Brant Jorgenson
Robertson-Bryan, Inc.
9888 Kent Street
Elk Grove, CA 95624

September 25, 2013

Brant:

I have enclosed our report "Evaluation of the Chronic Toxicity of Lehigh Permanente Cement Plant Site Water Samples" for the samples collected September 9, 11, and 13, 2013. A summary of the results of this testing follows:

Chronic Effects of Lehigh Pond 4A Site Water

Chronic Effects of Lehigh Pond 4A Site Water on *Selenastrum capricornutum*
The IC_{25} was >100% site water, resulting in <1 TUc (where TUc = $100/IC_{25}$).

Chronic Effects of Lehigh Pond 4A Site Water on Fathead Minnows
Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be assumed to be >100% site water, resulting in <1 TUc (where TUc = $100/EC_{25}$). The growth IC_{25} was >100% site water, resulting in <1 TUc (where TUc = $100/IC_{25}$).

Chronic Effects of Lehigh Pond 4A Site Water.				
Test Species	Survival EC_{25}	Survival TUc ($100/EC_{25}$)	Growth or Reproduction IC_{25}	Growth or Reproduction TUc ($100/IC_{25}$)
Selenastrum capricornutum			>100% site water	<1
Pimephales promelas	>100% site water	<1	>100% site water	<1

Chronic Effects of Lehigh Pond 9 Site Water

Chronic Effects of Lehigh Pond 9 Site Water on *Selenastrum capricornutum*
The IC_{25} was >100% site water, resulting in <1 TUc (where TUc = $100/IC_{25}$).

Chronic Effects of Lehigh Pond 9 Site Water on *Ceriodaphnia dubia*
Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be assumed to be >100% site water, resulting in <1 TUc (where TUc = $100/EC_{25}$). The reproduction IC_{25} was 87.6% site water, resulting in 1.2 TUc (where TUc = $100/IC_{25}$).

Chronic Effects of Lehigh Pond 9 Site Water on Fathead Minnows

Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be assumed to be >100% site water, resulting in <1 TUc (where TUc = 100/EC_{25}). The growth IC_{25} was >100% site water, resulting in <1 TUc (where TUc = 100/IC_{25}).

Chronic Effects of Lehigh Pond 9 Site Water.				
Test Species	Survival EC_{25}	Survival TUc (100/EC_{25})	Growth or Reproduction IC_{25}	Growth or Reproduction TUc (100/IC_{25})
Selenastrum capricornutum			>100% site water	<1
Ceriodaphnia dubia	>100% site water	<1	87.6% site water	1.2
Pimephales promelas	>100% site water	<1	>100% site water	<1

Chronic Effects of Lehigh Pond 13 Site Water

Chronic Effects of Lehigh Pond 13 Site Water on *Selenastrum capricornutum*

The IC_{25} was >100% site water, resulting in <1 TUc (where TUc = 100/IC_{25}).

Chronic Effects of Lehigh Pond 13 Site Water on Fathead Minnows

Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be assumed to be >100% site water, resulting in <1 TUc (where TUc = 100/EC_{25}). The growth IC_{25} was >100% site water, resulting in <1 TUc (where TUc = 100/IC_{25}).

Chronic Effects of Lehigh Pond 13 Site Water.				
Test Species	Survival EC_{25}	Survival TUc (100/EC_{25})	Growth or Reproduction IC_{25}	Growth or Reproduction TUc (100/IC_{25})
Selenastrum capricornutum			>100% site water	<1
Pimephales promelas	>100% site water	<1	>100% site water	<1

Chronic Effects of Lehigh Pond 14 Site Water

Chronic Effects of Lehigh Pond 14 Site Water on *Selenastrum capricornutum*

The IC_{25} was >100% site water, resulting in <1 TUc (where TUc = $100/IC_{25}$).

Chronic Effects of Lehigh Pond 14 Site Water on Fathead Minnows

Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be assumed to be >100% site water, resulting in <1 TUc (where TUc = $100/EC_{25}$). The growth IC_{25} was >100% site water, resulting in <1 TUc (where TUc = $100/IC_{25}$).

Chronic Effects of Lehigh Pond 14 Site Water.				
Test Species	Survival EC_{25}	Survival TUc ($100/EC_{25}$)	Growth or Reproduction IC_{25}	Growth or Reproduction TUc ($100/IC_{25}$)
Selenastrum capricornutum			>100% site water	<1
Pimephales promelas	>100% site water	<1	>100% site water	<1

Please note that the NPDES Compliance Summary is attached to this cover letter. If you have any questions regarding the performance and interpretation of these tests, feel free to contact my colleague Alison Briden or myself at (707) 207-7760.

Regards,

Digitally signed by Stephen L. Clark
Date: 2013.09.25 11:08:47 -08'00'

Stephen L. Clark
Vice President & Special Projects Director

This testing was performed under Lab Order 21442. The test results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report, and only relate to the sample(s) tested. This report shall not be reproduced, except in full, without the written consent of Pacific EcoRisk.

NPDES Compliance Summary

Lehigh Southwest Cement Company
Permanente Facility
Chronic Toxicity for SFBRWQCB Reporting

Testing Facility: Pacific EcoRisk
2250 Cordelia Rd.
Fairfield, CA 94534

Chronic Toxicity Test Species:	*Selenastrum capricornutum*	Sampling Date: September 9, 2013
Test Protocol:	EPA-821-R-02-013	Test Date: September 10-September 14, 2013
Dilution Series:	6.25, 12.5, 25, 50, 100%	
Test Endpoint:	Cell Growth	

Current Pond 4A Site Water Test Data.	
Site Water Concentration	Mean Algal Cell Density (cells/mL x 10^6)
Hardness Blank	3.62
Lab Control	4.29
6.25%	4.56
12.5%	4.64
25%	4.74
50%	4.77
100%	4.55

Current Pond 4A Site Water Test Endpoints.

Endpoint	NOEC	IC_{15}	IC_{25}	IC_{40}	IC_{50}	TUc	TUc Method
Cell Growth	100%	>100%	>100%	>100%	>100%	<1	100/IC_{25}

Summary of 11 Test Window for *Selenastrum capricornutum*: Pond 4A

Test #	Sample Dates	NOEC (%)	EC_{25} or IC_{25}	TUc	Comments
1	3/25/13	100%	>100%	<1	
2	6/10/13	100%	>100%	<1	
3	9/9/13	100%	>100%	<1	
4					
5					
6					
7					
8					
9					
10					
11					

Chronic Toxicity Test Species:	*Selenastrum capricornutum*	Sampling Date: September 9, 2013
Test Protocol:	EPA-821-R-02-013	Test Date: September 10-September 14, 2013
Dilution Series:	6.25, 12.5, 25, 50, 100%	
Test Endpoint:	Cell Growth	

Current Pond 9 Site Water Test Data.	
Site Water Concentration	Mean Algal Cell Density (cells/mL x 10^6)
Hardness Blank	3.62
Lab Control	4.40
6.25%	4.49
12.5%	4.70
25%	4.89
50%	4.61
100%	4.88

Current Pond 9 Site Water Test Endpoints.							
Endpoint	NOEC	IC_{15}	IC_{25}	IC_{40}	IC_{50}	TUc	TUc Method
Cell Growth	100%	>100%	>100%	>100%	>100%	<1	100/IC_{25}

Summary of 11 Test Window for *Selenastrum capricornutum*: Pond 9					
Test #	Sample Dates	NOEC (%)	EC_{25} or IC_{25}	TUc	Comments
1	3/25/13	100%	>100%	<1	
2	6/10/13	100%	>100%	<1	
3	9/9/13	100%	>100%	<1	
4					
5					
6					
7					
8					
9					
10					
11					

Chronic Toxicity Test Species:	*Selenastrum capricornutum*	Sampling Date: September 9, 2013
Test Protocol:	EPA-821-R-02-013	Test Date: September 10-September 14, 2013
Dilution Series:	6.25, 12.5, 25, 50, 100%	
Test Endpoint:	Cell Growth	

Current Pond 13 Site Water Test Data.	
Site Water Concentration	Mean Algal Cell Density (cells/mL x 10^6)
Hardness Blank	3.62
Lab Control	4.54
6.25%	4.45
12.5%	4.76
25%	4.92
50%	5.14
100%	5.72

Current Pond 13 Site Water Test Endpoints.							
Endpoint	NOEC	IC_{15}	IC_{25}	IC_{40}	IC_{50}	TUc	TUc Method
Cell Growth	100%	>100%	>100%	>100%	>100%	<1	100/IC_{25}

Summary of 11 Test Window for *Selenastrum capricornutum*: Pond 13					
Test #	Sample Dates	NOEC (%)	EC_{25} or IC_{25}	TUc	Comments
1	3/25/13	100%	>100%	<1	
2	6/10/13	100%	>100%	<1	
3	9/9/13	100%	>100%	<1	
4					
5					
6					
7					
8					
9					
10					
11					

Chronic Toxicity Test Species:	*Selenastrum capricornutum*	Sampling Date: September 9, 2013
Test Protocol:	EPA-821-R-02-013	Test Date: September 10-September 14, 2013
Dilution Series:	6.25, 12.5, 25, 50, 100%	
Test Endpoint:	Cell Growth	

Current Pond 14 Site Water Test Data.	
Site Water Concentration	Mean Algal Cell Density (cells/mL x 10^6)
Hardness Blank	3.62
Lab Control	4.31
6.25%	4.44
12.5%	4.58
25%	4.80
50%	4.93
100%	5.05

Current Pond 14 Site Water Test Endpoints.							
Endpoint	NOEC	IC_{15}	IC_{25}	IC_{40}	IC_{50}	TUc	TUc Method
Cell Growth	100%	>100%	>100%	>100%	>100%	<1	100/IC_{25}

Summary of 11 Test Window for *Selenastrum capricornutum*: Pond 14					
Test #	Sample Dates	NOEC (%)	EC_{25} or IC_{25}	TUc	Comments
1	3/25/13	100%	>100%	<1	
2	6/10/13	100%	>100%	<1	
3	9/9/13	100%	>100%	<1	
4					
5					
6					
7					
8					
9					
10					
11					

Chronic Toxicity Test Species:	*Ceriodaphnia dubia*	Sampling Dates: September 9, 11, and 13, 2013
Test Protocol:	EPA-821-R-02-013	Test Dates: September 10-September 16, 2013
Dilution Series:	6.25, 12.5, 25, 50, 100%	
Test Endpoint:	Survival, Reproduction	

Current Pond 9 Site Water Test Data.		
Site Water Concentration	% Survival	Mean Reproduction (# neonates /female)
Hardness Blank	80	**7.5***
Lab Control	90	33.3
6.25%	100	34.0
12.5%	100	35.8
25%	100	31.2
50%	100	35.6
100%	90	**23.0***

Current Pond 9 Site Water Test Endpoints.							
Endpoint	NOEC	EC_{15}-IC_{15}	EC_{25}-IC_{25}	EC_{40}-IC_{40}	EC_{50}-IC_{50}	TUc	TUc Method
Survival	100%	>100%	>100%	>100%	>100%	<1	100/EC_{25}
Reproduction	50%	70.1%	86.7%	>100%	>100%	1.2	100/IC_{25}

Lab Control Survival (after ~96 hrs)	90%
100% Site Water Survival (after ~96 hrs)	100%

* The response at this test treatment was significantly less than the Lab Control treatment response ($p < 0.05$).

Summary of 11 Test Window for *Ceriodaphnia dubia*: Pond 9						
Test #	Sample Dates	NOEC (%)	EC_{25} or IC_{25}	TUc	96-hr Survival	Comments
1	3/25, 3/27, 3/29/13	100% (repro)	>100% (repro)	<1	100%	
2	6/10, 6/12, 6/14/13	50% (repro)	>100% (repro)	<1	100%	
3	9/9, 9/11, 9/13/13	50% (repro)	86.7% (repro)	1.2	90%	
4						
5						
6						
7						
8						
9						
10						
11						

Chronic Toxicity Test Species:	*Pimephales promelas*	Sampling Dates: September 9, 11, and 13, 2013
Test Protocol:	EPA-821-R-02-013	Test Dates: September10-September 17, 2013
Dilution Series:	6.25, 12.5, 25, 50, 100%	
Test Endpoint:	Survival, Growth	

Current Pond 4A Site Water Test Data.		
Site Water Concentration	% Survival	Mean Biomass (mg)
Hardness Blank	100	0.93
Lab Control	97.5	0.95
6.25%	95.0	0.88
12.5%	97.5	0.96
25%	100	0.90
50%	97.5	0.88
100%	97.5	0.95

Current Pond 4A Site Water Test Endpoints.							
Endpoint	NOEC	EC_{15}-IC_{15}	EC_{25}-IC_{25}	EC_{40}-IC_{40}	EC_{50}-IC_{50}	TUc	TUc Method
Survival	100%	>100%	>100%	>100%	>100%	<1	100/EC_{25}
Growth	100%	>100%	>100%	>100%	>100%	<1	100/IC_{25}

Lab Control Survival (after ~96 hrs)	95%
100% Site Water Survival (after ~96 hrs)	97.5%

Summary of 11 Test Window for *Pimephales promelas*: Pond 4A						
Test #	Sample Dates	NOEC (%)	EC_{25} or IC_{25}	TUc	96-hr Survival	Comments
1	3/25, 3/27, 3/29/13	100% (biomass)	>100% (biomass)	<1	100%	
2	6/10, 6/12, 6/14/13	100% (biomass)	>100% (biomass)	<1	95%	
3	9/9, 9/11, 9/13/13	100% (biomass)	>100% (biomass)	<1	95%	
4						
5						
6						
7						
8						
9						
10						
11						

Chronic Toxicity Test Species:	*Pimephales promelas*	Sampling Dates: September 9, 11, and 13, 2013
Test Protocol:	EPA-821-R-02-013	Test Dates: September 10-September 17, 2013
Dilution Series:	6.25, 12.5, 25, 50, 100%	
Test Endpoint:	Survival, Growth	

Current Pond 9 Site Water Test Data.		
Site Water Concentration	% Survival	Mean Biomass (mg)
Hardness Blank	100	0.93
Lab Control	97.5	0.91
6.25%	90.0	0.87
12.5%	100	0.98
25%	97.5	0.99
50%	97.5	1.01
100%	97.5	1.07

Current Pond 9 Site Water Test Endpoints.							
Endpoint	NOEC	EC_{15}-IC_{15}	EC_{25}-IC_{25}	EC_{40}-IC_{40}	EC_{50}-IC_{50}	TUc	TUc Method
Survival	100%	>100%	>100%	>100%	>100%	<1	100/EC_{25}
Growth	100%	>100%	>100%	>100%	>100%	<1	100/IC_{25}

Lab Control Survival (after ~96 hrs)	97.5%
100% Site Water Survival (after ~96 hrs)	97.5%

Summary of 11 Test Window for *Pimephales promelas*: Pond 9						
Test #	Sample Dates	NOEC (%)	EC_{25} or IC_{25}	TUc	96-hr Survival	Comments
1	3/25, 3/27, 3/29/13	100% (biomass)	>100% (biomass)	<1	100%	
2	6/10, 6/12, 6/14/13	100% (biomass)	>100% (biomass)	<1	97.5%	
3	9/9, 9/11, 9/13/13	100% (biomass)	>100% (biomass)	<1	97.5%	
4						
5						
6						
7						
8						
9						
10						
11						

Chronic Toxicity Test Species:	*Pimephales promelas*	Sampling Dates: September 9, 11, and 13, 2013
Test Protocol:	EPA-821-R-02-013	Test Dates: September 10-September 17, 2013
Dilution Series:	6.25, 12.5, 25, 50, 100%	
Test Endpoint:	Survival, Growth	

Current Pond 13 Site Water Test Data.		
Site Water Concentration	% Survival	Mean Biomass (mg)
Hardness Blank	100	0.93
Lab Control	100	0.86
6.25%	100	0.86
12.5%	97.5	0.86
25%	95.0	0.84
50%	77.5	0.73
100%	92.5	0.86

Current Pond 13 Site Water Test Endpoints.							
Endpoint	NOEC	EC_{15}-IC_{15}	EC_{25}-IC_{25}	EC_{40}-IC_{40}	EC_{50}-IC_{50}	TUc	TUc Method
Survival	100%	>100%	>100%	>100%	>100%	<1	100/EC_{25}
Growth	100%	>100%	>100%	>100%	>100%	<1	100/IC_{25}

Lab Control Survival (after ~96 hrs)	100%
100% Site Water Survival (after ~96 hrs)	92.5%

Summary of 11 Test Window for *Pimephales promelas*: Pond 13						
Test #	Sample Dates	NOEC (%)	EC_{25} or IC_{25}	TUc	96-hr Survival	Comments
1	3/25, 3/27, 3/29/13	50% (biomass)	>100% (biomass)	<1	100%	
2	6/10, 6/12, 6/14/13	100% (biomass)	>100% (biomass)	<1	100%	
3	9/9, 9/11, 9/13/13	100% (biomass)	>100% (biomass)	<1	100%	
4						
5						
6						
7						
8						
9						
10						
11						

Chronic Toxicity Test Species:	*Pimephales promelas*	Sampling Dates: September 9, 11, and 13, 2013
Test Protocol:	EPA-821-R-02-013	Test Dates: September 10-September 17, 2013
Dilution Series:	6.25, 12.5, 25, 50, 100%	
Test Endpoint:	Survival, Growth	

Current Pond 14 Site Water Test Data.		
Site Water Concentration	% Survival	Mean Biomass (mg)
Hardness Blank	100	0.93
Lab Control	100	0.88
6.25%	100	0.94
12.5%	97.5	0.92
25%	97.5	0.95
50%	100	0.90
100%	97.5	0.97

Current Pond 14 Site Water Test Endpoints.							
Endpoint	NOEC	EC_{15}-IC_{15}	EC_{25}-IC_{25}	EC_{40}-IC_{40}	EC_{50}-IC_{50}	TUc	TUc Method
Survival	100%	>100%	>100%	>100%	>100%	<1	100/EC_{25}
Growth	100%	>100%	>100%	>100%	>100%	<1	100/IC_{25}

Lab Control Survival (after ~96 hrs)	100%
100% Site Water Survival (after ~96 hrs)	97.5%

Summary of 11 Test Window for *Pimephales promelas*: Pond 14						
Test #	Sample Dates	NOEC (%)	EC_{25} or IC_{25}	TUc	96-hr Survival	Comments
1	3/25, 3/27, 3/29/13	50% (biomass)	>100% (biomass)	<1	100%	
2	6/10, 6/12, 6/14/13	100% (biomass)	>100% (biomass)	<1	92.5%	
3	9/9, 9/11, 9/13/13	100% (biomass)	>100% (biomass)	<1	100%	
4						
5						
6						
7						
8						
9						
10						
11						

Evaluation of the Chronic Toxicity of Lehigh Permanente Cement Plant Site Water Samples

Samples collected September 9, 11, and 13, 2013

Prepared For

Lehigh Southwest Cement Company
24001 Stevens Creek Boulevard
Cupertino, CA 95014

Prepared By

Pacific EcoRisk, Inc.
2250 Cordelia Rd.
Fairfield, CA 94534

September 2013

PACIFIC ECORISK
ENVIRONMENTAL CONSULTING & TESTING

Evaluation of the Chronic Toxicity of Lehigh Permanente Cement Plant Site Water Samples

Samples collected September 9, 11, and 13, 2013

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Appendix A Chain-of-Custody Records for the Collection and Delivery of the Lehigh Site Water Samples

Appendix B Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 4A Site Water to *Selenastrum capricornutum*

Appendix C Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 9 Site Water to *Selenastrum capricornutum*

Appendix D Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 13 Site Water to *Selenastrum capricornutum*

Appendix E Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 14 Site Water to *Selenastrum capricornutum*

Appendix F Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 9 Site Water to *Ceriodaphnia dubia*

Appendix G Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 4A Site Water to Fathead Minnows

Appendix H Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 9 Site Water to Fathead Minnows

Appendix I Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 13 Site Water to Fathead Minnows

Appendix J Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 14 Site Water to Fathead Minnows

Appendix K Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the *Selenastrum capricornutum*

Appendix L Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the *Ceriodaphnia dubia*

Appendix M Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the Fathead Minnow

1. INTRODUCTION

Under contract to the Lehigh Southwest Cement Company, Pacific EcoRisk (PER) conducted an evaluation of the chronic toxicity of Lehigh Southwest Cement Company Permanente Facility (Lehigh) site water samples. This evaluation consist of performing the following US EPA short-term chronic and acute toxicity tests:

- 96-hour algal growth test with the green alga *Selenastrum capricornutum;*
- 3-brood (6-8 day) survival and reproduction test with the crustacean *Ceriodaphnia dubia*; and
- 7-day survival and growth test with larval fathead minnows (*Pimephales promelas*).

These toxicity tests were conducted on site water samples collected on September 9, 11, and 13, 2013. The site water samples were collected from Pond 4A, Pond 9, Pond 13, and Pond 14. In order to assess the sensitivity of the organisms to chemical stress, a reference toxicant test was performed concurrently with each test. This report describes the performance and results of these tests.

2. CHRONIC TOXICITY TEST PROCEDURES

The methods used in conducting the chronic toxicity tests followed the guidance established by the following EPA manual:

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

2.1 Sample Receipt and Handling

On September 9, 11, and 13, samples of Lehigh Permanente site water samples were collected from 4 sites (designated Pond 4A, Pond 9, Pond 13, and Pond 14) into appropriately cleaned sample containers. These samples were transported, on ice and under chain-of-custody, to the PER testing laboratory in Fairfield, CA. Upon receipt at the testing laboratory, aliquots of each site water sample were collected for analysis of initial water quality characteristics (Table 1), with the remainder of each sample being stored at 0-6˚C except when being used to prepare test solutions.

The chain-of-custody records for the collection and delivery of the site water samples are provided as Appendix A.

Table 1. Initial water quality characteristics of the Lehigh site water samples.

Sample Receipt Date	Sample ID	Temp. (˚C)	pH	D.O. (mg/L)	Alkalinity (mg/L)	Hardness (mg/L)	Conductivity (µS/cm)	Total Ammonia (mg/L N)
9/9/13	Pond 4A	2.1	8.05	9.0	89	510	1083	<1.0
	Pond 9	2.6	7.56	8.9	215	700	1429	<1.0
	Pond 13	2.8	7.85	10.1	135	590	1113	<1.0
	Pond 14	2.3	7.68	8.8	262	660	1367	<1.0
9/11/13	Pond 4A	4.5	7.96	9.1	81	497	1094	<1.0
	Pond 9	3.8	7.57	8.6	211	677	1436	<1.0
	Pond 13	5.4	7.75	9.3	134	551	1110	<1.0
	Pond 14	5.9	7.58	8.0	264	628	1373	<1.0
9/13/13	Pond 4A	3.0	7.93	9.5	84	487	1090	<1.0
	Pond 9	2.4	7.59	8.7	209	674	1432	<1.0
	Pond 13	4.8	7.76	9.8	133	547	1109	<1.0
	Pond 14	3.4	7.62	7.7	254	608	1377	<1.0

2.2 Algal Growth Toxicity Testing with *Selenastrum capricornutum*

The short-term chronic algal toxicity test consists of a ~96-hr bioassay in which the green alga *S. capricornutum* is exposed to a series of site water dilutions and the effects on cellular reproduction (= growth) determined. The specific procedures used in this testing are described below.

The Lab Control/diluent for this testing consisted of Type 1 lab water (reverse-osmosis, de-ionized water). Aliquots of the Lab Control water and each of site water was spiked with nutrients and then 0.45-µm filtered before use in the algal test, as per EPA guidelines. The nutrient-amended, filtered Lab Control water was then used to prepare test solutions of each site water at test treatment concentrations of 6.25%, 12.5%, 25%, 50%, and 100% site water. At the request of the client, an additional Hardness Blank, adjusted to a nominal hardness of 661 mg/L, was prepared by PER staff by addition of reagent grade chemicals to Type 1 water (reverse-osmosis, de-ionized water) as per EPA guidance (EPA 1994, 2002). On the day prior to the initiation of testing, the Hardness Blank was filtered to remove any insoluble particulate material. Routine water quality characteristics (pH, dissolved oxygen [D.O.], and conductivity) were measured on these test solutions prior to their use in the test.

There were 4 replicates for each test treatment, each replicate consisting of a 250-mL glass Erlenmeyer flask containing 100 mL of test solution; an additional replicate was established at each test treatment in order to measure the test solution water quality characteristics during the test and at test termination. Each flask was inoculated to an initial cell density of 10,000 cells/mL of *S. capricornutum* from an ongoing laboratory culture that is maintained in log growth phase.

These flasks were loosely-capped and randomly positioned within a temperature-controlled room at 25°C, under continuous cool-white fluorescent illumination. Each replicate flask was gently shaken a minimum of 3 times daily.

After 96 (±2) hrs exposure, the algal cell density in each replicate flask was determined by spectrophotometric analysis. Due to the observation of 'plated' cells (i.e., algal cells that had become attached to the inside surface of the test replicate flasks), the algal cell density was also determined after re-suspension of the algal cells via scraping of the test replicate flask surface with a silicon spatula. The resulting cell density data were analyzed to evaluate any impairment of algal growth caused by each site water sample. All statistical analyses were performed using the CETIS® statistical software (TidePool Scientific, McKinleyville, CA).

2.2.1 Reference Toxicant Testing of the *Selenastrum capricornutum*

In order to assess the sensitivity of the *S. capricornutum* to toxic stress, a reference toxicant test was performed concurrently with the site water tests. The reference toxicant test was performed similarly to the site water test except that test solutions consisted of Lab Control water spiked with NaCl at concentrations of 0.125, 0.25, 0.5, 1, 2, and 4 g/L. The resulting test response data were statistically analyzed to determine key dose-response point estimates (e.g., IC_{50}); all statistical analyses were performed using the CETIS® software. These response endpoints were then compared to the 'typical response' range established by the mean ± 2 SD of the point estimates generated by the most recent previous reference toxicant tests performed by this lab.

2.3 Survival and Reproduction Toxicity Testing with *Ceriodaphnia dubia*

The short-term chronic *C. dubia* test consists of exposing individual females to a series of site water dilutions for the length of time it takes for the Control treatment females to produce 3 broods (typically 6-8 days), after which effects on survival and reproduction are evaluated. The specific procedures used in this testing are described below.

The Lab Control/diluent water for this testing was modified EPA synthetic moderately-hard water. The Lab Control water was used to prepare test solutions of each site water at test treatment concentrations of 6.25%, 12.5%, 25%, 50%, and 100% site water. At the request of the client, an additional Hardness Blank, to a nominal hardness of 661 mg/L, was prepared by PER staff by addition of reagent grade chemicals to Type 1 water (reverse-osmosis, de-ionized water) as per EPA guidance (EPA 1994, 2002). On the day prior to the initiation of testing, the Hardness Blank was filtered to remove any insoluble particulate material. For each test treatment, a 200 mL aliquot of test solution was amended with the alga *Selenastrum capricornutum* and Yeast-Cerophyll-Trout Food (YCT) to provide food for the test organisms "New" water quality characteristics (pH, D.O., and conductivity) were measured on these food-amended test solutions prior to use in this test.

There were 10 replicates for each test treatment, each replicate consisting of 15 mL of test solution in a 30-mL plastic cup. This "3-brood" test was initiated by allocating one neonate (<24 hrs old, and within 8 hrs of age) *C. dubia*, obtained from in-house laboratory cultures, into each replicate cup. The test replicate cups were placed into a temperature-controlled room at 25˚C, under cool white fluorescent lighting on a 16L:8D photoperiod.

Each day of the test, fresh test solutions were prepared and characterized as before, and a "new" set of replicate cups was prepared. The original test replicate cups were examined, with surviving "original" individual organisms being transferred to the corresponding new cup. The contents of each of the remaining "old" replicate cups was carefully examined and the number of neonate offspring produced by each original organism was determined, after which the "old" water quality characteristics (pH, D.O., and conductivity) were measured for the old media from one randomly-selected replicate at each treatment.

After it was determined that ≥60% of the *C. dubia* in the Lab Control treatment had produced their third brood of offspring, the test was terminated. The resulting survival and reproduction (number of offspring) data were analyzed to evaluate any impairment caused by the site water samples; all statistical analyses were performed using the CETIS® statistical software.

2.3.1 Reference Toxicant Testing of the *Ceriodaphnia dubia*

In order to assess the sensitivity of the test organisms to toxic stress, a reference toxicant test was performed concurrently with the site water tests. The reference toxicant test was performed similarly to the site water tests except that test solutions consisted of Lab Control water spiked with NaCl at test concentrations of 500, 1000, 1500, 2000, and 2500 mg/L. The resulting test response data were statistically analyzed to determine key dose-response point estimates (e.g., EC_{50}); all statistical analyses were made using the CETIS® software. These response endpoints were then compared to the 'typical response' ranges established by the mean ± 2 SD of the point estimates generated by the most recent previous reference toxicant tests performed by this lab.

2.4 Survival and Growth Toxicity Testing with Larval Fathead Minnows

The short-term chronic fathead minnow test consists of exposing larval fish to a series of site water dilutions for 7 days, after which effects on survival and growth are evaluated. The specific procedures used in this testing are described below.

The larval fathead minnows used in this testing were obtained from a commercial supplier (Aquatox, Hot Springs, AR); upon receipt at the testing lab, the larval fish were maintained in aerated tanks of US EPA moderately-hard water at 25˚C, and were fed brine shrimp nauplii *ad libitum*.

The Lab Control/diluent water for this testing was EPA synthetic moderately-hard water. The Lab Control water was used to prepare test solutions of each site water at test treatment concentrations of 6.25%, 12.5%, 25%, 50%, and 100% site water. At the request of the client, an additional Hardness Blank, adjusted to a nominal hardness of 661 mg/L, was prepared by PER staff by addition of reagent grade chemicals to Type 1 water (reverse-osmosis, de-ionized water) as per EPA guidance (EPA 2002). On the day prior to the initiation of testing, the Hardness Blank was filtered to remove any insoluble particulate material. "New" water quality characteristics (pH, D.O., and conductivity) were measured on these test solutions prior to use in the test.

There were 4 replicates for each test treatment, each replicate consisting of 400 mL of test solution in a 600-mL glass beaker. The test was initiated by randomly allocating 10 larval fathead minnows (<48 hrs old) into each replicate. The replicate beakers were placed in a temperature-controlled room at 25˚C, under cool-white fluorescent lighting on a 16L:8D photoperiod. The test fish were fed brine shrimp nauplii twice daily.

Each day of testing, fresh test solutions were prepared for each treatment, and water quality characteristics were determined as before. The replicate beakers were examined, with any dead animals, uneaten food, wastes, and other detritus being removed. The number of live fish in each replicate was determined and then approximately 80% of the old test media in each beaker was carefully poured out and replaced with fresh test solution. "Old" water quality characteristics (pH, D.O., and conductivity) were measured on the old test water that had been discarded from one randomly-selected replicate at each treatment.

After 7 days exposure, the tests were terminated and the number of live fish in each replicate beaker was recorded. The fish from each replicate were then carefully euthanized in methanol, rinsed in de-ionized water, and transferred to a pre-dried and pre-tared weighing pan. These fish were then dried at 100˚C for ~24 hrs and re-weighed to determine the total weight of fish in each replicate; the total weight was then divided by the initial number of fish per replicate (n=10) to determine the "biomass value". The resulting survival and growth ("biomass value") data were analyzed to evaluate any reductions caused by the site waters; all statistical analyses were performed using the CETIS® statistical software.

2.4.1 Reference Toxicant Testing of the Larval Fathead Minnows

In order to assess the sensitivity of the fish to toxic stress, a reference toxicant test was performed concurrently with the site water tests. The reference toxicant test was performed similarly to the site water test, except that test solutions consisted of "Lab Control" media spiked with NaCl at test concentrations of 0.75, 1.5, 3, 6, and 9 g/L. The resulting test response data were analyzed to determine key dose-response point estimates (e.g., EC_{50}); all statistical analyses were made using the CETIS® software. These response endpoints were then compared to the

'typical response' ranges established by the mean ± 2 SD of the point estimates generated by the 20 most recent previous reference toxicant tests performed by this lab.

3. RESULTS

3.1 Effects of Lehigh Site Water on *Selenastrum capricornutum*

3.1.1 Effects of Lehigh Pond 4A Site Water on *Selenastrum capricornutum*

The results of this test are summarized below in Table 2. There was a mean final algal cell density of 4,290,000 cells/mL at the Lab Water Control treatment. The IC_{25} point estimate was >100% site water, resulting in <1 cell growth TUc (where TUc = $100/IC_{25}$).

The test data and summary of statistical analyses for this test are presented in Appendix B.

Table 2. Effects of Lehigh Pond 4A site water on *Selenastrum capricornutum* growth.

Test Site Water Treatment	Mean Algal Cell Density (cells/mL x 10^6)
Hardness Blank	**3.62***
Lab Water Control	4.29
6.25%	4.56
12.5%	4.64
25%	4.74
50%	4.77
100%	4.55
Summary of Statistics	
No Observable Effect Concentration (NOEC) =	100% site water
TUc (where TUc = 100/NOEC) =	1.0
Growth IC_{25} =	>100% site water
TUc (where TUc = $100/IC_{25}$) =	<1
Growth IC_{50} =	>100% site water
TUc (where TUc = $100/IC_{50}$) =	<1
Test PMSD =	7.6%

* The response at this test treatment was significantly less than the Lab Control treatment response ($p < 0.05$).

3.1.2 Effects of Lehigh Pond 9 Site Water on *Selenastrum capricornutum*

The results of this test are summarized below in Table 3. There was a mean final algal cell density of 4,400,000 cells/mL at the Lab Water Control treatment. The IC_{25} point estimate was >100% site water, resulting in <1 cell growth TUc (where TUc = $100/IC_{25}$).

The test data and summary of statistical analyses for this test are presented in Appendix C.

Table 3. Effects of Lehigh Pond 9 site water on *Selenastrum capricornutum* growth.

Test Site Water Treatment	Mean Algal Cell Density (cells/mL x 10^6)
Hardness Blank	**3.62***
Lab Water Control	4.40
6.25%	4.49
12.5%	4.70
25%	4.89
50%	4.61
100%	4.88
Summary of Statistics	
No Observable Effect Concentration (NOEC) =	100% site water
TUc (where TUc = 100/NOEC) =	1.0
Growth IC_{25} =	>100% site water
TUc (where TUc = $100/IC_{25}$) =	<1
Growth IC_{50} =	>100% site water
TUc (where TUc = $100/IC_{50}$) =	<1
Test PMSD =	7.1%

* The response at this test treatment was significantly less than the Lab Control treatment response ($p < 0.05$).

3.1.3 Effects of Lehigh Pond 13 Site Water on *Selenastrum capricornutum*

The results of this test are summarized below in Table 4. There was a mean final algal cell density of 4,540,000 cells/mL at the Lab Water Control treatment. The IC_{25} point estimate was >100% site water, resulting in <1 cell growth TUc (where TUc = $100/IC_{25}$).

The test data and summary of statistical analyses for this test are presented in Appendix D.

Table 4. Effects of Lehigh Pond 13 site water on *Selenastrum capricornutum* growth.

Test Site Water Treatment	Mean Algal Cell Density (cells/mL x 10^6)
Hardness Blank	**3.62***
Lab Water Control	4.54
6.25%	4.45
12.5%	4.76
25%	4.92
50%	5.14
100%	5.72
Summary of Statistics	
No Observable Effect Concentration (NOEC) =	100% site water
TUc (where TUc = 100/NOEC) =	1.0
Growth IC_{25} =	>100% site water
TUc (where TUc = $100/IC_{25}$) =	<1
Growth IC_{50} =	>100% site water
TUc (where TUc = $100/IC_{50}$) =	<1
Test PMSD =	6.1%

* The response at this test treatment was significantly less than the Lab Control treatment response ($p < 0.05$).

3.1.4 Effects of Lehigh Pond 14 Site Water on *Selenastrum capricornutum*

The results of this test are summarized below in Table 5. There was a mean final algal cell density of 4,310,000 cells/mL at the Lab Water Control treatment. The IC_{25} point estimate was >100% site water, resulting in <1 cell growth TUc (where TUc = $100/IC_{25}$).

The test data and summary of statistical analyses for this test are presented in Appendix E.

Table 5. Effects of Lehigh Pond 14 site water on *Selenastrum capricornutum* growth.

Test Site Water Treatment	Mean Algal Cell Density (cells/mL x 10^6)
Hardness Blank	**3.62***
Lab Water Control	4.31
6.25%	4.44
12.5%	4.58
25%	4.80
50%	4.93
100%	5.05
Summary of Statistics	
No Observable Effect Concentration (NOEC) =	100% site water
TUc (where TUc = 100/NOEC) =	1.0
Growth IC_{25} =	>100% site water
TUc (where TUc = $100/IC_{25}$) =	<1
Growth IC_{50} =	>100% site water
TUc (where TUc = $100/IC_{50}$) =	<1
Test PMSD =	5.2%

* The response at this test treatment was significantly less than the Lab Control treatment response ($p < 0.05$).

3.2 Effects of Lehigh Site Water on *Ceriodaphnia dubia*

3.2.1 Effects of Lehigh Pond 9 Site Water on *Ceriodaphnia dubia*

The results of this test are summarized below in Table 6. There was 90% survival in the Lab Water Control treatment. Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be assumed to be >100% site water, resulting in <1 survival TUc (where TUc = 100/EC_{25}).

There was a mean of 33.3 offspring per female at the Lab Water Control treatment. The IC_{25} was 86.7% site water, resulting in 1.2 reproduction TUc (where TUc = 100/IC_{25}). The significant reduction in reproduction in the Hardness Blank suggests that the significant reduction in reproduction at the 100% Pond 9 site water was likely due to the elevated hardness of the sample.

The test data and summary of statistical analyses for this test are presented in Appendix F.

Table 6. Effects of Lehigh Pond 9 site water on *Ceriodaphnia dubia* survival and reproduction.

Site Water Treatment	Mean % Survival	Mean Reproduction (# neonates /female)
Hardness Blank	80	**7.5***
Lab Control	90	33.3
6.25%	100	34.0
12.5%	100	35.8
25%	100	31.2
50%	100	35.6
100%	90	**23.0***
Summary of Key Statistics		
NOEC =	100% site water	50% site water
TUc (TUc = 100/NOEC) =	1	2
Survival EC_{25} or Reproduction IC_{25} =	>100% site water[a]	86.7% site water
TUc (TUc = 100/EC_{25} or 100/IC_{25}) =	<1	1.2
Survival EC_{50} or Reproduction IC_{50} =	>100% site water[a]	>100% site water
TUc (TUc = 100/EC_{50} or 100/IC_{50}) =	<1	<1
Test PMSD		26.5%

* The response at this test treatment was significantly less than the Lab Control treatment response ($p < 0.05$).

a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% site water.

