



ANALYTICAL REPORT

PREPARED FOR

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Spokane Valley, Washington 99216

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JOB DESCRIPTION

Q4 Acute Biomonitoring

JOB NUMBER

192-21568-1

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing South Central, LLC Project Manager.

Authorization



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Re: Acute Biomonitoring utilizing *Pimephales promelas* (Fathead minnow) and *Ceriodaphnia dubia*
 Sample ID: Outfall 001
 Job number: 192-21568
 Permit No.: WA0000892

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

Testing procedure and Quality Assurance were in accordance with "Methods for measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms" EPA-821-R-02-012, Fifth Edition, October 2002.

Test results are summarized below:

Acute *Ceriodaphnia dubia* Survival Test:

The permit requirement is NOEC not less than 40%.

The following were concluded from the test:

Survival:	NOEC	LOEC	LC50
	100	>100	>100

The sample therefore **PASSED** the *Ceriodaphnia dubia* test.

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Ceriodaphnia dubia

Appendix (Reference Toxicant)

Appendix (Water Chemistry)

I. Introduction and Summary

48-hour non renewal definitive toxicity test using *Ceriodaphnia dubia*

The *Ceriodaphnia dubia* test was conducted from May 15, 2025 at 1809 to May 17, 2025 at 1714.

The test was performed in accordance with EPA-821-R-02-012. Statistical analyses were performed on the observed data.

The test was conducted in temperature and light cycle controlled environmental chamber. The test temperature was 25 degrees C +/- 1 degree for the *Ceriodaphnia dubia*

II. Control Acceptance Criteria

ORGANISM	CRITERIA	RESULTS	PASS/FAIL
<i>Ceriodaphnia dubia</i>	Control Survival > or = 90%	95	Pass
<i>Ceriodaphnia dubia</i>	Control Dilution CV <= 40	10.526	Pass
<i>Ceriodaphnia dubia</i>	Critical Dilution CV < or = 40 *	0.000	Pass

*EPA Region 6 Requirement consult permit

III. Outlined Report

A. Introduction

- Permit Number: WA0000892
- Test Requirements: 48-hour non-renewal definitive toxicity test using:
Ceriodaphnia dubia

B. Effluent Samples:

- Sampling Point: Outfall 001
- Chemical Data:

Analysis	Sample 1
Dissolved oxygen (mg/l)	8.67
pH (standard units)	7.77
Alkalinity (mg/l as CaCO ₃)	180
Hardness (mg/l as CaCO ₃)	170
Conductivity (umhos/cm)	413
Residual Chlorine (mg/l)	<0.05
Ammonia as N (mg/l)	0.42

C. Dilution Water Samples: Synthetic Moderately Hard Chemical Data:

Analysis	192-21264-A-1
Dissolved oxygen (mg/l)	8.47
pH (standard units)	7.63
Alkalinity (mg/l as CaCO ₃)	63
Hardness (mg/l as CaCO ₃)	92
Conductivity (umhos/cm)	308
Residual Chlorine (mg/l)	<0.05
Ammonia as N (mg/l)	N/A

D. Test Methods

Methods for measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, (Fifth Ed.), EPA-821-R-02-012, 48-hour acute definitive test and 96-hour acute definitive test.

Endpoints:

Death; the criteria employed to establish death are:

- No movement
- No reaction to gentle prodding

Criteria	<i>Ceriodaphnia dubia</i>
Type and Volume of Test Chamber	30ml disposable beaker
Volume of Sample	15 ml
Organism per chamber	5
Replicates per dilution	4
Test Temperature	25 deg. C
Test Initiated	5/15/2025 at 1809
Test Terminated	5/16/2025 at 1657
Feeding	None required
Age of Test Organisms	< 24 hours

E. Test Organisms

Ceriodaphnia dubia

F. Quality Assurance - Toxicity Tests

Reference Toxicant: Sodium Chloride

Date of test:

Ceriodaphnia dubia:

5/14/2025

19221652

Synthetic moderately hard dilution water used

Organism	LC50	Warning Limits
<i>Ceriodaphnia dubia</i>	2.00	1.66 - 2.23

G. Organism History

Ceriodaphnia dubia

Date: 5/15/2025

Age: <24 hours

Source: In-house culture

IV. Results Summary

Ceriodaphnia dubia and Pimephales promelas are exposed in a static non-renewal system to different concentrations of effluent and dilution water. Effluent dilutions for this test were 2.5, 4.9, 25, 40 and 100%. The low-flow concentration was 40%. Test results are based on survival.

