISv2.1.4
Analyzed:	14 Dec-23 11:54	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1
Edit Date:	14 Dec-23 11:53	MD5 Hash:	0DC5ABA07818A6ABCDE75EC39DEAA80	Editor ID:	009-702-627-3

### Graphics



# CETIS Analytical Report

Report Date: 14 Dec-23 11:56 (p 3 of 4)

Test Code/ID: VCF1123.232tops / 14-8588-5597

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 02-7747-5181	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 11:54	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 14 Dec-23 11:53	MD5 Hash: 3366DB088AC44C7BFC52941EA855060C	Editor ID: 009-702-627-3
Batch ID: 14-8093-9047	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 15:42	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 24 Nov-23 15:20	Species: Atherinops affinis	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: 11d
Sample ID: 20-0185-6835	Code: VCF1123.232tops	Project: 2023/24-1 (Wet)
Sample Date: 16 Nov-23 08:50	Material: Sample Water	Source: Bioassay Report
Receipt Date: 16 Nov-23 12:35	CAS (PC):	Station: ME-CC
Sample Age: 31h (5.8 °C)	Client: Ventura County Watershed Protection Distri	

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1761199	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

### TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1.502	0.85	<<	Yes	Passes Criteria

## Point Estimates

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

## Mean Dry Biomass-mg Summary

### Calculated Variate

### Isotonic Variate

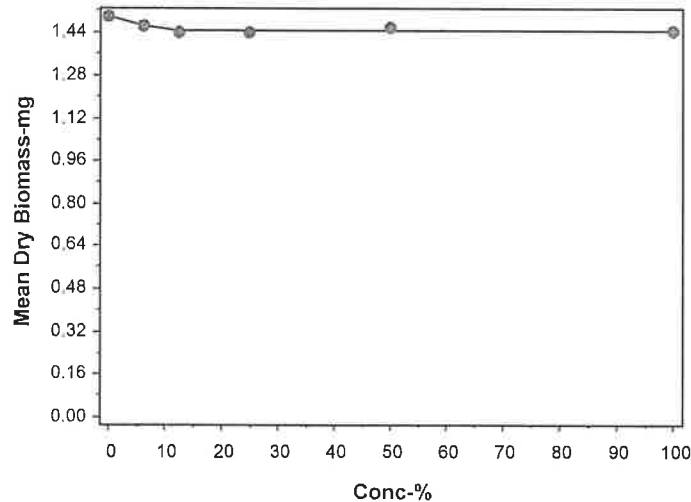
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	N	5	1.502	1.486	1.436	1.564	3.50%	0.00%	1.502	0.00%
6.25		5	1.464	1.444	1.408	1.548	3.75%	2.48%	1.464	2.53%
12.5		5	1.443	1.43	1.424	1.48	1.68%	3.89%	1.448	3.60%
25		5	1.44	1.432	1.426	1.462	1.07%	4.10%	1.448	3.60%
50		5	1.46	1.45	1.424	1.528	2.75%	2.80%	1.448	3.60%
100		5	1.45	1.424	1.41	1.522	3.21%	3.46%	1.448	3.60%

## Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.436	1.546	1.486	1.564	1.476
6.25		1.548	1.408	1.488	1.444	1.434
12.5		1.43	1.456	1.426	1.424	1.48
25		1.45	1.432	1.426	1.462	1.43
50		1.44	1.424	1.456	1.45	1.528
100		1.424	1.422	1.41	1.522	1.47

Pacific Topsmelt 7-d Survival and Growth Test			Aquatic Bioassay & Consulting Labs, Inc.		
Analysis ID:	02-7747-5181	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv2.1.4
Analyzed:	14 Dec-23 11:54	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1
Edit Date:	14 Dec-23 11:53	MD5 Hash:	3366DB088AC44C7BFC52941EA855060C	Editor ID:	009-702-627-3

Graphics



# CETIS Measurement Report

Report Date: 14 Dec-23 11:56 (p 1 of 1)

Test Code/ID: VCF1123.232tops / 14-8588-5597

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 14-8093-9047	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 15:42	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 24 Nov-23 15:20	Species: Atherinops affinis	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: 11d
Sample ID: 20-0185-6835	Code: VCF1123.232tops	Project: 2023/24-1 (Wet)
Sample Date: 16 Nov-23 08:50	Material: Sample Water	Source: Bioassay Report
Receipt Date: 16 Nov-23 12:35	CAS (PC):	Station: ME-CC
Sample Age: 31h (5.8 °C)	Client: Ventura County Watershed Protection Distri	

## Dissolved Oxygen-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	7.325	7.069	7.581	6.7	7.7	0.03824	0.3059	4.18%	0
6.25		8	7.35	7.105	7.595	6.7	7.6	0.0366	0.2928	3.98%	0
12.5		8	7.338	7.073	7.602	6.6	7.6	0.03949	0.3159	4.31%	0
25		8	7.313	7.028	7.597	6.5	7.5	0.04249	0.3399	4.65%	0
50		8	7.338	7.081	7.594	6.6	7.5	0.03835	0.3068	4.18%	0
100		8	7.35	7.118	7.582	6.7	7.6	0.03472	0.2777	3.78%	0
Overall		48	7.335	7.251	7.42	6.5	7.7	0.04195	0.2906	3.96%	0 (0%)

## pH-Units

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	7.888	7.858	7.917	7.8	7.9	0.004417	0.03533	0.45%	0
6.25		8	7.875	7.836	7.914	7.8	7.9	0.005785	0.04628	0.59%	0
12.5		8	7.863	7.819	7.906	7.8	7.9	0.006468	0.05175	0.66%	0
25		8	7.825	7.766	7.884	7.7	7.9	0.008839	0.07071	0.90%	0
50		8	7.788	7.758	7.817	7.7	7.8	0.004421	0.03537	0.45%	0
100		8	7.788	7.758	7.817	7.7	7.8	0.004421	0.03537	0.45%	0
Overall		48	7.838	7.82	7.855	7.7	7.9	0.008744	0.06058	0.77%	0 (0%)

## Salinity-ppt

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	34	34	34	34	34	0	0	0.00%	0
6.25		8	34	34	34	34	34	0	0	0.00%	0
12.5		8	34	34	34	34	34	0	0	0.00%	0
25		8	34	34	34	34	34	0	0	0.00%	0
50		8	34	34	34	34	34	0	0	0.00%	0
100		8	34	34	34	34	34	0	0	0.00%	0
Overall		48	34	34	34	34	34	0	0	0.00%	0 (0%)

## Temperature-°C

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	21	21	21	21	21	0	0	0.00%	0
6.25		8	21	21	21	21	21	0	0	0.00%	0
12.5		8	21	21	21	21	21	0	0	0.00%	0
25		8	21	21	21	21	21	0	0	0.00%	0
50		8	21	21	21	21	21	0	0	0.00%	0
100		8	21	21	21	21	21	0	0	0.00%	0
Overall		48	21	21	21	21	21	0	0	0.00%	0 (0%)



**Chain of Custody Record**  
**Ventura County Watershed Protection District**  
**NPDES Stormwater Monitoring Program**  
**Wet Weather Toxicity - ABC Laboratories (Contract AE20-007)**

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Sampling Date: Nov 11/16/2023 Project Number: 2023/24-1 (Wet)

Sampling Team: Dave Laak & Dean Wilkinson

SAMPLE ID	DATE/TIME COLLECTED	Chronic toxicity - topsmelt ( <i>Atherinops affinis</i> )	Chronic toxicity - purple sea urchin ( <i>Strongylocentrotus purpuratus</i> )	Chronic toxicity - fathead minnow ( <i>Pimephales promelas</i> )	Chronic toxicity - daphnid ( <i>Ceriodaphnia dubia</i> )	Chronic toxicity - green alga ( <i>Raphidocelis subcapitata</i> )	Chronic toxicity - inland silverside ( <i>Menidia beryllina</i> )	Number of 5-Gallon Buckets	NOTES
ME-CC	11/16/23 08:50	X						2	Note 1, Note 2, Note 3
ME-SCR			X					2	Note 1, Note 2, Note 3
ME-VR2		X						2	Note 1, Note 2, Note 3
MO-CAM				X				2	Note 1, Note 2, Note 3
MO-OJA				X				2	Note 1, Note 2, Note 3
MO-MEI				X				2	Note 1, Note 2, Note 3
MO-VEN					X			2	Note 1, Note 2, Note 3

MOVED C.F. = 0.3%  
 5-8%  
 AFTER MONITORING = SAMPLE PRESERVING  
 CO-1  
 CO-1  
 232

Print Name	Signature	Company	Received Date/Time	Relinquished Date/Time
David Laak		V/CWPD	NA	11/16/23 12:35
Dean Wilkinson		ABC LABS	11-16-23 1235	

**Other Notes:**

Note 1: Dilutions - 6.25%, 12.5%, 25%, 50%, 100%.

Note 2: Please execute TIE if mortality is > 50%.

Note 3: Notify District within 24 hours if significant toxicity is observed.



Chain of Custody Record  
Ventura County Watershed Protection District  
NPDES Stormwater Monitoring Program  
Wet Weather Toxicity - ABC Laboratories (Contract AE20-007)

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Sampling Date: 11/15/2023 Project Number: 2023/24-1 (Wet)  
Sampling Team: Emily McLeod, Shanna Morris

SAMPLE ID	DATE/TIME COLLECTED	Chronic toxicity - topsmelt ( <i>Atherinops affinis</i> )	Chronic toxicity - purple sea urchin ( <i>Strongylocentrotus purpuratus</i> )	Chronic toxicity - fathead minnow ( <i>Pimephales promelas</i> )	Chronic toxicity - daphnid ( <i>Ceriodaphnia dubia</i> )	Chronic toxicity - green alga ( <i>Raphidocelis subcapitata</i> )	Chronic toxicity - inland silverside ( <i>Menidia beryllina</i> )	Number of 5-Gallon Buckets	NOTES
MO-OXN				X				2	Note 1, Note 2, Note 3
MO-HUE					X			2	Note 1, Note 2, Note 3, Note 4
MO-THO	11/15 1945				X			2	Note 1, Note 2, Note 3
MO-MPK	11/15 1725					X		2	Note 1, Note 2, Note 3
MO-SIM	11/15 1845				X			2	Note 1, Note 2, Note 3
MO-FIL					X			2	Note 1, Note 2, Note 3
MO-SPA				X				2	Note 1, Note 2, Note 3

TEMP = 20  
CHLOROPHYLLINE  
pH = 7

MO  
-241  
-242

10.3-12.5 = 1.1  
6.3-12.5 = 1.1  
6.3-12.5 = 1.1

Print Name	Signature	Company	Received Date/Time	Relinquished Date/Time
Emily McLeod		Rincon	NA	2100
Victor Marquez		ABC LABS	2100	

Other Notes:

Note 1: Dilutions - 6.25%, 12.5%, 25%, 50%, 100%. Note 2: Please execute TIE if mortality is > 50%.  
Note 3: Notify District within 24 hours if significant toxicity is observed.  
Note 4: Note 4: If salinity >2 ppt then also run topsmelt for comparison. If topsmelt unavailable, use *Hyaella azteca*

MO to -243 = ADDED C.F. = +0.3°C, TEMPERATURE = SAMPLE RECEIVING



Chain of Custody Record  
Ventura County Watershed Protection District  
NPDES Stormwater Monitoring Program  
Wet Weather Toxicity - ABC Laboratories (Contract AE20-007)

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Sampling Date:

11/15/2023

Project Number: 2023/24-1 (Wet)

Sampling Team:

Emily McCord, Shanon Morris

SAMPLE ID	DATE/TIME COLLECTED	Chronic toxicity - topsmelt ( <i>Atherinops affinis</i> )	Chronic toxicity - purple sea urchin ( <i>Strongylocentrotus purpuratus</i> )	Chronic toxicity - fathead minnow ( <i>Pimephales promelas</i> )	Chronic toxicity - daphnid ( <i>Ceriodaphnia dubia</i> )	Chronic toxicity - green alga ( <i>Raphidocelis subcapitata</i> )	Chronic toxicity - inland silverside ( <i>Menidia beryllina</i> )	Number of 5-Gallon Buckets	NOTES
ME-CC		X						2	Note 1, Note 2, Note 3
ME-SCR			X					2	Note 1, Note 2, Note 3
ME-VR2		X						2	Note 1, Note 2, Note 3
MO-CAM	11/15 1530			X				2	Note 1, Note 2, Note 3
MO-OJA				X				2	Note 1, Note 2, Note 3
MO-MEI				X				2	Note 1, Note 2, Note 3
MO-VEN					X			2	Note 1, Note 2, Note 3

Print Name	Signature	Company	Received Date/Time	Relinquished Date/Time
Emily McCord	[Signature]	Rincon	NA	2100
Victor Marquez	[Signature]	ABCLABS	2100	

Other Notes:

Note 1: Dilutions - 6.25%, 12.5%, 25%, 50%, 100%.

Note 2: Please execute TIE if mortality is > 50%.

Note 3: Notify District within 24 hours if significant toxicity is observed.



Chain of Custody Record  
Ventura County Watershed Protection District  
NPDES Stormwater Monitoring Program  
Wet Weather Toxicity - ABC Laboratories (Contract AE20-007)

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Sampling Date: 11/15/23 Project Number: 2023/24-1 (Wet)  
Sampling Team: Samuel Carman, Rosanna Chapman, Cannon Birch

SAMPLE ID	DATE/TIME COLLECTED	Chronic toxicity - topsmelt (Atherinops affinis)	Chronic toxicity - purple sea urchin (Strongylocentrotus purpuratus)	Chronic toxicity - fathead minnow (Pimephales promelas)	Chronic toxicity - daphnid (Ceriodaphnia dubia)	Chronic toxicity - green alga (Raphidocelis subcapitata)	Chronic toxicity - inland silverside (Menidia beryllina)	Number of 5-Gallon Buckets	NOTES
ME-CC		X						2	Note 1, Note 2, Note 3
ME-SCR			X					2	Note 1, Note 2, Note 3
ME-VR2		X						2	Note 1, Note 2, Note 3
MO-CAM				X				2	Note 1, Note 2, Note 3
MO-OJA				X				2	Note 1, Note 2, Note 3
MO-MEI				X				2	Note 1, Note 2, Note 3
MO-VEN	11/15/23 1700				X			2	Note 1, Note 2, Note 3

Temp = 0.6  
Chronic ME is  
11/15/23

1.3 = 2.3

Print Name	Signature	Company	Received Date/Time	Relinquished Date/Time
Samuel Carman	[Signature]	River	NA	11/15/23 2140
Victor Marquez	[Signature]	ABC LABS	11/15/23 2140	

Other Notes:

Note 1: Dilutions - 6.25%, 12.5%, 25%, 50%, 100%. Note 2: Please execute TIE if mortality is > 50%.

Note 3: Notify District within 24 hours if significant toxicity is observed.

\* 214 to 217 = Added C.F. = +0.3°C thermometer = sample receiving



Chain of Custody Record  
Ventura County Watershed Protection District  
NPDES Stormwater Monitoring Program  
Wet Weather Toxicity - ABC Laboratories (Contract AE20-007)

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Sampling Date:

Project Number: 2023/24-1 (Wet)

Sampling Team:

SAMPLE ID	DATE/TIME COLLECTED	Chronic toxicity - topsmelt ( <i>Atherinops affinis</i> )	Chronic toxicity - purple sea urchin ( <i>Strongylocentrotus purpuratus</i> )	Chronic toxicity - fathead minnow ( <i>Pimephales promelas</i> )	Chronic toxicity - daphnid ( <i>Ceriodaphnia dubia</i> )	Chronic toxicity - green alga ( <i>Raphidocelis subcapitata</i> )	Chronic toxicity - inland silverside ( <i>Menidia beryllina</i> )	Number of 5-Gallon Buckets	NOTES
MO-OXN	11/15/23 · 15:55			X				2	Note 1, Note 2, Note 3
MO-HUE					X			2	Note 1, Note 2, Note 3, Note 4
MO-THO					X			2	Note 1, Note 2, Note 3
MO-MPK						X		2	Note 1, Note 2, Note 3
MO-SIM					X			2	Note 1, Note 2, Note 3
MO-FIL	11/15/23 · 20:00				X			2	Note 1, Note 2, Note 3
MO-SPA	11/15/23 · 18:50			X				2	Note 1, Note 2, Note 3

Print Name	Signature	Company	Received Date/Time	Relinquished Date/Time
Jamyl Camacho		Recon	NA	11/15/23 · 21:40
Victor Marguier		ABC LABS	11/15/23 21:40	

Other Notes:

Note 1: Dilutions - 6.25%, 12.5%, 25%, 50%, 100%.

Note 2: Please execute TIE if mortality is > 50%.

Note 3: Notify District within 24 hours if significant toxicity is observed.

Note 4: Note 4: If salinity >2 ppt then also run topsmelt for comparison. If topsmelt unavailable, use *Hyalella azteca*



Chain of Custody Record  
Ventura County Watershed Protection District  
NPDES Stormwater Monitoring Program  
Wet Weather Toxicity - ABC Laboratories (Contract AE20-007)

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Sampling Date: 11/15/23 Project Number: 2023/24-1 (Wet)

Sampling Team: SP, LL

SAMPLE ID	DATE/TIME COLLECTED	Chronic toxicity - topsmelt ( <i>Atherinops affinis</i> )	Chronic toxicity - purple sea urchin ( <i>Strongylocentrotus purpuratus</i> )	Chronic toxicity - fathead minnow ( <i>Pimephales promelas</i> )	Chronic toxicity - daphnid ( <i>Ceriodaphnia dubia</i> )	Chronic toxicity - green alga ( <i>Raphidocelis subcapitata</i> )	Chronic toxicity - inland silverside ( <i>Menidia beryllina</i> )	Number of 5-Gallon Buckets	NOTES
<del>ME-CC</del>		X						2	Note 1, Note 2, Note 3
<del>MF-SCR</del>			X					2	Note 1, Note 2, Note 3
<del>ME-VR2</del>		X						2	Note 1, Note 2, Note 3
<del>MO-CAM</del>				X				2	Note 1, Note 2, Note 3
MO-OJA	11/15/23 1600			X				2	Note 1, Note 2, Note 3
<del>MO-MEI</del>				X				2	Note 1, Note 2, Note 3
<del>MO-VEN</del>					X			2	Note 1, Note 2, Note 3

Print Name	Signature	Company	Received Date/Time	Relinquished Date/Time
Landon Lujan		Rinion	NA	11/15/23 1935
Victor Marquez		ABCLABS	11/15/23 1935	

Other Notes:

Note 1: Dilutions - 6.25%, 12.5%, 25%, 50%, 100%.

Note 2: Please execute TIE if mortality is > 50%.

Note 3: Notify District within 24 hours if significant toxicity is observed.

W8 = 209  
Temp. Col = 14.8  
Phenomenon = sample receiving = 7.3  
Chlorophyll = 40.1  
pH = 7.0  
Added 0.5% 40.8°C



**Chain of Custody Record**  
**Ventura County Watershed Protection District**  
**NPDES Stormwater Monitoring Program**  
**Wet Weather Toxicity - ABC Laboratories (Contract AE20-007)**  
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Sampling Date: 11/15/2023 Project Number: 2023/24-1 (Wet)

Sampling Team: Shelby Palasik, Landon Lujan

SAMPLE ID	DATE/TIME COLLECTED	Chronic toxicity - topmelt ( <i>Atherinops affinis</i> )	Chronic toxicity - purple sea urchin ( <i>Strongylocentrotus purpuratus</i> )	Chronic toxicity - fathead minnow ( <i>Pimephales promelas</i> )	Chronic toxicity - daphnid ( <i>Ceriodaphnia dubia</i> )	Chronic toxicity - green alga ( <i>Raphidocelis subcapitata</i> )	Chronic toxicity - inland silverside ( <i>Menidia beryllina</i> )	Number of 5-Gallon Buckets	NOTES
MO-OXN				X				2	Note 1, Note 2, Note 3
MO-HUE	11/15/23 1800				X			2	Note 1, Note 2, Note 3, Note 4
MO-THO					X			2	Note 1, Note 2, Note 3
MO-MPK						X		2	Note 1, Note 2, Note 3
MO-SIM					X			2	Note 1, Note 2, Note 3
MO-FIL					X			2	Note 1, Note 2, Note 3
MO-SPA				X				2	Note 1, Note 2, Note 3

Print Name	Signature	Company	Received Date/Time	Relinquished Date/Time
Landon Lujan	<i>Landon Lujan</i>	RINCON	NA	11/15/23 1935
Victor Marquez	<i>Victor Marquez</i>	ABC LABS	11/15/23 1935	11/15/23 1935

**Other Notes:**

Note 1: Dilutions - 6.25%, 12.5%, 25%, 50%, 100%.

Note 2: Please execute TIE if mortality is > 50%.

Note 3: Notify District within 24 hours if significant toxicity is observed.

Note 4: Note 4: If salinity > 2 ppt then also run topmelt for comparison. If topmelt unavailable, use *Hyaella azteca*

MO-HUE = SALINITY = 2 ppt



**Chain of Custody Record**  
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**Wet Weather Toxicity - ABC Laboratories (Contract AE20-007)**

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Sampling Date: \_\_\_\_\_ Project Number: 2023/24-1 (Wet)

Sampling Team: \_\_\_\_\_

SAMPLE ID	DATE/TIME COLLECTED	Chronic toxicity - topsmelt ( <i>Atherinops affinis</i> )	Chronic toxicity - purple sea urchin ( <i>Strongylocentrotus purpuratus</i> )	Chronic toxicity - fathead minnow ( <i>Pimephales promelas</i> )	Chronic toxicity - daphnid ( <i>Ceriodaphnia dubia</i> )	Chronic toxicity - green alga ( <i>Raphidocelis subcapitata</i> )	Chronic toxicity - inland silverside ( <i>Menidia beryllina</i> )	Number of 5-Gallon Buckets	NOTES
MO-OXN				X				2	Note 1, Note 2, Note 3
MO-HUE					X			2	Note 1, Note 2, Note 3, Note 4
MO-THO					X			2	Note 1, Note 2, Note 3
MO-MPK						X		2	Note 1, Note 2, Note 3
MO-SIM					X			2	Note 1, Note 2, Note 3
MO-FIL					X			2	Note 1, Note 2, Note 3
MO-SPA				X				2	Note 1, Note 2, Note 3

Print Name	Signature	Company	Received Date/Time	Relinquished Date/Time
			NA	

**Other Notes:**

Note 1: Dilutions - 6.25%, 12.5%, 25%, 50%, 100%.

Note 2: Please execute TIE if mortality is > 50%.

Note 3: Notify District within 24 hours if significant toxicity is observed.

Note 4: Note 4: If salinity >2 ppt then also run topsmelt for comparison. If topsmelt unavailable, use *Hyaella azteca*



Chain of Custody Record  
Ventura County Watershed Protection District  
NPDES Stormwater Monitoring Program  
Wet Weather Toxicity - ABC Laboratories (Contract AE20-007)

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Sampling Date: 11/16/2023 Project Number: 2023/24-1 (Wet)  
Sampling Team: Samuel Carman, Lannon Birch

SAMPLE ID	DATE/TIME COLLECTED	Chronic toxicity - topsmelt ( <i>Atherinops affinis</i> )	Chronic toxicity - purple sea urchin ( <i>Strongylocentrotus purpuratus</i> )	Chronic toxicity - fathead minnow ( <i>Pimephales promelas</i> )	Chronic toxicity - daphnid ( <i>Ceriodaphnia dubia</i> )	Chronic toxicity - green alga ( <i>Raphidocelis subcapitata</i> )	Chronic toxicity - inland silverside ( <i>Menidia beryllina</i> )	Number of 5-Gallon Buckets	NOTES
ME-CC		X						2	Note 1, Note 2, Note 3
ME-SCR	11/16/23 · 0830		X					2	Note 1, Note 2, Note 3
ME-VR2		X						2	Note 1, Note 2, Note 3
MO-CAM				X				2	Note 1, Note 2, Note 3
MO-OJA				X				2	Note 1, Note 2, Note 3
MO-MEI				X				2	Note 1, Note 2, Note 3
MO-VEN					X			2	Note 1, Note 2, Note 3

ADDED C.F. = +0.3°C  
TEMP = 9.3°C  
CHROMIUM = 40.1  
NH3 = 40.1  
THERMOMETER =  
SAMPLE TOXICITY

Print Name	Signature	Company	Received Date/Time	Relinquished Date/Time
Samuel Carman		River	NA	11/16/23 1132
ELIZABETH MARGULIES		ABC LABS	11-16-23 1132	

Other Notes:

Note 1: Dilutions - 6.25%, 12.5%, 25%, 50%, 100%. Note 2: Please execute TIE if mortality is > 50%.

Note 3: Notify District within 24 hours if significant toxicity is observed.



Chain of Custody Record  
Ventura County Watershed Protection District  
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Wet Weather Toxicity - ABC Laboratories (Contract AE20-007)

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Sampling Date: Nov 11/16/2023 Project Number: 2023/24-1 (Wet)

Sampling Team: Dave Laak & Dean Wilkinson

SAMPLE ID	DATE/TIME COLLECTED	Chronic toxicity - topsmelt (Atherinops affinis)	Chronic toxicity - purple sea urchin (Strongylocentrotus purpuratus)	Chronic toxicity - fathead minnow (Pimephales promelas)	Chronic toxicity - daphnid (Ceriodaphnia dubia)	Chronic toxicity - green alga (Raphidocelis subcapitata)	Chronic toxicity - inland silverside (Menidia beryllina)	Number of 5-Gallon Buckets	NOTES
232 ME-CC	11/16/23 08:50	X						2	Note 1, Note 2, Note 3
ME-SCR			X					2	Note 1, Note 2, Note 3
ME-VR2		X						2	Note 1, Note 2, Note 3
MO-CAM				X				2	Note 1, Note 2, Note 3
MO-OJA				X				2	Note 1, Note 2, Note 3
MO-MEI				X				2	Note 1, Note 2, Note 3
MO-VEN					X			2	Note 1, Note 2, Note 3

Print Name	Signature	Company	Received Date/Time	Relinquished Date/Time
David Laak		VCLWAD	NA	11/16/23 12:35
BIZBEN MARRAS		ABC LABS	11-16-23 1235	

Other Notes:

Note 1: Dilutions - 6.25%, 12.5%, 25%, 50%, 100%.

Note 2: Please execute TIE if mortality is > 50%.

Note 3: Notify District within 24 hours if significant toxicity is observed.



**Chain of Custody Record**  
**Ventura County Watershed Protection District**  
**NPDES Stormwater Monitoring Program**  
**Wet Weather Toxicity - ABC Laboratories (Contract AE20-007)**

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Sampling Date: \_\_\_\_\_ Project Number: 2023/24-1 (Wet) \_\_\_\_\_

Sampling Team: \_\_\_\_\_

SAMPLE ID	DATE/TIME COLLECTED	Chronic toxicity - topsmelt ( <i>Atherinops affinis</i> )	Chronic toxicity - purple sea urchin ( <i>Strongylocentrotus purpuratus</i> )	Chronic toxicity - fathead minnow ( <i>Pimephales promelas</i> )	Chronic toxicity - daphnid ( <i>Ceriodaphnia dubia</i> )	Chronic toxicity - green alga ( <i>Raphidocelis subcapitata</i> )	Chronic toxicity - inland silverside ( <i>Menidia beryllina</i> )		Number of 5-Gallon Buckets	NOTES
MO-OXN				X					2	Note 1, Note 2, Note 3
MO-HUE					X				2	Note 1, Note 2, Note 3, Note 4
MO-THO					X				2	Note 1, Note 2, Note 3
MO-MPK						X			2	Note 1, Note 2, Note 3
MO-SIM					X				2	Note 1, Note 2, Note 3
MO-FIL					X				2	Note 1, Note 2, Note 3
MO-SPA				X					2	Note 1, Note 2, Note 3

Print Name	Signature	Company	Received Date/Time	Relinquished Date/Time
			NA	

**Other Notes:**

Note 1: Dilutions - 6.25%, 12.5%, 25%, 50%, 100%. Note 2: Please execute TIE if mortality is > 50%.

Note 3: Notify District within 24 hours if significant toxicity is observed.

Note 4: Note 4: If salinity >2 ppt then also run topsmelt for comparison. If topsmelt unavailable, use *Hyalella azteca*



### CHRONIC SELENASTRUM GROWTH BIOASSAY

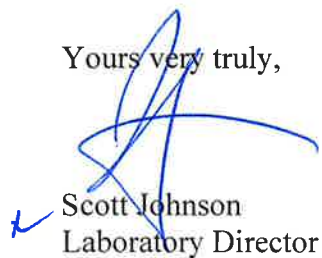
DATE: 9 November 2023

STANDARD TOXICANT: Cadmium Chloride

NOEC = 20.00 ug/l

IC25 = 84.15 ug/l  
IC50 = 123.50 ug/l

Yours very truly,



Scott Johnson  
Laboratory Director

# CETIS Summary Report

Report Date: 22 Jan-24 15:24 (p 1 of 1)  
Test Code/ID: SEL110923 / 18-1968-9109

Selenastrum Growth Test				Aquatic Bioassay & Consulting Labs, Inc.			
Batch ID:	08-3112-4152	Test Type:	Cell Growth	Analyst:			
Start Date:	09 Nov-23 14:36	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water		
Ending Date:	13 Nov-23 14:45	Species:	Selenastrum capricornutum	Brine:	Not Applicable		
Test Length:	4d 0h	Taxon:	Chlorophyta	Source:	Aquatic Biosystems, CO	Age:	7d
Sample ID:	09-5081-0211	Code:	SEL110923	Project:	REF TOX		
Sample Date:	09 Nov-23 14:36	Material:	Cadmium chloride	Source:	Reference Toxicant		
Receipt Date:		CAS (PC):		Station:	REF TOX		
Sample Age:	---	Client:	Internal Lab				

Multiple Comparison Summary							
Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD
03-9836-0679	Cell Density	Dunnett Multiple Comparison Test		20	40	28.28	6.55%

Point Estimate Summary							
Analysis ID	Endpoint	Point Estimate Method	✓	Level	µg/L	95% LCL	95% UCL
03-4845-3669	Cell Density	Linear Interpolation (ICPIN)		IC15	42.22	30.51	68.75
				IC20	67.87	25.5	90.02
				IC25	84.15	70.26	92.16
				IC40	107.8	100	112.6
				IC50	123.5	116.7	128.6

Test Acceptability				TAC Limits			
Analysis ID	Endpoint	Attribute	Test Stat	Lower	Upper	Overlap	Decision
03-4845-3669	Cell Density	Control CV	0.0527	<<	0.2	Yes	Passes Criteria
03-9836-0679	Cell Density	Control CV	0.0527	<<	0.2	Yes	Passes Criteria
03-4845-3669	Cell Density	Control Resp	1.33E+6	1.00E+6	<<	Yes	Passes Criteria
03-9836-0679	Cell Density	Control Resp	1.33E+6	1.00E+6	<<	Yes	Passes Criteria

Cell Density Summary											
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	1.331E+6	1.219E+6	1.443E+6	1.240E+6	1.409E+6	3.507E+4	7.015E+4	5.27%	0.00%
20		4	1.336E+6	1.229E+6	1.443E+6	1.261E+6	1.422E+6	3.370E+4	6.739E+4	5.04%	-0.38%
40		4	1.139E+6	1.049E+6	1.229E+6	1.076E+6	1.196E+6	2.832E+4	5.664E+4	4.97%	14.41%
80		4	1.035E+6	9.703E+5	1.100E+6	1.000E+6	1.093E+6	2.040E+4	4.080E+4	3.94%	22.22%
140		4	5.270E+5	4.723E+5	5.817E+5	5.020E+5	5.770E+5	1.720E+4	3.440E+4	6.53%	60.41%
180		4	2.115E+5	1.882E+5	2.348E+5	1.970E+5	2.300E+5	7.331E+3	1.466E+4	6.93%	84.11%

Cell Density Detail						MD5: 165015374C0B012C8242F4A0F5872D74					
Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4						
0	N	1.325E+6	1.350E+6	1.409E+6	1.240E+6						
20		1.314E+6	1.422E+6	1.261E+6	1.347E+6						
40		1.177E+6	1.076E+6	1.196E+6	1.108E+6						
80		1.093E+6	1.033E+6	1.015E+6	1.000E+6						
140		5.220E+5	5.020E+5	5.770E+5	5.070E+5						
180		1.970E+5	2.030E+5	2.300E+5	2.160E+5						

# CETIS Analytical Report

Report Date: 22 Jan-24 15:24 (p 1 of 2)  
Test Code/ID: SEL110923 / 18-1968-9109

Selenastrum Growth Test				Aquatic Bioassay & Consulting Labs, Inc.			
Analysis ID:	03-9836-0679	Endpoint:	Cell Density	CETIS Version:	CETISv2.1.4		
Analyzed:	15 Nov-23 12:13	Analysis:	Parametric-Control vs Treatments	Status Level:	1		
Edit Date:	15 Nov-23 12:07	MD5 Hash:	165015374C0B012C8242F4A0F5872D74	Editor ID:			
Batch ID:	08-3112-4152	Test Type:	Cell Growth	Analyst:			
Start Date:	09 Nov-23 14:36	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water		
Ending Date:	13 Nov-23 14:45	Species:	Selenastrum capricornutum	Brine:	Not Applicable		
Test Length:	4d 0h	Taxon:	Chlorophyta	Source:	Aquatic Biosystems, CO	Age:	7d
Sample ID:	09-5081-0211	Code:	SEL110923	Project:	REF TOX		
Sample Date:	09 Nov-23 14:36	Material:	Cadmium chloride	Source:	Reference Toxicant		
Receipt Date:		CAS (PC):		Station:	REF TOX		
Sample Age:	---	Client:	Internal Lab				

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	20	40	28.28	---	87160	6.55%

Dunnett Multiple Comparison Test									
Control	vs	Conc-µg/L	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Negative Control		20	6	-0.1381	2.407	87160	CDF	0.8708	Non-Significant Effect
		40*	6	5.296	2.407	87160	CDF	0.0001	Significant Effect
		80*	6	8.168	2.407	87160	CDF	2.7E-05	Significant Effect
		140*	6	22.2	2.407	87160	CDF	2.7E-05	Significant Effect
		180*	6	30.92	2.407	87160	CDF	2.7E-05	Significant Effect

Test Acceptability Criteria					
		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control CV	0.0527	<<	0.2	Yes	Passes Criteria
Control Resp	1.33E+6	1.00E+6	<<	Yes	Passes Criteria

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.237E+12	8.473E+11	5	323.1	<1.0E-05	Significant Effect
Error	4.72E+10	2.622E+09	18			
Total	4.284E+12		23			

ANOVA Assumptions Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variance	Bartlett Equality of Variance Test	6.297	15.09	0.2784	Equal Variances	
	Levene Equality of Variance Test	1.325	4.248	0.2980	Equal Variances	
	Mod Levene Equality of Variance Test	1.198	4.248	0.3492	Equal Variances	
Distribution	Anderson-Darling A2 Test	0.3236	3.878	0.5449	Normal Distribution	
	D'Agostino Kurtosis Test	0.01344	2.576	0.9893	Normal Distribution	
	D'Agostino Skewness Test	0.1493	2.576	0.8814	Normal Distribution	
	D'Agostino-Pearson K2 Omnibus Test	0.02246	9.21	0.9888	Normal Distribution	
	Kolmogorov-Smirnov D Test	0.1031	0.2056	0.7773	Normal Distribution	
	Shapiro-Wilk W Normality Test	0.974	0.884	0.7645	Normal Distribution	

Cell Density Summary											
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.331E+6	1.219E+6	1.443E+6	1.338E+6	1.240E+6	1.409E+6	3.507E+4	5.27%	0.00%
20		4	1.336E+6	1.229E+6	1.443E+6	1.330E+6	1.261E+6	1.422E+6	3.370E+4	5.04%	-0.38%
40		4	1.139E+6	1.049E+6	1.229E+6	1.142E+6	1.076E+6	1.196E+6	2.832E+4	4.97%	14.41%
80		4	1.035E+6	9.703E+5	1.100E+6	1.024E+6	1.000E+6	1.093E+6	2.040E+4	3.94%	22.22%
140		4	5.270E+5	4.723E+5	5.817E+5	5.145E+5	5.020E+5	5.770E+5	1.720E+4	6.53%	60.41%
180		4	2.115E+5	1.882E+5	2.348E+5	2.095E+5	1.970E+5	2.300E+5	7.331E+3	6.93%	84.11%

## CETIS Analytical Report

**Report Date:** 22 Jan-24 15:24 (p 2 of 2)  
**Test Code/ID:** SEL110923 / 18-1968-9109

### Selenastrum Growth Test

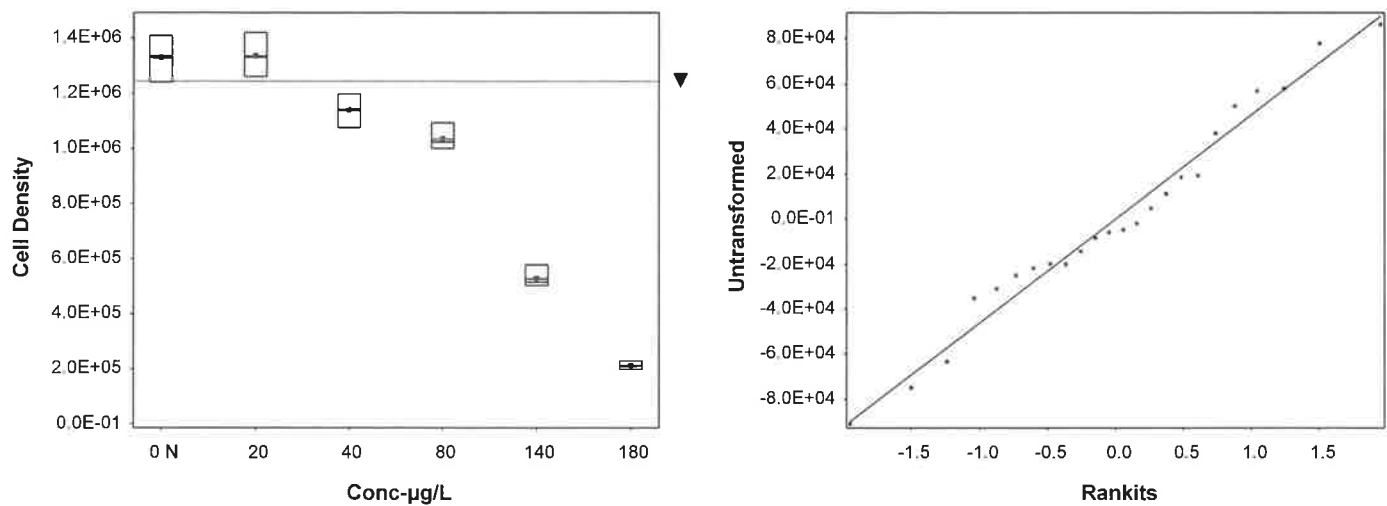
**Aquatic Bioassay & Consulting Labs, Inc.**

<b>Analysis ID:</b>	03-9836-0679	<b>Endpoint:</b>	Cell Density	<b>CETIS Version:</b>	CETISv2.1.4
<b>Analyzed:</b>	15 Nov-23 12:13	<b>Analysis:</b>	Parametric-Control vs Treatments	<b>Status Level:</b>	1
<b>Edit Date:</b>	15 Nov-23 12:07	<b>MD5 Hash:</b>	165015374C0B012C8242F4A0F5872D74	<b>Editor ID:</b>	

### Cell Density Detail

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.325E+6	1.350E+6	1.409E+6	1.240E+6
20		1.314E+6	1.422E+6	1.261E+6	1.347E+6
40		1.177E+6	1.076E+6	1.196E+6	1.108E+6
80		1.093E+6	1.033E+6	1.015E+6	1.000E+6
140		5.220E+5	5.020E+5	5.770E+5	5.070E+5
180		1.970E+5	2.030E+5	2.300E+5	2.160E+5

## Graphics



## CETIS Analytical Report

Report Date: 22 Jan-24 15:24 (p 1 of 2)

Test Code/ID: SEL110923 / 18-1968-9109

## Selenastrum Growth Test

Aquatic Bioassay &amp; Consulting Labs, Inc.

Analysis ID: 03-4845-3669      Endpoint: Cell Density      CETIS Version: CETISv2.1.4  
Analyzed: 15 Nov-23 12:13      Analysis: Linear Interpolation (ICPIN)      Status Level: 1  
Edit Date: 15 Nov-23 12:07      MD5 Hash: 165015374C0B012C8242F4A0F5872D74      Editor ID:

Batch ID: 08-3112-4152      Test Type: Cell Growth      Analyst:  
Start Date: 09 Nov-23 14:36      Protocol: EPA/821/R-02-013 (2002)      Diluent: Laboratory Water  
Ending Date: 13 Nov-23 14:45      Species: Selenastrum capricornutum      Brine: Not Applicable  
Test Length: 4d 0h      Taxon: Chlorophyta      Source: Aquatic Biosystems, CO      Age: 7d

Sample ID: 09-5081-0211      Code: SEL110923      Project: REF TOX  
Sample Date: 09 Nov-23 14:36      Material: Cadmium chloride      Source: Reference Toxicant  
Receipt Date:      CAS (PC):      Station: REF TOX  
Sample Age: ---      Client: Internal Lab

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control CV	0.0527	<<	0.2	Yes	Passes Criteria
Control Resp	1.33E+6	1.00E+6	<<	Yes	Passes Criteria

## Point Estimates

Level	µg/L	95% LCL	95% UCL
IC15	42.22	30.51	68.75
IC20	67.87	25.5	90.02
IC25	84.15	70.26	92.16
IC40	107.8	100	112.6
IC50	123.5	116.7	128.6

## Cell Density Summary

Cell Density Summary			Calculated Variate						Isotonic Variate	
Conc-µg/L	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	N	4	1.331E+6	1.338E+6	1.240E+6	1.409E+6	5.27%	0.00%	1.334E+6	0.00%
20		4	1.336E+6	1.330E+6	1.261E+6	1.422E+6	5.04%	-0.38%	1.334E+6	0.00%
40		4	1.139E+6	1.142E+6	1.076E+6	1.196E+6	4.97%	14.41%	1.139E+6	14.62%
80		4	1.035E+6	1.024E+6	1.000E+6	1.093E+6	3.94%	22.22%	1.035E+6	22.41%
140		4	5.270E+5	5.145E+5	5.020E+5	5.770E+5	6.53%	60.41%	5.270E+5	60.49%
180		4	2.115E+5	2.095E+5	1.970E+5	2.300E+5	6.93%	84.11%	2.115E+5	84.15%

## Cell Density Detail

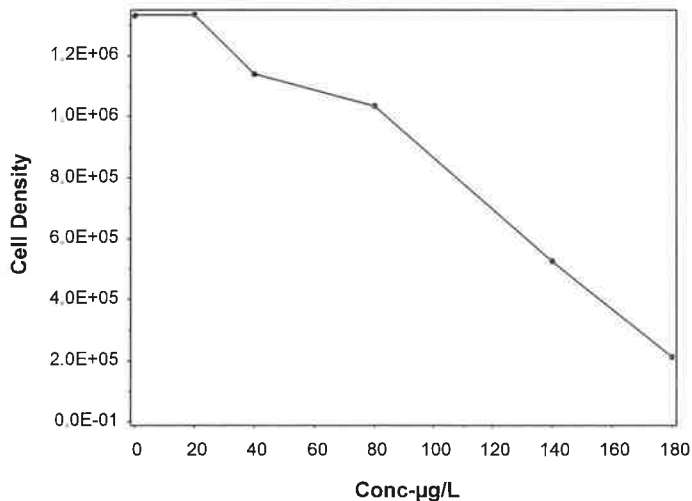
Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.325E+6	1.350E+6	1.409E+6	1.240E+6
20		1.314E+6	1.422E+6	1.261E+6	1.347E+6
40		1.177E+6	1.076E+6	1.196E+6	1.108E+6
80		1.093E+6	1.033E+6	1.015E+6	1.000E+6
140		5.220E+5	5.020E+5	5.770E+5	5.070E+5
180		1.970E+5	2.030E+5	2.300E+5	2.160E+5

# CETIS Analytical Report

Report Date: 22 Jan-24 15:24 (p 2 of 2)  
Test Code/ID: SEL110923 / 18-1968-9109

Selenastrum Growth Test		Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID:	03-4845-3669	Endpoint:	Cell Density
Analyzed:	15 Nov-23 12:13	Analysis:	Linear Interpolation (ICPIN)
Edit Date:	15 Nov-23 12:07	MD5 Hash:	165015374C0B012C8242F4A0F5872D74
		CETIS Version:	CETISv2.1.4
		Status Level:	1
		Editor ID:	

## Graphics



# CETIS Measurement Report

Report Date: 22 Jan-24 15:24 (p 1 of 2)  
Test Code/ID: SEL110923 / 18-1968-9109

## Selenastrum Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 08-3112-4152	Test Type: Cell Growth	Analyst:
Start Date: 09 Nov-23 14:36	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 13 Nov-23 14:45	Species: Selenastrum capricornutum	Brine: Not Applicable
Test Length: 4d 0h	Taxon: Chlorophyta	Source: Aquatic Biosystems, CO Age: 7d
Sample ID: 09-5081-0211	Code: SEL110923	Project: REF TOX
Sample Date: 09 Nov-23 14:36	Material: Cadmium chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: Internal Lab	

## Alkalinity (CaCO3)-mg/L

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	1	48	---	---	48	48	---	---	---	0
20		1	70	---	---	70	70	---	---	---	0
40		1	68	---	---	68	68	---	---	---	0
80		1	61	---	---	61	61	---	---	---	0
140		1	49	---	---	49	49	---	---	---	0
180		1	48	---	---	48	48	---	---	---	0
Overall		6	57.33	46.52	68.15	48	70	4.208	10.31	17.98%	0 (0%)

## Conductivity-µmhos

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	5	515.4	494.2	536.6	502	545	3.408	17.04	3.31%	0
20		5	516	509	523	510	525	1.131	5.657	1.10%	0
40		5	509.2	503	515.4	502	515	0.994	4.97	0.98%	0
80		5	494.2	489.6	498.8	490	499	0.7403	3.701	0.75%	0
140		5	460.4	456.7	464.1	457	465	0.5933	2.966	0.64%	0
180		5	440.6	437.4	443.8	437	444	0.5215	2.608	0.59%	0
Overall		30	489.3	478	500.6	437	545	5.531	30.29	6.19%	0 (0%)

## Hardness (CaCO3)-mg/L

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	1	117	---	---	117	117	---	---	---	0
20		1	124	---	---	124	124	---	---	---	0
40		1	121	---	---	121	121	---	---	---	0
80		1	120	---	---	120	120	---	---	---	0
140		1	104	---	---	104	104	---	---	---	0
180		1	101	---	---	101	101	---	---	---	0
Overall		6	114.5	104.4	124.6	101	124	3.922	9.607	8.39%	0 (0%)

## pH-Units

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	5	7.92	7.716	8.124	7.8	8.2	0.03286	0.1643	2.07%	0
20		5	8.02	7.884	8.156	7.9	8.2	0.02191	0.1095	1.37%	0
40		5	8.02	7.884	8.156	7.9	8.2	0.02191	0.1095	1.37%	0
80		5	8.02	7.884	8.156	7.9	8.2	0.02191	0.1095	1.37%	0
140		5	8.04	7.929	8.151	8	8.2	0.01789	0.08944	1.11%	0
180		5	8.04	7.929	8.151	8	8.2	0.01789	0.08944	1.11%	0
Overall		30	8.01	7.968	8.052	7.8	8.2	0.02054	0.1125	1.40%	0 (0%)

## Temperature-°C

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	5	25.14	24.97	25.31	25	25.3	0.02683	0.1342	0.53%	0
20		5	25.02	24.88	25.16	24.9	25.2	0.02192	0.1096	0.44%	0
40		5	25.02	24.88	25.16	24.9	25.2	0.02192	0.1096	0.44%	0
80		5	25.04	24.9	25.18	24.9	25.2	0.02281	0.114	0.46%	0
140		5	25.04	24.85	25.23	24.9	25.2	0.03034	0.1517	0.61%	0
180		5	25.04	24.85	25.23	24.9	25.2	0.03034	0.1517	0.61%	0
Overall		30	25.05	25	25.1	24.9	25.3	0.02287	0.1253	0.50%	0 (0%)

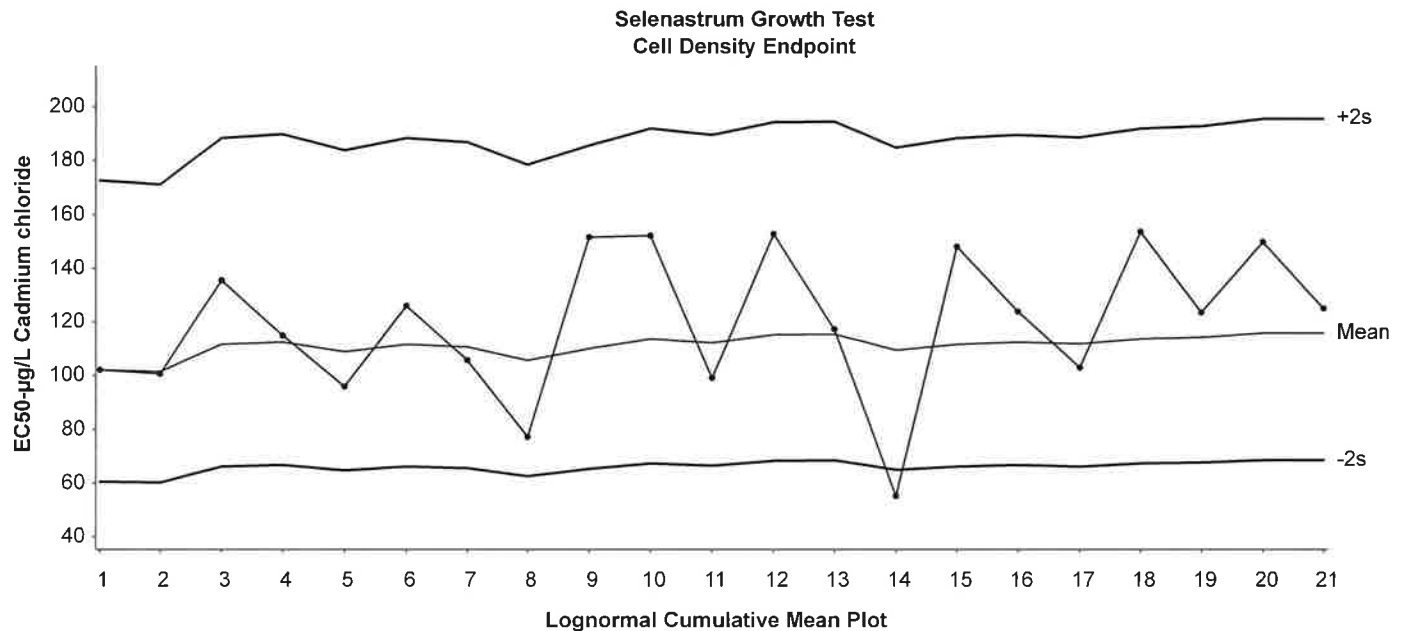
# CETIS Measurement Report

Report Date: 22 Jan-24 15:24 (p 2 of 2)  
Test Code/ID: SEL110923 / 18-1968-9109

Selenastrum Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Selenastrum Growth Test		Aquatic Bioassay & Consulting Labs, Inc.	
Test Type: Cell Growth	Organism: Selenastrum capricornutum	Material: Cadmium chloride	
Protocol: EPA/821/R-02-013 (2002)	Endpoint: Cell Density	Source: Reference Toxicant-REF	



Mean:	115.9	Count:	20	-2s Action Limit:	68.7
Sigma:	NA	CV:	26.60%	+2s Action Limit:	196

Quality Control Data											
Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2023	Jan	12	13:24	102.3	-13.65	-0.4789			04-7405-9726	05-1997-3179
2			18	8:05	100.7	-15.25	-0.5395			15-8641-7867	00-5848-8143
3			25	12:57	135.6	19.66	0.599			15-5088-3099	17-9685-4044
4		Feb	10	12:00	114.8	-1.096	-0.03631			11-5841-8051	17-0782-7839
5		Mar	23	12:00	95.9	-20.03	-0.7254			05-1302-6342	11-3290-5546
6		Apr	5	12:52	125.9	10	0.3164			18-0758-6142	19-2800-0197
7			6	15:42	105.6	-10.31	-0.3562			03-0998-2943	02-8133-5365
8		May	4	12:00	77.13	-38.8	-1.558			01-0737-1929	18-3733-1362
9		Jun	7	12:21	151.6	35.62	1.025			16-8574-4893	21-0572-6399
10			8	11:21	152	36.1	1.037			12-1195-7370	09-7182-0791
11			15	12:36	99.06	-16.87	-0.6014			08-3971-7306	10-0960-6666
12		Jul	13	13:34	152.6	36.68	1.051			10-9290-4337	02-8734-3001
13		Aug	10	12:32	117.4	1.434	0.04701			06-8780-0775	13-4709-7977
14		Sep	1	13:02	55.24	-60.69	-2.835		(-)	09-3857-7521	04-7208-7581
15			14	13:07	147.9	32.01	0.9323			00-8853-5252	10-3764-2589
16		Oct	5	14:03	123.8	7.878	0.2514			16-9416-8096	01-0472-7509
17			26	13:04	102.9	-13.02	-0.4554			14-7990-2784	04-5719-6152
18		Nov	2	14:34	153.5	37.57	1.073			04-4160-5303	18-2029-7634
19			9	14:36	123.5	7.571	0.2419			18-1968-9109	03-4845-3669
20		Dec	7	13:02	149.8	33.83	0.9792			14-4776-3774	20-7264-0544
21	2024	Jan	11	13:06	125.2	9.219	0.2926			12-9043-2177	17-7744-5581