3.3 Effects of Lehigh Site Water on Fathead Minnows

3.3.1 Effects of Lehigh Pond 4A Site Water on Fathead Minnows

The results of this test are summarized below in Table 7. There was 97.5% survival at the Lab Water Control treatment. Due to the absence of significant mortalities, the EC_{25} and EC_{50} could not be calculated, but can both be assumed to be >100% site water, resulting in <1 survival TUc (where TUc = $100/EC_{25}$).

The mean fish biomass value was 0.95 mg at the Lab Water Control treatment. The IC_{25} was >100% site water, resulting in <1 survival TUc (where TUc = $100/IC_{25}$).

The test data and summary of statistical analyses for this test are presented in Appendix G.

Table 7. Effects of Lehigh Pond 4A site water on fathead minnow survival and growth.

Test Site Water Treatment	Mean % Survival	Mean Fish Biomass Value (mg)
Hardness Blank	100	0.93
Lab Water Control	97.5	0.95
6.25%	95.0	0.88
12.5%	97.5	0.96
25%	100	0.90
50%	97.5	0.88
100%	97.5	0.95
Summary of Statistics		
NOEC =	100% site water	100% site water
TUc (TUc = 100/NOEC) =	1.0	1.0
Survival EC_{25} or Growth IC_{25} =	>100% site water[a]	>100% site water
TUc (TUc = $100/EC_{25}$ or $100/IC_{25}$) =	<1.0	<1.0
Survival EC_{50} or Growth IC_{50} =	>100% site water[a]	>100% site water
TUc (TUc = $100/EC_{50}$ or $100/IC_{50}$) =	<1.0	<1.0
Test PMSD		13.7%

a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% site water.

3.3.2 Effects of Lehigh Pond 9 Site Water on Fathead Minnows

The results of this test are summarized below in Table 8. There was 97.5% survival at the Lab Water Control treatment. Due to the absence of significant mortalities, the EC_{25} and EC_{50} could not be calculated, but can both be assumed to be >100% site water, resulting in <1 survival TUc (where TUc = 100/EC_{25}).

The mean fish biomass value was 0.91 mg at the Lab Water Control treatment. The IC_{25} was >100% site water, resulting in <1 survival TUc (where TUc = 100/IC_{25}).

The test data and summary of statistical analyses for this test are presented in Appendix H.

Table 8. Effects of Lehigh Pond 9 site water on fathead minnow survival and growth.

Test Site Water Treatment	Mean % Survival	Mean Fish Biomass Value (mg)
Hardness Blank	100	0.93
Lab Water Control	97.5	0.91
6.25%	90.0	0.87
12.5%	100	0.98
25%	97.5	0.99
50%	97.5	1.01
100%	97.5	1.07
Summary of Statistics		
NOEC =	100% site water	100% site water
TUc (TUc = 100/NOEC) =	1.0	1.0
Survival EC_{25} or Growth IC_{25} =	>100% site water[a]	>100% site water
TUc (TUc = 100/EC_{25} or 100/IC_{25}) =	<1.0	<1.0
Survival EC_{50} or Growth IC_{50} =	>100% site water[a]	>100% site water
TUc (TUc = 100/EC_{50} or 100/IC_{50}) =	<1.0	<1.0
Test PMSD		16.6%

a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% site water.

3.3.3 Effects of Lehigh Pond 13 Site Water on Fathead Minnows

The results of this test are summarized below in Table 9. There was 100% survival at the Lab Water Control treatment. Due to the absence of significant mortalities, the EC_{25} and EC_{50} could not be calculated, but can both be assumed to be >100% site water, resulting in <1 survival TUc (where TUc = 100/EC_{25}).

The mean fish biomass value was 0.86 mg at the Lab Water Control treatment. The IC_{25} was >100% site water, resulting in <1 survival TUc (where TUc = 100/IC_{25}).

The test data and summary of statistical analyses for this test are presented in Appendix I.

Table 9. Effects of Lehigh Pond 13 site water on fathead minnow survival and growth.

Test Site Water Treatment	Mean % Survival	Mean Fish Biomass Value (mg)
Hardness Blank	100	0.93
Lab Water Control	100	0.86
6.25%	100	0.86
12.5%	97.5	0.86
25%	95.0	0.84
50%	77.5	0.73
100%	92.5	0.86
Summary of Statistics		
NOEC =	100% site water	100% site water
TUc (TUc = 100/NOEC) =	1.0	1.0
Survival EC_{25} or Growth IC_{25} =	>100% site water[a]	>100% site water
TUc (TUc = 100/EC_{25} or 100/IC_{25}) =	<1.0	<1.0
Survival EC_{50} or Growth IC_{50} =	>100% site water[a]	>100% site water
TUc (TUc = 100/EC_{50} or 100/IC_{50}) =	<1.0	<1.0
Test PMSD		17.5%

a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% site water.

3.3.4 Effects of Lehigh Pond 14 Site Water on Fathead Minnows

The results of this test are summarized below in Table 10. There was 100% survival at the Lab Water Control treatment. Due to the absence of significant mortalities, the EC_{25} and EC_{50} could not be calculated, but can both be assumed to be >100% site water, resulting in <1 survival TUc (where TUc = 100/EC_{25}).

The mean fish biomass value was 0.88 mg at the Lab Water Control treatment. The IC_{25} was >100% site water, resulting in <1 survival TUc (where TUc = 100/IC_{25}).

The test data and summary of statistical analyses for this test are presented in Appendix J.

Table 10. Effects of Lehigh Pond 14 site water on fathead minnow survival and growth.

Test Site Water Treatment	Mean % Survival	Mean Fish Biomass Value (mg)
Hardness Blank	100	0.93
Lab Water Control	100	0.88
6.25%	100	0.94
12.5%	97.5	0.92
25%	97.5	0.95
50%	100	0.90
100%	97.5	0.97
Summary of Statistics		
NOEC =	100% site water	100% site water
TUc (TUc = 100/NOEC) =	1.0	1.0
Survival EC_{25} or Growth IC_{25} =	>100% site water[a]	>100% site water
TUc (TUc = 100/EC_{25} or 100/IC_{25}) =	<1.0	<1.0
Survival EC_{50} or Growth IC_{50} =	>100% site water[a]	>100% site water
TUc (TUc = 100/EC_{50} or 100/IC_{50}) =	<1.0	<1.0
Test PMSD		18.7%

a - Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be determined by inspection to be >100% site water.

4. AQUATIC TOXICITY DATA QUALITY CONTROL

Four QC measures were assessed during the toxicity testing:

- Maintenance of acceptable test conditions;
- Negative Control testing;
- Positive Control (reference toxicant) testing; and
- Concentration Response Relationship assessment.

4.1 Maintenance of Acceptable Test Conditions

All test conditions (pH, D.O., temperature, etc.) were within acceptable limits for these tests. All analyses were performed according to laboratory Standard Operating Procedures.

4.2 Negative Control Testing

The responses at the Lab Control treatments were acceptable.

4.3 Positive Control Testing

4.3.1 Reference Toxicant Toxicity to *Selenastrum capricornutum*

The results of this test are summarized below in Table 11. There was a mean of 3,900,000 cells/mL at the Lab Control treatment. The IC_{50} was 2.0 g/L NaCl. This IC_{50} is consistent with the "typical response" range established by the reference toxicant test database for this species, indicating that these organisms were responding to toxic stress in a typical fashion. The test data and summary of statistical analyses for this test are presented in Appendix K.

Table 11. Reference toxicant testing: Effects of NaCl on *Selenastrum capricornutum*.

NaCl Treatment (g/L)	Mean Algal Cell Density (cells/mL x 10^6)
Lab Water Control	3.90
0.125	4.02
0.25	3.52
0.5	**3.20***
1	**2.65***
2	**1.97***
4	**0.462***
Summary of Statistics	
Algal Growth IC_{50} =	2.0 g/L NaCl
"Typical Response" =	1.4 – 2.0 g/L NaCl

* The response at this test treatment was significantly less than the Lab Control treatment response ($p < 0.05$).

4.3.2 Reference Toxicant Toxicity to *Ceriodaphnia dubia*

The results of this test are summarized below in Table 12. There was 100% survival and a mean of 33.6 offspring in the Lab Control treatment. The survival EC_{50} was 1790 mg/L NaCl, and the reproduction IC_{50} was 941 mg/L NaCl. These reference toxicant test results are consistent with the "typical response" ranges established by the reference toxicant test database for this species, indicating that these test organisms were responding to toxicant stress in a typical and consistent fashion.

The test data and summary of statistical analyses for this test are presented in Appendix L.

Table 12. Reference toxicant testing: effects of NaCl on *Ceriodaphnia dubia*.

NaCl Treatment (mg/L)	Mean % Survival	Mean Reproduction (# neonates/female)
Lab Control	100	33.6
500	100	32.9
1000	88.9	14.7
1500	90	**5.6***
2000	**50***	0.5
2500	**0***	0
Summary of Statistics		
Survival EC_{50} or Reproduction IC_{50} =	1790 mg/L NaCl	941 mg/L NaCl
"Typical Response" =	1218 - 2827 mg/L NaCl	638 - 2297 mg/L NaCl

* The response at this test treatment was significantly less than the Lab Control treatment response ($p < 0.05$).

4.3.3 Reference Toxicant Toxicity to Fathead Minnows

The results of this test are summarized below in Table 13. There was 87.5% survival and a mean biomass value of 0.82 mg at the Lab Control treatment. The survival EC_{50} was 4.5 g/L NaCl and the growth IC_{50} was 2.9 g/L NaCl. These reference toxicant test results are consistent with the "typical response" ranges established by the reference toxicant test database for this species, indicating that these test organisms were responding to toxicant stress in a typical and consistent fashion.

The test data and summary of statistical analyses for this test are attached in Appendix M.

Table 13. Reference toxicant testing: effects of NaCl on fathead minnows.

NaCl Treatment (g/L)	Mean % Survival	Mean Fish Biomass Value (mg)
Lab Control	87.5	0.82
0.75	100	1.04
1.5	90	0.88
3	62.5	**0.44***
6	**47.5***	0.15
9	**0***	-
Summary of Statistics		
Survival EC_{50} or Growth IC_{50} =	4.5 g/L NaCl	2.9 g/L NaCl
"Typical Response" =	3.3 – 5.7 g/L NaCl	2.3 – 5.0 g/L NaCl

* The response at this test treatment was significantly less than the Lab Control treatment response ($p < 0.05$).

4.4 Concentration Response Relationships

There were valid concentration-response relationships for both the site water and reference toxicant tests (EPA821-B-00-004).

5. SUMMARY AND CONCLUSIONS

Chronic Effects of Lehigh Pond 4A Site Water

Chronic Effects of Lehigh Pond 4A Site Water on *Selenastrum capricornutum*

The IC_{25} was >100% site water, resulting in <1 TUc (where TUc = $100/IC_{25}$).

Chronic Effects of Lehigh Pond 4A Site Water on Fathead Minnows

Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be assumed to be >100% site water, resulting in <1 TUc (where TUc = $100/EC_{25}$). The growth IC_{25} was >100% site water, resulting in <1 TUc (where TUc = $100/IC_{25}$).

Chronic Effects of Lehigh Pond 4A Site Water.				
Test Species	Survival EC_{25}	Survival TUc ($100/EC_{25}$)	Growth or Reproduction IC_{25}	Growth or Reproduction TUc ($100/IC_{25}$)
Selenastrum capricornutum			>100% site water	<1
Pimephales promelas	>100% site water	<1	>100% site water	<1

Chronic Effects of Lehigh Pond 9 Site Water

Chronic Effects of Lehigh Pond 9 Site Water on *Selenastrum capricornutum*

The IC_{25} was >100% site water, resulting in <1 TUc (where TUc = $100/IC_{25}$).

Chronic Effects of Lehigh Pond 9 Site Water on *Ceriodaphnia dubia*

Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be assumed to be >100% site water, resulting in <1 TUc (where TUc = $100/EC_{25}$). The reproduction IC_{25} was 87.6% site water, resulting in 1.2 TUc (where TUc = $100/IC_{25}$).

Chronic Effects of Lehigh Pond 9 Site Water on Fathead Minnows

Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be assumed to be >100% site water, resulting in <1 TUc (where TUc = $100/EC_{25}$). The growth IC_{25} was >100% site water, resulting in <1 TUc (where TUc = $100/IC_{25}$).

Chronic Effects of Lehigh Pond 9 Site Water.				
Test Species	Survival EC_{25}	Survival TUc ($100/EC_{25}$)	Growth or Reproduction IC_{25}	Growth or Reproduction TUc ($100/IC_{25}$)
Selenastrum capricornutum			>100% site water	<1
Ceriodaphnia dubia	>100% site water	<1	87.6% site water	1.2
Pimephales promelas	>100% site water	<1	>100% site water	<1

Chronic Effects of Lehigh Pond 13 Site Water

Chronic Effects of Lehigh Pond 13 Site Water on *Selenastrum capricornutum*

The IC_{25} was >100% site water, resulting in <1 TUc (where TUc = $100/IC_{25}$).

Chronic Effects of Lehigh Pond 13 Site Water on Fathead Minnows

Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be assumed to be >100% site water, resulting in <1 TUc (where TUc = $100/EC_{25}$). The growth IC_{25} was >100% site water, resulting in <1 TUc (where TUc = $100/IC_{25}$).

Chronic Effects of Lehigh Pond 13 Site Water.				
Test Species	Survival EC_{25}	Survival TUc ($100/EC_{25}$)	Growth or Reproduction IC_{25}	Growth or Reproduction TUc ($100/IC_{25}$)
Selenastrum capricornutum			>100% site water	<1
Pimephales promelas	>100% site water	<1	>100% site water	<1

Chronic Effects of Lehigh Pond 14 Site Water

Chronic Effects of Lehigh Pond 14 Site Water on *Selenastrum capricornutum*

The IC_{25} was >100% site water, resulting in <1 TUc (where TUc = $100/IC_{25}$).

Chronic Effects of Lehigh Pond 14 Site Water on Fathead Minnows

Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be assumed to be >100% site water, resulting in <1 TUc (where TUc = $100/EC_{25}$). The growth IC_{25} was >100% site water, resulting in <1 TUc (where TUc = $100/IC_{25}$).

Chronic Effects of Lehigh Pond 14 Site Water.				
Test Species	Survival EC_{25}	Survival TUc ($100/EC_{25}$)	Growth or Reproduction IC_{25}	Growth or Reproduction TUc ($100/IC_{25}$)
Selenastrum capricornutum			>100% site water	<1
Pimephales promelas	>100% site water	<1	>100% site water	<1

Appendix A

Chain-of-Custody Records for the Collection and Delivery of the Lehigh Site Water Samples

Pacific EcoRisk
2250 Cordelia Rd., Fairfield, CA 94534
(707) 207-7760 FAX (707) 207-7916

CHAIN-OF-CUSTODY RECORD

Results To:	Robertson-Bryan, Inc	**Invoice To:**	Lehigh Southwest Cement Co.
Address:	9888 Kent Street	**Address:**	P.O. Box 660140
	Elk Grove, CA 95624		Dallas, TX 75266
Phone:	916 405-8911	**Phone:**	(925) 244-6570
Attn:	Brant Jorgenson	**Attn:**	Greg Knapp
E-mail:	brant@robertson-bryan.com	**E-mail:**	Greg.Knapp@hanson.biz
Project Name:	Lehigh Southwest Cement - Permanente Creek		
P.O.#/Ref:			

REQUESTED ANALYSIS

	Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Grab/ Comp	Container Number	Container Type	*Seleanstrum capricornutum* Growth, EPA 1003.0	*Ceriodapnia dubia* Surival and Reproduction, EPA 1002.0	Fathead Minnow Larval Survival and Growth, EPA 1000.0								
1	Pond 4A	9/9/13	1049	FW	Grab	1	2.5 gallon LDPE Cube	x		x								
2	Pond 13	9/9/13	1139	FW	Grab	1	2.5 gallon LDPE Cube	x		x								
3	Pond 9	9/9/13	1215	FW	Grab	1	2.5 gallon LDPE Cube	x	x	x								
4	Pond 14	9/9/13	1243	FW	Grab	1	2.5 gallon LDPE Cube	x		x								
5																		
6																		
7																		
8																		
9																		
10																		

Samples collected by: B. Jorgenson & B. Giudice

Comments/Special Instruction:

Perform concurent reference toxicant tests.

RELIQUINSHED BY:	RECEIVED BY:
Signature:	Signature:
Print: Brant Jorgenson	Print: Jennifer L. Audal
Organization: RBI	Organization: PER
Date: 9/9/13 Time: 1430	Date: 9/9/13 Time: 1430
RELIQUINSHED BY:	**RECEIVED BY:**
Signature:	Signature:
Print:	Print:
Organization:	Organization:
Date: Time:	Date: Time:

***Example Matrix Codes**: (**EFF** - Effluent) (**FW** = Freshwater); (**SW** = Saltwater); (**WW** = Wastewater); (**STRMW** = Stormwater); (**SED** = Sediment); or other

Pacific EcoRisk
2250 Cordelia Rd., Fairfield, CA 94534
(707) 207-7760 FAX (707) 207-7916

CHAIN-OF-CUSTODY RECORD

Results To:	Robertson-Bryan, Inc	**Invoice To:**	Lehigh Southwest Cement Co.
Address:	9888 Kent Street	**Address:**	P.O. Box 660140
	Elk Grove, CA 95624		Dallas, TX 75266
Phone:	916 405-8911	**Phone:**	(925) 244-6570
Attn:	Brant Jorgenson	**Attn:**	Greg Knapp
E-mail:	brant@robertson-bryan.com	**E-mail:**	Greg.Knapp@hanson.biz
Project Name:	Lehigh Southwest Cement - Permanente Creek		
P.O.#/Ref:			

REQUESTED ANALYSIS

	Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Grab/ Comp	Container Number	Container Type	*Seleanstrum capricornutum* Growth, EPA 1003.0	*Ceriodapnia dubia* Surival and Reproduction, EPA 1002.0	Fathead Minnow Larval Survival and Growth, EPA 1000.0								
1	Pond 4A	9/11/13	1028	FW	Comp	1	2.5 gallon LDPE Cube	x		x								
2	Pond 13	9/11/13	1120	FW	Grab	1	2.5 gallon LDPE Cube	x		x								
3	Pond 9	9/11/13	1155	FW	Grab	1	2.5 gallon LDPE Cube	x	x	x								
4	Pond 14	9/11/13	1235	FW	Grab	1	2.5 gallon LDPE Cube	x		x								
5																		
6																		
7																		
8																		
9																		
10																		

Samples collected by: B. Jorgenson & B. Giudice

Comments/Special Instruction:

Perform concurent reference toxicant tests.

RELIQUINSHED BY:	**RECEIVED BY:** NJ
Signature:	**Signature:** Vince Landi
Print: Brant Jorgenson	**Print:** Vince Landi
Organization: RBJ	**Organization:** PER
Date: 9/11/13 **Time:** 1515	**Date:** 9/11/13 **Time:** 1515
RELIQUINSHED BY:	**RECEIVED BY:**
Signature:	**Signature:**
Print:	**Print:**
Organization:	**Organization:**
Date: **Time:**	**Date:** **Time:**

***Example Matrix Codes**: (**EFF** - Effluent) (**FW** = Freshwater); (**SW** = Saltwater); (**WW** = Wastewater); (**STRMW** = Stormwater); (**SED** = Sediment); or other

Pacific EcoRisk
2250 Cordelia Rd., Fairfield, CA 94534
(707) 207-7760 FAX (707) 207-7916

CHAIN-OF-CUSTODY RECORD

Results To:	Robertson-Bryan, Inc	**Invoice To:**	Lehigh Southwest Cement Co.
Address:	9888 Kent Street	**Address:**	P.O. Box 660140
	Elk Grove, CA 95624		Dallas, TX 75266
Phone:	916 405-8911	**Phone:**	(925) 244-6570
Attn:	Brant Jorgenson	**Attn:**	Greg Knapp
E-mail:	brant@robertson-bryan.com	**E-mail:**	Greg.Knapp@hanson.biz
Project Name:	Lehigh Southwest Cement - Permanente Creek		
P.O.#/Ref:			

REQUESTED ANALYSIS

	Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Grab/ Comp	Container Number	Container Type	*Seleanstrum capricornutum* Growth, EPA 1003.0	*Ceriodapnia dubia* Surival and Reproduction, EPA 1002.0	Fathead Minnow Larval Survival and Growth, EPA 1000.0								
1	Pond 4A	9/13/13	1125	FW	Comp	1	2.5 gallon LDPE Cube	x		x								
2	Pond 13	9/13/13	1027	FW	Grab	1	2.5 gallon LDPE Cube	x		x								
3	Pond 9	9/13/13	1009	FW	Grab	1	2.5 gallon LDPE Cube	x	x	x								
4	Pond 14	9/13/13	936	FW	Grab	1	2.5 gallon LDPE Cube	x		x								
5																		
6																		
7																		
8																		
9																		
10																		

Samples collected by: B. Jorgenson & B. Giudice

Comments/Special Instruction:

Perform concurent reference toxicant tests.

RELIQUINSHED BY:		**RECEIVED BY:** VL	
Signature:		**Signature:** Vince Landi	
Print: Brant Jorgenson		**Print:** Vince Landi	
Organization: RBI		**Organization:** PER	
Date: 9/13/13	**Time:** 1511	**Date:** 9/13/13	**Time:** 1511
RELIQUINSHED BY:		**RECEIVED BY:**	
Signature:		**Signature:**	
Print:		**Print:**	
Organization:		**Organization:**	
Date:	**Time:**	**Date:**	**Time:**

***Example Matrix Codes**: (**EFF** - Effluent) (**FW** = Freshwater); (**SW** = Saltwater); (**WW** = Wastewater); (**STRMW** = Stormwater); (**SED** = Sediment); or other

Appendix B

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 4A Site Water to *Selenastrum capricornutum*

CETIS Summary Report

Report Date:	19 Sep-13 17:26 (p 1 of 1)
Test Code:	52986 | 17-0331-7047

Algal Growth Test — **Pacific EcoRisk**

Batch ID:	15-3702-6417	**Test Type:**	Cell Growth	**Analyst:**	Padrick Anderson
Start Date:	10 Sep-13 16:19	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	14 Sep-13 16:15	**Species:**	Selenastrum capricornutum	**Brine:**	Not Applicable
Duration:	96h	**Source:**	In-House Culture	**Age:**	6

Sample ID:	13-6980-2253	**Code:**	Pond 4A	**Client:**	Lehigh Permanente
Sample Date:	09 Sep-13 10:49	**Material:**	Effluent	**Project:**	21442
Receive Date:	09 Sep-13 14:30	**Source:**	Lehigh Permanente		
Sample Age:	29h (2.1 °C)	**Station:**	Pond 4A		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
14-3794-5444	96h Cell Density-with EDTA	<0	0		5.07%		Equal Variance t Two-Sample Test
13-4416-6550	96h Cell Density-with EDTA	100	>100	NA	7.55%	1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
04-7842-4138	96h Cell Density-with EDTA	IC5	>100	N/A	N/A	<1	Linear Interpolation (ICPIN)
		IC10	>100	N/A	N/A	<1	
		IC15	>100	N/A	N/A	<1	
		IC20	>100	N/A	N/A	<1	
		IC25	>100	N/A	N/A	<1	
		IC40	>100	N/A	N/A	<1	
		IC50	>100	N/A	N/A	<1	

96h Cell Density-with EDTA Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	4	3.62E+6	3.59E+6	3.64E+6	3.56E+6	3.72E+6	3.57E+4	7.14E+4	1.97%	0.0%
0	Lab Water Contr	4	4.29E+6	4.21E+6	4.37E+6	4.06E+6	4.51E+6	1.06E+5	2.12E+5	4.95%	-18.7%
6.25		4	4.56E+6	4.49E+6	4.62E+6	4.37E+6	4.74E+6	8.15E+4	1.63E+5	3.58%	-25.9%
12.5		4	4.64E+6	4.58E+6	4.70E+6	4.40E+6	4.76E+6	8.27E+4	1.65E+5	3.57%	-28.2%
25		4	4.74E+6	4.64E+6	4.84E+6	4.46E+6	5.05E+6	1.28E+5	2.56E+5	5.41%	-31.0%
50		4	4.77E+6	4.69E+6	4.86E+6	4.50E+6	5.03E+6	1.11E+5	2.22E+5	4.65%	-31.9%
100		4	4.55E+6	4.52E+6	4.57E+6	4.46E+6	4.60E+6	3.01E+4	6.03E+4	1.33%	-25.6%

96h Cell Density-with EDTA Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	3.56E+6	3.61E+6	3.72E+6	3.58E+6
0	Lab Water Contr	4.51E+6	4.17E+6	4.43E+6	4.06E+6
6.25		4.74E+6	4.63E+6	4.37E+6	4.48E+6
12.5		4.65E+6	4.40E+6	4.76E+6	4.74E+6
25		5.05E+6	4.62E+6	4.46E+6	4.83E+6
50		4.50E+6	4.72E+6	4.84E+6	5.03E+6
100		4.46E+6	4.60E+6	4.55E+6	4.57E+6

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	13-4416-6550	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	17 Sep-13 15:08	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	7.55%	100	>100	NA	1

Dunnett Multiple Comparison Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	-1.95	2.41	3E+05	6	0.9990	CDF	Non-Significant Effect
		12.5	-2.56	2.41	3E+05	6	0.9998	CDF	Non-Significant Effect
		25	-3.32	2.41	3E+05	6	1.0000	CDF	Non-Significant Effect
		50	-3.56	2.41	3E+05	6	1.0000	CDF	Non-Significant Effect
		100	-1.88	2.41	3E+05	6	0.9987	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	5.992708E+11	1.198542E+11	5	3.3	0.0272	Significant Effect
Error	6.52825E+11	36268060000	18			
Total	1.252096E+12		23			

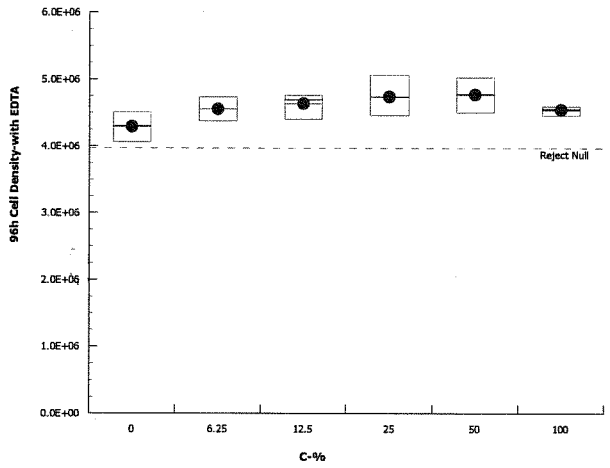
Distributional Tests

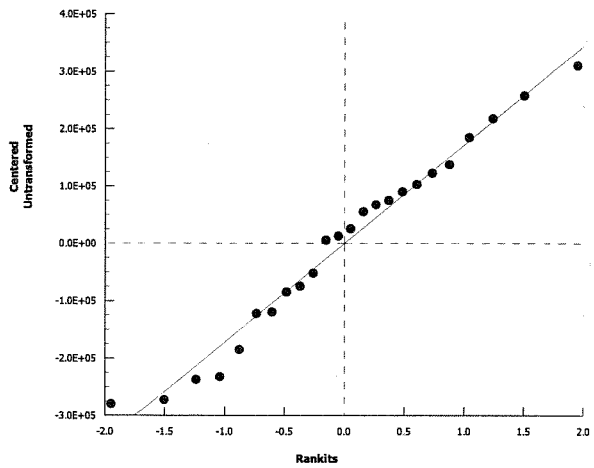
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	4.72	15.1	0.4515	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.969	0.884	0.6529	Normal Distribution

96h Cell Density-with EDTA Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	4.29E+6	3.95E+6	4.63E+6	4300000	4.06E+6	4.51E+6	1.06E+5	4.95%	0.0%
6.25		4	4.56E+6	4.30E+6	4.81E+6	4560000	4.37E+6	4.74E+6	8.15E+4	3.58%	-6.12%
12.5		4	4.64E+6	4.37E+6	4.90E+6	4700000	4.40E+6	4.76E+6	8.27E+4	3.57%	-8.04%
25		4	4.74E+6	4.33E+6	5.15E+6	4730000	4.46E+6	5.05E+6	1.28E+5	5.41%	-10.4%
50		4	4.77E+6	4.42E+6	5.13E+6	4780000	4.50E+6	5.03E+6	1.11E+5	4.65%	-11.2%
100		4	4.55E+6	4.45E+6	4.64E+6	4560000	4.46E+6	4.60E+6	3.01E+4	1.33%	-5.88%

Graphics





CETIS Analytical Report

Report Date:	17 Sep-13 15:09 (p 1 of 1)
Test Code:	52986 | 17-0331-7047

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	04-7842-4138	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	17 Sep-13 15:08	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	354279	200	Yes	Two-Point Interpolation

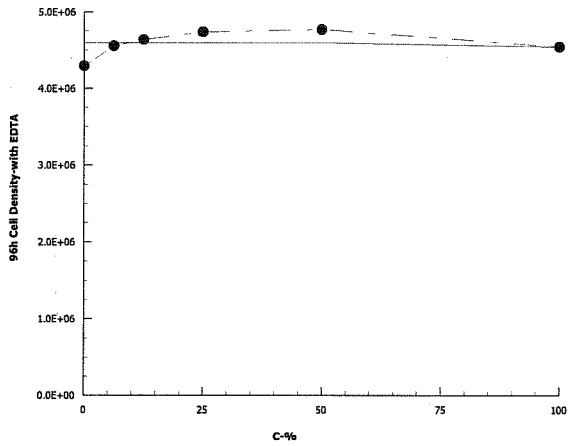
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>100	N/A	N/A	<1	NA	NA
IC10	>100	N/A	N/A	<1	NA	NA
IC15	>100	N/A	N/A	<1	NA	NA
IC20	>100	N/A	N/A	<1	NA	NA
IC25	>100	N/A	N/A	<1	NA	NA
IC40	>100	N/A	N/A	<1	NA	NA
IC50	>100	N/A	N/A	<1	NA	NA

96h Cell Density-with EDTA Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contro	4	4.29E+6	4.06E+6	4.51E+6	1.06E+5	2.12E+5	4.95%	0.0%
6.25		4	4.56E+6	4.37E+6	4.74E+6	8.15E+4	1.63E+5	3.58%	-6.12%
12.5		4	4.64E+6	4.40E+6	4.76E+6	8.27E+4	1.65E+5	3.57%	-8.04%
25		4	4.74E+6	4.46E+6	5.05E+6	1.28E+5	2.56E+5	5.41%	-10.4%
50		4	4.77E+6	4.50E+6	5.03E+6	1.11E+5	2.22E+5	4.65%	-11.2%
100		4	4.55E+6	4.46E+6	4.60E+6	3.01E+4	6.03E+4	1.33%	-5.88%

Graphics



Selenastrum capricornutum Cell Density Enumeration Data

Client: **Lehigh Permanente**
Test Material: Pond 4A
Test Start Date: 9/10/13 Start Time: 1619
Test End Date: 9/14/13 End Time: 1615
Initial Count: 10,000 cells/mL
Enumerating Scientist: KP
Project #: 21442
Test ID #: 52986

Treatment	Cell Density (cells/ml x 10^6)				
	Rep A	Rep B	Rep C	Rep D	Mean
Lab Water	4.51	4.17	4.43	4.06	4.29
6.25%	4.74	4.63	4.37	4.48	4.56
12.5%	4.65	4.40	4.76	4.74	4.64
25%	5.05	4.62	4.46	4.83	4.74
50%	4.50	4.72	4.84	5.03	4.77
100%	4.46	4.60	4.55	4.57	4.55
This datasheet has been reviewed for completeness and consistency with Test Acceptability Criteria and/or other issues of concern.	**Control Mean Density (cells/mL x 10^6)**	**% CV**	**Date:**	**Time:**	**Signoff:**
	4.29	4.95	9/14/13	1800	AB for MK

Selenastrum capricornutum Algal Toxicity Test Water Quality Data

Client: **Lehigh Permanente** Test ID #: 52986 Test Date: 9/10/13
Test Material: Pond 4A Project #: 21442 Control/Diluent: Type I Water W/EDTA
Shelf Zone #: R251

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Lab Water Control	25.6	7.50	8.8	~~120~~ 91	Date: 9/10/13
6.25% Effluent	25.6	7.38	8.5	179	Sample ID: 32678
12.5%Effluent	25.6	7.45	8.5	257	Test Solution Prep:
25% Effluent	25.6	7.72	8.6	400	New WQ:
50% Effluent	25.6	7.93	9.1	666	Innoculation Time: 1649
100% Effluent	25.6	8.05	9.8	1159	Innoculation Signoff:
Meter ID:	06	PH15	RD06	EC06	
Lab Water Control	25.7	8.25			Date: 9-11-13
6.25% Effluent	25.7	7.73			WQ Time: 09-00
12.5%Effluent	25.7	7.55			WQ Signoff:
25% Effluent	25.7	7.60			
50% Effluent	25.7	7.63			
100% Effluent	25.7	7.86			
Meter ID:	06	PH19			
Lab Water Control	25.5	8.86			Date: 9/12/13
6.25% Effluent	25.5	8.33			WQ Time: 0852
12.5%Effluent	25.5	8.18			WQ Signoff: CP
25% Effluent	25.5	8.17			
50% Effluent	25.5	8.09			
100% Effluent	25.5	8.14			
Meter ID:	06	PH16			
Lab Water Control	25.5	9.65			Date: 9/13/13
6.25% Effluent	25.5	9.47			WQ Time: 0900
12.5%Effluent	25.5	9.53			WQ Signoff:
25% Effluent	25.5	9.39			
50% Effluent	25.5	9.12			
100% Effluent	25.5	8.77			
Meter ID:	06	PH16			
Lab Water Control	25.5	10.12	13.1	113	Date: 9/14/13
6.25% Effluent	25.5	9.90	12.8	180	Termination Time: 1615
12.5%Effluent	25.5	10.17	12.6	262	Termination Signoff:
25% Effluent	25.5	10.05	14.5	397	WQ Time: 1030
50% Effluent	25.5	9.66	14.6	618	WQ Signoff:
100% Effluent	25.5	9.33	14.9	1035	
Meter ID:	06	PH15	RD06	EC07	

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	96 ✓	494 ✓	391.5

CETIS Analytical Report

Report Date: 17 Sep-13 15:08 (p 1 of 2)
Test Code: 52986 | 17-0331-7047

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	14-3794-5444	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	17 Sep-13 15:08	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	5.07%	Fails 96h cell density-with edta

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		Hardness Blank	6.03	1.94	2E+05	6	0.0005	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	9.1125E+11	9.1125E+11	1	36.3	0.0009	Significant Effect
Error	1.5055E+11	25091670000	6			
Total	1.0618E+12		7			

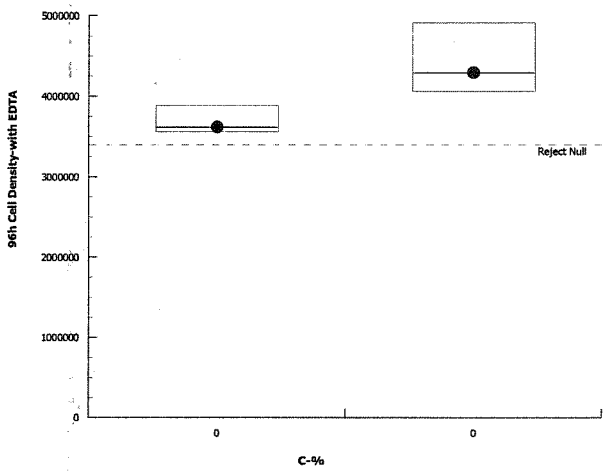
Distributional Tests

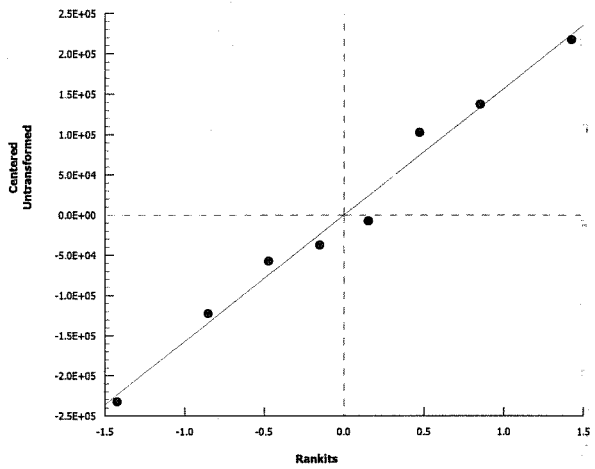
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	8.86	47.5	0.1063	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.981	0.645	0.9659	Normal Distribution

96h Cell Density-with EDTA Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	4.29E+6	3.95E+6	4.63E+6	3890000	4.06E+6	4.51E+6	1.06E+5	4.95%	0.0%
0	Hardness Blank	4	3.62E+6	3.50E+6	3.73E+6	3890000	3.56E+6	3.72E+6	3.57E+4	1.97%	15.7%

Graphics





Selenastrum capricornutum Algal Toxicity Test Data Sheet

Client: **Lehigh Permanente** Sample ID: Hardness Blank

Test Start Date: 9/10/13 Test ID #: - Project #: 21442

Test End Date: 9/14/13 Control/Diluent: Type 1 Water w/ EDTA Shelf #: R251

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Hardness Blank	25.6	8.00	9.2	1444	Date: 9/10/13
					Sample ID #: 32594
					Test Solution Prep: Le
					New WQ: OR
					Inoculation Time: 1619
Meter ID	06	pH19	RD05	EC04	Innoculation Signoff: Le
Hardness Blank	25.7	8.02			Date: 9-11-13
					WQ Time: 09.00
Meter ID	06	Ph 19			WQ Signoff: ML
Hardness Blank	25.5	8.18			Date: 9/12/13
					WQ Time: CP ~~CP~~ 0852
Meter ID	06	PH16			WQ Signoff: CP ~~0852~~ CP
Hardness Blank	25.5	8.68			Date: 9/13/13
					WQ Time: 0900
Meter ID	06	PH16			WQ Signoff: NF
Hardness Blank	25.5	9.14	12.6	1290	Date: 9/14/13
					WQ Time: 1030
Meter ID	06	pH15	RD06	EC07	WQ Signoff: OR