Ceriodaphnia dubia

The Ceriodaphnia dubia test was conducted from May 15, 2025 at 1809 to May 17, 2025 at 1714.

Concentration	24 hour % Survival	48 hour % Survival
Control	100	95
2.5%	100	100
4.9%	100	95
25%	100	100
40%	100	100
100%	100	100

Appendix (Data)

Ceriodaphnia dubia
Survival Data

Number of organisms per chamber: 5
Volume of test chamber: 30 ml

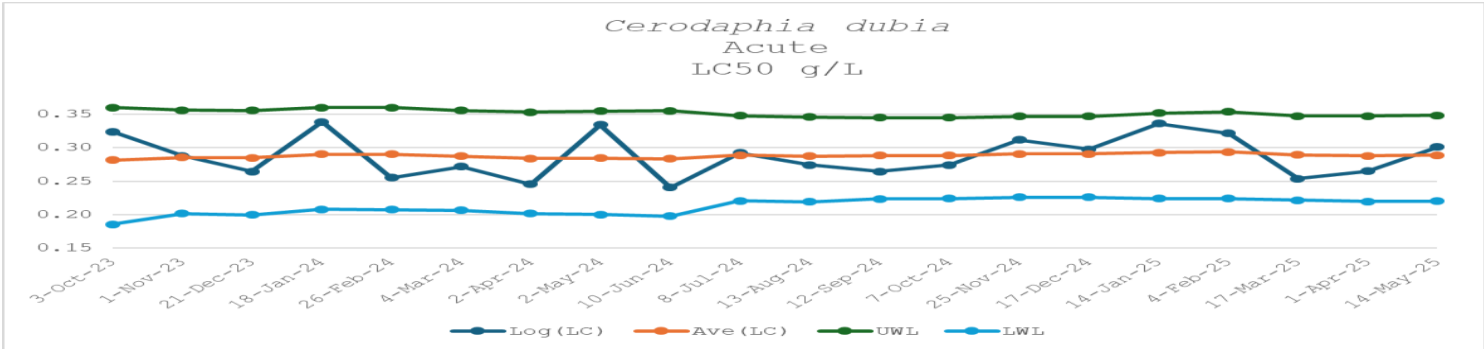
Age of organisms: <24 hour
Volume of test solution: 15 ml

Effluent Concentration	Number of survivors		% Survival	CV %
	24 hours	48 hours		
Control	rep. A	5	95	10.53
	rep. B	5		
	rep. C	5		
	rep. D	5		
2.5%	rep. A	5	100	0.00
	rep. B	5		
	rep. C	5		
	rep. D	5		
4.9%	rep. A	5	95	10.53
	rep. B	5		
	rep. C	5		
	rep. D	5		
25%	rep. A	5	100	0.00
	rep. B	5		
	rep. C	5		
	rep. D	5		
40%	rep. A	5	100	0.00
	rep. B	5		
	rep. C	5		
	rep. D	5		
100%	rep. A	5	100	0.00
	rep. B	5		
	rep. C	5		
	rep. D	5		

CV = Coefficient of variance = standard deviation X 100/mean

Appendix (Reference Toxicant)

Acute Reference Toxicant, *Ceriodaphnia dubia*



Appendix (Water Chemistry)
Chemical Data for
Ceriodaphnia dubia

Day 1		Control	2.5	4.9	25	40	100
DO, mg/l	Initial	8.47	8.46	8.52	8.51	8.56	8.67
	Final 2	8.34	8.34	8.26	8.27	8.23	8.24
pH, su	Initial	7.63	7.58	7.59	7.68	7.73	7.77
	Final 2	7.70	7.75	7.79	7.99	8.10	8.36
Conductivity, umho/cm		308	310	313	331	346	413
Alkalinity, mg/l		63					180
Hardness, mg/l		92					170
Ammonia, mg/l		N/A					0.42
Residual Chlorine, mg/l		<0.05					<0.05
Day 2		Control	2.5	4.9	25	40	100
DO, mg/l	Final 2	8.38	8.45	8.43	8.44	8.44	8.41
pH, su	Final 2	7.89	7.87	7.88	8.08	8.17	8.44