## CETIS QC Plot

**Report Date:** 22 Jan-24 15:23 ( 1 of 1)

### Selenastrum Growth Test

**Aquatic Bioassay & Consulting Labs, Inc.**

**Test Type:** Cell Growth

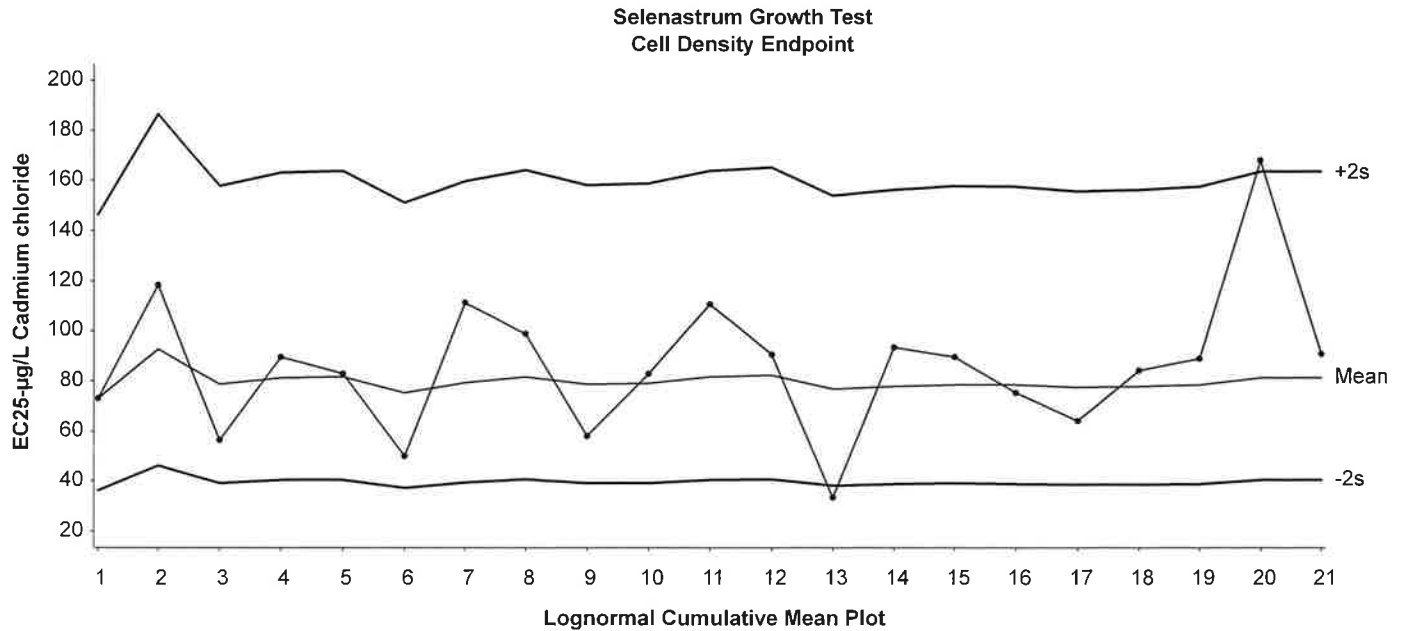
**Organism:** *Selenastrum capricornutum*

**Material:** Cadmium chloride

**Protocol:** EPA/821/R-02-013 (2002)

**Endpoint:** Cell Density

**Source:** Reference Toxicant-REF



**Mean:** 81.29

**Count:** 20

**-2s Action Limit:** 40.4

**Sigma:**

**CV:** 36.00%

+2s Action Limit: 163

### Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2023	Feb	10	12:00	72.83	-8.456	-0.3145			11-5841-8051	17-0782-7839
2		Mar	16	12:00	118.3	37.01	1.074			05-1935-7352	17-3186-6791
3			23	12:00	56.28	-25.01	-1.052			05-1302-6342	11-3290-5546
4		Apr	5	12:52	89.66	8.375	0.2807			18-0758-6142	19-2800-0197
5			6	15:42	82.99	1.699	0.05922			03-0998-2943	02-8133-5365
6		May	4	12:00	49.84	-31.45	-1.401			01-0737-1929	18-3733-1362
7			Jun	7	12:21	111.2	29.95	0.898			16-8574-4893
8		8		11:21	98.71	17.42	0.5559			12-1195-7370	09-7182-0791
9		15		12:36	57.93	-23.36	-0.97			08-3971-7306	10-0960-6666
10		29		12:27	82.75	1.464	0.05111			21-0635-4283	18-8979-9292
11		Jul	13	13:34	110.6	29.28	0.8808			10-9290-4337	02-8734-3001
12		Aug	10	12:32	90.37	9.086	0.3033			06-8780-0775	13-4709-7977
13		Sep	1	13:02	33.28	-48	-2.556		(-)	09-3857-7521	04-7208-7581
14			14	13:07	93.41	12.12	0.3978			00-8853-5252	10-3764-2589
15	Oct	5	14:03	89.48	8.192	0.2749			16-9416-8096	01-0472-7509	
16		26	13:04	75.21	-6.075	-0.2224			14-7990-2784	04-5719-6152	
17	Nov	2	14:34	64.17	-17.12	-0.6772			04-4160-5303	18-2029-7634	
18		9	14:36	84.15	2.858	0.09894			18-1968-9109	03-4845-3669	
19	Dec	7	13:02	88.75	7.464	0.2515			14-4776-3774	20-7264-0544	
20		13	12:22	167.9	86.66	2.077		(+)	10-7882-7723	04-3713-2980	
21		2024	Jan	11	13:06	90.79	9.502	0.3165		12-9043-2177	17-7744-5581



**AQUATIC BIOASSAY**  
& CONSULTING LABORATORIES, INC.

### **CHRONIC SEA URCHIN FERTILIZATION BIOASSAY**

DATE: 16 November 2023

STANDARD TOXICANT: Copper Chloride

NOEC = 18.00 ug/l

EC25 = 35.14 ug/l

EC50 = 46.25 ug/l

Yours very truly,

  
Scott Johnson  
Laboratory Director

# CETIS Summary Report

Report Date: 14 Dec-23 13:36 (p 1 of 1)  
Test Code/ID: URC111623 / 17-4700-8723

Purple Sea Urchin Sperm Cell Fertilization Test				Aquatic Bioassay & Consulting Labs, Inc.	
Batch ID:	02-6796-4617	Test Type:	Fertilization	Analyst:	
Start Date:	16 Nov-23 14:23	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	16 Nov-23 15:03	Species:	Strongylocentrotus purpuratus	Brine:	Not Applicable
Test Length:	40m	Taxon:	Echinoidea	Source:	Ventura Dive
					Age:
Sample ID:	09-8209-1585	Code:	URC111623	Project:	
Sample Date:	16 Nov-23 14:23	Material:	Copper chloride	Source:	Reference Toxicant
Receipt Date:		CAS (PC):		Station:	REF TOX
Sample Age:	---	Client:	Internal Lab		

Multiple Comparison Summary							
Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD
12-3655-5268	Fertilization Rate	Steel Many-One Rank Sum Test		18	32	24	4.15%

Point Estimate Summary							
Analysis ID	Endpoint	Point Estimate Method	✓	Level	µg/L	95% LCL	95% UCL
05-3513-4937	Fertilization Rate	Linear Interpolation (ICPIN)		EC15	29.7	27.28	31.59
				EC20	32.91	30.96	34.01
				EC25	35.14	33.52	36.14
				EC40	41.8	40.69	42.53
				EC50	46.25	45.45	46.79

Test Acceptability							
Analysis ID	Endpoint	Attribute	Test Stat	Lower	Upper	Overlap	Decision
05-3513-4937	Fertilization Rate	Control Resp	0.9225	0.7	<<	Yes	Passes Criteria
12-3655-5268	Fertilization Rate	Control Resp	0.9225	0.7	<<	Yes	Passes Criteria
12-3655-5268	Fertilization Rate	PMSD	0.0415	<<	0.25	No	Passes Criteria

Fertilization Rate Summary											
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	0.9225	0.8986	0.9464	0.9100	0.9400	0.0075	0.0150	1.63%	0.00%
18		4	0.9300	0.8910	0.9690	0.9100	0.9600	0.0123	0.0245	2.63%	-0.81%
32		4	0.7600	0.7282	0.7918	0.7300	0.7700	0.0100	0.0200	2.63%	17.62%
56		4	0.2600	0.2599	0.2601	0.2600	0.2600	0.0000	0.0000	0.00%	71.82%
100		4	0.0525	0.0068	0.0982	0.0300	0.0900	0.0144	0.0287	54.71%	94.31%
180		4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	---	100.00%

Fertilization Rate Detail						MD5: 85FCD72F309FA69BAAF55BD700763E92					
Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4						
0	N	0.9100	0.9100	0.9400	0.9300						
18		0.9600	0.9100	0.9400	0.9100						
32		0.7700	0.7300	0.7700	0.7700						
56		0.2600	0.2600	0.2600	0.2600						
100		0.0300	0.0600	0.0900	0.0300						
180		0.0000	0.0000	0.0000	0.0000						

Fertilization Rate Binomials					
Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	91/100	91/100	94/100	93/100
18		96/100	91/100	94/100	91/100
32		77/100	73/100	77/100	77/100
56		26/100	26/100	26/100	26/100
100		3/100	6/100	9/100	3/100
180		0/100	0/100	0/100	0/100

PASS

# CETIS Analytical Report

Report Date: 14 Dec-23 13:35 (p 1 of 3)  
Test Code/ID: URC111623 / 17-4700-8723

## Purple Sea Urchin Sperm Cell Fertilization Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 12-3655-5268	Endpoint: Fertilization Rate	CETIS Version: CETISv2.1.4
Analyzed: 12 Dec-23 13:17	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 12 Dec-23 13:15	MD5 Hash: 85FCD72F309FA69BAAF55BD700763E92	Editor ID: 006-853-889-6
Batch ID: 02-6796-4617	Test Type: Fertilization	Analyst:
Start Date: 16 Nov-23 14:23	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 16 Nov-23 15:03	Species: Strongylocentrotus purpuratus	Brine: Not Applicable
Test Length: 40m	Taxon: Echinoidea	Source: Ventura Dive Age:
Sample ID: 09-8209-1585	Code: URC111623	Project:
Sample Date: 16 Nov-23 14:23	Material: Copper chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: Internal Lab	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	18	32	24	---	0.03828	4.15%

## Steel Many-One Rank Sum Test

Control	vs	Conc-µg/L	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Negative Control		18	6	19.5	10	2	CDF	0.9118	Non-Significant Effect
		32*	6	10	10	0	CDF	0.0350	Significant Effect
		56*	6	10	10	0	CDF	0.0350	Significant Effect
		100*	6	10	10	0	CDF	0.0350	Significant Effect

## Test Acceptability Criteria

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.9225	0.7	<<	Yes	Passes Criteria
PMSD	0.0415	<<	0.25	No	Passes Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.71761	0.929402	4	591.4	<1.0E-05	Significant Effect
Error	0.0235732	0.0015716	15			
Total	3.74118		19			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
	Levene Equality of Variance Test	7.172	4.893	0.0020	Unequal Variances
	Mod Levene Equality of Variance Test	4.309	4.893	0.0161	Equal Variances
Distribution	Anderson-Darling A2 Test	0.5062	3.878	0.2054	Normal Distribution
	D'Agostino Kurtosis Test	0.3914	2.576	0.6955	Normal Distribution
	D'Agostino Skewness Test	0.9706	2.576	0.3318	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	1.095	9.21	0.5783	Normal Distribution
	Kolmogorov-Smirnov D Test	0.15	0.2235	0.2809	Normal Distribution
	Shapiro-Wilk W Normality Test	0.9418	0.866	0.2592	Normal Distribution

## Fertilization Rate Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	0.9225	0.8986	0.9464	0.9167	0.9100	0.9400	0.0075	1.63%	0.00%
18		4	0.9300	0.8910	0.9690	0.9200	0.9100	0.9600	0.0123	2.63%	-0.81%
32		4	0.7600	0.7282	0.7918	0.7700	0.7300	0.7700	0.0100	2.63%	17.62%
56		4	0.2600	0.2599	0.2601	0.2600	0.2600	0.2600	0.0000	0.00%	71.82%
100		4	0.0525	0.0068	0.0982	0.0400	0.0300	0.0900	0.0144	54.71%	94.31%
180		4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	---	100.00%

# CETIS Analytical Report

Report Date: 14 Dec-23 13:35 (p 2 of 3)  
Test Code/ID: URC111623 / 17-4700-8723

## Purple Sea Urchin Sperm Cell Fertilization Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 12-3655-5268 Endpoint: Fertilization Rate CETIS Version: CETISv2.1.4  
Analyzed: 12 Dec-23 13:17 Analysis: Nonparametric-Control vs Treatments Status Level: 1  
Edit Date: 12 Dec-23 13:15 MD5 Hash: 85FCD72F309FA69BAAF55BD700763E92 Editor ID: 006-853-889-6

### Angular (Corrected) Transformed Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.2900	1.2440	1.3350	1.2780	1.2660	1.3230	0.0142	2.20%	0.00%
18		4	1.3060	1.2270	1.3860	1.2850	1.2660	1.3690	0.0250	3.83%	-1.29%
32		4	1.0590	1.0220	1.0960	1.0710	1.0240	1.0710	0.0116	2.18%	17.88%
56		4	0.5351	0.5349	0.5353	0.5351	0.5351	0.5351	0.0000	0.00%	58.51%
100		4	0.2251	0.1243	0.3259	0.1985	0.1741	0.3047	0.0317	28.15%	82.55%
180		4	0.0500	0.0500	0.0500	0.0500	0.0500	0.0500	0.0000	0.00%	96.12%

### Fertilization Rate Detail

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.9100	0.9100	0.9400	0.9300
18		0.9600	0.9100	0.9400	0.9100
32		0.7700	0.7300	0.7700	0.7700
56		0.2600	0.2600	0.2600	0.2600
100		0.0300	0.0600	0.0900	0.0300
180		0.0000	0.0000	0.0000	0.0000

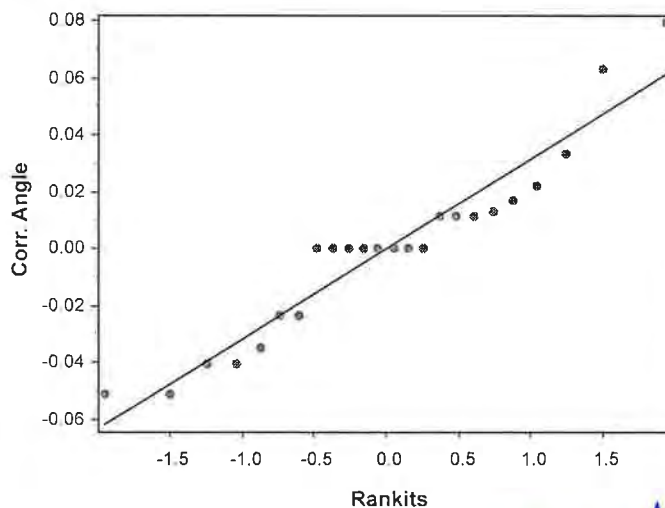
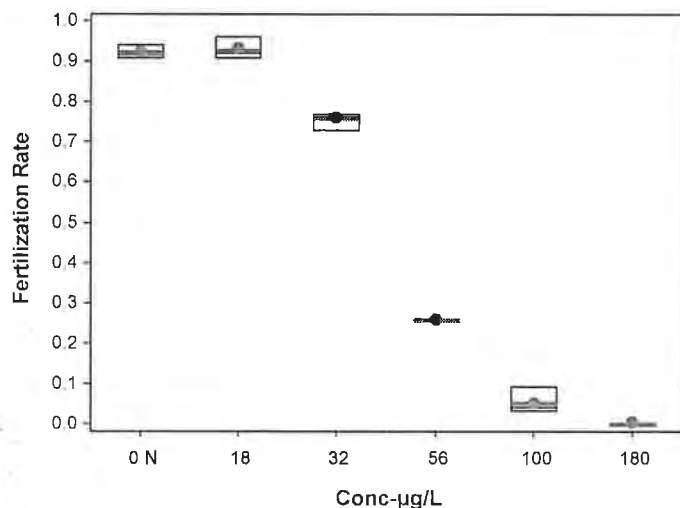
### Angular (Corrected) Transformed Detail

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.2660	1.2660	1.3230	1.3030
18		1.3690	1.2660	1.3230	1.2660
32		1.0710	1.0240	1.0710	1.0710
56		0.5351	0.5351	0.5351	0.5351
100		0.1741	0.2475	0.3047	0.1741
180		0.0500	0.0500	0.0500	0.0500

### Fertilization Rate Binomials

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	91/100	91/100	94/100	93/100
18		96/100	91/100	94/100	91/100
32		77/100	73/100	77/100	77/100
56		26/100	26/100	26/100	26/100
100		3/100	6/100	9/100	3/100
180		0/100	0/100	0/100	0/100

### Graphics



## CETIS Analytical Report

Report Date: 14 Dec-23 13:36 (p 1 of 2)

Test Code/ID: URC111623 / 17-4700-8723

Purple Sea Urchin Sperm Cell Fertilization Test				Aquatic Bioassay & Consulting Labs, Inc.			
Analysis ID:	05-3513-4937	Endpoint:	Fertilization Rate	CETIS Version:	CETISv2.1.4		
Analyzed:	12 Dec-23 13:17	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1		
Edit Date:	12 Dec-23 13:15	MD5 Hash:	85FCD72F309FA69BAAF55BD700763E92	Editor ID:	006-853-889-6		
Batch ID:	02-6796-4617	Test Type:	Fertilization	Analyst:			
Start Date:	16 Nov-23 14:23	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater		
Ending Date:	16 Nov-23 15:03	Species:	Strongylocentrotus purpuratus	Brine:	Not Applicable		
Test Length:	40m	Taxon:	Echinoidea	Source:	Ventura Dive	Age:	
Sample ID:	09-8209-1585	Code:	URC111623	Project:			
Sample Date:	16 Nov-23 14:23	Material:	Copper chloride	Source:	Reference Toxicant		
Receipt Date:		CAS (PC):		Station:	REF TOX		
Sample Age:	---	Client:	Internal Lab				

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

## TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.9225	0.7	<<	Yes	Passes Criteria

## Point Estimates

Level	µg/L	95% LCL	95% UCL
EC15	29.7	27.28	31.59
EC20	32.91	30.96	34.01
EC25	35.14	33.52	36.14
EC40	41.8	40.69	42.53
EC50	46.25	45.45	46.79

## Fertilization Rate Summary

## Calculated Variate(A/B)

## Isotonic Variate

Conc-µg/L	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	N	4	0.9225	0.9167	0.9100	0.9400	1.63%	0.00%	369/400	0.9262	0.00%
18		4	0.9300	0.9200	0.9100	0.9600	2.63%	-0.81%	372/400	0.9262	0.00%
32		4	0.7600	0.7700	0.7300	0.7700	2.63%	17.62%	304/400	0.7600	17.94%
56		4	0.2600	0.2600	0.2600	0.2600	0.00%	71.82%	104/400	0.2600	71.93%
100		4	0.0525	0.0400	0.0300	0.0900	54.71%	94.31%	21/400	0.0525	94.33%
180		4	0.0000	0.0000	0.0000	0.0000	---	100.00%	0/400	0.0000	100.00%

## Fertilization Rate Detail

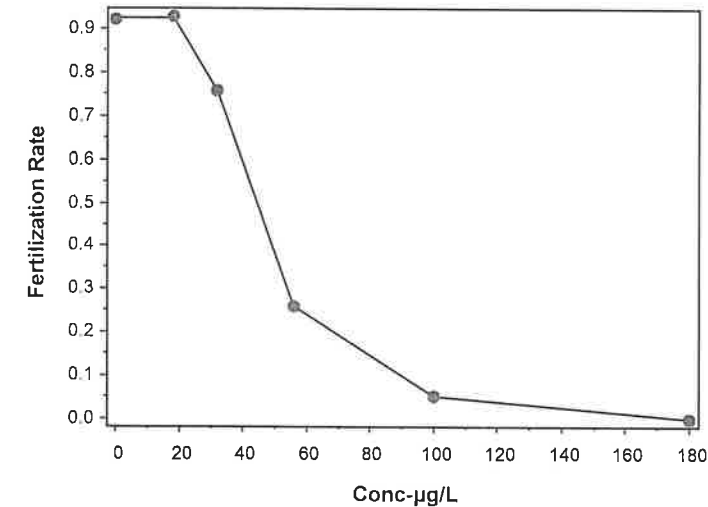
Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.9100	0.9100	0.9400	0.9300
18		0.9600	0.9100	0.9400	0.9100
32		0.7700	0.7300	0.7700	0.7700
56		0.2600	0.2600	0.2600	0.2600
100		0.0300	0.0600	0.0900	0.0300
180		0.0000	0.0000	0.0000	0.0000

## Fertilization Rate Binomials

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	91/100	91/100	94/100	93/100
18		96/100	91/100	94/100	91/100
32		77/100	73/100	77/100	77/100
56		26/100	26/100	26/100	26/100
100		3/100	6/100	9/100	3/100
180		0/100	0/100	0/100	0/100

Purple Sea Urchin Sperm Cell Fertilization Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID:	05-3513-4937	Endpoint:	Fertilization Rate	CETIS Version: CETISv2.1.4
Analyzed:	12 Dec-23 13:17	Analysis:	Linear Interpolation (ICPIN)	Status Level: 1
Edit Date:	12 Dec-23 13:15	MD5 Hash:	85FCD72F309FA69BAAF55BD700763E92	Editor ID: 006-853-889-6

Graphics



# CETIS Measurement Report

Report Date: 14 Dec-23 13:36 (p 1 of 1)

Test Code/ID: URC111623 / 17-4700-8723

## Purple Sea Urchin Sperm Cell Fertilization Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 02-6796-4617	Test Type: Fertilization	Analyst:
Start Date: 16 Nov-23 14:23	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 16 Nov-23 15:03	Species: Strongylocentrotus purpuratus	Brine: Not Applicable
Test Length: 40m	Taxon: Echinoidea	Source: Ventura Dive Age:
Sample ID: 09-8209-1585	Code: URC111623	Project:
Sample Date: 16 Nov-23 14:23	Material: Copper chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: Internal Lab	

## Parameter Acceptability Criteria

Parameter	TAC Limits				Overlap	Decision
	Min	Max	Lower	Upper		
Salinity	34	34	32	36	Yes	Passes Criteria
Temperature	15.7	15.7	11	13	Yes	Above Criteria

## Dissolved Oxygen-mg/L

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	7.1	7.086	7.114	7.1	7.1	0	0	0.00%	0
18		2	7.1	7.086	7.114	7.1	7.1	0	0	0.00%	0
32		2	7.2	7.188	7.212	7.2	7.2	0	0	0.00%	0
56		2	7.2	7.188	7.212	7.2	7.2	0	0	0.00%	0
100		2	7.3	7.283	7.317	7.3	7.3	0	0	0.00%	0
180		2	7.2	7.188	7.212	7.2	7.2	0	0	0.00%	0
Overall		12	7.183	7.138	7.229	7.1	7.3	0.02072	0.07177	1.00%	0 (0%)

## pH-Units

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
18		2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
32		2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
56		2	8	8	8	8	8	0	0	0.00%	0
100		2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
180		2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
Overall		12	7.917	7.892	7.941	7.9	8	0.01124	0.03892	0.49%	0 (0%)

## Salinity-ppt

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	34	34	34	34	34	0	0	0.00%	0
18		2	34	34	34	34	34	0	0	0.00%	0
32		2	34	34	34	34	34	0	0	0.00%	0
56		2	34	34	34	34	34	0	0	0.00%	0
100		2	34	34	34	34	34	0	0	0.00%	0
180		2	34	34	34	34	34	0	0	0.00%	0
Overall		12	34	34	34	34	34	0	0	0.00%	0 (0%)

## Temperature-°C

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	15.7	15.68	15.72	15.7	15.7	0	0	0.00%	0
18		2	15.7	15.68	15.72	15.7	15.7	0	0	0.00%	0
32		2	15.7	15.68	15.72	15.7	15.7	0	0	0.00%	0
56		2	15.7	15.68	15.72	15.7	15.7	0	0	0.00%	0
100		2	15.7	15.68	15.72	15.7	15.7	0	0	0.00%	0
180		2	15.7	15.68	15.72	15.7	15.7	0	0	0.00%	0
Overall		12	15.7	15.7	15.7	15.7	15.7	0	0	0.00%	0 (0%)

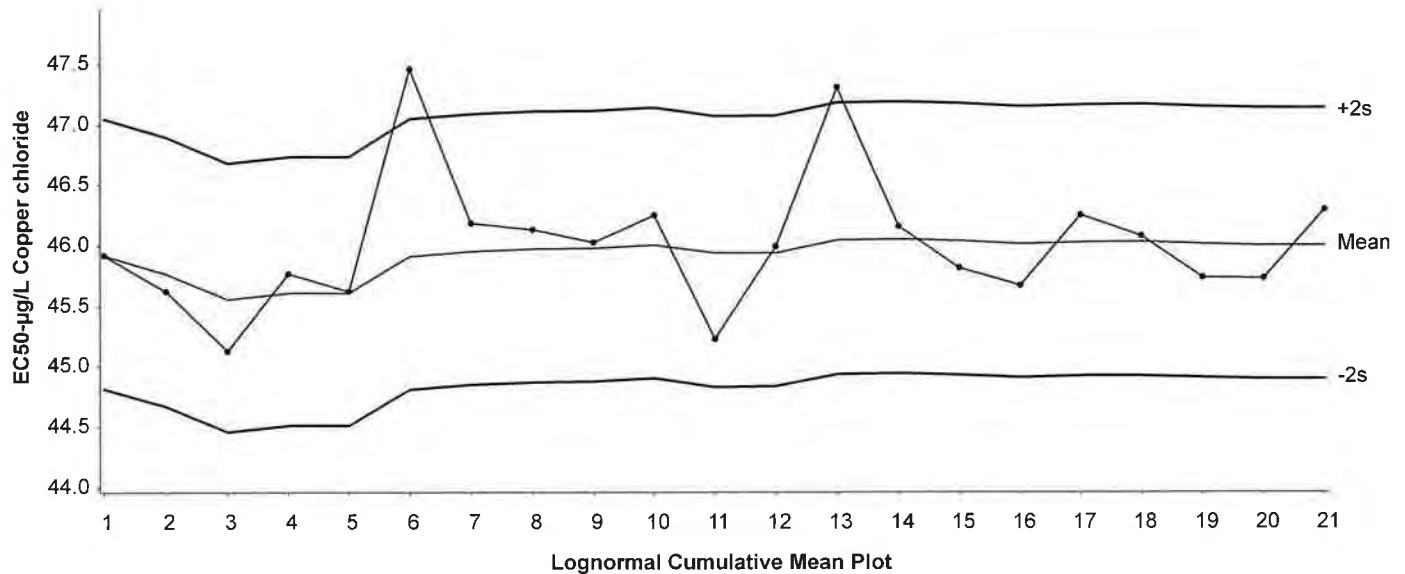
## Purple Sea Urchin Sperm Cell Fertilization Test

Aquatic Bioassay &amp; Consulting Labs, Inc.

Test Type: Fertilization  
Protocol: EPA/600/R-95/136 (1995)

Organism: Strongylocentrotus purpuratus  
Endpoint: Fertilization Rate

Material: Copper chloride  
Source: Reference Toxicant-REF

Purple Sea Urchin Sperm Cell Fertilization Test  
Fertilization Rate Endpoint

## Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2023	Aug	29	17:00	45.92	-0.0965	-0.1724			08-3063-6831	14-8099-4742
2		Sep	7	15:00	45.62	-0.3956	-0.709			15-6841-6431	14-5836-8083
3			12	15:00	45.12	-0.8915	-1.606			15-9455-2428	20-9071-2532
4			21	16:00	45.77	-0.2465	-0.441			05-6582-9376	12-8417-5511
5			26	17:00	45.62	-0.3933	-0.7048			17-3561-3322	07-2839-5387
6		Oct	3	15:00	47.46	1.445	2.539		(+)	19-8843-3290	13-9451-4391
7			5	16:28	46.19	0.1707	0.304			01-0812-8693	10-8801-0792
8			11	14:26	46.13	0.1135	0.2023			03-6004-3535	08-1124-4309
9			12	16:20	46.03	0.01248	0.02227			03-5759-4625	18-8846-7519
10			17	16:24	46.25	0.2335	0.4156			19-8301-1578	08-8883-2294
11			24	13:00	45.23	-0.7879	-1.418			08-7599-4842	18-5227-0974
12			25	17:00	45.99	-0.0264	-0.04712			09-2300-7416	11-9681-9717
13			25	17:20	47.31	1.29	2.269		(+)	10-1784-7526	06-6880-9839
14		Nov	2	16:20	46.16	0.1435	0.2556			12-4808-1614	13-4205-8029
15			8	16:00	45.81	-0.2019	-0.361			01-1936-9647	09-4788-7902
16			15	16:20	45.67	-0.3482	-0.6236			03-0532-0512	07-8930-6545
17			16	14:23	46.25	0.2335	0.4156			17-4700-8723	05-3513-4937
18			17	9:00	46.08	0.05933	0.1058			08-0040-6481	12-9680-6612
19		Dec	5	16:00	45.74	-0.2812	-0.5033			06-6952-8328	00-2105-8747
20			23	12:00	45.73	-0.2897	-0.5185			03-1103-0786	16-5248-5004
21			23	12:00	46.3	0.2794	0.497			04-6706-3720	19-0265-8315

**Aquatic Bioassay & Consulting Labs, Inc.**

**Material:** Copper chloride  
**Source:** Reference Toxicant-REF



Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2023	Aug	29	17:00	34.64	-0.3128	-0.8159			08-3063-6831	14-8099-4742
2		Sep	7	15:00	35.03	0.07558	0.196			15-6841-6431	14-5836-8083
3			12	15:00	34.26	-0.6884	-1.805			15-9455-2428	20-9071-2532
4			21	16:00	34.54	-0.4178	-1.091			05-6582-9376	12-8417-5511
5			26	17:00	34.81	-0.1413	-0.3675			17-3561-3322	07-2839-5387
6		Oct	3	15:00	35.15	0.1955	0.5061			19-8843-3290	13-9451-4391
7	5		16:28	35.19	0.2393	0.6191			01-0812-8693	10-8801-0792	
8	11		14:26	34.96	0.00215	0.005577			03-6004-3535	08-1124-4309	
9			12	16:20	35.3	0.3515	0.908			03-5759-4625	18-8846-7519
10			17	16:24	35.14	0.1822	0.4717			19-8301-1578	08-8883-2294
11			24	13:00	34.47	-0.4814	-1.259			08-7599-4842	18-5227-0974
12			25	17:00	34.93	-0.02711	-0.0704			09-2300-7416	11-9681-9717
13			25	17:20	35.98	1.027	2.627		(+)	10-1784-7526	06-6880-9839
14		Nov	2	16:20	35	0.04715	0.1223			12-4808-1614	13-4205-8029
15			8	16:00	34.93	-0.02602	-0.06758			01-1936-9647	09-4788-7902
16			15	16:20	34.71	-0.2455	-0.6397		03-0532-0512	07-8930-6545	
17			16	14:23	35.14	0.1822	0.4717			17-4700-8723	05-3513-4937
18			17	9:00	35.48	0.5306	1.367			08-0040-6481	12-9680-6612
19		Dec	5	16:00	34.6	-0.3499	-0.913			06-6952-8328	00-2105-8747
20			23	12:00	34.8	-0.1577	-0.4104			03-1103-0786	16-5248-5004
21			23	12:00	34.4	-0.5498	-1.439			04-6706-3720	19-0265-8315



## CHRONIC TOPSMELT SURVIVAL AND GROWTH BIOASSAY

DATE: 17 November - 2023

STANDARD TOXICANT: Copper Chloride

ENDPOINT: SURVIVAL

NOEC = 100.00 ug/l

EC25 = 152.10 ug/l

EC50 = 208.30 ug/l

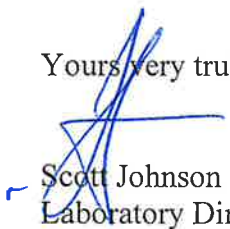
ENDPOINT: GROWTH

NOEC = 100.00 ug/l

IC25 = 131.80 ug/l

IC50 = 176.50 ug/l

Yours very truly,

  
Scott Johnson  
Laboratory Director

\*34ppt

# CETIS Summary Report

Report Date: 14 Dec-23 12:00 (p 1 of 2)

Test Code/ID: TOPS111723 / 19-2377-5181

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 06-2449-1312	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 15:38	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 24 Nov-23 15:10	Species: Atherinops affinis	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age:
Sample ID: 17-9005-2423	Code: TOPS111723	Project: REF TOX
Sample Date: 17 Nov-23 15:38	Material: Copper chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: Internal Lab	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	S
20-0665-9079	7d Survival Rate	Steel Many-One Rank Sum Test	✓	100	180	134.2	13.8%	1
12-5583-7468	Mean Dry Biomass-mg	Steel Many-One Rank Sum Test	✓	100	180	134.2	22.8%	1

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓	Level	µg/L	95% LCL	95% UCL	S
18-6025-6643	7d Survival Rate	Linear Interpolation (ICPIN)	✓	EC15	131.3	117.4	152	1
				EC20	141.7	126.1	171.4	
				EC25	152.1	133.1	189.2	
				EC40	184	155.1	220	
				EC50	208.3	171.7	237.9	
02-3393-6623	Mean Dry Biomass-mg	Linear Interpolation (ICPIN)	✓	IC15	114	69.46	137.2	1
				IC20	122.9	79.16	151.1	
				IC25	131.8	93.47	165.6	
				IC40	158.6	133.8	208.3	
				IC50	176.5	148.7	245	

## Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits			Decision
				Lower	Upper	Overlap	
18-6025-6643	7d Survival Rate	Control Resp	0.96	0.8	<<	Yes	Passes Criteria
20-0665-9079	7d Survival Rate	Control Resp	0.96	0.8	<<	Yes	Passes Criteria
02-3393-6623	Mean Dry Biomass-mg	Control Resp	1.431	0.85	<<	Yes	Passes Criteria
12-5583-7468	Mean Dry Biomass-mg	Control Resp	1.431	0.85	<<	Yes	Passes Criteria
20-0665-9079	7d Survival Rate	PMSD	0.1377	<<	0.25	No	Passes Criteria

## 7d Survival Rate Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	0.9600	0.8489	1.0710	0.8000	1.0000	0.0400	0.0894	9.32%	0.00%
56		5	0.9600	0.8489	1.0710	0.8000	1.0000	0.0400	0.0894	9.32%	0.00%
100		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-4.17%
180		5	0.6000	0.4244	0.7756	0.4000	0.8000	0.0633	0.1414	23.57%	37.50%
320		5	0.0400	-0.0711	0.1511	0.0000	0.2000	0.0400	0.0894	223.61%	95.83%
560		5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	---	100.00%

## Mean Dry Biomass-mg Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	1.431	1.404	1.459	1.404	1.462	0.009952	0.02225	1.55%	0.00%
56		5	1.431	1.391	1.471	1.408	1.488	0.01449	0.03239	2.26%	0.00%
100		5	1.329	1.019	1.638	0.884	1.472	0.1115	0.2494	18.77%	7.15%
180		5	0.6872	0.3346	1.04	0.436	1.13	0.127	0.284	41.33%	51.98%
320		5	0.1464	-0.2601	0.5529	0	0.732	0.1464	0.3274	223.61%	89.77%
560		5	0	0	0	0	0	0	0	---	100.00%

# CETIS Summary Report

Report Date: 14 Dec-23 12:00 (p 2 of 2)  
 Test Code/ID: TOPS111723 / 19-2377-5181

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

### 7d Survival Rate Detail

MD5: AF304C1CE7269CFED908B04D9D6C846D

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	0.8000	1.0000	1.0000	1.0000
56		0.8000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000
180		0.6000	0.4000	0.6000	0.8000	0.6000
320		0.0000	0.0000	0.0000	0.2000	0.0000
560		0.0000	0.0000	0.0000	0.0000	0.0000

### Mean Dry Biomass-mg Detail

MD5: 548D68CC807306EC9C089AF6A7B7F7C3

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.442	1.462	1.43	1.418	1.404
56		1.424	1.408	1.422	1.488	1.414
100		0.884	1.434	1.426	1.472	1.428
180		0.784	0.436	0.464	1.13	0.622
320		0	0	0	0.732	0
560		0	0	0	0	0

### 7d Survival Rate Binomials

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	5/5	4/5	5/5	5/5	5/5
56		4/5	5/5	5/5	5/5	5/5
100		5/5	5/5	5/5	5/5	5/5
180		3/5	2/5	3/5	4/5	3/5
320		0/5	0/5	0/5	1/5	0/5
560		0/5	0/5	0/5	0/5	0/5

## CETIS Analytical Report

Report Date: 14 Dec-23 12:00 (p 1 of 3)  
 Test Code/ID: TOPS111723 / 19-2377-5181

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay &amp; Consulting Labs, Inc.

Analysis ID: 20-0665-9079	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 11:58	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 14 Dec-23 11:57	MD5 Hash: AF304C1CE7269CFED908B04D9D6C846	Editor ID: 009-702-627-3
Batch ID: 06-2449-1312	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 15:38	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 24 Nov-23 15:10	Species: Atherinops affinis	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age:
Sample ID: 17-9005-2423	Code: TOPS111723	Project: REF TOX
Sample Date: 17 Nov-23 15:38	Material: Copper chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: Internal Lab	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	100	180	134.2	---	0.1322	13.77%

## Steel Many-One Rank Sum Test

Control	vs	Conc-µg/L	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Negative Control		56	8	27.5	17	2	CDF	0.8000	Non-Significant Effect
		100	8	30	17	1	CDF	0.9275	Non-Significant Effect
		180*	8	15.5	17	1	CDF	0.0211	Significant Effect
		320*	8	15	17	0	CDF	0.0158	Significant Effect

## Test Acceptability Criteria

## TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.96	0.8	<<	Yes	Passes Criteria
PMSD	0.1377	<<	0.25	No	Passes Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.17343	1.04336	4	92.56	<1.0E-05	Significant Effect
Error	0.225439	0.0112719	20			
Total	4.39887		24			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
	Levene Equality of Variance Test	1.257	4.431	0.3193	Equal Variances
	Mod Levene Equality of Variance Test	0.4899	4.893	0.7432	Equal Variances
Distribution	Anderson-Darling A2 Test	1.645	3.878	<1.0E-05	Non-Normal Distribution
	D'Agostino Kurtosis Test	1.499	2.576	0.1339	Normal Distribution
	D'Agostino Skewness Test	0.5553	2.576	0.5787	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	2.555	9.21	0.2788	Normal Distribution
	Kolmogorov-Smirnov D Test	0.2316	0.2018	0.0013	Non-Normal Distribution
	Shapiro-Wilk W Normality Test	0.8716	0.8877	0.0047	Non-Normal Distribution

## 7d Survival Rate Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	0.9600	0.8489	1.0000	1.0000	0.8000	1.0000	0.0400	9.32%	0.00%
56		5	0.9600	0.8489	1.0000	1.0000	0.8000	1.0000	0.0400	9.32%	0.00%
100		5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-4.17%
180		5	0.6000	0.4244	0.7756	0.6000	0.4000	0.8000	0.0633	23.57%	37.50%
320		5	0.0400	0.0000	0.1511	0.0000	0.0000	0.2000	0.0400	223.61%	95.83%
560		5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	---	100.00%

# CETIS Analytical Report

Report Date: 14 Dec-23 12:00 (p 2 of 3)  
Test Code/ID: TOPS111723 / 19-2377-5181

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 20-0665-9079 Endpoint: 7d Survival Rate CETIS Version: CETISv2.1.4  
Analyzed: 14 Dec-23 11:58 Analysis: Nonparametric-Control vs Treatments Status Level: 1  
Edit Date: 14 Dec-23 11:57 MD5 Hash: AF304C1CE7269CFED908B04D9D6C846 Editor ID: 009-702-627-3

### Angular (Corrected) Transformed Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.2980	1.1650	1.4300	1.3450	1.1070	1.3450	0.0476	8.21%	0.00%
56		5	1.2980	1.1650	1.4300	1.3450	1.1070	1.3450	0.0476	8.21%	0.00%
100		5	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	-3.67%
180		5	0.8900	0.7045	1.0760	0.8861	0.6847	1.1070	0.0668	16.79%	31.41%
320		5	0.2731	0.1409	0.4054	0.2255	0.2255	0.4636	0.0476	38.99%	78.95%
560		5	0.2255	0.2255	0.2256	0.2255	0.2255	0.2255	0.0000	0.00%	82.62%

### 7d Survival Rate Detail

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	0.8000	1.0000	1.0000	1.0000
56		0.8000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000
180		0.6000	0.4000	0.6000	0.8000	0.6000
320		0.0000	0.0000	0.0000	0.2000	0.0000
560		0.0000	0.0000	0.0000	0.0000	0.0000

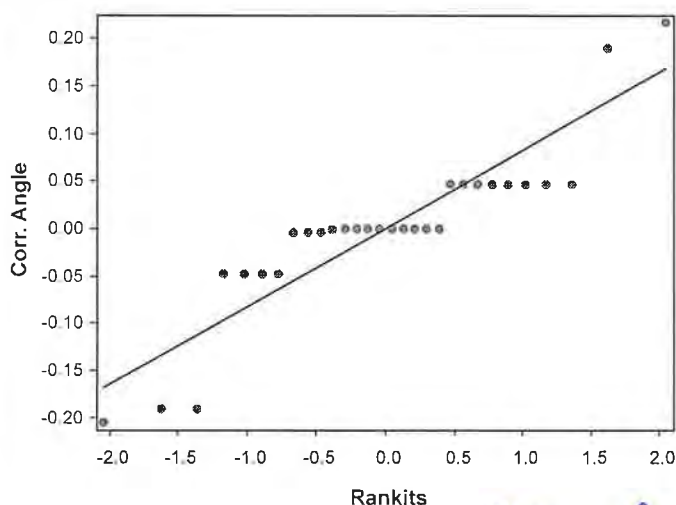
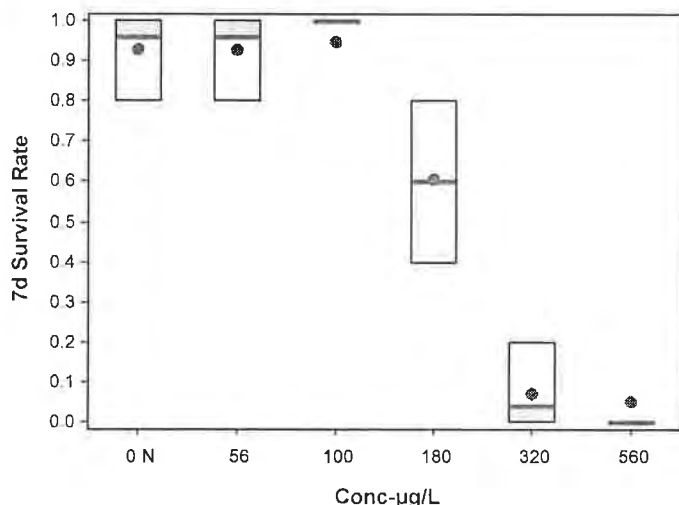
### Angular (Corrected) Transformed Detail

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.3450	1.1070	1.3450	1.3450	1.3450
56		1.1070	1.3450	1.3450	1.3450	1.3450
100		1.3450	1.3450	1.3450	1.3450	1.3450
180		0.8861	0.6847	0.8861	1.1070	0.8861
320		0.2255	0.2255	0.2255	0.4636	0.2255
560		0.2255	0.2255	0.2255	0.2255	0.2255

### 7d Survival Rate Binomials

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	5/5	4/5	5/5	5/5	5/5
56		4/5	5/5	5/5	5/5	5/5
100		5/5	5/5	5/5	5/5	5/5
180		3/5	2/5	3/5	4/5	3/5
320		0/5	0/5	0/5	1/5	0/5
560		0/5	0/5	0/5	0/5	0/5

### Graphics



# CETIS Analytical Report

Report Date: 14 Dec-23 12:00 (p 3 of 3)  
Test Code/ID: TOPS111723 / 19-2377-5181

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 12-5583-7468	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 11:58	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 14 Dec-23 11:57	MD5 Hash: 548D68CC807306EC9C089AF6A7B7F7C3	Editor ID: 009-702-627-3
Batch ID: 06-2449-1312	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 15:38	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 24 Nov-23 15:10	Species: Atherinops affinis	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age:
Sample ID: 17-9005-2423	Code: TOPS111723	Project: REF TOX
Sample Date: 17 Nov-23 15:38	Material: Copper chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: Internal Lab	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	100	180	134.2	---	0.3269	22.84%

## Steel Many-One Rank Sum Test

Control	vs	Conc-µg/L	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Negative Control		56	8	26	17	0	CDF	0.6824	Non-Significant Effect
		100	8	27	17	0	CDF	0.7639	Non-Significant Effect
		180*	8	15	17	0	CDF	0.0158	Significant Effect
		320*	8	15	17	0	CDF	0.0158	Significant Effect

## Test Acceptability Criteria

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1.431	0.85	<<	Yes	Passes Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6.53165	1.63291	4	32.46	<1.0E-05	Significant Effect
Error	1.00616	0.0503079	20			
Total	7.53781		24			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	25.64	13.28	3.7E-05	Unequal Variances
	Levene Equality of Variance Test	3.329	4.431	0.0304	Equal Variances
	Mod Levene Equality of Variance Test	0.8965	4.893	0.4903	Equal Variances
Distribution	Anderson-Darling A2 Test	1.111	3.878	0.0067	Non-Normal Distribution
	D'Agostino Kurtosis Test	2.214	2.576	0.0268	Normal Distribution
	D'Agostino Skewness Test	1.883	2.576	0.0597	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	8.446	9.21	0.0147	Normal Distribution
	Kolmogorov-Smirnov D Test	0.1837	0.2018	0.0292	Normal Distribution
	Shapiro-Wilk W Normality Test	0.9015	0.8877	0.0197	Normal Distribution

## Mean Dry Biomass-mg Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.431	1.404	1.459	1.43	1.404	1.462	0.009952	1.55%	0.00%
56		5	1.431	1.391	1.471	1.422	1.408	1.488	0.01449	2.26%	0.00%
100		5	1.329	1.019	1.638	1.428	0.884	1.472	0.1115	18.77%	7.15%
180		5	0.6872	0.3346	1.04	0.622	0.436	1.13	0.127	41.33%	51.98%
320		5	0.1464	-0.2601	0.5529	0	0	0.732	0.1464	223.61%	89.77%
560		5	0	0	0	0	0	0	0	---	100.00%

# CETIS Analytical Report

Report Date: 14 Dec-23 12:00 (p 4 of 3)  
Test Code/ID: TOPS111723 / 19-2377-5181

## Pacific Topsmelt 7-d Survival and Growth Test

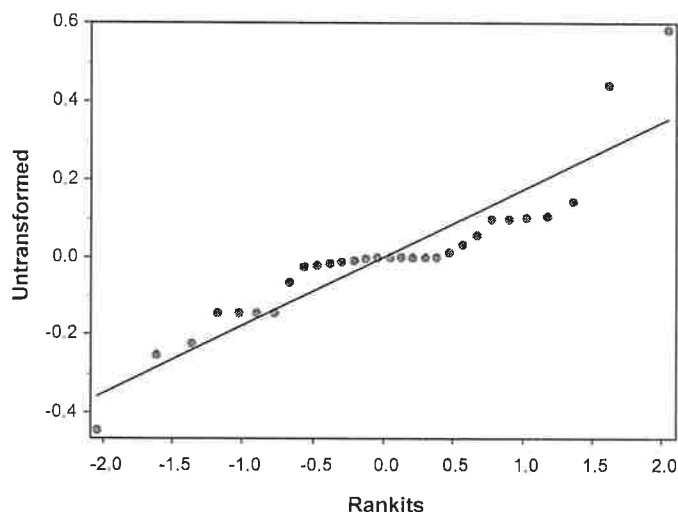
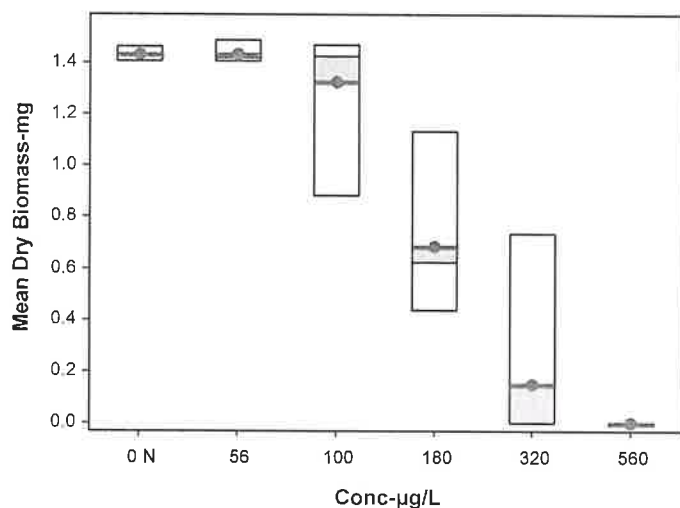
Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 12-5583-7468      Endpoint: Mean Dry Biomass-mg      CETIS Version: CETISv2.1.4  
Analyzed: 14 Dec-23 11:58      Analysis: Nonparametric-Control vs Treatments      Status Level: 1  
Edit Date: 14 Dec-23 11:57      MD5 Hash: 548D68CC807306EC9C089AF6A7B7F7C3      Editor ID: 009-702-627-3

### Mean Dry Biomass-mg Detail

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.442	1.462	1.43	1.418	1.404
56		1.424	1.408	1.422	1.488	1.414
100		0.884	1.434	1.426	1.472	1.428
180		0.784	0.436	0.464	1.13	0.622
320		0	0	0	0.732	0
560		0	0	0	0	0

### Graphics



## CETIS Analytical Report

Report Date: 14 Dec-23 12:00 (p 1 of 4)

Test Code/ID: TOPS111723 / 19-2377-5181

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay &amp; Consulting Labs, Inc.

Analysis ID:	18-6025-6643	Endpoint:	7d Survival Rate	CETIS Version:	CETISv2.1.4
Analyzed:	14 Dec-23 11:58	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1
Edit Date:	14 Dec-23 11:57	MD5 Hash:	AF304C1CE7269CFED908B04D9D6C846	Editor ID:	009-702-627-3

Batch ID:	06-2449-1312	Test Type:	Growth-Survival (7d)	Analyst:	
Start Date:	17 Nov-23 15:38	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	24 Nov-23 15:10	Species:	Atherinops affinis	Brine:	Not Applicable
Test Length:	7d	Taxon:	Actinopterygii	Source:	Aquatic Biosystems, CO
				Age:	

Sample ID:	17-9005-2423	Code:	TOPS111723	Project:	REF TOX
Sample Date:	17 Nov-23 15:38	Material:	Copper chloride	Source:	Reference Toxicant
Receipt Date:		CAS (PC):		Station:	REF TOX
Sample Age:	---	Client:	Internal Lab		

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

## TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.96	0.8	<<	Yes	Passes Criteria

## Point Estimates

Level	µg/L	95% LCL	95% UCL
EC15	131.3	117.4	152
EC20	141.7	126.1	171.4
EC25	152.1	133.1	189.2
EC40	184	155.1	220
EC50	208.3	171.7	237.9

## 7d Survival Rate Summary

## Calculated Variate(A/B)

## Isotonic Variate

Conc-µg/L	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	N	5	0.9600	1.0000	0.8000	1.0000	9.32%	0.00%	24/25	0.9733	0.00%
56		5	0.9600	1.0000	0.8000	1.0000	9.32%	0.00%	24/25	0.9733	0.00%
100		5	1.0000	1.0000	1.0000	1.0000	0.00%	-4.17%	25/25	0.9733	0.00%
180		5	0.6000	0.6000	0.4000	0.8000	23.57%	37.50%	15/25	0.6000	38.35%
320		5	0.0400	0.0000	0.0000	0.2000	223.61%	95.83%	1/25	0.0400	95.89%
560		5	0.0000	0.0000	0.0000	0.0000	---	100.00%	0/25	0.0000	100.00%

## 7d Survival Rate Detail

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	0.8000	1.0000	1.0000	1.0000
56		0.8000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000
180		0.6000	0.4000	0.6000	0.8000	0.6000
320		0.0000	0.0000	0.0000	0.2000	0.0000
560		0.0000	0.0000	0.0000	0.0000	0.0000

## 7d Survival Rate Binomials

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	5/5	4/5	5/5	5/5	5/5
56		4/5	5/5	5/5	5/5	5/5
100		5/5	5/5	5/5	5/5	5/5
180		3/5	2/5	3/5	4/5	3/5
320		0/5	0/5	0/5	1/5	0/5
560		0/5	0/5	0/5	0/5	0/5

# CETIS Analytical Report

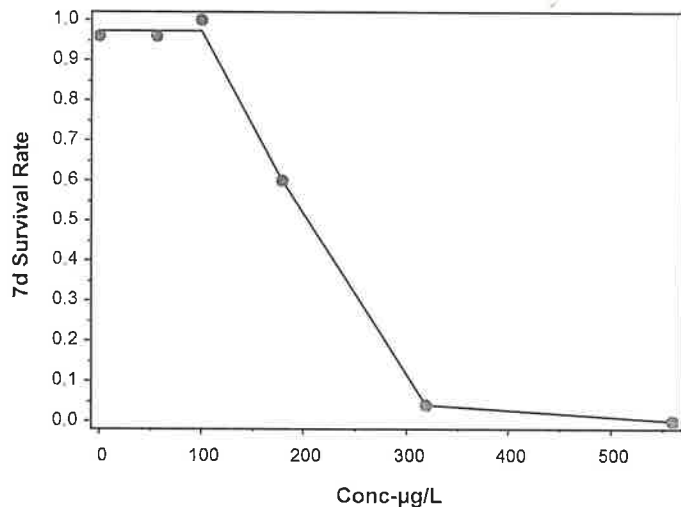
Report Date: 14 Dec-23 12:00 (p 2 of 4)  
Test Code/ID: TOPS111723 / 19-2377-5181

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 18-6025-6643	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 11:58	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 14 Dec-23 11:57	MD5 Hash: AF304C1CE7269CFED908B04D9D6C846	Editor ID: 009-702-627-3

### Graphics



# CETIS Analytical Report

Report Date: 14 Dec-23 12:00 (p 3 of 4)  
 Test Code/ID: TOPS111723 / 19-2377-5181

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 02-3393-6623	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 11:58	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 14 Dec-23 11:57	MD5 Hash: 548D68CC807306EC9C089AF6A7B7F7C3	Editor ID: 009-702-627-3
Batch ID: 06-2449-1312	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 15:38	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 24 Nov-23 15:10	Species: Atherinops affinis	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age:
Sample ID: 17-9005-2423	Code: TOPS111723	Project: REF TOX
Sample Date: 17 Nov-23 15:38	Material: Copper chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: Internal Lab	

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	2044549	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

		TAC Limits		Overlap	Decision
Attribute	Test Stat	Lower	Upper		
Control Resp	1.431	0.85	<<	Yes	Passes Criteria

## Point Estimates

Level	µg/L	95% LCL	95% UCL
IC15	114	69.46	137.2
IC20	122.9	79.16	151.1
IC25	131.8	93.47	165.6
IC40	158.6	133.8	208.3
IC50	176.5	148.7	245

## Mean Dry Biomass-mg Summary

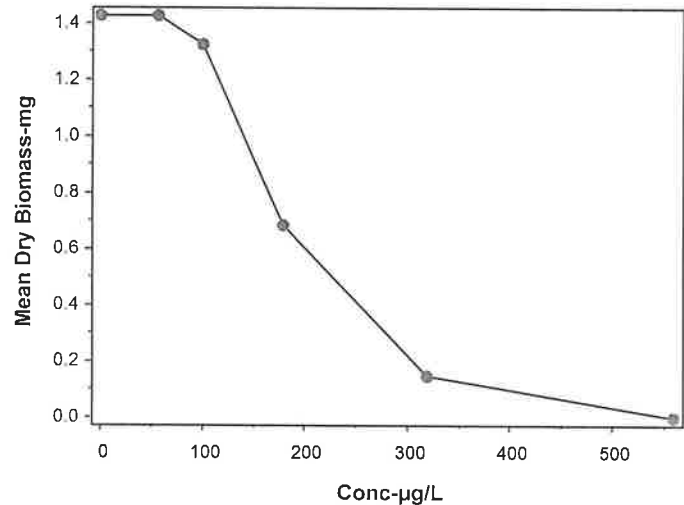
			Calculated Variate						Isotonic Variate	
Conc-µg/L	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	N	5	1.431	1.43	1.404	1.462	1.55%	0.00%	1.431	0.00%
56		5	1.431	1.422	1.408	1.488	2.26%	0.00%	1.431	0.00%
100		5	1.329	1.428	0.884	1.472	18.77%	7.15%	1.329	7.13%
180		5	0.6872	0.622	0.436	1.13	41.33%	51.98%	0.6872	51.98%
320		5	0.1464	0	0	0.732	223.61%	89.77%	0.1464	89.77%
560		5	0	0	0	0	---	100.00%	0	100.00%

## Mean Dry Biomass-mg Detail

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.442	1.462	1.43	1.418	1.404
56		1.424	1.408	1.422	1.488	1.414
100		0.884	1.434	1.426	1.472	1.428
180		0.784	0.436	0.464	1.13	0.622
320		0	0	0	0.732	0
560		0	0	0	0	0

Pacific Topsmelt 7-d Survival and Growth Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID: 02-3393-6623	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4		
Analyzed: 14 Dec-23 11:58	Analysis: Linear Interpolation (ICPIN)	Status Level: 1		
Edit Date: 14 Dec-23 11:57	MD5 Hash: 548D68CC807306EC9C089AF6A7B7F7C3	Editor ID: 009-702-627-3		

Graphics



# CETIS Measurement Report

Report Date: 14 Dec-23 12:00 (p 1 of 1)  
Test Code/ID: TOPS111723 / 19-2377-5181

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 06-2449-1312	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 15:38	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 24 Nov-23 15:10	Species: Atherinops affinis	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age:
Sample ID: 17-9005-2423	Code: TOPS111723	Project: REF TOX
Sample Date: 17 Nov-23 15:38	Material: Copper chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: Internal Lab	

## Dissolved Oxygen-mg/L

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	7.325	7.069	7.581	6.7	7.7	0.03824	0.3059	4.18%	0
56		8	7.3	7.055	7.545	6.7	7.7	0.0366	0.2928	4.01%	0
100		8	7.262	7.018	7.507	6.6	7.5	0.03656	0.2925	4.03%	0
180		8	7.287	6.983	7.592	6.5	7.7	0.04553	0.3643	5.00%	0
320		8	7.287	6.983	7.592	6.5	7.7	0.04553	0.3643	5.00%	0
560		1	7.4	---	---	7.4	7.4	---	---	---	0
Overall		41	7.295	7.199	7.392	6.5	7.7	0.04775	0.3057	4.19%	0 (0%)

## pH-Units

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	7.888	7.858	7.917	7.8	7.9	0.004417	0.03533	0.45%	0
56		8	7.888	7.858	7.917	7.8	7.9	0.004417	0.03533	0.45%	0
100		8	7.875	7.836	7.914	7.8	7.9	0.005785	0.04628	0.59%	0
180		8	7.875	7.836	7.914	7.8	7.9	0.005785	0.04628	0.59%	0
320		8	7.875	7.836	7.914	7.8	7.9	0.005785	0.04628	0.59%	0
560		1	7.8	---	---	7.8	7.8	---	---	---	0
Overall		41	7.878	7.865	7.891	7.8	7.9	0.006545	0.04191	0.53%	0 (0%)

## Salinity-ppt

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	34	34	34	34	34	0	0	0.00%	0
56		8	34	34	34	34	34	0	0	0.00%	0
100		8	34	34	34	34	34	0	0	0.00%	0
180		8	34	34	34	34	34	0	0	0.00%	0
320		8	34	34	34	34	34	0	0	0.00%	0
560		1	34	---	---	34	34	---	---	---	0
Overall		41	34	34	34	34	34	0	0	0.00%	0 (0%)

## Temperature-°C

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	21	21	21	21	21	0	0	0.00%	0
56		8	21	21	21	21	21	0	0	0.00%	0
100		8	21	21	21	21	21	0	0	0.00%	0
180		8	21	21	21	21	21	0	0	0.00%	0
320		8	21	21	21	21	21	0	0	0.00%	0
560		1	21	---	---	21	21	---	---	---	0
Overall		41	21	21	21	21	21	0	0	0.00%	0 (0%)

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay &amp; Consulting Labs, Inc.