Initial Count: 10,000 cells/mL Termination Time: 1615 Enumerating Scientist: KP

Treatment	Cell Density (cells/mL x 10^6)				Mean Cell Density (cells/mL x 10^6)
	Rep A	Rep B	Rep C	Rep D	
Hardness Blank	3.56	3.61	3.72	3.58	3.62

This datasheet has been reviewed for completeness and consistency with Test Acceptability Criteria and/or other issues of concern.	Control Mean Density (cells/mL x 10^6)	% CV	Date:	Time:	Signoff:
	3.62	1.97	9/14/13	1800	MK

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	128 ✓	587 ✓	371.5

Appendix C

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 9 Site Water to *Selenastrum capricornutum*

CETIS Summary Report

Report Date:	19 Sep-13 17:26 (p 1 of 1)
Test Code:	52988 | 08-9207-0664

Algal Growth Test — **Pacific EcoRisk**

Batch ID:	00-0323-5598	**Test Type:**	Cell Growth	**Analyst:**	Padrick Anderson
Start Date:	10 Sep-13 16:21	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	14 Sep-13 16:35	**Species:**	Selenastrum capricornutum	**Brine:**	Not Applicable
Duration:	4d 0h	**Source:**	In-House Culture	**Age:**	6

Sample ID:	01-7549-5013	**Code:**	Pond 9	**Client:**	Lehigh Permanente
Sample Date:	09 Sep-13 12:15	**Material:**	Effluent	**Project:**	21442
Receive Date:	09 Sep-13 14:30	**Source:**	Lehigh Permanente		
Sample Age:	28h (2.6 °C)	**Station:**	Pond 9		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
18-7807-1387	96h Cell Density-with EDTA	<0	0		2.3%		Equal Variance t Two-Sample Test
00-1720-0222	96h Cell Density-with EDTA	100	>100	NA	7.09%	1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
00-6336-1002	96h Cell Density-with EDTA	IC5	>100	N/A	N/A	<1	Linear Interpolation (ICPIN)
		IC10	>100	N/A	N/A	<1	
		IC15	>100	N/A	N/A	<1	
		IC20	>100	N/A	N/A	<1	
		IC25	>100	N/A	N/A	<1	
		IC40	>100	N/A	N/A	<1	
		IC50	>100	N/A	N/A	<1	

96h Cell Density-with EDTA Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	4	3.62E+6	3.59E+6	3.64E+6	3.56E+6	3.72E+6	3.57E+4	7.14E+4	1.97%	0.0%
0	Lab Water Contr	4	4.40E+6	4.37E+6	4.43E+6	4.33E+6	4.48E+6	3.81E+4	7.62E+4	1.73%	-21.6%
6.25		4	4.49E+6	4.44E+6	4.55E+6	4.35E+6	4.69E+6	7.26E+4	1.45E+5	3.23%	-24.2%
12.5		4	4.70E+6	4.64E+6	4.76E+6	4.51E+6	4.88E+6	7.78E+4	1.56E+5	3.31%	-29.9%
25		4	4.89E+6	4.78E+6	4.99E+6	4.54E+6	5.24E+6	1.43E+5	2.86E+5	5.85%	-35.1%
50		4	4.61E+6	4.54E+6	4.67E+6	4.39E+6	4.76E+6	8.67E+4	1.73E+5	3.76%	-27.3%
100		4	4.88E+6	4.81E+6	4.95E+6	4.63E+6	5.08E+6	9.79E+4	1.96E+5	4.01%	-34.9%

96h Cell Density-with EDTA Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	3.56E+6	3.61E+6	3.72E+6	3.58E+6
0	Lab Water Contr	4.45E+6	4.48E+6	4.34E+6	4.33E+6
6.25		4.35E+6	4.69E+6	4.50E+6	4.43E+6
12.5		4.75E+6	4.88E+6	4.66E+6	4.51E+6
25		4.54E+6	4.90E+6	5.24E+6	4.87E+6
50		4.76E+6	4.54E+6	4.39E+6	4.73E+6
100		4.83E+6	5.08E+6	4.63E+6	4.98E+6

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	00-1720-0222	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	17 Sep-13 9:52	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	7.09%	100	>100	NA	1

Dunnett Multiple Comparison Test

Control vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control	6.25	-0.714	2.41	3E+05	6	0.9638	CDF	Non-Significant Effect
	12.5	-2.32	2.41	3E+05	6	0.9997	CDF	Non-Significant Effect
	25	-3.76	2.41	3E+05	6	1.0000	CDF	Non-Significant Effect
	50	-1.58	2.41	3E+05	6	0.9968	CDF	Non-Significant Effect
	100	-3.71	2.41	3E+05	6	1.0000	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	8.017333E+11	1.603467E+11	5	4.78	0.0059	Significant Effect
Error	6.0385E+11	33547220000	18			
Total	1.405583E+12		23			

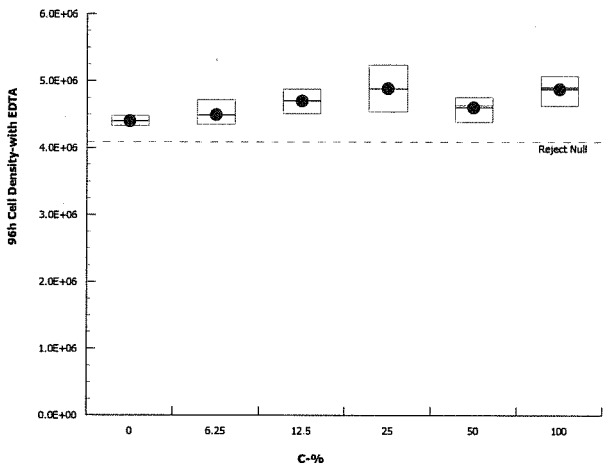
Distributional Tests

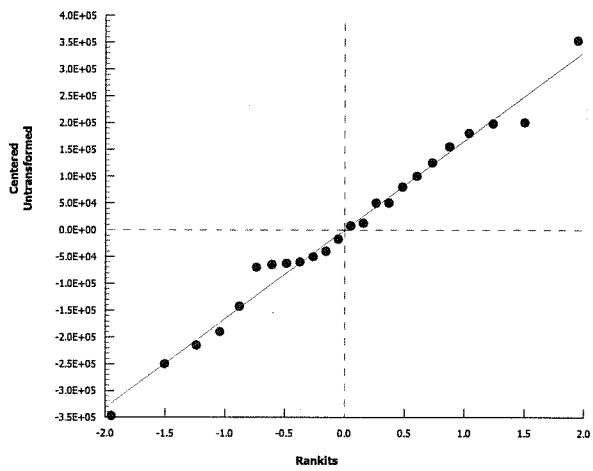
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	4.33	15.1	0.5026	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.988	0.884	0.9881	Normal Distribution

96h Cell Density-with EDTA Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	4.40E+6	4.28E+6	4.52E+6	4400000	4.33E+6	4.48E+6	3.81E+4	1.73%	0.0%
6.25		4	4.49E+6	4.26E+6	4.72E+6	4470000	4.35E+6	4.69E+6	7.26E+4	3.23%	-2.1%
12.5		4	4.70E+6	4.45E+6	4.95E+6	4710000	4.51E+6	4.88E+6	7.78E+4	3.31%	-6.82%
25		4	4.89E+6	4.43E+6	5.34E+6	4890000	4.54E+6	5.24E+6	1.43E+5	5.85%	-11.1%
50		4	4.61E+6	4.33E+6	4.88E+6	4640000	4.39E+6	4.76E+6	8.67E+4	3.76%	-4.66%
100		4	4.88E+6	4.57E+6	5.19E+6	4910000	4.63E+6	5.08E+6	9.79E+4	4.01%	-10.9%

Graphics





CETIS Analytical Report

Report Date:	17 Sep-13 09:52 (p 1 of 1)
Test Code:	52988 | 08-9207-0664

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	00-6336-1002	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	17 Sep-13 9:52	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1143748	200	Yes	Two-Point Interpolation

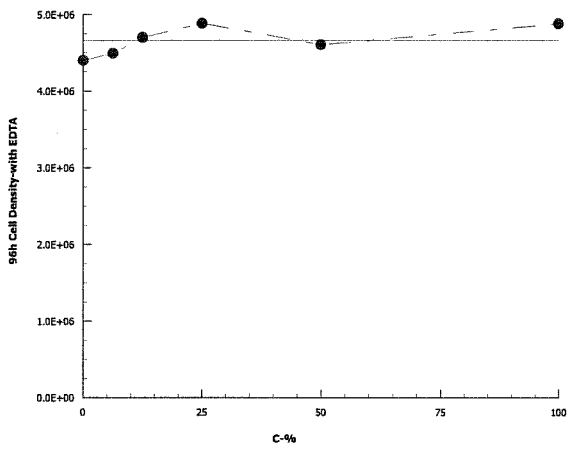
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>100	N/A	N/A	<1	NA	NA
IC10	>100	N/A	N/A	<1	NA	NA
IC15	>100	N/A	N/A	<1	NA	NA
IC20	>100	N/A	N/A	<1	NA	NA
IC25	>100	N/A	N/A	<1	NA	NA
IC40	>100	N/A	N/A	<1	NA	NA
IC50	>100	N/A	N/A	<1	NA	NA

96h Cell Density-with EDTA Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contro	4	4.40E+6	4.33E+6	4.48E+6	3.81E+4	7.62E+4	1.73%	0.0%
6.25		4	4.49E+6	4.35E+6	4.69E+6	7.26E+4	1.45E+5	3.23%	-2.1%
12.5		4	4.70E+6	4.51E+6	4.88E+6	7.78E+4	1.56E+5	3.31%	-6.82%
25		4	4.89E+6	4.54E+6	5.24E+6	1.43E+5	2.86E+5	5.85%	-11.1%
50		4	4.61E+6	4.39E+6	4.76E+6	8.67E+4	1.73E+5	3.76%	-4.66%
100		4	4.88E+6	4.63E+6	5.08E+6	9.79E+4	1.96E+5	4.01%	-10.9%

Graphics



Selenastrum capricornutum Cell Density Enumeration Data

Client: **Lehigh Permanente**
Test Material: Pond 9
Test Start Date: 9/10/13 Start Time: 1621
Test End Date: 9/14/13 End Time: 1635

Initial Count: 10,000 cells/mL
Enumerating Scientist: GP
Project #: 21442
Test ID #: 52988

Treatment	Cell Density (cells/mL x 10^6)				
	Rep A	Rep B	Rep C	Rep D	Mean
Lab Water Control	4.45	4.48	4.34	4.33	4.40
6.25%	4.35	4.69	4.50	4.43	4.49
12.5%	4.75	4.88	4.66	4.51	4.70
25%	4.54	4.90	5.24	4.87	4.89
50%	4.76	4.54	4.39	4.73	4.61
100%	4.83	5.08	4.63	4.98	4.88
This datasheet has been reviewed for completeness and consistency with Test Acceptability Criteria and/or other issues of concern.	**Control Mean Density (cells/mL x 10^6)**	**% CV**	**Date:**	**Time:**	**Signoff:**
	4.40	1.73	9/14/13	1805	MK

Selenastrum capricornutum Algal Toxicity Test Water Quality Data

Client: **Lehigh Permanente** Test ID #: 52988 Test Date: 9/10/13
Test Material: Pond 9 Project #: 21442 Control/Diluent: Type I Water W/EDTA
Shelf Zone #: R251

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Lab Water Control	25.6	7.50	9.1	~~127~~ 91	Date: 9/10/13
6.25% Effluent	25.6	7.80	8.6	211	Sample ID: 32680
12.5%Effluent	25.6	7.69	8.5	312	Test Solution Prep: Le
25% Effluent	25.6	7.72	8.8	510	New WQ: AR
50% Effluent	25.6	7.77	~~8.7~~ 9.0	860	Innoculation Time: 1621
100% Effluent	25.6	7.77	9.5	1510	Innoculation Signoff: Le
Meter ID:	06	pH15	RD06	EC06	
Lab Water Control	25.6	8.07			Date: 9/11/13
6.25% Effluent	25.6	7.67			WQ Time: 0910
12.5%Effluent	25.6	7.61			WQ Signoff: CP
25% Effluent	25.6	7.71			
50% Effluent	25.6	7.98			
100% Effluent	25.6	8.14			
Meter ID:	06	~~pH14~~ CP ~~16~~	pH14		
Lab Water Control	25.5	8.53			Date: 9/12/13
6.25% Effluent	25.5	8.25			WQ Time: 0902
12.5%Effluent	25.5	8.17			WQ Signoff: CP
25% Effluent	25.5	8.16			
50% Effluent	25.5	8.27			
100% Effluent	25.5	8.42			
Meter ID:	06	~~pH14~~ CP 16			
Lab Water Control	25.5	9.54			Date: 9/13/13
6.25% Effluent	25.5	9.66			WQ Time: 0900
12.5%Effluent	25.5	9.49			WQ Signoff: NF
25% Effluent	25.5	9.21			
50% Effluent	25.5	9.05			
100% Effluent	25.5	8.66			
Meter ID:	06	pH16			
Lab Water Control	25.5	10.04	13.0	105	Date: 9/14/13
6.25% Effluent	25.5	10.21	14.9	223	Termination Time: 1635
12.5%Effluent	25.5	10.16	14.7	312	Termination Signoff: KP
25% Effluent	25.5	9.65	14.9	471	WQ Time: 1015
50% Effluent	25.5	9.62	14.9	712	WQ Signoff: AR
100% Effluent	25.5	9.13	15.6	1227	
Meter ID:	06	pH15	RD06	EC07	

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	222 ✓	691 ✓	391.5

CETIS Analytical Report

Report Date: 17 Sep-13 09:52 (p 1 of 2)
Test Code: 52988 | 08-9207-0664

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	18-7807-1387	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	17 Sep-13 9:52	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	2.3%	Fails 96h cell density-with edta

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		Hardness Blank	15	1.94	1E+05	6	<0.0001	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.224613E+12	1.224613E+12	1	225	<0.0001	Significant Effect
Error	32675000000	5445833000	6			
Total	1.257287E+12		7			

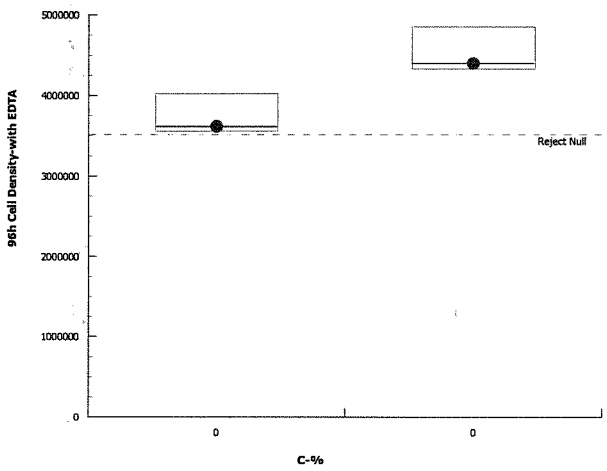
Distributional Tests

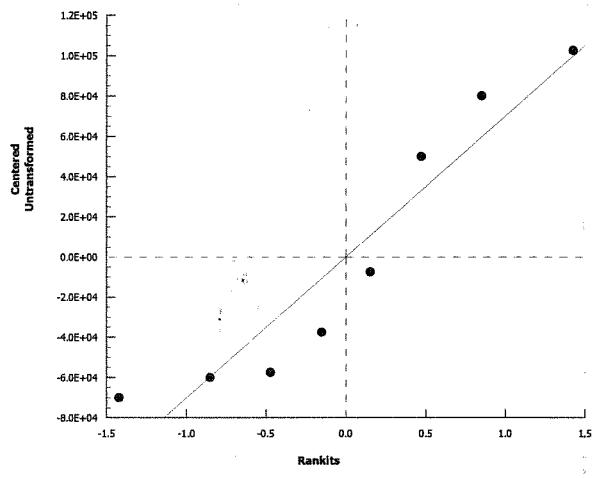
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	1.14	47.5	0.9173	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.876	0.645	0.1720	Normal Distribution

96h Cell Density-with EDTA Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	4.40E+6	4.28E+6	4.52E+6	4030000	4.33E+6	4.48E+6	3.81E+4	1.73%	0.0%
0	Hardness Blank	4	3.62E+6	3.50E+6	3.73E+6	4030000	3.56E+6	3.72E+6	3.57E+4	1.97%	17.8%

Graphics





Selenastrum capricornutum Algal Toxicity Test Data Sheet

Client: **Lehigh Permanente**
Sample ID: Hardness Blank
Test Start Date: 9/10/13
Test ID #: -
Project #: 21442
Test End Date: 9/14/13
Control/Diluent: Type 1 Water w/ EDTA
Shelf #: R251

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Hardness Blank	25.6	8.00	9.2	1444	Date: 9/10/13
					Sample ID #: 32594
					Test Solution Prep: Le
					New WQ: OR
					Inoculation Time: 1619
Meter ID	06	pH19	RD05	EC04	Innoculation Signoff: Le
Hardness Blank	25.7	8.02			Date: 9-11-13
					WQ Time: 09.00
Meter ID	06	Ph 19			WQ Signoff: ML
Hardness Blank	25.5	8.18			Date: 9/12/13
					WQ Time: CP ~~CP~~ 0852
Meter ID	06	PH16			WQ Signoff: CP ~~0852~~ CP
Hardness Blank	25.5	8.68			Date: 9/13/13
					WQ Time: 0900
Meter ID	06	PH16			WQ Signoff: NF
Hardness Blank	25.5	9.14	12.6	1290	Date: 9/14/13
					WQ Time: 1030
Meter ID	06	pH15	RD06	EC07	WQ Signoff: OR

Initial Count: 10,000 cells/mL
Termination Time: 1615
Enumerating Scientist: KP

Treatment	Cell Density (cells/mL x 10^6)				Mean Cell Density (cells/mL x 10^6)
	Rep A	Rep B	Rep C	Rep D	
Hardness Blank	3.56	3.61	3.72	3.58	3.62

This datasheet has been reviewed for completeness and consistency with Test Acceptability Criteria and/or other issues of concern.	Control Mean Density (cells/mL x 10^6)	% CV	Date:	Time:	Signoff:
	3.62	1.97	9/14/13	1800	MK

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	128 ✓	587 ✓	371.5

Appendix D

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 13 Site Water to *Selenastrum capricornutum*

CETIS Summary Report

Report Date: 19 Sep-13 17:27 (p 1 of 1)
Test Code: 52987 | 06-3034-3466

Algal Growth Test — **Pacific EcoRisk**

Batch ID:	13-2690-1033	**Test Type:**	Cell Growth	**Analyst:**	Padrick Anderson
Start Date:	10 Sep-13 16:20	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	14 Sep-13 17:30	**Species:**	Selenastrum capricornutum	**Brine:**	Not Applicable
Duration:	4d 1h	**Source:**	In-House Culture	**Age:**	6

Sample ID:	03-1575-0328	**Code:**	Pond 13	**Client:**	Lehigh Permanente
Sample Date:	09 Sep-13 11:39	**Material:**	Effluent	**Project:**	21442
Receive Date:	09 Sep-13 14:30	**Source:**	Lehigh Permanente		
Sample Age:	29h (2.8 °C)	**Station:**	Pond 13		

Batch Notes: Plating observed. Results post-resuspension.

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
00-5518-0344	96h Cell Density-with EDTA	<0	0		2.26%		Equal Variance t Two-Sample Test
03-3224-6953	96h Cell Density-with EDTA	100	>100	NA	6.1%	1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
16-7859-3011	96h Cell Density-with EDTA	IC5	>100	N/A	N/A	<1	Linear Interpolation (ICPIN)
		IC10	>100	N/A	N/A	<1	
		IC15	>100	N/A	N/A	<1	
		IC20	>100	N/A	N/A	<1	
		IC25	>100	N/A	N/A	<1	
		IC40	>100	N/A	N/A	<1	
		IC50	>100	N/A	N/A	<1	

96h Cell Density-with EDTA Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	4	3.62E+6	3.59E+6	3.64E+6	3.56E+6	3.72E+6	3.57E+4	7.14E+4	1.97%	0.0%
0	Lab Water Contr	4	4.54E+6	4.51E+6	4.57E+6	4.48E+6	4.65E+6	3.90E+4	7.80E+4	1.72%	-25.6%
6.25		4	4.45E+6	4.34E+6	4.55E+6	4.18E+6	4.77E+6	1.40E+5	2.80E+5	6.29%	-22.9%
12.5		4	4.76E+6	4.71E+6	4.81E+6	4.57E+6	4.88E+6	6.60E+4	1.32E+5	2.77%	-31.5%
25		4	4.92E+6	4.86E+6	4.99E+6	4.81E+6	5.19E+6	8.98E+4	1.80E+5	3.65%	-36.1%
50		4	5.14E+6	5.08E+6	5.20E+6	4.91E+6	5.26E+6	7.80E+4	1.56E+5	3.04%	-42.0%
100		4	5.72E+6	5.71E+6	5.72E+6	5.69E+6	5.75E+6	1.26E+4	2.52E+4	0.44%	-58.0%

96h Cell Density-with EDTA Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	3.56E+6	3.61E+6	3.72E+6	3.58E+6
0	Lab Water Contr	4.49E+6	4.65E+6	4.55E+6	4.48E+6
6.25		4.77E+6	4.25E+6	4.59E+6	4.18E+6
12.5		4.79E+6	4.79E+6	4.57E+6	4.88E+6
25		4.86E+6	5.19E+6	4.83E+6	4.81E+6
50		4.91E+6	5.21E+6	5.17E+6	5.26E+6
100		5.69E+6	5.71E+6	5.75E+6	5.71E+6

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	03-3224-6953	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	17 Sep-13 14:53	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	6.1%	100	>100	NA	1

Dunnett Multiple Comparison Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	0.825	2.41	3E+05	6	0.5007	CDF	Non-Significant Effect
		12.5	-1.87	2.41	3E+05	6	0.9987	CDF	Non-Significant Effect
		25	-3.3	2.41	3E+05	6	1.0000	CDF	Non-Significant Effect
		50	-5.17	2.41	3E+05	6	1.0000	CDF	Non-Significant Effect
		100	-10.2	2.41	3E+05	6	1.0000	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.286021E+12	8.572042E+11	5	32.3	<0.0001	Significant Effect
Error	4.77075E+11	26504170000	18			
Total	4.763096E+12		23			

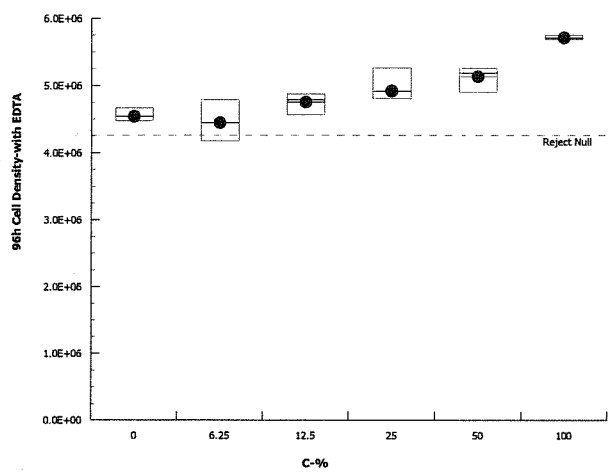
Distributional Tests

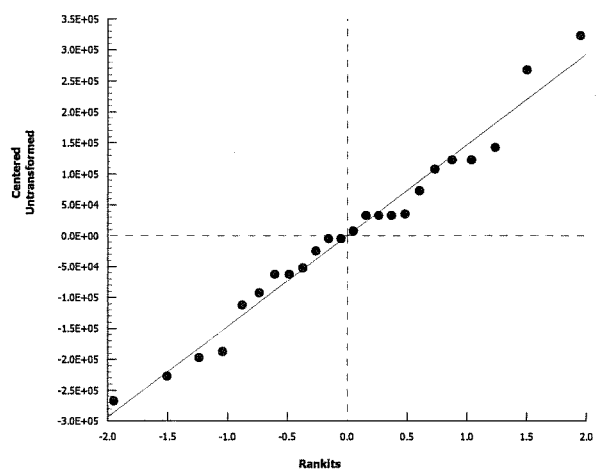
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	11.8	15.1	0.0382	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.976	0.884	0.8046	Normal Distribution

96h Cell Density-with EDTA Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	4.54E+6	4.42E+6	4.67E+6	4520000	4.48E+6	4.65E+6	3.90E+4	1.72%	0.0%
6.25		4	4.45E+6	4.00E+6	4.89E+6	4420000	4.18E+6	4.77E+6	1.40E+5	6.29%	2.09%
12.5		4	4.76E+6	4.55E+6	4.97E+6	4790000	4.57E+6	4.88E+6	6.60E+4	2.77%	-4.73%
25		4	4.92E+6	4.64E+6	5.21E+6	4850000	4.81E+6	5.19E+6	8.98E+4	3.65%	-8.37%
50		4	5.14E+6	4.89E+6	5.39E+6	5190000	4.91E+6	5.26E+6	7.80E+4	3.04%	-13.1%
100		4	5.72E+6	5.67E+6	5.76E+6	5710000	5.69E+6	5.75E+6	1.26E+4	0.44%	-25.8%

Graphics





CETIS Analytical Report

Report Date:	19 Sep-13 17:28 (p 1 of 1)
Test Code:	52987 | 06-3034-3466

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	16-7859-3011	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	19 Sep-13 17:27	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1099567	200	Yes	Two-Point Interpolation

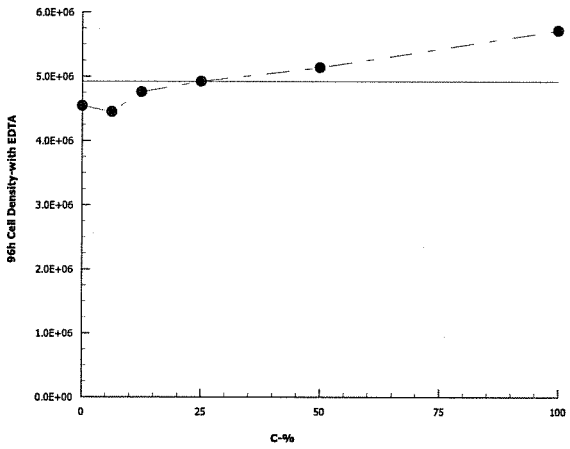
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>100	N/A	N/A	<1	NA	NA
IC10	>100	N/A	N/A	<1	NA	NA
IC15	>100	N/A	N/A	<1	NA	NA
IC20	>100	N/A	N/A	<1	NA	NA
IC25	>100	N/A	N/A	<1	NA	NA
IC40	>100	N/A	N/A	<1	NA	NA
IC50	>100	N/A	N/A	<1	NA	NA

96h Cell Density-with EDTA Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contro	4	4.54E+6	4.48E+6	4.65E+6	3.90E+4	7.80E+4	1.72%	0.0%
6.25		4	4.45E+6	4.18E+6	4.77E+6	1.40E+5	2.80E+5	6.29%	2.09%
12.5		4	4.76E+6	4.57E+6	4.88E+6	6.60E+4	1.32E+5	2.77%	-4.73%
25		4	4.92E+6	4.81E+6	5.19E+6	8.98E+4	1.80E+5	3.65%	-8.37%
50		4	5.14E+6	4.91E+6	5.26E+6	7.80E+4	1.56E+5	3.04%	-13.1%
100		4	5.72E+6	5.69E+6	5.75E+6	1.26E+4	2.52E+4	0.44%	-25.8%

Graphics



Analyst: PG QA: KB

Selenastrum capricornutum Cell Density Enumeration Data

Client: **Lehigh Permanente**
Test Material: Pond 13
Test Start Date: 9/10/13 Start Time: 1620
Test End Date: 9/14/13 End Time: 1730

Initial Count: 10,000 cells/mL
Enumerating Scientist: KP
Project #: 21442
Test ID #: 52987

Treatment	Cell Density (cells/mL x 10^6)				
	Rep A	Rep B	Rep C	Rep D	Mean
Lab Water Control	4.49	4.65	4.55	4.48	4.54
6.25%	4.77	4.25	4.59	4.18	4.45
12.5%	4.79	4.79	4.57	4.88	4.76
25%	4.86	5.19	4.83	4.81	4.92
50%	4.91	5.21	5.17	5.26	5.14
100%	5.69	5.71	5.75	5.71	5.72
This datasheet has been reviewed for completeness and consistency with Test Acceptability Criteria and/or other issues of concern.	**Control Mean Density (cells/mL x 10^6)**	**% CV**	**Date:**	**Time:**	**Signoff:**
	4.54	1.72	9/14/13	1800	MK

Selenastrum capricornutum Algal Toxicity Test Water Quality Data

Client: **Lehigh Permanente** Test ID #: 52987 Test Date: 9/10/13
Test Material: Pond 13 Project #: 21442 Control/Diluent: Type I Water W/EDTA
Shelf Zone #: R351

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Lab Water Control	25.7	7.50	8.7	92	Date: 9/10/13
6.25% Effluent	25.7	7.70	8.8	188	Sample ID: 32679
12.5%Effluent	25.7	7.64	8.6	260	Test Solution Prep: Le
25% Effluent	25.7	7.76	8.6	409	New WQ: OR
50% Effluent	25.7	7.90	9.0	686	Innoculation Time: 1620
100% Effluent	25.7	7.87	9.9	1184	Innoculation Signoff: Le
Meter ID:	65A	pH15	RD06	EC06	
Lab Water Control	25.9	8.00			Date: 9/11/13
6.25% Effluent	25.9	7.59			WQ Time: 0938
12.5%Effluent	25.9	7.60			WQ Signoff: CP
25% Effluent	25.9	7.68			
50% Effluent	25.9	7.85			
100% Effluent	25.9	8.01			
Meter ID:	65A	pH19			
Lab Water Control	25.7	8.57			Date: 9/12/13
6.25% Effluent	25.7	8.42			WQ Time: 0913
12.5%Effluent	25.7	8.32			WQ Signoff: CP
25% Effluent	25.7	8.22			
50% Effluent	25.7	8.19			
100% Effluent	25.7	8.31			
Meter ID:	65A	pH16			
Lab Water Control	25.7	9.57			Date: 9/13/13
6.25% Effluent	25.7	9.73			WQ Time: 0835
12.5%Effluent	25.7	9.62			WQ Signoff: NZ
25% Effluent	25.7	9.35			
50% Effluent	25.7	9.10			
100% Effluent	25.7	8.89			
Meter ID:	N/A ~~pH16~~ 65A	pH16			
Lab Water Control	25.6	10.08	14.6	113	Date: 9/14/13
6.25% Effluent	25.6	10.23	15.2	202	Termination Time: 1730
12.5%Effluent	25.6	10.38	14.6	286	Termination Signoff: KP
25% Effluent	25.6	10.24	15.0	422	WQ Time: ~~0840~~ 0940
50% Effluent	25.6	9.78	14.9	622	WQ Signoff: OR
100% Effluent	25.6	9.44	14.3	1011	
Meter ID:	65A	pH15	RD06	EC07	

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	~~128~~ 147 ✓	557 ✓	404.2

CETIS Analytical Report

Report Date: 17 Sep-13 14:53 (p 1 of 2)
Test Code: 52987 | 06-3034-3466

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	00-5518-0344	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	17 Sep-13 14:53	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	2.26%	Fails 96h cell density-with edta

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		Hardness Blank	17.5	1.94	1E+05	6	<0.0001	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.71125E+12	1.71125E+12	1	306	<0.0001	Significant Effect
Error	33550000000	5591667000	6			
Total	1.7448E+12		7			

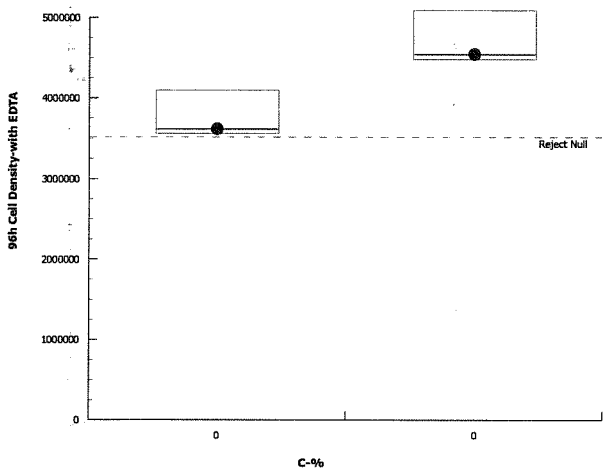
Distributional Tests

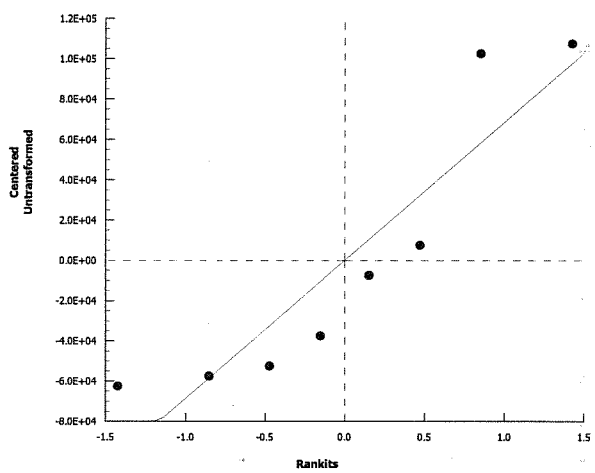
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	1.2	47.5	0.8863	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.818	0.645	0.0445	Normal Distribution

96h Cell Density-with EDTA Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Hardness Blank	4	3.62E+6	3.50E+6	3.73E+6	4100000	3.56E+6	3.72E+6	3.57E+4	1.97%	0.0%
0	Lab Water Contr	4	4.54E+6	4.42E+6	4.67E+6	4100000	4.48E+6	4.65E+6	3.90E+4	1.72%	-25.6%

Graphics





Selenastrum capricornutum Algal Toxicity Test Data Sheet

Client: **Lehigh Permanente**
Test Start Date: 9/10/13
Test End Date: 9/14/13
Sample ID: Hardness Blank
Test ID #: -
Control/Diluent: Type 1 Water w/ EDTA
Project #: 21442
Shelf #: R251

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Hardness Blank	25.6	8.00	9.2	1444	Date: 9/10/13
					Sample ID #: 32594
					Test Solution Prep: Le
					New WQ: OR
					Inoculation Time: 1619
Meter ID	06	pH19	RD05	EC04	Innoculation Signoff: Le
Hardness Blank	25.7	8.02			Date: 9-11-13
					WQ Time: 09.00
Meter ID	06	Ph 19			WQ Signoff: ML
Hardness Blank	25.5	8.18			Date: 9/12/13
					WQ Time: CP ~~CP~~ 0852
Meter ID	06	PH16			WQ Signoff: CP ~~0852~~ CP
Hardness Blank	25.5	8.68			Date: 9/13/13
					WQ Time: 0900
Meter ID	06	PH16			WQ Signoff: NF
Hardness Blank	25.5	9.14	12.6	1290	Date: 9/14/13
					WQ Time: 1030
Meter ID	06	pH15	RD06	EC07	WQ Signoff: OR

Initial Count: 10,000 cells/mL
Termination Time: 1615
Enumerating Scientist: KP

Treatment	Cell Density (cells/mL x 10^6)				Mean Cell Density (cells/mL x 10^6)
	Rep A	Rep B	Rep C	Rep D	
Hardness Blank	3.56	3.61	3.72	3.58	3.62

This datasheet has been reviewed for completeness and consistency with Test Acceptability Criteria and/or other issues of concern.	Control Mean Density (cells/mL x 10^6)	% CV	Date:	Time:	Signoff:
	3.62	1.97	9/14/13	1800	MK

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	128 ✓	587 ✓	371.5

Appendix E

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 14 Site Water to *Selenastrum capricornutum*

CETIS Summary Report

Report Date:	19 Sep-13 15:50 (p 1 of 1)
Test Code:	52989 | 10-7128-4235

Algal Growth Test — **Pacific EcoRisk**

Batch ID:	00-7168-4964	**Test Type:**	Cell Growth	**Analyst:**	Padrick Anderson
Start Date:	10 Sep-13 16:18	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	14 Sep-13 15:40	**Species:**	Selenastrum capricornutum	**Brine:**	Not Applicable
Duration:	95h	**Source:**	In-House Culture	**Age:**	6

Sample ID:	01-3632-8037	**Code:**	Pond 14	**Client:**	Lehigh Permanente
Sample Date:	09 Sep-13 12:43	**Material:**	Effluent	**Project:**	21442
Receive Date:	09 Sep-13 14:30	**Source:**	Lehigh Permanente		
Sample Age:	28h (2.3 °C)	**Station:**	Pond 14		

Batch Notes: Plating observed. Results post-resuspension

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
14-2754-7736	96h Cell Density-with EDTA	<0	0		2.54%		Equal Variance t Two-Sample Test
01-0230-8416	96h Cell Density-with EDTA	100	>100	NA	5.22%	1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
20-6059-4093	96h Cell Density-with EDT	IC5	>100	N/A	N/A	<1	Linear Interpolation (ICPIN)
		IC10	>100	N/A	N/A	<1	
		IC15	>100	N/A	N/A	<1	
		IC20	>100	N/A	N/A	<1	
		IC25	>100	N/A	N/A	<1	
		IC40	>100	N/A	N/A	<1	
		IC50	>100	N/A	N/A	<1	

96h Cell Density-with EDTA Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	4	3.62E+6	3.59E+6	3.64E+6	3.56E+6	3.72E+6	3.57E+4	7.14E+4	1.97%	0.0%
0	Lab Water Contr	4	4.31E+6	4.28E+6	4.34E+6	4.20E+6	4.38E+6	4.36E+4	8.72E+4	2.02%	-19.1%
6.25		4	4.44E+6	4.38E+6	4.51E+6	4.24E+6	4.64E+6	8.59E+4	1.72E+5	3.87%	-22.8%
12.5		4	4.58E+6	4.52E+6	4.64E+6	4.40E+6	4.74E+6	7.53E+4	1.51E+5	3.29%	-26.6%
25		4	4.80E+6	4.77E+6	4.82E+6	4.72E+6	4.86E+6	2.90E+4	5.80E+4	1.21%	-32.6%
50		4	4.93E+6	4.89E+6	4.97E+6	4.76E+6	5.01E+6	5.68E+4	1.14E+5	2.3%	-36.2%
100		4	5.05E+6	4.99E+6	5.12E+6	4.83E+6	5.24E+6	8.47E+4	1.69E+5	3.35%	-39.7%