Analysts: YHC4, E5VU, B6YF, V6YL, GCX6, CT4D, HQN3

CETIS Summary Report

Report Date: 29 May-25 17:02 (p 1 of 1)
Test Code/ID: 21568_CD / 11-6492-4879

Ceriodaphnia 48-h Acute Survival Test

Eurofins Arkansas

Batch ID:	03-5235-5091	Test Type:	Survival (48h)	Analyst:	
Start Date:	15 May-25 18:09	Protocol:	EPA/821/R-02-012 (2002)	Diluent:	Mod-Hard Synthetic Water
Ending Date:	17 May-25 17:14	Species:	Ceriodaphnia dubia	Brine:	
Test Length:	47h	Taxon:	Branchiopoda	Source:	In-House Culture
				Age:	<24
Sample ID:	08-1778-6737	Code:	21568	Project:	
Sample Date:	14 May-25 08:50	Material:	POTW Effluent	Source:	Kaiser Aluminum (WA0000892)
Receipt Date:	15 May-25 09:55	CAS (PC):		Station:	Outfall 001
Sample Age:	33h	Client:			

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	PMSD	TU
07-9140-8368	48h Survival Rate	Steel Many-One Rank Sum Test	100	>100	---	10.9%	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU
18-4945-5282	48h Survival Rate	Linear Interpolation (ICPIN)	LC50	>100	---	---	<1

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
07-9140-8368	48h Survival Rate	Control Resp	0.95	0.9	>>	Yes	Passes Criteria
18-4945-5282	48h Survival Rate	Control Resp	0.95	0.9	>>	Yes	Passes Criteria

48h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	0.9500	0.7909	1.0000	0.8000	1.0000	0.0500	0.1000	10.53%	0.00%
2.5		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-5.26%
4.9		4	0.9500	0.7909	1.0000	0.8000	1.0000	0.0500	0.1000	10.53%	0.00%
25		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-5.26%
40		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-5.26%
100		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-5.26%

48h Survival Rate Detail

MD5: 2EF4B6E04F548CDDFDC88038B4D0BB06

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	0.8000	1.0000	1.0000
2.5		1.0000	1.0000	1.0000	1.0000
4.9		1.0000	0.8000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000
40		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

48h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	5/5	4/5	5/5	5/5
2.5		5/5	5/5	5/5	5/5
4.9		5/5	4/5	5/5	5/5
25		5/5	5/5	5/5	5/5
40		5/5	5/5	5/5	5/5
100		5/5	5/5	5/5	5/5

CETIS Analytical Report

Report Date: 29 May-25 17:01 (p 1 of 2)
 Test Code/ID: 21568_CD / 11-6492-4879

Ceriodaphnia 48-h Acute Survival Test

Eurofins Arkansas

Analysis ID: 07-9140-8368	Endpoint: 48h Survival Rate	CETIS Version: CETIS v2.1.5
Analyzed: 29 May-25 17:00	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 29 May-25 0:00	MD5 Hash: 2EF4B6E04F548CDDFDC88038B4D0BB06	Editor ID: 009-809-445-9
Batch ID: 03-5235-5091	Test Type: Survival (48h)	Analyst:
Start Date: 15 May-25 18:09	Protocol: EPA/821/R-02-012 (2002)	Diluent: Mod-Hard Synthetic Water
Ending Date: 17 May-25 17:14	Species: Ceriodaphnia dubia	Brine:
Test Length: 47h	Taxon: Branchiopoda	Source: In-House Culture Age: <24
Sample ID: 08-1778-6737	Code: 21568	Project:
Sample Date: 14 May-25 08:50	Material: POTW Effluent	Source: Kaiser Aluminum (WA0000892)
Receipt Date: 15 May-25 09:55	CAS (PC):	Station: Outfall 001
Sample Age: 33h	Client:	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	100	>100	---	1	0.1031	10.86%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Dilution Water		2.5	6	20	10	1	CDF	0.9516	Non-Significant Effect
		4.9	6	18	10	2	CDF	0.8333	Non-Significant Effect
		25	6	20	10	1	CDF	0.9516	Non-Significant Effect
		40	6	20	10	1	CDF	0.9516	Non-Significant Effect
		100	6	20	10	1	CDF	0.9516	Non-Significant Effect

Test Acceptability Criteria

TAC Limits					
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.95	0.9	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0189026	0.0037805	5	0.8	0.5640	Non-Significant Effect
Error	0.0850618	0.0047257	18			
Total	0.103964		23			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test	0.6154	0.884	<1.0E-05	Non-Normal Distribution