Test Type: Growth-Survival (7d)

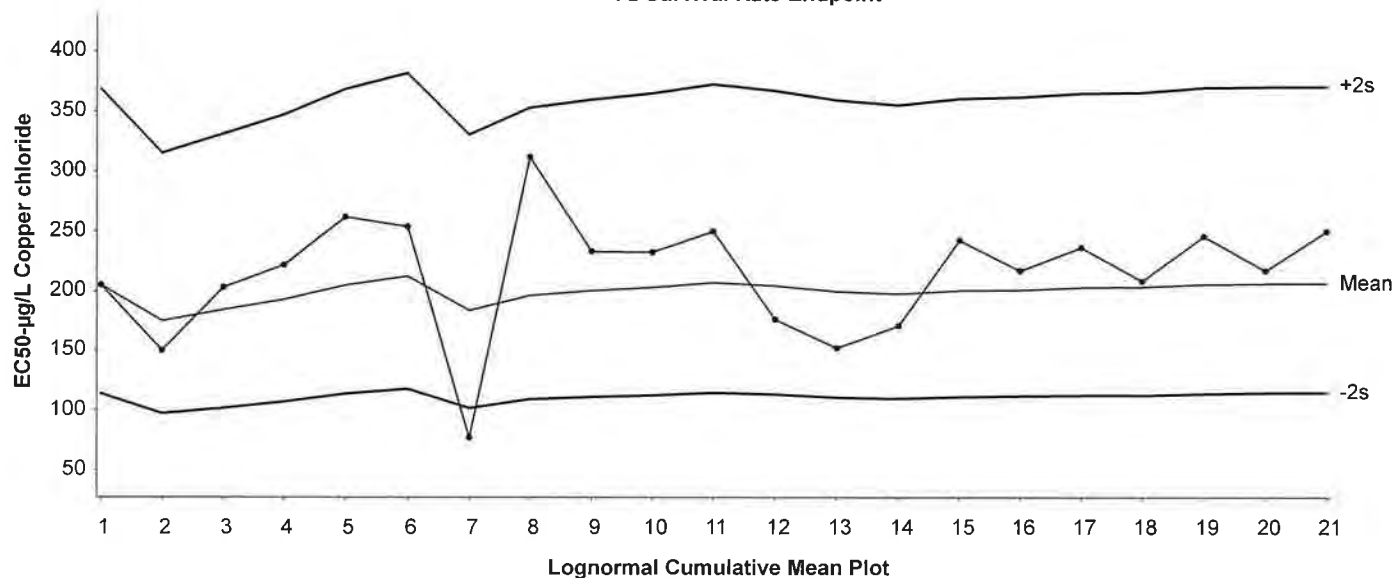
Organism: Atherinops affinis

Material: Copper chloride

Protocol: EPA/600/R-95/136 (1995)

Endpoint: 7d Survival Rate

Source: Reference Toxicant-REF

Pacific Topsmelt 7-d Survival and Growth Test  
7d Survival Rate Endpoint

Mean: 206.2

Count: 20

-2s Action Limit: 115

Sigma: NA

CV: 30.00%

+2s Action Limit: 371

## Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2023	May	12	11:14	204.9	-1.343	-0.02226			13-6002-6142	12-9304-3186
2		Jun	6	11:45	150	-56.23	-1.085			19-6903-9165	06-4698-1002
3		Jul	11	12:00	203.3	-2.898	-0.04824			03-5083-6556	12-8861-7377
4			25	15:00	222	15.77	0.2511			07-3893-3422	21-0068-7069
5		Aug	2	14:00	261.7	55.44	0.8114			15-6160-5570	06-5746-4737
6			15	14:30	253.5	47.27	0.7034			20-6308-1453	08-0913-7377
7			15	15:00	77.45	-128.8	-3.338		(-)	17-1957-3934	02-5957-0865
8			24	15:34	312.2	106	1.413			14-0954-0135	12-7595-9597
9			29	12:16	233.1	26.92	0.4181			08-0817-4353	08-1102-0363
10		Sep	12	11:53	232.5	26.27	0.4086			20-9484-2864	01-4198-3977
11			26	12:30	250	43.77	0.656			11-5823-5634	17-8097-7412
12		Oct	4	11:46	176.7	-29.56	-0.5274			20-3931-6197	13-1260-6110
13			10	11:52	152.6	-53.6	-1.026			19-8217-9815	04-6360-6307
14			17	12:00	170.8	-35.46	-0.6431			08-1731-1699	06-6669-8289
15			24	12:16	242.6	36.4	0.554			18-8541-2862	06-7541-3933
16		Nov	8	11:18	217.1	10.83	0.1744			19-8053-9354	09-6641-7236
17			14	15:30	236.7	30.44	0.4692			14-7944-9644	03-5198-9583
18			17	15:38	208.3	2.102	0.03456			19-2377-5181	18-6025-6643
19			28	14:45	246.1	39.88	0.6025			15-3512-7319	11-9237-1453
20		Dec	5	12:45	217.1	10.83	0.1744			14-0752-6324	09-9741-8756
21	2024	Jan	3	11:45	250	43.77	0.656			14-6510-8883	06-3400-0300

## Pacific Topsmelt 7-d Survival and Growth Test

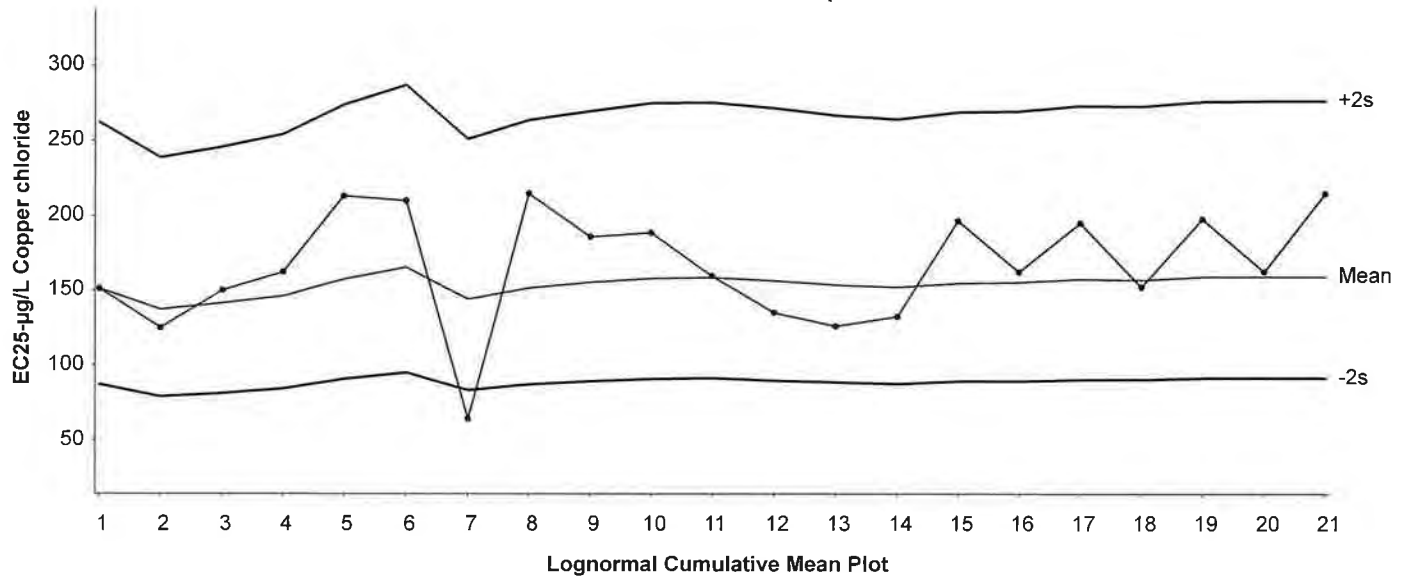
Aquatic Bioassay &amp; Consulting Labs, Inc.

Test Type: Growth-Survival (7d)  
Protocol: EPA/600/R-95/136 (1995)

Organism: Atherinops affinis  
Endpoint: 7d Survival Rate

Material: Copper chloride  
Source: Reference Toxicant-REF

Pacific Topsmelt 7-d Survival and Growth Test  
7d Survival Rate Endpoint



## Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2023	May	12	11:14	151	-8.14	-0.19			13-6002-6142	12-9304-3186
2		Jun	6	11:45	125	-34.17	-0.8747			19-6903-9165	06-4698-1002
3		Jul	11	12:00	150	-9.174	-0.2149			03-5083-6556	12-8861-7377
4			25	15:00	162.5	3.326	0.07484			07-3893-3422	21-0068-7069
5		Aug	2	14:00	213.1	53.88	1.055			15-6160-5570	06-5746-4737
6			15	14:30	209.8	50.58	0.9986			20-6308-1453	08-0913-7377
7			15	15:00	63.98	-95.2	-3.299		(-)	17-1957-3934	02-5957-0865
8			24	15:34	215	55.83	1.088			14-0954-0135	12-7595-9597
9			29	12:16	185.8	26.66	0.5604			08-0817-4353	08-1102-0363
10		Sep	12	11:53	188.8	29.58	0.6168			20-9484-2864	01-4198-3977
11			26	12:30	160	0.8257	0.01873			11-5823-5634	17-8097-7412
12		Oct	4	11:46	135	-24.17	-0.5962			20-3931-6197	13-1260-6110
13			10	11:52	126.3	-32.86	-0.8368			19-8217-9815	04-6360-6307
14			17	12:00	132.3	-26.87	-0.6691			08-1731-1699	06-6669-8289
15			24	12:16	196.6	37.4	0.7639			18-8541-2862	06-7541-3933
16		Nov	8	11:18	162.5	3.326	0.07484			19-8053-9354	09-6641-7236
17			14	15:30	195	35.83	0.7347			14-7944-9644	03-5198-9583
18			17	15:38	152.1	-7.031	-0.1635			19-2377-5181	18-6025-6643
19			28	14:45	197.5	38.33	0.7808			15-3512-7319	11-9237-1453
20		Dec	5	12:45	162.5	3.326	0.07484			14-0752-6324	09-9741-8756
21	2024	Jan	3	11:45	215	55.83	1.088			14-6510-8883	06-3400-0300

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay &amp; Consulting Labs, Inc.

Test Type: Growth-Survival (7d)

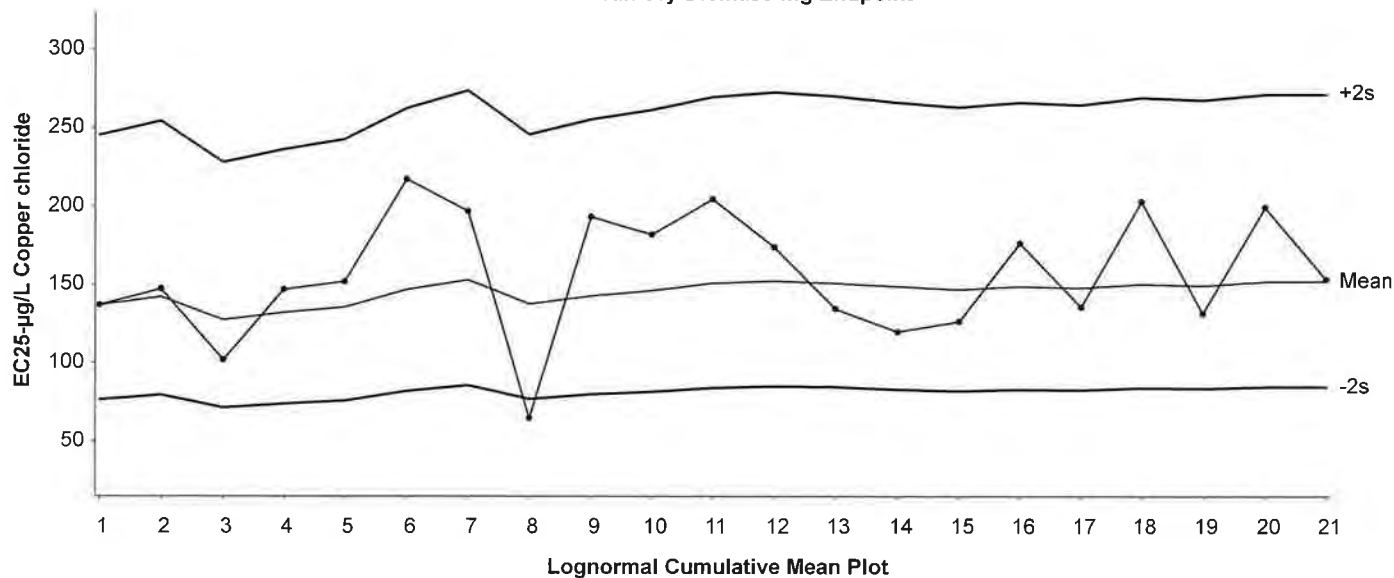
Organism: Atherinops affinis

Material: Copper chloride

Protocol: EPA/600/R-95/136 (1995)

Endpoint: Mean Dry Biomass-mg

Source: Reference Toxicant-REF

Pacific Topsmelt 7-d Survival and Growth Test  
Mean Dry Biomass-mg Endpoint

## Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2023	May	9	13:00	137.1	-14.8	-0.3525			03-9684-0887	03-3492-8153
2			12	11:14	147.6	-4.248	-0.09753			13-6002-6142	09-1765-9976
3		Jun	6	11:45	102.3	-49.58	-1.359			19-6903-9165	04-6596-5737
4		Jul	11	12:00	147.1	-4.789	-0.1101			03-5083-6556	04-8218-0636
5			25	15:00	151.9	-0.00642	-0.00015			07-3893-3422	07-4555-5373
6		Aug	2	14:00	217.3	65.47	1.232			15-6160-5570	04-7649-5254
7			15	14:30	197	45.18	0.8953			20-6308-1453	00-0271-5510
8			15	15:00	64.75	-87.12	-2.931		(-)	17-1957-3934	09-9630-8539
9			24	15:34	193.2	41.36	0.828			14-0954-0135	07-6180-0626
10			29	12:16	182.2	30.36	0.6266			08-0817-4353	16-3898-9585
11		Sep	12	11:53	204.9	53.03	1.03			20-9484-2864	01-7647-6381
12			26	12:30	173.8	21.9	0.4631			11-5823-5634	18-1550-4416
13		Oct	4	11:46	134.6	-17.3	-0.4156			20-3931-6197	07-2167-8587
14			10	11:52	120.1	-31.77	-0.8069			19-8217-9815	15-3349-3568
15			17	12:00	126.7	-25.13	-0.6217			08-1731-1699	20-8444-0697
16			24	12:16	176.8	24.9	0.5219			18-8541-2862	16-0654-2598
17		Nov	8	11:18	135.9	-15.96	-0.3816			19-8053-9354	08-6220-6203
18			14	15:30	203	51.09	0.9968			14-7944-9644	07-9639-9204
19			17	15:38	131.8	-20.02	-0.486			19-2377-5181	02-3393-6623
20			28	14:45	199.8	47.88	0.9421			15-3512-7319	03-8593-9110
21		Dec	5	12:45	153.5	1.665	0.03747			14-0752-6324	16-3628-1249

**Report Date:** 22 Jan-24 15:08 ( 1 of 1)

**Aquatic Bioassay & Consulting Labs, Inc.**

**Material:** Copper chloride  
**Source:** Reference Toxicant-REF



Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	
1	2023	May	9	13:00	174.5	-19.9	-0.3613			03-9684-0887	03-3492-8153	
2			12	11:14	199.3	4.892	0.08315			13-6002-6142	09-1765-9976	
3		Jun	6	11:45	134.2	-60.19	-1.24			19-6903-9165	04-6596-5737	
4			11	12:00	199.7	5.283	0.0897			03-5083-6556	04-8218-0636	
5			25	15:00	208.2	13.75	0.2287	(-)		07-3893-3422	07-4555-5373	
6			Aug	2	14:00	261.6	67.23			0.9936	15-6160-5570	04-7649-5254
7		15		14:30	243.2	48.78	0.7489			20-6308-1453	00-0271-5510	
8		15	15:00	77.47	-116.9	-3.078	17-1957-3934			09-9630-8539		
9			24	15:34	281.4	87.01	1.237			14-0954-0135	07-6180-0626	
10			29	12:16	230.2	35.81	0.5656			08-0817-4353	16-3898-9585	
11			Sep	12	11:53	243.3	48.85			0.7499	20-9484-2864	01-7647-6381
12				26	12:30	242.1	47.64			0.7333	11-5823-5634	18-1550-4416
13		Oct	4	11:46	170.8	-23.62	-0.4333			20-3931-6197	07-2167-8587	
14			10	11:52	149	-45.38	-0.8893			19-8217-9815	15-3349-3568	
15		17	12:00	154.1	-40.34	-0.7781	08-1731-1699			20-8444-0697		
16		24	12:16	229	34.6	0.548	18-8541-2862			16-0654-2598		
17		Nov	8	11:18	172.3	-22.16	-0.4048			19-8053-9354	08-6220-6203	
18			14	15:30	242	47.55	0.732			14-7944-9644	07-9639-9204	
19		17	15:38	176.5	-17.96	-0.3242	19-2377-5181			02-3393-6623		
20		28	14:45	245.1	50.72	0.7756	15-3512-7319			03-8593-9110		
21		Dec	5	12:45	209.3	14.87	0.2466			14-0752-6324	16-3628-1249	



**AQUATIC BIOASSAY**  
& CONSULTING LABORATORIES, INC.

## **CHRONIC FATHEAD MINNOW SURVIVAL AND GROWTH BIOASSAY**

DATE: 17 November 2023

STANDARD TOXICANT: Copper Chloride

ENDPOINT: SURVIVAL

NOEC = 38.00 ug/l

EC25 = 51.06 ug/l

EC50 = 67.38 ug/l

ENDPOINT: GROWTH

NOEC = 38.00 ug/l

IC25 = 48.63 ug/l

IC50 = 61.66 ug/l

Yours very truly,

Scott Johnson  
Laboratory Director

# CETIS Summary Report

Report Date: 14 Dec-23 10:02 (p 1 of 2)  
Test Code/ID: FML111723 / 17-0726-1937

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 13-4476-2326	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:01	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 13:50	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 18-6859-5636	Code: FML111723	Project: REF TOX
Sample Date: 17 Nov-23 14:01	Material: Copper chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: ABC Labs	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	S
12-0238-8871	7d Survival Rate	Steel Many-One Rank Sum Test	✓	38	75	53.39	11.9%	1
16-1936-3068	Mean Dry Biomass-mg	Dunnett Multiple Comparison Test	✓	38	75	53.39	13.9%	1

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓	Level	µg/L	95% LCL	95% UCL	S
14-0961-0371	7d Survival Rate	Linear Interpolation (ICPIN)	✓	EC15	44.53	38.76	49.4	1
				EC20	47.79	41.47	54.05	
				EC25	51.06	43.57	58.67	
				EC40	60.85	49.28	74.26	
				EC50	67.38	53.26	87.85	
06-0317-0204	Mean Dry Biomass-mg	Linear Interpolation (ICPIN)	✓	IC15	43.42	37.23	46.53	1
				IC20	46.03	40.45	49.2	
				IC25	48.63	43.64	52.09	
				IC40	56.45	50.85	61.21	
				IC50	61.66	55.36	67.65	

## Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
12-0238-8871	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
14-0961-0371	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
06-0317-0204	Mean Dry Biomass-mg	Control Resp	0.3483	0.25	<<	Yes	Passes Criteria
16-1936-3068	Mean Dry Biomass-mg	Control Resp	0.3483	0.25	<<	Yes	Passes Criteria
16-1936-3068	Mean Dry Biomass-mg	PMSD	0.1388	0.12	0.3	Yes	Passes Criteria

## 7d Survival Rate Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
10		4	0.9833	0.9303	1.0360	0.9333	1.0000	0.0167	0.0333	3.39%	1.67%
19		4	0.9667	0.9054	1.0280	0.9333	1.0000	0.0193	0.0385	3.98%	3.33%
38		4	0.9500	0.8484	1.0520	0.8667	1.0000	0.0319	0.0638	6.72%	5.00%
75		4	0.3833	0.0223	0.7444	0.0667	0.6000	0.1134	0.2269	59.19%	61.67%
150		4	0.0333	-0.0279	0.0946	0.0000	0.0667	0.0193	0.0385	115.47%	96.67%

## Mean Dry Biomass-mg Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	0.3483	0.3372	0.3595	0.3433	0.3587	0.003512	0.007024	2.02%	0.00%
10		4	0.3262	0.2703	0.3821	0.274	0.35	0.01756	0.03513	10.77%	6.36%
19		4	0.3482	0.32	0.3763	0.334	0.374	0.008842	0.01768	5.08%	0.05%
38		4	0.3323	0.2816	0.3831	0.286	0.3553	0.01596	0.03191	9.60%	4.59%
75		4	0.085	0.01141	0.1586	0.02267	0.1287	0.02312	0.04625	54.41%	75.60%
150		4	0.007667	-0.00735	0.02268	0	0.01933	0.004718	0.009436	123.08%	97.80%

# CETIS Summary Report

Report Date: 14 Dec-23 10:02 (p 2 of 2)  
Test Code/ID: FML111723 / 17-0726-1937

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

### 7d Survival Rate Detail

MD5: FA3CF5A7826EE900327089DCF719B200

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	1.0000	1.0000	1.0000
10		1.0000	1.0000	1.0000	0.9333
19		1.0000	0.9333	0.9333	1.0000
38		0.8667	0.9333	1.0000	1.0000
75		0.4667	0.0667	0.4000	0.6000
150		0.0667	0.0000	0.0667	0.0000

### Mean Dry Biomass-mg Detail

MD5: B9E2FF8C08E483773AAF20B695D98716

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.3467	0.3587	0.3433	0.3447
10		0.35	0.338	0.274	0.3427
19		0.334	0.3413	0.374	0.3433
38		0.286	0.3367	0.3553	0.3513
75		0.07933	0.02267	0.1287	0.1093
150		0.01933	0	0.01133	0

### 7d Survival Rate Binomials

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	15/15	15/15	15/15	15/15
10		15/15	15/15	15/15	14/15
19		15/15	14/15	14/15	15/15
38		13/15	14/15	15/15	15/15
75		7/15	1/15	6/15	9/15
150		1/15	0/15	1/15	0/15

# CETIS Analytical Report

Report Date: 14 Dec-23 10:02 (p 1 of 3).  
Test Code/ID: FML111723 / 17-0726-1937

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 12-0238-8871	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 10:01	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 14 Dec-23 9:59	MD5 Hash: FA3CF5A7826EE900327089DCF719B200	Editor ID: 009-702-627-3
Batch ID: 13-4476-2326	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:01	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 13:50	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 18-6859-5636	Code: FML111723	Project: REF TOX
Sample Date: 17 Nov-23 14:01	Material: Copper chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: ABC Labs	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	38	75	53.39	---	0.1189	11.89%

## Steel Many-One Rank Sum Test

Control	vs	Conc-µg/L	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Negative Control		10	6	16	10	1	CDF	0.6105	Non-Significant Effect
		19	6	14	10	1	CDF	0.3451	Non-Significant Effect
		38	6	14	10	1	CDF	0.3451	Non-Significant Effect
		75*	6	10	10	0	CDF	0.0417	Significant Effect
		150*	6	10	10	0	CDF	0.0417	Significant Effect

## Test Acceptability Criteria

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.8	<<	Yes	Passes Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	5.47	1.094	5	63.96	<1.0E-05	Significant Effect
Error	0.307873	0.0171041	18			
Total	5.77788		23			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
	Levene Equality of Variance Test	3.699	4.248	0.0177	Equal Variances
	Mod Levene Equality of Variance Test	1.771	4.248	0.1698	Equal Variances
Distribution	Anderson-Darling A2 Test	1.025	3.878	0.0109	Normal Distribution
	D'Agostino Kurtosis Test	2.893	2.576	0.0038	Non-Normal Distribution
	D'Agostino Skewness Test	2.673	2.576	0.0075	Non-Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	15.51	9.21	0.0004	Non-Normal Distribution
	Kolmogorov-Smirnov D Test	0.1667	0.2056	0.0833	Normal Distribution
	Shapiro-Wilk W Normality Test	0.8779	0.884	0.0075	Non-Normal Distribution

## 7d Survival Rate Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
10		4	0.9833	0.9303	1.0000	1.0000	0.9333	1.0000	0.0167	3.39%	1.67%
19		4	0.9667	0.9054	1.0000	0.9667	0.9333	1.0000	0.0192	3.98%	3.33%
38		4	0.9500	0.8484	1.0000	0.9778	0.8667	1.0000	0.0319	6.72%	5.00%
75		4	0.3833	0.0223	0.7444	0.4333	0.0667	0.6000	0.1134	59.19%	61.67%
150		4	0.0333	0.0000	0.0946	0.0333	0.0000	0.0667	0.0193	115.47%	96.67%

# CETIS Analytical Report

Report Date: 14 Dec-23 10:02 (p 2 of 3)  
Test Code/ID: FML111723 / 17-0726-1937

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 12-0238-8871 Endpoint: 7d Survival Rate CETIS Version: CETISv2.1.4  
Analyzed: 14 Dec-23 10:01 Analysis: Nonparametric-Control vs Treatments Status Level: 1  
Edit Date: 14 Dec-23 9:59 MD5 Hash: FA3CF5A7826EE900327089DCF719B200 Editor ID: 009-702-627-3

### Angular (Corrected) Transformed Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.4410	1.4410	1.4420	1.4410	1.4410	1.4410	0.0000	0.00%	0.00%
10		4	1.4080	1.3040	1.5130	1.4410	1.3100	1.4410	0.0329	4.68%	2.28%
19		4	1.3750	1.2540	1.4960	1.3750	1.3100	1.4410	0.0380	5.53%	4.57%
38		4	1.3470	1.1600	1.5350	1.3970	1.1970	1.4410	0.0589	8.75%	6.52%
75		4	0.6460	0.2166	1.0750	0.7184	0.2612	0.8861	0.1349	41.78%	55.18%
150		4	0.1953	0.0743	0.3163	0.1953	0.1295	0.2612	0.0380	38.93%	86.45%

### 7d Survival Rate Detail

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	1.0000	1.0000	1.0000
10		1.0000	1.0000	1.0000	0.9333
19		1.0000	0.9333	0.9333	1.0000
38		0.8667	0.9333	1.0000	1.0000
75		0.4667	0.0667	0.4000	0.6000
150		0.0667	0.0000	0.0667	0.0000

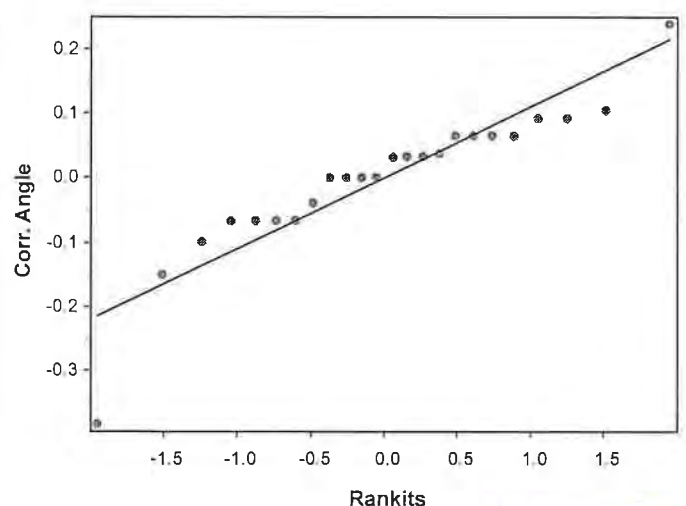
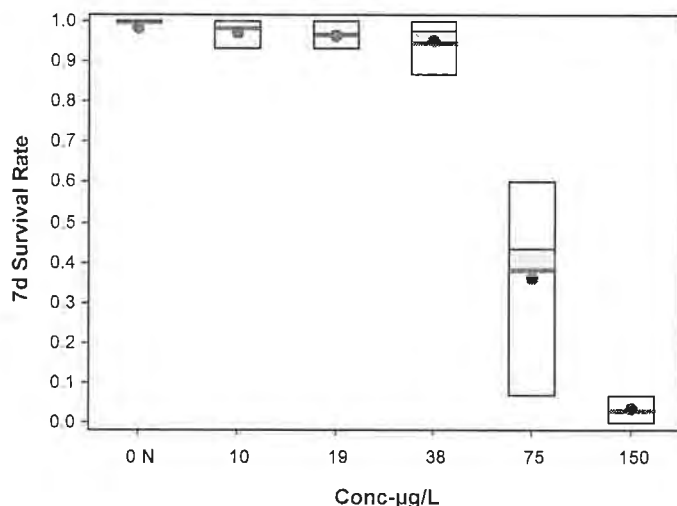
### Angular (Corrected) Transformed Detail

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.4410	1.4410	1.4410	1.4410
10		1.4410	1.4410	1.4410	1.3100
19		1.4410	1.3100	1.3100	1.4410
38		1.1970	1.3100	1.4410	1.4410
75		0.7520	0.2612	0.6847	0.8861
150		0.2612	0.1295	0.2612	0.1295

### 7d Survival Rate Binomials

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	15/15	15/15	15/15	15/15
10		15/15	15/15	15/15	14/15
19		15/15	14/15	14/15	15/15
38		13/15	14/15	15/15	15/15
75		7/15	1/15	6/15	9/15
150		1/15	0/15	1/15	0/15

### Graphics



# CETIS Analytical Report

Report Date: 14 Dec-23 10:02 (p 3 of 3)  
Test Code/ID: FML111723 / 17-0726-1937

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 16-1936-3068	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 10:01	Analysis: Parametric-Control vs Treatments	Status Level: 1
Edit Date: 14 Dec-23 9:59	MD5 Hash: B9E2FF8C08E483773AAF20B695D98716	Editor ID: 009-702-627-3
Batch ID: 13-4476-2326	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:01	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 13:50	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 18-6859-5636	Code: FML111723	Project: REF TOX
Sample Date: 17 Nov-23 14:01	Material: Copper chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: ABC Labs	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	38	75	53.39	---	0.04835	13.88%

## Dunnett Multiple Comparison Test

Control	vs	Conc-µg/L	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Negative Control		10	6	1.103	2.407	0.04835	CDF	0.3771	Non-Significant Effect
		19	6	0.008297	2.407	0.04835	CDF	0.8309	Non-Significant Effect
		38	6	0.7965	2.407	0.04835	CDF	0.5138	Non-Significant Effect
		75*	6	13.11	2.407	0.04835	CDF	2.7E-05	Significant Effect
		150*	6	16.96	2.407	0.04835	CDF	2.7E-05	Significant Effect

## Test Acceptability Criteria

		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.3483	0.25	<<	Yes	Passes Criteria
PMSD	0.1388	0.12	0.3	Yes	Passes Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.469521	0.0939042	5	116.4	<1.0E-05	Significant Effect
Error	0.0145269	0.0008070	18			
Total	0.484048		23			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	11.46	15.09	0.0430	Equal Variances
	Levene Equality of Variance Test	2.308	4.248	0.0872	Equal Variances
	Mod Levene Equality of Variance Test	1.135	4.248	0.3781	Equal Variances
Distribution	Anderson-Darling A2 Test	1.007	3.878	0.0120	Normal Distribution
	D'Agostino Kurtosis Test	1.289	2.576	0.1972	Normal Distribution
	D'Agostino Skewness Test	2.054	2.576	0.0400	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	5.88	9.21	0.0529	Normal Distribution
	Kolmogorov-Smirnov D Test	0.2135	0.2056	0.0061	Non-Normal Distribution
	Shapiro-Wilk W Normality Test	0.9047	0.884	0.0271	Normal Distribution

## Mean Dry Biomass-mg Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	0.3483	0.3372	0.3595	0.3457	0.3433	0.3587	0.003512	2.02%	0.00%
10		4	0.3262	0.2703	0.3821	0.3403	0.274	0.35	0.01756	10.77%	6.36%
19		4	0.3482	0.32	0.3763	0.3423	0.334	0.374	0.008842	5.08%	0.05%
38		4	0.3323	0.2816	0.3831	0.344	0.286	0.3553	0.01596	9.60%	4.59%
75		4	0.085	0.01141	0.1586	0.09433	0.02267	0.1287	0.02312	54.41%	75.60%
150		4	0.007667	-0.00735	0.02268	0.003778	0	0.01933	0.004718	123.08%	97.80%

Fathead Minnow 7-d Larval Survival and Growth Test

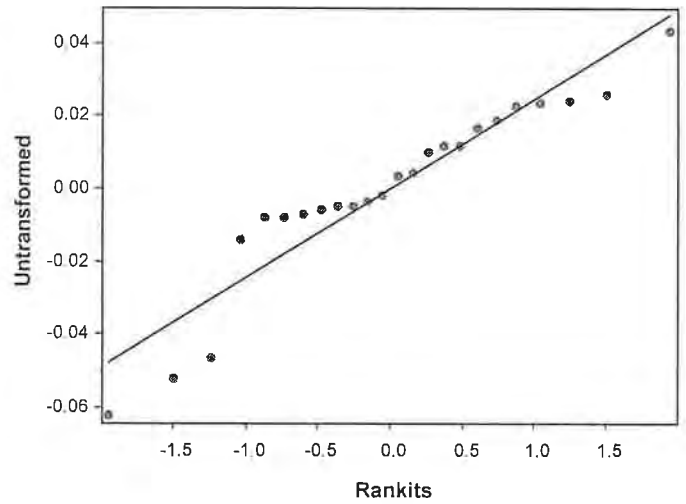
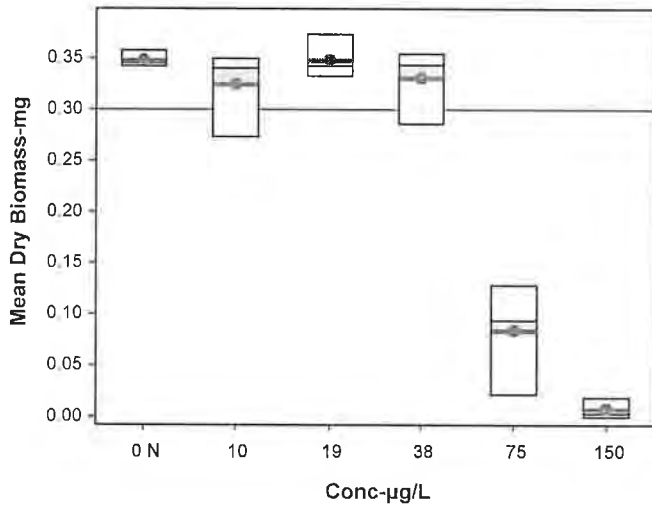
Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 16-1936-3068      Endpoint: Mean Dry Biomass-mg      CETIS Version: CETISv2.1.4  
 Analyzed: 14 Dec-23 10:01      Analysis: Parametric-Control vs Treatments      Status Level: 1  
 Edit Date: 14 Dec-23 9:59      MD5 Hash: B9E2FF8C08E483773AAF20B695D98716      Editor ID: 009-702-627-3

Mean Dry Biomass-mg Detail

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.3467	0.3587	0.3433	0.3447
10		0.35	0.338	0.274	0.3427
19		0.334	0.3413	0.374	0.3433
38		0.286	0.3367	0.3553	0.3513
75		0.07933	0.02267	0.1287	0.1093
150		0.01933	0	0.01133	0

Graphics



# CETIS Analytical Report

Report Date: 14 Dec-23 10:02 (p 1 of 4)  
Test Code/ID: FML111723 / 17-0726-1937

Fathead Minnow 7-d Larval Survival and Growth Test				Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID:	14-0961-0371	Endpoint:	7d Survival Rate	CETIS Version:	CETISv2.1.4
Analyzed:	14 Dec-23 10:01	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1
Edit Date:	14 Dec-23 9:59	MD5 Hash:	FA3CF5A7826EE900327089DCF719B200	Editor ID:	009-702-627-3
Batch ID:	13-4476-2326	Test Type:	Growth-Survival (7d)	Analyst:	
Start Date:	17 Nov-23 14:01	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water
Ending Date:	24 Nov-23 13:50	Species:	Pimephales promelas	Brine:	Not Applicable
Test Length:	7d	Taxon:	Actinopterygii	Source:	Aquatic Biosystems, CO      Age: <24
Sample ID:	18-6859-5636	Code:	FML111723	Project:	REF TOX
Sample Date:	17 Nov-23 14:01	Material:	Copper chloride	Source:	Reference Toxicant
Receipt Date:		CAS (PC):		Station:	REF TOX
Sample Age:	---	Client:	ABC Labs		

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Test Acceptability Criteria		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.8	<<	Yes	Passes Criteria

Point Estimates				
Level	µg/L	95% LCL	95% UCL	
EC15	44.53	38.76	49.4	
EC20	47.79	41.47	54.05	
EC25	51.06	43.57	58.67	
EC40	60.85	49.28	74.26	
EC50	67.38	53.26	87.85	

7d Survival Rate Summary				Calculated Variate(A/B)						Isotonic Variate	
Conc-µg/L	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	N	4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	60/60	1.0000	0.00%
10		4	0.9833	1.0000	0.9333	1.0000	3.39%	1.67%	59/60	0.9833	1.67%
19		4	0.9667	0.9667	0.9333	1.0000	3.98%	3.33%	58/60	0.9667	3.33%
38		4	0.9500	0.9778	0.8667	1.0000	6.72%	5.00%	57/60	0.9500	5.00%
75		4	0.3833	0.4333	0.0667	0.6000	59.19%	61.67%	23/60	0.3833	61.67%
150		4	0.0333	0.0333	0.0000	0.0667	115.47%	96.67%	2/60	0.0333	96.67%

7d Survival Rate Detail					
Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	1.0000	1.0000	1.0000
10		1.0000	1.0000	1.0000	0.9333
19		1.0000	0.9333	0.9333	1.0000
38		0.8667	0.9333	1.0000	1.0000
75		0.4667	0.0667	0.4000	0.6000
150		0.0667	0.0000	0.0667	0.0000

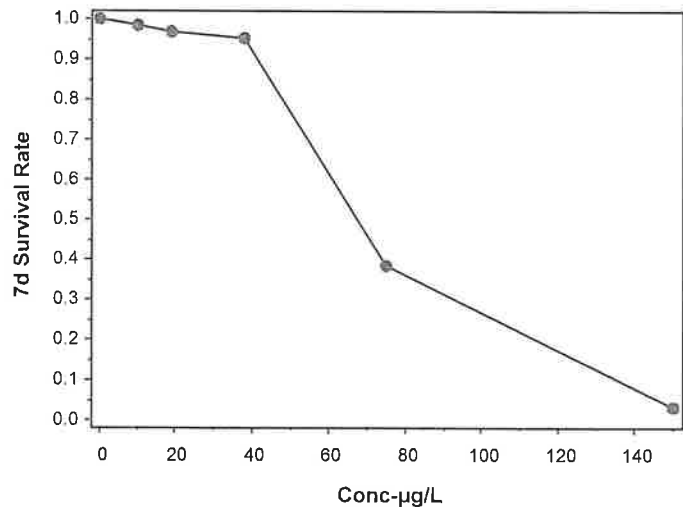
7d Survival Rate Binomials					
Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	15/15	15/15	15/15	15/15
10		15/15	15/15	15/15	14/15
19		15/15	14/15	14/15	15/15
38		13/15	14/15	15/15	15/15
75		7/15	1/15	6/15	9/15
150		1/15	0/15	1/15	0/15

CETIS Analytical Report

Report Date: 14 Dec-23 10:02 (p 2 of 4)  
Test Code/ID: FML111723 / 17-0726-1937

Fathead Minnow 7-d Larval Survival and Growth Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID: 14-0961-0371	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4		
Analyzed: 14 Dec-23 10:01	Analysis: Linear Interpolation (ICPIN)	Status Level: 1		
Edit Date: 14 Dec-23 9:59	MD5 Hash: FA3CF5A7826EE900327089DCF719B200	Editor ID: 009-702-627-3		

Graphics



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# CETIS Analytical Report

Report Date: 14 Dec-23 10:02 (p 3 of 4)  
Test Code/ID: FML111723 / 17-0726-1937

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 06-0317-0204	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed: 14 Dec-23 10:01	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 14 Dec-23 9:59	MD5 Hash: B9E2FF8C08E483773AAF20B695D98716	Editor ID: 009-702-627-3
Batch ID: 13-4476-2326	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:01	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 13:50	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 18-6859-5636	Code: FML111723	Project: REF TOX
Sample Date: 17 Nov-23 14:01	Material: Copper chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: ABC Labs	

### Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1505345	280	Yes	Two-Point Interpolation

### Test Acceptability Criteria

		TAC Limits		Overlap	Decision
Attribute	Test Stat	Lower	Upper		
Control Resp	0.3483	0.25	<<	Yes	Passes Criteria

### Point Estimates

Level	µg/L	95% LCL	95% UCL
IC15	43.42	37.23	46.53
IC20	46.03	40.45	49.2
IC25	48.63	43.64	52.09
IC40	56.45	50.85	61.21
IC50	61.66	55.36	67.65

### Mean Dry Biomass-mg Summary

			Calculated Variate						Isotonic Variate	
Conc-µg/L	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	N	4	0.3483	0.3457	0.3433	0.3587	2.02%	0.00%	0.3483	0.00%
10		4	0.3262	0.3403	0.274	0.35	10.77%	6.36%	0.3372	3.19%
19		4	0.3482	0.3423	0.334	0.374	5.08%	0.05%	0.3372	3.19%
38		4	0.3323	0.344	0.286	0.3553	9.60%	4.59%	0.3323	4.59%
75		4	0.085	0.09433	0.02267	0.1287	54.41%	75.60%	0.085	75.60%
150		4	0.007667	0.003778	0	0.01933	123.08%	97.80%	0.007667	97.80%

### Mean Dry Biomass-mg Detail

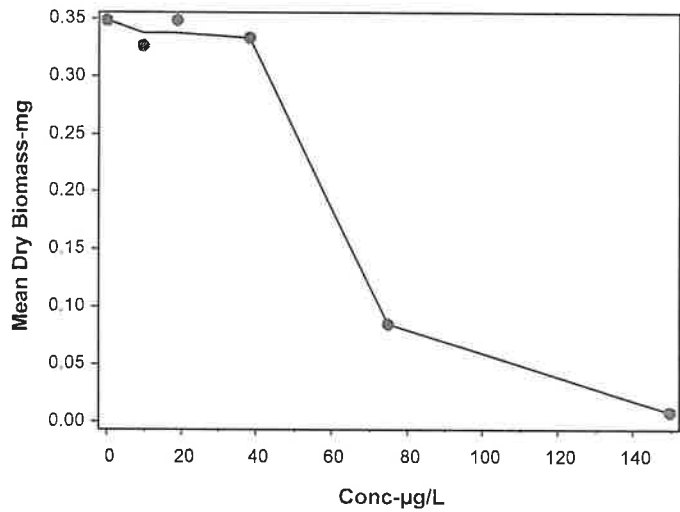
Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.3467	0.3587	0.3433	0.3447
10		0.35	0.338	0.274	0.3427
19		0.334	0.3413	0.374	0.3433
38		0.286	0.3367	0.3553	0.3513
75		0.07933	0.02267	0.1287	0.1093
150		0.01933	0	0.01133	0

CETIS Analytical Report

Report Date: 14 Dec-23 10:02 (p 4 of 4)  
Test Code/ID: FML111723 / 17-0726-1937

Fathead Minnow 7-d Larval Survival and Growth Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID: 06-0317-0204	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4		
Analyzed: 14 Dec-23 10:01	Analysis: Linear Interpolation (ICPIN)	Status Level: 1		
Edit Date: 14 Dec-23 9:59	MD5 Hash: B9E2FF8C08E483773AAF20B695D98716	Editor ID: 009-702-627-3		

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# CETIS Measurement Report

Report Date: 14 Dec-23 10:02 (p 1 of 2)  
Test Code/ID: FML111723 / 17-0726-1937

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 13-4476-2326	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 17 Nov-23 14:01	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Nov-23 13:50	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: <24
Sample ID: 18-6859-5636	Code: FML111723	Project: REF TOX
Sample Date: 17 Nov-23 14:01	Material: Copper chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: ABC Labs	

### Alkalinity (CaCO3)-mg/L

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	60	60	60	60	60	0	0	0.00%	0
150		8	62	62	62	62	62	0	0	0.00%	0
Overall		16	61	60.45	61.55	60	62	0.2582	1.033	1.69%	0 (0%)

### Conductivity-µmhos

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	376.4	372.4	380.4	369	383	0.5974	4.779	1.27%	0
10		8	373.6	370.9	376.3	370	379	0.4005	3.204	0.86%	0
19		8	374.5	371.9	377.1	371	378	0.3838	3.071	0.82%	0
38		8	377.1	375.2	379.1	374	380	0.2946	2.357	0.62%	0
75		8	378.4	376.1	380.7	375	382	0.3403	2.722	0.72%	0
150		8	380.4	377.8	382.9	377	386	0.3835	3.068	0.81%	0
Overall		48	376.7	375.6	377.9	369	386	0.5576	3.863	1.03%	0 (0%)

### Dissolved Oxygen-mg/L

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	7.887	7.58	8.195	7	8.2	0.04602	0.3682	4.67%	0
10		8	7.85	7.554	8.146	7	8.1	0.04432	0.3546	4.52%	0
19		8	7.838	7.545	8.13	7	8.1	0.04378	0.3503	4.47%	0
38		8	7.8	7.517	8.083	7	8.1	0.04226	0.3381	4.33%	0
75		8	7.788	7.503	8.072	7	8.1	0.04249	0.3399	4.36%	0
150		8	7.788	7.503	8.072	7	8.1	0.04249	0.3399	4.36%	0
Overall		48	7.825	7.729	7.921	7	8.2	0.04787	0.3317	4.24%	0 (0%)

### Hardness (CaCO3)-mg/L

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	97.62	96.74	98.51	95	98	0.1326	1.061	1.09%	0
150		8	115	115	115	115	115	0	0	0.00%	0
Overall		16	106.3	101.5	111.1	95	115	2.25	9.002	8.47%	0 (0%)

### pH-Units

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	8.088	8.018	8.157	8	8.2	0.01043	0.08346	1.03%	0
10		8	8.038	7.994	8.081	8	8.1	0.00647	0.05176	0.64%	0
19		8	8.038	7.994	8.081	8	8.1	0.00647	0.05176	0.64%	0
38		8	8.013	7.943	8.082	7.9	8.1	0.01043	0.08345	1.04%	0
75		8	7.988	7.918	8.057	7.9	8.1	0.01043	0.08345	1.04%	0
150		8	8	7.911	8.089	7.9	8.2	0.01336	0.1069	1.34%	0
Overall		48	8.027	8.003	8.051	7.9	8.2	0.01181	0.08184	1.02%	0 (0%)

Report Date: 14 Dec-23 10:02 (p 2 of 2)  
Test Code/ID: FML111723 / 17-0726-1937

14 Dec-23 10:02 (p 2 of 2)

FML111723 / 17-0726-1937

**Aquatic Bioassay & Consulting Labs, Inc.**

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	24	24	24	24	24	0	0	0.00%	0
10		8	24	24	24	24	24	0	0	0.00%	0
19		8	24	24	24	24	24	0	0	0.00%	0
38		8	24	24	24	24	24	0	0	0.00%	0
75		8	24	24	24	24	24	0	0	0.00%	0
150		8	24	24	24	24	24	0	0	0.00%	0
Overall		48	24	24	24	24	24	0	0	0.00%	0 (0%)

## Fathead Minnow 7-d Larval Survival and Growth Test

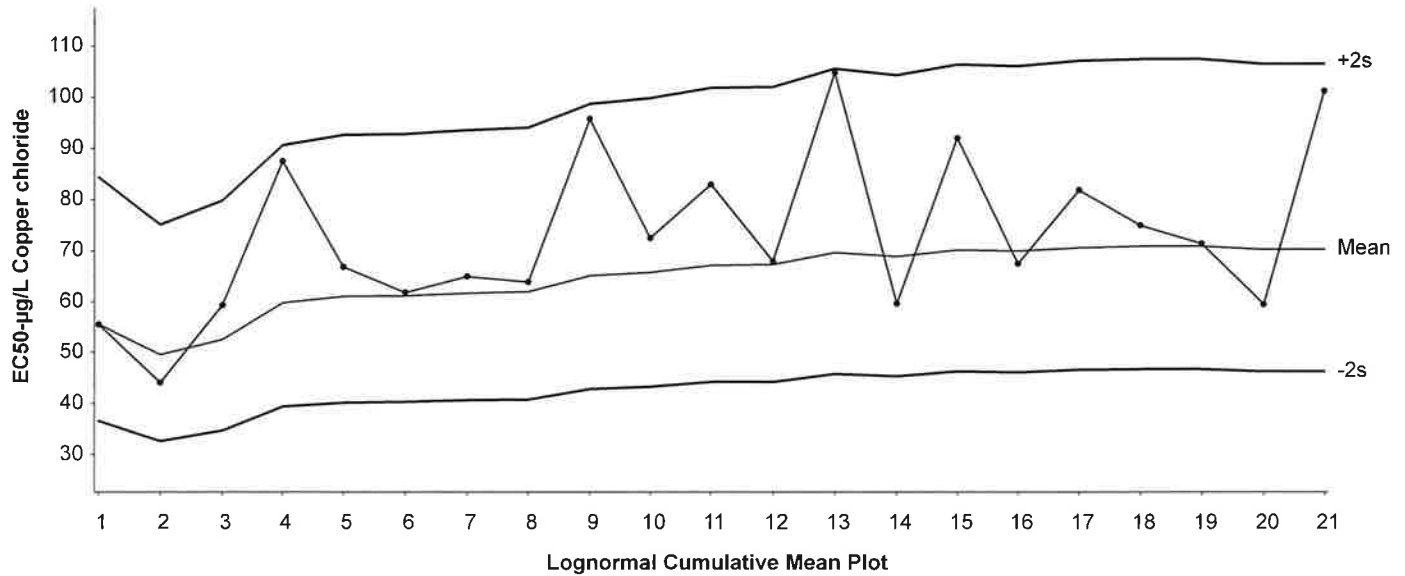
Aquatic Bioassay &amp; Consulting Labs, Inc.