96h Cell Density-with EDTA Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	3.56E+6	3.61E+6	3.72E+6	3.58E+6
0	Lab Water Contr	4.38E+6	4.28E+6	4.38E+6	4.20E+6
6.25		4.64E+6	4.38E+6	4.51E+6	4.24E+6
12.5		4.40E+6	4.74E+6	4.66E+6	4.52E+6
25		4.72E+6	4.79E+6	4.86E+6	4.81E+6
50		4.76E+6	5.01E+6	4.98E+6	4.96E+6
100		5.24E+6	5.09E+6	5.05E+6	4.83E+6

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	01-0230-8416	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	19 Sep-13 15:50	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	5.22%	100	>100	NA	1

Dunnett Multiple Comparison Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	-1.42	2.41	2E+05	6	0.9947	CDF	Non-Significant Effect
		12.5	-2.89	2.41	2E+05	6	0.9999	CDF	Non-Significant Effect
		25	-5.19	2.41	2E+05	6	1.0000	CDF	Non-Significant Effect
		50	-6.61	2.41	2E+05	6	1.0000	CDF	Non-Significant Effect
		100	-7.95	2.41	2E+05	6	1.0000	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.665671E+12	3.331342E+11	5	19.1	<0.0001	Significant Effect
Error	3.14125E+11	17451390000	18			
Total	1.979796E+12		23			

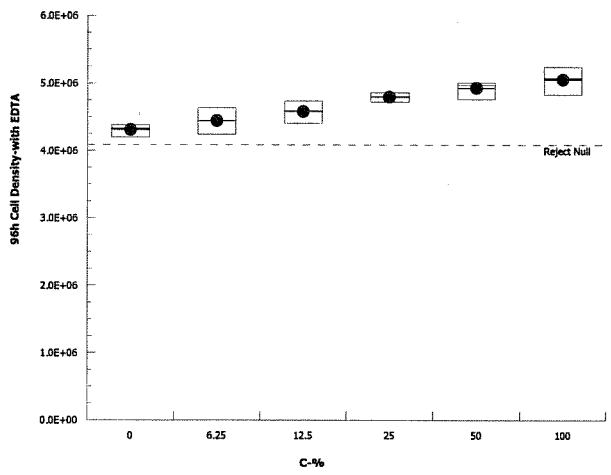
Distributional Tests

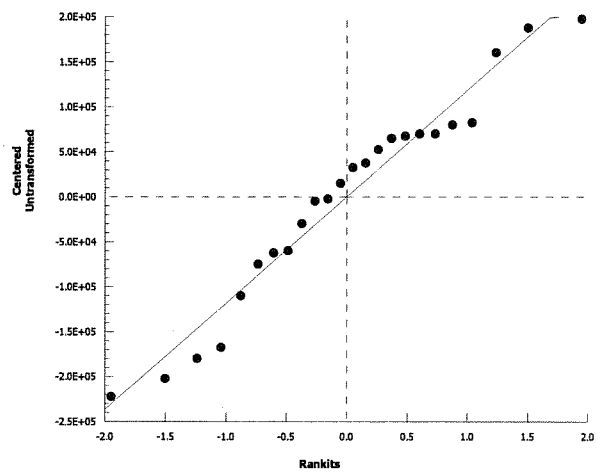
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	3.97	15.1	0.5532	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.955	0.884	0.3389	Normal Distribution

96h Cell Density-with EDTA Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	4.31E+6	4.17E+6	4.45E+6	4330000	4.20E+6	4.38E+6	4.36E+4	2.02%	0.0%
6.25		4	4.44E+6	4.17E+6	4.72E+6	4450000	4.24E+6	4.64E+6	8.59E+4	3.87%	-3.07%
12.5		4	4.58E+6	4.34E+6	4.82E+6	4590000	4.40E+6	4.74E+6	7.53E+4	3.29%	-6.26%
25		4	4.80E+6	4.70E+6	4.89E+6	4800000	4.72E+6	4.86E+6	2.90E+4	1.21%	-11.3%
50		4	4.93E+6	4.75E+6	5.11E+6	4970000	4.76E+6	5.01E+6	5.68E+4	2.3%	-14.3%
100		4	5.05E+6	4.78E+6	5.32E+6	5070000	4.83E+6	5.24E+6	8.47E+4	3.35%	-17.2%

Graphics





CETIS Analytical Report

Report Date:	19 Sep-13 15:50 (p 1 of 1)
Test Code:	52989 | 10-7128-4235

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	20-6059-4093	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	19 Sep-13 15:50	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1432957	200	Yes	Two-Point Interpolation

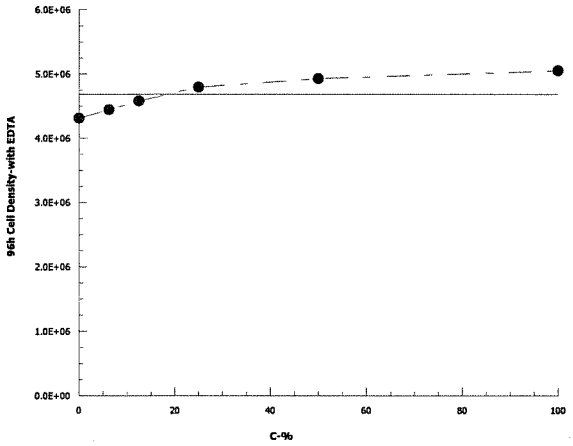
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>100	N/A	N/A	<1	NA	NA
IC10	>100	N/A	N/A	<1	NA	NA
IC15	>100	N/A	N/A	<1	NA	NA
IC20	>100	N/A	N/A	<1	NA	NA
IC25	>100	N/A	N/A	<1	NA	NA
IC40	>100	N/A	N/A	<1	NA	NA
IC50	>100	N/A	N/A	<1	NA	NA

96h Cell Density-with EDTA Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	4	4.31E+6	4.20E+6	4.38E+6	4.36E+4	8.72E+4	2.02%	0.0%
6.25		4	4.44E+6	4.24E+6	4.64E+6	8.59E+4	1.72E+5	3.87%	-3.07%
12.5		4	4.58E+6	4.40E+6	4.74E+6	7.53E+4	1.51E+5	3.29%	-6.26%
25		4	4.80E+6	4.72E+6	4.86E+6	2.90E+4	5.80E+4	1.21%	-11.3%
50		4	4.93E+6	4.76E+6	5.01E+6	5.68E+4	1.14E+5	2.3%	-14.3%
100		4	5.05E+6	4.83E+6	5.24E+6	8.47E+4	1.69E+5	3.35%	-17.2%

Graphics



Selenastrum capricornutum Cell Density Enumeration Data

Client: **Lehigh Permanente**
Test Material: Pond 14
Test Start Date: 9/10/13 Start Time: 1618
Test End Date: 9/14/13 End Time: 1540

Initial Count: 52989
Enumerating Scientist: KP
Project #: 21442
Test ID #: 52989

Treatment	Cell Density (cells/mL x 10^6)				
	Rep A	Rep B	Rep C	Rep D	Mean
Lab Water Control	4.38	4.28	4.38	4.20	4.31
6.25%	4.64	4.38	4.51	4.24	4.44
12.5%	4.40	4.74	4.66	4.52	4.58
25%	4.72	4.79	4.86	4.81	4.80
50%	4.76	5.01	4.98	4.96	4.93
100%	5.24	5.09	5.05	4.83	5.05
This datasheet has been reviewed for completeness and consistency with Test Acceptability Criteria and/or other issues of concern.	**Control Mean Density (cells/mL x 10^6)**	**% CV**	**Date:**	**Time:**	**Signoff:**
	4.31	2.02	9/14/13	1800	MK

Selenastrum capricornutum Algal Toxicity Test Water Quality Data

Client: **Lehigh Permanente** Test ID #: 52989 Test Date: 9/10/13
Test Material: Pond 14 Project #: 21442 Control/Diluent: Type I Water W/EDTA
Shelf Zone #: R351

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Lab Water Control	25.7	7.50	8.5	93	Date: 9/10/13
6.25% Effluent	25.7	7.79	8.6	196	Sample ID: 32681
12.5%Effluent	25.7	7.74	8.6	292	Test Solution Prep: Le
25% Effluent	25.7	7.85	8.5	477	New WQ: OL
50% Effluent	25.7	7.88	OL ~~8.6~~ 8.8	821	Innoculation Time: 1618
100% Effluent	25.7	7.87	9.4	1444	Innoculation Signoff: Le
Meter ID:	65A	pH15	RD06	EC06	
Lab Water Control	26.0	7.90			Date: 9/11/13
6.25% Effluent	26.0	7.64			WQ Time: 0926
12.5%Effluent	26.0	7.70			WQ Signoff: CP
25% Effluent	26.0	7.85			
50% Effluent	26.0	8.04			
100% Effluent	26.0	8.25			
Meter ID:	65A	pH19			
Lab Water Control	25.7	8.45			Date: 9/12/13
6.25% Effluent	25.7	8.28			WQ Time: 0922
12.5%Effluent	25.7	8.32			WQ Signoff: CP
25% Effluent	25.7	8.36			
50% Effluent	25.7	8.40			
100% Effluent	25.7	8.53			
Meter ID:	65A	pH16			
Lab Water Control	25.7	9.65			Date: 9/13/13
6.25% Effluent	25.7	9.69			WQ Time: 0845
12.5%Effluent	25.7	9.59			WQ Signoff: NL
25% Effluent	25.7	9.26			
50% Effluent	25.7	9.16			
100% Effluent	25.7	8.69			
Meter ID:	65A	pH16			
Lab Water Control	25.6	10.15	14.4	128	Date: 9/14/13
6.25% Effluent	25.6	10.33	OL ~~15~~ 16.2	219	Termination Time: 1540
12.5%Effluent	25.6	10.36	15.2	310	Termination Signoff: KO
25% Effluent	25.6	9.94	14.2	448	WQ Time: 1000
50% Effluent	25.6	9.72	15.4	682	WQ Signoff: OL
100% Effluent	25.6	9.04	13.9	1100	
Meter ID:	65A	pH15	RD06	EC07	

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	269 ✓	618 ✓	404.2

CETIS Analytical Report

Report Date: 19 Sep-13 15:50 (p 1 of 2)
Test Code: 52989 | 10-7128-4235

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	14-2754-7736	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	17 Sep-13 15:13	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	2.54%	Fails 96h cell density-with edta

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		Hardness Blank	12.3	1.94	1E+05	6	<0.0001	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	9.591125E+11	9.591125E+11	1	151	<0.0001	Significant Effect
Error	38075000000	6345833000	6			
Total	9.971875E+11		7			

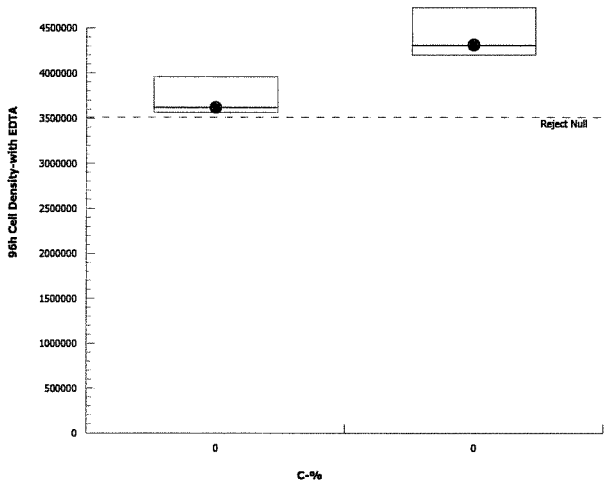
Distributional Tests

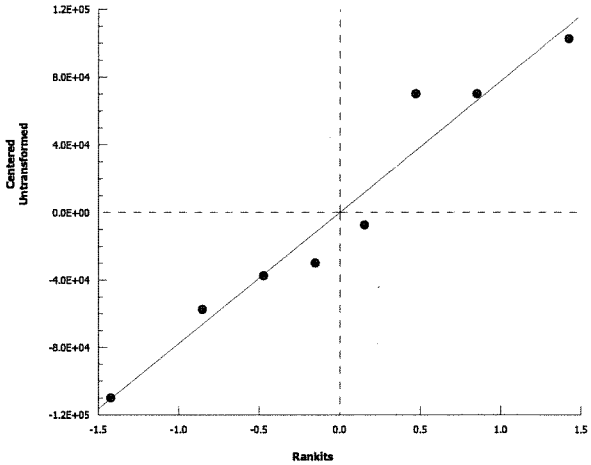
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	1.49	47.5	0.7500	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.938	0.645	0.5931	Normal Distribution

96h Cell Density-with EDTA Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	4.31E+6	4.17E+6	4.45E+6	3960000	4.20E+6	4.38E+6	4.36E+4	2.02%	0.0%
0	Hardness Blank	4	3.62E+6	3.50E+6	3.73E+6	3960000	3.56E+6	3.72E+6	3.57E+4	1.97%	16.1%

Graphics





Selenastrum capricornutum Algal Toxicity Test Data Sheet

Client: **Lehigh Permanente**
Test Start Date: 9/10/13
Test End Date: 9/14/13
Sample ID: Hardness Blank
Test ID #: -
Control/Diluent: Type 1 Water w/ EDTA
Project #: 21442
Shelf #: R251

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Hardness Blank	25.6	8.00	9.2	1444	Date: 9/10/13
					Sample ID #: 32594
					Test Solution Prep: Le
					New WQ: Ok
					Inoculation Time: 1619
Meter ID	06	pH19	RD05	EC04	Innoculation Signoff: Le
Hardness Blank	25.7	8.02			Date: 9-11-13
					WQ Time: 09.00
Meter ID	06	Ph 19			WQ Signoff: ML
Hardness Blank	25.5	8.18			Date: 9/12/13
					WQ Time: CP ~~CP~~ 0852
Meter ID	06	PH16			WQ Signoff: CP ~~0852~~ CP
Hardness Blank	25.5	8.68			Date: 9/13/13
					WQ Time: 0900
Meter ID	06	PH16			WQ Signoff: NF
Hardness Blank	25.5	9.14	12.6	1290	Date: 9/14/13
					WQ Time: 1030
Meter ID	06	pH15	RD06	EC07	WQ Signoff: OR

Initial Count: 10,000 cells/mL
Termination Time: 1615
Enumerating Scientist: KP

Treatment	Cell Density (cells/mL x 10^6)				Mean Cell Density (cells/mL x 10^6)
	Rep A	Rep B	Rep C	Rep D	
Hardness Blank	3.56	3.61	3.72	3.58	3.62

This datasheet has been reviewed for completeness and consistency with Test Acceptability Criteria and/or other issues of concern.	Control Mean Density (cells/mL x 10^6)	% CV	Date:	Time:	Signoff:
	3.62	1.97	9/14/13	1800	MK

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	128 ✓	587 ✓	391.5

Appendix F

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 9 Site Water to *Ceriodaphnia dubia*

CETIS Summary Report

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Batch ID:	04-4446-8350	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Padrick Anderson
Start Date:	10 Sep-13 13:30	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	16 Sep-13 16:00	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 2h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	10-7308-1469	**Code:**	Pond 9	**Client:**	Lehigh Permanente
Sample Date:	09 Sep-13 12:15	**Material:**	Effluent	**Project:**	21442
Receive Date:	09 Sep-13 14:30	**Source:**	Lehigh Permanente		
Sample Age:	25h (2.6 °C)	**Station:**	Pond 9		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
10-8957-9150	Reproduction	50	100	70.71	26.5%	2	Wilcoxon/Bonferroni Adj Test
12-1542-6514	Reproduction	<0	0		21.6%		Wilcoxon Rank Sum Two-Sample Test
19-9076-0978	Survival	0	>0		NA		Fisher Exact Test
07-5495-4886	Survival	100	>100	NA	NA	1	Fisher Exact/Bonferroni-Holm Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
10-2869-9346	Reproduction	IC5	53.6	2.5	62.3	1.865	Linear Interpolation (ICPIN)
		IC10	61.9	5	76.1	1.616	
		IC15	70.1	17	90.4	1.426	
		IC20	78.4	57	N/A	1.276	
		IC25	86.7	63.1	N/A	1.154	
		IC40	>100	N/A	N/A	<1	
		IC50	>100	N/A	N/A	<1	

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	10	7.5	5.77	9.23	0	13	1.46	4.62	61.7%	0.0%
0	Lab Water Contr	10	33.3	28.7	37.9	0	44	3.88	12.3	36.9%	-344.0%
6.25		9	34	32.8	35.2	29	40	1.05	3.16	9.3%	-353.0%
12.5		10	35.8	34.4	37.2	29	42	1.22	3.85	10.8%	-377.0%
25		10	31.2	27.5	34.9	4	38	3.1	9.8	31.4%	-316.0%
50		10	35.6	34	37.2	27	42	1.32	4.17	11.7%	-375.0%
100		10	23	19.1	26.9	2	39	3.31	10.5	45.5%	-207.0%

Survival Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	10	0.8	0.643	0.957	0	1	0.133	0.422	52.7%	0.0%
0	Lab Water Contr	10	0.9	0.782	1	0	1	0.1	0.316	35.1%	-12.5%
6.25		9	1	1	1	1	1	0	0	0.0%	-25.0%
12.5		10	1	1	1	1	1	0	0	0.0%	-25.0%
25		10	1	1	1	1	1	0	0	0.0%	-25.0%
50		10	1	1	1	1	1	0	0	0.0%	-25.0%
100		10	0.9	0.782	1	0	1	0.1	0.316	35.1%	-12.5%

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Reproduction Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Hardness Blank	10	7	6	10	12	0	6	11	0	13
0	Lab Water Contr	38	35	32	44	0	35	38	32	41	38
6.25		29	36	31	35	35	34	34	32	40	
12.5		37	33	29	34	32	37	36	39	42	39
25		31	32	36	34	36	32	34	4	35	38
50		42	36	38	34	27	38	39	32	36	34
100		31	24	12	26	2	28	16	27	39	25

Survival Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Hardness Blank	1	1	0	1	1	0	1	1	1	1
0	Lab Water Contr	1	1	1	1	0	1	1	1	1	1
6.25		1	1	1	1	1	1	1	1	1	
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	0	1	1	1	1	1

Survival Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Hardness Blank	1/1	1/1	0/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1
0	Lab Water Contr	1/1	1/1	1/1	1/1	0/1	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	
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	0/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	07-5495-4886	**Endpoint:**	Survival	**CETIS Version:**	CETISv1.8.5
Analyzed:	17 Sep-13 9:36	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU
Untransformed		C > T	NA	NA	100	>100	NA	1

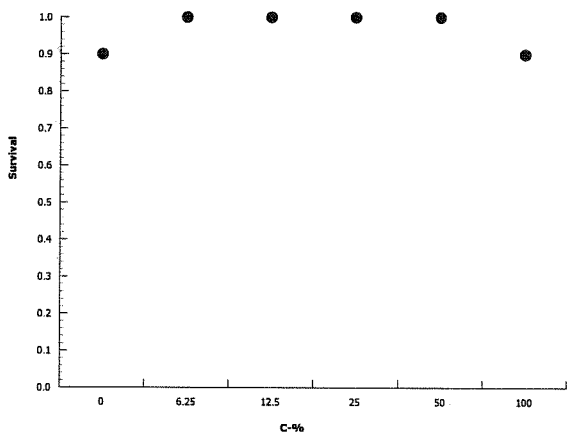
Fisher Exact/Bonferroni-Holm Test

Control	vs	C-%	Test Stat	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	1	1.0000	Exact	Non-Significant Effect
		12.5	1	1.0000	Exact	Non-Significant Effect
		25	1	1.0000	Exact	Non-Significant Effect
		50	1	1.0000	Exact	Non-Significant Effect
		100	0.763	1.0000	Exact	Non-Significant Effect

Data Summary

C-%	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Lab Water Cont	9	1	10	0.9	0.1	0.0%
6.25		9	0	9	1	0	-11.1%
12.5		10	0	10	1	0	-11.1%
25		10	0	10	1	0	-11.1%
50		10	0	10	1	0	-11.1%
100		9	1	10	0.9	0.1	0.0%

Graphics



Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	10-8957-9150	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.5
Analyzed:	17 Sep-13 9:36	**Analysis:**	Nonparametric-Multiple Comparison	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	26.5%	50	100	70.71	2

Wilcoxon/Bonferroni Adj Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	76	NA	2	17	0.6589	Exact	Non-Significant Effect
		12.5	104	NA	1	18	1.0000	Exact	Non-Significant Effect
		25	87.5	NA	3	18	0.4727	Exact	Non-Significant Effect
		50	104	NA	2	18	1.0000	Exact	Non-Significant Effect
		100*	72	NA	0	18	0.0266	Exact	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1142.469	228.4939	5	3.38	0.0100	Significant Effect
Error	3577.7	67.50378	53			
Total	4720.169		58			

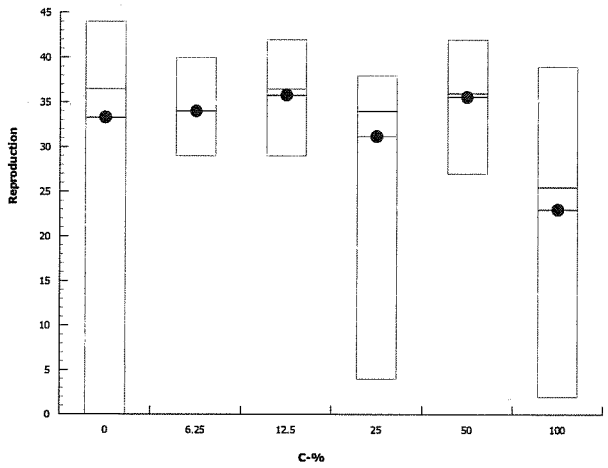
Distributional Tests

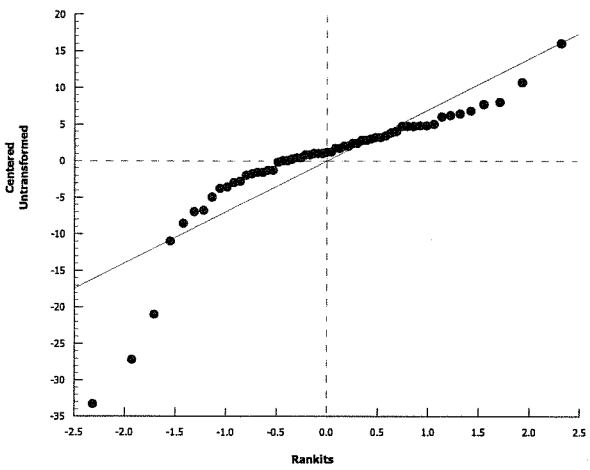
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	25.2	15.1	0.0001	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.783	0.945	<0.0001	Non-normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	10	33.3	24.5	42.1	36.5	0	44	3.88	36.9%	0.0%
6.25		9	34	31.6	36.4	34	29	40	1.05	9.3%	-2.1%
12.5		10	35.8	33	38.6	36.5	29	42	1.22	10.8%	-7.51%
25		10	31.2	24.2	38.2	34	4	38	3.1	31.4%	6.31%
50		10	35.6	32.6	38.6	36	27	42	1.32	11.7%	-6.91%
100		10	23	15.5	30.5	25.5	2	39	3.31	45.5%	30.9%

Graphics





CETIS Analytical Report

Report Date:	17 Sep-13 09:36 (p 1 of 1)
Test Code:	52990 | 18-5989-6843

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	10-2869-9346	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.5
Analyzed:	17 Sep-13 9:36	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	123800	200	Yes	Two-Point Interpolation

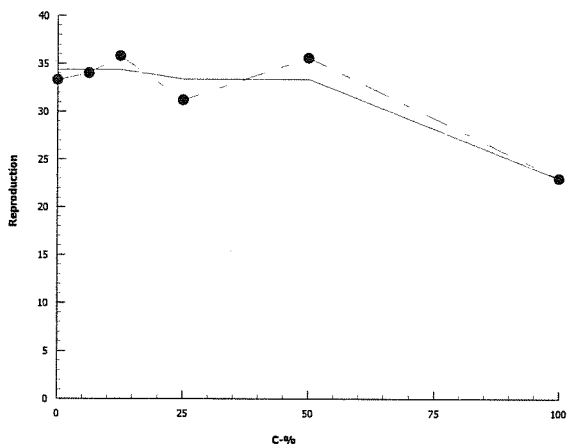
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	53.6	2.5	62.3	1.865	1.606	40.03
IC10	61.9	5	76.1	1.616	1.314	20.02
IC15	70.1	17	90.4	1.426	1.107	5.875
IC20	78.4	57	N/A	1.276	NA	1.753
IC25	86.7	63.1	N/A	1.154	NA	1.585
IC40	>100	N/A	N/A	<1	NA	NA
IC50	>100	N/A	N/A	<1	NA	NA

Reproduction Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contro	10	33.3	0	44	3.88	12.3	36.9%	0.0%
6.25		9	34	29	40	1.05	3.16	9.3%	-2.1%
12.5		10	35.8	29	42	1.22	3.85	10.8%	-7.51%
25		10	31.2	4	38	3.1	9.8	31.4%	6.31%
50		10	35.6	27	42	1.32	4.17	11.7%	-6.91%
100		10	23	2	39	3.31	10.5	45.5%	30.9%

Graphics



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Lehigh Permanente** Material: **Pond 9** Test Date: 9/10/13

Project #: 21442 Test ID: 52990 Randomization: 10.7.1 Control Water: Modified EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	A	B	C	D	E	F	G	H	I	J	SIGN-OFF
Lab Water Control	0	7.93		7.4		346	25.9	0	0	0	0	0	0	0	0	0	0	Date: 9/10/13 New WQ: Sol'n Prep: New WQ: Test Init.: Time: 1330
	1	8.08	7.91	7.0	~~8.2~~ 6.7	346	25.7	0	0	0	0	0	0	0	0	0	0	Date: 9-11-13 New WQ: Sol'n Prep: Old WQ: Counts: Time: 1405
	2	7.78	8.02	7.4	5.8	345	25.4	0	0	0	0	0	0	0	0	0	0	Date: 9-12-13 New WQ: GG Sol'n Prep: Old WQ: JLA Counts: SH Time: 1330
	3	7.97	8.02	7.9	7.2	349	25.5	4	3	3	6	0	4	5	0	6	4	Date: 9/13/13 New WQ: Sol'n Prep: Old WQ: Counts: DS Time: 1600
	4	7.98	7.84	7.7	7.9	348	25.3	14	13	9	14	~~0~~	12	12	12	12	13	Date: 9/14/13 New WQ: FOUR Sol'n Prep: Old WQ: DS Counts: DS Time: 1430
	5	7.83	7.95	8.5	4.2	376	25.2	0	0	0	0	–	19	0	0	0	0	Date: 9-15-13 New WQ: GG Sol'n Prep: Old WQ: GG Counts: SS Time: 1355
	6	—	7.93	—	4.1	385	25.5	20	19	20	24	–	21*	21	20	23	21	Date: 9/16/13 New WQ: — Sol'n Prep: — Old WQ: KB Counts: Time: 1400
	7											–						Date: New WQ: Sol'n Prep: Old WQ: Counts: Time:
	8											–						Date: Old WQ: Counts: Time:
							Total=	38	35	32	44	~~0~~	35	38	32	41	38	Mean Neonates/Female = 33.3

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	A	B	C	D	E	F	G	H	I	J	Sample ID
6.25%	0	7.88		7.5		432	0	0	0	0	0	0	0	0	0	0	32680
	1	8.05	8.08	7.0	7.8	459	~~0~~	0	0	0	0	0	0	0	0	0	32680
	2	7.79	8.02	7.6	6.8	429	–	0	0	0	0	0	0	0	0	0	32724
	3	7.97	8.04	8.0	7.4	436	–	3	4	5	2	3	4	4	5	4	32724
	4	7.94	7.86	7.6	7.7	429	–	8	14	13	11	14	10	10	12	12	32748
	5	7.91	7.93	8.4	4.8	437	–	0	0	11	0	18	0	18	0	0	32748
	6	—	7.96	—	5.6	474	–	18	18	2	22	0	20	2	15	24	—
	7						–										
	8						–										
							Total= ~~0~~	29	36	31	35	35	34	34	32	40	Mean Neonates/Female = ~~30.6~~ 34.0

* fourth brood exclude from stats

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Lehigh Permanente** Material: **Pond 9** Test Date: 9/10/13

Project #: 21442 Test ID: 52990 Control Water: Modified EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	A	B	C	D	E	F	G	H	I	J	SIGN-OFF
12.5%	0	7.85		7.3		519		0	0	0	0	0	0	0	0	0	0	
	1	7.97	8.03	7.2	7.2	499		0	0	0	0	0	0	0	0	0	0	
	2	7.81	8.05	7.6	6.0	505		0	0	0	0	0	0	0	0	0	0	
	3	7.95	8.12	8.1	7.7	512		4	6	5	4	4	6	5	6	6	6	
	4	7.90	7.91	7.7	7.9	511		12	12	15	11	10	12	12	15	14	14	
	5	7.91	8.00	8.5	4.0	496		0	0	0	19	0	19	15	15	0	0	
	6	—	8.01	—	6.1	538		21	15	9	0	18	0	4	3	22	19	
	7																	
	8																	
							Total=	37	33	29	34	32	37	36	39	42	39	Mean Neonates/Female = 35.8

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)		A	B	C	D	E	F	G	H	I	J	
25%	0	7.79		7.6		647		0	0	0	0	0	0	0	0	0	0	
	1	7.89	8.09	7.2	7.5	655		0	0	0	0	0	0	0	0	0	0	
	2	7.80	8.11	7.7	6.3	653		0	0	0	0	0	0	0	0	0	0	
	3	7.91	8.20	8.2	7.2	665		0	0	5	5	7	6	5	4	6	6	
	4	7.85	8.02	7.7	7.7	664		13	14	13	11	12	10	12	0	9	10	
	5	7.86	8.11	8.7	4.6	654		0	0	0	0	14	16	17	0	0	0	
	6	—	8.07	—	5.3	702		18	18	18	18	3	0	0	0	20	22	
	7																	
	8																	
							Total=	31	32	36	34	36	32	34	4	35	38	Mean Neonates/Female = 31.2

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Lehigh Permanente** Material: **Pond 9** Test Date: 9/10/13

Project #: 21442 Test ID: 52990 Control Water: Modified EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	A	B	C	D	E	F	G	H	I	J	SIGN-OFF
50%	0	7.75		7.9		908		0	0	0	0	0	0	0	0	0	0	
	1	7.83	8.20	7.5	7.6	917		0	0	0	0	0	0	0	0	0	0	
	2	7.84	8.27	7.9	6.1	915		0	0	0	0	0	0	0	0	0	0	
	3	7.87	8.34	8.5	7.3	945		5	6	4	5	4	5	5	4	5	4	
	4	7.80	8.18	7.7	7.8	919		~~20~~ 15	13	14	12	13	16	15	13	0	12	
	5	7.81	8.23	9.0	5.8	909		0	0	0	0	10	0	0	15	9	0	
	6	—	8.26	—	5.6	995		22	17	20	17	0	17	19	0	22	18	
	7																	
	8																	
							Total=	42	36	38	34	27	38	39	32	36	34	Mean Neonates/Female = 35.6

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)		A	B	C	D	E	F	G	H	I	J	
100%	0	7.61		8.7		~~1410~~ 1417		0	0	0	0	0	0	0	0	0	0	
	1	7.74	8.16	8.5	~~8.7~~ 8.6	1400		0	0	0	0	0	0	0	0	0	0	
	2	7.76	8.21	8.0	6.4	1396		0	0	0	0	0	0	0	0	0	0	
	3	7.81	8.25	9.3	7.4	1423		5	4	0	5	2	5	4	4	6	3	
	4	7.68	8.13	7.8	7.8	1405		10	10	12	11	0	12	0	13	13	12	
	5	7.69	8.18	9.2	5.2	1388		0	10	0	10	X/0	0	0	10	0	0	
	6	—	8.29	—	4.2	1502		16	6	0	0	-	11	12	0	20	10	
	7											-						
	8											-						
							Total=	31	24	12	26	X/2	28	16	27	39	25	Mean Neonates/Female = 23.0

CETIS Analytical Report

Report Date: 17 Sep-13 09:36 (p 1 of 2)
Test Code: 52990 | 18-5989-6843

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	19-9076-0978	**Endpoint:**	Survival	**CETIS Version:**	CETISv1.8.5
Analyzed:	17 Sep-13 9:35	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	Test Result
Untransformed		C > T	NA	NA	Passes survival

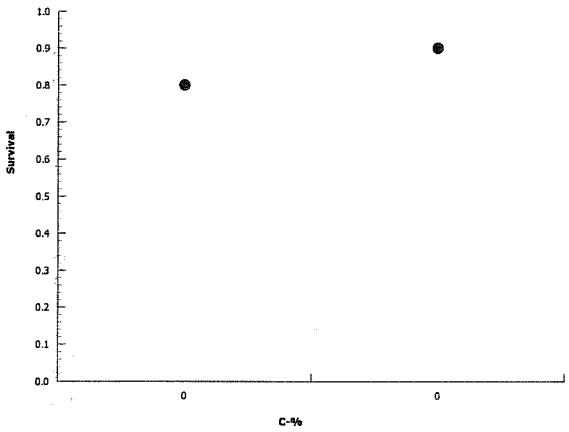
Fisher Exact Test

Control	vs	Control	Test Stat	P-Value	P-Type	Decision(α:5%)
Lab Water Control		Hardness Blank	0.5	0.5000	Exact	Non-Significant Effect

Data Summary

C-%	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Hardness Blank	8	2	10	0.8	0.2	11.1%
0	Lab Water Cont	9	1	10	0.9	0.1	0.0%

Graphics



CETIS Analytical Report

Report Date: 17 Sep-13 09:36 (p 1 of 2)
Test Code: 52990 | 18-5989-6843

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	12-1542-6514	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.5
Analyzed:	17 Sep-13 9:35	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	21.6%	Fails reproduction

Wilcoxon Rank Sum Two-Sample Test

Control	vs	Control	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		Hardness Blank	64	NA	1	18	0.0005	Exact	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3328.2	3328.2	1	38.6	<0.0001	Significant Effect
Error	1550.6	86.14445	18			
Total	4878.8		19			

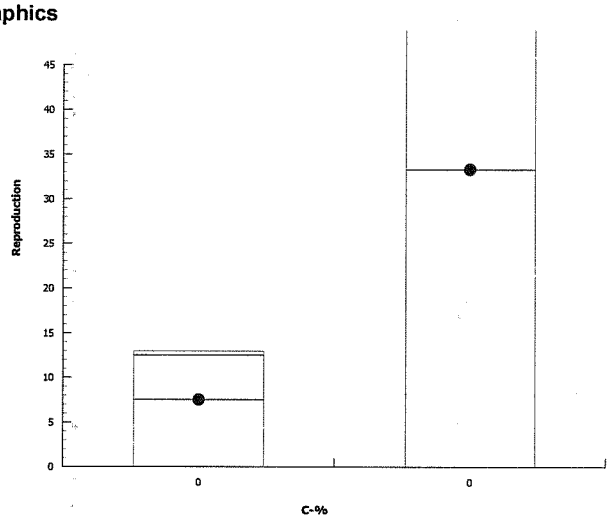
Distributional Tests

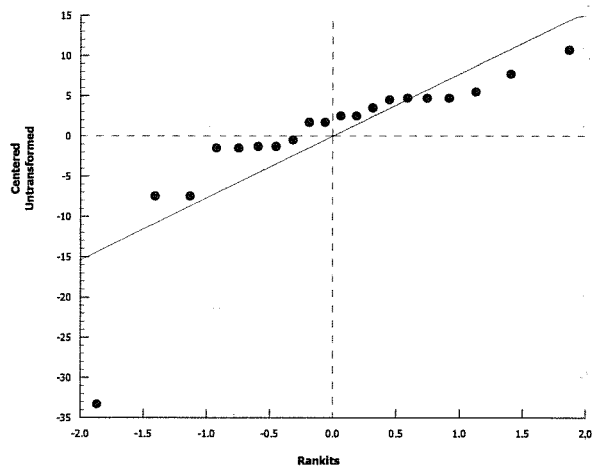
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	7.06	6.54	0.0076	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.707	0.866	<0.0001	Non-normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	10	33.3	24.5	42.1	12.5	0	44	3.88	36.9%	0.0%
0	Hardness Blank	10	7.5	4.19	10.8	12.5	0	13	1.46	61.7%	77.5%

Graphics





Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Lehigh Permanente** Material: **Hardness Control** Test Date: 9/10/13

Project #: 21442 Test ID: 52990 Randomization: 10.7.1 Control Water: Modified EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	A	B	C	D	E	F	G	H	I	J	SIGN-OFF
Hardness Control	0	8.09		9.8		1370	25.9	0	0	0	0	0	0	0	0	0	0	Date: 9.10.13 New WQ: Test Init.: Sol'n Prep: PO Time: 1330
	1	7.95	8.11	8.5	7.9	1336	25.7	0	0	0	0	0	0	0	0	0	0	Date: 9-11-13 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1405
	2	7.97	8.25	8.6	6.5	1340	25.4	0	0	0	0	0	0	0	0	0	0	Date: 9-12-13 New WQ: GG Counts: SM Sol'n Prep: Old WQ: JLA Time: 1330
	3	8.01	8.25	9.5	7.3	1383	25.5	0	0	0	0	0	X/0	0	0	0	0	Date: 9/13/13 New WQ: Counts: DS Sol'n Prep: Old WQ: DH Time: 1600
	4	8.03	8.18	8.9	7.9	1396	25.3	0	0	0	0	0	–	0	0	0	2	Date: 9/14/13 New WQ: Counts: DS Sol'n Prep: Old WQ: DS Time: 1630
	5	7.95	8.20	10.3	4.0	1336	25.2	0	0	0	0	0	–	6	11	0	0	Date: 9-15-13 New WQ: GG Counts: SS Sol'n Prep: Old WQ: GG Time: 1355
	6	–	8.26	–	6.3	1471	25.5	10	7	X/6	10	12	–	0	0	0	11	Date: 9/16/13 New WQ: – Counts: Sol'n Prep: – Old WQ: KB Time: 1600
	7												–					Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
	8												–					Date: Old WQ: Counts: Sol'n Prep: Time:
							Total=	10	7	X/6	10	12	X/0	6	11	0	13	Mean Neonates/Female = 7.5

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: Lehigh Permanente Material: Meter IDs Test Date: 9/10/13