48h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	0.9500	0.7909	1.0000	1.0000	0.8000	1.0000	0.0500	10.53%	0.00%
2.5		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-5.26%
4.9		4	0.9500	0.7909	1.0000	1.0000	0.8000	1.0000	0.0500	10.53%	0.00%
25		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-5.26%
40		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-5.26%
100		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-5.26%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.2860	1.0960	1.4750	1.3450	1.1070	1.3450	0.0595	9.26%	0.00%
2.5		4	1.3450	1.3450	1.3450	1.3450	1.3450	1.3450	0.0000	0.00%	-4.63%
4.9		4	1.2860	1.0960	1.4750	1.3450	1.1070	1.3450	0.0595	9.26%	0.00%
25		4	1.3450	1.3450	1.3450	1.3450	1.3450	1.3450	0.0000	0.00%	-4.63%
40		4	1.3450	1.3450	1.3450	1.3450	1.3450	1.3450	0.0000	0.00%	-4.63%
100		4	1.3450	1.3450	1.3450	1.3450	1.3450	1.3450	0.0000	0.00%	-4.63%

CETIS Analytical Report

Report Date: 29 May-25 17:01 (p 2 of 2)
Test Code/ID: 21568_CD / 11-6492-4879

Ceriodaphnia 48-h Acute Survival Test

Eurofins Arkansas

Analysis ID: 07-9140-8368 Endpoint: 48h Survival Rate CETIS Version: CETIS v2.1.5
Analyzed: 29 May-25 17:00 Analysis: Nonparametric-Control vs Treatments Status Level: 1
Edit Date: 29 May-25 0:00 MD5 Hash: 2EF4B6E04F548CDDFDC88038B4D0BB06 Editor ID: 009-809-445-9

48h Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	0.8000	1.0000	1.0000
2.5		1.0000	1.0000	1.0000	1.0000
4.9		1.0000	0.8000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000
40		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

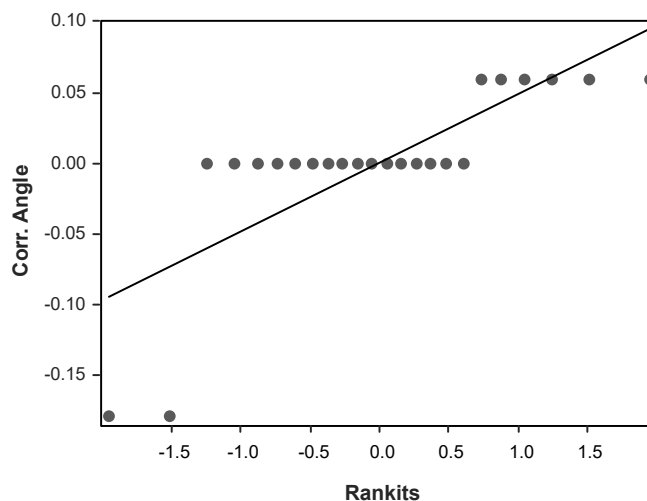
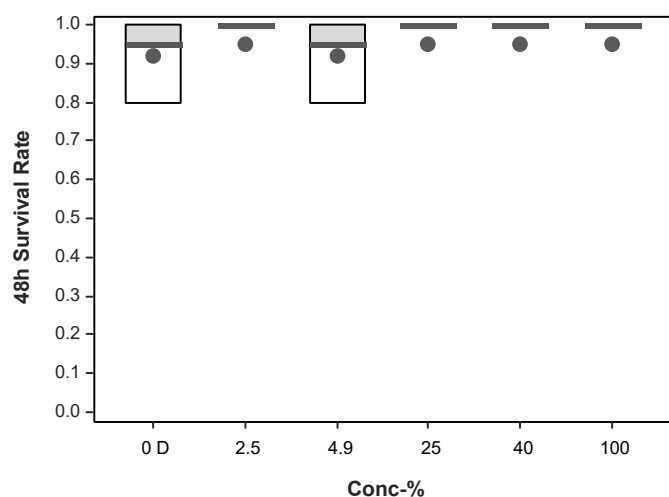
Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.3450	1.1070	1.3450	1.3450
2.5		1.3450	1.3450	1.3450	1.3450
4.9		1.3450	1.1070	1.3450	1.3450
25		1.3450	1.3450	1.3450	1.3450
40		1.3450	1.3450	1.3450	1.3450
100		1.3450	1.3450	1.3450	1.3450

48h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	5/5	4/5	5/5	5/5
2.5		5/5	5/5	5/5	5/5
4.9		5/5	4/5	5/5	5/5
25		5/5	5/5	5/5	5/5
40		5/5	5/5	5/5	5/5
100		5/5	5/5	5/5	5/5