Test Type: Growth-Survival (7d)  
Protocol: EPA/821/R-02-013 (2002)

Organism: Pimephales promelas  
Endpoint: 7d Survival Rate

Material: Copper chloride  
Source: Reference Toxicant-REF

Fathead Minnow 7-d Larval Survival and Growth Test  
7d Survival Rate Endpoint



## Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2023	Aug	29	14:00	55.58	-14.67	-1.124			12-9494-5992	06-1175-4109
2		Sep	6	13:30	44.17	-26.08	-2.226		(-)	18-3943-9841	03-3297-0652
3			12	12:00	59.35	-10.9	-0.8087			11-5627-5483	08-8943-5522
4			19	13:32	87.5	17.25	1.053			06-7578-5842	17-3655-8772
5		Oct	3	12:30	66.78	-3.468	-0.2428			01-2748-9589	03-0389-7072
6			4	12:15	61.84	-8.401	-0.6109			10-9866-3262	19-4548-1135
7			5	13:15	64.91	-5.337	-0.379			07-7980-5469	03-0584-6653
8			6	14:45	63.9	-6.346	-0.4541			18-8099-7551	11-3195-6885
9			10	14:30	95.83	25.59	1.49			00-9395-0169	09-6776-4624
10			17	14:45	72.45	2.203	0.1481			10-4602-8256	00-4017-6619
11			24	13:40	83.04	12.79	0.8023			01-7885-2189	13-0007-2758
12			25	12:16	67.98	-2.269	-0.1575			11-1982-8946	16-3131-2159
13			31	15:30	104.9	34.68	1.924			07-7265-5981	14-1873-8638
14		Nov	7	15:10	59.58	-10.66	-0.7896			19-2888-5334	07-9547-8315
15			14	15:30	92.05	21.8	1.296			18-8754-0700	05-2558-7597
16			17	14:01	67.38	-2.863	-0.1996			17-0726-1937	14-0961-0371
17			28	14:49	81.82	11.57	0.7314			10-1970-7599	00-2724-7341
18		Dec	5	13:45	75	4.754	0.3141			19-1204-9208	03-6141-0747
19			12	13:30	71.3	1.054	0.07145			03-7560-9108	05-6885-8439
20			13	12:15	59.42	-10.82	-0.8026			14-7892-5887	04-9254-9827
21			22	14:30	101.4	31.11	1.758			00-5720-1635	14-1952-0593

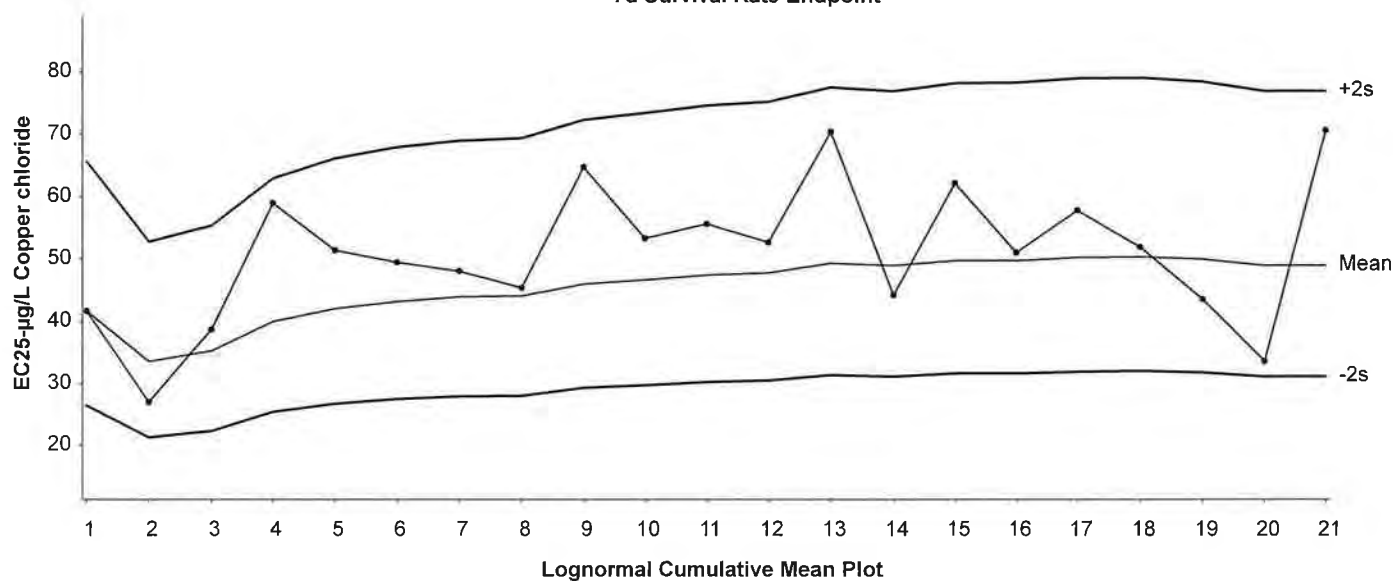
## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay &amp; Consulting Labs, Inc.

Test Type: Growth-Survival (7d)  
Protocol: EPA/821/R-02-013 (2002)

Organism: Pimephales promelas  
Endpoint: 7d Survival Rate

Material: Copper chloride  
Source: Reference Toxicant-REF

Fathead Minnow 7-d Larval Survival and Growth Test  
7d Survival Rate Endpoint

Mean: 48.96

Count: 20

-2s Action Limit: 31.1

Sigma: NA

CV: 22.90%

+2s Action Limit: 77

## Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2023	Aug	29	14:00	41.7	-7.26	-0.7086			12-9494-5992	06-1175-4109
2		Sep	6	13:30	27	-21.96	-2.628		(-)	18-3943-9841	03-3297-0652
3			12	12:00	38.71	-10.25	-1.037			11-5627-5483	08-8943-5522
4			19	13:32	58.91	9.953	0.8171			06-7578-5842	17-3655-8772
5		Oct	3	12:30	51.36	2.401	0.2114			01-2748-9589	03-0389-7072
6			4	12:15	49.51	0.5513	0.04944			10-9866-3262	19-4548-1135
7			5	13:15	48.09	-0.8689	-0.07906			07-7980-5469	03-0584-6653
8			6	14:45	45.4	-3.56	-0.3333			18-8099-7551	11-3195-6885
9			10	14:30	64.72	15.76	1.232			00-9395-0169	09-6776-4624
10			17	14:45	53.31	4.351	0.3759			10-4602-8256	00-4017-6619
11			24	13:40	55.7	6.736	0.5691			01-7885-2189	13-0007-2758
12			25	12:16	52.65	3.686	0.3205			11-1982-8946	16-3131-2159
13			31	15:30	70.38	21.42	1.602			07-7265-5981	14-1873-8638
14		Nov	7	15:10	44.17	-4.793	-0.4549			19-2888-5334	07-9547-8315
15			14	15:30	62.23	13.27	1.059			18-8754-0700	05-2558-7597
16			17	14:01	51.06	2.099	0.1853			17-0726-1937	14-0961-0371
17			28	14:49	57.82	8.862	0.7345			10-1970-7599	00-2724-7341
18		Dec	5	13:45	51.88	2.915	0.2554			19-1204-9208	03-6141-0747
19			12	13:30	43.55	-5.41	-0.517			03-7560-9108	05-6885-8439
20			13	12:15	33.53	-15.43	-1.671			14-7892-5887	04-9254-9827
21			22	14:30	70.65	21.69	1.619			00-5720-1635	14-1952-0593

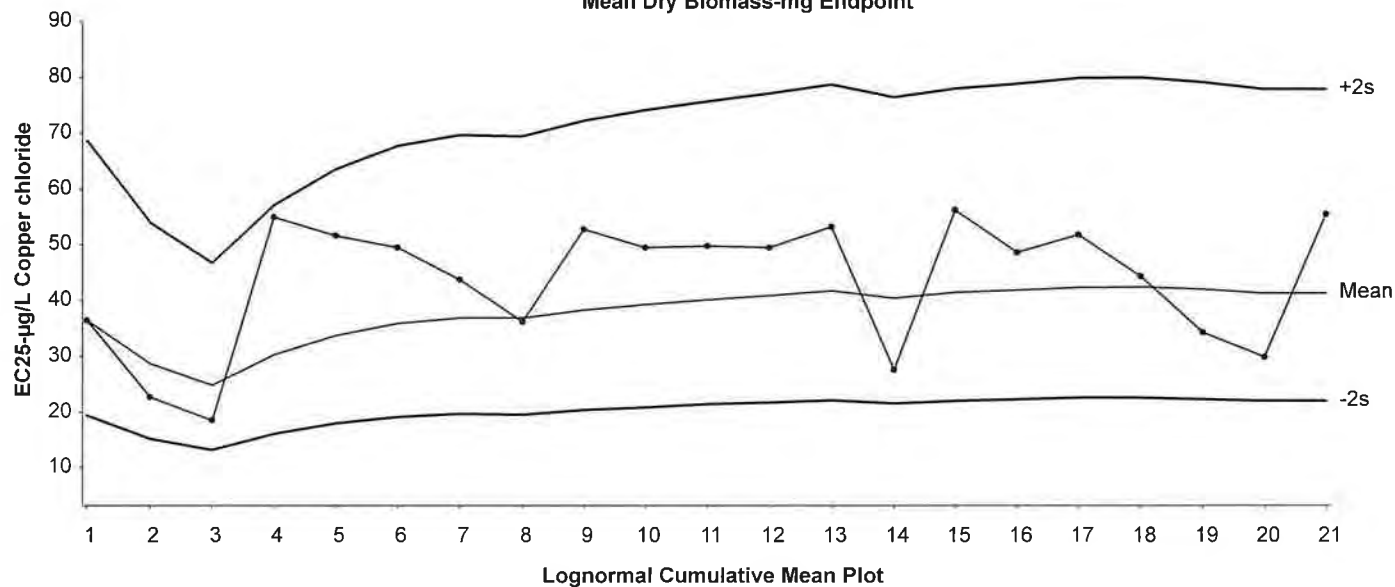
## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay &amp; Consulting Labs, Inc.

Test Type: Growth-Survival (7d)  
Protocol: EPA/821/R-02-013 (2002)

Organism: Pimephales promelas  
Endpoint: Mean Dry Biomass-mg

Material: Copper chloride  
Source: Reference Toxicant-REF

Fathead Minnow 7-d Larval Survival and Growth Test  
Mean Dry Biomass-mg Endpoint

Mean: 41.26

Count: 20

-2s Action Limit: 21.9

Sigma: NA

CV: 32.50%

+2s Action Limit: 77.8

## Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2023	Aug	29	14:00	36.44	-4.829	-0.3925			12-9494-5992	00-2085-7034
2		Sep	6	13:30	22.61	-18.66	-1.897			18-3943-9841	11-8736-0290
3			12	12:00	18.58	-22.69	-2.517		(-)	11-5627-5483	07-8518-7489
4			19	13:32	54.98	13.71	0.9048			06-7578-5842	09-3008-4004
5		Oct	3	12:30	51.56	10.29	0.7024			01-2748-9589	12-3505-7917
6			4	12:15	49.44	8.176	0.5701			10-9866-3262	15-4895-4606
7			5	13:15	43.69	2.421	0.1798			07-7980-5469	07-5020-1148
8			6	14:45	36.18	-5.082	-0.4145			18-8099-7551	15-1441-4720
9			10	14:30	52.79	11.53	0.777			00-9395-0169	18-9888-9667
10			17	14:45	49.41	8.148	0.5683			10-4602-8256	13-8119-0525
11			24	13:40	49.77	8.503	0.5909			01-7885-2189	06-8805-4487
12			25	12:16	49.53	8.261	0.5755			11-1982-8946	04-1492-8778
13			31	15:30	53.26	11.99	0.8047			07-7265-5981	21-3432-7293
14		Nov	7	15:10	27.53	-13.73	-1.276			19-2888-5334	11-0119-4879
15			14	15:30	56.26	15	0.9776			18-8754-0700	03-4458-8213
16			17	14:01	48.63	7.369	0.5182			17-0726-1937	06-0317-0204
17			28	14:49	51.82	10.55	0.7181			10-1970-7599	09-5836-2004
18		Dec	5	13:45	44.32	3.06	0.2256			19-1204-9208	02-5721-3294
19			12	13:30	34.29	-6.971	-0.5836			03-7560-9108	19-0990-5343
20			13	12:15	29.79	-11.47	-1.027			14-7892-5887	19-1033-5713
21			22	14:30	55.47	14.21	0.9331			00-5720-1635	06-1309-8628

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay &amp; Consulting Labs, Inc.

Test Type: Growth-Survival (7d)

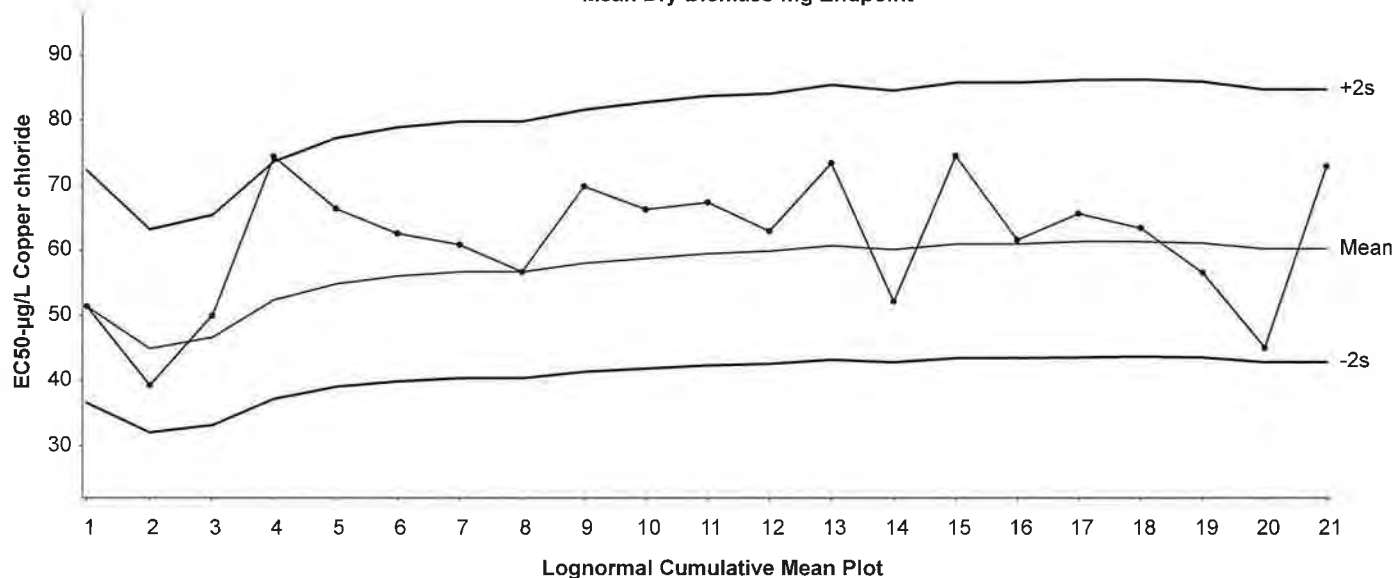
Organism: Pimephales promelas

Material: Copper chloride

Protocol: EPA/821/R-02-013 (2002)

Endpoint: Mean Dry Biomass-mg

Source: Reference Toxicant-REF

Fathead Minnow 7-d Larval Survival and Growth Test  
Mean Dry Biomass-mg Endpoint

Mean: 60.22

Count: 20

-2s Action Limit: 42.9

Sigma: NA

CV: 17.10%

+2s Action Limit: 84.7

## Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2023	Aug	29	14:00	51.41	-8.807	-0.9295			12-9494-5992	00-2085-7034
2		Sep	6	13:30	39.35	-20.87	-2.502		(-)	18-3943-9841	11-8736-0290
3			12	12:00	50.02	-10.2	-1.091			11-5627-5483	07-8518-7489
4			19	13:32	74.34	14.12	1.238			06-7578-5842	09-3008-4004
5		Oct	3	12:30	66.38	6.163	0.5728			01-2748-9589	12-3505-7917
6			4	12:15	62.55	2.332	0.2233			10-9866-3262	15-4895-4606
7			5	13:15	60.85	0.6332	0.06149			07-7980-5469	07-5020-1148
8			6	14:45	56.73	-3.487	-0.3507			18-8099-7551	15-1441-4720
9			10	14:30	69.86	9.638	0.8728			00-9395-0169	18-9888-9667
10			17	14:45	66.23	6.006	0.5589			10-4602-8256	13-8119-0525
11			24	13:40	67.38	7.164	0.6608			01-7885-2189	06-8805-4487
12			25	12:16	63.01	2.79	0.2662			11-1982-8946	04-1492-8778
13			31	15:30	73.46	13.24	1.168			07-7265-5981	21-3432-7293
14		Nov	7	15:10	52.21	-8.007	-0.8388			19-2888-5334	11-0119-4879
15			14	15:30	74.52	14.3	1.253			18-8754-0700	03-4458-8213
16			17	14:01	61.66	1.441	0.1391			17-0726-1937	06-0317-0204
17			28	14:49	65.63	5.414	0.5061			10-1970-7599	09-5836-2004
18		Dec	5	13:45	63.46	3.238	0.3079			19-1204-9208	02-5721-3294
19			12	13:30	56.61	-3.608	-0.3632			03-7560-9108	19-0990-5343
20			13	12:15	45.01	-15.21	-1.711			14-7892-5887	19-1033-5713
21			22	14:30	72.95	12.73	1.127			00-5720-1635	06-1309-8628

# CHEMICAL ANALYSIS DATA SHEET

VCF 1

Start Date: 11/16/2023 1500

Lab #: VCF 11 23. 208

End Date: 11/23/23 1445

Date Rec'd: 11/15

YSI / T#: B17 B17

Renewal Sample Used:

b/h b/h B17 B17 R17 b/v

DAY	11/16	11/17	11/18	11/19	11/20	11/21	11/22	11/23
Initials	ED	ED 100S	100S NV	100S NV	ED 0914	ED 1203	ED 0929	N

## DISSOLVED OXYGEN (mg/L)

Control	7.9	7.3	8.0	7.1	8.0	7.0	8.0	7.1	8.2	7.8	7.9	7.6	8.0	7.1
6.25%	7.9	7.3	7.8	7.1	8.0	7.0	8.0	7.1	8.1	7.8	7.8	7.6	7.9	7.0
12.5%	7.9	7.3	7.8	7.1	7.9	7.1	8.0	7.1	8.0	7.8	7.8	7.6	7.9	7.0
25%	7.9	7.2	7.8	7.1	7.9	7.1	8.0	7.2	8.0	7.7	7.8	7.5	7.8	7.0
50%	8.0	7.2	7.9	7.0	7.9	7.1	8.0	7.1	8.0	7.7	7.8	7.5	7.8	7.0
100%	8.0	7.2	7.9	7.0	7.9	7.0	8.0	7.1	8.0	7.7	7.8	7.5	7.8	7.0

## TEMPERATURE (°C)

Control	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
6.25%	24.0	24.0	24.2	24.0	24.0	24.0	24.0	24.0	24.2	24.0	24.2	24.0	24.1	24.0
12.5%	24.0	24.0	24.2	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.2	24.0	24.1	24.0
25%	24.2	24.0	24.1	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.2	24.0	24.2	24.0
50%	24.2	24.0	24.1	24.0	24.0	24.0	24.0	24.0	24.1	24.0	24.2	24.0	24.2	24.0
100%	24.2	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.1	24.0	24.2	24.0	24.2	24.0

## pH

Control	8.0	8.0	8.2	8.0	8.1	8.0	8.1	8.1	8.1	8.0	8.2	8.0	8.0	8.0
6.25%	7.9	7.9	8.0	8.0	8.1	8.0	8.1	8.0	8.1	8.0	7.9	8.0	7.9	8.0
12.5%	7.9	7.9	7.9	8.0	8.0	8.0	8.1	8.0	8.1	8.0	7.9	8.0	7.9	8.0
25%	7.8	7.8	7.8	7.9	7.9	7.9	8.1	7.9	8.1	8.0	8.0	7.9	7.8	7.9
50%	7.7	7.8	7.8	7.8	7.8	7.8	8.0	7.9	8.0	7.9	8.0	7.8	7.8	7.9
100%	7.7	7.8	7.8	7.8	7.8	7.8	8.0	7.9	8.0	7.9	7.9	7.8	7.8	7.9

## CONDUCTIVITY (uS/cm)

Control	376	369	370	371	372	376	379	378
6.25%	772	780	784	788	785	782	780	784
12.5%	1226	1230	1240	1237	1244	1246	1243	1250
25%	1989	1992	1993	1995	1998	1992	1989	1990
50%	3519	3520	3525	3536	3538	3537	3530	3535
100%	6519	6522	6545	6547	6544	6549	6539	6570

## ALKALINITY

Control	60	60	60	60	60	60	60	60
100%	278	278	278	278	278	278	278	278

## HARDNESS

Control	95	98	98	98	98	98	98	98
100%	1035	1035	1035	1035	1035	1035	1035	1035

Residual Chlorine

1st Sample:

LOI

2nd Sample:

3rd Sample:

# Chronic *Ceriodaphnia dubia* survival and reproduction - VCF 1

Aquatic Bioassay & Consulting Laboratories, Inc.

Start Date: 11/16/23

Lab #: VCF 11 23. 208

End Date: 11/20/23

Conc.	Day#	Initial	# YOUNG / REPLICATE									
			1	2	3	4	5	6	7	8	9	10
CON	3	<u>40</u>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	<u>40</u>	6	6	4	4	5	3	5	6	4	7
	5	<u>40</u>	7	8	8	9	6	7	5	5	6	7
	6	<u>40</u>	10	12	10	9	13	12	10	10	11	14
	7	<u>N</u>	8	10	10	7	9	8	10	9	10	10
	Total		31	36	32	29	33	30	30	30	33	38
6.25%	3	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	-	6	4	3	5	5	6	5	6	7	5
	5	-	8	9	6	7	7	8	6	5	7	9
	6	-	13	12	12	10	11	14	12	12	10	10
	7	-	10	11	11	10	10	9	9	8	8	10
	Total	-	37	36	32	33	33	34	32	31	32	34
12.5%	3	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	-	5	6	6	4	5	5	6	4	5	6
	5	-	9	9	8	6	6	5	7	7	9	8
	6	-	10	13	12	10	11	11	10	12	10	9
	7	-	10	9	8	10	10	16	10	11	11	10
	Total	-	34	37	31	30	32	31	33	34	35	33
25%	3	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	-	6	4	5	5	6	7	5	5	6	5
	5	-	10	9	9	6	7	7	7	8	7	9
	6	-	7	10	9	9	13	12	12	9	10	11
	7	-	10	9	7	7	9	8	10	9	7	12
	Total	-	33	32	30	27	35	34	34	28	30	37
50%	3	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	-	6	5	5	4	6	7	5	5	6	4
	5	-	7	9	8	9	6	6	9	8	7	7
	6	-	13	10	10	12	10	9	14	12	10	14
	7	-	12	11	10	7	7	9	10	11	8	8
	Total	-	38	35	33	32	29	31	38	36	31	33
100%	3	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	-	4	6	5	5	6	6	4	5	5	6
	5	-	7	7	6	9	9	8	9	7	7	8
	6	-	13	10	12	10	14	13	12	12	14	13
	7	-	9	7	10	12	13	12	11	11	11	17
	Total	-	31	30	33	36	42	39	36	35	37	45

## CHEMICAL ANALYSIS DATA SHEET

VCF 2

Start Date: 11/16/2023 1502Lab #: VCF 11 23.210End Date: 11/23/23 1450Date Rec'd: 11/15YSI / T#: B17 B17

Renewal Sample Used:

0/20/2B17B17B170/2

DAY	11/16	11/17	11/18	11/19	11/20	11/21	11/22	11/23
Initials	20	401019	M20 N	M10 N	20 0932	20 1330	20 1944	2

## DISSOLVED OXYGEN (mg/L)

Control	7.9	7.3	8.0	7.1	8.0	7.0	8.0	7.1	8.2	7.8	7.9	7.6	8.0	7.1
6.25%	8.0	7.2	7.9	7.1	8.0	7.1	7.9	7.0	8.1	7.7	7.8	7.5	7.9	7.1
12.5%	8.0	7.2	7.7	7.2	7.9	7.2	7.8	7.1	8.0	7.6	7.8	7.5	7.9	7.2
25%	8.0	7.1	7.8	7.1	7.9	7.1	7.8	7.1	7.9	7.6	7.9	7.4	8.0	7.2
50%	8.0	7.1	7.8	7.1	7.8	7.1	7.8	7.0	7.9	7.5	7.9	7.4	8.0	7.1
100%	8.0	7.0	7.8	7.1	7.8	7.1	7.7	7.2	7.9	7.6	7.8	7.4	7.9	7.1

## TEMPERATURE (°C)

Control	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
6.25%	24.0	24.0	24.1	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
12.5%	24.1	24.0	24.1	24.0	24.0	24.0	24.0	24.0	24.1	24.0	24.2	24.0	24.3	24.0
25%	24.1	24.0	24.2	24.0	24.0	24.0	24.0	24.0	24.1	24.0	24.2	24.0	24.4	24.0
50%	24.2	24.0	24.2	24.0	24.0	24.0	24.0	24.0	24.2	24.0	24.2	24.0	24.4	24.0
100%	24.2	24.0	24.2	24.0	24.0	24.0	24.0	24.0	24.2	24.0	24.2	24.0	24.6	24.0

## pH

Control	8.0	8.0	8.2	8.0	8.1	8.0	8.1	8.1	8.1	8.0	8.2	8.0	8.0	8.0
6.25%	8.2	8.0	8.0	8.0	8.1	8.0	8.0	8.0	8.0	8.0	8.2	8.0	7.9	8.0
12.5%	8.3	8.0	8.0	8.0	8.1	8.0	8.0	8.0	8.0	8.0	8.2	8.0	7.9	8.0
25%	8.2	8.0	8.1	8.0	8.1	8.0	8.0	8.0	8.0	7.9	8.1	8.0	7.9	7.9
50%	8.1	8.0	8.2	8.0	8.1	8.0	8.0	8.0	8.0	7.9	8.1	8.0	7.9	7.9
100%	8.0	8.0	8.2	8.1	8.2	8.0	8.0	8.0	8.0	7.9	8.0	8.0	7.9	7.9

## CONDUCTIVITY (uS/cm)

Control	376	369	370	377	377	376	379	378
6.25%	609	611	615	602	608	602	609	615
12.5%	498	499	595	587	599	586	592	599
25%	592	602	607	613	620	620	619	618
50%	776	779	788	789	795	796	794	799
100%	1302	1312	1315	1317	1320	1317	1320	1326

## ALKALINITY

Control	60	60	60	60	60	60	60	60
100%	148	148	148	148	148	148	148	148

## HARDNESS

Control	95	98	98	98	98	98	98	98
100%	400	400	400	400	400	400	400	400

Residual Chlorine

1st Sample: 60.1

2nd Sample: \_\_\_\_\_

3rd Sample: \_\_\_\_\_

# Chronic *Ceriodaphnia dubia* survival and reproduction - VCF 2

Aquatic Bioassay & Consulting Laboratories, Inc.

Start Date: 11/16/23

Lab #: VCF 11 23. 210

End Date: 11/23/23

Conc.	Day#	Initial	# YOUNG / REPLICATE									
			1	2	3	4	5	6	7	8	9	10
CON	3	<u>no</u>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	<u>40</u>	3	3	4	6	5	5	6	4	3	5
	5	<u>40</u>	7	9	9	6	5	7	6	5	6	9
	6	<u>40</u>	13	10	10	7	7	9	13	12	10	10
	7	<u>no</u>	10	10	11	10	11	12	11	10	11	5
	Total		33	31	34	29	28	33	37	31	29	29
6.25%	3	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	-	6	6	3	4	5	5	6	3	5	5
	5	-	8	6	7	7	9	9	8	9	10	9
	6	-	14	10	13	12	12	10	9	9	14	10
	7	-	10	9	9	10	11	10	11	12	12	11
	Total	-	38	31	32	33	37	34	34	33	41	35
12.5%	3	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	-	6	4	5	5	6	4	5	6	5	5
	5	-	7	7	6	9	8	8	6	6	5	10
	6	-	13	12	10	14	10	10	11	13	12	10
	7	-	10	11	12	11	10	11	12	12	11	12
	Total	-	36	34	33	39	34	33	34	37	33	39
25%	3	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	-	6	3	4	4	5	6	6	4	7	7
	5	-	11	10	9	7	7	9	8	9	6	6
	6	-	14	13	10	10	9	9	8	10	11	11
	7	-	12	12	11	10	10	10	9	10	9	9
	Total	-	43	38	34	31	31	34	31	33	33	33
50%	3	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	-	5	6	6	4	4	5	5	6	6	3
	5	-	5	5	10	6	7	7	✓	10	12	10
	6	-	10	9	9	13	12	10	13	14	14	12
	7	-	10	10	10	10	11	12	11	11	12	10
	Total	-	30	30	35	33	34	34	29	41	44	35
100%	3	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	-	4	5	6	6	5	5	3	4	5	5
	5	-	10	6	6	4	9	8	10	12	10	10
	6	-	16	10	10	11	9	13	10	11	12	12
	7	-	10	14	11	12	14	14	10	10	9	15
	Total	-	40	35	33	38	37	40	33	37	37	42

# Chemical Analysis Data Sheet - Selenastrum Growth

Aquatic Bioassay & Consulting Laboratories, Inc.

Company: VCF Lab #: VCF1123. 211  
 Start date and time: 11-16-23 Sample ID:  
 End date and time: 11-20-23 Date Rec'd: 11-15-23  
 YSI Used:

Day	0	1	2	3	4
Analyst	<u>WV</u>	<u>WV</u>	<u>WV</u>	<u>WV</u>	<u>WV</u>
Time	<u>1500</u>	<u>1600</u>	<u>1500</u>	<u>1500</u>	<u>1300</u>
Temperature (°C)					

Control	<u>25.5</u>	<u>25.5</u>	<u>25.5</u>	<u>25.5</u>	<u>25.8</u>
<u>6/15</u>	<u>25.5</u>	<u>25.5</u>	<u>25.5</u>	<u>25.5</u>	<u>25.8</u>
<u>12/15</u>	<u>25.5</u>	<u>25.5</u>	<u>25.5</u>	<u>25.5</u>	<u>25.8</u>
<u>W</u>	<u>25.5</u>	<u>25.5</u>	<u>25.5</u>	<u>25.5</u>	<u>25.8</u>
<u>SV</u>	<u>25.5</u>	<u>25.5</u>	<u>25.5</u>	<u>25.5</u>	<u>25.8</u>
<u>WV</u>	<u>25.5</u>	<u>25.5</u>	<u>25.5</u>	<u>25.5</u>	<u>25.8</u>

pH

Control	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.1</u>
<u>6/15</u>	<u>7.9</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.1</u>
<u>12/15</u>	<u>7.9</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.1</u>
<u>W</u>	<u>7.9</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.1</u>
<u>SV</u>	<u>7.9</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.1</u>
<u>WV</u>	<u>7.9</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.1</u>

Conductivity (uS/cm)

Control	<u>541</u>	<u>545</u>	<u>547</u>	<u>545</u>	<u>545</u>
<u>6/15</u>	<u>516</u>	<u>517</u>	<u>517</u>	<u>515</u>	<u>519</u>
<u>12/15</u>	<u>529</u>	<u>530</u>	<u>525</u>	<u>527</u>	<u>533</u>
<u>W</u>	<u>539</u>	<u>539</u>	<u>538</u>	<u>535</u>	<u>543</u>
<u>SV</u>	<u>533</u>	<u>553</u>	<u>550</u>	<u>555</u>	<u>556</u>
<u>WV</u>	<u>598</u>	<u>597</u>	<u>599</u>	<u>598</u>	<u>601</u>

ATC = 7D

DAY 0 = used thermometer #1 C.F. = 0.0 °C

DAY 1 to 4 = incubator #1 C.F. = -0.2 °C

QC: Wm RASS

# SELANASTRUM GROWTH TOXICITY TEST

COMPANY: VCF  
 SAMPLE I.D.: \_\_\_\_\_  
 START DATE: 11-16-23  
 END DATE: 11-20-23

LAB NO. VCF123-21  
 REC'D DATE: 11-15-23

TREATMENT	EFFLUENT CONCENTRATION						REMARKS
	CON	6.25	12.5	25	50	100	
Temp. °C.							
pH							
Alkalinity mg/L	51	68	71	74	76	89	
Hardness mg/L (CaCO3)	133	128	133	136	139	147	
Salinity (ppt)							
Chlorine mg/L							

Test Chamber Concentration		Cell Density Measurement Number of Cells Per mL Sample Replicate Per Test Chamber			Average Per Replicate
		1	2	3	
Control	1	1.614	1.654	1.626	1.629
Control	2	1.795	1.818	1.808	1.807
Control	3	1.636	1.614	1.646	1.632
Control	4	1.781	1.781	1.763	1.775 am
6.25	1	2.085	2.081	2.063	2.076
	2	1.835	1.822	1.807	1.821
	3	2.097	2.115	2.122	2.111
	4	2.006	2.007	1.998	2.001
12.5	1	2.058	2.017	2.014	2.030
	2	2.049	2.050	2.055	2.051
	3	1.896	1.872	1.870	1.879
	4	1.920	1.900	1.881	1.900
25	1	2.147	2.147	2.164	2.153
	2	1.997	1.980	1.949	1.975
	3	1.944	1.952	1.929	1.941
	4	2.110	2.092	2.062	2.088
50	1	2.028	2.010	1.991	2.010
	2	1.965	1.923	1.994	1.941
	3	2.233	2.231	2.240	2.235
	4	1.952	1.954	1.945	1.950
100	1	2.192	2.192	2.168	2.184
	2	2.194	2.175	2.154	2.174
	3	2.049	2.036	2.019	2.038
	4	1.856	1.830	1.827	1.838

Hemocytometer Conversion Formula:  $\text{Selenastrum / mL} = \frac{(\text{Total Algae Counted}) (4,000,000)}{\text{Number of Squares Counted}}$

QC = am 7

## CHEMICAL ANALYSIS DATA SHEET

VCF 3

Start Date: 11/16/2023 1504

Lab #: VCF 11 23. 212

End Date: 11/23/2023 1455

Date Rec'd: 11/15

YSI / T#: B17 B17

Renewal Sample Used:

DAY	11/16/0	11/17 1	11/18 2	11/19 3	11/20 4	11/21 5	11/22 6	11/23 7
Initials	EB	EB 1037	M24 M	M12 M	EB 0949	EB 1346	EB 0957	A

## DISSOLVED OXYGEN (mg/L)

Control	7.9	7.3	8.0	7.1	8.0	7.0	8.0	7.1	8.2	7.8	7.9	7.6	8.0	7.1
6.25%	8.0	7.4	7.9	7.2	8.0	7.1	8.0	7.1	8.1	7.6	7.9	7.5	7.8	7.2
12.5%	8.0	7.4	7.9	7.1	7.5	7.1	7.9	7.1	8.0	7.6	7.8	7.5	7.8	7.1
25%	8.0	7.3	7.9	7.1	7.5	7.2	7.9	7.0	7.9	7.5	7.8	7.4	7.9	7.1
50%	8.0	7.3	7.9	7.2	7.5	7.1	7.5	7.9	7.5	7.8	7.4	7.9	7.9	7.1
100%	8.0	7.2	7.9	7.1	7.5	7.1	7.5	7.1	7.5	7.5	7.8	7.3	7.9	7.1

## TEMPERATURE (°C)

Control	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
6.25%	24.2	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.2	24.0	24.2	24.0	24.1	24.0
12.5%	24.2	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.2	24.0	24.3	24.0	24.1	24.0
25%	24.3	24.0	24.1	24.0	24.0	24.0	24.0	24.0	24.1	24.0	24.3	24.0	24.2	24.0
50%	24.3	24.0	24.2	24.0	24.0	24.0	24.1	24.0	24.1	24.0	24.4	24.0	24.2	24.0
100%	24.4	24.0	24.3	24.0	24.0	24.0	24.2	24.0	24.1	24.0	24.4	24.0	24.2	24.0

## pH

Control	8.0	8.0	8.2	8.0	8.1	8.0	8.1	8.1	8.1	8.0	8.2	8.0	8.0	8.0
6.25%	8.2	8.0	8.0	8.0	8.1	8.0	8.1	8.1	8.1	7.9	8.0	7.9	8.0	8.0
12.5%	8.2	8.0	8.0	8.0	8.1	8.0	8.1	8.0	8.1	7.9	8.0	7.9	8.0	8.0
25%	8.1	7.9	8.1	8.1	8.1	8.0	8.1	8.0	8.1	7.9	8.0	7.8	8.0	7.9
50%	8.0	7.9	8.1	8.1	8.0	8.0	8.1	8.0	8.1	7.9	7.9	7.8	8.0	7.8
100%	7.9	7.9	8.2	8.2	8.0	8.0	8.1	8.0	8.1	7.9	7.9	7.8	8.0	7.8

## CONDUCTIVITY (uS/cm)

Control	376	369	370	377	377	376	379	378
6.25%	544	546	547	547	548	545	549	550
12.5%	516	510	515	528	537	533	532	519
25%	613	620	628	635	644	650	649	651
50%	857	862	867	871	875	872	877	879
100%	1256	1249	1250	1254	1255	1256	1249	1255

## ALKALINITY

Control	60	60	60	60	60	60	60	60
100%	111	111	111	111	111	111	111	111

## HARDNESS

Control	95	98	98	98	98	98	98	98
100%	460	460	460	460	460	460	460	460

Residual Chlorine

1st Sample:

2.01

2nd Sample:

3rd Sample:

# Chronic *Ceriodaphnia dubia* survival and reproduction - VCF 3

Aquatic Bioassay & Consulting Laboratories, Inc.

Start Date: 11/16/23

Lab #: VCF 11 23. 212

End Date: 11/23/23

Conc.	Day#	Initial	# YOUNG / REPLICATE									
			1	2	3	4	5	6	7	8	9	10
CON	3	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>
	4	<u>✓</u>	<u>6</u>	<u>6</u>	<u>5</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>6</u>	<u>3</u>	<u>5</u>
	5	<u>✓</u>	<u>7</u>	<u>6</u>	<u>6</u>	<u>6</u>	<u>5</u>	<u>5</u>	<u>6</u>	<u>9</u>	<u>6</u>	<u>11</u>
	6	<u>✓</u>	<u>11</u>	<u>11</u>	<u>12</u>	<u>14</u>	<u>10</u>	<u>10</u>	<u>13</u>	<u>10</u>	<u>14</u>	<u>13</u>
	7	<u>✓</u>	<u>12</u>	<u>12</u>	<u>11</u>	<u>12</u>	<u>11</u>	<u>12</u>	<u>11</u>	<u>12</u>	<u>12</u>	<u>12</u>
	Total		<u>36</u>	<u>38</u>	<u>34</u>	<u>35</u>	<u>31</u>	<u>32</u>	<u>41</u>	<u>37</u>	<u>39</u>	<u>41</u>
6.25%	3	-	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>
	4	-	<u>6</u>	<u>4</u>	<u>5</u>	<u>5</u>	<u>6</u>	<u>4</u>	<u>4</u>	<u>5</u>	<u>3</u>	<u>6</u>
	5	-	<u>11</u>	<u>10</u>	<u>9</u>	<u>9</u>	<u>8</u>	<u>7</u>	<u>7</u>	<u>9</u>	<u>9</u>	<u>8</u>
	6	-	<u>12</u>	<u>11</u>	<u>11</u>	<u>14</u>	<u>13</u>	<u>12</u>	<u>10</u>	<u>10</u>	<u>11</u>	<u>12</u>
	7	-	<u>11</u>	<u>11</u>	<u>10</u>	<u>12</u>	<u>12</u>	<u>12</u>	<u>13</u>	<u>12</u>	<u>12</u>	<u>12</u>
	Total	-	<u>40</u>	<u>36</u>	<u>35</u>	<u>40</u>	<u>39</u>	<u>35</u>	<u>34</u>	<u>36</u>	<u>35</u>	<u>34</u>
12.5%	3	-	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>
	4	-	<u>5</u>	<u>6</u>	<u>4</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>6</u>	<u>4</u>	<u>5</u>	<u>5</u>
	5	-	<u>6</u>	<u>7</u>	<u>7</u>	<u>9</u>	<u>8</u>	<u>9</u>	<u>4</u>	<u>6</u>	<u>7</u>	<u>5</u>
	6	-	<u>10</u>	<u>12</u>	<u>10</u>	<u>10</u>	<u>13</u>	<u>12</u>	<u>10</u>	<u>14</u>	<u>10</u>	<u>10</u>
	7	-	<u>12</u>	<u>12</u>	<u>12</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>12</u>	<u>11</u>	<u>14</u>	<u>13</u>
	Total	-	<u>33</u>	<u>37</u>	<u>38</u>	<u>34</u>	<u>38</u>	<u>40</u>	<u>34</u>	<u>35</u>	<u>36</u>	<u>33</u>
25%	3	-	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>
	4	-	<u>6</u>	<u>6</u>	<u>4</u>	<u>5</u>	<u>5</u>	<u>6</u>	<u>6</u>	<u>4</u>	<u>3</u>	<u>6</u>
	5	-	<u>5</u>	<u>7</u>	<u>6</u>	<u>6</u>	<u>5</u>	<u>9</u>	<u>8</u>	<u>10</u>	<u>10</u>	<u>9</u>
	6	-	<u>11</u>	<u>11</u>	<u>12</u>	<u>10</u>	<u>9</u>	<u>9</u>	<u>13</u>	<u>12</u>	<u>10</u>	<u>11</u>
	7	-	<u>12</u>	<u>12</u>	<u>13</u>	<u>12</u>	<u>11</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>11</u>	<u>12</u>
	Total	-	<u>34</u>	<u>36</u>	<u>35</u>	<u>39</u>	<u>30</u>	<u>34</u>	<u>38</u>	<u>38</u>	<u>34</u>	<u>38</u>
50%	3	-	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>
	4	-	<u>6</u>	<u>5</u>	<u>6</u>	<u>6</u>	<u>4</u>	<u>4</u>	<u>3</u>	<u>6</u>	<u>6</u>	<u>3</u>
	5	-	<u>9</u>	<u>7</u>	<u>7</u>	<u>9</u>	<u>8</u>	<u>6</u>	<u>9</u>	<u>10</u>	<u>10</u>	<u>12</u>
	6	-	<u>9</u>	<u>13</u>	<u>12</u>	<u>12</u>	<u>14</u>	<u>13</u>	<u>12</u>	<u>14</u>	<u>15</u>	<u>12</u>
	7	-	<u>12</u>	<u>12</u>	<u>12</u>	<u>13</u>	<u>10</u>	<u>12</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>12</u>
	Total	-	<u>36</u>	<u>37</u>	<u>34</u>	<u>40</u>	<u>39</u>	<u>35</u>	<u>35</u>	<u>42</u>	<u>44</u>	<u>39</u>
100%	3	-	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>
	4	-	<u>6</u>	<u>4</u>	<u>6</u>	<u>6</u>	<u>5</u>	<u>5</u>	<u>6</u>	<u>4</u>	<u>4</u>	<u>6</u>
	5	-	<u>10</u>	<u>10</u>	<u>9</u>	<u>7</u>	<u>7</u>	<u>6</u>	<u>6</u>	<u>9</u>	<u>8</u>	<u>7</u>
	6	-	<u>15</u>	<u>15</u>	<u>12</u>	<u>10</u>	<u>11</u>	<u>11</u>	<u>9</u>	<u>9</u>	<u>10</u>	<u>14</u>
	7	-	<u>12</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>10</u>	<u>13</u>	<u>12</u>	<u>11</u>	<u>14</u>	<u>10</u>
	Total	-	<u>43</u>	<u>40</u>	<u>39</u>	<u>36</u>	<u>36</u>	<u>35</u>	<u>33</u>	<u>33</u>	<u>36</u>	<u>40</u>

# CHEMICAL ANALYSIS DATA SHEET

VCF 4

Start Date: 11/16/2023 1506

Lab #: VCF 11 23. 215

End Date: 11/23/23 1501

Date Rec'd: 11/15

YSI / T#: B17 B17 6/1 8/2 B17 B17 B17 oh  
Renewal Sample Used:

DAY	11/16	11/17	11/18	11/19	11/20	11/21	11/22	11/27
Initials	eb	eb 1049	1430M	1415 M	eb 1003	eb 1359	eb 1017	12

## DISSOLVED OXYGEN (mg/L)

Control	7.9	7.3	8.0	7.1	8.0	7.0	8.0	7.1	8.2	7.8	7.9	7.6	8.0	7.1
6.25%	8.0	7.2	8.0	7.2	8.0	7.1	7.9	7.1	8.0	7.8	7.9	7.5	7.8	7.2
12.5%	8.0	7.2	8.0	7.1	8.0	7.1	7.9	7.0	8.0	7.6	7.9	7.8	7.8	7.2
25%	8.0	7.1	7.9	7.2	7.9	7.0	8.0	7.1	7.9	7.6	7.8	7.5	7.7	7.1
50%	8.1	7.1	7.9	7.1	7.9	7.1	7.9	7.1	7.9	7.8	7.8	7.4	7.7	7.2
100%	8.2	7.0	8.0	7.1	7.8	7.1	7.9	7.1	7.9	7.8	7.8	7.4	7.7	7.2

## TEMPERATURE (°C)

Control	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
6.25%	24.3	24.0	24.2	24.0	24.0	24.0	24.0	24.0	24.2	24.0	24.2	24.0	24.2	24.0
12.5%	24.3	24.0	24.3	24.0	24.0	24.0	24.0	24.0	24.2	24.0	24.2	24.0	24.3	24.0
25%	24.1	24.0	24.3	24.0	24.0	24.0	24.0	24.0	24.1	24.0	24.2	24.0	24.3	24.0
50%	24.1	24.0	24.4	24.0	24.0	24.0	24.0	24.0	24.1	24.0	24.3	24.0	24.4	24.0
100%	24.2	24.0	24.4	24.0	24.0	24.0	24.0	24.0	24.1	24.0	24.3	24.0	24.4	24.0

## pH

Control	8.0	8.0	8.2	8.0	8.1	8.0	8.1	8.1	8.1	8.0	8.2	8.0	8.0	8.0
6.25%	8.3	8.0	8.2	8.0	8.1	8.0	8.1	8.1	8.1	8.0	8.0	7.9	8.0	8.0
12.5%	8.2	8.0	8.2	8.1	8.1	8.0	8.1	8.0	8.0	8.0	8.0	7.9	8.0	7.9
25%	8.1	8.0	8.1	8.1	8.1	8.0	8.1	8.0	8.0	8.0	8.0	7.9	8.0	7.9
50%	8.0	8.0	8.1	8.1	8.1	8.1	8.1	8.0	8.0	8.0	8.1	7.8	8.0	7.9
100%	8.0	8.0	8.0	8.1	8.1	8.1	8.1	8.0	8.0	8.0	8.1	7.8	8.0	7.9

## CONDUCTIVITY (uS/cm)

Control	376	369	370	377	377	376	379	378
6.25%	422	427	429	430	428	422	432	440
12.5%	377	380	388	389	392	390	393	397
25%	360	369	375	369	373	374	367	370
50%	331	332	335	340	338	339	340	338
100%	266	267	269	267	269	270	266	269

## ALKALINITY

Control	60	60	60	60	60	60	60	60
100%	36	36	36	36	36	36	36	36

## HARDNESS

Control	95	98	98	98	98	98	98	98
100%	100	100	100	100	100	100	100	100

Residual Chlorine 1st Sample: 2.01 2nd Sample: 3rd Sample:

# Chronic *Ceriodaphnia dubia* survival and reproduction - VCF 4

Aquatic Bioassay & Consulting Laboratories, Inc.

Start Date: 11 / 16 / 23

End Date: 11 / 23 / 23

Lab #: VCF 11 23. 215

Conc.	Day#	Initial	# YOUNG / REPLICATE									
			1	2	3	4	5	6	7	8	9	10
CON	3	<u>2</u>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	<u>40</u>	6	6	4	3	3	4	6	6	5	5
	5	<u>40</u>	9	6	5	5	10	9	7	✓	7	7
	6	<u>40</u>	12	10	10	12	11	11	13	10	13	12
	7	<u>2</u>	11	10	11	11	12	9	10	11	12	10
	Total		38	32	30	31	34	33	37	28	37	34
6.25%	3	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	-	6	4	4	5	6	6	4	6	5	5
	5	-	6	6	7	8	8	9	6	✓	5	5
	6	-	12	12	10	11	11	12	12	16	12	10
	7	-	9	8	7	7	7	9	12	12	15	15
	Total	-	33	30	28	31	31	36	34	34	37	35
12.5%	3	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	-	5	5	6	3	3	4	5	5	6	5
	5	-	5	5	7	9	9	8	6	6	7	✓
	6	-	11	11	10	9	10	9	7	12	16	12
	7	-	7	7	15	12	11	10	12	15	11	17
	Total	-	28	28	38	33	33	31	30	38	40	31
25%	3	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	-	7	6	6	5	3	4	3	5	5	6
	5	-	10	9	9	8	7	7	10	9	8	9
	6	-	10	10	11	11	13	12	14	13	12	14
	7	-	13	10	10	11	12	15	10	7	7	6
	Total	-	40	35	36	35	35	38	37	34	32	35
50%	3	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	-	5	5	6	6	4	5	6	4	5	5
	5	-	10	10	6	6	7	7	8	6	6	9
	6	-	11	13	10	14	12	10	10	11	12	13
	7	-	12	15	12	11	10	12	7	8	7	10
	Total	-	38	43	34	37	33	34	28	29	30	37
100%	3	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	-	5	6	3	6	6	4	5	5	6	6
	5	-	8	6	6	9	10	12	13	12	✓	10
	6	-	13	10	10	11	13	10	12	12	15	12
	7	-	12	15	10	7	7	10	12	11	13	14
	Total	-	38	39	29	33	36	36	42	40	34	42

## CHEMICAL ANALYSIS DATA SHEET

VCF 5Start Date: 11/16/2023 1510Lab #: VCF 11 23.217End Date: 11/23/23 1507Date Rec'd: 11/15YSI / T#: B17 B17Renewal Sample Used: 0/2 0/2 B17 B17 B17 0/2

DAY	<u>11/16</u>	<u>11/17</u>	<u>11/18</u>	<u>11/19</u>	<u>11/20</u>	<u>11/21</u>	<u>11/22</u>	<u>11/23</u>
Initials	<u>CB</u>	<u>CB</u>	<u>1102</u>	<u>1432M</u>	<u>1418M</u>	<u>CB</u>	<u>1019</u>	<u>CB</u>

## DISSOLVED OXYGEN (mg/L)

Control	<u>7.9</u>	<u>7.2</u>	<u>8.0</u>	<u>7.1</u>	<u>8.0</u>	<u>7.0</u>	<u>8.0</u>	<u>7.1</u>	<u>8.2</u>	<u>7.8</u>	<u>7.9</u>	<u>7.6</u>	<u>8.0</u>	<u>7.1</u>
6.25%	<u>7.8</u>	<u>7.2</u>	<u>8.0</u>	<u>7.2</u>	<u>8.0</u>	<u>7.1</u>	<u>7.9</u>	<u>7.0</u>	<u>8.1</u>	<u>7.7</u>	<u>7.9</u>	<u>7.8</u>	<u>7.8</u>	<u>7.2</u>
12.5%	<u>7.9</u>	<u>7.2</u>	<u>7.9</u>	<u>7.1</u>	<u>7.9</u>	<u>7.1</u>	<u>7.9</u>	<u>7.0</u>	<u>8.0</u>	<u>7.7</u>	<u>7.9</u>	<u>7.5</u>	<u>7.8</u>	<u>7.3</u>
25%	<u>7.9</u>	<u>7.3</u>	<u>7.8</u>	<u>7.2</u>	<u>8.0</u>	<u>7.2</u>	<u>8.0</u>	<u>7.1</u>	<u>8.0</u>	<u>7.6</u>	<u>7.8</u>	<u>7.5</u>	<u>7.8</u>	<u>7.2</u>
50%	<u>7.7</u>	<u>7.3</u>	<u>7.8</u>	<u>7.1</u>	<u>8.0</u>	<u>7.1</u>	<u>7.9</u>	<u>7.1</u>	<u>7.9</u>	<u>7.6</u>	<u>7.8</u>	<u>7.4</u>	<u>7.8</u>	<u>7.2</u>
100%	<u>7.6</u>	<u>7.3</u>	<u>7.7</u>	<u>7.1</u>	<u>8.0</u>	<u>7.1</u>	<u>7.9</u>	<u>7.1</u>	<u>7.9</u>	<u>7.6</u>	<u>7.8</u>	<u>7.4</u>	<u>7.8</u>	<u>7.2</u>

## TEMPERATURE (°C)

Control	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>
6.25%	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.2</u>	<u>24.0</u>	<u>24.2</u>	<u>24.0</u>	<u>24.2</u>	<u>24.0</u>
12.5%	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.2</u>	<u>24.0</u>	<u>24.2</u>	<u>24.0</u>	<u>24.2</u>	<u>24.0</u>
25%	<u>24.1</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.3</u>	<u>24.0</u>	<u>24.3</u>	<u>24.0</u>	<u>24.1</u>	<u>24.0</u>
50%	<u>24.1</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.3</u>	<u>24.0</u>	<u>24.2</u>	<u>24.0</u>	<u>24.1</u>	<u>24.0</u>
100%	<u>24.2</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.3</u>	<u>24.0</u>	<u>24.2</u>	<u>24.0</u>	<u>24.1</u>	<u>24.0</u>

## pH

Control	<u>8.0</u>	<u>8.0</u>	<u>8.2</u>	<u>8.0</u>	<u>8.1</u>	<u>8.0</u>	<u>8.1</u>	<u>8.1</u>	<u>8.1</u>	<u>8.0</u>	<u>8.2</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>
6.25%	<u>7.8</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.1</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.1</u>	<u>8.0</u>	<u>8.2</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>
12.5%	<u>7.8</u>	<u>7.9</u>	<u>8.0</u>	<u>7.9</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.2</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>
25%	<u>7.8</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>8.0</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>8.0</u>	<u>7.9</u>	<u>8.2</u>	<u>7.9</u>	<u>8.1</u>	<u>8.0</u>
50%	<u>7.8</u>	<u>7.8</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>8.2</u>	<u>7.9</u>	<u>8.1</u>	<u>8.0</u>
100%	<u>7.7</u>	<u>7.8</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>8.2</u>	<u>7.9</u>	<u>8.1</u>	<u>8.0</u>

## CONDUCTIVITY (uS/cm)

Control	<u>370</u>	<u>369</u>	<u>370</u>	<u>377</u>	<u>377</u>	<u>376</u>	<u>379</u>	<u>378</u>
6.25%	<u>398</u>	<u>399</u>	<u>398</u>	<u>398</u>	<u>399</u>	<u>392</u>	<u>398</u>	<u>399</u>
12.5%	<u>443</u>	<u>442</u>	<u>445</u>	<u>445</u>	<u>447</u>	<u>447</u>	<u>440</u>	<u>444</u>
25%	<u>449</u>	<u>450</u>	<u>455</u>	<u>458</u>	<u>465</u>	<u>469</u>	<u>452</u>	<u>462</u>
50%	<u>510</u>	<u>507</u>	<u>510</u>	<u>514</u>	<u>520</u>	<u>521</u>	<u>519</u>	<u>525</u>
100%	<u>626</u>	<u>630</u>	<u>638</u>	<u>645</u>	<u>651</u>	<u>649</u>	<u>649</u>	<u>653</u>

## ALKALINITY

Control	<u>60</u>	<u>60</u>	<u>60</u>	<u>60</u>	<u>60</u>	<u>60</u>	<u>60</u>	<u>60</u>
100%	<u>53</u>	<u>53</u>	<u>53</u>	<u>53</u>	<u>53</u>	<u>53</u>	<u>53</u>	<u>53</u>

## HARDNESS

Control	<u>98</u>	<u>98</u>	<u>98</u>	<u>98</u>	<u>98</u>	<u>98</u>	<u>98</u>	<u>98</u>
100%	<u>184</u>	<u>184</u>	<u>184</u>	<u>184</u>	<u>184</u>	<u>184</u>	<u>184</u>	<u>184</u>

Residual Chlorine

1st Sample: LOI

2nd Sample: \_\_\_\_\_

3rd Sample: \_\_\_\_\_

# Chronic *Ceriodaphnia dubia* survival and reproduction - VCF 5

Aquatic Bioassay & Consulting Laboratories, Inc.