Project #: 21442 Test ID: 52990 Control Water: Modified EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	SIGN-OFF Date	New WQ	Old WQ
Meter ID's	0	pH16		RD07		EC07	30A	9/10/13	AE	
	1	pH16	pH16	RD07	RD07	EC07	30A	9-11-13	AE	AE
	2	PH15	pH15	RD07	RD07	EC06	30A	9/12/13	GG	JLA
	3	pH19	PH19	RD06	RD06	EC06	30A	9/13/13	AE	AH
	4	PH19	pH15	RD05	RD06	EC04	30A	9/14/13	FOVB	DS
	5	PH16	PH19	RD06	RD07	EC04	30A	9-15-13	GG	GG
	6	—	pH16	—	RD07	EC04	30A	9/16/13	—	KB
	7									
	8									

Appendix G

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 4A Site Water to Fathead Minnows

CETIS Summary Report

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Batch ID:	14-1016-1067	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Padrick Anderson
Start Date:	10 Sep-13 15:20	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	17 Sep-13 08:30	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 17h	**Source:**	Aquatox, AR	**Age:**	1

Sample ID:	19-9035-0812	**Code:**	Pond 4A	**Client:**	Lehigh Permanente
Sample Date:	09 Sep-13 10:49	**Material:**	Effluent	**Project:**	21442
Receive Date:	09 Sep-13 14:30	**Source:**	Lehigh Permanente		
Sample Age:	29h (2.1 °C)	**Station:**	Pond 4A		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
04-7778-5420	7d Survival Rate	100	>100	NA	8.33%	1	Steel Many-One Rank Sum Test
17-4216-5583	7d Survival Rate	0	>0		5.24%		Wilcoxon Rank Sum Two-Sample Test
00-1605-6742	Mean Dry Biomass-mg	0	>0		13.1%		Equal Variance t Two-Sample Test
00-1375-7650	Mean Dry Biomass-mg	100	>100	NA	13.7%	1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
02-2839-3498	Mean Dry Biomass-mg	IC5	>100	N/A	N/A	<1	Linear Interpolation (ICPIN)
		IC10	>100	N/A	N/A	<1	
		IC15	>100	N/A	N/A	<1	
		IC20	>100	N/A	N/A	<1	
		IC25	>100	N/A	N/A	<1	
		IC40	>100	N/A	N/A	<1	
		IC50	>100	N/A	N/A	<1	

7d Survival Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	4	1	1	1	1	1	0	0	0.0%	0.0%
0	Lab Water Contr	4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	2.5%
6.25		4	0.95	0.928	0.972	0.9	1	0.0289	0.0577	6.08%	5.0%
12.5		4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	2.5%
25		4	1	1	1	1	1	0	0	0.0%	0.0%
50		4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	2.5%
100		4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	2.5%

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	4	0.933	0.901	0.966	0.866	1.05	0.0435	0.087	9.32%	0.0%
0	Lab Water Contr	4	0.948	0.913	0.983	0.875	1.08	0.0465	0.093	9.81%	-1.56%
6.25		4	0.883	0.857	0.909	0.806	0.972	0.0347	0.0695	7.87%	5.44%
12.5		4	0.963	0.932	0.993	0.911	1.09	0.041	0.0821	8.53%	-3.13%
25		4	0.901	0.87	0.931	0.79	0.982	0.0404	0.0807	8.97%	3.53%
50		4	0.881	0.852	0.909	0.815	0.984	0.0384	0.0768	8.73%	5.68%
100		4	0.946	0.928	0.965	0.881	0.992	0.0248	0.0497	5.25%	-1.39%

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	1	1	1	1
0	Lab Water Contr	1	1	0.9	1
6.25		0.9	0.9	1	1
12.5		0.9	1	1	1
25		1	1	1	1
50		1	1	0.9	1
100		1	1	0.9	1

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	0.95	1.05	0.866	0.868
0	Lab Water Contr	1.08	0.903	0.875	0.931
6.25		0.893	0.86	0.806	0.972
12.5		0.911	0.92	1.09	0.935
25		0.982	0.79	0.927	0.903
50		0.83	0.984	0.893	0.815
100		0.977	0.936	0.881	0.992

7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	10/10	10/10	10/10	10/10
0	Lab Water Contr	9/9	10/10	9/10	10/10
6.25		9/10	9/10	10/10	10/10
12.5		9/10	10/10	10/10	10/10
25		10/10	10/10	10/10	10/10
50		10/10	10/10	9/10	10/10
100		10/10	10/10	9/10	10/10

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	04-7778-5420	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	19 Sep-13 15:47	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	8.33%	100	>100	NA	1

Steel Many-One Rank Sum Test

Control vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control	6.25	16	10	2	6	0.6105	Asymp	Non-Significant Effect
	12.5	18	10	2	6	0.8333	Asymp	Non-Significant Effect
	25	20	10	1	6	0.9516	Asymp	Non-Significant Effect
	50	18	10	2	6	0.8333	Asymp	Non-Significant Effect
	100	18	10	2	6	0.8333	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.01329532	0.002659064	5	0.453	0.8054	Non-Significant Effect
Error	0.1055874	0.005865965	18			
Total	0.1188827		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	0.617	4.25	0.6887	Equal Variances
Variances	Levene Equality of Variance	2.81	4.25	0.0480	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.781	0.884	0.0001	Non-normal Distribution

7d Survival Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	0.975	0.895	1	1	0.9	1	0.025	5.13%	0.0%
6.25		4	0.95	0.858	1	0.95	0.9	1	0.0289	6.08%	2.56%
12.5		4	0.975	0.895	1	1	0.9	1	0.025	5.13%	0.0%
25		4	1	1	1	1	1	1	0	0.0%	-2.56%
50		4	0.975	0.895	1	1	0.9	1	0.025	5.13%	0.0%
100		4	0.975	0.895	1	1	0.9	1	0.025	5.13%	0.0%

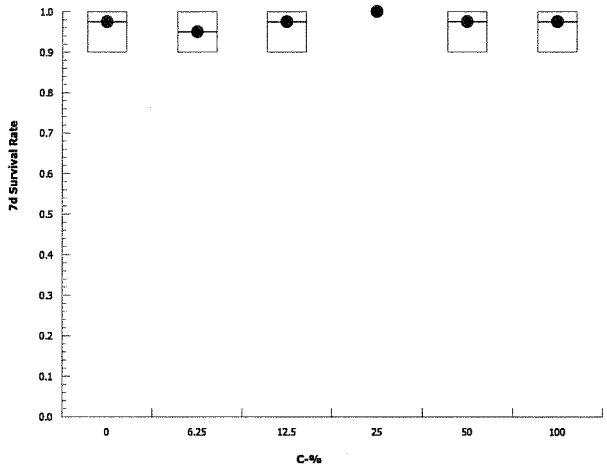
Angular (Corrected) Transformed Summary

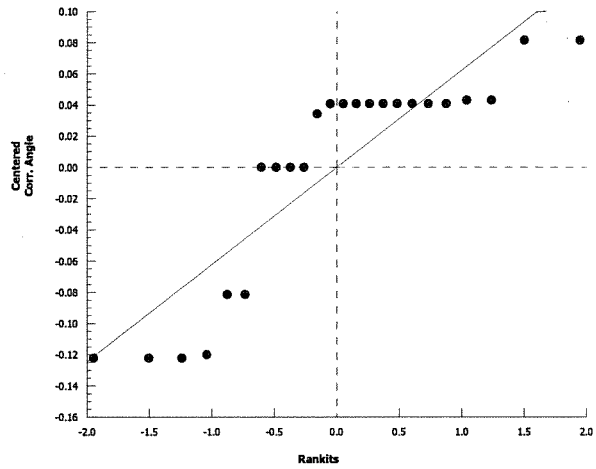
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Cont	4	1.37	1.24	1.5	1.41	1.25	1.41	0.0401	5.85%	0.0%
6.25		4	1.33	1.18	1.48	1.33	1.25	1.41	0.047	7.07%	2.82%
12.5		4	1.37	1.24	1.5	1.41	1.25	1.41	0.0407	5.94%	-0.16%
25		4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	-3.13%
50		4	1.37	1.24	1.5	1.41	1.25	1.41	0.0407	5.94%	-0.16%
100		4	1.37	1.24	1.5	1.41	1.25	1.41	0.0407	5.94%	-0.16%

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	04-7778-5420	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	19 Sep-13 15:47	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Graphics





7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Lehigh Permanente**
Test Material: Pond 4A
Test ID#: 52991 Project #: 21442
Test Date: 9-10-13 Randomization: 6.4.1

Organism Log#: ~~7814~~ 7515 Age: <48h
Organism Supplier: Aquatox
Control/Diluent: EPAMH
Control Water Batch: 1618

Treatment (%)	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. old	Conductivity (µs/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Water	25.3	8.07		8.1		300	~~10~~ 9	10	10	10	Date: 9-10-13
6.25	25.3	8.07		8.0		364	10	10	10	10	Sample ID: 32678
12.5	25.3	8.07		8.1		413	10	10	10	10	Test Solution Prep: [illegible]
25	25.3	8.07		8.2		527	10	10	10	10	New WQ: NL
50	25.3	8.02		8.1		723	10	10	10	10	Initiation Time: 1520
100	25.3	8.01		8.5		1067	10	10	10	10	Initiation Signoff: [illegible]
Meter ID	30A	PH19		RD05		EC04					
Lab Water	25.7	8.06	7.77	7.7	7.4	298	9	10	10	10	Date: 9-11-13
6.25	25.7	7.98	7.83	7.9	7.4	351	10	10	10	10	Sample ID: 32678
12.5	25.7	8.01	7.83	8.1	7.0	411	10	10	10	10	Test Solution Prep: [illegible]
25	25.7	7.99	7.83	8.2	6.9	515	10	10	10	10	New WQ: JLA
50	25.7	7.98	7.80	8.7	7.1	713	10	10	10	10	Renewal Time: 1315
100	25.7	8.00	7.82	9.7	7.1	1086	10	10	10	10	Renewal Signoff: SM
Meter ID	30A	PH19	PH15	RD06	RD04	EC04					Old WQ: KP
Lab Water	25.5	8.16	7.92	8.4	6.3	306	9	10	9	10	Date: 9-12-13
6.25	25.5	8.11	7.86	8.5	6.2	361	9	10	10	10	Sample ID: 32722
12.5	25.5	8.11	7.83	8.5	6.4	417	10	10	10	10	Test Solution Prep: [illegible]
25	25.5	8.08	7.80	8.6	6.7	522	10	10	10	10	New WQ: GG
50	25.5	8.04	7.86	8.9	5.6	715	10	10	10	10	Renewal Time: 1000
100	25.5	8.05	7.82	9.7	6.4	1077	10	10	10	10	Renewal Signoff: [illegible]
Meter ID	30A	PH15	PH15	RD07	RD07	EC06					Old WQ: GG
Lab Water	25.7	8.19	7.95	8.7	8.0	303	9	10	9	10	Date: 9/13/13
6.25	25.7	8.20	7.95	8.4	8.0	359	9	10	10	10	Sample ID: 32722
12.5	25.7	8.17	7.90	8.5	7.9	422	10	10	10	10	Test Solution Prep: [illegible]
25	25.7	8.16	7.90	8.8	7.8	522	10	10	10	10	New WQ: OE
50	25.7	8.13	7.92	8.9	7.7	726	10	10	10	10	Renewal Time: 1105
100	25.7	8.13	7.94	9.6	7.2	1077	10	10	10	10	Renewal Signoff: [illegible]
Meter ID	30A	PH19	PH19	RD06	RD06	EC06					Old WQ: OE

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Lehigh Permanente**
Test Material: Pond 4A
Test ID#: 52991 Project #: 21442
Test Date: 9-10-13 Randomization: 6.4.1

Organism Log#: 7819 7519 Age: <48h
Organism Supplier: Aquatox
Control/Diluent: EPAMH
Control Water Batch: 1618

Treatment (%)	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Conductivity (µs/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Water	25.4	7.97	8.05	8.4	8.2	302	9	10	9	10	Date: 9/14/13
6.25	25.4	8.05	8.02	8.3	8.1	360	9	10	10	10	Sample ID: 32746
12.5	25.4	8.08	7.95	8.3	7.9	412	9	10	10	10	Test Solution Prep: [illegible]
25	25.4	8.07	7.92	8.6	7.9	522	10	10	10	10	New WQ: FOB
50	25.4	8.07	7.91	8.4	7.9	721	10	10	10	10	Renewal Time: 0905
100	25.4	8.06	7.96	8.2	7.9	~~105~~ FOB 1076	10	10	9	10	Renewal Signoff: SS
Meter ID	30A	PH19	PH15	RD05	RD06	EC04					Old WQ: FOB
Lab Water	25.2	7.92	8.00	8.3	8.0	302	9	10	9	10	Date: 9.15.13
6.25	25.2	8.05	7.94	8.4	8.1	359	9	10	10	10	Sample ID: 32746
12.5	25.2	8.06	7.92	8.4	8.0	419	9	10	10	10	Test Solution Prep: [illegible]
25	25.2	8.05	7.90	8.5	7.9	524	10	10	10	10	New WQ: CP
50	25.2	8.03	7.93	8.5	8.0	716	10	10	10	10	Renewal Time: 1015
100	25.2	8.01	7.94	9.1	8.0	1070	10	10	9	10	Renewal Signoff: SS
Meter ID	30A	PH19	PH19	RD07	RD07	EC07					Old WQ: CP
Lab Water	25.6	8.16	7.77	8.2	7.6.4	306	9	10	9	10	Date: 9.16.13
6.25	25.6	8.11	7.73	8.2	6.5	377	9	9	10	10	Sample ID: 32746
12.5	25.6	8.10	7.69	8.4	6.4	417	9	10	10	10	Test Solution Prep: [illegible]
25	25.6	8.08	7.85	8.3	7.2	521	10	10	10	10	New WQ: [illegible]
50	25.6	8.05	7.87	8.6	7.3	718	10	10	10	10	Renewal Time: 1015
100	25.6	8.00	7.90	8.4	7.0	1066	10	10	9	10	Renewal Signoff: SVV
Meter ID	30A	PH16	PH19	RD05	RD05	EC06					Old WQ: PD
Lab Water	25.4		8.03		7.7	322	9	10	9	10	Date: 9/17/13
6.25	25.4		8.00		7.5	385	9	9	10	10	Sample ID: —
12.5	25.4		7.95		7.2	439	9	10	10	10	Termination Time: 0830
25	25.4		8.01		7.6	546	10	10	10	10	Termination Signoff: MF
50	25.4		8.03		7.6	762	10	10	9	10	Old WQ: [illegible]
100	25.4		8.05		7.4	1153	10	10	9	10	
Meter ID	30A		PH19		RD06	EC07					

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	00-1375-7650	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.5
Analyzed:	19 Sep-13 15:47	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	13.7%	100	>100	NA	1

Dunnett Multiple Comparison Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	1.21	2.41	0.13	6	0.3339	CDF	Non-Significant Effect
		12.5	-0.271	2.41	0.13	6	0.9008	CDF	Non-Significant Effect
		25	0.88	2.41	0.13	6	0.4758	CDF	Non-Significant Effect
		50	1.25	2.41	0.13	6	0.3175	CDF	Non-Significant Effect
		100	0.0293	2.41	0.13	6	0.8246	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.02658524	0.005317047	5	0.909	0.4971	Non-Significant Effect
Error	0.1053284	0.005851575	18			
Total	0.1319136		23			

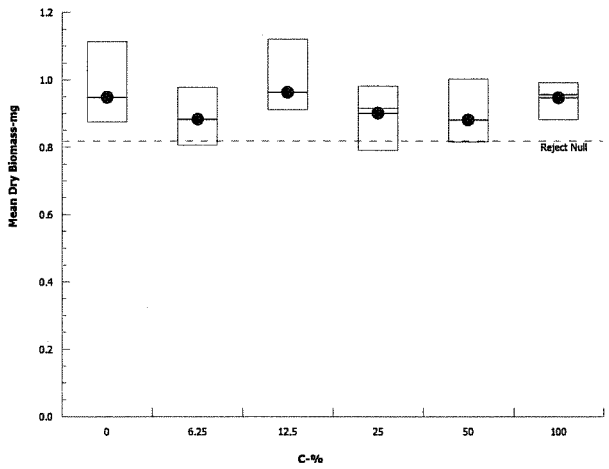
Distributional Tests

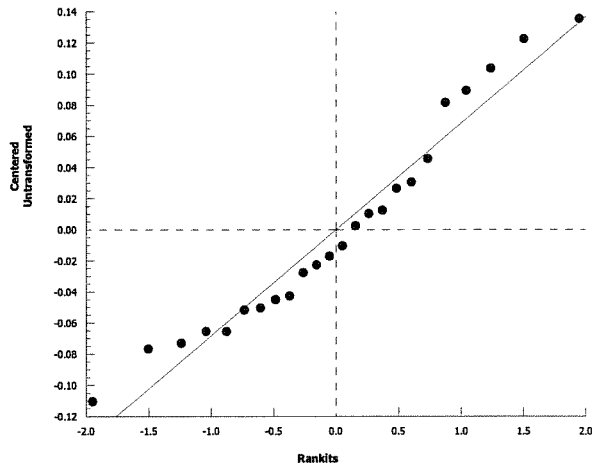
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	1.08	15.1	0.9558	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.949	0.884	0.2518	Normal Distribution

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	0.948	0.8	1.1	0.917	0.875	1.08	0.0465	9.81%	0.0%
6.25		4	0.883	0.772	0.993	0.877	0.806	0.972	0.0347	7.87%	6.89%
12.5		4	0.963	0.832	1.09	0.928	0.911	1.09	0.041	8.53%	-1.55%
25		4	0.901	0.772	1.03	0.915	0.79	0.982	0.0404	8.97%	5.02%
50		4	0.881	0.758	1	0.862	0.815	0.984	0.0384	8.73%	7.13%
100		4	0.946	0.867	1.03	0.956	0.881	0.992	0.0248	5.25%	0.17%

Graphics





CETIS Analytical Report

Report Date: 19 Sep-13 15:48 (p 1 of 1)
Test Code: 52991 | 16-9936-9078

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	02-2839-3498	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.5
Analyzed:	19 Sep-13 15:47	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	336225	200	Yes	Two-Point Interpolation

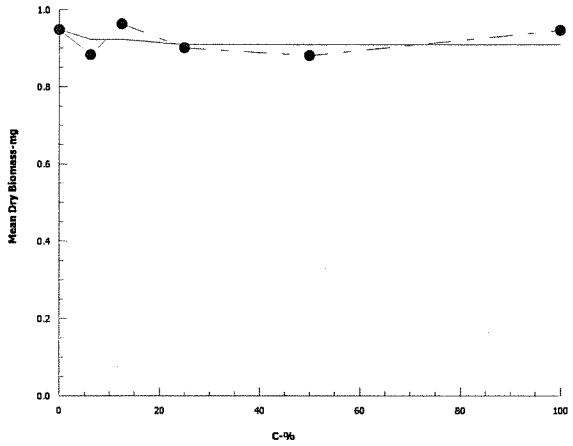
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>100	N/A	N/A	<1	NA	NA
IC10	>100	N/A	N/A	<1	NA	NA
IC15	>100	N/A	N/A	<1	NA	NA
IC20	>100	N/A	N/A	<1	NA	NA
IC25	>100	N/A	N/A	<1	NA	NA
IC40	>100	N/A	N/A	<1	NA	NA
IC50	>100	N/A	N/A	<1	NA	NA

Mean Dry Biomass-mg Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	4	0.948	0.875	1.08	0.0465	0.093	9.81%	0.0%
6.25		4	0.883	0.806	0.972	0.0347	0.0695	7.87%	6.89%
12.5		4	0.963	0.911	1.09	0.041	0.0821	8.53%	-1.55%
25		4	0.901	0.79	0.982	0.0404	0.0807	8.97%	5.02%
50		4	0.881	0.815	0.984	0.0384	0.0768	8.73%	7.13%
100		4	0.946	0.881	0.992	0.0248	0.0497	5.25%	0.17%

Graphics



Fathead Minnow Dry Weight Data Sheet

Client: **Lehigh Peranente** Test ID #: 52991 Project # 21442

Sample: ~~AB Effluent~~ Pond 4A Tare Weight Date: 9/15/13 Sign-off: CA

Test Date: 9/10/13 Final Weight Date: 9/18/13 Sign-off: JLA

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Control	A	151.81	161.56	~~10~~ 9 AB	1.083
2		B	147.87	156.90	10	0.903
3		C	170.48	179.23	10	0.8~~8~~75 AB
4		D	145.73	155.04	10	0.931
5	6.25	A	166.14	175.07	10	0.893
6		B	150.90	159.50	10	0.860
7		C	143.00	151.06	10	0.806
8		D	153.13	162.85	10	0.972
9	12.5	A	170.74	179.85	10	0.911
10		B	157.65	166.85	10	0.920
11		C	141.48	152.33	10	1.085
12		D	153.31	162.66	10	0.935
13	25	A	163.34	173.16	10	0.982
14		B	159.26	167.16	10	0.790
15		C	165.86	175.13	10	0.927
16		D	155.91	164.94	10	0.903
17	50	A	175.76	184.06	10	0.830
18		B	151.56	161.40	10	0.984
19		C	157.20	166.13	10	0.893
20		D	181.93	190.08	10	0.815
21	100	A	146.10	155.87	10	0.977
22		B	164.93	174.29	10	0.936
23		C	172.48	181.29	10	0.881
24		D	152.78	162.70	10	0.992
QA 1			144.73	144.76		
QA 2			145.14	145.17		
Balance ID			BAL01	BAL01		

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	17-4216-5583	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	19 Sep-13 15:47	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Angular (Corrected)	NA	C > T	NA	NA	5.24%	Passes 7d survival rate

Wilcoxon Rank Sum Two-Sample Test

Control	vs	Control	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		Hardness Blank	20	NA	1	6	1.0000	Exact	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.003682459	0.003682459	1	1.15	0.3254	Non-Significant Effect
Error	0.01926954	0.003211591	6			
Total	0.022952		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	1.24	13.7	0.3086	Equal Variances
Variances	Levene Equality of Variance	8.91	13.7	0.0245	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.725	0.645	0.0043	Non-normal Distribution

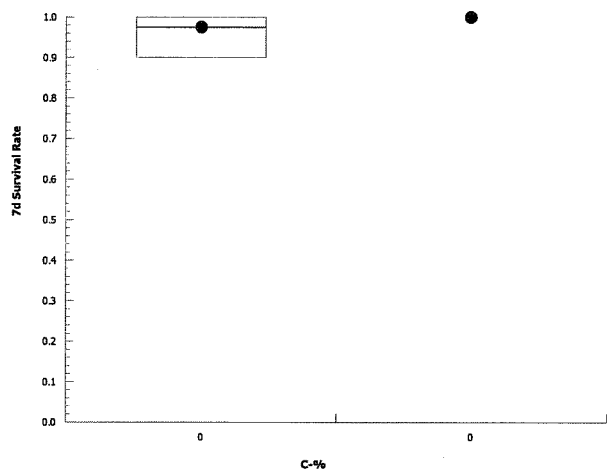
7d Survival Rate Summary

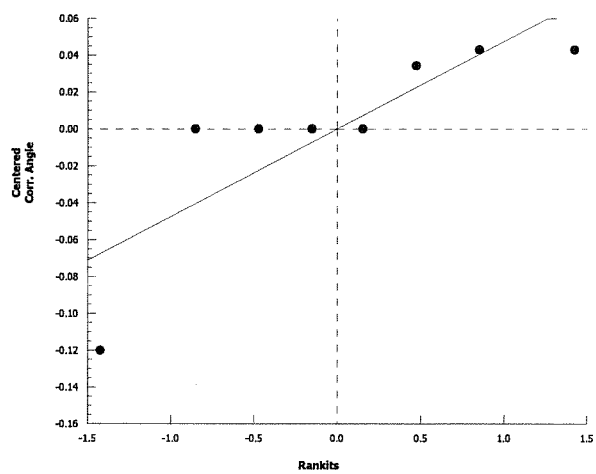
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	0.975	0.895	1	1	0.9	1	0.025	5.13%	0.0%
0	Hardness Blank	4	1	1	1	1	1	1	0	0.0%	-2.56%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Cont	4	1.37	1.24	1.5	1.41	1.25	1.41	0.0401	5.85%	0.0%
0	Hardness Blank	4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	-3.13%

Graphics





7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Lehigh Permanente**
Test Material: Hardness Blank
Test ID#: 52993 Project #: 21442
Test Date: 9-10-13 Randomization: 7-4-2

Organism Log#: 7519 Age: <48hrs
Organism Supplier: Aquatox
Control/Diluent: EPAMH
Control Water Batch: 1618

Test Treatment	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. old	Conductivity (µS/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Hardness Blank	25.1	8.10		9.7		1381	10	10	10	10	Date: PA 9.10.13
											Test Solution Prep: PA ~~32594~~
											Initiation Time: 1521
Meter ID	30A	pH15		RD06		EC06	New WQ: OG				Initiation Signoff: KW
Hardness Blank	25.9	8.05	8.07	9.9	7.3	1381	10	10	10	10	Date: 9-11-13
											Test Solution Prep: [illegible]
											Renewal Time: 1205
Meter ID	30A	pH15	pH15	RD06	RD07	EC04	New WQ: JLA		Old WQ: OG		Renewal Signoff: [illegible]
Hardness Blank	25.5	7.86	7.81	9.2	7.1	1359	10	10	10	10	Date: 9-12-13
											Test Solution Prep: [illegible]
											Renewal Time: 1115
Meter ID	30A	pH19	Ph19	RD05	RD06	EC04	New WQ: MO		Old WQ: [illegible]		Renewal Signoff: [illegible]
Hardness Blank	25.6	8.13	8.00	10.6	7.2	1381	10	10	10	10	Date: 9-13-13
											Test Solution Prep: KW
											Renewal Time: 1230
Meter ID	30A	pH19	PH16	RD06	RD05	EC06	New WQ: OG		Old WQ: DH		Renewal Signoff: KP
Hardness Blank	25.4	7.99	8.17	10.4	8.1	1386	10	10	10	10	Date: 9/14/13
											Test Solution Prep: KW
											Renewal Time: 0915
Meter ID	30A	PH19	pH19	RD05	RD05	EC04	New WQ: ~~JAB~~		Old WQ: OG		Renewal Signoff: KP
Hardness Blank	25.3	7.96	8.11	9.3	8.4	1345	10	10	10	10	Date: 9-15-13
											Test Solution Prep: [illegible]
											Renewal Time: 1015
Meter ID	30A	PH16	PH16	RD06	RD06	EC04	New WQ: GG		Old WQ: GG		Renewal Signoff: PA
Hardness Blank	25.4	8.05	8.10	9.5	7.3	1358	10	10	10	10	Date: 9-16-13
											Test Solution Prep: [illegible]
											Renewal Time: 1110
Meter ID	30A	pH16	pH19	RD05	RD05	EC06	New WQ: CA		Old WQ: [illegible]		Renewal Signoff: [illegible]
Hardness Blank	25.5		8.11		6.6	1432	10	10	10	10	Date: 9/17/13
											Termination Time: 0940
Meter ID	30A		pH19		RD07	EC07			Old WQ: OG		Termination Signoff: [illegible]

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	00-1605-6742	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.5
Analyzed:	19 Sep-13 15:47	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	13.1%	Passes mean dry biomass-mg

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		Hardness Blank	0.229	1.94	0.124	6	0.4132	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0004253708	0.0004253708	1	0.0525	0.8264	Non-Significant Effect
Error	0.04864935	0.008108226	6			
Total	0.04907472		7			

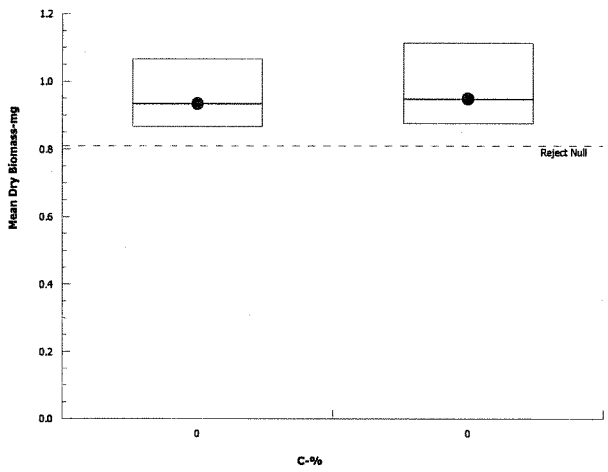
Distributional Tests

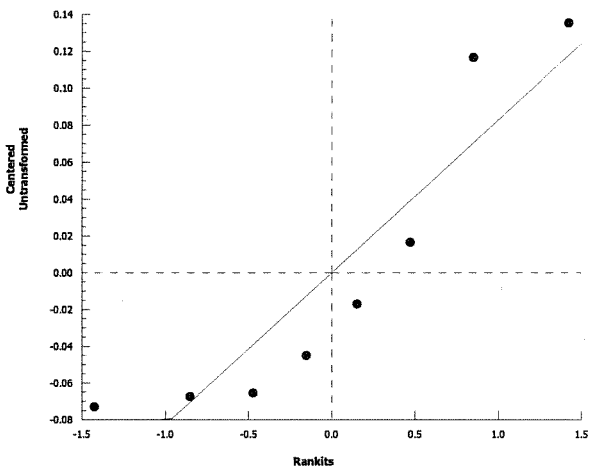
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	1.14	47.5	0.9146	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.824	0.645	0.0512	Normal Distribution

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	0.948	0.8	1.1	0.917	0.875	1.08	0.0465	9.81%	0.0%
0	Hardness Blank	4	0.933	0.795	1.07	0.917	0.866	1.05	0.0435	9.32%	1.54%

Graphics





Fathead Minnow Dry Weight Data Sheet

Client:	**Lehigh Permanente**	Test ID #:	52993	Project #	21442
Test Material:	Hardness Blank	Tare Weight Date:	9/16/13	Sign-off:	CA
Test Date:	9-10-13	Final Weight Date:	9/18/13	Sign-off:	JLA

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
25	**Hardness Blank**	A	159.52	169.02	10	0.950
26		B	165.58	176.08	10	1.050
27		C	174.52	183.18	10	0.866
28		D	155.38	164.06	10	0.868
QA			154.51	154.54		

Appendix H

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 9 Site Water to Fathead Minnows

CETIS Summary Report

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Batch ID:	14-1476-3763	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Padrick Anderson
Start Date:	10 Sep-13 15:21	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	17 Sep-13 09:40	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 18h	**Source:**	Aquatox, AR	**Age:**	1

Sample ID:	00-0180-2220	**Code:**	Pond 9	**Client:**	Lehigh Permanente
Sample Date:	09 Sep-13 12:15	**Material:**	Effluent	**Project:**	21442
Receive Date:	09 Sep-13 14:30	**Source:**	Lehigh Permanente		
Sample Age:	27h (2.6 °C)	**Station:**	Pond 9		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
21-4556-7247	7d Survival Rate	100	>100	NA	8.98%	1	Steel Many-One Rank Sum Test
15-0748-7419	7d Survival Rate	0	>0		5.2%		Wilcoxon Rank Sum Two-Sample Test
10-3231-1690	Mean Dry Biomass-mg	0	>0		11.6%		Equal Variance t Two-Sample Test
15-7584-8216	Mean Dry Biomass-mg	100	>100	NA	16.6%	1	Dunnett Multiple Comparison Test
18-4093-9417	Mean Dry Weight-mg	100	>100	NA	13.1%	1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
04-1284-4394	Mean Dry Biomass-mg	IC5	>100	N/A	N/A	<1	Linear Interpolation (ICPIN)
		IC10	>100	N/A	N/A	<1	
		IC15	>100	N/A	N/A	<1	
		IC20	>100	N/A	N/A	<1	
		IC25	>100	N/A	N/A	<1	
		IC40	>100	N/A	N/A	<1	
		IC50	>100	N/A	N/A	<1	

7d Survival Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	4	1	1	1	1	1	0	0	0.0%	0.0%
0	Lab Water Contr	4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	2.5%
6.25		4	0.9	0.87	0.93	0.8	1	0.0408	0.0816	9.07%	10.0%
12.5		4	1	1	1	1	1	0	0	0.0%	0.0%
25		4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	2.5%
50		4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	2.5%
100		4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	2.5%

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	4	0.933	0.901	0.966	0.866	1.05	0.0435	0.087	9.32%	0.0%
0	Lab Water Contr	4	0.91	0.886	0.935	0.821	0.967	0.0329	0.0659	7.24%	2.49%
6.25		4	0.866	0.799	0.933	0.653	1.09	0.09	0.18	20.8%	7.26%
12.5		4	0.981	0.963	0.998	0.942	1.04	0.0235	0.0469	4.78%	-5.03%
25		4	0.993	0.973	1.01	0.934	1.04	0.027	0.054	5.44%	-6.35%
50		4	1.01	0.994	1.02	0.966	1.05	0.0171	0.0341	3.39%	-7.82%
100		4	1.07	1.05	1.09	0.976	1.13	0.033	0.066	6.16%	-14.6%

Mean Dry Weight-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	4	0.933	0.901	0.966	0.866	1.05	0.0435	0.087	9.32%	0.0%
0	Lab Water Contr	4	0.937	0.897	0.977	0.821	1.07	0.0531	0.106	11.3%	-0.39%
6.25		4	0.954	0.912	0.997	0.816	1.09	0.0567	0.113	11.9%	-2.22%
12.5		4	0.981	0.963	0.998	0.942	1.04	0.0235	0.0469	4.78%	-5.03%
25		4	1.02	0.998	1.04	0.934	1.07	0.0293	0.0585	5.74%	-9.2%
50		4	1.03	1.02	1.05	1	1.07	0.0169	0.0338	3.27%	-10.7%
100		4	1.1	1.09	1.11	1.08	1.13	0.0109	0.0218	1.99%	-17.6%

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	1	1	1	1
0	Lab Water Contr	1	1	0.9	1
6.25		0.8	0.9	0.9	1
12.5		1	1	1	1
25		1	0.9	1	1
50		1	1	0.9	1
100		1	0.9	1	1

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	0.95	1.05	0.866	0.868
0	Lab Water Contr	0.821	0.901	0.967	0.952
6.25		0.653	0.847	0.87	1.09
12.5		1.04	0.942	0.947	0.99
25		1.04	0.96	1.04	0.934
50		1.05	1.01	0.966	1
100		1.13	0.976	1.09	1.09

Mean Dry Weight-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	0.95	1.05	0.866	0.868
0	Lab Water Contr	0.821	0.901	1.07	0.952
6.25		0.816	0.941	0.967	1.09
12.5		1.04	0.942	0.947	0.99
25		1.04	1.07	1.04	0.934
50		1.05	1.01	1.07	1
100		1.13	1.08	1.09	1.09

7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	10/10	10/10	10/10	10/10
0	Lab Water Contr	10/10	10/10	9/10	10/10
6.25		8/10	9/10	9/10	10/10
12.5		10/10	10/10	10/10	10/10
25		10/10	9/10	10/10	10/10
50		10/10	10/10	9/10	10/10
100		10/10	9/10	10/10	10/10

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID: 21-4556-7247 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.8.5
Analyzed: 18 Sep-13 16:03 **Analysis:** Nonparametric-Control vs Treatments **Official Results:** Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	8.98%	100	>100	NA	1

Steel Many-One Rank Sum Test

Control vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control	6.25	13.5	10	2	6	0.2853	Asymp	Non-Significant Effect
	12.5	20	10	1	6	0.9516	Asymp	Non-Significant Effect
	25	18	10	2	6	0.8333	Asymp	Non-Significant Effect
	50	18	10	2	6	0.8333	Asymp	Non-Significant Effect
	100	18	10	2	6	0.8333	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0574852	0.01149704	5	1.64	0.2005	Non-Significant Effect
Error	0.1262611	0.007014505	18			
Total	0.1837463		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	0.407	4.25	0.8378	Equal Variances
Variances	Levene Equality of Variance	1.29	4.25	0.3106	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.795	0.884	0.0002	Non-normal Distribution

7d Survival Rate Summary

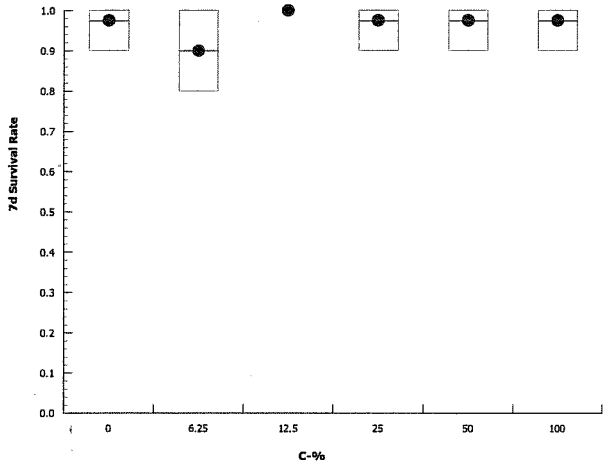
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	0.975	0.895	1	1	0.9	1	0.025	5.13%	0.0%
6.25		4	0.9	0.77	1	0.9	0.8	1	0.0408	9.07%	7.69%
12.5		4	1	1	1	1	1	1	0	0.0%	-2.56%
25		4	0.975	0.895	1	1	0.9	1	0.025	5.13%	0.0%
50		4	0.975	0.895	1	1	0.9	1	0.025	5.13%	0.0%
100		4	0.975	0.895	1	1	0.9	1	0.025	5.13%	0.0%

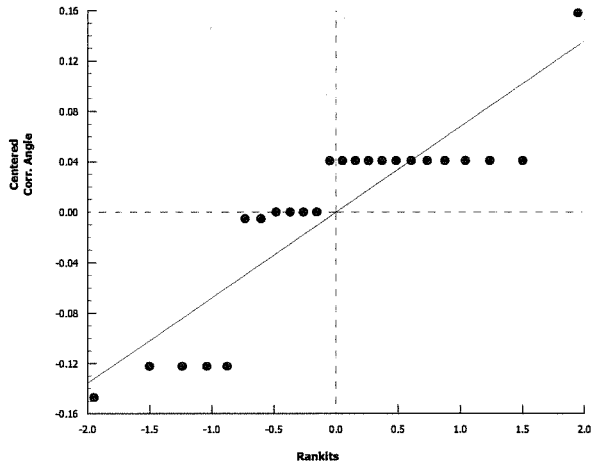
Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Cont	4	1.37	1.24	1.5	1.41	1.25	1.41	0.0407	5.94%	0.0%
6.25		4	1.25	1.06	1.45	1.25	1.11	1.41	0.0623	9.93%	8.53%
12.5		4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	-2.97%
25		4	1.37	1.24	1.5	1.41	1.25	1.41	0.0407	5.94%	0.0%
50		4	1.37	1.24	1.5	1.41	1.25	1.41	0.0407	5.94%	0.0%
100		4	1.37	1.24	1.5	1.41	1.25	1.41	0.0407	5.94%	0.0%