Graphics



CETIS Analytical Report

Report Date: 29 May-25 17:02 (p 1 of 2)
 Test Code/ID: 21568_CD / 11-6492-4879

Ceriodaphnia 48-h Acute Survival Test

Eurofins Arkansas

Analysis ID: 18-4945-5282	Endpoint: 48h Survival Rate	CETIS Version: CETIS v2.1.5
Analyzed: 29 May-25 17:01	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 29 May-25 0:00	MD5 Hash: 2EF4B6E04F548CDDFDC88038B4D0BB06	Editor ID: 009-809-445-9
Batch ID: 03-5235-5091	Test Type: Survival (48h)	Analyst:
Start Date: 15 May-25 18:09	Protocol: EPA/821/R-02-012 (2002)	Diluent: Mod-Hard Synthetic Water
Ending Date: 17 May-25 17:14	Species: Ceriodaphnia dubia	Brine:
Test Length: 47h	Taxon: Branchiopoda	Source: In-House Culture Age: <24
Sample ID: 08-1778-6737	Code: 21568	Project:
Sample Date: 14 May-25 08:50	Material: POTW Effluent	Source: Kaiser Aluminum (WA0000892)
Receipt Date: 15 May-25 09:55	CAS (PC):	Station: Outfall 001
Sample Age: 33h	Client:	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1607479	1000	Yes	Two-Point Interpolation

Test Acceptability Criteria

TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.95	0.9	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
LC50	>100	---	---	<1	---	---

48h Survival Rate Summary

Calculated Variate(A/B)

Isotonic Variate

Conc.-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	D	4	0.9500	1.0000	0.8000	1.0000	10.53%	0.00%	19/20	0.9833	0.00%
2.5		4	1.0000	1.0000	1.0000	1.0000	0.00%	-5.26%	20/20	0.9833	0.00%
4.9		4	0.9500	1.0000	0.8000	1.0000	10.53%	0.00%	19/20	0.9833	0.00%
25		4	1.0000	1.0000	1.0000	1.0000	0.00%	-5.26%	20/20	0.9833	0.00%
40		4	1.0000	1.0000	1.0000	1.0000	0.00%	-5.26%	20/20	0.9833	0.00%
100		4	1.0000	1.0000	1.0000	1.0000	0.00%	-5.26%	20/20	0.9833	0.00%

48h Survival Rate Detail

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	0.8000	1.0000	1.0000
2.5		1.0000	1.0000	1.0000	1.0000
4.9		1.0000	0.8000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000
40		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

48h Survival Rate Binomials

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	5/5	4/5	5/5	5/5
2.5		5/5	5/5	5/5	5/5
4.9		5/5	4/5	5/5	5/5
25		5/5	5/5	5/5	5/5
40		5/5	5/5	5/5	5/5
100		5/5	5/5	5/5	5/5

CETIS Analytical Report

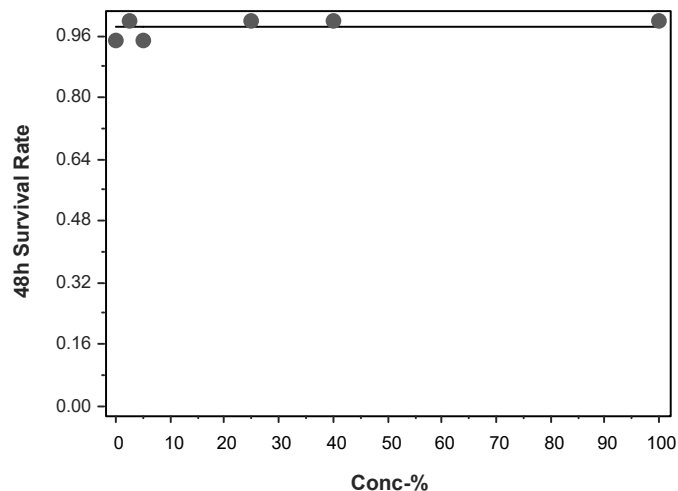
Report Date: 29 May-25 17:02 (p 2 of 2)
Test Code/ID: 21568_CD / 11-6492-4879

Ceriodaphnia 48-h Acute Survival Test

Eurofins Arkansas

Analysis ID:	18-4945-5282	Endpoint:	48h Survival Rate	CETIS Version:	CETIS v2.1.5
Analyzed:	29 May-25 17:01	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1
Edit Date:	29 May-25 0:00	MD5 Hash:	2EF4B6E04F548CDDFDC88038B4D0BB06	Editor ID:	009-809-445-9

Graphics





Chain of Custody Record

[illegible]