Start Date: 11 / 16 / 23

Lab #: VCF 11 23. 217

End Date: 11 / 27 / 23

Conc.	Day#	Initial	# YOUNG / REPLICATE									
			1	2	3	4	5	6	7	8	9	10
USE CON of VCF 1123- 213	3	<u>2</u>										
	4	<u>40</u>										
	5	<u>40</u>										
	6	<u>40</u>										
	7	<u>2</u>										
	Total											
6.25%	3	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	-	<u>4</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>5</u>	<u>3</u>	<u>6</u>	<u>4</u>	<u>4</u>	<u>5</u>
	5	-	<u>10</u>	<u>6</u>	<u>7</u>	<u>7</u>	<u>5</u>	<u>6</u>	<u>9</u>	<u>8</u>	<u>9</u>	<u>7</u>
	6	-	<u>10</u>	<u>12</u>	<u>10</u>	<u>10</u>	<u>13</u>	<u>10</u>	<u>9</u>	<u>9</u>	<u>10</u>	<u>12</u>
	7	-	<u>12</u>	<u>12</u>	<u>11</u>	<u>12</u>	<u>10</u>	<u>11</u>	<u>10</u>	<u>11</u>	<u>14</u>	<u>12</u>
		-										
	Total	-	<u>36</u>	<u>34</u>	<u>33</u>	<u>35</u>	<u>33</u>	<u>30</u>	<u>34</u>	<u>34</u>	<u>37</u>	<u>36</u>
12.5%	3	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	-	<u>6</u>	<u>6</u>	<u>4</u>	<u>5</u>	<u>5</u>	<u>6</u>	<u>6</u>	<u>4</u>	<u>5</u>	<u>6</u>
	5	-	<u>7</u>	<u>9</u>	<u>9</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>11</u>	<u>10</u>	<u>9</u>
	6	-	<u>13</u>	<u>10</u>	<u>13</u>	<u>10</u>	<u>10</u>	<u>7</u>	<u>14</u>	<u>12</u>	<u>12</u>	<u>13</u>
	7	-	<u>12</u>	<u>11</u>	<u>12</u>	<u>14</u>	<u>14</u>	<u>13</u>	<u>12</u>	<u>13</u>	<u>12</u>	<u>15</u>
		-										
	Total	-	<u>38</u>	<u>36</u>	<u>38</u>	<u>37</u>	<u>38</u>	<u>36</u>	<u>43</u>	<u>40</u>	<u>39</u>	<u>43</u>
25%	3	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	-	<u>5</u>	<u>8</u>	<u>6</u>	<u>6</u>	<u>4</u>	<u>5</u>	<u>5</u>	<u>6</u>	<u>4</u>	<u>5</u>
	5	-	<u>6</u>	<u>7</u>	<u>7</u>	<u>9</u>	<u>8</u>	<u>6</u>	<u>6</u>	<u>5</u>	<u>7</u>	<u>8</u>
	6	-	<u>14</u>	<u>12</u>	<u>10</u>	<u>10</u>	<u>11</u>	<u>11</u>	<u>14</u>	<u>12</u>	<u>10</u>	<u>13</u>
	7	-	<u>15</u>	<u>15</u>	<u>14</u>	<u>13</u>	<u>13</u>	<u>14</u>	<u>13</u>	<u>12</u>	<u>15</u>	<u>15</u>
		-										
	Total	-	<u>40</u>	<u>39</u>	<u>37</u>	<u>38</u>	<u>36</u>	<u>36</u>	<u>38</u>	<u>35</u>	<u>36</u>	<u>38</u>
50%	3	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	-	<u>6</u>	<u>4</u>	<u>5</u>	<u>5</u>	<u>6</u>	<u>6</u>	<u>4</u>	<u>5</u>	<u>2</u>	<u>6</u>
	5	-	<u>6</u>	<u>5</u>	<u>5</u>	<u>7</u>	<u>6</u>	<u>7</u>	<u>5</u>	<u>6</u>	<u>9</u>	<u>8</u>
	6	-	<u>12</u>	<u>10</u>	<u>10</u>	<u>13</u>	<u>12</u>	<u>10</u>	<u>11</u>	<u>11</u>	<u>14</u>	<u>12</u>
	7	-	<u>15</u>	<u>17</u>	<u>14</u>	<u>15</u>	<u>15</u>	<u>14</u>	<u>14</u>	<u>15</u>	<u>17</u>	<u>15</u>
		-										
	Total	-	<u>39</u>	<u>33</u>	<u>34</u>	<u>40</u>	<u>39</u>	<u>37</u>	<u>34</u>	<u>37</u>	<u>39</u>	<u>41</u>
100%	3	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	-	<u>6</u>	<u>4</u>	<u>4</u>	<u>6</u>	<u>5</u>	<u>5</u>	<u>6</u>	<u>6</u>	<u>4</u>	<u>4</u>
	5	-	<u>7</u>	<u>7</u>	<u>9</u>	<u>8</u>	<u>6</u>	<u>6</u>	<u>7</u>	<u>9</u>	<u>8</u>	<u>9</u>
	6	-	<u>12</u>	<u>12</u>	<u>10</u>	<u>14</u>	<u>9</u>	<u>13</u>	<u>12</u>	<u>16</u>	<u>12</u>	<u>9</u>
	7	-	<u>14</u>	<u>15</u>	<u>17</u>	<u>15</u>	<u>15</u>	<u>14</u>	<u>15</u>	<u>17</u>	<u>15</u>	<u>15</u>
		-										
	Total	-	<u>34</u>	<u>38</u>	<u>37</u>	<u>43</u>	<u>35</u>	<u>38</u>	<u>40</u>	<u>45</u>	<u>39</u>	<u>37</u>

# CHEMICAL ANALYSIS DATA SHEET

VCF 6

Start Date: 11/17/2023 1406

Lab #: VCF 11 23. 209

End Date: 11/21/23 1402

Date Rec'd: 11/15

YSI / T#:

Renewal Sample Used:

DAY	11/17	11/18	11/19	11/20	11/21	11/22	11/23	11/24
Initials	1155	1048	1220	1610	1134	1421		

## DISSOLVED OXYGEN (mg/L)

Control	8.0	7.1	8.0	7.0	8.0	7.1	8.2	7.8	7.9	7.6	8.0	7.1	8.0	7.0
6.25%	7.0	7.1	8.0	7.0	8.0	7.1	8.1	7.7	7.9	7.2	7.9	7.2	8.0	7.0
12.5%	7.8	7.1	7.9	7.1	7.9	7.2	8.0	7.6	7.9	7.3	7.9	7.2	8.0	7.0
25%	7.9	7.1	7.8	7.1	7.9	7.1	8.0	7.0	7.8	7.2	7.8	7.1	7.9	7.1
50%	7.3	7.1	7.8	7.1	7.9	7.2	7.9	7.8	7.8	7.2	7.8	7.1	7.9	7.1
100%	7.3	7.2	7.0	7.1	7.8	7.2	7.9	7.5	7.8	7.2	7.8	7.1	7.9	7.1

## TEMPERATURE (°C)

Control	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
6.25%	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.1	24.0	24.0	24.0	24.0	24.0
12.5%	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.1	24.0	24.0	24.0	24.0	24.0
25%	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.2	24.0	24.0	24.0	24.0	24.0
50%	24.1	24.0	24.0	24.0	24.0	24.0	24.1	24.0	24.2	24.0	24.0	24.0	24.0	24.0
100%	24.2	24.0	24.0	24.0	24.0	24.0	24.2	24.0	24.2	24.0	24.0	24.0	24.0	24.0

## pH

Control	8.2	8.0	8.1	8.0	8.1	8.1	8.0	8.2	8.0	8.0	8.0	8.0	8.0	8.0
6.25%	7.9	8.0	8.0	8.0	8.1	8.0	7.9	8.0	7.9	8.0	8.0	8.0	8.0	8.0
12.5%	7.6	7.8	7.8	8.0	8.0	8.0	7.8	8.0	7.9	8.0	8.0	8.0	8.0	8.0
25%	7.6	7.7	7.7	7.9	7.9	8.0	7.8	8.0	7.9	8.0	8.0	7.9	8.0	8.0
50%	7.6	7.6	7.7	7.8	7.8	8.0	7.8	8.0	7.9	8.0	8.0	7.9	8.0	8.0
100%	7.8	7.8	7.6	7.7	7.8	7.9	7.8	8.0	7.9	8.0	8.0	7.9	8.0	8.0

## CONDUCTIVITY (uS/cm)

Control	369	370	377	377	376	379	380	383
6.25%	429	430	431	435	430	432	435	438
12.5%	502	510	515	520	522	530	529	536
25%	598	599	598	599	598	599	598	599
50%	763	768	769	769	760	762	761	768
100%	1124	1130	1135	1138	1142	1139	1140	1145

## ALKALINITY

Control	60	60	60	60	60	60	60	60
100%	180	180	180	180	180	180	180	180

## HARDNESS

Control	95	98	98	98	98	98	98	98
100%	420	420	420	420	420	420	420	420

Residual Chlorine

1st Sample: 20.1

2nd Sample: \_\_\_\_\_

3rd Sample: \_\_\_\_\_

# Chronic juvenile Fathead minnow (*Pimephales promelas*) toxicity test - Survival

Aquatic Bioassay & Consulting Laboratories, Inc.

Company: VCF

Lab #: VCF 11 23. 209

Sample I.D.:

Date & Time Start: 11/17

Date & Time End: 11-24-23

Conc.	Rep.#	INITIAL	1	2	3	4	5	6	FINAL
CONTROL	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
6.25%	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
12.5%	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
25%	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
50%	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
100%	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15

CHAMBER NUMBER	EFF. CONC.	REPL. #	NUMBER FISH	BOAT TARE	BOAT + FISH	FISH WEIGHT (g)	AVG. WT. PER FISH (g)
LB 1	CONTROL	1		1.14484	1.15004	.00520	
LB 2		2		1.14091	1.14611	.00520	
LB 3		3		1.15194	1.15703	.00509	
LB 4		4		1.14341	1.14877	.00536	
LB 5	6.25%	1		1.14057	1.14583	.00526	
LB 6		2		1.14266	1.14798	.00532	
LB 7		3		1.14460	1.14993	.00533	
LB 8		4		1.12979	1.13521	.00542	
LB 9	12.5%	1		1.15055	1.15589	.00534	
LB 10		2		1.13946	1.14462	.00516	
LB 11		3		1.14760	1.15273	.00513	
LB 12		4		1.15468	1.15970	.00508	
LB 13	25%	1		1.13627	1.14142	.00515	
LB 14		2		1.14413	1.14926	.00513	
LB 15		3		1.15390	1.15914	.00524	
LB 16		4		1.14919	1.15437	.00518	
LB 17	50%	1		1.15455	1.15986	.00531	
LB 18		2		1.15336	1.15783	.00417	
LB 19		3		1.13260	1.13769	.00509	
LB 20		4		1.13177	1.13682	.00505	
LB 21	100%	1		1.14231	1.14749	.00518	
LB 22		2		1.14876	1.15380	.00504	
LB 23		3		1.14160	1.14699	.00539	
LB 24		4		1.15122	1.15673	.00520	

# CHEMICAL ANALYSIS DATA SHEET

VCF 7

Start Date: 11/17/2023 1414

Lab #: VCF 11 23. 213

End Date: 11/24/23 1712

Date Rec'd: 11/15

YSI / T#: B17

Renewal Sample Used: 0h 0h 0h B17 B17 0h 0h

DAY	11/17	0	11/18	1	11/19	2	11/20	3	11/21	4	11/22	5	11/23	6	11/24	7
Initials	Ph	1210	Ph	1055	Ph	1238	Ph	1030	Ph	1152	Ph	1424	Ph	1424	Ph	1424

## DISSOLVED OXYGEN (mg/L)

Control	8.0	7.1	8.0	7.0	8.0	7.1	8.2	7.8	7.9	7.0	8.0	7.1	8.0	7.0
6.25%	7.6	7.2	7.9	7.1	7.9	7.2	8.0	7.8	7.8	7.5	7.9	7.2	8.0	7.1
12.5%	7.6	7.1	7.8	7.1	7.9	7.2	7.9	7.8	7.8	7.5	7.9	7.1	8.0	7.0
25%	7.8	7.2	7.8	7.2	7.9	7.1	7.9	7.7	7.9	7.4	7.9	7.1	8.0	7.1
50%	7.8	7.2	7.7	7.1	7.9	7.2	7.9	7.7	7.9	7.4	7.8	7.2	7.9	7.1
100%	7.4	7.1	7.7	7.1	7.8	7.2	7.9	7.7	7.9	7.3	7.8	7.1	7.9	7.1

## TEMPERATURE (°C)

Control	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
6.25%	24.2	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.2	24.0	24.0	24.0	24.0	24.0
12.5%	24.3	24.0	24.1	24.0	24.0	24.0	24.0	24.0	24.2	24.0	24.0	24.0	24.0	24.0
25%	24.3	24.0	24.1	24.0	24.0	24.0	24.0	24.0	24.1	24.0	24.0	24.0	24.0	24.0
50%	24.4	24.0	24.1	24.0	24.0	24.0	24.0	24.0	24.1	24.0	24.0	24.0	24.0	24.0
100%	24.4	24.0	24.1	24.0	24.0	24.0	24.0	24.0	24.1	24.0	24.0	24.0	24.0	24.0

## pH

Control	8.2	8.0	8.1	8.0	8.1	8.1	8.1	8.0	8.2	8.0	8.0	8.0	8.0	8.0
6.25%	7.8	7.7	7.7	7.9	8.0	8.0	8.0	7.9	8.0	7.8	7.9	8.0	8.0	8.0
12.5%	7.8	7.0	7.0	7.8	7.8	8.0	8.0	7.9	8.0	7.8	7.8	7.9	7.9	8.0
25%	7.6	7.5	7.6	7.7	7.7	7.9	7.9	7.8	8.0	7.8	7.8	7.8	7.9	7.9
50%	7.6	7.0	7.5	7.6	7.6	7.8	7.8	7.8	8.0	7.7	7.8	7.8	7.8	7.9
100%	7.6	7.5	7.5	7.6	7.6	7.7	7.7	7.8	8.0	7.7	7.8	7.7	7.8	7.9

## CONDUCTIVITY (uS/cm)

Control	369	370	377	377	376	379	380	383
6.25%	402	409	407	410	407	410	411	415
12.5%	370	375	378	378	372	372	379	387
25%	341	340	339	338	337	337	338	350
50%	292	298	299	300	298	298	299	299
100%	193	195	194	198	190	192	195	198

## ALKALINITY

Control	60	60	60	60	60	60	60	60
100%	30	30	30	30	30	30	30	30

## HARDNESS

Control	95	98	98	98	98	98	98	98
100%	53	53	53	53	53	53	53	53

Residual Chlorine

1st Sample: 60.1

2nd Sample:

3rd Sample:

# Chronic juvenile Fathead minnow (*Pimephales promelas*) toxicity test - Survival

Aquatic Bioassay & Consulting Laboratories, Inc.

Company: VCF 7

Sample I.D.:

Date & Time Start:

Lab #: VCF 11 23. 213

Date & Time End: 11-24-23

Conc.	Rep.#	INITIAL	1	2	3	4	5	6	FINAL
USE CONTROL VCF 1123.209	1								
	2								
	3								
	4								
6.25%	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
12.5%	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
25%	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
50%	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
100%	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15

CHAMBER NUMBER	EFF. CONC.	REPL. #	NUMBER FISH	BOAT TARE	BOAT + FISH	FISH WEIGHT (g)	AVG. WT. PER FISH (g)
LC 1	CONTROL	1					
		2					
		3					
		4					
LC 2	6.25%	1		1.14509	1.15046	.00537	
		2		1.14595	1.15112	.00517	
		3		1.14239	1.14793	.00554	
		4		1.14848	1.15365	.00517	
LC 3	12.5%	1		1.15131	1.15670	.00539	
		2		1.15012	1.15537	.00525	
		3		1.14152	1.14684	.00532	
		4		1.13583	1.14099	.00516	
LC 4	25%	1		1.13786	1.14260	.00504	
		2		1.15702	1.16297	.00595	
		3		1.14377	1.14883	.00506	
		4		1.15309	1.15781	.00472	
LC 5	50%	1		1.15423	1.15991	.00568	
		2		1.14275	1.14794	.00519	
		3		1.12933	1.13472	.00539	
		4		1.14694	1.15214	.00520	
LC 6	100%	1		1.13481	1.13998	.00517	
		2		1.13542	1.14073	.00531	
		3		1.14598	1.15112	.00514	
		4		1.14082	1.15202	.00520	

# CHEMICAL ANALYSIS DATA SHEET

VCF 8

Start Date: 11/17/2023 1432

Lab #: VCF 11 23.214

End Date: 11/29/23 1423

Date Rec'd: 11/15

YSI / T#: B17

Renewal Sample Used:

DAY	11/17	11/18	1	11/19	2	11/20	3	11/21	4	11/22	5	11/23	6	11/24	7
Initials	EB	11/17 N		11/19 N		11/20 N		EB 11/21		EB 11/22		11/23 N		N	

## DISSOLVED OXYGEN (mg/L)

Control	8.0	7.1	8.0	7.0	8.0	7.1	8.2	7.8	7.9	7.6	8.0	7.1	8.0	7.0	
6.25%	7.0	7.2	7.0	7.1	7.9	7.1	8.1	7.7	7.8	7.4	7.7	7.2	7.0	7.0	
12.5%	7.0	7.2	7.0	7.1	7.9	7.2	8.0	7.6	7.8	7.4	7.7	7.1	7.5	7.0	
25%	7.2	7.1	8.1	7.2	8.0	7.2	8.0	7.6	7.7	7.3	7.8	7.2	7.8	7.0	
50%	7.2	7.1	7.0	7.1	7.5	7.1	7.5	7.6	7.7	7.3	7.8	7.2	7.8	7.0	
100%	7.3	7.1	8.0	7.1	7.5	7.1	8.0	7.5	7.7	7.2	7.8	7.1	7.8	7.0	

## TEMPERATURE (°C)

Control	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	
6.25%	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.2	24.0	24.0	24.0	24.0	24.0	
12.5%	24.1	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.2	24.0	24.1	24.0	24.0	24.0	
25%	24.2	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.3	24.0	24.1	24.0	24.0	24.0	
50%	24.2	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.3	24.0	24.2	24.0	24.0	24.0	
100%	24.3	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.3	24.0	24.2	24.0	24.0	24.0	

## pH

Control	8.2	8.0	8.1	8.0	8.1	8.1	8.1	8.0	8.2	8.0	8.0	8.0	8.0	8.0	
6.25%	7.2	7.4	7.6	7.6	8.0	8.1	8.1	8.0	8.2	8.0	7.9	7.9	7.9	8.0	
12.5%	7.2	7.3	7.5	7.5	7.7	8.0	7.9	8.0	8.2	8.0	7.9	7.9	7.9	8.0	
25%	7.4	7.2	7.4	7.5	7.6	7.9	7.8	7.9	8.1	7.9	7.8	7.9	7.8	7.9	
50%	7.4	7.2	7.4	7.3	7.5	7.8	7.7	7.9	8.1	7.9	7.8	7.9	7.8	7.9	
100%	7.5	7.3	7.4	7.3	7.4	7.7	7.6	7.9	8.1	7.9	7.7	7.9	7.8	7.9	

## CONDUCTIVITY (uS/cm)

Control	369	370	377	377	377	377	377	376	379	380	383	383	383	383	
6.25%	382	385	383	385	385	385	385	377	380	382	385	385	385	385	
12.5%	391	390	387	388	388	388	388	380	383	385	385	385	385	385	
25%	397	397	395	395	395	395	395	382	390	390	390	390	390	390	
50%	404	408	407	410	410	410	410	383	410	410	410	410	410	410	
100%	421	424	422	425	425	425	425	386	402	418	418	418	418	418	

## ALKALINITY

Control	60	60	60	60	60	60	60	60	60	60	60	60	60	60	
100%	55	55	55	55	55	55	55	55	55	55	55	55	55	55	

## HARDNESS

Control	95	98	98	98	98	98	98	98	98	98	98	98	98	98	
100%	125	125	125	125	125	125	125	125	125	125	125	125	125	125	

Residual Chlorine

1st Sample: 201

2nd Sample:

3rd Sample:

QC: em-lab

# Chronic juvenile Fathead minnow (*Pimephales promelas*) toxicity test - Survival

Aquatic Bioassay & Consulting Laboratories, Inc.

Company: VCF 8

Lab #: VCF 11 23. 214

Sample I.D.:

Date & Time Start: 11/17

Date & Time End: 11-24-23

Conc.	Rep.#	INITIAL	1	2	3	4	5	6	FINAL
CONTROL	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	12
	3	15	15	15	15	15	15	15	13
	4	15	15	15	15	15	15	15	15
6.25%	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
12.5%	1	15	15	15	15	15	15	15	14
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
25%	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
50%	1	15	15	15	15	15	15	15	14
	2	15	15	15	15	15	15	15	13
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
100%	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	14
	4	15	15	15	15	15	15	15	15

CHAMBER NUMBER	EFF. CONC.	REPL. #	NUMBER FISH	BOAT TARE	BOAT + FISH	FISH WEIGHT (g)	AVG. WT. PER FISH (g)
LD 1	CONTROL	1		1.13892	1.14402	.00510	
LD 2		2		1.14783	1.15166	.00413	
LD 3		3		1.14546	1.14955	.00409	
LD 4		4		1.13836	1.14374	.00538	
LD 5	6.25%	1		1.14022	1.15133	.00511	
LD 6		2		1.15847	1.16377	.00530	
LD 7		3		1.14254	1.14760	.00506	
LD 8		4		1.14812	1.15372	.00560	
LD 9	12.5%	1		1.15227	1.15745	.00518	
LD 10		2		1.15102	1.15634	.00532	
LD 11		3		1.14166	1.14692	.00526	
LD 12		4		1.13336	1.13877	.00541	
LD 13	25%	1		1.13261	1.13798	.00537	
LD 14		2		1.12978	1.13502	.00524	
LD 15		3		1.15712	1.16234	.00522	
LD 16		4		1.15522	1.16073	.00551	
LD 17	50%	1		1.15364	1.15874	.00510	
LD 18		2		1.14072	1.14589	.00517	
LD 19		3		1.14228	1.14783	.00555	
LD 20		4		1.12829	1.13370	.00541	
LD 21	100%	1		1.14805	1.15013	.00508	
LD 22		2		1.14976	1.14989	.00513	
LD 23		3		1.13435	1.13964	.00529	
LD 24		4		1.15728	1.16252	.00514	

## CHEMICAL ANALYSIS DATA SHEET

VCF 9

Start Date: 11/17/2023 1439

Lab #: VCF 11 23. 216

End Date: 11/24/23 1445

Date Rec'd: 11/15

YSI / T#: B17

Renewal Sample Used: 0/2 0/2 0/2 B17 B17 0/2 0/2

DAY	11/17	11/18	1	11/19	2	11/20	3	11/21	4	11/22	5	11/23	6	11/24	7
Initials	EB	1135 M		11/19 M		11/20 M		EB 11937		EB 1230		1135 M		M	

## DISSOLVED OXYGEN (mg/L)

Control	8.0	7.1	8.0	7.0	8.0	7.1	8.2	7.8	7.9	7.6	8.0	7.1	8.0	7.0	
6.25%	7.2	7.2	8.0	7.1	8.0	7.0	8.1	7.8	7.9	7.3	7.8	7.1	8.0	7.0	
12.5%	7.2	7.1	7.5	7.1	7.9	7.0	8.0	7.7	7.9	7.3	7.8	7.2	7.9	7.0	
25%	7.3	7.1	7.9	7.0	7.9	7.1	8.0	7.6	7.8	7.2	7.8	7.1	7.9	7.0	
50%	7.4	7.1	7.8	7.0	7.9	7.1	8.0	7.6	7.8	7.2	7.9	7.1	7.9	7.1	
100%	7.4	7.1	7.8	7.0	7.9	7.1	8.0	7.6	7.8	7.2	7.9	7.1	7.9	7.1	

## TEMPERATURE (°C)

Control	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	
6.25%	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.3	24.0	24.0	24.0	24.0	24.0	
12.5%	24.2	24.0	24.0	24.0	24.0	24.0	24.1	24.0	24.3	24.0	24.0	24.0	24.0	24.0	
25%	24.2	24.0	24.0	24.0	24.0	24.0	24.1	24.0	24.4	24.0	24.1	24.0	24.0	24.0	
50%	24.2	24.0	24.0	24.0	24.0	24.0	24.2	24.0	24.5	24.0	24.2	24.0	24.0	24.0	
100%	24.3	24.0	24.1	24.0	24.0	24.0	24.2	24.0	24.6	24.0	24.2	24.0	24.0	24.0	

## pH

Control	8.2	8.0	8.1	8.0	8.1	8.1	8.1	8.0	8.2	8.0	8.0	8.0	8.0	8.0	
6.25%	7.3	7.5	7.5	7.6	7.8	7.9	7.9	7.9	7.8	7.8	7.9	7.9	7.9	7.9	
12.5%	7.4	7.4	7.7	7.5	7.8	7.8	7.8	7.9	7.8	7.8	7.9	7.9	7.9	7.9	
25%	7.4	7.4	7.4	7.4	7.7	7.8	7.7	7.9	7.8	7.8	7.9	7.9	7.9	7.9	
50%	7.5	7.4	7.7	7.4	7.6	7.7	7.7	7.8	7.8	7.7	7.9	7.8	7.9	7.9	
100%	7.5	7.4	7.4	7.5	7.6	7.6	7.6	7.8	7.8	7.7	7.9	7.8	7.9	7.9	

## CONDUCTIVITY (uS/cm)

Control	369	370	377	377		376	379	380	383						
6.25%	383	380	381	383		382	382	388	388						
12.5%	376	377	378	379		377	379	380	382						
25%	358	363	367	369		362	364	365	365						
50%	329	330	335	338		340	337	339	339						
100%	270	285	288	282		289	282	288	289						

## ALKALINITY

Control	60	60	60	60	60	60	60	60	60	60	60	60	60	60	
100%	27	27	27	27	27	27	27	27	27	27	27	27	27	27	

## HARDNESS

Control	95	98	98	98	98	98	98	98	98	98	98	98	98	98	
100%	81	81	81	81	81	81	81	81	81	81	81	81	81	81	

Residual Chlorine

1st Sample: 60.1

2nd Sample: 60.1

3rd Sample: 60.1

# Chronic juvenile Fathead minnow (*Pimephales promelas*) toxicity test - Survival

Aquatic Bioassay & Consulting Laboratories, Inc.

Company: VCF 9

Lab #: VCF 11 23. 214

Sample I.D.: \_\_\_\_\_

Date & Time Start: 11/17

Date & Time End: \_\_\_\_\_

Conc.	Rep.#	INITIAL <u>N</u>	1 <u>M</u>	2 <u>M</u>	3 <u>K</u>	4 <u>ED</u>	5 <u>ED</u>	6 <u>N</u>	FINAL <u>43</u>
<u>VCF</u> CONTROL <u>NOFIM. 214</u>	1								
	2								
	3								
	4								
6.25%	1	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>
	2	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>
	3	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>
	4	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>
12.5%	1	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>14</u>
	2	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>
	3	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>
	4	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>
25%	1	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>14</u>
	2	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>
	3	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>9</u>
	4	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>14</u>
50%	1	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>
	2	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>
	3	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>
	4	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>
100%	1	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>14</u>
	2	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>
	3	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>
	4	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>

CHAMBER NUMBER	EFF. CONC.	REPL. #	NUMBER FISH	BOAT TARE	BOAT + FISH	FISH WEIGHT (g)	AVG. WT. PER FISH (g)
<u>/</u>	CONTROL	1					
		2					
		3					
		4					
<u>LE</u> <u>1</u>	6.25%	1		<u>1.14512</u>	<u>1.15033</u>	<u>.00521</u>	
<u>2</u>		2		<u>1.14144</u>	<u>1.14670</u>	<u>.005210</u>	
<u>3</u>		3		<u>1.15903</u>	<u>1.16422</u>	<u>.00519</u>	
<u>4</u>		4		<u>1.13649</u>	<u>1.14156</u>	<u>.00507</u>	
<u>LE</u> <u>5</u>	12.5%	1		<u>1.14538</u>	<u>1.15045</u>	<u>.00507</u>	
<u>6</u>		2		<u>1.18450</u>	<u>1.18953</u>	<u>.00503</u>	
<u>7</u>		3		<u>1.14918</u>	<u>1.15463</u>	<u>.00545</u>	
<u>8</u>		4		<u>1.15838</u>	<u>1.16375</u>	<u>.00537</u>	
<u>LE</u> <u>9</u>	25%	1		<u>1.15806</u>	<u>1.15829</u>	<u>.00523</u>	
<u>10</u>		2		<u>1.12361</u>	<u>1.12884</u>	<u>.00523</u>	
<u>11</u>		3		<u>1.14007</u>	<u>1.14913</u>	<u>.00306</u>	
<u>12</u>		4		<u>1.14289</u>	<u>1.14792</u>	<u>.00503</u>	
<u>LE</u> <u>13</u>	50%	1		<u>1.15445</u>	<u>1.15953</u>	<u>.00508</u>	
<u>14</u>		2		<u>1.15167</u>	<u>1.15685</u>	<u>.00518</u>	
<u>15</u>		3		<u>1.15441</u>	<u>1.15991</u>	<u>.00550</u>	
<u>16</u>		4		<u>1.13403</u>	<u>1.13927</u>	<u>.00524</u>	
<u>LE</u> <u>17</u>	100%	1		<u>1.13852</u>	<u>1.14372</u>	<u>.00520</u>	
<u>18</u>		2		<u>1.18916</u>	<u>1.14433</u>	<u>.00517</u>	
<u>19</u>		3		<u>1.14479</u>	<u>1.14981</u>	<u>.00502</u>	
<u>20</u>		4		<u>1.14247</u>	<u>1.14853</u>	<u>.00506</u>	

# CHEMICAL ANALYSIS

VCF - Topsmelt

Start Date: 11/17/2023 1542

10

Lab #: VCF 11 23. 232

End Date: 11/24/23 1520

Date Rec'd: 11/15

YSI / T#: B17

Sample used for renewal: 3/2 3/2 3/2 B17 B17 3/2 3/2

Day	11/17	11/18	11/19	11/20	11/21	11/22	11/23	11/24
Analyst Int.	40	0959W	0558W	0930W	40 1042	40 1250	0926W	W
DISSOLVED OXYGEN (mg/L)								
CONTROL	7.3	7.0	7.6	7.1	7.0	7.3	6.9	7.5
6.25%	7.0	7.0	7.5	7.1	7.0	7.3	6.8	7.5
12.5%	7.0	7.0	7.5	7.1	7.0	7.3	6.9	7.5
25%	7.8	7.1	7.5	7.1	7.0	7.3	7.0	7.5
50%	7.8	7.1	7.5	7.1	7.0	7.3	6.9	7.5
100%	7.0	7.1	7.5	7.1	7.0	7.3	7.0	7.5
TEMPERATURE (°C)								
CONTROL	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
6.25%	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
12.5%	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
25%	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
50%	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
100%	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
pH								
CONTROL	7.8	7.9	7.9	7.9	7.9	7.8	7.9	7.9
6.25%	7.8	7.9	7.8	7.9	7.9	7.8	7.9	7.9
12.5%	7.8	7.8	7.8	7.9	7.9	7.8	7.9	7.9
25%	7.7	7.8	7.8	7.9	7.8	7.8	7.9	7.9
50%	7.7	7.7	7.8	7.8	7.8	7.8	7.8	7.8
100%	7.7	7.7	7.8	7.8	7.8	7.8	7.8	7.8
SALINITY (ppt)								
CONTROL	34	34	34	34	34	34	34	34
6.25%	34	34	34	34	34	34	34	34
12.5%	34	34	34	34	34	34	34	34
25%	34	34	34	34	34	34	34	34
50%	34	34	34	34	34	34	34	34
100%	34	34	34	34	34	34	34	34

NOTES:

ME = 110

# TOPSMELT SURVIVAL

Company: VCF 10

Sample ID:

Lab#: VCF 11 23. 232

Start Date: 11/17/23

End Date: 11/24/23

Daily # of Surviving Fish									
Concentration	Rep. #	Initial	1	2	3	4	5	6	Final
CON	1	8	8	8	8	8	8	8	8
	2	8	8	8	8	8	8	8	8
	3	8	8	8	8	8	8	8	8
	4	8	8	8	8	8	8	8	8
	5	8	8	8	8	8	8	8	8
6.25%	1	8	8	8	8	8	8	8	8
	2	8	8	8	8	8	8	8	8
	3	8	8	8	8	8	8	8	8
	4	8	8	8	8	8	8	8	8
	5	8	8	8	8	8	8	8	8
12.5%	1	8	8	8	8	8	8	8	8
	2	8	8	8	8	8	8	8	8
	3	8	8	8	8	8	8	8	8
	4	8	8	8	8	8	8	8	8
	5	8	8	8	8	8	8	8	8
25%	1	8	8	8	8	8	8	8	8
	2	8	8	8	8	8	8	8	8
	3	8	8	8	8	8	8	8	8
	4	8	8	8	8	8	8	8	8
	5	8	8	8	8	8	8	8	8
50%	1	8	8	8	8	8	8	8	8
	2	8	8	8	8	8	8	8	8
	3	8	8	8	8	8	8	8	8
	4	8	8	8	8	8	8	8	8
	5	8	8	8	8	8	8	8	8
100%	1	8	8	8	8	8	8	8	8
	2	8	8	8	8	8	8	8	8
	3	8	8	8	8	8	8	8	8
	4	8	8	8	8	8	8	8	8
	5	8	8	8	8	8	8	8	8

Aquatic Bioassay & Consulting Laboratories, Inc.

# TOPSMELT GROWTH

Company: VCF

10

11/17/23

Lab#:

VCF 11.23.232

Sample ID:

11/24/23

Chamber #	Eff Conc.	Rep. #	Number Fish	Boat Tare	Boat + Fish	Fish Wt. (mg)	Average Weight Per Fish (mg)
LN 1	CON	1		1.16295	1.17013	.00718	
2		2		1.17017	1.17790	.00773	
3		3		1.14904	1.18647	.00743	
4		4		1.14512	1.18294	.00782	
5		5		1.15307	1.16048	.00738	
LN 6	6.25%	1		1.16209	1.16983	.00774	
7		2		1.15328	1.16032	.00704	
8		3		1.15726	1.16470	.00744	
9		4		1.13072	1.13794	.00722	
10		5		1.16066	1.16783	.00717	
LN 11	12.5%	1		1.16597	1.17312	.00715	
12		2		1.16483	1.17211	.00728	
13		3		1.15153	1.18866	.00713	
14		4		1.16637	1.17349	.00712	
15		5		1.14621	1.15361	.00740	
LN 16	25%	1		1.14912	1.15637	.00725	
17		2		1.15567	1.16283	.00716	
18		3		1.14769	1.15482	.00713	
19		4		1.15941	1.16672	.00731	
20		5		1.15786	1.16501	.00715	
LN 21	50%	1		1.14278	1.14998	.00720	
22		2		1.14262	1.14974	.00712	
23		3		1.13355	1.14083	.00728	
24		4		1.14352	1.15077	.00725	
25		5		1.14202	1.14966	.00764	
LN 26	100%	1		1.13889	1.14601	.00712	
27		2		1.15661	1.16372	.00711	
28		3		1.15829	1.16534	.00705	
29		4		1.15428	1.16189	.00761	
30		5		1.13932	1.14667	.00735	

Aquatic Bioassay & Consulting Laboratories, Inc.

2023

## CHEMICAL ANALYSIS DATA SHEET

## STD TOX - FML

Start Date: 11/17/2023 1401Lab #: FML 111723End Date: 11/29/23 1350

Date Rec'd: \_\_\_\_\_

YSI used:

T#/CF:

B176/2B176/2B17B176/26/2

DAY	<u>11/17</u>	<u>11/18</u>	<u>1</u>	<u>11/19</u>	<u>2</u>	<u>11/20</u>	<u>3</u>	<u>11/21</u>	<u>4</u>	<u>11/22</u>	<u>5</u>	<u>11/23</u>	<u>6</u>	<u>11/24</u>	<u>7</u>
Initials	<u>JP</u>	<u>MS</u>	<u>W</u>	<u>JP</u>	<u>W</u>	<u>MS</u>	<u>W</u>	<u>JP</u>	<u>MS</u>	<u>W</u>	<u>JP</u>	<u>MS</u>	<u>W</u>	<u>JP</u>	<u>MS</u>

## DISSOLVED OXYGEN (mg/L)

Control	<u>8.0</u>	<u>7.1</u>	<u>8.0</u>	<u>7.0</u>	<u>8.0</u>	<u>7.1</u>	<u>8.0</u>	<u>7.8</u>	<u>7.9</u>	<u>7.6</u>	<u>8.0</u>	<u>7.1</u>	<u>8.0</u>	<u>7.0</u>
0.010	<u>8.0</u>	<u>7.0</u>	<u>8.0</u>	<u>7.0</u>	<u>8.0</u>	<u>7.1</u>	<u>8.1</u>	<u>7.6</u>	<u>7.8</u>	<u>7.8</u>	<u>7.9</u>	<u>7.2</u>	<u>8.0</u>	<u>7.0</u>
0.019	<u>8.0</u>	<u>7.0</u>	<u>8.0</u>	<u>7.0</u>	<u>7.9</u>	<u>7.1</u>	<u>8.1</u>	<u>7.6</u>	<u>7.8</u>	<u>7.8</u>	<u>7.9</u>	<u>7.2</u>	<u>8.0</u>	<u>7.0</u>
0.038	<u>7.9</u>	<u>7.0</u>	<u>7.9</u>	<u>7.0</u>	<u>7.9</u>	<u>7.1</u>	<u>8.1</u>	<u>7.5</u>	<u>7.8</u>	<u>7.8</u>	<u>7.8</u>	<u>7.1</u>	<u>8.0</u>	<u>7.0</u>
0.075	<u>7.9</u>	<u>7.0</u>	<u>7.9</u>	<u>7.0</u>	<u>7.9</u>	<u>7.0</u>	<u>8.1</u>	<u>7.5</u>	<u>7.7</u>	<u>7.4</u>	<u>7.8</u>	<u>7.2</u>	<u>8.0</u>	<u>7.0</u>
0.15	<u>7.9</u>	<u>7.0</u>	<u>7.9</u>	<u>7.0</u>	<u>7.9</u>	<u>7.0</u>	<u>8.1</u>	<u>7.5</u>	<u>7.7</u>	<u>7.4</u>	<u>7.8</u>	<u>7.2</u>	<u>8.0</u>	<u>7.0</u>

## TEMPERATURE (°C)

Control	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>
0.010	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>
0.019	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>
0.038	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>
0.075	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>
0.15	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>	<u>24.0</u>

## pH

Control	<u>8.2</u>	<u>8.0</u>	<u>8.1</u>	<u>8.0</u>	<u>8.1</u>	<u>8.1</u>	<u>8.1</u>	<u>8.0</u>	<u>8.2</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>
0.010	<u>8.0</u>	<u>8.0</u>	<u>8.1</u>	<u>8.0</u>	<u>8.1</u>	<u>8.1</u>	<u>8.1</u>	<u>7.9</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>
0.019	<u>8.0</u>	<u>8.0</u>	<u>8.1</u>	<u>8.0</u>	<u>8.1</u>	<u>8.1</u>	<u>8.1</u>	<u>7.9</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>
0.038	<u>8.1</u>	<u>8.1</u>	<u>8.0</u>	<u>8.0</u>	<u>8.1</u>	<u>8.1</u>	<u>8.1</u>	<u>7.9</u>	<u>8.0</u>	<u>8.0</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>8.0</u>
0.075	<u>8.1</u>	<u>8.1</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.1</u>	<u>8.1</u>	<u>7.9</u>	<u>8.0</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>
0.15	<u>8.2</u>	<u>8.1</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>	<u>7.9</u>	<u>8.1</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>

## CONDUCTIVITY (uS/cm)

Control	<u>369</u>	<u>370</u>	<u>377</u>	<u>377</u>	<u>377</u>	<u>376</u>	<u>379</u>	<u>380</u>	<u>383</u>
0.010	<u>370</u>	<u>370</u>	<u>373</u>	<u>375</u>	<u>375</u>	<u>372</u>	<u>373</u>	<u>377</u>	<u>379</u>
0.019	<u>372</u>	<u>371</u>	<u>371</u>	<u>373</u>	<u>373</u>	<u>376</u>	<u>377</u>	<u>378</u>	<u>378</u>
0.038	<u>376</u>	<u>375</u>	<u>374</u>	<u>375</u>	<u>375</u>	<u>379</u>	<u>380</u>	<u>379</u>	<u>379</u>
0.075	<u>377</u>	<u>377</u>	<u>375</u>	<u>375</u>	<u>375</u>	<u>380</u>	<u>382</u>	<u>381</u>	<u>380</u>
0.15	<u>380</u>	<u>378</u>	<u>377</u>	<u>377</u>	<u>377</u>	<u>382</u>	<u>386</u>	<u>382</u>	<u>381</u>

## ALKALINITY

Control	<u>60</u>	<u>60</u>	<u>60</u>	<u>60</u>	<u>60</u>	<u>60</u>	<u>60</u>	<u>60</u>	<u>60</u>
0.15	<u>62</u>	<u>62</u>	<u>62</u>	<u>62</u>	<u>62</u>	<u>62</u>	<u>62</u>	<u>62</u>	<u>62</u>

## HARDNESS

Control	<u>95</u>	<u>98</u>	<u>98</u>	<u>98</u>	<u>98</u>	<u>98</u>	<u>98</u>	<u>98</u>	<u>98</u>
0.15	<u>115</u>	<u>115</u>	<u>115</u>	<u>115</u>	<u>115</u>	<u>115</u>	<u>115</u>	<u>115</u>	<u>115</u>

Residual Chlorine

1st Sample: \_\_\_\_\_

2nd Sample: \_\_\_\_\_

3rd Sample: \_\_\_\_\_

# Chronic juvenile Fathead minnow (*Pimephales promelas*) Survival and Growth

Aquatic Bioassay & Consulting Laboratories, Inc.

Company: STD. TOX.

Sample I.D.:

Date & Time Start: 11/17

Lab #: FML 111723

Date & Time End: 11-24-23

Conc.	Rep.#	INITIAL	1	2	3	4	5	6	FINAL
CONTROL	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
.010	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
.019	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
.038	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
.075	1	15	14	11	11	7	7	7	7
	2	15	14	14	12	7	7	7	7
	3	15	14	14	12	8	8	8	8
	4	15	14	14	13	10	10	10	10
.15	1	15	8	5	2	1	1	1	1
	2	15	6	6	5	1	1	1	1
	3	15	5	5	2	1	1	1	1
	4	15	5	5	1	1	1	1	1

CHAMBER NUMBER	EFF. CONC.	REPL. #	NUMBER FISH	BOAT TARE	BOAT + FISH	FISH WEIGHT (g)	AVG. WT. PER FISH (g)
LA 1	CONTROL	1		1.14767	1.15287	.00520	
LA 2		2		1.15960	1.16498	.00538	
LA 3		3		1.12902	1.13477	.00515	
LA 4		4		1.13115	1.13632	.00517	
LA 5	.010	1		1.13286	1.13811	.00525	
LA 6		2		1.12779	1.13286	.00507	
LA 7		3		1.14002	1.14413	.00411	
LA 8		4		1.13913	1.14427	.00514	
LA 9	.019	1		1.15088	1.15589	.00501	
LA 10		2		1.13689	1.14201	.00512	
LA 11		3		1.15401	1.15962	.00561	
LA 12		4		1.13584	1.14099	.00515	
LA 13	.038	1		1.14768	1.15197	.00429	
LA 14		2		1.14998	1.15503	.00505	
LA 15		3		1.15982	1.16515	.00533	
LA 16		4		1.15156	1.15683	.00527	
LA 17	.075	1		1.13894	1.14013	.00119	
LA 18		2		1.14143	1.14177	.00034	
LA 19		3		1.16003	1.16190	.00193	
LA 20		4		1.15076	1.15240	.00164	
LA 21	.15	1		1.13969	1.13998	.00029	
LA 22		2		1.14480	1.14489	.00009	
LA 23		3		1.14940	1.14987	.00017	
LA 24		4					

**CHEMICAL ANALYSIS  
STD TOX-TOPS**

Start Date: 11/17/2023 1538

Lab #: TOPS 111723

End Date: 11/20/23 1510

Date Rec'd: \_\_\_\_\_

YSI/T#: B17

Sample used for renewal: sh sh sh B17 B17 sh sh

Day	11/17	11/18	11/19	11/20	11/21	11/22	11/23	11/24
Analyst Int.	CB	CB	CB	CB	CB	CB	CB	CB
<b>DISSOLVED OXYGEN (mg/L)</b>								
CONTROL	7.3	7.0	7.1	7.0	7.4	7.2	7.0	7.3
56	7.4	7.0	7.1	7.0	7.3	7.2	7.0	7.3
100	7.4	7.0	7.1	7.0	7.3	7.2	7.0	7.3
180	7.4	7.0	7.1	7.0	7.3	7.2	7.0	7.3
320	7.4	7.0	7.1	7.0	7.3	7.2	7.0	7.3
560	7.4	7.0	7.1	7.0	7.3	7.2	7.0	7.3
<b>TEMPERATURE (°C)</b>								
CONTROL	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
56	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
100	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
180	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
320	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
560	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
<b>pH</b>								
CONTROL	7.8	7.9	7.9	7.9	7.9	7.9	7.8	7.9
56	7.8	7.9	7.9	7.9	7.9	7.9	7.8	7.9
100	7.8	7.9	7.9	7.9	7.9	7.9	7.8	7.9
180	7.8	7.9	7.9	7.9	7.9	7.9	7.8	7.9
320	7.8	7.9	7.9	7.9	7.9	7.9	7.8	7.9
560	7.8	7.9	7.9	7.9	7.9	7.9	7.8	7.9
<b>SALINITY (ppt)</b>								
CONTROL	34	34	34	34	34	34	34	34
56	34	34	34	34	34	34	34	34
100	34	34	34	34	34	34	34	34
180	34	34	34	34	34	34	34	34
320	34	34	34	34	34	34	34	34
560	34	34	34	34	34	34	34	34

NOTES:

AGE = 11D

# TOPSMELT SURVIVAL

Company: STD TOX

Sample ID:

Lab#: TOPS

Start Date: 11/17/23

End Date: 11/24/23

Daily # of Surviving Fish									
Concentration	Rep. #	Initial	1 <sup>h</sup>	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	Final
CON	1	8	8	8	8	8	8	8	8
	2	8	8	8	8	8	8	8	8
	3	8	8	8	8	8	8	8	8
	4	8	8	8	8	8	8	8	8
	5	8	8	8	8	8	8	8	8
56	1	8	8	8	8	8	8	8	8
	2	8	8	8	8	8	8	8	8
	3	8	8	8	8	8	8	8	8
	4	8	8	8	8	8	8	8	8
	5	8	8	8	8	8	8	8	8
100	1	8	8	8	8	8	8	8	8
	2	8	8	8	8	8	8	8	8
	3	8	8	8	8	8	8	8	8
	4	8	8	8	8	8	8	8	8
	5	8	8	8	8	8	8	8	8
180	1	8	3	3	3	3	3	3	3
	2	8	3	3	3	3	3	3	3
	3	8	8	8	8	8	8	8	8
	4	8	8	8	8	8	8	8	8
	5	8	3	3	3	3	3	3	3
320	1	8	2ye	2	2	1	1	1	0
	2	8	2	2	2	1	1	1	0
	3	8	2	2	2	1	1	0	0
	4	8	1	1	1	1	1	1	1
	5	8	2	2	2				
560	1	8	0						
	2	8	0						
	3	8	0						
	4	8	0						
	5	8	0						

Aquatic Bioassay & Consulting Laboratories, Inc.

# TOPSMELT GROWTH

Company: STD TOX

Lab#: TOPS

Sample ID:

Chamber #	Eff Conc.	Rep. #	Number Fish	Boat Tare	Boat + Fish	Fish Wt. (mg)	Average Weight Per Fish (mg)
Lm 1	CON	1		1.13890	1.14011	.00721	
2		2		1.14539	1.15270	.00731	
3		3		1.16179	1.16894	.00715	
4		4		1.14655	1.15304	.00709	
5		5		1.14769	1.15471	.00702	
Lm 6	56	1		1.16070	1.16782	.00712	
7		2		1.14986	1.15690	.00704	
8		3		1.15668	1.16379	.00711	
9		4		1.15347	1.16091	.00744	
10		5		1.15385	1.16092	.00707	
Lm 11	100	1		1.17254	1.17696	.00442	
12		2		1.15884	1.16601	.00717	
13		3		1.14774	1.15487	.00713	
14		4		1.13236	1.13972	.00736	
15		5		1.15307	1.16021	.00714	
Lm 16	180	1		1.14501	1.14893	.00392	
17		2		1.13644	1.13862	.00218	
18		3		1.16863	1.17095	.00232	
19		4		1.16720	1.17285	.00565	
20		5		1.14942	1.15253	.00311	
Lm 21	320	1		1.14783	1.18103	.00366	
22		2		1.14438	—		
23		3		1.15121	—		
24		4		1.15992	—		
		5					
	560	1					
		2					
		3					
		4					
		5					

Aquatic Bioassay & Consulting Laboratories, Inc.

## Toxicity Test Data Sheet

[illegible]

## PURPLE URCHIN FERTILIZATION TEST DATA SHEET

Test Start Date: 11/16/23 1423  
 Test End Date: 11/16/23 1503  
 Microscope: 1  
 Urchin Source: Ventura Bay  
 Analyst: [Signature]

Company: STANDARD TOX.  
 Sample Rec'd: 11/16  
 Lab No.: NA  
 Sample I.D.: URLF 11/16/23  
 Dilution Water: Con 34ppt

NOEC: \_\_\_\_\_

Test Cont. No.	Nominal Conc.	Number of FERTILIZED Larvae	Number of UNFERTILIZED Larvae	Proportion of Normal Larvae
1	32	77	23	
2	CON	91	9	
3	56	26	74	
4	32	73	27	
5	100	3	97	
6	56	26	74	
7	CON	91	9	
8	100	6	94	
9	CON	94	6	
10	100	9	91	
11	CON	93	7	
12	18	96	4	
13	18	91	9	
14	18	94	6	
15	32	77	23	
16	18	91	9	
17	56	26	74	
18	180	0	100	
19	180	0	100	
20	32	77	23	
21	100	3	97	
22	180	0	100	
23	180	0	100	
24	56	26	74	

# PURPLE URCHIN FERTILIZATION TEST DATA SHEET

Test Start Date: 11/16/23 1426  
 Test End Date: 11/16/23 1506  
 Microscope: 1  
 Urchin Source: Ventura Div  
 Analyst: Jg

Company: VCF  
 Sample Rec'd: 11/16  
 Lab No.: MM  
 Sample I.D.: VCF 1123.231  
 Dilution Water: CON 34ppt

NOEC: \_\_\_\_\_

Test Cont. No.	Nominal Conc.	Number of FERTILIZED Larvae	Number of UNFERTILIZED Larvae	Proportion of Normal Larvae
1	12.5	21	9	
2	CON	93	7	
3	25	96	4	
4	12.5	94	6	
5	50	95	5	
6	25	91	9	
7	CON	93	7	
8	50	96	4	
9	CON	94	6	
10	50	91	9	
11	CON	95	5	
12	6.25	93	7	
13	6.25	96	4	
14	6.25	93	7	
15	12.5	93	7	
16	6.25	93	7	
17	25	94	6	
18	100	96	4	
19	100	91	9	
20	12.5	95	5	
21	50	93	7	
22	100	96	4	
23	100	94	6	
24	25	93	7	



**AQUATIC BIOASSAY**  
& CONSULTING LABORATORIES, INC.

## **Toxicity Report for Ventura County Watershed Protection District**

NPDES Stormwater Wet Season (Contract AE20-007)

PROJECT: 2023/24-1 (Wet)  
CONTRACT: AE20-007  
CLIENT: Ms. Kelly Hahs  
VCWPD  
800 South Victoria Avenue, L#1670  
Ventura, CA 93003-1670  
SAMPLE I.D.: ME-VR2, MO-MEI  
DATE RECEIVED: 12/19/2023  
DATE REPORTED: Preliminary Results: 1/24/2024, Final Report: 2/2/2024  
ABC LAB NO.: VCF1223.095, VCY1223.096

29 North Olive Street Ventura, California 93001 (805) 643-5621

## INTRODUCTION

Toxicity tests using chronic fathead (*P. promelas*), Topsmelt (*A. affinis*), were performed to evaluate the quality of stormwater samples for Ventura County Watershed Protection District. The samples were collected on December 19<sup>th</sup>, 2023, and delivered the same day. Testing was conducted at Aquatic Bioassay and Consulting Labs, Inc. in Ventura, California from December 21<sup>st</sup>, through December 28<sup>th</sup>, 2023.

## MATERIALS AND METHODS

### Test Material

Test material consisted of 2 grab samples collected by Ventura County Watershed Protection District (VCWPD) outfall sites. Sample collection was performed by VCWPD personnel under the direction of Ms. Kelly Hahs. The samples were collected in 5-gallon low-density polyethylene buckets and were delivered to Aquatic Bioassay immediately after sampling. Sample temperature was recorded upon acceptance at Aquatic Bioassay Laboratories and is included in the report for each station.

Samples were stored at 4°C. Upon arrival at Aquatic Bioassay, an aliquot of each sample was drawn and water quality parameters of pH, dissolved oxygen (DO), conductivity, temperature, salinity, alkalinity, and hardness were measured and recorded.