Chronic Larval Fish Survival and Growth Test					Pacific EcoRisk
Analysis ID:	21-4556-7247	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	18 Sep-13 16:03	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Graphics





7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Lehigh Permanente**
Test Material: Pond 9
Test ID#: 52993 Project #: 21442
Test Date: 9-10-13 Randomization: 7:4.2

Organism Log#: 7579 Age: <48 hrs
Organism Supplier: Aquatox
Control/Diluent: EPAMH
Control Water Batch: 1618

Treatment (%)	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Conductivity (µs/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Water	25.1	8.11		8.1		301	10	10	10	10	Date: 9-10-13
6.25	25.1	7.98		8.0		400	10	10	10	10	Sample ID: 32680
12.5	25.1	7.93		8.0		471	10	10	10	10	Test Solution Prep: [illegible]
25	25.1	7.83		8.0		611	10	10	10	10	New WQ: NL
50	25.1	7.68		8.0		903	10	10	10	10	Initiation Time: 1521
100	25.1	7.56		8.1		1397	10	10	10	10	Initiation Signoff: [illegible]
Meter ID	30A	PH19		RD05		EC04					
Lab Water	25.9	8.08	7.94	8.0	7.4	295	10	10	10	10	Date: 9-11-13
6.25	25.9	8.03	7.86	8.1	6.0	374	10	10	10	10	Sample ID: 32680
12.5	25.9	7.94	7.88	8.0	7.0	464	10	10	10	10	Test Solution Prep: [illegible]
25	25.9	7.86	7.93	8.2	7.1	614	10	9	10	10	New WQ: JLA
50	25.9	7.80	8.07	8.4	6.9	890	10	10	10	10	Renewal Time: 1205
100	25.9	7.75	8.22	9.5	7.2	1403	10	9	10	10	Renewal Signoff: [illegible]
Meter ID	30A	PH15	PH15	RD06	RD07	EC04					Old WQ: [illegible]
Lab Water	25.5	7.89	8.06	8.4	7.1	297	10	10	9	10	Date: 9-12-13
6.25	25.5	7.97	8.15	8.9	6.6	383	10	10	9	10	Sample ID: 32724
12.5	25.5	7.86	7.93	8.4	6.6	460	10	10	10	10	Test Solution Prep: [illegible]
25	25.5	7.74	7.90	8.4	7.0	610	10	9	10	10	New WQ: [illegible]
50	25.5	7.64	7.91	8.5	6.7	886	10	10	10	10	Renewal Time: 1115
100	25.5	7.55	8.09	8.5	6.8	1412	10	9	10	10	Renewal Signoff: [illegible]
Meter ID	30A	pH19	PH 19	RD05	RD06	EC04					Old WQ: [illegible]
Lab Water	25.6	8.18	7.83	9.1	7.4	302	10	10	9	10	Date: 9/13/13
6.25	25.6	8.10	7.82	8.3	7.0	382	10	10	9	10	Sample ID: 32724
12.5	25.6	8.01	7.88	8.3	7.1	452	10	10	10	10	Test Solution Prep: [illegible]
25	25.6	7.90	8.01	8.4	7.1	595	10	9	10	10	New WQ: [illegible]
50	25.6	7.81	8.09	8.7	7.2	871	10	10	10	10	Renewal Time: 1230
100	25.6	7.84	8.19	9.6	7.3	1368	10	9	10	10	Renewal Signoff: [illegible]
Meter ID	30A	pH19	PH16	RD06	RD05	EC06					Old WQ: [illegible]

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Lehigh Permanente**
Test Material: Pond 9
Test ID#: 52993 Project #: 21442
Test Date: 9-10-13 Randomization: 2.4.2

Organism Log#: 7519 Age: < 48hrs
Organism Supplier: Aquatox
Control/Diluent: EPAMH
Control Water Batch: 1618

Treatment (%)	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. old	Conductivity (µs/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Water	25.4	~~7.98~~ 8.18	7.99	~~8.6~~ 9.1	8.8	~~47~~ 302	10	10	9	10	Date: 9/14/13
6.25	25.4	7.98	8.01	8.5	8.1	~~470~~ 397	10	10	9	10	Sample ID: 32748
12.5	25.4	8.03	8.03	8.4	7.9	470	10	10	10	10	Test Solution Prep: [illegible]
25	25.4	7.89	8.16	8.4	8.0	614	10	9	10	10	New WQ: FOUS
50	25.4	7.78	8.25	8.4	8.0	906	10	10	10	10	Renewal Time: 0915
100	25.4	7.68	8.23	8.6	8.0	1426	10	9	10	10	Renewal Signoff: KP
Meter ID	30A	pH19	pH19	RD05	RD05	EC04					Old WQ: OE
Lab Water	25.3	8.03	7.98	8.6	8.7	313	10	10	9	10	Date: 9-15-13
6.25	25.3	8.06	8.08	9.3	8.5	392	10	10	9	10	Sample ID: 32748
12.5	25.3	7.98	8.04	9.0	8.4	464	10	10	10	10	Test Solution Prep: [illegible]
25	25.3	7.87	8.13	9.1	8.5	613	10	9	10	10	New WQ: GG
50	25.3	7.78	8.20	9.3	8.4	903	10	10	10	10	Renewal Time: 1015
100	25.3	7.72	8.20	9.6	8.5	1395	10	9	10	10	Renewal Signoff: PJ
Meter ID	30A	pH16	pH16	RD06	RD06	EC04					Old WQ: GG
Lab Water	25.4	8.17	7.88	8.4	7.3	302	10	10	9	10	Date: 9-16-13
6.25	25.4	8.11	7.94	8.8	7.2	382	10	10	9	10	Sample ID: 32748
12.5	25.4	8.06	7.95	8.7	7.4	472	10	10	10	10	Test Solution Prep: [illegible]
25	25.4	8.01	8.04	8.5	7.2	626	10	9	10	10	New WQ: [illegible]
50	25.4	7.94	8.21	8.6	7.1	897	10	10	9	10	Renewal Time: 1110
100	25.4	7.91	8.18	9.4	7.2	1382	10	9	10	10	Renewal Signoff: [illegible]
Meter ID	30A	pH16	pH19	RD05	RD05	EC06					Old WQ: PJ
Lab Water	25.5		7.84		7.1	613	10	10	9	10	Date: 9/17/13
6.25	25.5		8.00		7.0	401	8	9	9	10	Sample ID: –
12.5	25.5		8.03		6.8	489	10	10	10	10	Termination Time: 0940
25	25.5		8.10		6.9	648	10	9	10	10	Termination Signoff: [illegible]
50	25.5		8.22		6.5	937	10	10	9	10	Old WQ: OE
100	25.5		8.23		6.7	1420	10	9	10	10	
Meter ID	30A		pH19		RD07	EC07					

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	15-7584-8216	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.5
Analyzed:	18 Sep-13 16:04	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	16.6%	100	>100	NA	1

Dunnett Multiple Comparison Test

Control vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control	6.25	0.708	2.41	0.151	6	0.5543	CDF	Non-Significant Effect
	12.5	-1.12	2.41	0.151	6	0.9875	CDF	Non-Significant Effect
	25	-1.31	2.41	0.151	6	0.9928	CDF	Non-Significant Effect
	50	-1.53	2.41	0.151	6	0.9962	CDF	Non-Significant Effect
	100	-2.55	2.41	0.151	6	0.9998	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.1057693	0.02115387	5	2.68	0.0559	Non-Significant Effect
Error	0.142163	0.007897943	18			
Total	0.2479323		23			

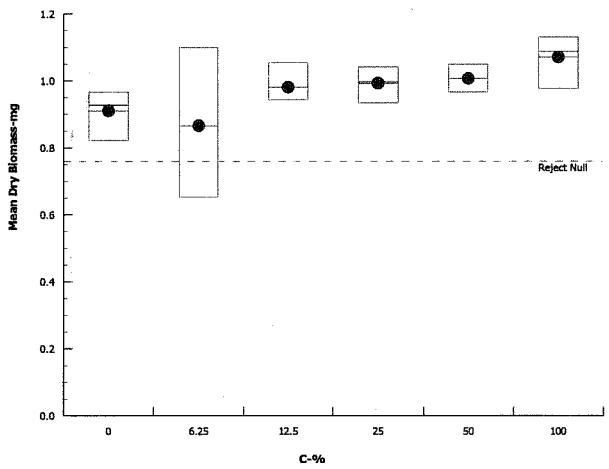
Distributional Tests

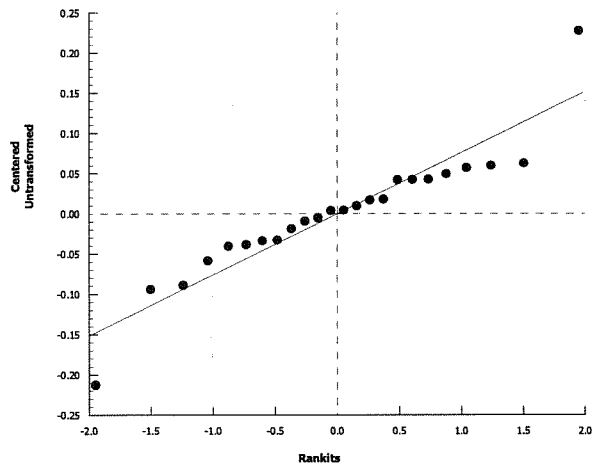
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	10.6	15.1	0.0609	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.905	0.884	0.0277	Normal Distribution

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	0.91	0.805	1.02	0.926	0.821	0.967	0.0329	7.24%	0.0%
6.25		4	0.866	0.579	1.15	0.858	0.653	1.09	0.09	20.8%	4.89%
12.5		4	0.981	0.906	1.06	0.969	0.942	1.04	0.0235	4.78%	-7.72%
25		4	0.993	0.907	1.08	0.998	0.934	1.04	0.027	5.44%	-9.06%
50		4	1.01	0.952	1.06	1.01	0.966	1.05	0.0171	3.39%	-10.6%
100		4	1.07	0.965	1.18	1.09	0.976	1.13	0.033	6.16%	-17.6%

Graphics





CETIS Analytical Report

Report Date:	18 Sep-13 16:05 (p 1 of 1)
Test Code:	52993 | 11-0235-5327

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	04-1284-4394	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.5
Analyzed:	18 Sep-13 16:04	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	600768	200	Yes	Two-Point Interpolation

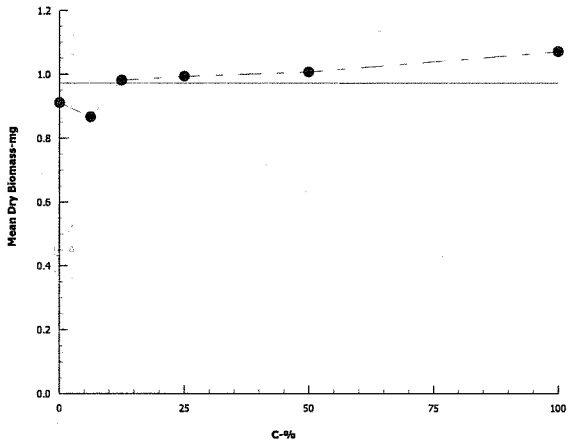
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>100	N/A	N/A	<1	NA	NA
IC10	>100	N/A	N/A	<1	NA	NA
IC15	>100	N/A	N/A	<1	NA	NA
IC20	>100	N/A	N/A	<1	NA	NA
IC25	>100	N/A	N/A	<1	NA	NA
IC40	>100	N/A	N/A	<1	NA	NA
IC50	>100	N/A	N/A	<1	NA	NA

Mean Dry Biomass-mg Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contro	4	0.91	0.821	0.967	0.0329	0.0659	7.24%	0.0%
6.25		4	0.866	0.653	1.09	0.09	0.18	20.8%	4.89%
12.5		4	0.981	0.942	1.04	0.0235	0.0469	4.78%	-7.72%
25		4	0.993	0.934	1.04	0.027	0.054	5.44%	-9.06%
50		4	1.01	0.966	1.05	0.0171	0.0341	3.39%	-10.6%
100		4	1.07	0.976	1.13	0.033	0.066	6.16%	-17.6%

Graphics



Fathead Minnow Dry Weight Data Sheet

Client: **Lehigh Permanente** Test ID #: 52993 Project # 21442
Sample: Pond 9 Tare Weight Date: 9/16/13 Sign-off: CA
Test Date: ~~2/1/49~~ 9/10/13 Final Weight Date: 9/18/13 Sign-off: JLA

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Lab Water	A	151.16	159.37	10	0.821
2		B	165.00	174.01	10	0.901
3		C	151.73	161.40	10	0.967
4		D	156.83	166.35	10	0.952
5	6.25	A	151.70	158.23	10	0.653
6		B	147.66	156.13	10	0.847
7		C	153.34	162.04	10	0.870
8		D	143.75	154.68	10	1.093
9	12.5	A	153.02	163.45	10	1.043
10		B	143.36	152.78	10	0.942
11		C	144.76	154.23	10	0.947
12		D	164.34	174.24	10	0.990
13	25	A	160.73	171.08	10	1.035
14		B	156.61	166.21	10	0.960
15		C	174.12	184.54	10	1.042
16		D	166.09	175.43	10	0.934
17	50	A	177.64	188.13	10	1.049
18		B	157.83	167.93	10	1.010
19		C	169.50	179.16	10	0.966
20		D	158.21	168.22	10	1.001
21	100	A	174.55	185.85	10	1.130
22		B	139.89	149.65	10	0.976
23		C	144.54	155.42	10	1.088
24		D	180.00	190.87	10	1.087
QA 1			154.51	154.54		
QA 2			178.00	178.00		
QA3			~~174.~~ 173.96	173.97		
Balance ID:			BAL01	BAL01		

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	15-0748-7419	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	18 Sep-13 16:04	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Angular (Corrected)	NA	C > T	NA	NA	5.2%	Passes 7d survival rate

Wilcoxon Rank Sum Two-Sample Test

Control	vs	Control	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		Hardness Blank	20	NA	1	6	1.0000	Exact	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.003319917	0.003319917	1	1	0.3559	Non-Significant Effect
Error	0.0199195	0.003319917	6			
Total	0.02323942		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	1	13.7	0.3559	Equal Variances
Variances	Levene Equality of Variance	9	13.7	0.0240	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.706	0.645	0.0027	Non-normal Distribution

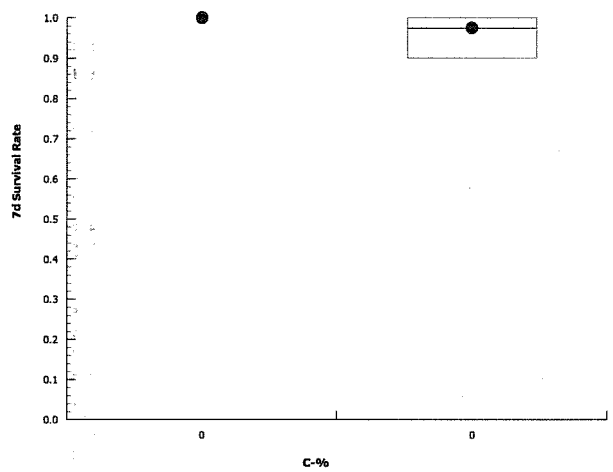
7d Survival Rate Summary

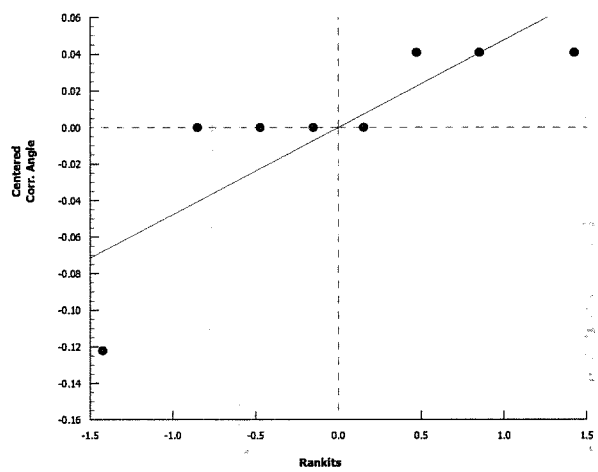
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	0.975	0.895	1	1	0.9	1	0.025	5.13%	0.0%
0	Hardness Blank	4	1	1	1	1	1	1	0	0.0%	-2.56%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Cont	4	1.37	1.24	1.5	1.41	1.25	1.41	0.0407	5.94%	0.0%
0	Hardness Blank	4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	-2.97%

Graphics





7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Lehigh Permanente**
Test Material: Hardness Blank
Test ID#: 52993 Project #: 21442
Test Date: 9-10-13 Randomization: 7-4-2

Organism Log#: 7519 Age: <48hrs
Organism Supplier: Aquatox
Control/Diluent: EPAMH
Control Water Batch: 1618

Test Treatment	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. old	Conductivity (µS/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Hardness Blank	25.1	8.10		9.7		1381	10	10	10	10	Date: PA 9.10.13
											Test Solution Prep: PA ~~32594~~
											Initiation Time: 1521
Meter ID	30A	pH15		RD06		EC06	New WQ: OG				Initiation Signoff: KW
Hardness Blank	25.9	8.05	8.07	9.9	7.3	1381	10	10	10	10	Date: 9-11-13
											Test Solution Prep: [illegible]
											Renewal Time: 1205
Meter ID	30A	pH15	pH15	RD06	RD07	EC04	New WQ: JLA		Old WQ: OG		Renewal Signoff: [illegible]
Hardness Blank	25.5	7.86	7.81	9.2	7.1	1359	10	10	10	10	Date: 9-12-13
											Test Solution Prep: [illegible]
											Renewal Time: 1115
Meter ID	30A	pH19	Ph19	RD05	RD06	EC04	New WQ: MO		Old WQ: YU		Renewal Signoff: [illegible]
Hardness Blank	25.6	8.13	8.00	10.6	7.2	1381	10	10	10	10	Date: 9-13-13
											Test Solution Prep: KW
											Renewal Time: 1030
Meter ID	30A	pH19	PH16	RD06	RD05	EC06	New WQ: OG		Old WQ: DH		Renewal Signoff: KP
Hardness Blank	25.4	7.99	8.17	10.4	8.1	1386	10	10	10	10	Date: 9/14/13
											Test Solution Prep: KW
											Renewal Time: 0915
Meter ID	30A	PH19	pH19	RD05	RD05	EC04	New WQ: ~~JLB~~		Old WQ: OG		Renewal Signoff: KP
Hardness Blank	25.3	7.96	8.11	9.3	8.4	1345	10	10	10	10	Date: 9-15-13
											Test Solution Prep: [illegible]
											Renewal Time: 1015
Meter ID	30A	PH16	PH16	RD06	RD06	EC04	New WQ: GG		Old WQ: GG		Renewal Signoff: PA
Hardness Blank	25.4	8.05	8.10	9.5	7.3	1358	10	10	10	10	Date: 9-16-13
											Test Solution Prep: [illegible]
											Renewal Time: 1110
Meter ID	30A	PH16	pH19	RD05	RD05	EC06	New WQ: CA		Old WQ: [illegible]		Renewal Signoff: [illegible]
Hardness Blank	25.5		8.11		6.6	1432	10	10	10	10	Date: 9/17/13
											Termination Time: 0940
Meter ID	30A		pH19		RD07	EC07			Old WQ: OG		Termination Signoff: [illegible]

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	10-3231-1690	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.5
Analyzed:	18 Sep-13 16:04	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	11.6%	Passes mean dry biomass-mg

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		Hardness Blank	-0.426	1.94	0.106	6	0.6576	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.001081107	0.001081107	1	0.182	0.6848	Non-Significant Effect
Error	0.03570617	0.005951028	6			
Total	0.03678728		7			

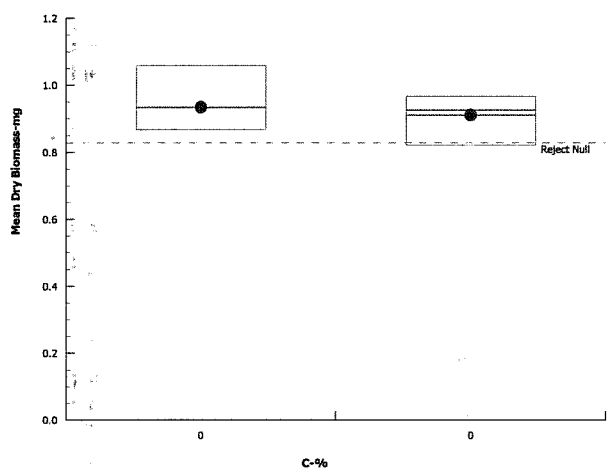
Distributional Tests

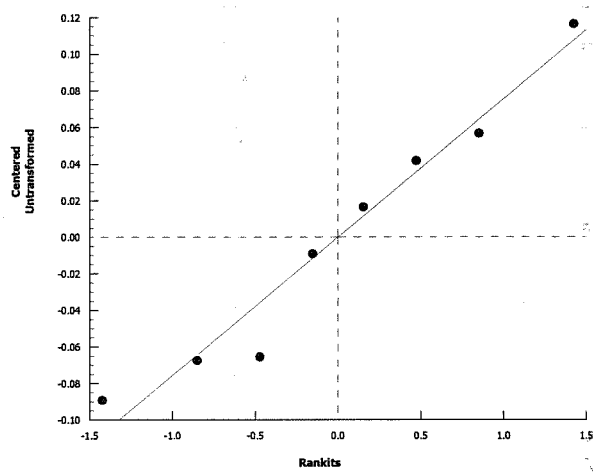
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	1.74	47.5	0.6592	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.948	0.645	0.6958	Normal Distribution

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	0.91	0.805	1.02	0.925	0.821	0.967	0.0329	7.24%	0.0%
0	Hardness Blank	4	0.933	0.795	1.07	0.925	0.866	1.05	0.0435	9.32%	-2.55%

Graphics





Fathead Minnow Dry Weight Data Sheet

Client: **Lehigh Permanente** Test ID #: 52993 Project # 21442

Test Material: Hardness Blank Tare Weight Date: 9/16/13 Sign-off: CA

Test Date: 9-10-13 Final Weight Date: 9/18/13 Sign-off: JLA

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
25	**Hardness Blank**	A	159.52	169.02	10	0.950
26		B	165.58	176.08	10	1.050
27		C	174.52	183.18	10	0.866
28		D	155.38	164.06	10	0.868
QA			154.51	154.54		

Appendix I

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 13 Site Water to Fathead Minnows

CETIS Summary Report

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Batch ID:	17-8708-7222	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Padrick Anderson
Start Date:	10 Sep-13 13:20	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	17 Sep-13 08:15	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 19h	**Source:**	Aquatox, AR	**Age:**	1

Sample ID:	19-1269-2136	**Code:**	Pond 13	**Client:**	Lehigh Permanente
Sample Date:	09 Sep-13 11:39	**Material:**	Effluent	**Project:**	21442
Receive Date:	09 Sep-13 11:39	**Source:**	Lehigh Permanente		
Sample Age:	26h (2.8 °C)	**Station:**	Pond 13		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
20-1151-4047	7d Survival Rate	100	>100	NA	18.0%	1	Steel Many-One Rank Sum Test
08-6545-5289	7d Survival Rate	0	>0		NA		Wilcoxon Rank Sum Two-Sample Test
13-2224-8677	Mean Dry Biomass-mg	0	>0		13.5%		Equal Variance t Two-Sample Test
10-1132-8065	Mean Dry Biomass-mg	100	>100	NA	17.5%	1	Dunnett Multiple Comparison Test
01-7053-4481	Mean Dry Weight-mg	100	>100	NA	22.9%	1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
20-0552-5278	Mean Dry Biomass-mg	IC5	35.6	N/A	N/A	2.812	Linear Interpolation (ICPIN)
		IC10	>100	N/A	N/A	<1	
		IC15	>100	N/A	N/A	<1	
		IC20	>100	N/A	N/A	<1	
		IC25	>100	N/A	N/A	<1	
		IC40	>100	N/A	N/A	<1	
		IC50	>100	N/A	N/A	<1	

7d Survival Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	4	1	1	1	1	1	0	0	0.0%	0.0%
0	Lab Water Contr	4	1	1	1	1	1	0	0	0.0%	0.0%
6.25		4	1	1	1	1	1	0	0	0.0%	0.0%
12.5		4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	2.5%
25		4	0.95	0.913	0.987	0.8	1	0.05	0.1	10.5%	5.0%
50		4	0.775	0.668	0.882	0.4	1	0.144	0.287	37.1%	22.5%
100		4	0.925	0.906	0.944	0.9	1	0.025	0.05	5.41%	7.5%

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	4	0.933	0.901	0.966	0.866	1.05	0.0435	0.087	9.32%	0.0%
0	Lab Water Contr	4	0.864	0.833	0.894	0.769	0.969	0.041	0.082	9.5%	7.5%
6.25		4	0.856	0.834	0.877	0.789	0.929	0.0286	0.0573	6.69%	8.33%
12.5		4	0.856	0.829	0.884	0.762	0.935	0.0362	0.0725	8.46%	8.25%
25		4	0.837	0.81	0.863	0.793	0.942	0.0356	0.0712	8.51%	10.4%
50		4	0.732	0.672	0.792	0.496	0.849	0.08	0.16	21.9%	21.6%
100		4	0.864	0.85	0.878	0.833	0.919	0.0189	0.0379	4.38%	7.47%

Mean Dry Weight-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	4	0.933	0.901	0.966	0.866	1.05	0.0435	0.087	9.32%	0.0%
0	Lab Water Contr	4	0.864	0.833	0.894	0.769	0.969	0.041	0.082	9.5%	7.5%
6.25		4	0.856	0.834	0.877	0.789	0.929	0.0286	0.0573	6.69%	8.33%
12.5		4	0.878	0.862	0.893	0.847	0.935	0.0207	0.0414	4.72%	5.98%
25		4	0.888	0.845	0.931	0.793	1.02	0.0573	0.115	12.9%	4.88%
50		4	1	0.92	1.09	0.777	1.24	0.113	0.226	22.5%	-7.59%
100		4	0.936	0.91	0.962	0.851	1.02	0.035	0.07	7.48%	-0.28%

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	1	1	1	1
0	Lab Water Contr	1	1	1	1
6.25		1	1	1	1
12.5		1	1	1	0.9
25		0.8	1	1	1
50		0.7	1	1	0.4
100		1	0.9	0.9	0.9

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	0.95	1.05	0.866	0.868
0	Lab Water Contr	0.852	0.769	0.864	0.969
6.25		0.852	0.789	0.929	0.853
12.5		0.935	0.848	0.881	0.762
25		0.819	0.793	0.942	0.793
50		0.806	0.849	0.777	0.496
100		0.851	0.852	0.833	0.919

Mean Dry Weight-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	0.95	1.05	0.866	0.868
0	Lab Water Contr	0.852	0.769	0.864	0.969
6.25		0.852	0.789	0.929	0.853
12.5		0.935	0.848	0.881	0.847
25		1.02	0.793	0.942	0.793
50		1.15	0.849	0.777	1.24
100		0.851	0.947	0.926	1.02

7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	10/10	10/10	10/10	10/10
0	Lab Water Contr	10/10	10/10	10/10	10/10
6.25		10/10	10/10	10/10	10/10
12.5		10/10	10/10	10/10	9/10
25		8/10	10/10	10/10	10/10
50		7/10	10/10	10/10	4/10
100		10/10	9/10	9/10	9/10

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	20-1151-4047	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	18 Sep-13 15:28	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	18.0%	100	>100	NA	1

Steel Many-One Rank Sum Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	18	10	1	6	0.8333	Asymp	Non-Significant Effect
		12.5	16	10	1	6	0.6105	Asymp	Non-Significant Effect
		25	16	10	1	6	0.6105	Asymp	Non-Significant Effect
		50	14	10	1	6	0.3451	Asymp	Non-Significant Effect
		100	12	10	1	6	0.1424	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.2345908	0.04691815	5	1.74	0.1771	Non-Significant Effect
Error	0.4860648	0.0270036	18			
Total	0.7206556		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	4.69	4.25	0.0065	Unequal Variances
Variances	Levene Equality of Variance	11.1	4.25	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.871	0.884	0.0056	Non-normal Distribution

7d Survival Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	1	1	1	1	1	1	0	0.0%	0.0%
6.25		4	1	1	1	1	1	1	0	0.0%	0.0%
12.5		4	0.975	0.895	1	1	0.9	1	0.025	5.13%	2.5%
25		4	0.95	0.791	1	1	0.8	1	0.05	10.5%	5.0%
50		4	0.775	0.318	1	0.85	0.4	1	0.144	37.1%	22.5%
100		4	0.925	0.845	1	0.9	0.9	1	0.025	5.41%	7.5%

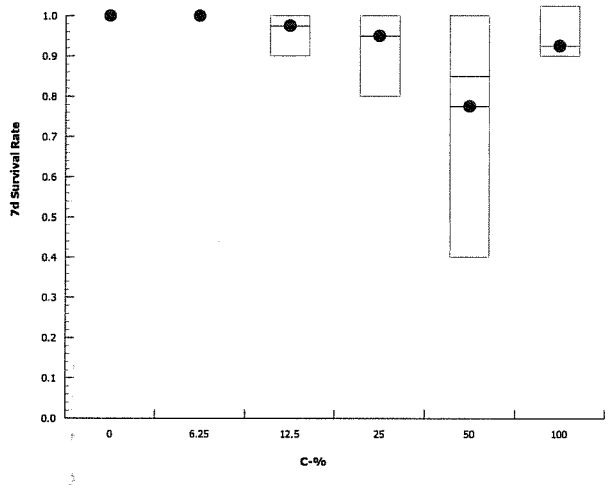
Angular (Corrected) Transformed Summary

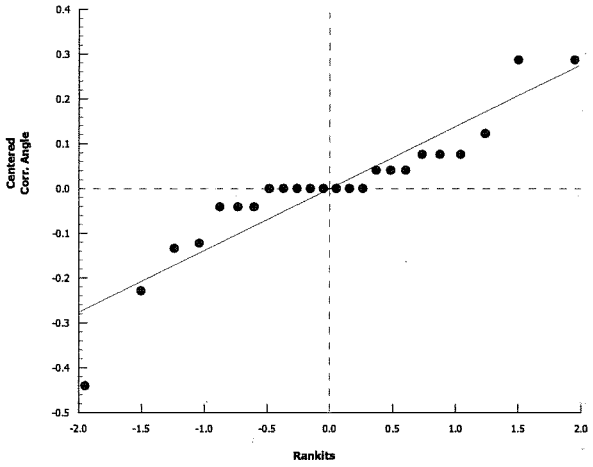
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Cont	4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%
6.25		4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%
12.5		4	1.37	1.24	1.5	1.41	1.25	1.41	0.0407	5.94%	2.89%
25		4	1.34	1.09	1.58	1.41	1.11	1.41	0.0762	11.4%	5.4%
50		4	1.12	0.561	1.69	1.2	0.685	1.41	0.177	31.5%	20.3%
100		4	1.29	1.16	1.42	1.25	1.25	1.41	0.0407	6.32%	8.66%

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	20-1151-4047	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	18 Sep-13 15:28	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Graphics





7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Lehigh Permanente**
Test Material: Pond 13
Test ID#: 52992 Project #: 21442
Test Date: 9-10-13 Randomization: 6-4-2

Organism Log#: 7519 Age: <48h
Organism Supplier: Aquatox
Control/Diluent: EPAMH
Control Water Batch: 1618

Treatment (%)	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Conductivity (µs/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Water	25.3	8.14		8.3		316	10	10	10	10	Date: 9-10-13
6.25	25.3	8.08		8.4		351	10	10	10	10	Sample ID: 32679
12.5	25.3	8.01		8.4		412	10	10	10	10	Test Solution Prep: [illegible]
25	25.3	7.93		8.6		531	10	10	10	10	New WQ: OE
50	25.3	7.87		8.8		722	10	10	10	10	Initiation Time: 1320
100	25.3	7.77		9.4		1088	10	10	10	10	Initiation Signoff: PB
Meter ID	30A	pH16		RD07		EC07					
Lab Water	25.9	7.98	7.98	8.4	6.9	301	10	10	10	10	Date: 9-11-13
6.25	25.9	7.98	7.89	8.0	7.0	355	10	10	10	10	Sample ID: 32679
12.5	25.9	7.97	7.88	7.9	7.1	414	10	10	10	10	Test Solution Prep: [illegible]
25	25.9	7.94	7.96	8.1	7.1	524	10	10	10	10	New WQ: OE
50	25.9	7.92	7.96	8.6	6.7	728	10	10	10	10	Renewal Time: 1130
100	25.9	7.86	8.09	9.5	6.7	1094	10	10	10	10	Renewal Signoff: [illegible]
Meter ID	30A	pH16	pH16	RD07	RD07	EC07					Old WQ: OE
Lab Water	25.5	8.02	7.72	8.5	6.3	301	10	10	10	10	Date: 9-12-13
6.25	25.5	7.94	7.69	8.2	6.4	358	10	10	10	10	Sample ID: 32723
12.5	25.5	7.90	7.78	8.2	6.9	405	10	10	10	10	Test Solution Prep: [illegible]
25	25.5	7.82	7.77	8.2	6.6	523	10	10	10	10	New WQ: 540
50	25.5	7.72	7.75	8.7	6.7	726	10	10	10	10	Renewal Time: 1000
100	25.5	7.65	7.89	8.8	7.0	1086	10	9	10	10	Renewal Signoff: SM
Meter ID	30A	pH19	pH19	RD05	RD06	EC04					Old WQ: NO
Lab Water	25.7	8.21	7.81	8.4	7.6	324	10	10	10	10	Date: 9/13/13
6.25	25.7	8.15	7.87	8.4	7.5	370	10	10	10	10	Sample ID: 32723
12.5	25.7	8.10	7.90	8.4	7.7	431	10	10	10	10	Test Solution Prep: [illegible]
25	25.7	8.04	7.94	8.5	7.5	528	10	10	10	10	New WQ: OE
50	25.7	7.96	8.07	8.8	7.6	737	10	10	10	10	Renewal Time: 1130
100	25.7	7.89	8.18	9.4 10.1	7.6	1099	10	9	9	10	Renewal Signoff: [illegible]
Meter ID	30A	pH19	pH16	RD06	RD05	EC06					Old WQ: DH

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Lehigh Permanente**
Test Material: Pond 13
Test ID#: 52992 Project #: 21442
Test Date: 9-10-13 Randomization: 6.9.2

Organism Log#: 7517 Age: <48h
Organism Supplier: Aquatox
Control/Diluent: EPAMH
Control Water Batch: 1618

Treatment (%)	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Conductivity (µs/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Water	25.5	8.07	7.83	8.7	8.1	303	10	10	10	10	Date: 9/14/13
6.25	25.5	8.07	7.89	8.5	7.8	365	10	10	10	10	Sample ID: 32747
12.5	25.5	8.05	7.89	8.6	7.7	409	10	10	10	10	Test Solution Prep: [illegible]
25	25.5	8.00	7.95	8.6	7.6	536	9	10	10	10	New WQ: FDVB
50	25.5	7.90	8.10	8.7	7.7	730	8	10	10	10	Renewal Time: 0915
100	25.5	7.79	8.24	9.2	7.8	1105	10	9	9	9	Renewal Signoff: [illegible]
Meter ID	30A	PH19	PH19	RD05	RD05	EC04					Old WQ: [illegible]
Lab Water	25.2	8.06	7.87	8.3	8.3	302	10	10	10	10	Date: 9-15-13
6.25	25.2	8.06	7.96	8.4	8.3	355	10	10	10	10	Sample ID: 32747
12.5	25.2	8.03	8.03	8.4	8.3	421	10	10	10	10	Test Solution Prep: [illegible]
25	25.2	7.97	8.04	8.4	8.3	520	8	10	10	10	New WQ: CP
50	25.2	7.88	8.11	9.0	8.3	729	8	10	10	4	Renewal Time: 0925
100	25.2	7.77	8.26	9.0	8.3	1065	10	9	9	9	Renewal Signoff: SS
Meter ID	30A	PH19	PH16	RD07	RD06	EC07					Old WQ: GG
Lab Water	25.4	8.21	8.03	8.2	7.5	306	10	10	10	10	Date: 9-16-13
6.25	25.4	8.13	7.91	8.2	7.3	362	10	10	10	10	Sample ID: 32747
12.5	25.4	8.08	7.94	8.3	7.5	418	10	10	10	9	Test Solution Prep: [illegible]
25	25.4	8.01	7.95	8.4	7.4	638	8	10	10	10	New WQ: GG
50	25.4	7.94	8.10	8.6	6.8	728	7	10	10	4	Renewal Time: 1020
100	25.4	7.88	8.24	8.5	7.3	1071	10	9	9	9	Renewal Signoff: [illegible]
Meter ID	30A	PH19	PH19	RD07	RD07	EC07					Old WQ: [illegible]
Lab Water	25.5		8.42		6.6	315	10	10	10	10	Date: 9/17/13
6.25	25.5		8.18		5.9	379	10	10	10	10	Sample ID: —
12.5	25.5		8.11		~~7.5~~ 6.3	436	10	10	10	9	Termination Time: 0815
25	25.5		8.05		6.7	550	8	10	10	10	Termination Signoff: SM
50	25.5		8.08		6.1	757	7	10	10	4	Old WQ: [illegible]
100	25.5		8.27		7.1	1139	10	9	9	9	
Meter ID	30A		PH19		RD06	EC07					

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	10-1132-8065	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.5
Analyzed:	18 Sep-13 15:29	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	17.5%	100	>100	NA	1

Dunnett Multiple Comparison Test

Control vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control	6.25	0.123	2.41	0.151	6	0.7944	CDF	Non-Significant Effect
	12.5	0.111	2.41	0.151	6	0.7984	CDF	Non-Significant Effect
	25	0.426	2.41	0.151	6	0.6793	CDF	Non-Significant Effect
	50	2.09	2.41	0.151	6	0.0889	CDF	Non-Significant Effect
	100	-0.00398	2.41	0.151	6	0.8345	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.05257268	0.01051454	5	1.33	0.2959	Non-Significant Effect
Error	0.1422067	0.007900374	18			
Total	0.1947794		23			