### Bioassay Testing

The study was performed in accordance with the United States Environmental Protection Agency (USEPA) protocols:

Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, October 2002, US EPA-821-R-02-013.

Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms, Third Edition, October 2002, US EPA-821-R-02-014.

Summary of results for 100% sample concentration:

Sample ID	Test	Endpoint	Control	100% Sample	Statistically Different From Control	TST Result	*Percent Effect
MO-MEI	Chronic Fathead	Survival (%)	100.00	100.00	No	Pass	0.00
		Biomass (mg)	0.3493	0.3515	No	Pass	-0.62
ME-VR2	Chronic Topsmelt	Survival (%)	100.00	100.00	No	Pass	0.00
		Biomass (mg)	1.446	1.466	No	Pass	-1.41

\*Percent Effect at IWC = (Mean Control Response – Mean IWC Response) \* 100 / Mean Control Response.

### Quality Assurance

All samples were received in good condition at the appropriate temperatures, and all tests were initiated within 72 hours of sample collection. The natural negative controls met the minimum test acceptability criterion of 80 percent mean survival. Variability among replicates was minimal, and the ability to detect a statistical difference was deemed appropriate.

Survival counts were recorded daily to ensure tests were progressing as expected. Counts were conducted daily on the control replicates. The temperatures in samples were within the recommended range for the entire test duration.

### Reference Toxicant Test

A concurrent reference toxicant test using copper chloride was conducted to assess the health of the test organisms. Mean control survival met the test acceptability criterion. The median lethal concentration (LC50) calculated for this test was within two standard deviations of the internal control chart mean, indicating test organism sensitivity was typical. Reference toxicant test results are summarized in the report.

### Results and Discussion

Mean survival and statistical differences from control for the tests, error bars, results summaries including individual replicate data, statistical summaries, and raw datasheets are located in in the appendix. Appropriate chain-of-custody (COC) procedures were followed during all phases of this study, and copies of the COC forms are provided in the appendix.

### Data Analysis and Reporting

The response observed in this test includes survival, biomass, reproduction, and fertilization of the test organism. Two statistical methods were employed to determine whether there was an effect between the control and test sample: 1) A standard t-test approach following the statistical analysis decision tree in EPA 2002; and 2) A more recent EPA-recommended Test of Significant Toxicity (TST) approach (EPA 2010).

References:

*United States Environmental Protection Agency, 1995. Short-Term Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms, EPA/R-95/136.*

*United States Environmental Protection Agency, 2002. Short-Term Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms, EPA/821/R-02-014.*

*United States Environmental Protection Agency, 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms EPA/821/R-02/012.*

*United States Environmental Protection Agency, 2010. National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document. Office of Wastewater Management. EPA 833-R-10-003.*



**AQUATIC BIOASSAY**  
& CONSULTING LABORATORIES, INC.

January 24, 2024

Ms. Kelly Hahs  
Ventura County Watershed Protection District  
800 South Victoria Ave  
Ventura, CA 93009

Dear Ms. Hahs:

We are pleased to present the enclosed revised bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* EPA-821-R-02-013. "All acceptability criteria were met and the concentration-response was normal. This is a valid test." Results were as follows:

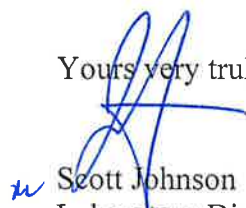
CLIENT:	Ventura County Flood Control
SAMPLE I.D.:	MO-MEI
DATE RECEIVED:	12/19/2023
ABC LAB. NO.:	VCF1223.096

**CHRONIC FATHEAD MINNOW SURVIVAL & GROWTH BIOASSAY**

SURVIVAL	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	EC25 =	>100.00 %
	EC50 =	>100.00 %

BIOMASS	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	IC25 =	>100.00 %
	IC50 =	>100.00 %

Yours very truly,

  
Scott Johnson  
Laboratory Director

# CETIS Summary Report

Report Date: 24 Jan-24 10:27 (p 1 of 2)  
 Test Code/ID: VCF1223.096fml / 14-5359-4030

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 03-6496-7360	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 21 Dec-23 13:39	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 28 Dec-23 13:20	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age:
Sample ID: 03-5928-6852	Code: VCF1223.096fml	Project: 2023/24-1 (Wet)
Sample Date: 19 Dec-23 13:56	Material: Sample Water	Source: Bioassay Report
Receipt Date: 19 Dec-23 17:30	CAS (PC):	Station: MO-MEI
Sample Age: 48h (8.5 °C)	Client: Ventura County Watershed Protection Distri	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	PMSD	TU	S
15-7992-8754	7d Survival Rate	Steel Many-One Rank Sum Test	100	>100	---	3.04%	1	1
12-9470-7037	Mean Dry Biomass-mg	Dunnett Multiple Comparison Test	100	>100	---	4.67%	1	1

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓ Level	%	95% LCL	95% UCL	TU	S
02-4401-5837	7d Survival Rate	Linear Interpolation (ICPIN)	✓ EC15	>100	---	---	<1	1
			✓ EC20	>100	---	---	<1	
			✓ EC25	>100	---	---	<1	
			✓ EC40	>100	---	---	<1	
			✓ EC50	>100	---	---	<1	
04-7293-3668	Mean Dry Biomass-mg	Linear Interpolation (ICPIN)	✓ IC15	>100	---	---	<1	1
			✓ IC20	>100	---	---	<1	
			✓ IC25	>100	---	---	<1	
			✓ IC40	>100	---	---	<1	
			✓ IC50	>100	---	---	<1	

## Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
02-4401-5837	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
15-7992-8754	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
04-7293-3668	Mean Dry Biomass-mg	Control Resp	0.3493	0.25	<<	Yes	Passes Criteria
12-9470-7037	Mean Dry Biomass-mg	Control Resp	0.3493	0.25	<<	Yes	Passes Criteria
12-9470-7037	Mean Dry Biomass-mg	PMSD	0.04666	0.12	0.3	Yes	Below Criteria

## 7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
6.25		4	0.9833	0.9303	1.0360	0.9333	1.0000	0.0167	0.0333	3.39%	1.67%
12.5		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
25		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
100		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%

## Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	0.3493	0.3295	0.3691	0.3427	0.368	0.006224	0.01245	3.56%	0.00%
6.25		4	0.3528	0.3487	0.3569	0.3513	0.3567	0.001287	0.002575	0.73%	-1.00%
12.5		4	0.3538	0.3328	0.3749	0.344	0.372	0.006619	0.01324	3.74%	-1.29%
25		4	0.3453	0.3331	0.3576	0.3353	0.354	0.003839	0.007679	2.22%	1.15%
50		4	0.3507	0.3373	0.3641	0.3433	0.362	0.004208	0.008415	2.40%	-0.38%
100		4	0.3515	0.3369	0.3661	0.3447	0.3647	0.004573	0.009147	2.60%	-0.62%

2023 PASS

# CETIS Summary Report

Report Date: 24 Jan-24 10:27 (p 2 of 2)

Test Code/ID: VCF1223.096fml / 14-5359-4030

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

### 7d Survival Rate Detail

MD5: 85C973C5013F8F093072AB8FA9AE7F2D

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	0.9333	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

### Mean Dry Biomass-mg Detail

MD5: 30830BF70C82EB9BFF1259F5A4C60B2F

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.3427	0.368	0.3433	0.3433
6.25		0.352	0.3513	0.3513	0.3567
12.5		0.344	0.344	0.3553	0.372
25		0.3453	0.3353	0.354	0.3467
50		0.3433	0.362	0.3453	0.352
100		0.3447	0.346	0.3507	0.3647

### 7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	15/15	15/15	15/15	15/15
6.25		15/15	14/15	15/15	15/15
12.5		15/15	15/15	15/15	15/15
25		15/15	15/15	15/15	15/15
50		15/15	15/15	15/15	15/15
100		15/15	15/15	15/15	15/15

# CETIS Analytical Report

Report Date: 24 Jan-24 10:27 (p 1 of 3)  
Test Code/ID: VCF1223.096fml / 14-5359-4030

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 15-7992-8754	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed: 24 Jan-24 10:26	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 24 Jan-24 10:25	MD5 Hash: 85C973C5013F8F093072AB8FA9AE7F2D	Editor ID: 009-702-627-3
Batch ID: 03-6496-7360	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 21 Dec-23 13:39	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 28 Dec-23 13:20	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age:
Sample ID: 03-5928-6852	Code: VCF1223.096fml	Project: 2023/24-1 (Wet)
Sample Date: 19 Dec-23 13:56	Material: Sample Water	Source: Bioassay Report
Receipt Date: 19 Dec-23 17:30	CAS (PC):	Station: MO-MEI
Sample Age: 48h (8.5 °C)	Client: Ventura County Watershed Protection Distri	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	100	>100	---	1	0.03039	3.04%

## Steel Many-One Rank Sum Test

Control	vs	Conc.-%	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	6	16	10	1	CDF	0.6105	Non-Significant Effect
		12.5	6	18	10	1	CDF	0.8333	Non-Significant Effect
		25	6	18	10	1	CDF	0.8333	Non-Significant Effect
		50	6	18	10	1	CDF	0.8333	Non-Significant Effect
		100	6	18	10	1	CDF	0.8333	Non-Significant Effect

## Test Acceptability Criteria

		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.8	<<	Yes	Passes Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0036133	0.0007227	5	1	0.4457	Non-Significant Effect
Error	0.013008	0.0007227	18			
Total	0.0166213		23			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
	Levene Equality of Variance Test	9	4.248	0.0002	Unequal Variances
	Mod Levene Equality of Variance Test	1	4.248	0.4457	Equal Variances
Distribution	Anderson-Darling A2 Test	6.297	3.878	<1.0E-05	Non-Normal Distribution
	D'Agostino Kurtosis Test	4.325	2.576	1.5E-05	Non-Normal Distribution
	D'Agostino Skewness Test	4.595	2.576	<1.0E-05	Non-Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	39.82	9.21	<1.0E-05	Non-Normal Distribution
	Kolmogorov-Smirnov D Test	0.4583	0.2056	<1.0E-05	Non-Normal Distribution
	Shapiro-Wilk W Normality Test	0.4634	0.884	<1.0E-05	Non-Normal Distribution

## 7d Survival Rate Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
6.25		4	0.9833	0.9303	1.0000	1.0000	0.9333	1.0000	0.0167	3.39%	1.67%
12.5		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
25		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
100		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%

CETIS Analytical Report

Report Date: 24 Jan-24 10:27 (p 2 of 3)  
Test Code/ID: VCF1223.096fml / 14-5359-4030

Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 15-7992-8754 Endpoint: 7d Survival Rate CETIS Version: CETISv2.1.4  
Analyzed: 24 Jan-24 10:26 Analysis: Nonparametric-Control vs Treatments Status Level: 1  
Edit Date: 24 Jan-24 10:25 MD5 Hash: 85C973C5013F8F093072AB8FA9AE7F2D Editor ID: 009-702-627-3

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.4410	1.4410	1.4420	1.4410	1.4410	1.4410	0.0000	0.00%	0.00%
6.25		4	1.4080	1.3040	1.5130	1.4410	1.3100	1.4410	0.0329	4.68%	2.28%
12.5		4	1.4410	1.4410	1.4420	1.4410	1.4410	1.4410	0.0000	0.00%	0.00%
25		4	1.4410	1.4410	1.4420	1.4410	1.4410	1.4410	0.0000	0.00%	0.00%
50		4	1.4410	1.4410	1.4420	1.4410	1.4410	1.4410	0.0000	0.00%	0.00%
100		4	1.4410	1.4410	1.4420	1.4410	1.4410	1.4410	0.0000	0.00%	0.00%

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	0.9333	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

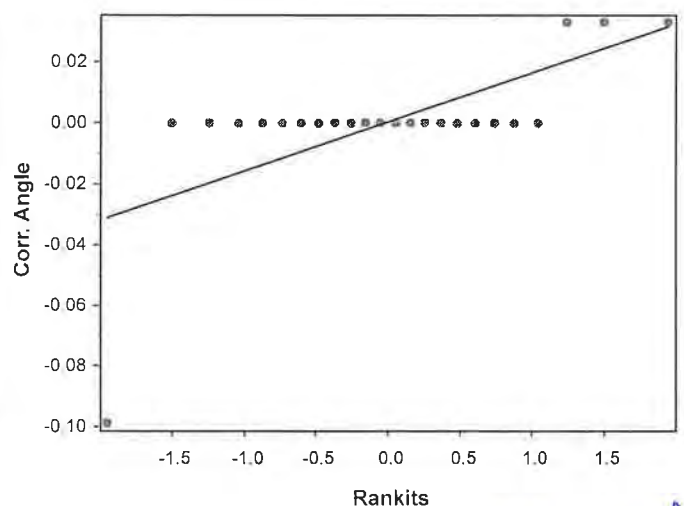
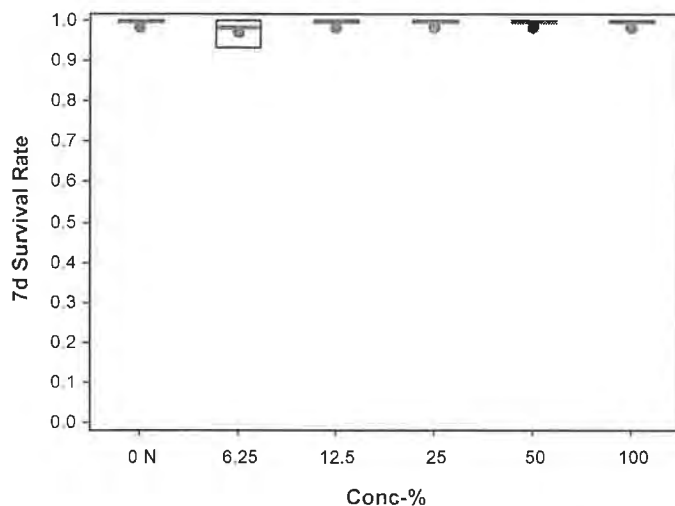
Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.4410	1.4410	1.4410	1.4410
6.25		1.4410	1.3100	1.4410	1.4410
12.5		1.4410	1.4410	1.4410	1.4410
25		1.4410	1.4410	1.4410	1.4410
50		1.4410	1.4410	1.4410	1.4410
100		1.4410	1.4410	1.4410	1.4410

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	15/15	15/15	15/15	15/15
6.25		15/15	14/15	15/15	15/15
12.5		15/15	15/15	15/15	15/15
25		15/15	15/15	15/15	15/15
50		15/15	15/15	15/15	15/15
100		15/15	15/15	15/15	15/15

Graphics



# CETIS Analytical Report

Report Date: 24 Jan-24 10:27 (p 3 of 3)  
Test Code/ID: VCF1223.096fml / 14-5359-4030

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 12-9470-7037	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed: 24 Jan-24 10:26	Analysis: Parametric-Control vs Treatments	Status Level: 1
Edit Date: 24 Jan-24 10:25	MD5 Hash: 30830BF70C82EB9BFF1259F5A4C60B2F	Editor ID: 009-702-627-3
Batch ID: 03-6496-7360	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 21 Dec-23 13:39	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 28 Dec-23 13:20	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age:
Sample ID: 03-5928-6852	Code: VCF1223.096fml	Project: 2023/24-1 (Wet)
Sample Date: 19 Dec-23 13:56	Material: Sample Water	Source: Bioassay Report
Receipt Date: 19 Dec-23 17:30	CAS (PC):	Station: MO-MEI
Sample Age: 48h (8.5 °C)	Client: Ventura County Watershed Protection Distri	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	0.0163	4.67%

## Dunnett Multiple Comparison Test

Control	vs	Conc.-%	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	6	-0.5169	2.407	0.0163	CDF	0.9419	Non-Significant Effect
		12.5	6	-0.6645	2.407	0.0163	CDF	0.9591	Non-Significant Effect
		25	6	0.5907	2.407	0.0163	CDF	0.6075	Non-Significant Effect
		50	6	-0.1969	2.407	0.0163	CDF	0.8847	Non-Significant Effect
		100	6	-0.32	2.407	0.0163	CDF	0.9103	Non-Significant Effect

## Test Acceptability Criteria

		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.3493	0.25	<<	Yes	Passes Criteria
PMSD	0.04666	0.12	0.3	Yes	Below Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0001824	3.648E-05	5	0.3978	0.8439	Non-Significant Effect
Error	0.0016508	9.171E-05	18			
Total	0.0018332		23			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	5.968	15.09	0.3094	Equal Variances
	Levene Equality of Variance Test	1.308	4.248	0.3044	Equal Variances
	Mod Levene Equality of Variance Test	0.5419	4.248	0.7422	Equal Variances
Distribution	Anderson-Darling A2 Test	1.016	3.878	0.0114	Normal Distribution
	D'Agostino Kurtosis Test	0.3535	2.576	0.7237	Normal Distribution
	D'Agostino Skewness Test	1.994	2.576	0.0461	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	4.103	9.21	0.1285	Normal Distribution
	Kolmogorov-Smirnov D Test	0.1797	0.2056	0.0436	Normal Distribution
	Shapiro-Wilk W Normality Test	0.8909	0.884	0.0138	Normal Distribution

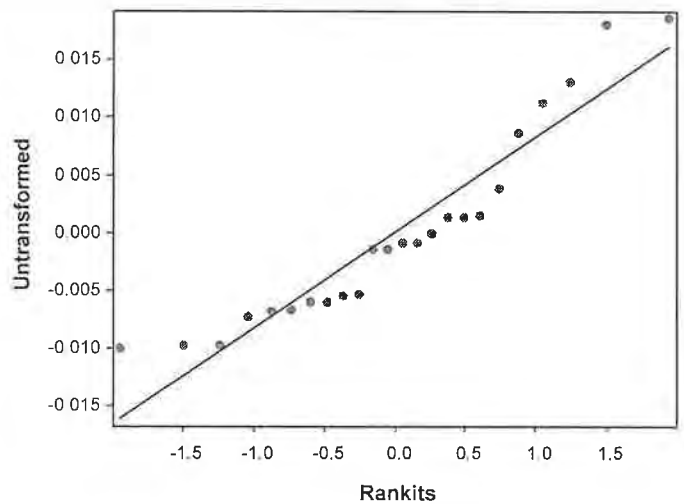
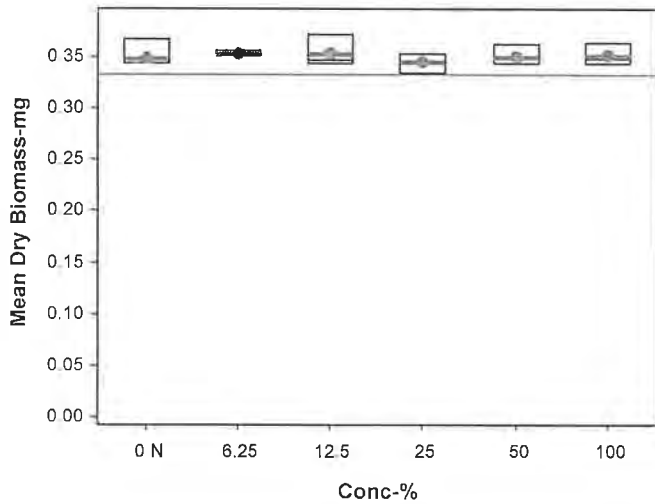
## Mean Dry Biomass-mg Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	0.3493	0.3295	0.3691	0.3433	0.3427	0.368	0.006224	3.56%	0.00%
6.25		4	0.3528	0.3487	0.3569	0.3516	0.3513	0.3567	0.001288	0.73%	-1.00%
12.5		4	0.3538	0.3328	0.3749	0.3478	0.344	0.372	0.006618	3.74%	-1.29%
25		4	0.3453	0.3331	0.3576	0.346	0.3353	0.354	0.003839	2.22%	1.15%
50		4	0.3507	0.3373	0.3641	0.3487	0.3433	0.362	0.004208	2.40%	-0.38%
100		4	0.3515	0.3369	0.3661	0.3483	0.3447	0.3647	0.004573	2.60%	-0.62%

Fathead Minnow 7-d Larval Survival and Growth Test				Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID:	12-9470-7037	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv2.1.4
Analyzed:	24 Jan-24 10:26	Analysis:	Parametric-Control vs Treatments	Status Level:	1
Edit Date:	24 Jan-24 10:25	MD5 Hash:	30830BF70C82EB9BFF1259F5A4C60B2F	Editor ID:	009-702-627-3

Mean Dry Biomass-mg Detail					
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.3427	0.368	0.3433	0.3433
6.25		0.352	0.3513	0.3513	0.3567
12.5		0.344	0.344	0.3553	0.372
25		0.3453	0.3353	0.354	0.3467
50		0.3433	0.362	0.3453	0.352
100		0.3447	0.346	0.3507	0.3647

Graphics



# CETIS Analytical Report

Report Date: 24 Jan-24 10:27 (p 1 of 4)  
Test Code/ID: VCF1223.096fml / 14-5359-4030

Fathead Minnow 7-d Larval Survival and Growth Test				Aquatic Bioassay & Consulting Labs, Inc.			
Analysis ID: 02-4401-5837		Endpoint: 7d Survival Rate		CETIS Version: CETISv2.1.4			
Analyzed: 24 Jan-24 10:26		Analysis: Linear Interpolation (ICPIN)		Status Level: 1			
Edit Date: 24 Jan-24 10:25		MD5 Hash: 85C973C5013F8F093072AB8FA9AE7F2D		Editor ID: 009-702-627-3			
Batch ID: 03-6496-7360		Test Type: Growth-Survival (7d)		Analyst:			
Start Date: 21 Dec-23 13:39		Protocol: EPA/821/R-02-013 (2002)		Diluent: Laboratory Water			
Ending Date: 28 Dec-23 13:20		Species: Pimephales promelas		Brine: Not Applicable			
Test Length: 7d		Taxon: Actinopterygii		Source: Aquatic Biosystems, CO		Age:	
Sample ID: 03-5928-6852		Code: VCF1223.096fml		Project: 2023/24-1 (Wet)			
Sample Date: 19 Dec-23 13:56		Material: Sample Water		Source: Bioassay Report			
Receipt Date: 19 Dec-23 17:30		CAS (PC):		Station: MO-MEI			
Sample Age: 48h (8.5 °C)		Client: Ventura County Watershed Protection Distri					

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Test Acceptability Criteria					
TAC Limits					
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.8	<<	Yes	Passes Criteria

Point Estimates						
Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
EC15	>100	---	---	<1	---	---
EC20	>100	---	---	<1	---	---
EC25	>100	---	---	<1	---	---
EC40	>100	---	---	<1	---	---
EC50	>100	---	---	<1	---	---

7d Survival Rate Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	N	4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	60/60	1.0000	0.00%
6.25		4	0.9833	1.0000	0.9333	1.0000	3.39%	1.67%	59/60	0.9967	0.33%
12.5		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	60/60	0.9967	0.33%
25		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	60/60	0.9967	0.33%
50		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	60/60	0.9967	0.33%
100		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	60/60	0.9967	0.33%

7d Survival Rate Detail					
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	0.9333	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

7d Survival Rate Binomials					
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	15/15	15/15	15/15	15/15
6.25		15/15	14/15	15/15	15/15
12.5		15/15	15/15	15/15	15/15
25		15/15	15/15	15/15	15/15
50		15/15	15/15	15/15	15/15
100		15/15	15/15	15/15	15/15

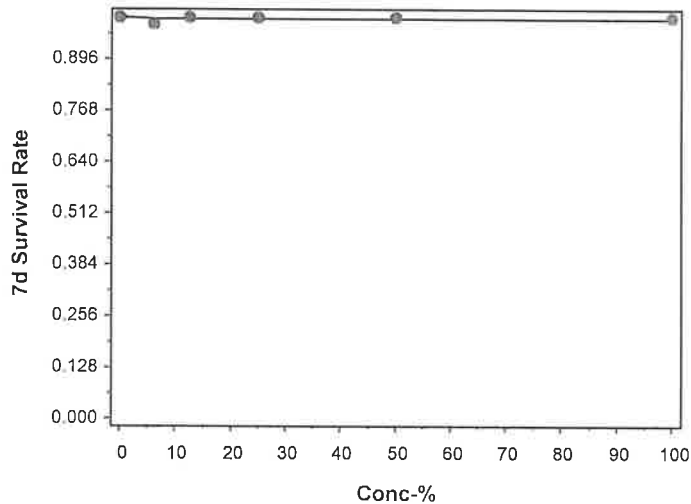
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CETIS Analytical Report

Report Date: 24 Jan-24 10:27 (p 2 of 4)  
Test Code/ID: VCF1223.096fml / 14-5359-4030

Fathead Minnow 7-d Larval Survival and Growth Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID:	02-4401-5837	Endpoint:	7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed:	24 Jan-24 10:26	Analysis:	Linear Interpolation (ICPIN)	Status Level: 1
Edit Date:	24 Jan-24 10:25	MD5 Hash:	85C973C5013F8F093072AB8FA9AE7F2D	Editor ID: 009-702-627-3

Graphics



## CETIS Analytical Report

Report Date: 24 Jan-24 10:27 (p 3 of 4)

Test Code/ID: VCF1223.096fml / 14-5359-4030

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay &amp; Consulting Labs, Inc.

Analysis ID: 04-7293-3668	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed: 24 Jan-24 10:26	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 24 Jan-24 10:25	MD5 Hash: 30830BF70C82EB9BFF1259F5A4C60B2F	Editor ID: 009-702-627-3
Batch ID: 03-6496-7360	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 21 Dec-23 13:39	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 28 Dec-23 13:20	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age:
Sample ID: 03-5928-6852	Code: VCF1223.096fml	Project: 2023/24-1 (Wet)
Sample Date: 19 Dec-23 13:56	Material: Sample Water	Source: Bioassay Report
Receipt Date: 19 Dec-23 17:30	CAS (PC):	Station: MO-MEI
Sample Age: 48h (8.5 °C)	Client: Ventura County Watershed Protection Distri	

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1321986	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

## TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.3493	0.25	<<	Yes	Passes Criteria

## Point Estimates

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

## Mean Dry Biomass-mg Summary

## Calculated Variate

## Isotonic Variate

Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	N	4	0.3493	0.3433	0.3427	0.368	3.56%	0.00%	0.352	0.00%
6.25		4	0.3528	0.3516	0.3513	0.3567	0.73%	-1.00%	0.352	0.00%
12.5		4	0.3538	0.3478	0.344	0.372	3.74%	-1.29%	0.352	0.00%
25		4	0.3453	0.346	0.3353	0.354	2.22%	1.15%	0.3492	0.80%
50		4	0.3507	0.3487	0.3433	0.362	2.40%	-0.38%	0.3492	0.80%
100		4	0.3515	0.3483	0.3447	0.3647	2.60%	-0.62%	0.3492	0.80%

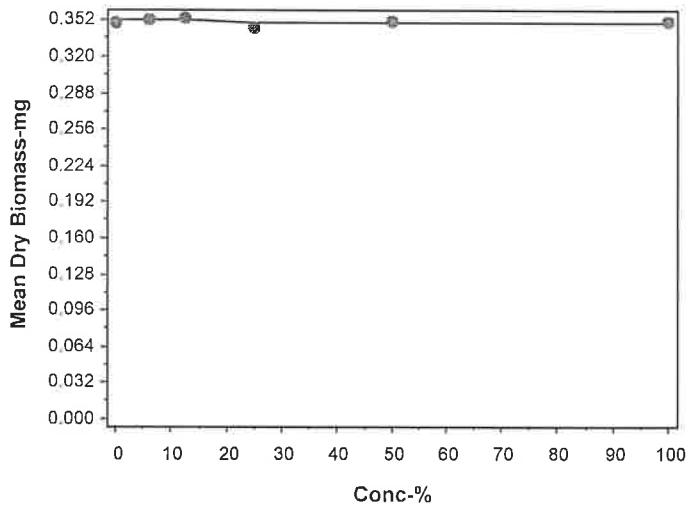
## Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.3427	0.368	0.3433	0.3433
6.25		0.352	0.3513	0.3513	0.3567
12.5		0.344	0.344	0.3553	0.372
25		0.3453	0.3353	0.354	0.3467
50		0.3433	0.362	0.3453	0.352
100		0.3447	0.346	0.3507	0.3647

Fathead Minnow 7-d Larval Survival and Growth Test Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	04-7293-3668	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv2.1.4
Analyzed:	24 Jan-24 10:26	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1
Edit Date:	24 Jan-24 10:25	MD5 Hash:	30830BF70C82EB9BFF1259F5A4C60B2F	Editor ID:	009-702-627-3

Graphics



# CETIS Measurement Report

Report Date: 24 Jan-24 10:27 (p 1 of 2)

Test Code/ID: VCF1223.096fml / 14-5359-4030

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 03-6496-7360	Test Type: Growth-Survival (7d)	Analyst:	
Start Date: 21 Dec-23 13:39	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water	
Ending Date: 28 Dec-23 13:20	Species: Pimephales promelas	Brine: Not Applicable	
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO	Age:
Sample ID: 03-5928-6852	Code: VCF1223.096fml	Project: 2023/24-1 (Wet)	
Sample Date: 19 Dec-23 13:56	Material: Sample Water	Source: Bioassay Report	
Receipt Date: 19 Dec-23 17:30	CAS (PC):	Station: MO-MEI	
Sample Age: 48h (8.5 °C)	Client: Ventura County Watershed Protection Distri		

### Alkalinity (CaCO3)-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	62	62	62	62	62	0	0	0.00%	0
100		8	31	31	31	31	31	0	0	0.00%	0
Overall		16	46.5	37.97	55.03	31	62	4.002	16.01	34.43%	0 (0%)

### Conductivity-µmhos

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	377.1	374.3	379.9	372	382	0.4196	3.357	0.89%	0
6.25		8	371.5	370.1	372.9	370	374	0.2113	1.69	0.45%	0
12.5		8	363	361.1	364.9	360	366	0.2912	2.33	0.64%	0
25		8	331.8	329.3	334.2	329	337	0.3644	2.915	0.88%	0
50		8	276.5	271	282	268	285	0.8156	6.525	2.36%	0
100		8	141.1	140	142.3	140	143	0.1695	1.356	0.96%	0
Overall		48	310.2	285.8	334.5	140	382	12.1	83.82	27.02%	0 (0%)

### Dissolved Oxygen-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	7.8	7.536	8.064	7.1	8.2	0.03953	0.3162	4.05%	0
6.25		8	7.8	7.532	8.068	7.1	8.2	0.04009	0.3207	4.11%	0
12.5		8	7.763	7.477	8.048	7	8.1	0.04275	0.342	4.41%	0
25		8	7.788	7.486	8.089	7	8.2	0.04504	0.3603	4.63%	0
50		8	7.738	7.489	7.986	7.1	8.1	0.03716	0.2973	3.84%	0
100		8	7.713	7.45	7.975	7	8	0.03921	0.3137	4.07%	0
Overall		48	7.767	7.677	7.857	7	8.2	0.04469	0.3097	3.99%	0 (0%)

### Hardness (CaCO3)-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	100	100	100	100	100	0	0	0.00%	0
100		8	36	36	36	36	36	0	0	0.00%	0
Overall		16	68	50.39	85.61	36	100	8.262	33.05	48.60%	0 (0%)

### pH-Units

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	8.113	8.018	8.207	8	8.3	0.01408	0.1126	1.39%	0
6.25		8	8.075	8.001	8.149	8	8.2	0.01108	0.08865	1.10%	0
12.5		8	8.075	8.001	8.149	8	8.2	0.01108	0.08865	1.10%	0
25		8	8.063	7.974	8.151	7.9	8.2	0.01326	0.1061	1.32%	0
50		8	8.038	7.949	8.126	7.9	8.2	0.01326	0.1061	1.32%	0
100		8	8.025	7.938	8.112	7.9	8.2	0.01294	0.1035	1.29%	0
Overall		48	8.065	8.036	8.094	7.9	8.3	0.01443	0.09998	1.24%	0 (0%)

CETIS Measurement Report

Report Date: 24 Jan-24 10:27 (p 2 of 2)  
Test Code/ID: VCF1223.096fml / 14-5359-4030

Fathead Minnow 7-d Larval Survival and Growth Test Aquatic Bioassay & Consulting Labs, Inc.

Temperature-°C											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	24	24	24	24	24	0	0	0.00%	0
6.25		8	24.1	24.02	24.18	24	24.2	0.01156	0.0925	0.38%	0
12.5		8	24.13	24.04	24.21	24	24.3	0.01293	0.1035	0.43%	0
25		8	24.16	24.07	24.25	24	24.3	0.01325	0.106	0.44%	0
50		8	24.19	24.08	24.29	24	24.4	0.01557	0.1246	0.52%	0
100		8	24.2	24.08	24.32	24	24.4	0.01767	0.1414	0.58%	0
Overall		48	24.13	24.09	24.16	24	24.4	0.01735	0.1202	0.50%	0 (0%)



**AQUATIC BIOASSAY**  
& CONSULTING LABORATORIES, INC.

January 24, 2024

Ms. Kelly Hahs  
Ventura County Watershed Protection District  
800 South Victoria Ave  
Ventura, CA 93009

Dear Ms. Hahs:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to West Coast Estuarine Organisms*, EPA/821/R-02-014. Results were as follows:

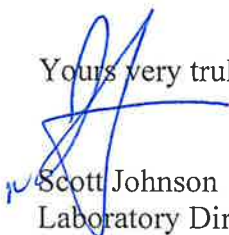
CLIENT:	Ventura County Flood Control
SAMPLE I.D.:	ME-VR2
DATE RECEIVED:	12/19/2023
ABC LAB. NO.:	VCF1223.095

**CHRONIC TOPSMELT SURVIVAL AND GROWTH BIOASSAY**

Survival	NOEC =	100.00
	TU <sub>c</sub> =	1.00
	EC25 =	>100.00 %
	EC50 =	>100.00 %

Biomass	NOEC =	100.00 %
	TU <sub>c</sub> =	1.00
	IC25 =	>100.00 %
	IC50 =	>100.00 %

Yours very truly,

  
Scott Johnson  
Laboratory Director

# CETIS Summary Report

Report Date: 23 Jan-24 16:37 (p 1 of 2)

Test Code/ID: VCF1223.095tops / 11-7535-6425

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 04-8585-5031	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 21 Dec-23 12:45	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 28 Dec-23 13:10	Species: Atherinops affinis	Brine: Not Applicable
Test Length: 7d 0h	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: 13d
Sample ID: 17-8510-4353	Code: VCF1223.095tops	Project: 2023/24-1 (Wet)
Sample Date: 19 Dec-23 16:40	Material: Sample Water	Source: Bioassay Report
Receipt Date: 19 Dec-23 17:30	CAS (PC):	Station: ME-VR2
Sample Age: 44h (17.2 °C)	Client: Ventura County Watershed Protection Distri	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	TU	S
04-7551-5431	7d Survival Rate	Steel Many-One Rank Sum Test	100	>100	---	9.02%	1	1	
19-2785-6671	Mean Dry Biomass-mg	Dunnett Multiple Comparison Test	100	>100	---	3.3%	1	1	

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓	Level	%	95% LCL	95% UCL	TU	S
10-0246-2751	7d Survival Rate	Linear Interpolation (ICPIN)	✓	EC15	>100	---	---	<1	1
			✓	EC20	>100	---	---	<1	
			✓	EC25	>100	---	---	<1	
			✓	EC40	>100	---	---	<1	
			✓	EC50	>100	---	---	<1	
06-0594-4045	Mean Dry Biomass-mg	Linear Interpolation (ICPIN)	✓	IC15	>100	---	---	<1	1
			✓	IC20	>100	---	---	<1	
			✓	IC25	>100	---	---	<1	
			✓	IC40	>100	---	---	<1	
			✓	IC50	>100	---	---	<1	

## Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
04-7551-5431	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
10-0246-2751	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
06-0594-4045	Mean Dry Biomass-mg	Control Resp	1.446	0.85	<<	Yes	Passes Criteria
19-2785-6671	Mean Dry Biomass-mg	Control Resp	1.446	0.85	<<	Yes	Passes Criteria
04-7551-5431	7d Survival Rate	PMSD	0.0902	<<	0.25	No	Passes Criteria

## 7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
6.25		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
12.5		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
25		5	0.9200	0.7840	1.0560	0.8000	1.0000	0.0490	0.1095	11.91%	8.00%
50		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
100		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%

## Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	1.446	1.402	1.49	1.412	1.498	0.01586	0.03547	2.45%	0.00%
6.25		5	1.464	1.416	1.511	1.436	1.53	0.01708	0.03819	2.61%	-1.22%
12.5		5	1.441	1.417	1.465	1.42	1.462	0.008593	0.01921	1.33%	0.33%
25		5	1.43	1.404	1.456	1.404	1.446	0.009445	0.02112	1.48%	1.11%
50		5	1.453	1.413	1.493	1.422	1.498	0.01446	0.03233	2.22%	-0.50%
100		5	1.466	1.418	1.515	1.416	1.514	0.01752	0.03918	2.67%	-1.41%

EM PAS

# CETIS Summary Report

Report Date: 23 Jan-24 16:37 (p 2 of 2)

Test Code/ID: VCF1223.095tops / 11-7535-6425

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

### 7d Survival Rate Detail

MD5: A369925E72A62392AEBA47F62FC2C38F

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	0.8000	0.8000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

### Mean Dry Biomass-mg Detail

MD5: 84864C6943C484532C8622C624DE6859

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.498	1.416	1.462	1.442	1.412
6.25		1.45	1.46	1.442	1.436	1.53
12.5		1.438	1.46	1.462	1.426	1.42
25		1.444	1.446	1.404	1.41	1.446
50		1.498	1.456	1.422	1.422	1.468
100		1.46	1.416	1.446	1.514	1.496

### 7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	5/5	5/5	5/5	5/5	5/5
6.25		5/5	5/5	5/5	5/5	5/5
12.5		5/5	5/5	5/5	5/5	5/5
25		5/5	5/5	4/5	4/5	5/5
50		5/5	5/5	5/5	5/5	5/5
100		5/5	5/5	5/5	5/5	5/5

# CETIS Analytical Report

Report Date: 23 Jan-24 16:37 (p 1 of 3)  
Test Code/ID: VCF1223.095tops / 11-7535-6425

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 04-7551-5431	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed: 23 Jan-24 16:36	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 23 Jan-24 16:35	MD5 Hash: A369925E72A62392AEBA47F62FC2C38F	Editor ID: 009-702-627-3
Batch ID: 04-8585-5031	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 21 Dec-23 12:45	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 28 Dec-23 13:10	Species: Atherinops affinis	Brine: Not Applicable
Test Length: 7d 0h	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: 13d
Sample ID: 17-8510-4353	Code: VCF1223.095tops	Project: 2023/24-1 (Wet)
Sample Date: 19 Dec-23 16:40	Material: Sample Water	Source: Bioassay Report
Receipt Date: 19 Dec-23 17:30	CAS (PC):	Station: ME-VR2
Sample Age: 44h (17.2 °C)	Client: Ventura County Watershed Protection Distri	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	100	>100	---	1	0.0902	9.02%

## Steel Many-One Rank Sum Test

Control	vs	Conc-%	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	8	27.5	16	1	CDF	0.8333	Non-Significant Effect
		12.5	8	27.5	16	1	CDF	0.8333	Non-Significant Effect
		25	8	22.5	16	1	CDF	0.3937	Non-Significant Effect
		50	8	27.5	16	1	CDF	0.8333	Non-Significant Effect
		100	8	27.5	16	1	CDF	0.8333	Non-Significant Effect

## Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	1	0.8	<<	Yes	Passes Criteria
PMSD	0.0902	<<	0.25	No	Passes Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0378053	0.0075611	5	2.667	0.0471	Significant Effect
Error	0.0680495	0.0028354	24			
Total	0.105855		29			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
	Levene Equality of Variance Test	96	3.895	<1.0E-05	Unequal Variances
	Mod Levene Equality of Variance Test	3	4.248	0.0384	Equal Variances
Distribution	Anderson-Darling A2 Test	7.491	3.878	<1.0E-05	Non-Normal Distribution
	D'Agostino Kurtosis Test	3.067	2.576	0.0022	Non-Normal Distribution
	D'Agostino Skewness Test	2.356	2.576	0.0185	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	14.96	9.21	0.0006	Non-Normal Distribution
	Kolmogorov-Smirnov D Test	0.4333	0.1853	<1.0E-05	Non-Normal Distribution
	Shapiro-Wilk W Normality Test	0.5565	0.9031	<1.0E-05	Non-Normal Distribution

## 7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
6.25		5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
12.5		5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
25		5	0.9200	0.7840	1.0000	1.0000	0.8000	1.0000	0.0490	11.91%	8.00%
50		5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
100		5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%

Pacific Topsmelt 7-d Survival and Growth Test Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	04-7551-5431	Endpoint:	7d Survival Rate	CETIS Version:	CETISv2.1.4
Analyzed:	23 Jan-24 16:36	Analysis:	Nonparametric-Control vs Treatments	Status Level:	1
Edit Date:	23 Jan-24 16:35	MD5 Hash:	A369925E72A62392AEBA47F62FC2C38F	Editor ID:	009-702-627-3

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
6.25		5	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
12.5		5	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
25		5	1.2500	1.0880	1.4120	1.3450	1.1070	1.3450	0.0583	10.43%	7.08%
50		5	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
100		5	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	0.8000	0.8000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

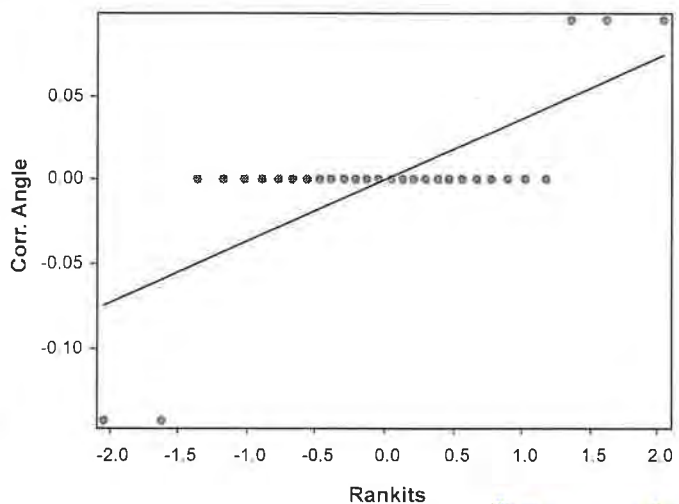
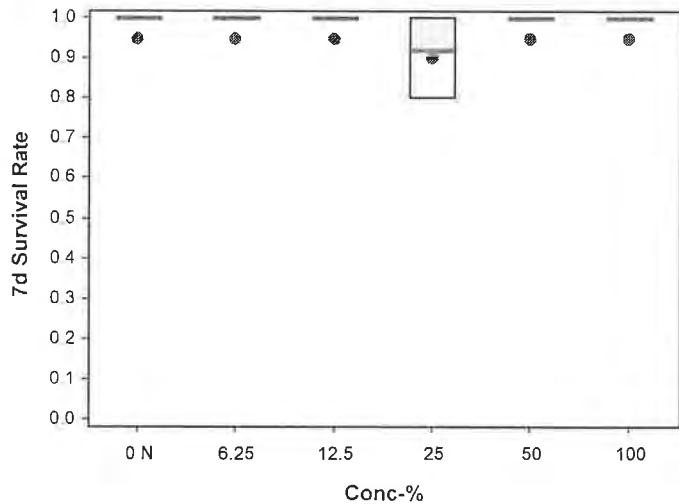
Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.3450	1.3450	1.3450	1.3450	1.3450
6.25		1.3450	1.3450	1.3450	1.3450	1.3450
12.5		1.3450	1.3450	1.3450	1.3450	1.3450
25		1.3450	1.3450	1.1070	1.1070	1.3450
50		1.3450	1.3450	1.3450	1.3450	1.3450
100		1.3450	1.3450	1.3450	1.3450	1.3450

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	5/5	5/5	5/5	5/5	5/5
6.25		5/5	5/5	5/5	5/5	5/5
12.5		5/5	5/5	5/5	5/5	5/5
25		5/5	5/5	4/5	4/5	5/5
50		5/5	5/5	5/5	5/5	5/5
100		5/5	5/5	5/5	5/5	5/5

Graphics



# CETIS Analytical Report

Report Date: 23 Jan-24 16:37 (p 3 of 3)  
Test Code/ID: VCF1223.095tops / 11-7535-6425

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 19-2785-6671	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed: 23 Jan-24 16:36	Analysis: Parametric-Control vs Treatments	Status Level: 1
Edit Date: 23 Jan-24 16:35	MD5 Hash: 84864C6943C484532C8622C624DE6859	Editor ID: 009-702-627-3
Batch ID: 04-8585-5031	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 21 Dec-23 12:45	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 28 Dec-23 13:10	Species: Atherinops affinis	Brine: Not Applicable
Test Length: 7d 0h	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: 13d
Sample ID: 17-8510-4353	Code: VCF1223.095tops	Project: 2023/24-1 (Wet)
Sample Date: 19 Dec-23 16:40	Material: Sample Water	Source: Bioassay Report
Receipt Date: 19 Dec-23 17:30	CAS (PC):	Station: ME-VR2
Sample Age: 44h (17.2 °C)	Client: Ventura County Watershed Protection Distri	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	100	>100	---	1	0.04767	3.30%

## Dunnett Multiple Comparison Test

Control	vs	Conc.-%	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Negative Control		6.25	8	-0.8719	2.362	0.04767	CDF	0.9763	Non-Significant Effect
		12.5	8	0.2378	2.362	0.04767	CDF	0.7537	Non-Significant Effect
		25	8	0.7926	2.362	0.04767	CDF	0.5143	Non-Significant Effect
		50	8	-0.3567	2.362	0.04767	CDF	0.9174	Non-Significant Effect
		100	8	-1.011	2.362	0.04767	CDF	0.9838	Non-Significant Effect

## Test Acceptability Criteria

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1.446	0.85	<<	Yes	Passes Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0047879	0.0009576	5	0.94	0.4732	Non-Significant Effect
Error	0.024448	0.0010187	24			
Total	0.0292359		29			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	3.044	15.09	0.6932	Equal Variances
	Levene Equality of Variance Test	0.612	3.895	0.6916	Equal Variances
	Mod Levene Equality of Variance Test	0.5401	4.248	0.7435	Equal Variances
Distribution	Anderson-Darling A2 Test	0.5934	3.878	0.1251	Normal Distribution
	D'Agostino Kurtosis Test	0.3188	2.576	0.7499	Normal Distribution
	D'Agostino Skewness Test	1.289	2.576	0.1973	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	1.764	9.21	0.4140	Normal Distribution
	Kolmogorov-Smirnov D Test	0.1212	0.1853	0.3055	Normal Distribution
	Shapiro-Wilk W Normality Test	0.9538	0.9031	0.2132	Normal Distribution

## Mean Dry Biomass-mg Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.446	1.402	1.49	1.442	1.412	1.498	0.01586	2.45%	0.00%
6.25		5	1.464	1.416	1.511	1.45	1.436	1.53	0.01708	2.61%	-1.22%
12.5		5	1.441	1.417	1.465	1.438	1.42	1.462	0.008593	1.33%	0.33%
25		5	1.43	1.404	1.456	1.444	1.404	1.446	0.009444	1.48%	1.11%
50		5	1.453	1.413	1.493	1.456	1.422	1.498	0.01446	2.22%	-0.50%
100		5	1.466	1.418	1.515	1.46	1.416	1.514	0.01752	2.67%	-1.41%

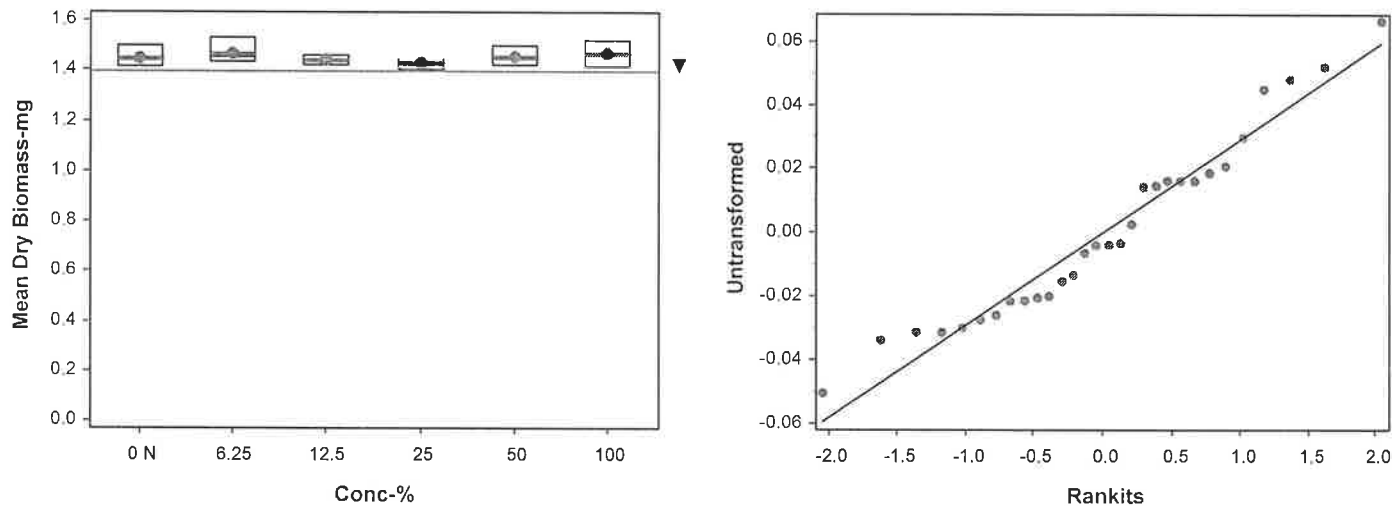
Pacific Topsmelt 7-d Survival and Growth Test Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	19-2785-6671	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv2.1.4
Analyzed:	23 Jan-24 16:36	Analysis:	Parametric-Control vs Treatments	Status Level:	1
Edit Date:	23 Jan-24 16:35	MD5 Hash:	84864C6943C484532C8622C624DE6859	Editor ID:	009-702-627-3

Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.498	1.416	1.462	1.442	1.412
6.25		1.45	1.46	1.442	1.436	1.53
12.5		1.438	1.46	1.462	1.426	1.42
25		1.444	1.446	1.404	1.41	1.446
50		1.498	1.456	1.422	1.422	1.468
100		1.46	1.416	1.446	1.514	1.496

Graphics



# CETIS Analytical Report

Report Date: 23 Jan-24 16:37 (p 1 of 4)  
Test Code/ID: VCF1223.095tops / 11-7535-6425

Pacific Topsmelt 7-d Survival and Growth Test				Aquatic Bioassay & Consulting Labs, Inc.		
Analysis ID:	10-0246-2751	Endpoint:	7d Survival Rate	CETIS Version:	CETISv2.1.4	
Analyzed:	23 Jan-24 16:36	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1	
Edit Date:	23 Jan-24 16:35	MD5 Hash:	A369925E72A62392AEBA47F62FC2C38F	Editor ID:	009-702-627-3	
Batch ID:	04-8585-5031	Test Type:	Growth-Survival (7d)	Analyst:		
Start Date:	21 Dec-23 12:45	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater	
Ending Date:	28 Dec-23 13:10	Species:	Atherinops affinis	Brine:	Not Applicable	
Test Length:	7d 0h	Taxon:	Actinopterygii	Source:	Aquatic Biosystems, CO	Age: 13d
Sample ID:	17-8510-4353	Code:	VCF1223.095tops	Project:	2023/24-1 (Wet)	
Sample Date:	19 Dec-23 16:40	Material:	Sample Water	Source:	Bioassay Report	
Receipt Date:	19 Dec-23 17:30	CAS (PC):		Station:	ME-VR2	
Sample Age:	44h (17.2 °C)	Client:	Ventura County Watershed Protection Distri			

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Test Acceptability Criteria		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.8	<<	Yes	Passes Criteria

Point Estimates						
Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
EC15	>100	---	---	<1	---	---
EC20	>100	---	---	<1	---	---
EC25	>100	---	---	<1	---	---
EC40	>100	---	---	<1	---	---
EC50	>100	---	---	<1	---	---

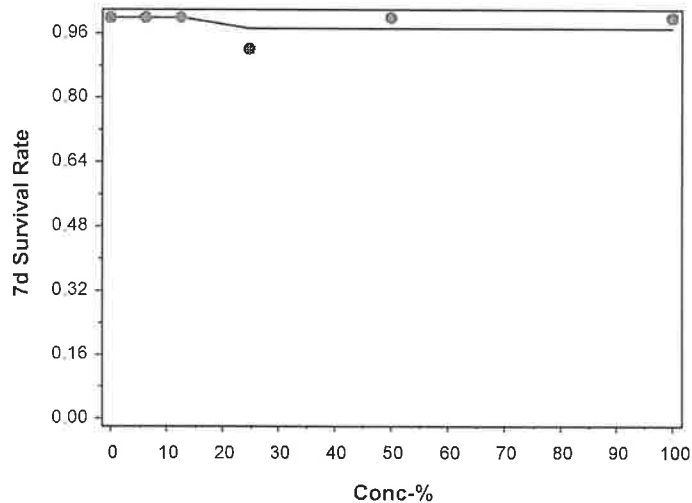
7d Survival Rate Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	N	5	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	25/25	1.0000	0.00%
6.25		5	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	25/25	1.0000	0.00%
12.5		5	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	25/25	1.0000	0.00%
25		5	0.9200	1.0000	0.8000	1.0000	11.91%	8.00%	23/25	0.9733	2.67%
50		5	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	25/25	0.9733	2.67%
100		5	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	25/25	0.9733	2.67%

7d Survival Rate Detail						
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	0.8000	0.8000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

7d Survival Rate Binomials						
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	5/5	5/5	5/5	5/5	5/5
6.25		5/5	5/5	5/5	5/5	5/5
12.5		5/5	5/5	5/5	5/5	5/5
25		5/5	5/5	4/5	4/5	5/5
50		5/5	5/5	5/5	5/5	5/5
100		5/5	5/5	5/5	5/5	5/5

Pacific Topsmelt 7-d Survival and Growth Test				Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID:	10-0246-2751	Endpoint:	7d Survival Rate	CETIS Version:	CETISv2.1.4
Analyzed:	23 Jan-24 16:36	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1
Edit Date:	23 Jan-24 16:35	MD5 Hash:	A369925E72A62392AEBA47F62FC2C38F	Editor ID:	009-702-627-3

Graphics



# CETIS Analytical Report

Report Date: 23 Jan-24 16:37 (p 3 of 4)

Test Code/ID: VCF1223.095tops / 11-7535-6425

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 06-0594-4045	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed: 23 Jan-24 16:36	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 23 Jan-24 16:35	MD5 Hash: 84864C6943C484532C8622C624DE6859	Editor ID: 009-702-627-3
Batch ID: 04-8585-5031	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 21 Dec-23 12:45	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 28 Dec-23 13:10	Species: Atherinops affinis	Brine: Not Applicable
Test Length: 7d 0h	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: 13d
Sample ID: 17-8510-4353	Code: VCF1223.095tops	Project: 2023/24-1 (Wet)
Sample Date: 19 Dec-23 16:40	Material: Sample Water	Source: Bioassay Report
Receipt Date: 19 Dec-23 17:30	CAS (PC):	Station: ME-VR2
Sample Age: 44h (17.2 °C)	Client: Ventura County Watershed Protection Distri	

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1322626	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

### TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1.446	0.85	<<	Yes	Passes Criteria

## Point Estimates

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

## Mean Dry Biomass-mg Summary

### Calculated Variate

### Isotonic Variate

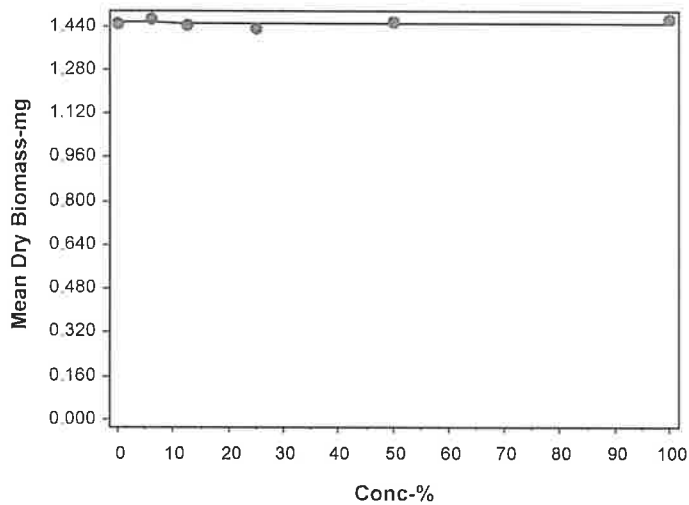
Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	N	5	1.446	1.442	1.412	1.498	2.45%	0.00%	1.455	0.00%
6.25		5	1.464	1.45	1.436	1.53	2.61%	-1.22%	1.455	0.00%
12.5		5	1.441	1.438	1.42	1.462	1.33%	0.33%	1.448	0.48%
25		5	1.43	1.444	1.404	1.446	1.48%	1.11%	1.448	0.48%
50		5	1.453	1.456	1.422	1.498	2.22%	-0.50%	1.448	0.48%
100		5	1.466	1.46	1.416	1.514	2.67%	-1.41%	1.448	0.48%

## Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.498	1.416	1.462	1.442	1.412
6.25		1.45	1.46	1.442	1.436	1.53
12.5		1.438	1.46	1.462	1.426	1.42
25		1.444	1.446	1.404	1.41	1.446
50		1.498	1.456	1.422	1.422	1.468
100		1.46	1.416	1.446	1.514	1.496

Pacific Topsmelt 7-d Survival and Growth Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID:	06-0594-4045	Endpoint:	Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed:	23 Jan-24 16:36	Analysis:	Linear Interpolation (ICPIN)	Status Level: 1
Edit Date:	23 Jan-24 16:35	MD5 Hash:	84864C6943C484532C8622C624DE6859	Editor ID: 009-702-627-3

Graphics



# CETIS Measurement Report

Report Date: 23 Jan-24 16:37 (p 1 of 1)  
Test Code/ID: VCF1223.095tops / 11-7535-6425

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 04-8585-5031	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 21 Dec-23 12:45	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 28 Dec-23 13:10	Species: Atherinops affinis	Brine: Not Applicable
Test Length: 7d 0h	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: 13d
Sample ID: 17-8510-4353	Code: VCF1223.095tops	Project: 2023/24-1 (Wet)
Sample Date: 19 Dec-23 16:40	Material: Sample Water	Source: Bioassay Report
Receipt Date: 19 Dec-23 17:30	CAS (PC):	Station: ME-VR2
Sample Age: 44h (17.2 °C)	Client: Ventura County Watershed Protection Distri	

## Dissolved Oxygen-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	7.537	7.301	7.774	6.9	7.8	0.03532	0.2825	3.75%	0
6.25		8	7.538	7.262	7.813	6.8	7.8	0.04115	0.3292	4.37%	0
12.5		8	7.55	7.267	7.833	6.8	7.8	0.04226	0.3381	4.48%	0
25		8	7.5	7.232	7.768	6.8	7.8	0.04009	0.3207	4.28%	0
50		8	7.512	7.232	7.793	6.8	7.9	0.04196	0.3357	4.47%	0
100		8	7.538	7.248	7.827	6.8	7.9	0.04327	0.3462	4.59%	0
Overall		48	7.529	7.44	7.619	6.8	7.9	0.04456	0.3087	4.10%	0 (0%)

## pH-Units

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	7.863	7.819	7.906	7.8	7.9	0.006468	0.05175	0.66%	0
6.25		8	7.875	7.816	7.934	7.8	8	0.008838	0.07071	0.90%	0
12.5		8	7.875	7.816	7.934	7.8	8	0.008838	0.07071	0.90%	0
25		8	7.863	7.819	7.906	7.8	7.9	0.006468	0.05175	0.66%	0
50		8	7.875	7.836	7.914	7.8	7.9	0.005785	0.04628	0.59%	0
100		8	7.875	7.836	7.914	7.8	7.9	0.005785	0.04628	0.59%	0
Overall		48	7.871	7.855	7.887	7.8	8	0.007854	0.05441	0.69%	0 (0%)

## Salinity-ppt

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	34	34	34	34	34	0	0	0.00%	0
6.25		8	34	34	34	34	34	0	0	0.00%	0
12.5		8	34	34	34	34	34	0	0	0.00%	0
25		8	34	34	34	34	34	0	0	0.00%	0
50		8	34	34	34	34	34	0	0	0.00%	0
100		8	34	34	34	34	34	0	0	0.00%	0
Overall		48	34	34	34	34	34	0	0	0.00%	0 (0%)

## Temperature-°C

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	21	21	21	21	21	0	0	0.00%	0
6.25		8	21	21	21	21	21	0	0	0.00%	0
12.5		8	21	21	21	21	21	0	0	0.00%	0
25		8	21	21	21	21	21	0	0	0.00%	0
50		8	21	21	21	21	21	0	0	0.00%	0
100		8	21	21	21	21	21	0	0	0.00%	0
Overall		48	21	21	21	21	21	0	0	0.00%	0 (0%)





**AQUATIC BIOASSAY**  
& CONSULTING LABORATORIES, INC.

## **CHRONIC FATHEAD MINNOW SURVIVAL AND GROWTH BIOASSAY**

DATE: 21 December 2023

STANDARD TOXICANT: Copper Chloride

ENDPOINT: SURVIVAL

NOEC = 38.00 ug/l

EC25 = 49.00 ug/l

EC50 = 64.00 ug/l

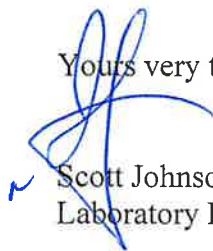
ENDPOINT: GROWTH

NOEC = 19.00 ug/l

IC25 = 46.06 ug/l

IC50 = 59.44 ug/l

Yours very truly,



Scott Johnson  
Laboratory Director

# CETIS Summary Report

Report Date: 23 Jan-24 16:44 (p 1 of 2)  
Test Code/ID: FML122123 / 06-6036-2868

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 19-5049-3661	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 21 Dec-23 13:29	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 28 Dec-23 13:25	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age:
Sample ID: 00-3772-8874	Code: FML122123	Project: REF TOX
Sample Date: 21 Dec-23 13:29	Material: Copper chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: ABC Labs	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	PMSD	S
17-8822-2941	7d Survival Rate	Steel Many-One Rank Sum Test	38	75	53.39	7.15%	1
15-0298-6000	Mean Dry Biomass-mg	Dunnett Multiple Comparison Test	✓ 19	38	26.87	9.52%	1

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓ Level	µg/L	95% LCL	95% UCL	S
13-4891-1637	7d Survival Rate	Linear Interpolation (ICPIN)	EC15	43	38.48	46.55	1
			EC20	46	41.91	49.64	
			EC25	49	45.06	52.93	
			EC40	58	53.32	63	
			EC50	64	58.2	70.5	
01-3251-7777	Mean Dry Biomass-mg	Linear Interpolation (ICPIN)	✓ IC15	40.7	29.04	45	1
			✓ IC20	43.38	35.38	47.36	
			✓ IC25	46.06	38.83	49.72	
			✓ IC40	54.09	48.8	57.21	
			✓ IC50	59.44	55.33	62.39	

## Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
13-4891-1637	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
17-8822-2941	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
01-3251-7777	Mean Dry Biomass-mg	Control Resp	0.355	0.25	<<	Yes	Passes Criteria
15-0298-6000	Mean Dry Biomass-mg	Control Resp	0.355	0.25	<<	Yes	Passes Criteria
15-0298-6000	Mean Dry Biomass-mg	PMSD	0.0952	0.12	0.3	Yes	Below Criteria

## 7d Survival Rate Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
10		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
19		4	0.9833	0.9303	1.0360	0.9333	1.0000	0.0167	0.0333	3.39%	1.67%
38		4	0.9333	0.8467	1.0200	0.8667	1.0000	0.0272	0.0544	5.83%	6.67%
75		4	0.3167	0.1575	0.4758	0.2000	0.4000	0.0500	0.1000	31.58%	68.33%
150		4	0.0333	-0.0728	0.1394	0.0000	0.1333	0.0333	0.0667	200.00%	96.67%

## Mean Dry Biomass-mg Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	0.355	0.3427	0.3673	0.3473	0.362	0.003873	0.007746	2.18%	0.00%
10		4	0.3448	0.3284	0.3613	0.3353	0.358	0.005167	0.01033	3.00%	2.86%
19		4	0.358	0.3295	0.3865	0.3427	0.3813	0.008953	0.01791	5.00%	-0.85%
38		4	0.3197	0.2674	0.3719	0.272	0.3427	0.01641	0.03283	10.27%	9.95%
75		4	0.07433	0.04539	0.1033	0.054	0.09067	0.009094	0.01819	24.47%	79.06%
150		4	0.01083	-0.02364	0.04531	0	0.04333	0.01083	0.02167	200.00%	96.95%

ANALYST: [Signature] PASS

# CETIS Summary Report

Report Date: 23 Jan-24 16:44 (p 2 of 2)  
Test Code/ID: FML122123 / 06-6036-2868

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

### 7d Survival Rate Detail

MD5: 7802B1972573C95B9E4DF31BE76CFFD8

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	1.0000	1.0000	1.0000
10		1.0000	1.0000	1.0000	1.0000
19		1.0000	1.0000	1.0000	0.9333
38		1.0000	0.9333	0.8667	0.9333
75		0.2667	0.4000	0.2000	0.4000
150		0.0000	0.0000	0.0000	0.1333

### Mean Dry Biomass-mg Detail

MD5: 42A1DA01120815014006036A98869372

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.362	0.3473	0.3613	0.3493
10		0.3353	0.348	0.358	0.338
19		0.3627	0.3427	0.3453	0.3813
38		0.3427	0.34	0.272	0.324
75		0.054	0.09067	0.064	0.08867
150		0	0	0	0.04333

### 7d Survival Rate Binomials

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	15/15	15/15	15/15	15/15
10		15/15	15/15	15/15	15/15
19		15/15	15/15	15/15	14/15
38		15/15	14/15	13/15	14/15
75		4/15	6/15	3/15	6/15
150		0/15	0/15	0/15	2/15

# CETIS Analytical Report

Report Date: 23 Jan-24 16:44 (p 1 of 3)  
 Test Code/ID: FML122123 / 06-6036-2868

Fathead Minnow 7-d Larval Survival and Growth Test				Aquatic Bioassay & Consulting Labs, Inc.		
Analysis ID:	17-8822-2941	Endpoint:	7d Survival Rate	CETIS Version:	CETISv2.1.4	
Analyzed:	23 Jan-24 16:43	Analysis:	Nonparametric-Control vs Treatments	Status Level:	1	
Edit Date:	23 Jan-24 16:42	MD5 Hash:	7802B1972573C95B9E4DF31BE76CFFD8	Editor ID:	009-702-627-3	
Batch ID:	19-5049-3661	Test Type:	Growth-Survival (7d)	Analyst:		
Start Date:	21 Dec-23 13:29	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water	
Ending Date:	28 Dec-23 13:25	Species:	Pimephales promelas	Brine:	Not Applicable	
Test Length:	7d	Taxon:	Actinopterygii	Source:	Aquatic Biosystems, CO	Age:
Sample ID:	00-3772-8874	Code:	FML122123	Project:	REF TOX	
Sample Date:	21 Dec-23 13:29	Material:	Copper chloride	Source:	Reference Toxicant	
Receipt Date:		CAS (PC):		Station:	REF TOX	
Sample Age:	---	Client:	ABC Labs			

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	38	75	53.39	---	0.07147	7.15%

Steel Many-One Rank Sum Test									
Control	vs	Conc-µg/L	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Negative Control		10	6	18	10	1	CDF	0.8333	Non-Significant Effect
		19	6	16	10	1	CDF	0.6105	Non-Significant Effect
		38	6	12	10	1	CDF	0.1424	Non-Significant Effect
		75*	6	10	10	0	CDF	0.0417	Significant Effect
		150*	6	10	10	0	CDF	0.0417	Significant Effect

Test Acceptability Criteria		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.8	<<	Yes	Passes Criteria

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	5.79988	1.15998	5	168.6	<1.0E-05	Significant Effect
Error	0.123811	0.0068784	18			
Total	5.92369		23			

ANOVA Assumptions Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variance	Bartlett Equality of Variance Test				Indeterminate	
	Levene Equality of Variance Test	3.933	4.248	0.0138	Equal Variances	
	Mod Levene Equality of Variance Test	1.246	4.248	0.3290	Equal Variances	
Distribution	Anderson-Darling A2 Test	0.9038	3.878	0.0212	Normal Distribution	
	D'Agostino Kurtosis Test	0.978	2.576	0.3281	Normal Distribution	
	D'Agostino Skewness Test	1.106	2.576	0.2689	Normal Distribution	
	D'Agostino-Pearson K2 Omnibus Test	2.179	9.21	0.3364	Normal Distribution	
	Kolmogorov-Smirnov D Test	0.2083	0.2056	0.0084	Non-Normal Distribution	
	Shapiro-Wilk W Normality Test	0.9347	0.884	0.1243	Normal Distribution	

7d Survival Rate Summary											
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
10		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
19		4	0.9833	0.9303	1.0000	1.0000	0.9333	1.0000	0.0167	3.39%	1.67%
38		4	0.9333	0.8467	1.0000	0.9333	0.8667	1.0000	0.0272	5.83%	6.67%
75		4	0.3167	0.1575	0.4758	0.3556	0.2000	0.4000	0.0500	31.58%	68.33%
150		4	0.0333	0.0000	0.1394	0.0000	0.0000	0.1333	0.0333	200.00%	96.67%

Fathead Minnow 7-d Larval Survival and Growth Test Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	17-8822-2941	Endpoint:	7d Survival Rate	CETIS Version:	CETISv2.1.4
Analyzed:	23 Jan-24 16:43	Analysis:	Nonparametric-Control vs Treatments	Status Level:	1
Edit Date:	23 Jan-24 16:42	MD5 Hash:	7802B1972573C95B9E4DF31BE76CFFD8	Editor ID:	009-702-627-3

Angular (Corrected) Transformed Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.4410	1.4410	1.4420	1.4410	1.4410	1.4410	0.0000	0.00%	0.00%
10		4	1.4410	1.4410	1.4420	1.4410	1.4410	1.4410	0.0000	0.00%	0.00%
19		4	1.4080	1.3040	1.5130	1.4410	1.3100	1.4410	0.0329	4.68%	2.28%
38		4	1.3140	1.1550	1.4730	1.3100	1.1970	1.4410	0.0500	7.60%	8.81%
75		4	0.5939	0.4194	0.7685	0.6374	0.4636	0.6847	0.0548	18.47%	58.79%
150		4	0.1905	-0.0038	0.3849	0.1295	0.1295	0.3738	0.0611	64.11%	86.78%

7d Survival Rate Detail

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	1.0000	1.0000	1.0000
10		1.0000	1.0000	1.0000	1.0000
19		1.0000	1.0000	1.0000	0.9333
38		1.0000	0.9333	0.8667	0.9333
75		0.2667	0.4000	0.2000	0.4000
150		0.0000	0.0000	0.0000	0.1333

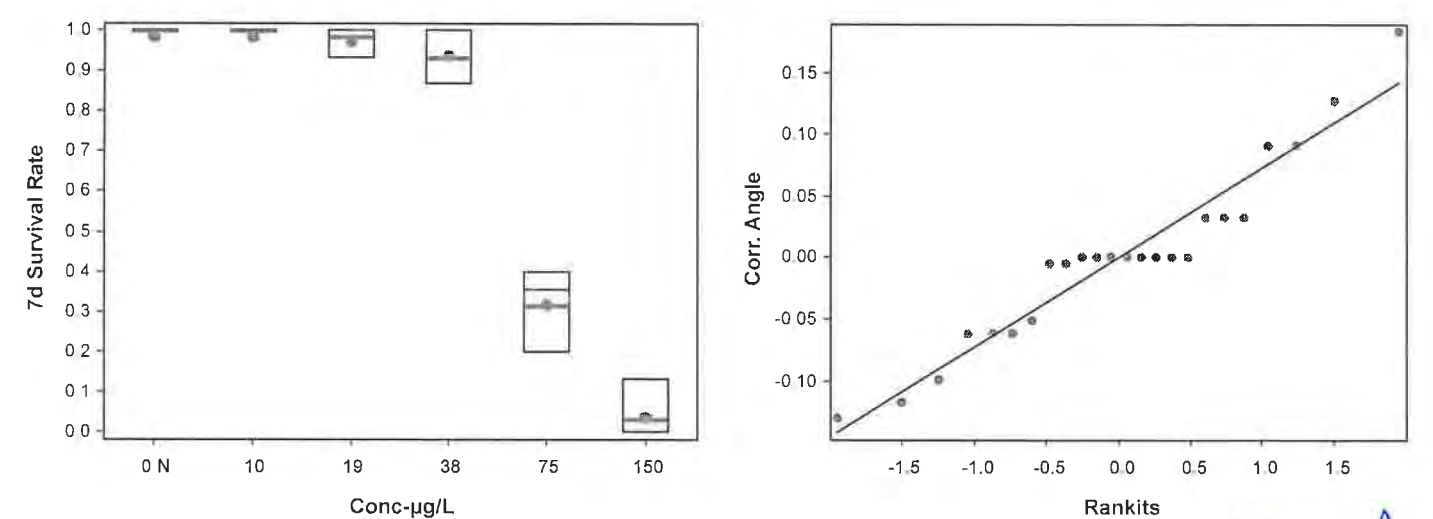
Angular (Corrected) Transformed Detail

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.4410	1.4410	1.4410	1.4410
10		1.4410	1.4410	1.4410	1.4410
19		1.4410	1.4410	1.4410	1.3100
38		1.4410	1.3100	1.1970	1.3100
75		0.5426	0.6847	0.4636	0.6847
150		0.1295	0.1295	0.1295	0.3738

7d Survival Rate Binomials

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	15/15	15/15	15/15	15/15
10		15/15	15/15	15/15	15/15
19		15/15	15/15	15/15	14/15
38		15/15	14/15	13/15	14/15
75		4/15	6/15	3/15	6/15
150		0/15	0/15	0/15	2/15

Graphics



# CETIS Analytical Report

Report Date: 23 Jan-24 16:44 (p 3 of 3)  
Test Code/ID: FML122123 / 06-6036-2868

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 15-0298-6000	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed: 23 Jan-24 16:43	Analysis: Parametric-Control vs Treatments	Status Level: 1
Edit Date: 23 Jan-24 16:42	MD5 Hash: 42A1DA01120815014006036A98869372	Editor ID: 009-702-627-3
Batch ID: 19-5049-3661	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 21 Dec-23 13:29	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 28 Dec-23 13:25	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age:
Sample ID: 00-3772-8874	Code: FML122123	Project: REF TOX
Sample Date: 21 Dec-23 13:29	Material: Copper chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: ABC Labs	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	19	38	26.87	---	0.0338	9.52%

## Dunnett Multiple Comparison Test

Control	vs	Conc-µg/L	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Negative Control		10	6	0.7241	2.407	0.0338	CDF	0.5470	Non-Significant Effect
		19	6	-0.2137	2.407	0.0338	CDF	0.8885	Non-Significant Effect
		38*	6	2.517	2.407	0.0338	CDF	0.0405	Significant Effect
		75*	6	19.99	2.407	0.0338	CDF	2.7E-05	Significant Effect
		150*	6	24.51	2.407	0.0338	CDF	2.7E-05	Significant Effect

## Test Acceptability Criteria

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.355	0.25	<<	Yes	Passes Criteria
PMSD	0.0952	0.12	0.3	Yes	Below Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.497452	0.0994904	5	252.4	<1.0E-05	Significant Effect
Error	0.0070962	0.0003942	18			
Total	0.504548		23			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	6.349	15.09	0.2737	Equal Variances
	Levene Equality of Variance Test	1.723	4.248	0.1803	Equal Variances
	Mod Levene Equality of Variance Test	0.5735	4.248	0.7195	Equal Variances
Distribution	Anderson-Darling A2 Test	0.5038	3.878	0.2082	Normal Distribution
	D'Agostino Kurtosis Test	1.181	2.576	0.2375	Normal Distribution
	D'Agostino Skewness Test	0.987	2.576	0.3237	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	2.37	9.21	0.3058	Normal Distribution
	Kolmogorov-Smirnov D Test	0.1265	0.2056	0.4077	Normal Distribution
	Shapiro-Wilk W Normality Test	0.9509	0.884	0.2835	Normal Distribution

## Mean Dry Biomass-mg Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	0.355	0.3427	0.3673	0.3553	0.3473	0.362	0.003873	2.18%	0.00%
10		4	0.3448	0.3284	0.3613	0.343	0.3353	0.358	0.005167	3.00%	2.86%
19		4	0.358	0.3295	0.3865	0.354	0.3427	0.3813	0.008953	5.00%	-0.85%
38		4	0.3197	0.2674	0.3719	0.332	0.272	0.3427	0.01641	10.27%	9.95%
75		4	0.07433	0.04539	0.1033	0.07633	0.054	0.09067	0.009094	24.47%	79.06%
150		4	0.01083	-0.02364	0.04531	0	0	0.04333	0.01083	200.00%	96.95%

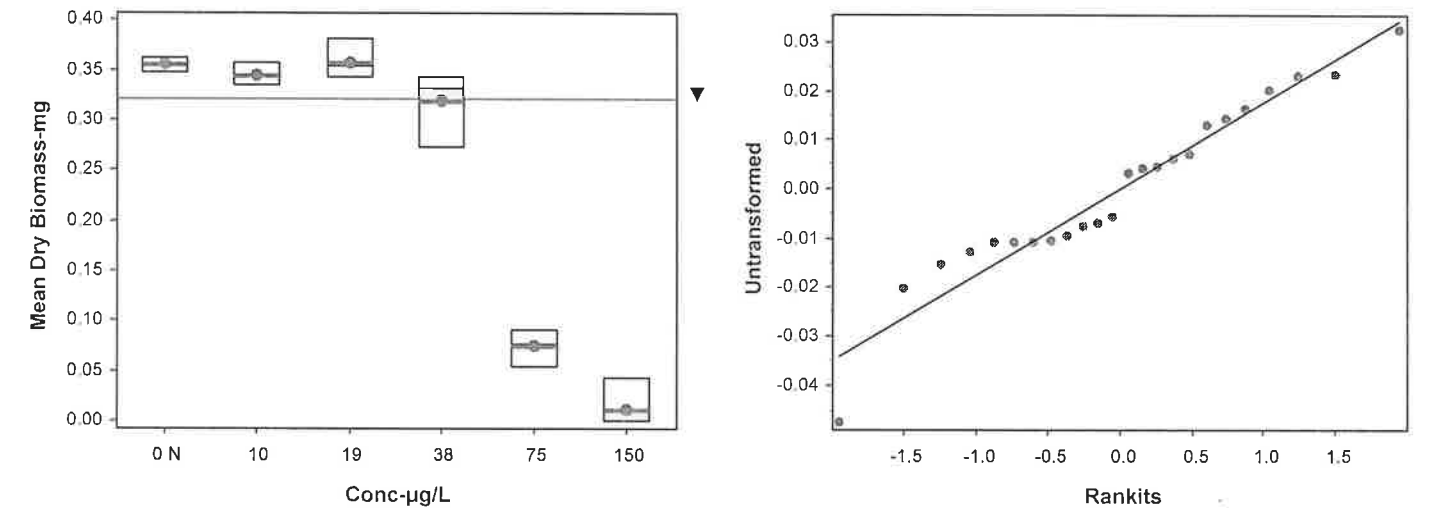
Fathead Minnow 7-d Larval Survival and Growth Test Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	15-0298-6000	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv2.1.4
Analyzed:	23 Jan-24 16:43	Analysis:	Parametric-Control vs Treatments	Status Level:	1
Edit Date:	23 Jan-24 16:42	MD5 Hash:	42A1DA01120815014006036A98869372	Editor ID:	009-702-627-3

Mean Dry Biomass-mg Detail

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.362	0.3473	0.3613	0.3493
10		0.3353	0.348	0.358	0.338
19		0.3627	0.3427	0.3453	0.3813
38		0.3427	0.34	0.272	0.324
75		0.054	0.09067	0.064	0.08867
150		0	0	0	0.04333

Graphics



CETIS Analytical Report

Report Date: 23 Jan-24 16:44 (p 1 of 4)  
Test Code/ID: FML122123 / 06-6036-2868

Fathead Minnow 7-d Larval Survival and Growth Test				Aquatic Bioassay & Consulting Labs, Inc.		
Analysis ID:	13-4891-1637	Endpoint:	7d Survival Rate	CETIS Version:	CETISv2.1.4	
Analyzed:	23 Jan-24 16:43	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1	
Edit Date:	23 Jan-24 16:42	MD5 Hash:	7802B1972573C95B9E4DF31BE76CFFD8	Editor ID:	009-702-627-3	
Batch ID:	19-5049-3661	Test Type:	Growth-Survival (7d)	Analyst:		
Start Date:	21 Dec-23 13:29	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water	
Ending Date:	28 Dec-23 13:25	Species:	Pimephales promelas	Brine:	Not Applicable	
Test Length:	7d	Taxon:	Actinopterygii	Source:	Aquatic Biosystems, CO	Age:
Sample ID:	00-3772-8874	Code:	FML122123	Project:	REF TOX	
Sample Date:	21 Dec-23 13:29	Material:	Copper chloride	Source:	Reference Toxicant	
Receipt Date:		CAS (PC):		Station:	REF TOX	
Sample Age:	---	Client:	ABC Labs			

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Test Acceptability Criteria		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.8	<<	Yes	Passes Criteria

Point Estimates			
Level	µg/L	95% LCL	95% UCL
EC15	43	38.48	46.55
EC20	46	41.91	49.64
EC25	49	45.06	52.93
EC40	58	53.32	63
EC50	64	58.2	70.5

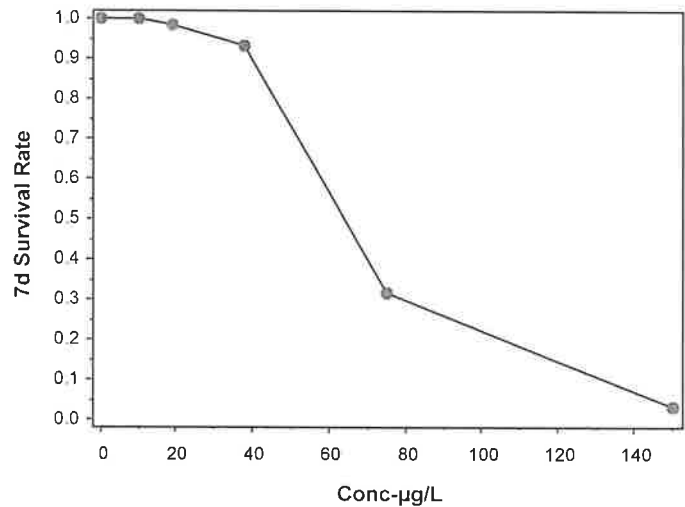
7d Survival Rate Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-µg/L	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	N	4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	60/60	1.0000	0.00%
10		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	60/60	1.0000	0.00%
19		4	0.9833	1.0000	0.9333	1.0000	3.39%	1.67%	59/60	0.9833	1.67%
38		4	0.9333	0.9333	0.8667	1.0000	5.83%	6.67%	56/60	0.9333	6.67%
75		4	0.3167	0.3556	0.2000	0.4000	31.58%	68.33%	19/60	0.3167	68.33%
150		4	0.0333	0.0000	0.0000	0.1333	200.00%	96.67%	2/60	0.0333	96.67%

7d Survival Rate Detail					
Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	1.0000	1.0000	1.0000
10		1.0000	1.0000	1.0000	1.0000
19		1.0000	1.0000	1.0000	0.9333
38		1.0000	0.9333	0.8667	0.9333
75		0.2667	0.4000	0.2000	0.4000
150		0.0000	0.0000	0.0000	0.1333

7d Survival Rate Binomials					
Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	15/15	15/15	15/15	15/15
10		15/15	15/15	15/15	15/15
19		15/15	15/15	15/15	14/15
38		15/15	14/15	13/15	14/15
75		4/15	6/15	3/15	6/15
150		0/15	0/15	0/15	2/15

Fathead Minnow 7-d Larval Survival and Growth Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID: 13-4891-1637	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4		
Analyzed: 23 Jan-24 16:43	Analysis: Linear Interpolation (ICPIN)	Status Level: 1		
Edit Date: 23 Jan-24 16:42	MD5 Hash: 7802B1972573C95B9E4DF31BE76CFFD8	Editor ID: 009-702-627-3		

Graphics



# CETIS Analytical Report

Report Date: 23 Jan-24 16:44 (p 3 of 4)  
Test Code/ID: FML122123 / 06-6036-2868

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 01-3251-7777	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed: 23 Jan-24 16:43	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 23 Jan-24 16:42	MD5 Hash: 42A1DA01120815014006036A98869372	Editor ID: 009-702-627-3
Batch ID: 19-5049-3661	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 21 Dec-23 13:29	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 28 Dec-23 13:25	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age:
Sample ID: 00-3772-8874	Code: FML122123	Project: REF TOX
Sample Date: 21 Dec-23 13:29	Material: Copper chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: ABC Labs	

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	600101	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

Test Acceptability Criteria		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.355	0.25	<<	Yes	Passes Criteria

## Point Estimates

Level	µg/L	95% LCL	95% UCL
IC15	40.7	29.04	45
IC20	43.38	35.38	47.36
IC25	46.06	38.83	49.72
IC40	54.09	48.8	57.21
IC50	59.44	55.33	62.39

## Mean Dry Biomass-mg Summary

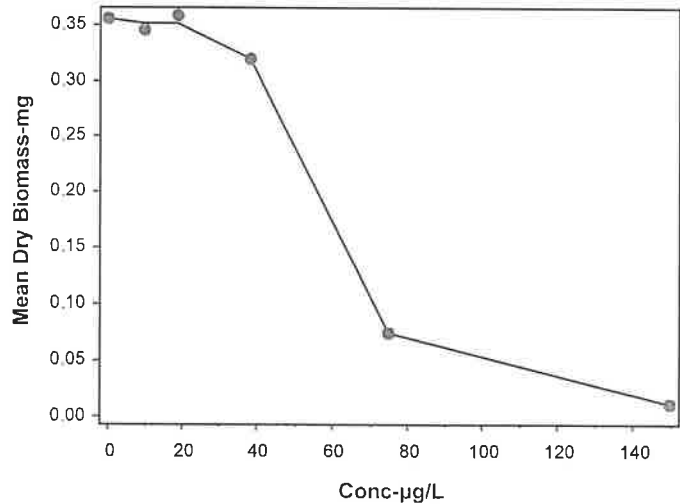
			Calculated Variate						Isotonic Variate	
Conc-µg/L	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	N	4	0.355	0.3553	0.3473	0.362	2.18%	0.00%	0.355	0.00%
10		4	0.3448	0.343	0.3353	0.358	3.00%	2.86%	0.3514	1.01%
19		4	0.358	0.354	0.3427	0.3813	5.00%	-0.85%	0.3514	1.01%
38		4	0.3197	0.332	0.272	0.3427	10.27%	9.95%	0.3197	9.94%
75		4	0.07433	0.07633	0.054	0.09067	24.47%	79.06%	0.07433	79.06%
150		4	0.01083	0	0	0.04333	200.00%	96.95%	0.01083	96.95%

## Mean Dry Biomass-mg Detail

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	0.362	0.3473	0.3613	0.3493
10		0.3353	0.348	0.358	0.338
19		0.3627	0.3427	0.3453	0.3813
38		0.3427	0.34	0.272	0.324
75		0.054	0.09067	0.064	0.08867
150		0	0	0	0.04333

Fathead Minnow 7-d Larval Survival and Growth Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID: 01-3251-7777	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4		
Analyzed: 23 Jan-24 16:43	Analysis: Linear Interpolation (ICPIN)	Status Level: 1		
Edit Date: 23 Jan-24 16:42	MD5 Hash: 42A1DA01120815014006036A98869372	Editor ID: 009-702-627-3		

Graphics



# CETIS Measurement Report

Report Date: 23 Jan-24 16:44 (p 1 of 2)  
 Test Code/ID: FML122123 / 06-6036-2868

## Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 19-5049-3661	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 21 Dec-23 13:29	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 28 Dec-23 13:25	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age:
Sample ID: 00-3772-8874	Code: FML122123	Project: REF TOX
Sample Date: 21 Dec-23 13:29	Material: Copper chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: ABC Labs	

### Alkalinity (CaCO3)-mg/L

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	62	62	62	62	62	0	0	0.00%	0
150		8	61	61	61	61	61	0	0	0.00%	0
Overall		16	61.5	61.22	61.78	61	62	0.1291	0.5164	0.84%	0 (0%)

### Conductivity-µmhos

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	377.1	374.3	379.9	372	382	0.4196	3.357	0.89%	0
10		8	375.5	373.1	377.9	372	380	0.366	2.928	0.78%	0
19		8	376.2	372.3	380.2	370	383	0.5967	4.773	1.27%	0
38		8	378.5	375.1	381.9	374	386	0.5089	4.071	1.08%	0
75		8	381.9	377.9	385.8	376	390	0.588	4.704	1.23%	0
150		8	383.4	379.7	387	378	392	0.5426	4.34	1.13%	0
Overall		48	378.8	377.4	380.2	370	392	0.7003	4.852	1.28%	0 (0%)

### Dissolved Oxygen-mg/L

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	7.8	7.536	8.064	7.1	8.2	0.03953	0.3162	4.05%	0
10		8	7.775	7.479	8.071	7	8.2	0.04419	0.3536	4.55%	0
19		8	7.763	7.48	8.045	7	8.1	0.04222	0.3378	4.35%	0
38		8	7.738	7.462	8.013	7	8.1	0.04115	0.3292	4.26%	0
75		8	7.763	7.484	8.041	7	8.1	0.04169	0.3335	4.30%	0
150		8	7.763	7.484	8.041	7	8.1	0.04169	0.3335	4.30%	0
Overall		48	7.767	7.675	7.859	7	8.2	0.04568	0.3165	4.07%	0 (0%)

### Hardness (CaCO3)-mg/L

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	100	100	100	100	100	0	0	0.00%	0
150		8	107	107	107	107	107	0	0	0.00%	0
Overall		16	103.5	101.6	105.4	100	107	0.9037	3.615	3.49%	0 (0%)

### pH-Units

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	8.113	8.018	8.207	8	8.3	0.01408	0.1126	1.39%	0
10		8	8.088	8.018	8.157	8	8.2	0.01043	0.08346	1.03%	0
19		8	8.088	8.018	8.157	8	8.2	0.01043	0.08346	1.03%	0
38		8	8.1	8.023	8.177	8	8.2	0.01157	0.09259	1.14%	0
75		8	8.112	8.03	8.195	8	8.2	0.01239	0.09911	1.22%	0
150		8	8.112	8.03	8.195	8	8.2	0.01239	0.09911	1.22%	0
Overall		48	8.102	8.076	8.129	8	8.3	0.01314	0.09107	1.12%	0 (0%)

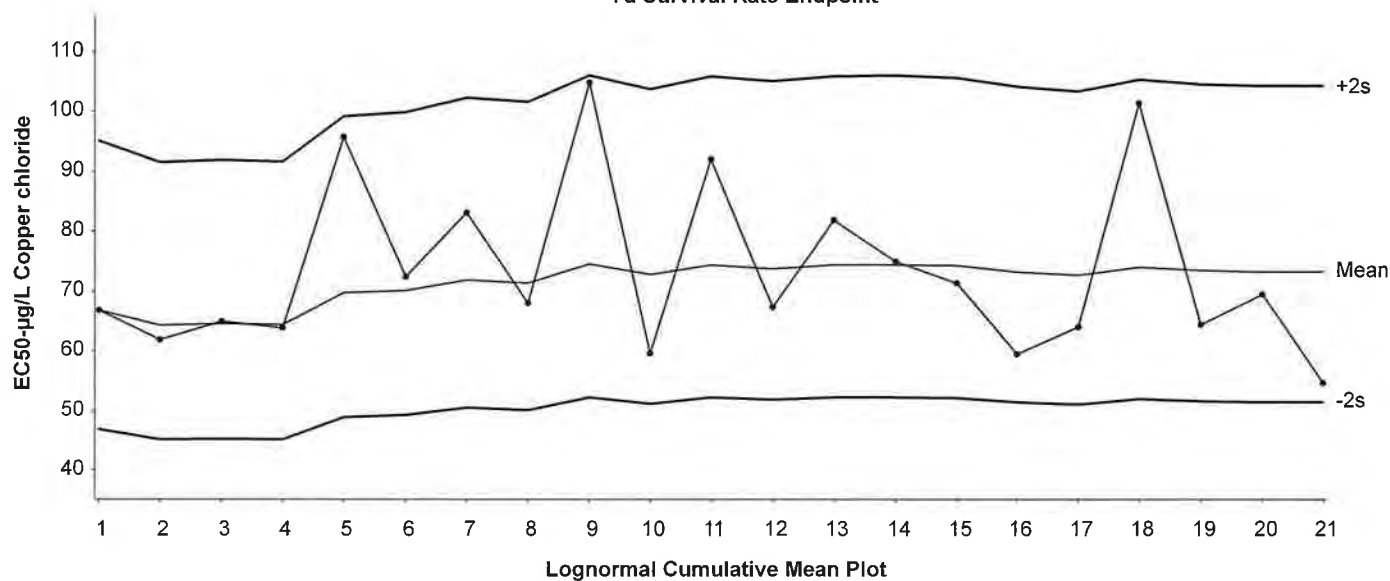
Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Temperature-°C											
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	24	24	24	24	24	0	0	0.00%	0
10		8	24	24	24	24	24	0	0	0.00%	0
19		8	24	24	24	24	24	0	0	0.00%	0
38		8	24	24	24	24	24	0	0	0.00%	0
75		8	24	24	24	24	24	0	0	0.00%	0
150		8	24	24	24	24	24	0	0	0.00%	0
Overall		48	24	24	24	24	24	0	0	0.00%	0 (0%)

Fathead Minnow 7-d Larval Survival and Growth Test			Aquatic Bioassay & Consulting Labs, Inc.	
Test Type: Growth-Survival (7d)	Organism: Pimephales promelas	Material: Copper chloride		
Protocol: EPA/821/R-02-013 (2002)	Endpoint: 7d Survival Rate	Source: Reference Toxicant-REF		

Fathead Minnow 7-d Larval Survival and Growth Test  
7d Survival Rate Endpoint



## Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2023	Oct	3	12:30	66.78	-6.481	-0.5233			01-2748-9589	03-0389-7072
2			4	12:15	61.84	-11.41	-0.9569			10-9866-3262	19-4548-1135
3			5	13:15	64.91	-8.35	-0.6837			07-7980-5469	03-0584-6653
4			6	14:45	63.9	-9.359	-0.7722			18-8099-7551	11-3195-6885
5			10	14:30	95.83	22.57	1.518			00-9395-0169	09-6776-4624
6			17	14:45	72.45	-0.8106	-0.06287			10-4602-8256	00-4017-6619
7			24	13:40	83.04	9.777	0.7077			01-7885-2189	13-0007-2758
8			25	12:16	67.98	-5.282	-0.4228			11-1982-8946	16-3131-2159
9			31	15:30	104.9	31.67	2.03		(+)	07-7265-5981	14-1873-8638
10		Nov	7	15:10	59.58	-13.68	-1.167			19-2888-5334	07-9547-8315
11			14	15:30	92.05	18.79	1.29			18-8754-0700	05-2558-7597
12			17	14:01	67.38	-5.877	-0.4724			17-0726-1937	14-0961-0371
13			28	14:49	81.82	8.559	0.6243			10-1970-7599	00-2724-7341
14		Dec	5	13:45	75	1.741	0.1327			19-1204-9208	03-6141-0747
15			12	13:30	71.3	-1.959	-0.1531			03-7560-9108	05-6885-8439
16			13	12:15	59.42	-13.84	-1.183			14-7892-5887	04-9254-9827
17			21	13:29	64	-9.259	-0.7634			06-6036-2868	13-4891-1637
18			22	14:30	101.4	28.09	1.834			00-5720-1635	14-1952-0593
19	2024	Jan	3	14:00	64.43	-8.83	-0.7257			04-0866-8727	01-4746-8383
20			4	14:05	69.52	-3.74	-0.2961			15-6608-9784	08-1717-2208
21			9	13:20	54.55	-18.71	-1.666			14-8299-7228	00-5651-6529

## Fathead Minnow 7-d Larval Survival and Growth Test

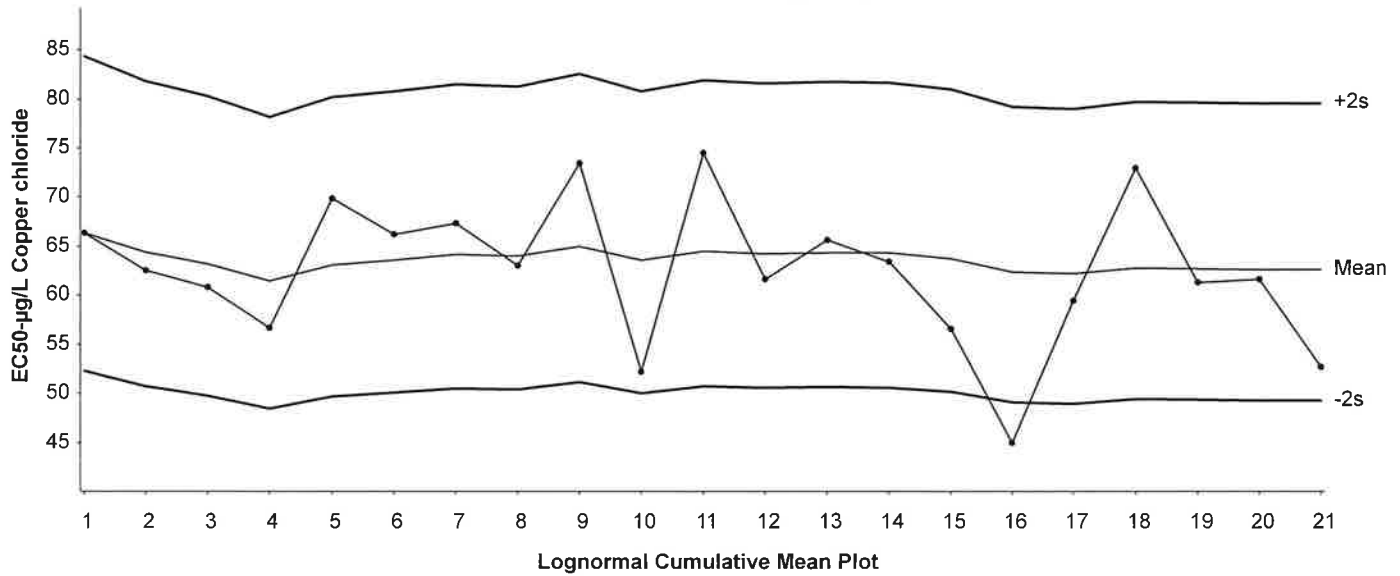
Aquatic Bioassay &amp; Consulting Labs, Inc.

Test Type: Growth-Survival (7d)  
Protocol: EPA/821/R-02-013 (2002)

Organism: Pimephales promelas  
Endpoint: Mean Dry Biomass-mg

Material: Copper chloride  
Source: Reference Toxicant-REF

Fathead Minnow 7-d Larval Survival and Growth Test  
Mean Dry Biomass-mg Endpoint



Mean: 62.61

Count: 20

-2s Action Limit: 49.3

Sigma: NA

CV: 12.00%

+2s Action Limit: 79.6

## Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2023	Oct	3	12:30	66.38	3.768	0.4886			01-2748-9589	12-3505-7917
2			4	12:15	62.55	-0.06341	-0.00847			10-9866-3262	15-4895-4606
3			5	13:15	60.85	-1.762	-0.2386			07-7980-5469	07-5020-1148
4			6	14:45	56.73	-5.882	-0.8248			18-8099-7551	15-1441-4720
5			10	14:30	69.86	7.243	0.9152			00-9395-0169	18-9888-9667
6			17	14:45	66.23	3.611	0.4689			10-4602-8256	13-8119-0525
7			24	13:40	67.38	4.769	0.6138			01-7885-2189	06-8805-4487
8			25	12:16	63.01	0.395	0.05258			11-1982-8946	04-1492-8778
9			31	15:30	73.46	10.84	1.335			07-7265-5981	21-3432-7293
10		Nov	7	15:10	52.21	-10.4	-1.519			19-2888-5334	11-0119-4879
11			14	15:30	74.52	11.91	1.456			18-8754-0700	03-4458-8213
12			17	14:01	61.66	-0.9536	-0.1283			17-0726-1937	06-0317-0204
13			28	14:49	65.63	3.019	0.3938			10-1970-7599	09-5836-2004
14		Dec	5	13:45	63.46	0.8429	0.1118			19-1204-9208	02-5721-3294
15			12	13:30	56.61	-6.003	-0.8426			03-7560-9108	19-0990-5343
16			13	12:15	45.01	-17.6	-2.76		(-)	14-7892-5887	19-1033-5713
17			21	13:29	59.44	-3.174	-0.4349			06-6036-2868	01-3251-7777
18			22	14:30	72.95	10.33	1.277			00-5720-1635	06-1309-8628
19	2024	Jan	3	14:00	61.34	-1.278	-0.1724			04-0866-8727	03-7640-5638
20			4	14:05	61.64	-0.9735	-0.131			15-6608-9784	18-2508-7781
21			9	13:20	52.68	-9.937	-1.445			14-8299-7228	08-4892-6835



**AQUATIC BIOASSAY**  
& CONSULTING LABORATORIES, INC.

## **CHRONIC TOPSMELT SURVIVAL AND GROWTH BIOASSAY**

DATE: 21 December - 2023

STANDARD TOXICANT: Copper Chloride

ENDPOINT: SURVIVAL

NOEC = 180.00 ug/l

EC25 = 198.50 ug/l

EC50 = 250.00 ug/l

ENDPOINT: GROWTH

NOEC = 100.00 ug/l

IC25 = 200.60 ug/l

IC50 = 250.00 ug/l

Yours very truly,

Scott Johnson  
Laboratory Director

\*34ppt

# CETIS Summary Report

Report Date: 23 Jan-24 16:32 (p 1 of 2)  
Test Code/ID: TOPS122123 / 05-0795-3914

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 19-5730-7327	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 21 Dec-23 12:50	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 28 Dec-23 13:00	Species: Atherinops affinis	Brine: Not Applicable
Test Length: 7d 0h	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: 13d
Sample ID: 02-5588-2598	Code: TOPS122123	Project: REF TOX
Sample Date: 21 Dec-23 12:50	Material: Copper chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: Internal Lab	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	PMSD	S
11-3229-0099	7d Survival Rate	Steel Many-One Rank Sum Test	180	320	240	15.4%	1
19-8029-3707	Mean Dry Biomass-mg	Steel Many-One Rank Sum Test	✓ 100	180	134.2	15.3%	1

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓ Level	µg/L	95% LCL	95% UCL	S
14-4372-3551	7d Survival Rate	Linear Interpolation (ICPIN)	✓ EC15	175	126.8	212.9	1
			✓ EC20	188.2	141.6	220.1	
			✓ EC25	198.5	157.9	228.8	
			✓ EC40	229.4	194.7	260.3	
			EC50	250	220.8	282.3	
07-1405-6858	Mean Dry Biomass-mg	Linear Interpolation (ICPIN)	IC15	180.8	118.8	204.3	1
			IC20	190.7	140.4	213	
			IC25	200.6	161.5	223.2	
			IC40	230.2	203	260	
			✓ IC50	250	226.7	285.9	

## Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
11-3229-0099	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
14-4372-3551	7d Survival Rate	Control Resp	1	0.8	<<	Yes	Passes Criteria
07-1405-6858	Mean Dry Biomass-mg	Control Resp	1.485	0.85	<<	Yes	Passes Criteria
19-8029-3707	Mean Dry Biomass-mg	Control Resp	1.485	0.85	<<	Yes	Passes Criteria
11-3229-0099	7d Survival Rate	PMSD	0.1542	<<	0.25	No	Passes Criteria

## 7d Survival Rate Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
56		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
100		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
180		5	0.8400	0.6322	1.0480	0.6000	1.0000	0.0748	0.1673	19.92%	16.00%
320		5	0.1600	-0.0478	0.3678	0.0000	0.4000	0.0748	0.1673	104.58%	84.00%
560		5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	---	100.00%

## Mean Dry Biomass-mg Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	1.485	1.45	1.521	1.448	1.52	0.01274	0.02848	1.92%	0.00%
56		5	1.44	1.367	1.513	1.376	1.536	0.02626	0.05872	4.08%	3.04%
100		5	1.444	1.419	1.47	1.422	1.47	0.009261	0.02071	1.43%	2.75%
180		5	1.269	1.008	1.53	0.912	1.438	0.09406	0.2103	16.58%	14.57%
320		5	0.216	-0.1177	0.5497	0	0.658	0.1202	0.2688	124.43%	85.46%
560		5	0	0	0	0	0	0	0	---	100.00%

CETIS Summary Report

Report Date: 23 Jan-24 16:32 (p 2 of 2)  
Test Code/ID: TOPS122123 / 05-0795-3914

Pacific Topsmelt 7-d Survival and Growth Test Aquatic Bioassay & Consulting Labs, Inc.