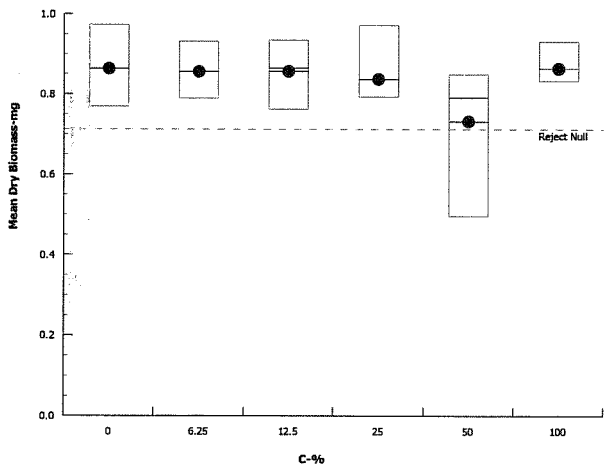
Distributional Tests

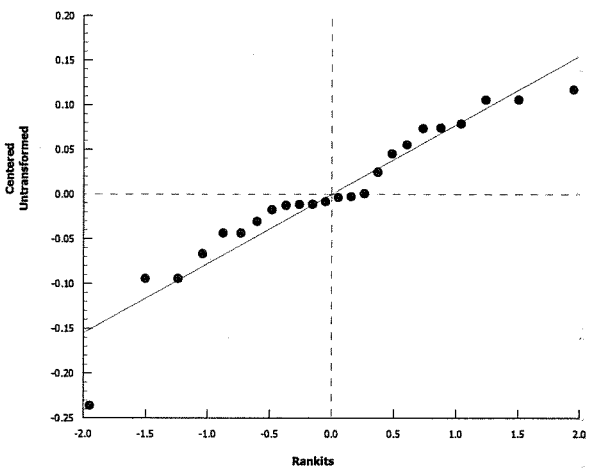
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	6.43	15.1	0.2669	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.924	0.884	0.0699	Normal Distribution

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	0.864	0.733	0.994	0.858	0.769	0.969	0.041	9.5%	0.0%
6.25		4	0.856	0.765	0.947	0.853	0.789	0.929	0.0286	6.69%	0.9%
12.5		4	0.856	0.741	0.972	0.864	0.762	0.935	0.0362	8.46%	0.81%
25		4	0.837	0.723	0.95	0.806	0.793	0.942	0.0356	8.51%	3.1%
50		4	0.732	0.477	0.987	0.792	0.496	0.849	0.08	21.9%	15.2%
100		4	0.864	0.804	0.924	0.851	0.833	0.919	0.0189	4.38%	-0.03%

Graphics





CETIS Analytical Report

Report Date:	18 Sep-13 15:30 (p 1 of 1)
Test Code:	52992 | 15-5202-7903

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	20-0552-5278	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.5
Analyzed:	18 Sep-13 15:29	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1096720	200	Yes	Two-Point Interpolation

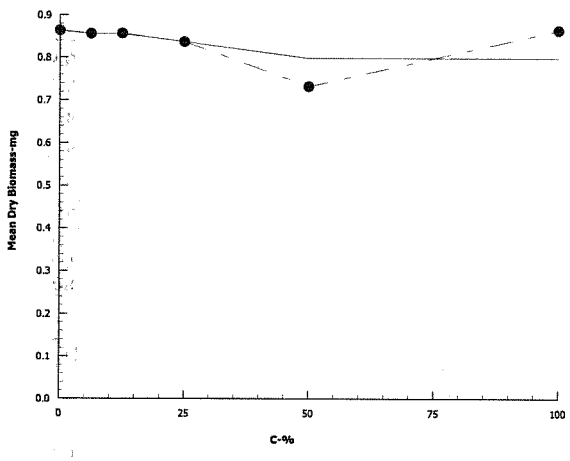
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	35.6	N/A	N/A	2.812	NA	NA
IC10	>100	N/A	N/A	<1	NA	NA
IC15	>100	N/A	N/A	<1	NA	NA
IC20	>100	N/A	N/A	<1	NA	NA
IC25	>100	N/A	N/A	<1	NA	NA
IC40	>100	N/A	N/A	<1	NA	NA
IC50	>100	N/A	N/A	<1	NA	NA

Mean Dry Biomass-mg Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contro	4	0.864	0.769	0.969	0.041	0.082	9.5%	0.0%
6.25		4	0.856	0.789	0.929	0.0286	0.0573	6.69%	0.9%
12.5		4	0.856	0.762	0.935	0.0362	0.0725	8.46%	0.81%
25		4	0.837	0.793	0.942	0.0356	0.0712	8.51%	3.1%
50		4	0.732	0.496	0.849	0.08	0.16	21.9%	15.2%
100		4	0.864	0.833	0.919	0.0189	0.0379	4.38%	-0.03%

Graphics



Analyst: PJ QA: KB

Fathead Minnow Dry Weight Data Sheet

Client: **Lehigh Permanente** Test ID #: 52992 Project # 21442
Sample: Pond 13 Tare Weight Date: 9/15/13 Sign-off: LA
Test Date: 9/10/13 Final Weight Date: 9/18/13 Sign-off: JLA

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Lab Water	A	154.98	163.50	10	0.852
2		B	173.89	181.58	10	0.769
3		C	164.82	173.46	10	0.864
4		D	166.06	175.75	10	0.969
5	6.25	A	155.20	163.72	10	0.852
6		B	159.08	166.97	10	0.789
7		C	158.32	167.61	10	0.929
8		D	169.58	178.11	10	0.853
9	12.5	A	172.16	181.51	10	0.935
10		B	188.17	196.65	10	0.848
11		C	147.94	156.75	10	0.881
12		D	168.63	176.25	10	0.762
13	25	A	154.90	163.09	10	0.819
14		B	166.22	174.15	10	0.793
15		C	169.30	178.72	10	0.942
16		D	155.50	163.43	10	0.793
17	50	A	168.16	176.22	10	0.806
18		B	173.92	182.41	10	0.849
19		C	164.75	172.52	10	0.777
20		D	152.74	157.70	10	0.496
21	100	A	168.52	177.03	10	0.851
22		B	169.23	177.74	10	0.852
23		C	155.00	163.33	10	0.833
24		D	156.59	165.78	10	0.919
QA 1			~~154.98~~ LA 171.48	171.49		
QA 2			166.21	166.26		
QA3			164.27	164.30		
Balance ID:			BAL01	BAL01		

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	08-6545-5289	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	18 Sep-13 15:28	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	Test Result
Angular (Corrected)	NA	C > T	NA	NA	Passes 7d survival rate

Wilcoxon Rank Sum Two-Sample Test

Control	vs	Control	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		Hardness Blank	18	NA	1	6	1.0000	Exact	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	1	65500	<0.0001	Significant Effect
Error	0	0	6			
Total	0		7			

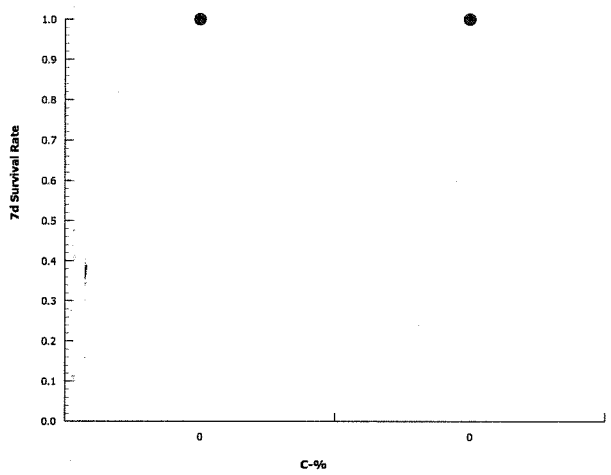
7d Survival Rate Summary

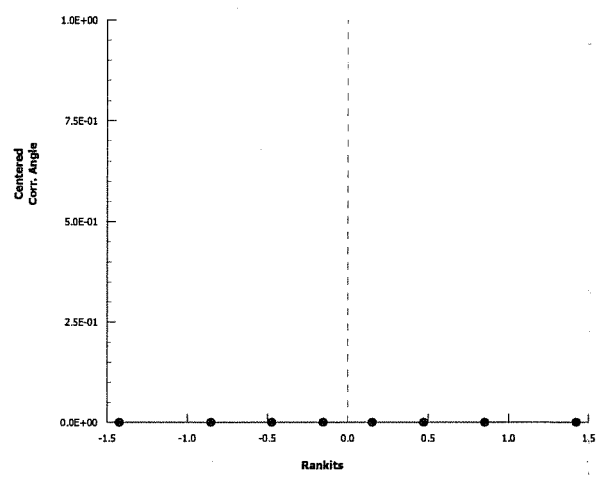
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Hardness Blank	4	1	1	1	1	1	1	0	0.0%	0.0%
0	Lab Water Contr	4	1	1	1	1	1	1	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Cont	4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%
0	Hardness Blank	4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%

Graphics





7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Lehigh Permanente**
Test Material: Hardness Blank
Test ID#: 52993 Project #: 21442
Test Date: 9-10-13 Randomization: 7-4-2

Organism Log#: 7519 Age: <48hrs
Organism Supplier: Aquatox
Control/Diluent: EPAMH
Control Water Batch: 1618

Test Treatment	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Conductivity (µS/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Hardness Blank	25.1	8.10		9.7		1381	10	10	10	10	Date: 9.10.13 Test Solution Prep: PA
											Initiation Time: 1521
Meter ID	30A	pH15		RD06		EC06	New WQ: OE				Initiation Signoff: KW
Hardness Blank	25.9	8.05	8.07	9.9	7.3	1381	10	10	10	10	Date: 9-11-13 Test Solution Prep:
											Renewal Time: 1205
Meter ID	30A	pH15	pH15	RD06	RD07	EC04	New WQ: JLA		Old WQ: OE		Renewal Signoff:
Hardness Blank	25.5	7.86	7.81	9.2	7.1	1359	10	10	10	10	Date: 9-12-13 Test Solution Prep:
											Renewal Time: 1115
Meter ID	30A	pH19	Ph19	RD05	RD06	EC04	New WQ: MO		Old WQ: YU		Renewal Signoff:
Hardness Blank	25.6	8.13	8.00	10.6	7.2	1381	10	10	10	10	Date: 9-13-13 Test Solution Prep: KW
											Renewal Time: 1230
Meter ID	30A	pH19	PH16	RD06	RD05	EC06	New WQ: OE		Old WQ: DH		Renewal Signoff: KP
Hardness Blank	25.4	7.99	8.17	10.4	8.1	1386	10	10	10	10	Date: 9/14/13 Test Solution Prep: KW
											Renewal Time: 0915
Meter ID	30A	PH19	pH19	RD05	RD05	EC04	New WQ: ~~JLB~~		Old WQ: OE		Renewal Signoff: KP
Hardness Blank	25.3	7.96	8.11	9.3	8.4	1345	10	10	10	10	Date: 9-15-13 Test Solution Prep:
											Renewal Time: 1015
Meter ID	30A	PH16	PH16	RD06	RD06	EC04	New WQ: GG		Old WQ: GG		Renewal Signoff: PA
Hardness Blank	25.4	8.05	8.10	9.5	7.3	1358	10	10	10	10	Date: 9-16-13 Test Solution Prep:
											Renewal Time: 1110
Meter ID	30A	pH16	pH19	RD05	RD05	EC06	New WQ: CA		Old WQ:		Renewal Signoff:
Hardness Blank	25.5		8.11		6.6	1432	10	10	10	10	Date: 9/17/13 Termination Time: 0940
Meter ID	30A		pH19		RD07	EC07			Old WQ: OE		Termination Signoff:

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	13-2224-8677	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.5
Analyzed:	18 Sep-13 15:28	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	13.5%	Passes mean dry biomass-mg

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		Hardness Blank	-1.17	1.94	0.116	6	0.8570	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.009799806	0.009799806	1	1.37	0.2860	Non-Significant Effect
Error	0.04288423	0.007147372	6			
Total	0.05268404		7			

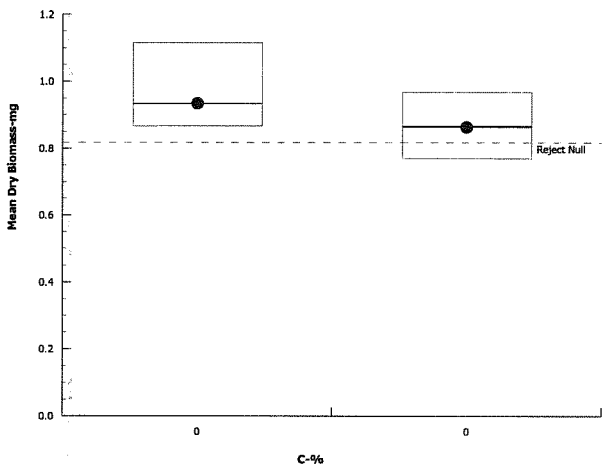
Distributional Tests

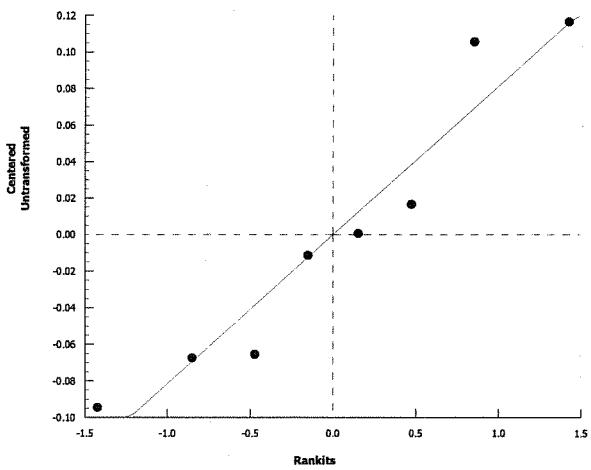
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	1.12	47.5	0.9259	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.909	0.645	0.3463	Normal Distribution

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Hardness Blank	4	0.933	0.795	1.07	0.867	0.866	1.05	0.0435	9.32%	0.0%
0	Lab Water Contr	4	0.864	0.733	0.994	0.867	0.769	0.969	0.041	9.5%	7.5%

Graphics





Fathead Minnow Dry Weight Data Sheet

Client: **Lehigh Permanente**
Test Material: Hardness Blank
Test Date: 9-10-13

Test ID #: 52993
Tare Weight Date: 9/16/13
Final Weight Date: 9/18/13

Project # 21442
Sign-off: CA
Sign-off: JCA

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
25	**Hardness Blank**	A	159.52	169.02	10	0.950
26		B	165.58	176.08	10	1.050
27		C	174.52	183.18	10	0.866
28		D	155.38	164.06	10	0.868
QA			154.51	154.54		

Appendix J

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 14 Site Water to Fathead Minnows

CETIS Summary Report

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Batch ID:	08-4902-8762	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Padrick Anderson
Start Date:	10 Sep-13 14:20	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	17 Sep-13 08:25	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 18h	**Source:**	Aquatox, AR	**Age:**	1

Sample ID:	14-8509-7931	**Code:**	Pond 14	**Client:**	Lehigh Permanente
Sample Date:	09 Sep-13 12:43	**Material:**	Effluent	**Project:**	21442
Receive Date:	09 Sep-13 14:30	**Source:**	Lehigh Permanente		
Sample Age:	26h (2.3 °C)	**Station:**	Pond 14		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
15-2981-7920	7d Survival Rate	100	>100	NA	6.45%	1	Steel Many-One Rank Sum Test
18-0208-3499	7d Survival Rate	0	>0		NA		Wilcoxon Rank Sum Two-Sample Test
18-4875-1003	Mean Dry Biomass-mg	0	>0		11.0%		Equal Variance t Two-Sample Test
09-3281-9849	Mean Dry Biomass-mg	100	>100	NA	18.7%	1	Dunnett Multiple Comparison Test
11-6078-6127	Mean Dry Weight-mg	100	>100	NA	16.9%	1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
00-2354-5271	Mean Dry Biomass-mg	IC5	>100	N/A	N/A	<1	Linear Interpolation (ICPIN)
		IC10	>100	N/A	N/A	<1	
		IC15	>100	N/A	N/A	<1	
		IC20	>100	N/A	N/A	<1	
		IC25	>100	N/A	N/A	<1	
		IC40	>100	N/A	N/A	<1	
		IC50	>100	N/A	N/A	<1	

7d Survival Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	4	1	1	1	1	1	0	0	0.0%	0.0%
0	Lab Water Contr	4	1	1	1	1	1	0	0	0.0%	0.0%
6.25		4	1	1	1	1	1	0	0	0.0%	0.0%
12.5		4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	2.5%
25		4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	2.5%
50		4	1	1	1	1	1	0	0	0.0%	0.0%
100		4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	2.5%

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	4	0.933	0.901	0.966	0.866	1.05	0.0435	0.087	9.32%	0.0%
0	Lab Water Contr	4	0.884	0.866	0.902	0.812	0.92	0.0244	0.0488	5.53%	5.33%
6.25		4	0.935	0.899	0.971	0.801	1.02	0.0483	0.0966	10.3%	-0.13%
12.5		4	0.916	0.857	0.974	0.77	1.1	0.0783	0.157	17.1%	1.93%
25		4	0.954	0.916	0.991	0.845	1.05	0.05	0.1	10.5%	-2.17%
50		4	0.898	0.866	0.929	0.772	0.959	0.0425	0.0849	9.46%	3.83%
100		4	0.97	0.95	0.991	0.917	1.05	0.0281	0.0562	5.79%	-3.96%

Mean Dry Weight-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	4	0.933	0.901	0.966	0.866	1.05	0.0435	0.087	9.32%	0.0%
0	Lab Water Contr	4	0.884	0.866	0.902	0.812	0.92	0.0244	0.0488	5.53%	5.33%
6.25		4	0.935	0.899	0.971	0.801	1.02	0.0483	0.0966	10.3%	-0.13%
12.5		4	0.938	0.885	0.99	0.77	1.1	0.0705	0.141	15.0%	-0.46%
25		4	0.977	0.95	1	0.894	1.05	0.0367	0.0734	7.51%	-4.68%
50		4	0.898	0.866	0.929	0.772	0.959	0.0425	0.0849	9.46%	3.83%
100		4	0.996	0.979	1.01	0.95	1.05	0.023	0.046	4.62%	-6.69%

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	1	1	1	1
0	Lab Water Contr	1	1	1	1
6.25		1	1	1	1
12.5		1	1	1	0.9
25		1	1	1	0.9
50		1	1	1	1
100		1	0.9	1	1

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	0.95	1.05	0.866	0.868
0	Lab Water Contr	0.812	0.92	0.907	0.896
6.25		0.931	0.986	0.801	1.02
12.5		0.77	0.985	1.1	0.804
25		1.02	1.05	0.894	0.845
50		0.93	0.772	0.93	0.959
100		0.95	0.917	0.966	1.05

Mean Dry Weight-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	0.95	1.05	0.866	0.868
0	Lab Water Contr	0.812	0.92	0.907	0.896
6.25		0.931	0.986	0.801	1.02
12.5		0.77	0.985	1.1	0.893
25		1.02	1.05	0.894	0.939
50		0.93	0.772	0.93	0.959
100		0.95	1.02	0.966	1.05

7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	10/10	10/10	10/10	10/10
0	Lab Water Contr	10/10	10/10	10/10	10/10
6.25		10/10	10/10	10/10	10/10
12.5		10/10	10/10	10/10	9/10
25		10/10	10/10	10/10	9/10
50		10/10	10/10	10/10	10/10
100		10/10	9/10	10/10	10/10

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	15-2981-7920	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	18 Sep-13 15:57	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	6.45%	100	>100	NA	1

Steel Many-One Rank Sum Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	18	10	1	6	0.8333	Asymp	Non-Significant Effect
		12.5	16	10	1	6	0.6105	Asymp	Non-Significant Effect
		25	16	10	1	6	0.6105	Asymp	Non-Significant Effect
		50	18	10	1	6	0.8333	Asymp	Non-Significant Effect
		100	16	10	1	6	0.6105	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.009959749	0.00199195	5	0.6	0.7006	Non-Significant Effect
Error	0.0597585	0.003319917	18			
Total	0.06971824		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	0.6	4.25	0.7006	Equal Variances
Variances	Levene Equality of Variance	5.4	4.25	0.0033	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.669	0.884	<0.0001	Non-normal Distribution

7d Survival Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	1	1	1	1	1	1	0	0.0%	0.0%
6.25		4	1	1	1	1	1	1	0	0.0%	0.0%
12.5		4	0.975	0.895	1	1	0.9	1	0.025	5.13%	2.5%
25		4	0.975	0.895	1	1	0.9	1	0.025	5.13%	2.5%
50		4	1	1	1	1	1	1	0	0.0%	0.0%
100		4	0.975	0.895	1	1	0.9	1	0.025	5.13%	2.5%

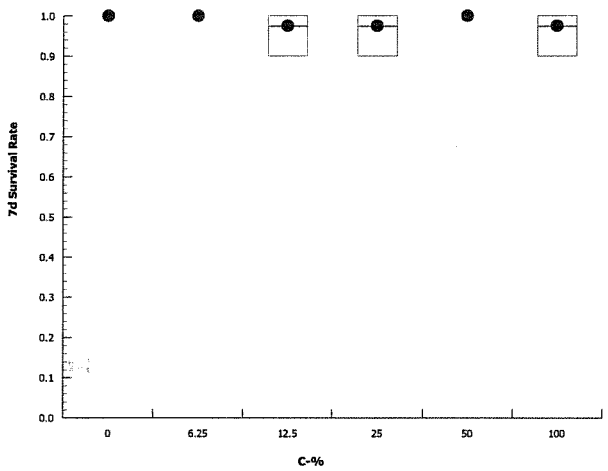
Angular (Corrected) Transformed Summary

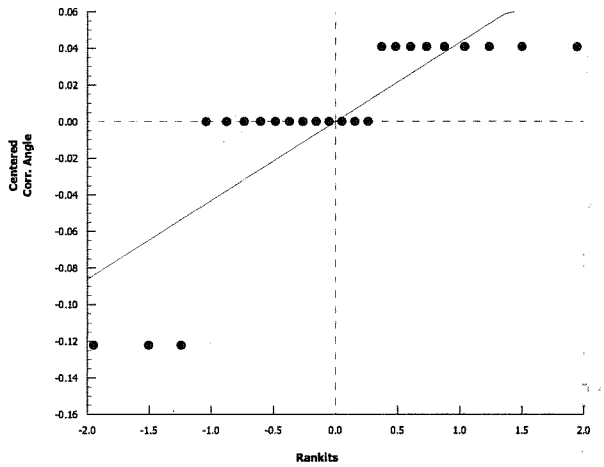
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Cont	4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%
6.25		4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%
12.5		4	1.37	1.24	1.5	1.41	1.25	1.41	0.0407	5.94%	2.89%
25		4	1.37	1.24	1.5	1.41	1.25	1.41	0.0407	5.94%	2.89%
50		4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%
100		4	1.37	1.24	1.5	1.41	1.25	1.41	0.0407	5.94%	2.89%

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	15-2981-7920	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	18 Sep-13 15:57	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Graphics





7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Lehigh Permanente
Test Material: Pond 14
Test ID#: 52994 Project #: 21442
Test Date: 9-10-13 Randomization: 6.4.3

Organism Log#: 7519 Age: 24h
Organism Supplier: Aquatox
Control/Diluent: EPAMH
Control Water Batch: 1618

Treatment (%)	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Conductivity (µs/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Water	25.3	7.98		8.1		300	10	10	10	10	Date: 9-10-13
6.25	25.3	8.03		8.0		375	10	10	10	10	Sample ID: 32681
12.5	25.3	7.96		8.0		447	10	10	10	10	Test Solution Prep: [illegible]
25	25.3	7.86		7.9		591	10	10	10	10	New WQ: [illegible]
50	25.3	7.74		7.9		857	10	10	10	10	Initiation Time: 1420
100	25.3	7.65		8.2		1341	10	10	10	10	Initiation Signoff: PJ
Meter ID	30A	pH19		RD05		EC04					
Lab Water	25.9	8.05	7.83	7.5	6.3	299	10	10	10	10	Date: 9-11-13
6.25	25.9	8.01	7.89	7.7	7.1	380	10	10	10	10	Sample ID: 32681
12.5	25.9	7.95	7.95	7.6	6.8	453	10	10	10	10	Test Solution Prep: [illegible]
25	25.9	7.92	8.01	7.6	6.3	590	10	10	10	9	New WQ: [illegible]
50	25.9	7.85	8.18	8.1	6.6	868	10	10	10	10	Renewal Time: 1200
100	25.9	7.81	8.17	9.1	6.6	1349	10	10	10	10	Renewal Signoff: MK
Meter ID	30A	pH16	pH16	RD07	RD07	EC07					Old WQ: [illegible]
Lab Water	25.6	7.88	7.83	8.5	7.4	301	10	10	10	10	Date: 9-12-13
6.25	25.6	7.78	7.78	8.3	7.1	373	10	10	10	10	Sample ID: 32725
12.5	25.6	7.71	7.77	8.2	7.1	447	10	10	10	10	Test Solution Prep: [illegible]
25	25.6	7.63	7.82	8.2	7.3	589	10	10	10	9	New WQ: [illegible]
50	25.6	7.55	7.98	8.0	7.2	862	10	10	10	10	Renewal Time: 1105
100	25.6	7.42	8.21	8.0	7.1	1333	10	9	10	10	Renewal Signoff: SVV
Meter ID	30A	pH19	pH16	RD05	RD05	EC04					Old WQ: [illegible]
Lab Water	25.6	8.21	7.89	8.5	8.0	301	10	10	10	10	Date: 9/13/13
6.25	25.6	8.11	7.97	8.3	7.9	375	10	10	10	10	Sample ID: 32725
12.5	25.6	8.09	8.04	8.4	7.7	461	10	10	10	10	Test Solution Prep: [illegible]
25	25.6	7.99	8.16	8.6	7.9	616	10	10	10	9	New WQ: [illegible]
50	25.6	7.89	8.32	9.0	~~7.8~~ 8.0	907	10	10	10	10	Renewal Time: 1115
100	25.6	7.85	8.44	10.0	7.9	1416	10	9	10	10	Renewal Signoff: [illegible]
Meter ID	30A	pH19	pH19	RD06	RD06	EC06					Old WQ: [illegible]

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Lehigh Permanente**
Test Material: Pond 14
Test ID#: 52994 Project #: 21442
Test Date: 9-10-13 Randomization: 6-7-3

Organism Log#: 7519 Age: <48h
Organism Supplier: Aquatox
Control/Diluent: EPAMH
Control Water Batch: 1618

Treatment (%)	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Conductivity (µs/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Water	25.5	8.19	7.78	8.5	8.0	299	10	10	10	10	Date: 9/14/13
6.25	25.5	8.07	7.91	8.3	7.8	398	10	10	10	10	Sample ID: 32749
12.5	25.5	7.99	7.99	8.3	7.8	447	10	10	10	10	Test Solution Prep: [illegible]
25	25.5	7.91	8.13	8.3	7.7	595	10	10	10	9	New WQ: FOUR
50	25.5	7.81	8.33	8.2	7.8	863	10	10	10	10	Renewal Time: 1000
100	25.5	7.72	8.40	8.2	7.8	1415	10	9	10	10	Renewal Signoff: [illegible]
Meter ID	30A	PH19	PH19	RD05	RD05	EC04					Old WQ: [illegible]
Lab Water	25.2	7.99	8.10	8.4	8.1	303	10	10	10	10	Date: 9/15/13
6.25	25.2	8.02	8.07	8.3	8.1	372	10	10	10	10	Sample ID: 32749
12.5	25.2	7.97	8.08	8.3	8.1	457	10	10	10	10	Test Solution Prep: [illegible]
25	25.2	7.87	8.16	8.3	8.1	596	10	10	10	9	New WQ: CP
50	25.2	7.78	8.33	8.3	8.1	858	10	10	10	10	Renewal Time: 1020
100	25.2	7.64	8.38	8.0	8.1	1328	10	9	10	10	Renewal Signoff: [illegible]
Meter ID	30A	PH19	PH19	RD07	RD07	EC07					Old WQ: CP
Lab Water	25.5	8.08	7.88	8.2	7.5	307	10	10	10	10	Date: 9-16-13
6.25	25.5	8.05	7.90	8.1	7.5	381	10	10	10	10	Sample ID: 32749
12.5	25.5	8.01	7.97	8.2	7.7	457	10	10	10	10	Test Solution Prep: [illegible]
25	25.5	7.96	8.07	8.2	7.6	593	10	10	10	9	New WQ: [illegible]
50	25.5	7.87	8.29	8.3	7.7	852	10	10	10	10	Renewal Time: 1040
100	25.5	7.82	8.34	9.0	7.7	1341	10	9	10	10	Renewal Signoff: [illegible]
Meter ID	30A	pH16	pH19	RD05	RD07	EC06					Old WQ: [illegible]
Lab Water	25.5		8.16		~~5.7a~~ 6.8	316	10	10	10	10	Date: 9/17/13
6.25	25.5		8.08		7.3	397	10	10	10	10	Sample ID: —
12.5	25.5		8.13		~~6.4a~~ 7.0	474	10	10	10	9	Termination Time: 0825
25	25.5		8.22		7.0	621	10	10	10	9	Termination Signoff: [illegible]
50	25.5		8.38		7.0	898	10	10	10	10	Old WQ: [illegible]
100	25.5		8.38		7.2	1367	10	9	10	10	
Meter ID	30A		PH19		RD06	EC07					

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	09-3281-9849	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.5
Analyzed:	18 Sep-13 15:58	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	18.7%	100	>100	NA	1

Dunnett Multiple Comparison Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	-0.743	2.41	0.165	6	0.9662	CDF	Non-Significant Effect
		12.5	-0.462	2.41	0.165	6	0.9342	CDF	Non-Significant Effect
		25	-1.02	2.41	0.165	6	0.9836	CDF	Non-Significant Effect
		50	-0.204	2.41	0.165	6	0.8863	CDF	Non-Significant Effect
		100	-1.26	2.41	0.165	6	0.9917	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.02208101	0.004416202	5	0.468	0.7950	Non-Significant Effect
Error	0.169805	0.009433609	18			
Total	0.191886		23			

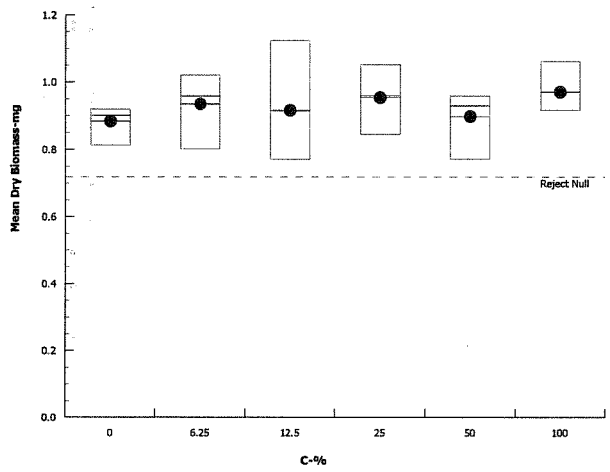
Distributional Tests

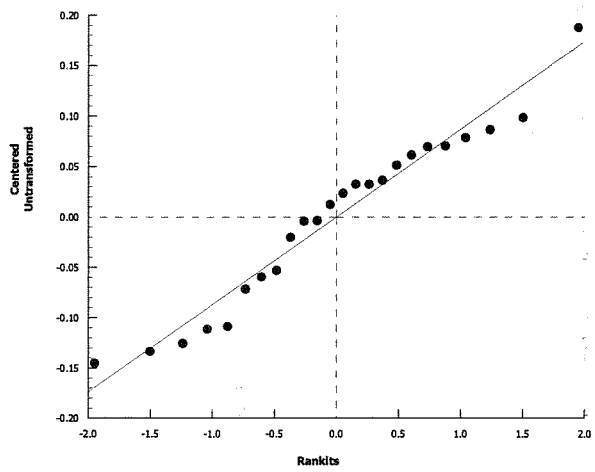
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	4.61	15.1	0.4648	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.957	0.884	0.3883	Normal Distribution

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	0.884	0.806	0.961	0.901	0.812	0.92	0.0244	5.53%	0.0%
6.25		4	0.935	0.781	1.09	0.958	0.801	1.02	0.0483	10.3%	-5.77%
12.5		4	0.916	0.666	1.16	0.895	0.77	1.1	0.0783	17.1%	-3.59%
25		4	0.954	0.795	1.11	0.959	0.845	1.05	0.05	10.5%	-7.92%
50		4	0.898	0.763	1.03	0.93	0.772	0.959	0.0425	9.46%	-1.58%
100		4	0.97	0.881	1.06	0.958	0.917	1.05	0.0281	5.79%	-9.82%

Graphics





CETIS Analytical Report

Report Date:	18 Sep-13 15:59 (p 1 of 1)
Test Code:	52994 | 05-8948-7542

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	00-2354-5271	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.5
Analyzed:	18 Sep-13 15:58	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	925346	200	Yes	Two-Point Interpolation

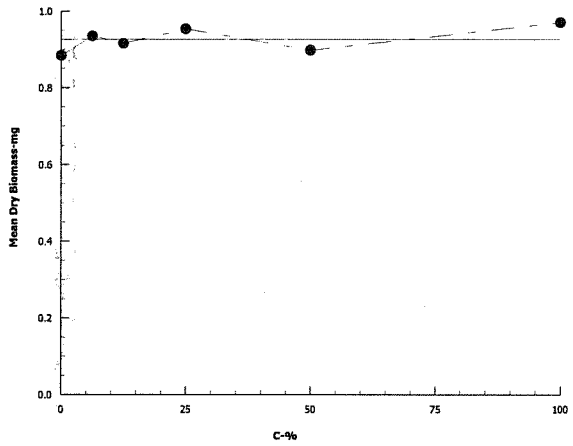
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>100	N/A	N/A	<1	NA	NA
IC10	>100	N/A	N/A	<1	NA	NA
IC15	>100	N/A	N/A	<1	NA	NA
IC20	>100	N/A	N/A	<1	NA	NA
IC25	>100	N/A	N/A	<1	NA	NA
IC40	>100	N/A	N/A	<1	NA	NA
IC50	>100	N/A	N/A	<1	NA	NA

Mean Dry Biomass-mg Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contro	4	0.884	0.812	0.92	0.0244	0.0488	5.53%	0.0%
6.25		4	0.935	0.801	1.02	0.0483	0.0966	10.3%	-5.77%
12.5		4	0.916	0.77	1.1	0.0783	0.157	17.1%	-3.59%
25		4	0.954	0.845	1.05	0.05	0.1	10.5%	-7.92%
50		4	0.898	0.772	0.959	0.0425	0.0849	9.46%	-1.58%
100		4	0.97	0.917	1.05	0.0281	0.0562	5.79%	-9.82%

Graphics



Fathead Minnow Dry Weight Data Sheet

Client: **Lehigh Permanente** Test ID #: 52994 Project # 21442
Sample: Pond 14 Tare Weight Date: 9/16/13 Sign-off: CA
Test Date: 9/10/13 Final Weight Date: 9/18/13 Sign-off: JLA

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Lab Water	A	160.69	168.81	10	0.812
2		B	165.52	174.72	10	0.920
3		C	177.61	186.68	10	0.907
4		D	169.12	178.08	10	0.896
5	6.25	A	182.64	191.95	10	0.931
6		B	166.14	176.00	10	0.986
7		C	152.89	160.90	10	0.801
8		D	155.64	165.85	10	1.021
9	12.5	A	154.20	161.90	10	0.770
10		B	173.17	183.02	10	0.985
11		C	153.90	164.93	10	1.103
12		D	166.54	174.58	10	0.804
13	25	A	166.85	177.09	10	1.024
14		B	154.12	164.64	10	1.052
15		C	159.34	168.28	10	0.894
16		D	171.56	180.01	10	0.845
17	50	A	163.46	172.76	10	0.930
18		B	162.05	169.77	10	0.772
19		C	161.70	171.00	10	0.930
20		D	169.71	179.30	10	0.959
21	100	A	168.90	178.40	10	0.950
22		B	156.06	165.23	10	0.917
23		C	161.08	170.74	10	0.966
24		D	163.02	173.51	10	1.049
QA 1			166.70	166.67		
QA 2			180.33	180.31		
QA3			166.19	166.18		
Balance ID:			BAL01	BAL01		

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	18-0208-3499	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	18 Sep-13 15:58	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	Test Result
Angular (Corrected)	NA	C > T	NA	NA	Passes 7d survival rate

Wilcoxon Rank Sum Two-Sample Test

Control	vs	Control	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		Hardness Blank	18	NA	1	6	1.0000	Exact	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	1	65500	<0.0001	Significant Effect
Error	0	0	6			
Total	0		7			

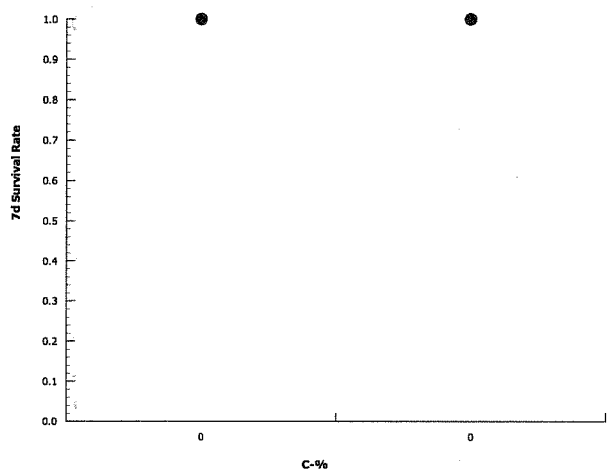
7d Survival Rate Summary

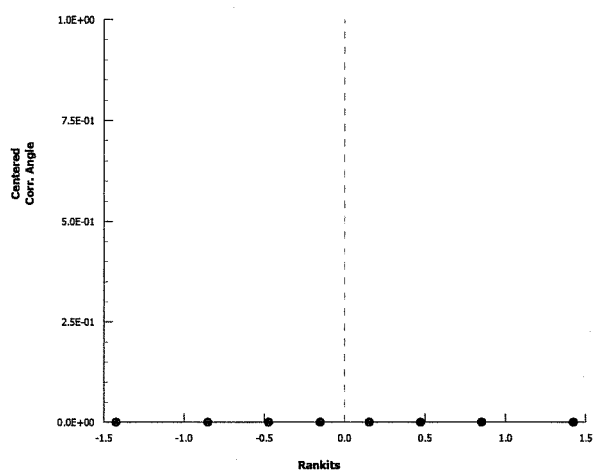
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	1	1	1	1	1	1	0	0.0%	0.0%
0	Hardness Blank	4	1	1	1	1	1	1	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Cont	4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%
0	Hardness Blank	4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%