7d Survival Rate Detail MD5: 8DDAC19A9A63B42DA60C0192DAA8BFE4

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
56		1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000
180		1.0000	0.8000	0.6000	0.8000	1.0000
320		0.2000	0.0000	0.4000	0.2000	0.0000
560		0.0000	0.0000	0.0000	0.0000	0.0000

Mean Dry Biomass-mg Detail MD5: C8AB248C08CD9279017ADECC28792ADD

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.52	1.486	1.504	1.468	1.448
56		1.536	1.42	1.376	1.436	1.432
100		1.47	1.422	1.43	1.438	1.462
180		1.41	1.29	0.912	1.294	1.438
320		0.2	0	0.658	0.222	0
560		0	0	0	0	0

7d Survival Rate Binomials

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	5/5	5/5	5/5	5/5	5/5
56		5/5	5/5	5/5	5/5	5/5
100		5/5	5/5	5/5	5/5	5/5
180		5/5	4/5	3/5	4/5	5/5
320		1/5	0/5	2/5	1/5	0/5
560		0/5	0/5	0/5	0/5	0/5

# CETIS Analytical Report

Report Date: 23 Jan-24 16:32 (p 1 of 3)  
 Test Code/ID: TOPS122123 / 05-0795-3914

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 11-3229-0099	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed: 23 Jan-24 16:31	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 23 Jan-24 16:30	MD5 Hash: 8DDAC19A9A63B42DA60C0192DAA8BFE	Editor ID: 009-702-627-3
Batch ID: 19-5730-7327	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 21 Dec-23 12:50	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 28 Dec-23 13:00	Species: Atherinops affinis	Brine: Not Applicable
Test Length: 7d 0h	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: 13d
Sample ID: 02-5588-2598	Code: TOPS122123	Project: REF TOX
Sample Date: 21 Dec-23 12:50	Material: Copper chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: Internal Lab	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	180	320	240	---	0.1542	15.42%

## Steel Many-One Rank Sum Test

Control	vs	Conc-µg/L	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Negative Control		56	8	27.5	17	1	CDF	0.8000	Non-Significant Effect
		100	8	27.5	17	1	CDF	0.8000	Non-Significant Effect
		180	8	20	17	1	CDF	0.1653	Non-Significant Effect
		320*	8	15	17	0	CDF	0.0158	Significant Effect

## Test Acceptability Criteria

		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.8	<<	Yes	Passes Criteria
PMSD	0.1542	<<	0.25	No	Passes Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.27055	0.817637	4	54.78	<1.0E-05	Significant Effect
Error	0.298527	0.0149263	20			
Total	3.56908		24			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
	Levene Equality of Variance Test	9.022	4.431	0.0002	Unequal Variances
	Mod Levene Equality of Variance Test	6.718	4.893	0.0026	Unequal Variances
Distribution	Anderson-Darling A2 Test	2.913	3.878	<1.0E-05	Non-Normal Distribution
	D'Agostino Kurtosis Test	1.87	2.576	0.0615	Normal Distribution
	D'Agostino Skewness Test	9.62E-16	2.576	1.0000	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	3.495	9.21	0.1742	Normal Distribution
	Kolmogorov-Smirnov D Test	0.3	0.2018	<1.0E-05	Non-Normal Distribution
	Shapiro-Wilk W Normality Test	0.8127	0.8877	0.0004	Non-Normal Distribution

## 7d Survival Rate Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
56		5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
100		5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
180		5	0.8400	0.6322	1.0000	0.8000	0.6000	1.0000	0.0748	19.92%	16.00%
320		5	0.1600	0.0000	0.3678	0.2000	0.0000	0.4000	0.0748	104.58%	84.00%
560		5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	---	100.00%

CETIS Analytical Report

Report Date: 23 Jan-24 16:32 (p 2 of 3)  
Test Code/ID: TOPS122123 / 05-0795-3914

Pacific Topsmelt 7-d Survival and Growth Test Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 11-3229-0099 Endpoint: 7d Survival Rate CETIS Version: CETISv2.1.4  
Analyzed: 23 Jan-24 16:31 Analysis: Nonparametric-Control vs Treatments Status Level: 1  
Edit Date: 23 Jan-24 16:30 MD5 Hash: 8DDAC19A9A63B42DA60C0192DAA8BFE Editor ID: 009-702-627-3

Angular (Corrected) Transformed Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
56		5	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
100		5	1.3450	1.3450	1.3460	1.3450	1.3450	1.3450	0.0000	0.00%	0.00%
180		5	1.1580	0.9183	1.3980	1.1070	0.8861	1.3450	0.0864	16.68%	13.91%
320		5	0.4126	0.1728	0.6525	0.4636	0.2255	0.6847	0.0864	46.82%	69.33%
560		5	0.2255	0.2255	0.2256	0.2255	0.2255	0.2255	0.0000	0.00%	83.24%

7d Survival Rate Detail

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
56		1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000
180		1.0000	0.8000	0.6000	0.8000	1.0000
320		0.2000	0.0000	0.4000	0.2000	0.0000
560		0.0000	0.0000	0.0000	0.0000	0.0000

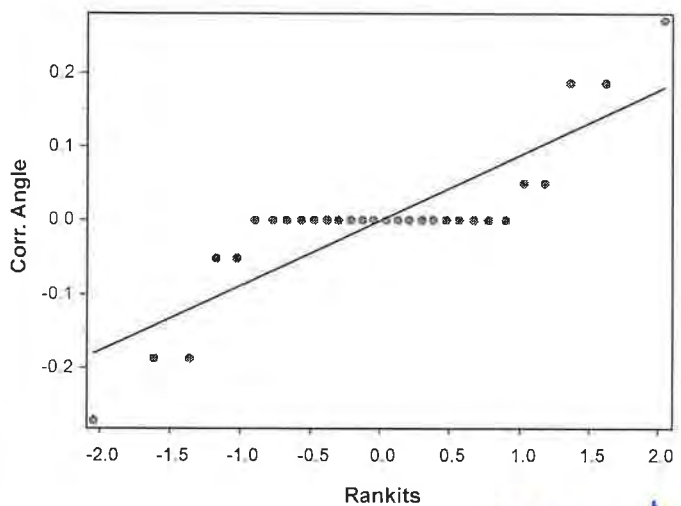
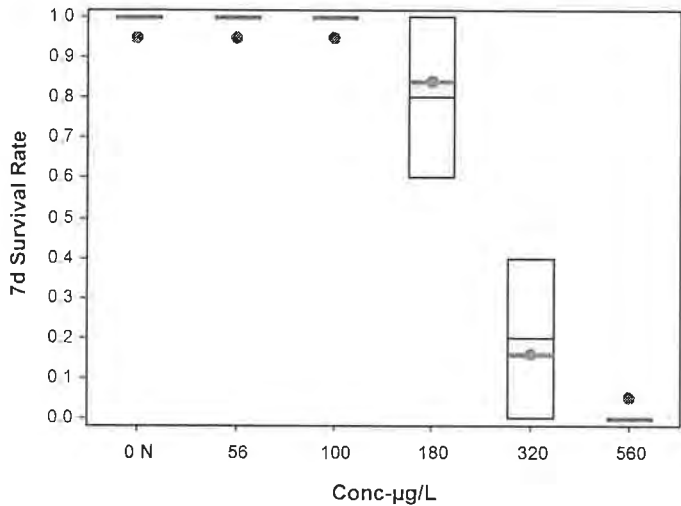
Angular (Corrected) Transformed Detail

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.3450	1.3450	1.3450	1.3450	1.3450
56		1.3450	1.3450	1.3450	1.3450	1.3450
100		1.3450	1.3450	1.3450	1.3450	1.3450
180		1.3450	1.1070	0.8861	1.1070	1.3450
320		0.4636	0.2255	0.6847	0.4636	0.2255
560		0.2255	0.2255	0.2255	0.2255	0.2255

7d Survival Rate Binomials

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	5/5	5/5	5/5	5/5	5/5
56		5/5	5/5	5/5	5/5	5/5
100		5/5	5/5	5/5	5/5	5/5
180		5/5	4/5	3/5	4/5	5/5
320		1/5	0/5	2/5	1/5	0/5
560		0/5	0/5	0/5	0/5	0/5

Graphics



# CETIS Analytical Report

Report Date: 23 Jan-24 16:32 (p 3 of 3)  
Test Code/ID: TOPS122123 / 05-0795-3914

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 19-8029-3707	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4
Analyzed: 23 Jan-24 16:31	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 23 Jan-24 16:30	MD5 Hash: C8AB248C08CD9279017ADECC28792AD	Editor ID: 009-702-627-3
Batch ID: 19-5730-7327	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 21 Dec-23 12:50	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 28 Dec-23 13:00	Species: Atherinops affinis	Brine: Not Applicable
Test Length: 7d 0h	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: 13d
Sample ID: 02-5588-2598	Code: TOPS122123	Project: REF TOX
Sample Date: 21 Dec-23 12:50	Material: Copper chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: Internal Lab	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Untransformed	C > T	100	180	134.2	---	0.2269	15.28%

## Steel Many-One Rank Sum Test

Control	vs	Conc-µg/L	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Negative Control		56	8	20	17	0	CDF	0.1653	Non-Significant Effect
		100	8	18	17	0	CDF	0.0740	Non-Significant Effect
		180*	8	15	17	0	CDF	0.0158	Significant Effect
		320*	8	15	17	0	CDF	0.0158	Significant Effect

## Test Acceptability Criteria

Test Acceptability Criteria		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1.485	0.85	<<	Yes	Passes Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	5.8371	1.45928	4	60.22	<1.0E-05	Significant Effect
Error	0.484677	0.0242338	20			
Total	6.32178		24			

## ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	27.95	13.28	1.3E-05	Unequal Variances
	Levene Equality of Variance Test	2.705	4.431	0.0598	Equal Variances
	Mod Levene Equality of Variance Test	2.749	4.893	0.0675	Equal Variances
Distribution	Anderson-Darling A2 Test	2.204	3.878	<1.0E-05	Non-Normal Distribution
	D'Agostino Kurtosis Test	2.806	2.576	0.0050	Non-Normal Distribution
	D'Agostino Skewness Test	1.03	2.576	0.3032	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	8.931	9.21	0.0115	Normal Distribution
	Kolmogorov-Smirnov D Test	0.2433	0.2018	0.0005	Non-Normal Distribution
	Shapiro-Wilk W Normality Test	0.829	0.8877	0.0007	Non-Normal Distribution

## Mean Dry Biomass-mg Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.485	1.45	1.521	1.486	1.448	1.52	0.01274	1.92%	0.00%
56		5	1.44	1.367	1.513	1.432	1.376	1.536	0.02626	4.08%	3.04%
100		5	1.444	1.419	1.47	1.438	1.422	1.47	0.009261	1.43%	2.75%
180		5	1.269	1.008	1.53	1.294	0.912	1.438	0.09406	16.58%	14.57%
320		5	0.216	-0.1177	0.5497	0.2	0	0.658	0.1202	124.43%	85.46%
560		5	0	0	0	0	0	0	0	---	100.00%

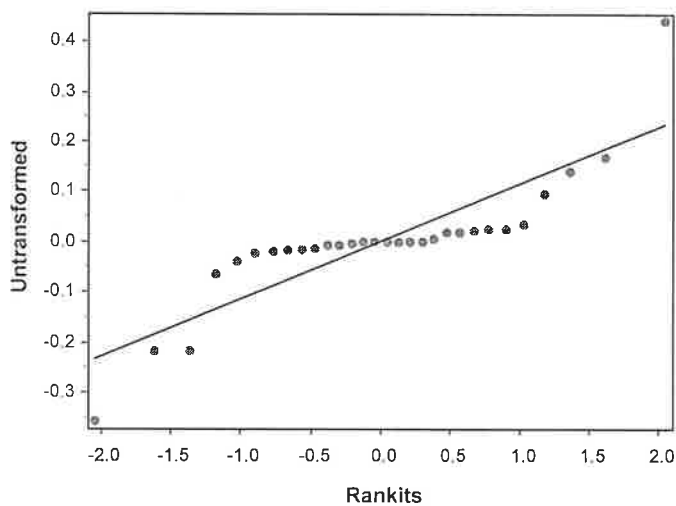
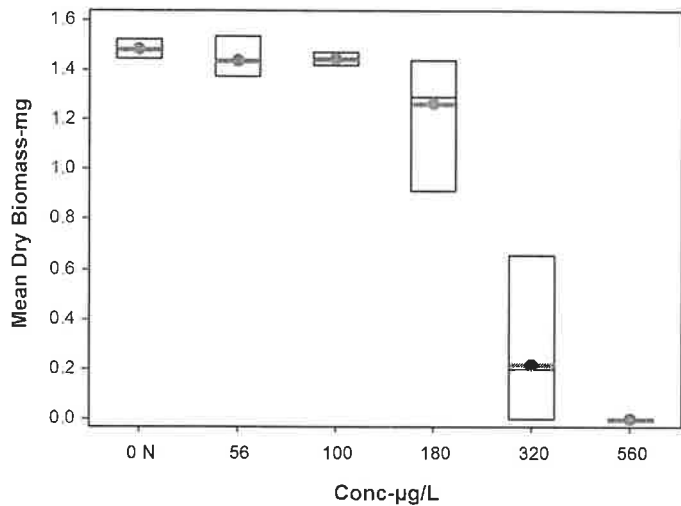
Pacific Topsmelt 7-d Survival and Growth Test Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	19-8029-3707	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv2.1.4
Analyzed:	23 Jan-24 16:31	Analysis:	Nonparametric-Control vs Treatments	Status Level:	1
Edit Date:	23 Jan-24 16:30	MD5 Hash:	C8AB248C08CD9279017ADECC28792AD	Editor ID:	009-702-627-3

Mean Dry Biomass-mg Detail

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.52	1.486	1.504	1.468	1.448
56		1.536	1.42	1.376	1.436	1.432
100		1.47	1.422	1.43	1.438	1.462
180		1.41	1.29	0.912	1.294	1.438
320		0.2	0	0.658	0.222	0
560		0	0	0	0	0

Graphics



# CETIS Analytical Report

Report Date: 23 Jan-24 16:32 (p 1 of 4)  
Test Code/ID: TOPS122123 / 05-0795-3914

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 14-4372-3551	Endpoint: 7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed: 23 Jan-24 16:31	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 23 Jan-24 16:30	MD5 Hash: 8DDAC19A9A63B42DA60C0192DAA8BFE	Editor ID: 009-702-627-3
Batch ID: 19-5730-7327	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 21 Dec-23 12:50	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 28 Dec-23 13:00	Species: Atherinops affinis	Brine: Not Applicable
Test Length: 7d 0h	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: 13d
Sample ID: 02-5588-2598	Code: TOPS122123	Project: REF TOX
Sample Date: 21 Dec-23 12:50	Material: Copper chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: Internal Lab	

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

Test Acceptability Criteria		TAC Limits		Overlap	Decision
Attribute	Test Stat	Lower	Upper		
Control Resp	1	0.8	<<	Yes	Passes Criteria

## Point Estimates

Level	µg/L	95% LCL	95% UCL
EC15	175	126.8	212.9
EC20	188.2	141.6	220.1
EC25	198.5	157.9	228.8
EC40	229.4	194.7	260.3
EC50	250	220.8	282.3

## 7d Survival Rate Summary

		Calculated Variate(A/B)							Isotonic Variate	
Conc-µg/L	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean %Effect
0	N	5	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	25/25	1.0000 0.00%
56		5	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	25/25	1.0000 0.00%
100		5	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	25/25	1.0000 0.00%
180		5	0.8400	0.8000	0.6000	1.0000	19.92%	16.00%	21/25	0.8400 16.00%
320		5	0.1600	0.2000	0.0000	0.4000	104.58%	84.00%	4/25	0.1600 84.00%
560		5	0.0000	0.0000	0.0000	0.0000	---	100.00%	0/25	0.0000 100.00%

## 7d Survival Rate Detail

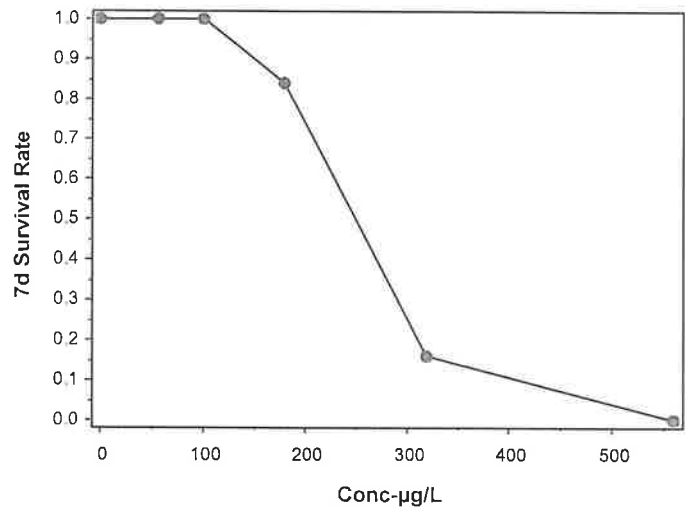
Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
56		1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000
180		1.0000	0.8000	0.6000	0.8000	1.0000
320		0.2000	0.0000	0.4000	0.2000	0.0000
560		0.0000	0.0000	0.0000	0.0000	0.0000

## 7d Survival Rate Binomials

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	5/5	5/5	5/5	5/5	5/5
56		5/5	5/5	5/5	5/5	5/5
100		5/5	5/5	5/5	5/5	5/5
180		5/5	4/5	3/5	4/5	5/5
320		1/5	0/5	2/5	1/5	0/5
560		0/5	0/5	0/5	0/5	0/5

Pacific Topsmelt 7-d Survival and Growth Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID:	14-4372-3551	Endpoint:	7d Survival Rate	CETIS Version: CETISv2.1.4
Analyzed:	23 Jan-24 16:31	Analysis:	Linear Interpolation (ICPIN)	Status Level: 1
Edit Date:	23 Jan-24 16:30	MD5 Hash:	8DDAC19A9A63B42DA60C0192DAA8BFE	Editor ID: 009-702-627-3

Graphics



CETIS Analytical Report

Report Date: 23 Jan-24 16:32 (p 3 of 4)  
Test Code/ID: TOPS122123 / 05-0795-3914

Pacific Topsmelt 7-d Survival and Growth Test				Aquatic Bioassay & Consulting Labs, Inc.		
Analysis ID:	07-1405-6858	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv2.1.4	
Analyzed:	23 Jan-24 16:31	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1	
Edit Date:	23 Jan-24 16:30	MD5 Hash:	C8AB248C08CD9279017ADECC28792AD	Editor ID:	009-702-627-3	
Batch ID:	19-5730-7327	Test Type:	Growth-Survival (7d)	Analyst:		
Start Date:	21 Dec-23 12:50	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater	
Ending Date:	28 Dec-23 13:00	Species:	Atherinops affinis	Brine:	Not Applicable	
Test Length:	7d 0h	Taxon:	Actinopterygii	Source:	Aquatic Biosystems, CO	Age: 13d
Sample ID:	02-5588-2598	Code:	TOPS122123	Project:	REF TOX	
Sample Date:	21 Dec-23 12:50	Material:	Copper chloride	Source:	Reference Toxicant	
Receipt Date:		CAS (PC):		Station:	REF TOX	
Sample Age:	---	Client:	Internal Lab			

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	788483	280	Yes	Two-Point Interpolation

Test Acceptability Criteria		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1.485	0.85	<<	Yes	Passes Criteria

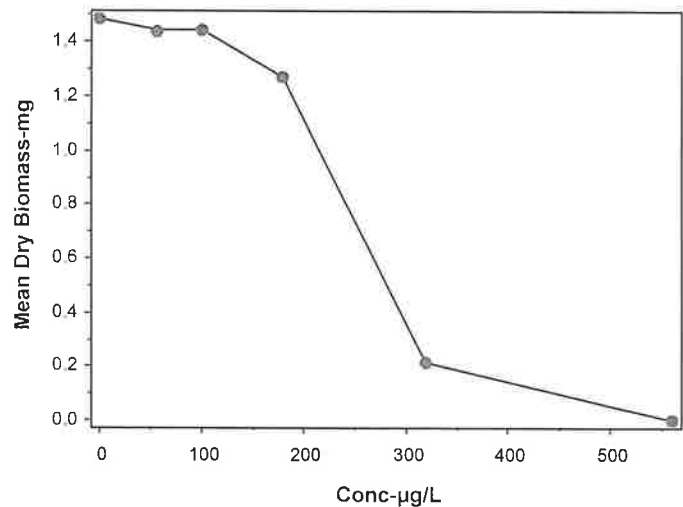
Point Estimates			
Level	µg/L	95% LCL	95% UCL
IC15	180.8	118.8	204.3
IC20	190.7	140.4	213
IC25	200.6	161.5	223.2
IC40	230.2	203	260
IC50	250	226.7	285.9

Mean Dry Biomass-mg Summary			Calculated Variate						Isotonic Variate	
Conc-µg/L	Code	Count	Mean	Median	Min	Max	CV%	%Effect	Mean	%Effect
0	N	5	1.485	1.486	1.448	1.52	1.92%	0.00%	1.485	0.00%
56		5	1.44	1.432	1.376	1.536	4.08%	3.04%	1.442	2.90%
100		5	1.444	1.438	1.422	1.47	1.43%	2.75%	1.442	2.90%
180		5	1.269	1.294	0.912	1.438	16.58%	14.57%	1.269	14.55%
320		5	0.216	0.2	0	0.658	124.43%	85.46%	0.216	85.45%
560		5	0	0	0	0	---	100.00%	0	100.00%

Mean Dry Biomass-mg Detail						
Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.52	1.486	1.504	1.468	1.448
56		1.536	1.42	1.376	1.436	1.432
100		1.47	1.422	1.43	1.438	1.462
180		1.41	1.29	0.912	1.294	1.438
320		0.2	0	0.658	0.222	0
560		0	0	0	0	0

Pacific Topsmelt 7-d Survival and Growth Test			Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID: 07-1405-6858	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv2.1.4		
Analyzed: 23 Jan-24 16:31	Analysis: Linear Interpolation (ICPIN)	Status Level: 1		
Edit Date: 23 Jan-24 16:30	MD5 Hash: C8AB248C08CD9279017ADECC28792AD	Editor ID: 009-702-627-3		

Graphics



# CETIS Measurement Report

Report Date: 23 Jan-24 16:32 (p 1 of 1)  
Test Code/ID: TOPS122123 / 05-0795-3914

## Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 19-5730-7327	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 21 Dec-23 12:50	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 28 Dec-23 13:00	Species: Atherinops affinis	Brine: Not Applicable
Test Length: 7d 0h	Taxon: Actinopterygii	Source: Aquatic Biosystems, CO Age: 13d
Sample ID: 02-5588-2598	Code: TOPS122123	Project: REF TOX
Sample Date: 21 Dec-23 12:50	Material: Copper chloride	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: Internal Lab	

### Dissolved Oxygen-mg/L

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	7.537	7.301	7.774	6.9	7.8	0.03532	0.2825	3.75%	0
56		8	7.488	7.258	7.717	6.9	7.8	0.03435	0.2748	3.67%	0
100		8	7.475	7.24	7.71	6.9	7.8	0.0352	0.2816	3.77%	0
180		8	7.463	7.231	7.694	6.9	7.8	0.03468	0.2774	3.72%	0
320		8	7.45	7.231	7.669	6.9	7.7	0.03273	0.2619	3.51%	0
560		1	7.5	---	---	7.5	7.5	---	---	---	0
Overall		41	7.483	7.401	7.565	6.9	7.8	0.04056	0.2597	3.47%	0 (0%)

### pH-Units

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	7.863	7.819	7.906	7.8	7.9	0.006468	0.05175	0.66%	0
56		8	7.863	7.8	7.925	7.7	7.9	0.009299	0.07439	0.95%	0
100		8	7.85	7.787	7.913	7.7	7.9	0.009448	0.07559	0.96%	0
180		8	7.838	7.775	7.9	7.7	7.9	0.0093	0.0744	0.95%	0
320		8	7.838	7.775	7.9	7.7	7.9	0.0093	0.0744	0.95%	0
560		1	7.8	---	---	7.8	7.8	---	---	---	0
Overall		41	7.849	7.827	7.87	7.7	7.9	0.01055	0.06754	0.86%	0 (0%)

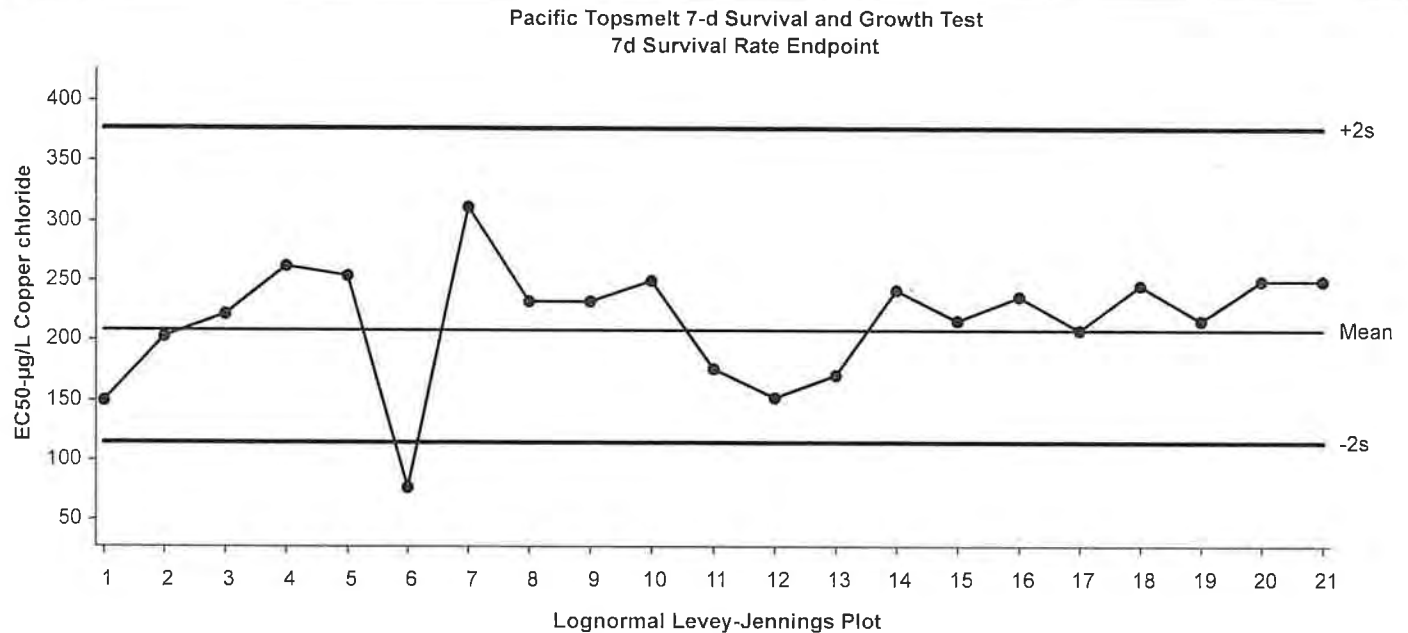
### Salinity-ppt

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	34	34	34	34	34	0	0	0.00%	0
56		8	34	34	34	34	34	0	0	0.00%	0
100		8	34	34	34	34	34	0	0	0.00%	0
180		8	34	34	34	34	34	0	0	0.00%	0
320		8	34	34	34	34	34	0	0	0.00%	0
560		1	34	---	---	34	34	---	---	---	0
Overall		41	34	34	34	34	34	0	0	0.00%	0 (0%)

### Temperature-°C

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	8	21	21	21	21	21	0	0	0.00%	0
56		8	21	21	21	21	21	0	0	0.00%	0
100		8	21	21	21	21	21	0	0	0.00%	0
180		8	21	21	21	21	21	0	0	0.00%	0
320		8	21	21	21	21	21	0	0	0.00%	0
560		1	21	---	---	21	21	---	---	---	0
Overall		41	21	21	21	21	21	0	0	0.00%	0 (0%)

Pacific Topsmelt 7-d Survival and Growth Test			Aquatic Bioassay & Consulting Labs, Inc.	
Test Type: Growth-Survival (7d)	Organism: Atherinops affinis	Material: Copper chloride		
Protocol: EPA/600/R-95/136 (1995)	Endpoint: 7d Survival Rate	Source: Reference Toxicant-REF		



Mean: 208.3      Count: 20      -2s Action Limit: 115  
 Sigma: NA      CV: 30.30%      +2s Action Limit: 377

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2023	Jun	6	11:45	150	-58.3	-1.107			19-6903-9165	06-4698-1002
2		Jul	11	12:00	203.3	-4.971	-0.08143			03-5083-6556	12-8861-7377
3			25	15:00	222	13.7	0.2147			07-3893-3422	21-0068-7069
4		Aug	2	14:00	261.7	53.36	0.769			15-6160-5570	06-5746-4737
5			15	14:30	253.5	45.2	0.662			20-6308-1453	08-0913-7377
6			15	15:00	77.45	-130.9	-3.336		(-)	17-1957-3934	02-5957-0865
7			24	15:34	312.2	103.9	1.365			14-0954-0135	12-7595-9597
8			29	12:16	233.1	24.84	0.3799			08-0817-4353	08-1102-0363
9		Sep	12	11:53	232.5	24.2	0.3705			20-9484-2864	01-4198-3977
10			26	12:30	250	41.7	0.6152			11-5823-5634	17-8097-7412
11		Oct	4	11:46	176.7	-31.64	-0.5554			20-3931-6197	13-1260-6110
12			10	11:52	152.6	-55.67	-1.048			19-8217-9815	04-6360-6307
13			17	12:00	170.8	-37.54	-0.6699			08-1731-1699	06-6669-8289
14			24	12:16	242.6	34.33	0.5143			18-8541-2862	06-7541-3933
15		Nov	8	11:18	217.1	8.754	0.1388			19-8053-9354	09-6641-7236
16			14	15:30	236.7	28.36	0.4304			14-7944-9644	03-5198-9583
17			17	15:38	208.3	0.029	0.00047			19-2377-5181	18-6025-6643
18			28	14:45	246.1	37.81	0.5623			15-3512-7319	11-9237-1453
19		Dec	5	12:45	217.1	8.754	0.1388			14-0752-6324	09-9741-8756
20			21	12:50	250	41.7	0.6152			05-0795-3914	14-4372-3551
21	2024	Jan	3	11:45	250	41.7	0.6152			14-6510-8883	06-3400-0300

Pacific Topsmelt 7-d Survival and Growth Test

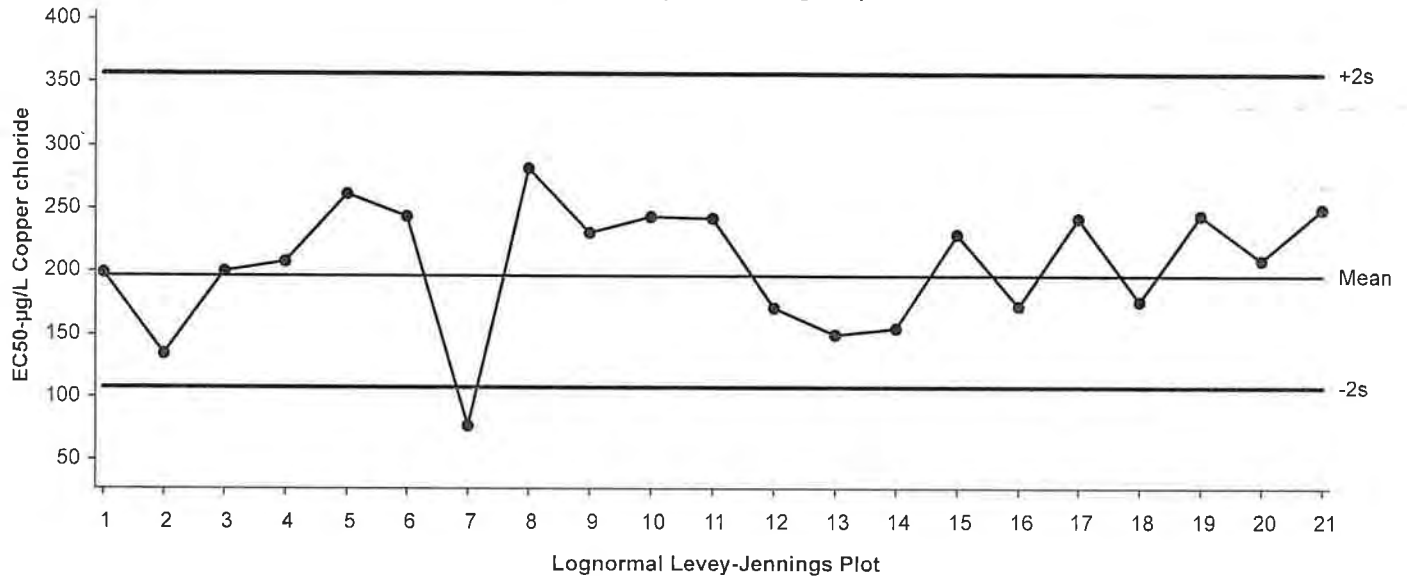
Aquatic Bioassay & Consulting Labs, Inc.

Test Type: Growth-Survival (7d)  
Protocol: EPA/600/R-95/136 (1995)

Organism: Atherinops affinis  
Endpoint: Mean Dry Biomass-mg

Material: Copper chloride  
Source: Reference Toxicant-REF

Pacific Topsmelt 7-d Survival and Growth Test  
Mean Dry Biomass-mg Endpoint



Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2023	May	12	11:14	199.3	3.135	0.05316			13-6002-6142	09-1765-9976
2		Jun	6	11:45	134.2	-61.95	-1.273			19-6903-9165	04-6596-5737
3		Jul	11	12:00	199.7	3.525	0.05973			03-5083-6556	04-8218-0636
4			25	15:00	208.2	12	0.199			07-3893-3422	07-4555-5373
5		Aug	2	14:00	261.6	65.47	0.9657			15-6160-5570	04-7649-5254
6			15	14:30	243.2	47.02	0.7205			20-6308-1453	00-0271-5510
7			15	15:00	77.47	-118.7	-3.116	(-)		17-1957-3934	09-9630-8539
8			24	15:34	281.4	85.25	1.21			14-0954-0135	07-6180-0626
9			29	12:16	230.2	34.05	0.5367			08-0817-4353	16-3898-9585
10		Sep	12	11:53	243.3	47.09	0.7215			20-9484-2864	01-7647-6381
11			26	12:30	242.1	45.88	0.7048			11-5823-5634	18-1550-4416
12		Oct	4	11:46	170.8	-25.37	-0.4645			20-3931-6197	07-2167-8587
13			10	11:52	149	-47.14	-0.9216			19-8217-9815	15-3349-3568
14			17	12:00	154.1	-42.1	-0.8101			08-1731-1699	20-8444-0697
15			24	12:16	229	32.84	0.5191			18-8541-2862	16-0654-2598
16		Nov	8	11:18	172.3	-23.91	-0.4359			19-8053-9354	08-6220-6203
17			14	15:30	242	45.79	0.7036			14-7944-9644	07-9639-9204
18			17	15:38	176.5	-19.71	-0.3552			19-2377-5181	02-3393-6623
19			28	14:45	245.1	48.97	0.7472			15-3512-7319	03-8593-9110
20		Dec	5	12:45	209.3	13.11	0.217			14-0752-6324	16-3628-1249
21			21	12:50	250	53.8	0.8127			05-0795-3914	07-1405-6858

## CHEMICAL ANALYSIS

## STD TOX-TOPS

Start Date:

12/21/23 1250

34ppt

Lab #: TOPS

End Date:

12/28/23 1300

Date Rec'd:

YSI/T#:

B17 B17

Sample used for renewal:

sh

sh

B17

B17

B17

sh

Day	12/21/23	12/22/23	12/23/23	12/24/23	12/25/23	12/26/23	12/27/23	12/28/23
Analyst Int.	sh	sh	sh	sh	sh	sh	sh	sh
DISSOLVED OXYGEN (mg/L)								
CONTROL	7.0	7.3	7.7	6.9	7.8	6.8	7.7	7.0
56	7.0	7.3	7.6	6.5	7.8	6.8	7.7	7.0
100	7.0	7.2	7.6	7.0	7.7	6.9	7.8	7.0
180	7.8	7.2	7.6	7.0	7.7	7.0	7.8	7.0
320	7.8	7.2	7.6	7.0	7.7	7.0	7.8	7.0
560	7.8	7.2	7.6	7.0	7.7	7.0	7.8	7.0
TEMPERATURE (°C)								
CONTROL	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
56	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
100	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
180	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
320	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
560	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
pH								
CONTROL	7.9	7.8	7.9	7.9	7.9	7.9	7.8	7.8
56	7.9	7.8	7.9	7.9	7.9	7.9	7.8	7.8
100	7.8	7.8	7.9	7.9	7.9	7.9	7.8	7.8
180	7.8	7.8	7.9	7.9	7.9	7.9	7.8	7.8
320	7.8	7.8	7.9	7.9	7.9	7.9	7.8	7.8
560	7.8	7.8	7.9	7.9	7.9	7.9	7.8	7.8
SALINITY (ppt)								
CONTROL	34	34	34	34	34	34	34	34
56	34	34	34	34	34	34	34	34
100	34	34	34	34	34	34	34	34
180	34	34	34	34	34	34	34	34
320	34	34	34	34	34	34	34	34
560	34	34	34	34	34	34	34	34

NOTES:

AGE = 130

# TOPSMELT SURVIVAL

Company: STD TOX

39 pp4

Sample ID:

Lab#: TOPS

Start Date:

12/21/23

End Date:

12/28/23

		Daily # of Surviving Fish							
Concentration	Rep. #	Initial	1 <sup>lb</sup>	2 <sup>lb</sup>	3 <sup>lb</sup>	4 <sup>lb</sup>	5 <sup>lb</sup>	6 <sup>lb</sup>	Final <sup>lb</sup>
CON	1	5	5	0	5	5	5	5	0
	2	0	5	0	0	5	5	5	0
	3	0	5	0	0	5	5	5	0
	4	0	5	0	0	5	5	5	0
	5	0	5	0	0	5	5	5	0
56	1	0	5	0	0	5	5	5	0
	2	0	5	0	0	5	5	5	0
	3	0	5	0	0	5	5	5	0
	4	0	5	0	0	5	5	5	0
	5	0	5	0	0	5	5	5	0
100	1	0	5	0	0	5	5	5	0
	2	0	5	0	0	5	5	5	0
	3	0	5	0	0	5	5	5	0
	4	0	5	0	0	5	5	5	0
	5	0	5	0	0	5	5	5	0
180	1	0	5	0	0	5	5	5	0
	2	0	5	0	0	5	5	5	0
	3	0	5	0	0	5	5	5	0
	4	0	5	0	0	5	5	5	0
	5	0	5	0	0	5	5	5	0
320	1	0	1	1	1	1	1	1	1
	2	0	0	0	0	0	0	0	0
	3	0	3	2	2	2	2	2	2
	4	0	1	1	1	1	1	1	1
	5	0	1	1	1	1	0	1	1
560	1	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0

Aquatic Bioassay & Consulting Laboratories, Inc.

# TOPSMELT GROWTH

Company: STD TOX

34 pot 12/21/23

Lab#: TOPS

Sample ID:

12/28/23

Chamber #	Eff Conc.	Rep. #	Number Fish	Boat Tare	Boat + Fish	Fish Wt. (mg)	Average Weight Per Fish (mg)
RA 1	CON	1	S	1.16336	1.17096	.00760	
2		2	S	1.16022	1.16765	.00743	
3		3	S	1.15521	1.16273	.00782	
4		4	S	1.15755	1.16489	.00734	
5		5		1.15332	1.16054	.00724	
RA 6	56	1	S	1.13604	1.14372	.00768	
7		2	S	1.14592	1.15302	.00710	
8		3	S	1.16199	1.16887	.00688	
9		4	S	1.15773	1.16491	.00718	
10		5	S	1.15954	1.16670	.00716	
RA 11	100	1	S	1.15704	1.16439	.00735	
12		2	S	1.12150	1.12861	.00711	
13		3	S	1.13818	1.14533	.00715	
14		4	S	1.13060	1.13779	.00719	
15		5	S	1.13666	1.14397	.00731	
RA 16	180	1	S	1.13088	1.13793	.00705	
17		2	4	1.13063	1.13708	.00645	
18		3	3	1.14634	1.15090	.00456	
19		4	4	1.14991	1.15638	.00647	
20		5	S	1.15675	1.16399	.00719	
RA 21	320	1	1	1.15570	1.15670	.00100	
22		2					
22		3	2	1.15289	1.15618	.00329	
23		4	1	1.14845	1.14956	.00111	
24	BLANK	5	—	1.13843	1.13849	.00006	
	560	1					
		2					
		3					
		4					
		5					

Aquatic Bioassay & Consulting Laboratories, Inc.

# CHEMICAL ANALYSIS DATA SHEET

VCF 1

Start Date: 12/21/2023 1339

Lab #: VCF 12 23. 096

End Date: 12/28/23 1320

Date Rec'd:

YSI / T#:

B17 B17

Renewal Sample Used:

dh dh B17 B17 B17 dh

DAY	12/21/0	12/22/1	12/23/2	12/24/3	12/25/4	12/26/5	12/27/6	12/28/7
Initials	eb	eb 1859	0905 M	1205 M	eb 1020	eb 1011	eb 0956	M

## DISSOLVED OXYGEN (mg/L)

Control	7.9	7.6	7.8	7.1	7.9	7.2	8.2	7.6	7.9	7.2	7.7	7.3	7.9	7.1
6.25%	8.0	7.6	7.8	7.0	7.9	7.2	8.2	7.6	7.8	7.2	7.7	7.2	7.8	7.1
12.5%	8.0	7.7	7.9	7.0	7.9	7.1	8.1	7.6	7.8	7.2	7.6	7.2	7.8	7.0
25%	8.0	7.7	7.9	7.1	7.9	7.1	8.2	7.6	7.8	7.1	7.6	7.2	7.9	7.0
50%	7.9	7.8	7.8	7.1	7.8	7.2	8.1	7.7	7.7	7.1	7.6	7.2	7.9	7.1
100%	7.9	7.8	7.8	7.1	7.8	7.1	8.0	7.7	7.7	7.0	7.6	7.2	7.9	7.0

## TEMPERATURE (°C)

Control	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
6.25%	24.2	24.0	24.1	24.0	24.1	24.0	24.0	24.0	24.2	24.0	24.2	24.0	24.0	24.0
12.5%	24.2	24.0	24.1	24.0	24.1	24.0	24.0	24.0	24.2	24.0	24.3	24.0	24.1	24.0
25%	24.3	24.0	24.2	24.0	24.1	24.0	24.1	24.0	24.2	24.0	24.3	24.0	24.1	24.0
50%	24.3	24.0	24.2	24.0	24.1	24.0	24.1	24.0	24.2	24.0	24.4	24.0	24.2	24.0
100%	24.4	24.0	24.2	24.0	24.1	24.0	24.1	24.0	24.2	24.0	24.4	24.0	24.2	24.0

## pH

Control	8.3	8.0	8.2	8.1	8.1	8.1	8.1	8.0	8.0	8.0	8.2	8.0	8.0	8.0
6.25%	8.2	8.0	8.0	8.0	8.1	8.1	8.1	7.9	8.0	8.0	8.2	8.0	8.0	8.0
12.5%	8.2	8.0	8.0	8.0	8.1	8.0	8.1	7.9	8.0	8.0	8.2	8.0	8.0	8.0
25%	8.2	8.0	8.1	8.0	8.0	8.0	8.1	7.9	7.9	8.0	8.2	8.0	8.0	8.0
50%	8.1	7.9	8.1	8.0	8.0	8.0	8.1	7.9	7.9	8.0	8.2	8.0	7.9	8.0
100%	8.1	7.9	8.1	8.0	8.0	8.0	8.0	7.9	7.9	8.0	8.2	8.0	7.9	8.0

## CONDUCTIVITY (uS/cm)

Control	380	373	372	377	379	382	377	377
6.25%	374	370	370	370	372	373	370	373
12.5%	360	362	365	364	360	362	366	365
25%	329	332	335	337	330	332	329	330
50%	268	269	270	279	282	279	280	255
100%	143	140	143	140	142	140	140	141

## ALKALINITY

Control	62	62	62	62	62	62	62	62
100%	31	31	31	31	31	31	31	31

## HARDNESS

Control	36	36	36	36	36	36	36	36
100%	36	36	36	36	36	36	36	36

Residual Chlorine

1st Sample:

LOJ

2nd Sample:

3rd Sample:

# Chronic juvenile Fathead minnow (*Pimephales promelas*) toxicity test - Survival

Aquatic Bioassay & Consulting Laboratories, Inc.

Company: VCF

Sample I.D.:

Lab #: VCF 12 23. 096

Date & Time Start: 12/21/23 1339

Date & Time End:

Conc.	Rep.#	INITIAL	1	2	3	4	5	6	FINAL
CONTROL	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
6.25%	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
12.5%	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
25%	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
50%	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15
100%	1	15	15	15	15	15	15	15	15
	2	15	15	15	15	15	15	15	15
	3	15	15	15	15	15	15	15	15
	4	15	15	15	15	15	15	15	15

CHAMBER NUMBER	EFF. CONC.	REPL. #	NUMBER FISH	BOAT TARE	BOAT + FISH	FISH WEIGHT (g)	AVG. WT. PER FISH (g)
RD 1	CONTROL	1		1.15099	1.15613	.00514	
2		2		1.14015	1.14567	.00552	
3		3		1.16254	1.16769	.00515	
4		4		1.15496	1.16011	.00515	
RD 5	6.25%	1		1.15075	1.15603	.00528	
6		2		1.16185	1.16712	.00527	
7		3		1.15802	1.16329	.00527	
8		4		1.14647	1.15182	.00535	
RD 9	12.5%	1		1.14521	1.15037	.00516	
10		2		1.15609	1.16125	.00516	
11		3		1.15150	1.15683	.00533	
12		4		1.16117	1.16675	.00558	
RD 13	25%	1		1.16581	1.17099	.00518	
14		2		1.15187	1.15690	.00503	
15		3		1.15079	1.15610	.00531	
16		4		1.12668	1.13185	.00520	
RD 17	50%	1		1.17032	1.17547	.00515	
18		2		1.15834	1.16377	.00543	
19		3		1.15521	1.16039	.00518	
20		4		1.13707	1.14235	.00528	
RD 21	100%	1		1.15595	1.16112	.00517	
22		2		1.16388	1.16907	.00519	
23		3		1.13436	1.13962	.00526	
24		4		1.16234	1.16781	.00547	

# CHEMICAL ANALYSIS

VCF - Topsmelt

Start Date: 12/21/23 1245

Lab #: VCF 23.095

End Date: 12/28/23 1310

Date Rec'd:

YSI / T#: B17 B17

Sample used for renewal:

Day	12/21/0	12/22/1	12/23/2	12/24/3	12/25/4	12/26/5	12/27/6	12/28/7
Analyst Int.	AD	EB 1921	OS 12	MS 10	EB 1082	EB 1197	EB 1321	AD

## DISSOLVED OXYGEN (mg/L)

CONTROL	7.0	7.3	7.7	6.9	7.8	6.8	7.7	7.0	7.6	7.2	7.4	7.1	7.6	6.9
6.25%	7.8	7.2	7.7	6.9	7.4	6.8	7.7	7.0	7.5	7.2	7.4	7.1	7.6	6.8
12.5%	7.8	7.2	7.7	6.9	7.8	6.5	7.8	7.0	7.5	7.1	7.4	7.1	7.6	6.8
25%	7.7	7.2	7.6	7.0	7.8	7.0	7.7	7.1	7.6	7.1	7.3	7.0	7.5	6.8
50%	7.7	7.3	7.6	7.0	7.9	7.0	7.7	7.1	7.6	7.0	7.3	7.0	7.5	6.8
100%	7.7	7.3	7.6	7.0	7.9	7.0	7.8	7.2	7.6	7.0	7.3	7.0	7.6	6.8

## TEMPERATURE (°C)

CONTROL	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
6.25%	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
12.5%	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
25%	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
50%	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
100%	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0

## pH

CONTROL	7.9	7.8	7.9	7.9	7.9	7.9	7.9	7.9	7.8	7.9	7.8	7.8	7.8	7.8
6.25%	8.0	7.8	7.9	7.9	7.9	7.9	7.9	7.9	7.8	7.9	7.8	7.8	7.8	7.8
12.5%	8.0	7.8	7.9	7.8	7.9	7.9	7.9	7.9	7.8	7.9	7.8	7.8	7.8	7.8
25%	7.9	7.7	7.9	7.9	7.9	7.9	7.9	7.8	7.8	7.8	7.9	7.8	7.8	7.8
50%	7.9	7.7	7.9	7.9	7.9	7.9	7.9	7.7	7.9	7.8	7.9	7.8	7.8	7.8
100%	7.9	7.7	7.9	7.9	7.9	7.9	7.9	7.7	7.9	7.8	7.9	7.8	7.8	7.8

## SALINITY (ppt)

CONTROL	34	34	34	34	34	34	34	34	34	34	34	34	34	34
6.25%	34	34	34	34	34	34	34	34	34	34	34	34	34	34
12.5%	34	34	34	34	34	34	34	34	34	34	34	34	34	34
25%	34	34	34	34	34	34	34	34	34	34	34	34	34	34
50%	34	34	34	34	34	34	34	34	34	34	34	34	34	34
100%	34	34	34	34	34	34	34	34	34	34	34	34	34	34

NOTES: AGE = BD

# TOPSMELT SURVIVAL

Company: VCF 3

Sample ID:

Lab#: VCF 23.095

Start Date: 12/21/23

End Date: 12/28/23

Concentration	Rep. #	Initial	Daily # of Surviving Fish						Final
			1 lb	2 lb	3 lb	4 lb	5 lb	6 lb	
CON	1	5	5	5	5	5	5	5	5
	2	5	5	5	5	5	5	5	5
	3	5	5	5	5	5	5	5	5
	4	5	5	5	5	5	5	5	5
	5	5	5	5	5	5	5	5	5
6.25%	1	5	5	5	5	5	5	5	5
	2	5	5	5	5	5	5	5	5
	3	5	5	5	5	5	5	5	5
	4	5	5	5	5	5	5	5	5
	5	5	5	5	5	5	5	5	5
12.5%	1	5	5	5	5	5	5	5	5
	2	5	5	5	5	5	5	5	5
	3	5	5	5	5	5	5	5	5
	4	5	5	5	5	5	5	5	5
	5	5	5	5	5	5	5	5	5
25%	1	5	5	5	5	5	5	5	5
	2	5	5	5	5	5	5	5	5
	3	5	5	5	5	5	5	5	5
	4	5	5	5	5	5	5	5	5
	5	5	5	5	5	5	5	5	5
50%	1	5	5	5	5	5	5	5	5
	2	5	5	5	5	5	5	5	5
	3	5	5	5	5	5	5	5	5
	4	5	5	5	5	5	5	5	5
	5	5	5	5	5	5	5	5	5
100%	1	5	5	5	5	5	5	5	5
	2	5	5	5	5	5	5	5	5
	3	5	5	5	5	5	5	5	5
	4	5	5	5	5	5	5	5	5
	5	5	5	5	5	5	5	5	5

Aquatic Bioassay & Consulting Laboratories, Inc.

# TOPSMELT GROWTH

Company: VCF

Lab#:

VCF 23.09K

Sample ID:

1 12/28/23

Chamber #	Eff Conc.	Rep. #	Number Fish	Boat Tare	Boat + Fish	Fish Wt. (mg)	Average Weight Per Fish (mg)
RB 1	CON	1	S	1.15741	1.16490	.00749	
2		2	S	1.15094	1.15802	.00708	
3		3	S	1.14706	1.15437	.00731	
4		4	S	1.15144	1.15865	.00721	
5		5	S	1.13470	1.14176	.00706	
RB 6	6.25%	1	S	1.15434	1.16159	.00725	
7		2	S	1.14931	1.15661	.00730	
8		3	S	1.16406	1.17127	.00721	
9		4	S	1.16900	1.17649	.00719	
10		5	S	1.15917	1.16682	.00705	
RB 11	12.5%	1	S	1.14180	1.14899	.00719	
12		2	S	1.15297	1.16027	.00730	
13		3	S	1.14451	1.15182	.00731	
14		4	S	1.13366	1.14079	.00713	
15		5	S	1.13222	1.13932	.00710	
RB 16	25%	1	S	1.13899	1.14621	.00722	
17		2	S	1.13716	1.14439	.00723	
18		3	S	1.16899	1.17601	.00702	
19		4	S	1.14288	1.14993	.00705	
20		5	S	1.16791	1.17514	.00723	
RB 21	50%	1	S	1.15649	1.16398	.00749	
22		2	S	1.12349	1.13077	.00728	
23		3	S	1.13380	1.14091	.00711	
24		4	S	1.16318	1.17029	.00711	
25		5	S	1.13519	1.14253	.00734	
RB 26	100%	1	S	1.13782	1.14512	.00730	
27		2	S	1.13749	1.14457	.00708	
28		3	S	1.15209	1.15939	.00723	
29		4	S	1.13523	1.14280	.00757	
30		5	S	1.16024	1.16772	.00748	

Aquatic Bioassay & Consulting Laboratories, Inc.

## CHEMICAL ANALYSIS DATA SHEET

## STD TOX - FML

Start Date: 12/21/2023 1329

Lab #: FML

End Date: 12/28/23 1515

Date Rec'd:

YSI used:

T#/CF:

B17 B17 o/v 4/v B17 B17 B17 o/v

DAY	12/21/0	12/22/1	12/23/2	12/24/3	12/25/4	12/26/5	12/27/6	12/28/7
Initials	eb	eb 1853	0905 JV	1000 JV	eb 1013	eb 1004	eb 0950	N

## DISSOLVED OXYGEN (mg/L)

Control	7.9	7.6	7.8	7.1	7.9	7.2	8.2	7.6	7.9	7.2	7.7	7.3	7.9	7.1
0.010	7.8	7.6	7.9	7.0	7.9	7.2	8.2	7.5	7.9	7.2	7.6	7.3	7.9	7.0
0.019	7.8	7.5	7.9	7.0	7.9	7.1	8.1	7.5	7.9	7.3	7.6	7.3	7.9	7.0
0.038	7.9	7.5	7.8	7.0	7.9	7.1	8.1	7.4	7.8	7.3	7.6	7.2	7.8	7.0
0.075	7.9	7.5	7.8	7.0	8.0	7.1	8.1	7.4	7.8	7.2	7.7	7.2	7.8	7.0
0.15	7.9	7.4	7.8	7.0	8.0	7.1	8.1	7.4	7.8	7.1	7.7	7.2	7.8	7.0

## TEMPERATURE (°C)

Control	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
0.010	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
0.019	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
0.038	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
0.075	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
0.15	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0

## pH

Control	8.3	8.0	8.2	8.1	8.1	8.1	8.1	8.0	8.0	8.0	8.2	8.0	8.0	8.0
0.010	8.2	8.0	8.1	8.1	8.1	8.1	8.1	8.0	8.0	7.9	8.2	7.9	8.0	8.0
0.019	8.2	8.0	8.1	8.1	8.1	8.1	8.1	8.0	8.0	7.9	8.2	7.9	8.0	8.0
0.038	8.2	8.0	8.2	8.0	8.1	8.1	8.2	8.0	8.0	7.9	8.1	7.8	8.0	8.0
0.075	8.2	8.0	8.2	8.0	8.2	8.1	8.2	8.0	8.0	7.9	8.1	7.8	8.0	8.0
0.15	8.2	8.0	8.2	8.0	8.2	8.2	8.2	8.0	8.0	7.9	8.1	7.8	8.0	8.0

## CONDUCTIVITY (uS/cm)

Control	380	373	372	377	379	382	377	377
0.010	379	372	373	375	377	380	373	375
0.019	377	370	370	373	380	383	379	378
0.038	376	376	375	374	382	386	380	379
0.075	376	380	379	378	383	390	382	387
0.15	378	382	380	381	386	392	383	385

## ALKALINITY

Control	62	62	62	62	62	62	62	62
0.15	61	61	61	61	61	61	61	61

## HARDNESS

Control	107	107	107	107	107	107	107	107
0.15	107	107	107	107	107	107	107	107

Residual Chlorine

1st Sample: \_\_\_\_\_ 2nd Sample: \_\_\_\_\_ 3rd Sample: \_\_\_\_\_

# Chronic juvenile Fathead minnow (*Pimephales promelas*) Survival and Growth

Aquatic Bioassay & Consulting Laboratories, Inc.

Company: STD. TOX.

Lab #: FML

Sample I.D.:

Date & Time Start: 12/21/23 1329

Date & Time End: 12/28/23

Conc.	Rep.#	INITIAL	1	2	3	4	5	6	FINAN
CONTROL	1	15	15	10	10	15	15	15	15
	2	15	15	10	10	15	15	15	10
	3	15	15	10	10	15	15	15	10
	4	15	15	10	10	15	15	15	10
.010	1	15	15	10	10	15	15	15	10
	2	15	15	10	10	15	15	15	10
	3	15	15	10	10	15	15	15	10
	4	15	15	10	10	15	15	15	10
.019	1	15	15	10	10	15	15	15	10
	2	15	15	10	10	15	15	15	10
	3	15	15	10	10	15	15	15	10
	4	15	15	10	10	15	15	15	10
.038	1	15	15	10	10	15	15	15	10
	2	15	15	10	10	15	15	15	10
	3	15	15	10	10	15	15	15	10
	4	15	15	10	10	15	15	15	10
.075	1	15	15	10	10	15	15	15	10
	2	15	15	10	10	15	15	15	10
	3	15	15	10	10	15	15	15	10
	4	15	15	10	10	15	15	15	10
.15	1	15	15	10	10	15	15	15	10
	2	15	15	10	10	15	15	15	10
	3	15	15	10	10	15	15	15	10
	4	15	15	10	10	15	15	15	10

CHAMBER NUMBER	EFF. CONC.	REPL. #	NUMBER FISH	BOAT TARE	BOAT + FISH	FISH WEIGHT (g)	AVG. WT. PER FISH (g)
RC 1	CONTROL	1		1.14318	1.14801	.00543	
2		2		1.15786	1.16307	.00521	
3		3		1.16048	1.16590	.00542	
4		4		1.14303	1.14827	.00524	
RC 5	.010	1		1.16179	1.16682	.00503	
6		2		1.16305	1.16827	.00512	
7		3		1.15648 <sup>2</sup>	1.16179	.00537	
8		4		1.13097	1.13604	.00507	
RC 9	.019	1		1.15929	1.16473	.00544	
10		2		1.16584	1.17098	.00519	
11		3		1.13551	1.14069	.00518	
12		4		1.15405	1.15977	.00572	
RC 13	.038	1		1.15938	1.16452	.00514	
14		2		1.15021	1.15531	.00510	
15		3		1.16119	1.16527	.00468	
16		4		1.13936	1.14422	.00486	
RC 17	.075	1		1.15718	1.15799	.00081	
18		2		1.15474	1.15610	.00136	
19		3		1.13961	1.14057	.00096	
20		4		1.15649	1.15782	.00133	
RC 21	.15	1		1.16618	1.16610	.00008	
22		2		1.14733 <sup>2</sup>			
23		3					
24		4		1.14722	1.14798	.00065	