Graphics





7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Lehigh Permanente**
Test Material: Hardness Blank
Test ID#: 52993 Project #: 21442
Test Date: 9-10-13 Randomization: 7-4-2

Organism Log#: 7519 Age: 48hrs
Organism Supplier: Aquatox
Control/Diluent: EPAMH
Control Water Batch: 1618

Test Treatment	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Conductivity (µS/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Hardness Blank	25.1	8.10		9.7		1381	10	10	10	10	Date: PA 9.10.13
											Test Solution Prep: PA ~~325~~
											Initiation Time: 1521
Meter ID	30A	pH15		RD06		EC06	New WQ: OG				Initiation Signoff: KW
Hardness Blank	25.9	8.05	8.07	9.9	7.3	1381	10	10	10	10	Date: 9-11-13
											Test Solution Prep: [illegible]
											Renewal Time: 1205
Meter ID	30A	pH15	pH15	RD06	RD07	EC04	New WQ: JLA		Old WQ: OG		Renewal Signoff: [illegible]
Hardness Blank	25.5	7.86	7.81	9.2	7.1	1359	10	10	10	10	Date: 9-12-13
											Test Solution Prep: [illegible]
											Renewal Time: 1115
Meter ID	30A	pH19	Ph19	RD05	RD06	EC04	New WQ: MO		Old WQ: [illegible]		Renewal Signoff: [illegible]
Hardness Blank	25.6	8.13	8.00	10.6	7.2	1381	10	10	10	10	Date: 9-13-13
											Test Solution Prep: KW
											Renewal Time: 1030
Meter ID	30A	pH19	PH16	RD06	RD05	EC06	New WQ: OG		Old WQ: DH		Renewal Signoff: KP
Hardness Blank	25.4	7.99	8.17	10.4	8.1	1386	10	10	10	10	Date: 9/14/13
											Test Solution Prep: KW
											Renewal Time: 0915
Meter ID	30A	PH19	pH19	RD05	RD05	EC04	New WQ: ~~JLB~~		Old WQ: OG		Renewal Signoff: KP
Hardness Blank	25.3	7.96	8.11	9.3	8.4	1345	10	10	10	10	Date: 9-15-13
											Test Solution Prep: [illegible]
											Renewal Time: 1015
Meter ID	30A	PH16	PH16	RD06	RD06	EC04	New WQ: GG		Old WQ: GG		Renewal Signoff: PA
Hardness Blank	25.4	8.05	8.10	9.5	7.3	1358	10	10	10	10	Date: 9-16-13
											Test Solution Prep: [illegible]
											Renewal Time: 1110
Meter ID	30A	PH16	pH19	RD05	RD05	EC06	New WQ: CA		Old WQ: [illegible]		Renewal Signoff: [illegible]
Hardness Blank	25.5		8.11		6.6	1432	10	10	10	10	Date: 9/17/13
											Termination Time: 0940
Meter ID	30A		pH19		RD07	EC07			Old WQ: OG		Termination Signoff: [illegible]

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	18-4875-1003	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.5
Analyzed:	18 Sep-13 15:58	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	11.0%	Passes mean dry biomass-mg

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		Hardness Blank	-0.998	1.94	0.097	6	0.8215	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.004950072	0.004950072	1	0.995	0.3570	Non-Significant Effect
Error	0.02984402	0.004974003	6			
Total	0.03479409		7			

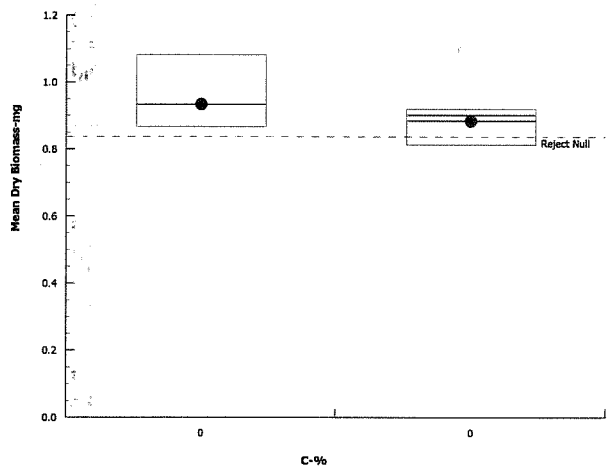
Distributional Tests

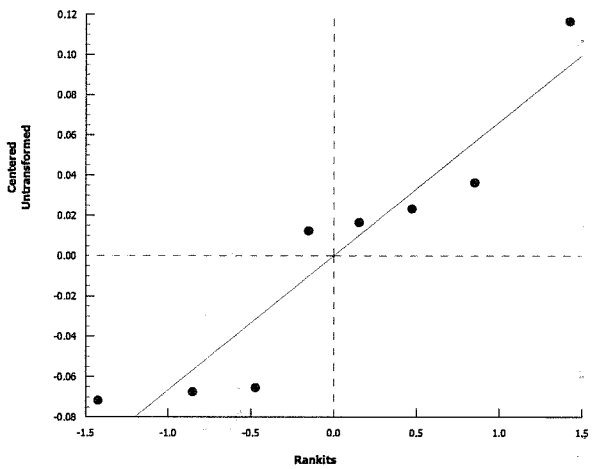
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	3.17	47.5	0.3684	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.885	0.645	0.2093	Normal Distribution

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	0.884	0.806	0.961	0.901	0.812	0.92	0.0244	5.53%	0.0%
0	Hardness Blank	4	0.933	0.795	1.07	0.901	0.866	1.05	0.0435	9.32%	-5.63%

Graphics





Fathead Minnow Dry Weight Data Sheet

Client: **Lehigh Permanente** Test ID #: 52993 Project # 21442

Test Material: Hardness Blank Tare Weight Date: 9/16/13 Sign-off: CA

Test Date: 9-10-13 Final Weight Date: 9/18/13 Sign-off: JCA

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
25	**Hardness Blank**	A	159.52	169.02	10	0.950
26		B	165.58	176.08	10	1.050
27		C	174.52	183.18	10	0.866
28		D	155.38	164.06	10	0.868
QA			154.51	154.54		

Appendix K

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the *Selenastrum capricornutum*

CETIS Summary Report

Report Date: 19 Sep-13 16:07 (p 1 of 1)
Test Code: 52927 | 16-2871-7045

Algal Growth Test — **Pacific EcoRisk**

Batch ID:	00-1842-3217	**Test Type:**	Cell Growth	**Analyst:**	Michelle Kawaguchi
Start Date:	10 Sep-13 16:17	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	14 Sep-13 14:17	**Species:**	Selenastrum capricornutum	**Brine:**	Not Applicable
Duration:	94h	**Source:**	In-House Culture	**Age:**	6

Sample ID:	02-8431-1189	**Code:**	NaCl	**Client:**	Pacific Ecorisk
Sample Date:	10 Sep-13 16:17	**Material:**	Sodium chloride	**Project:**	21403
Receive Date:	10 Sep-13 16:17	**Source:**	Reference Toxicant		
Sample Age:	NA (25.8 °C)	**Station:**	In House		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
09-3331-9448	96h Cell Density-with EDTA	0.25	0.5	0.3536	8.21%		Steel Many-One Rank Sum Test

Point Estimate Summary

Analysis ID	Endpoint	Level	g/L	95% LCL	95% UCL	TU	Method
01-8184-9629	96h Cell Density-with EDTA	IC5	0.181	0.0577	0.226		Linear Interpolation (ICPIN)
		IC10	0.237	0.139	0.388		
		IC15	0.369	0.161	0.557		
		IC20	0.529	0.276	0.735		
		IC25	0.709	0.404	0.895		
		IC40	1.4	1.06	1.73		
		IC50	1.98	1.67	2.34		

96h Cell Density-with EDTA Summary

C-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	4	3.90E+6	3.76E+6	4.04E+6	3.55E+6	4.37E+6	1.86E+5	3.71E+5	9.52%	0.0%
0.125		4	4.02E+6	3.93E+6	4.12E+6	3.70E+6	4.31E+6	1.27E+5	2.53E+5	6.29%	-3.21%
0.25		4	3.52E+6	3.51E+6	3.53E+6	3.50E+6	3.56E+6	1.44E+4	2.87E+4	0.82%	9.75%
0.5		4	3.20E+6	3.16E+6	3.24E+6	3.06E+6	3.34E+6	5.73E+4	1.15E+5	3.58%	17.9%
1		4	2.65E+6	2.62E+6	2.68E+6	2.59E+6	2.72E+6	3.49E+4	6.98E+4	2.63%	32.0%
2		4	1.97E+6	1.92E+6	2.01E+6	1.81E+6	2.13E+6	6.55E+4	1.31E+5	6.67%	49.6%
4		4	4.62E+5	4.49E+5	4.75E+5	4.17E+5	5.04E+5	1.78E+4	3.56E+4	7.7%	88.1%

96h Cell Density-with EDTA Detail

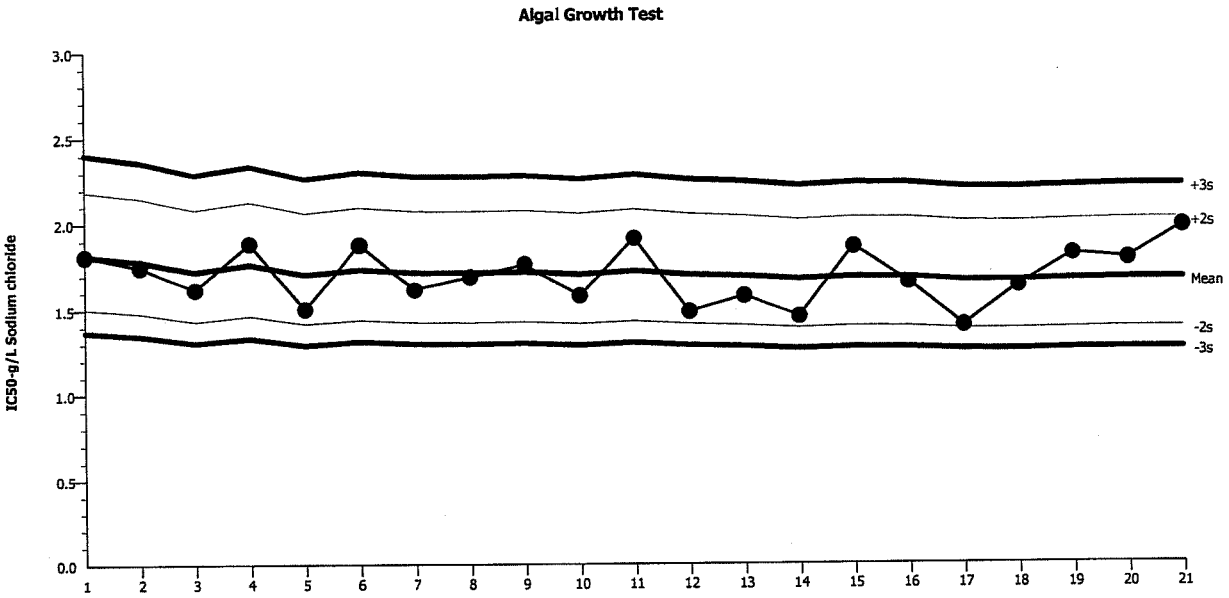
C-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Water Contr	3.55E+6	4.01E+6	3.66E+6	4.37E+6
0.125		4.09E+6	3.99E+6	4.31E+6	3.70E+6
0.25		3.50E+6	3.50E+6	3.51E+6	3.56E+6
0.5		3.21E+6	3.19E+6	3.06E+6	3.34E+6
1		2.59E+6	2.59E+6	2.70E+6	2.72E+6
2		1.81E+6	1.95E+6	1.97E+6	2.13E+6
4		4.65E+5	4.17E+5	4.62E+5	5.04E+5

CETIS QC Plot

Report Date: 19 Sep-13 16:08 (1 of 1)

Algal Growth Test — **Pacific EcoRisk**

Test Type:	Cell Growth	**Organism:**	Selenastrum capricornutum (Green A	**Material:**	Sodium chloride
Protocol:	EPA-821-R-02-013 (2002)	**Endpoint:**	96h Cell Density-with EDTA	**Source:**	Reference Toxicant-REF



Mean:	1.678	**Count:**	20	**-2s Warning Limit:**	1.392	**-3s Action Limit:**	1.268
Sigma:	NA	**CV:**	9.79%	**+2s Warning Limit:**	2.023	**+3s Action Limit:**	2.221

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2013	Apr	10	15:15	1.814	0.1364	0.8363			13-2732-7170	20-3961-1168
2			16	14:30	1.752	0.07414	0.4627			06-9817-4928	02-5501-2524
3			23	17:00	1.621	-0.05734	-0.3721			18-0793-2383	13-5151-7104
4		May	7	14:45	1.886	0.2083	1.252			09-5456-1579	14-3476-4063
5		Jun	4	14:20	1.505	-0.1733	-1.167			00-2423-3035	04-6093-8577
6			11	15:00	1.878	0.1998	1.204			20-5666-3881	05-5773-3102
7			25	12:25	1.618	-0.05961	-0.3871			09-0813-5376	15-4651-9953
8		Jul	11	11:50	1.692	0.01413	0.08973			06-2257-1373	00-2793-3515
9			12	14:20	1.762	0.08381	0.5216			19-1773-1113	17-6889-6793
10			16	16:55	1.58	-0.09754	-0.6409			06-8636-1594	02-2226-2416
11			18	13:50	1.913	0.2349	1.402			09-5365-4617	00-7985-1025
12			23	17:11	1.486	-0.1924	-1.303			16-4188-5545	09-6685-0497
13			24	13:15	1.576	-0.1016	-0.6684			09-1920-2405	08-9626-0911
14			25	17:15	1.456	-0.2225	-1.522			09-8114-1135	03-2523-0131
15		Aug	6	14:35	1.863	0.185	1.119			00-8002-7310	07-5554-3549
16			8	15:30	1.656	-0.02219	-0.1425			00-5433-1676	14-9545-4523
17			9	13:15	1.401	-0.2774	-1.934			02-1014-0219	12-1267-0002
18			13	16:10	1.633	-0.04458	-0.2882			14-0397-6273	20-9696-7696
19			20	13:45	1.818	0.1396	0.8555			03-6826-1909	06-6026-8699
20		Sep	4	15:35	1.789	0.1113	0.6874			15-5327-9765	11-7512-7945
21			10	16:17	1.978	0.3001	1.761			16-2871-7045	01-8184-9629

Selenastrum capricornutum Algal Toxicity Test Water Quality Data

Client: **Reference Toxicant** Test ID #: 52927 Test Date: 9/10/13

Test Material: NaCl Project #: 21403 Control/Diluent: Lab Water w/ EDTA

Reference Toxicant Test Treatment (g/L NaCl)	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Lab Water Control	25.8	7.50	8.2	90.8	Date: 9/10/13
0.125	25.8	8.05	8.0	342	Test Solution Prep: Le
0.25	25.8	7.80	8.2	642	New WQ: AE
0.5	25.8	7.69	8.4	1113	Innoculation Time: 1617
1	25.8	7.65	8.3	2096	Innoculation Signoff: Le
2	25.8	7.61	8.3	3930	Shelf ID: R152
4	25.8	7.57	8.3	7550	
Meter ID:	67A	pH15	RD06	EC06	
Lab Water Control	25.8	7.98			Date: 9/11/13
0.125	25.8	7.77			WQ Time: 1022
0.25	25.8	7.64			WQ Signoff: CP
0.5	25.8	7.58			
1	25.8	7.51			
2	25.8	7.44			
4	25.8	7.35			
Meter ID:	67A	pH15			
Lab Water Control	25.7	8.46			Date: 9/12/13
0.125	25.7	8.40			WQ Time: 0937
0.25	25.7	8.30			WQ Signoff: CP
0.5	25.7	8.18			
1	25.7	8.11			
2	25.7	8.00			
4	25.7	7.90			
Meter ID:	67A	pH16			
Lab Water Control	25.9	9.62			Date: 9/13/13
0.125	25.9	9.56			WQ Time: 0930
0.25	25.9	9.51			WQ Signoff: NL
0.5	25.9	9.36			
1	25.9	9.26			
2	25.9	8.46			
4	25.9	7.43			
Meter ID:	67A	pH16			
Lab Water Control	26.2	9.90	13.5	100	Date: 9/14/13
0.125	26.2	9.79	13.9	343	Termination Time: 1417
0.25	26.2	9.62	13.3	637	Termination Signoff: KS
0.5	26.2	9.59	13.0	1107	WQ Time: 1100
1	26.2	9.50 9.67	12.6	2077	WQ Signoff: AE
2	26.2	9.19	11.5	3920	
4	26.2	7.85	9.5	7470	
Meter ID:	67A	pH15	RD06	EC07	

Initial Test Conditions			
Target: 8.000 g NaCl in 2 L	Alkalinity	Hardness	Light Intensity (ftc)
Actual: 8.000 g/2L	11 ✓	15 ✓	385.4

Selenastrum capricornutum Cell Density Enumeration Data

Client: **Reference Toxicant**
Test Material: NaCl
Test Start Date: 9/10/13 Start Time: 1617
Test End Date: 9/14/13 End Time: 1417

Initial Count: 10,000 cells/mL
Enumerating Scientist: KP
Project #: 21403
Test ID #: 52927

Treatment	Cell Density (cells/mL x 10^6)				
	Rep A	Rep B	Rep C	Rep D	Mean
Lab Water Control	3.55	4.01	3.66	4.37	3.90
0.125	4.09	3.99	4.31	3.70	4.02
0.25	3.50	3.50	3.51	3.56	3.52
0.5	3.21	3.19	3.06	3.34	3.20
1	2.59	2.59	2.70	2.72	2.65
2	1.81	1.95	1.97	2.13	1.97
4	0.465	0.417	0.462	0.504	0.462
This datasheet has been reviewed for completeness and consistency with Test Acceptability Criteria and/or other issues of concern.	**Control Mean Density (cells/mL x 10^6)**	**% CV**	**Date:**	**Time:**	**Signoff:**
	3.90	9.52	9/14/13	1800	MK

Appendix L

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the *Ceriodaphnia dubia*

CETIS Summary Report

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Batch ID:	12-3319-2144	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Padrick Anderson
Start Date:	10 Sep-13 15:45	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	16 Sep-13 15:30	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d	**Source:**	In-House Culture	**Age:**	1

Sample ID:	19-7242-4658	**Code:**	NaCl	**Client:**	Pacific Ecorisk
Sample Date:	10 Sep-13 15:45	**Material:**	Sodium chloride	**Project:**	21404
Receive Date:	10 Sep-13 15:45	**Source:**	Reference Toxicant		
Sample Age:	NA (25.1 °C)	**Station:**	In House		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
02-5194-0021	Reproduction	500	1000	707.1	20.1%		Wilcoxon/Bonferroni Adj Test
01-7557-2365	Survival	2000	>2000	NA	NA		Fisher Exact/Bonferroni-Holm Test

Point Estimate Summary

Analysis ID	Endpoint	Level	mg/L	95% LCL	95% UCL	TU	Method
00-3824-1989	Reproduction	IC5	527	181	564		Linear Interpolation (ICPIN)
		IC10	573	361	629		
		IC15	619	510	696		
		IC20	665	553	761		
		IC25	711	604	827		
		IC40	849	727	1030		
		IC50	941	806	1160		
08-5511-7231	Survival	EC50	1790	1530	2090		Spearman-Kärber

Reproduction Summary

C-mg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	33.6	31.4	35.8	18	39	1.89	5.97	17.8%	0.0%
500		10	32.9	30.9	34.9	22	41	1.73	5.49	16.7%	2.08%
1000		9	14.7	10.5	18.8	0	28	3.69	11.1	75.4%	56.3%
1500		10	5.6	3.51	7.69	0	14	1.77	5.6	100.0%	83.3%
2000		10	0.5	0.0967	0.903	0	3	0.342	1.08	216.0%	98.5%
2500		10	0	0	0	0	0	0	0		100.0%

Survival Summary

C-mg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	1	1	1	1	1	0	0	0.0%	0.0%
500		10	1	1	1	1	1	0	0	0.0%	0.0%
1000		9	0.889	0.764	1	0	1	0.111	0.333	37.5%	11.1%
1500		10	0.9	0.782	1	0	1	0.1	0.316	35.1%	10.0%
2000		10	0.5	0.303	0.697	0	1	0.167	0.527	105.0%	50.0%
2500		10	0	0	0	0	0	0	0		100.0%

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Reproduction Detail

C-mg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Lab Water Contr	39	32	33	33	39	18	35	36	35	36
500		34	22	30	31	39	34	41	28	36	34
1000		0	20	22	4	22	25	28	11	0	
1500		0	0	2	3	2	13	13	14	6	3
2000		3	0	2	0	0	0	0	0	0	0
2500		0	0	0	0	0	0	0	0	0	0

Survival Detail

C-mg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Lab Water Contr	1	1	1	1	1	1	1	1	1	1
500		1	1	1	1	1	1	1	1	1	1
1000		1	1	1	1	1	0	1	1	1	
1500		0	1	1	1	1	1	1	1	1	1
2000		1	0	1	1	0	0	1	1	0	0
2500		0	0	0	0	0	0	0	0	0	0

Survival Binomials

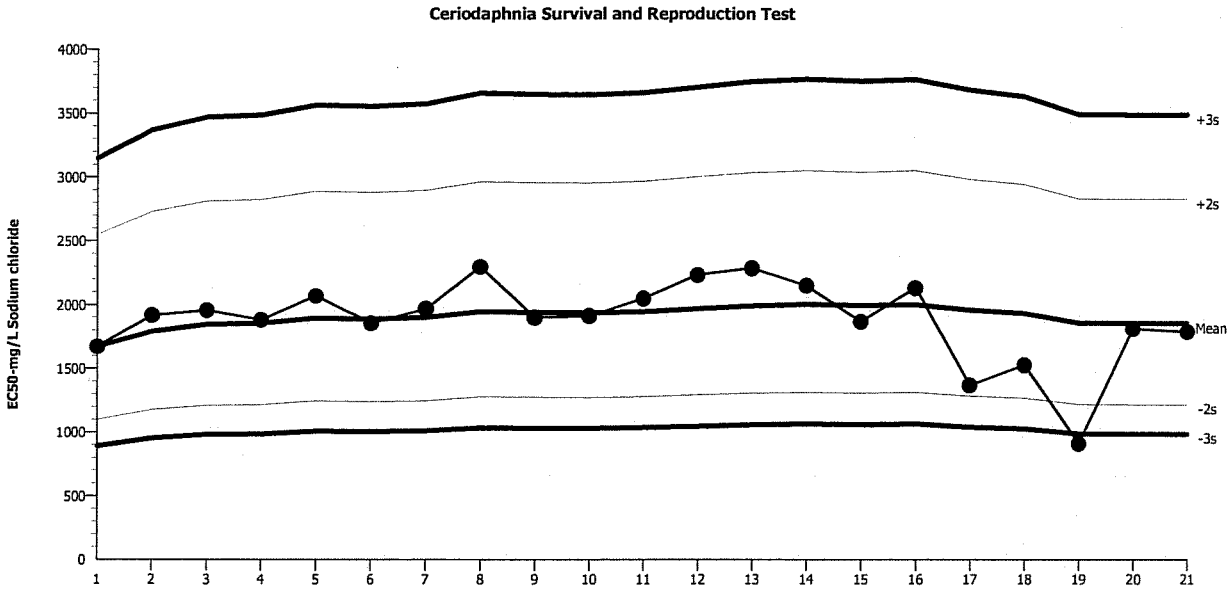
C-mg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Lab Water Contr	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
500		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
1000		1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	
1500		0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
2000		1/1	0/1	1/1	1/1	0/1	0/1	1/1	1/1	0/1	0/1
2500		0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1

CETIS QC Plot

Report Date: 20 Sep-13 11:00 (1 of 1)

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Test Type:	Reproduction-Survival (7d)	**Organism:**	Ceriodaphnia dubia (Water Flea)	**Material:**	Sodium chloride
Protocol:	EPA-821-R-02-013 (2002)	**Endpoint:**	Survival	**Source:**	Reference Toxicant-REF



Mean:	1856	**Count:**	20	**-2s Warning Limit:**	1218	**-3s Action Limit:**	986.3
Sigma:	NA	**CV:**	23.40%	**+2s Warning Limit:**	2827	**+3s Action Limit:**	3490

Quality Control Data

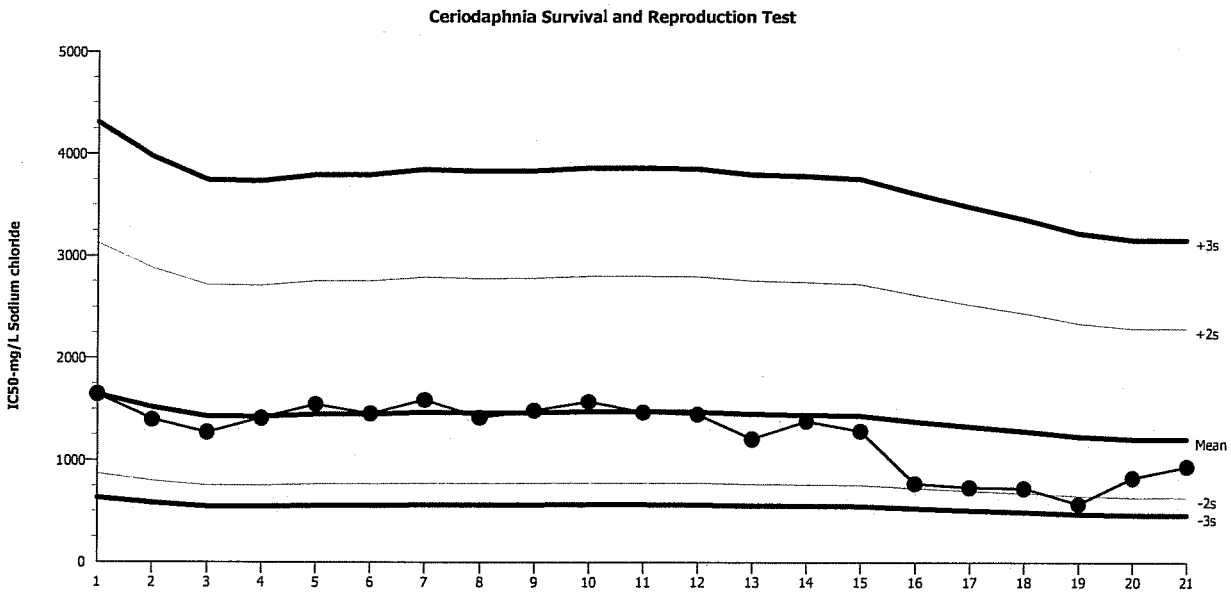
Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2013	Jun	5	14:15	1673	-182.6	-0.4919			20-1540-0884	14-0281-2345
2			11	16:00	1918	62.69	0.1578			14-5892-0357	16-2600-5363
3			18	16:31	1958	102	0.254			08-5265-3459	17-8933-5006
4		Jul	9	15:30	1882	26.11	0.06635			06-7165-5899	03-2029-0645
5			10	16:15	2071	215.5	0.5216			09-5526-5651	06-6183-0414
6			11	16:00	1857	0.918	0.002348			08-1160-9491	17-1248-0441
7			12	15:00	1968	112.3	0.279			09-5723-4998	19-6860-1557
8			16	16:00	2299	443.6	1.018			03-3511-7926	05-2874-2717
9			17	15:30	1900	44.79	0.1133			20-2601-2160	09-5528-0620
10			23	14:20	1913	57.05	0.1438			20-6293-4658	07-8381-3088
11			24	15:00	2050	194.2	0.4726			01-8536-7914	14-0243-4893
12			30	14:20	2236	380.4	0.8854			12-1136-4223	20-0201-8982
13		Aug	1	15:20	2288	432.7	0.9953			12-5327-6155	06-5418-0930
14			6	11:00	2152	296.2	0.7032			17-5067-0184	17-4659-1149
15			7	13:30	1870	14.32	0.03649			05-7858-8998	18-5915-9115
16			13	15:15	2135	279.1	0.6652			02-4060-1860	03-8416-8331
17			20	15:45	1371	-484.6	-1.437			02-9790-5022	17-0693-2451
18			22	14:15	1528	-327.4	-0.9218			15-4307-6994	15-8236-0910
19		Sep	3	15:45	911.9	-943.8	-3.374	(-)	(-)	13-8729-4703	05-7753-4891
20			4	15:50	1814	-41.97	-0.1086			13-8435-2568	07-3106-1297
21			10	15:45	1790	-65.25	-0.17			06-6892-1810	08-5511-7231

CETIS QC Plot

Report Date: 20 Sep-13 11:01 (1 of 1)

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Test Type:	Reproduction-Survival (7d)	**Organism:**	Ceriodaphnia dubia (Water Flea)	**Material:**	Sodium chloride
Protocol:	EPA-821-R-02-013 (2002)	**Endpoint:**	Reproduction	**Source:**	Reference Toxicant-REF



Mean:	1211	**Count:**	20	**-2s Warning Limit:**	637.7	**-3s Action Limit:**	462.9
Sigma:	NA	**CV:**	37.80%	**+2s Warning Limit:**	2297	**+3s Action Limit:**	3165

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2013	Jun	11	16:00	1648	437.3	0.9623			14-5892-0357	13-9288-2028
2			18	16:31	1401	190.1	0.4552			08-5265-3459	17-0626-6793
3		Jul	9	15:30	1273	62.54	0.1572			06-7165-5899	19-4789-3932
4			10	16:15	1413	202.4	0.4825			09-5526-5651	04-6867-3299
5			11	16:00	1549	338.7	0.7699			08-1160-9491	07-5826-0743
6			12	15:00	1457	246.4	0.5781			09-5723-4998	17-3941-7032
7			16	16:00	1593	382.4	0.8567			03-3511-7926	01-9263-8701
8			17	15:30	1420	209.7	0.4985			20-2601-2160	05-9581-6077
9			23	14:20	1488	277.5	0.644			20-6293-4658	17-0300-5501
10			24	15:00	1578	367.6	0.8274			01-8536-7914	00-6710-6642
11			30	14:20	1471	260.2	0.6075			12-1136-4223	09-3768-0076
12		Aug	1	15:20	1453	241.9	0.5686			12-5327-6155	04-7452-4330
13			6	11:00	1210	-1.079	-0.002781			17-5067-0184	14-6402-7009
14			7	13:30	1385	174.7	0.4208			05-7858-8998	12-6321-1886
15			13	15:15	1288	76.8	0.1919			02-4060-1860	18-0652-6682
16			20	15:45	776.3	-434.4	-1.387			02-9790-5022	01-4953-7446
17			22	14:15	736.2	-474.5	-1.553			15-4307-6994	17-9023-8716
18			23	14:50	728.3	-482.5	-1.587			18-2895-6024	07-8028-0503
19		Sep	3	15:45	572.9	-637.8	-2.335	(-)		13-8729-4703	13-0244-8354
20			4	15:50	829.8	-381	-1.179			13-8435-2568	00-9672-3503
21			10	15:45	941.5	-269.3	-0.785			06-6892-1810	00-3824-1989

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Reference Toxicant** Material: **Sodium Chloride** Test Date: 9/10/13

Project #: 21404 Test ID: 52928 Randomization: 10.7.2 Control Water: Modified EPAMH

Lab Water Control

Day	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm) New	Conductivity (µS/cm) Old	Temp (°C)	A	B	C	D	E	F	G	H	I	J
0	7.94		7.7		348		25.1	0	0	0	0	0	0	0	0	0	0
1	8.20	7.90	7.1	7.1	348	385	25.8	0	0	0	0	0	0	0	0	0	0
2	7.72	8.07	7.7	7.7	343	370	25.4	0	0	0	0	0	0	0	0	0	0
3	7.96	7.95	7.2	7.4	349	~~349~~ 379	25.5	6	4	4	6	5	2	7	3	7	3
4	7.89	7.76	7.7	7.1	376	376	25.3	0	10	~~10~~ 10	11	0	4	12	11	0	0
5	7.90	7.77	8.7	7.1	~~457~~ 353	358	25.3	14	0	0	0	16	0	0	0	10	11
6	–	7.92	–	5.5	–	408	25.5	19	18	19	16	18	12	16	22	18	22
7																	
8																	
							Total=	39	32	33	33	39	18	35	36	35	36

SIGN-OFF

Date: 9/10/13	New WQ:	Test Init:	
Sol'n Prep:	Old WQ:	Time: 1515	
Date: 9/11/13	New WQ:	Counts: KB	
Sol'n Prep: KB	Old WQ:	Time: 1540	
Date: 9/12/13	New WQ: GG	Counts: DS	
Sol'n Prep:	Old WQ:	Time: 1530	
Date: 9/13/13	New WQ:	Counts: DS	
Sol'n Prep: KP	Old WQ:	Time: 1530	
Date: 9/14/13	New WQ: DS	Counts:	
Sol'n Prep: KP	Old WQ:	Time: 1600	
Date: 9/15/13	New WQ: GG	Counts: SM	
Sol'n Prep: SM	Old WQ: PMB	Time: 1530	
Date: 9/16/13	New WQ: –	Counts:	
Sol'n Prep: –	Old WQ:	Time: 1530	
Date:	New WQ:	Counts:	
Sol'n Prep:	Old WQ:	Time:	
Date:	Old WQ:	Counts:	
		Time:	

Mean Neonates/Female = 33.6

500 mg/L

Day	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm) New	Conductivity (µS/cm) Old	A	B	C	D	E	F	G	H	I	J	RT BATCH NUMBER
0	7.91		7.8		1353		0	0	0	0	0	0	0	0	0	0	107
1	8.08	7.91	7.2	7.2	1320	1493	0	0	0	0	0	0	0	0	0	0	107
2	7.80	7.99	7.9	7.6	1382	1420	0	0	0	0	0	0	0	0	0	0	107
3	7.89	7.91	8.3	6.8	1352	1491	5	4	5	4	4	5	6	0	4	4	107
4	7.89	7.77	7.9	6.0	1306	1504	0	0	~~12~~ 0	12	14	14	17	0	0	10	109
5	7.92	7.89	8.5	5.0	1315	1423	13	14	12	0	0	15	0	11	12	0	109
6	–	7.86	–	5.6	–	1425	16	4	13	15	21	0	18	17	20	20	–
7																	
8																	
						Total=	34	22	30	31	39	34	41	28	36	34	

Mean Neonates/Female = 32.9

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Reference Toxicant** Material: **Sodium Chloride** Test Date: 9/10/13

Project #: 21404 Test ID: 52928 Randomization: 10.7.2 Control Water: Modified EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm) New	Conductivity (µS/cm) Old	Temp (°C)	A	B	C	D	E	F	G	H	I	J	
1000 mg/L	0	7.92		8.1		2315			0	0	0	0	0	0	0	0	0	0	
	1	8.04	7.84	7.2	6.8	2298	2632		0	0	0	0	0	0	0	0	0	0	
	2	7.84	7.99	8.1	7.3	2307	2507		0	0	0	0	0	0	0	0	0	0	
	3	7.84	7.91	8.5	6.9	2284	2535 ~~2284~~		0	3	5	4	3	4	4	5	3	2/0	
	4	7.89	7.82	7.7	5.4	2270	2517		0	0	0	0	8	0	0	0	0	–	
	5	7.90	7.96	8.6	5.5	2359	2463		0	7	9	0	0	7/a	11	13	0	–	
	6	–	7.85	–	6.0	–	2499		0	10	8	0	11	–	10	10	8	–	
	7													–				–	
	8													–				–	
								Total=	0	20	22	4	22	7/13	25	28	11	2/6	Mean Neonates/Female = ~~16.~~ 14.7

	Day	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm) New	Conductivity (µS/cm) Old		A	B	C	D	E	F	G	H	I	J	
1500 mg/L	0	7.90		8.4		3250			0	0	0	0	0	0	0	0	0	0	
	1	8.00	7.80	7.5	7.4	3240	3650		0	0	0	0	0	0	0	0	0	0	
	2	7.85	7.99	8.3	7.4	3220	3570		0	0	0	0	0	0	0	0	0	0	
	3	7.80	7.89	8.7	7.3	3220	3510		0	0	2	3	2	2	3	2	4	3	
	4	7.84	7.81	7.9	6.3	3230	3600		2/0	0	0	0	0	5	0	0	0	0	
	5	7.87	7.94	8.7	5.7	3300	3410		–	0	0	0	0	0	4	8	2	0	
	6	–	7.82	–	5.9	–	3530		–	0	0	0	0	6	6	4	0	0	
	7																		
	8																		
								Total=	2/0	0	2	3	2	13	13	14	6	3	Mean Neonates/Female = 5.6

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Reference Toxicant** Material: **Sodium Chloride** Test Date: 9/10/13

Project #: 21404 Test ID: 52928 Randomization: 10.7.2 Control Water: Modified EPAMH

2000 mg/L

Day	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm) New	Conductivity (µS/cm) Old	Temp (°C)	A	B	C	D	E	F	G	H	I	J
0	7.86		8.6		4090			0	0	0	0	0	0	0	0	0	0
1	7.97	7.80	7.1	7.0 6.3	4090	4490		0	0	0	0	0	0	0	0	0	0
2	7.84	7.98	8.7	7.0	4130	4350		0	0	0	0	0	0	0	0	0	0
3	7.79	7.89	8.9	6.8	4140	4500		0	0	0	0	X/0	0	0	0	0	0
4	7.83	7.81	8.5	6.6	4150	4440		0	0	0	0	–	0	0	0	X/0	X/0
5	7.84	~~8.8~~ 7.90	8.8	5.8	4230	NM		0	X/0	0	0	–	0	0	0	–	–
6	–	7.83	–	6.2	–	4630		3	–	2	0	–	X/0	0	0	–	–
7									–			–	–			–	–
8									–			–	–				
							Total=	3	X/0	2	0	X/0	X/0	0	0	X/0	X/0

Mean Neonates/Female = 0.5

2500 mg/L

Day	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm) New	Conductivity (µS/cm) Old	Temp (°C)	A	B	C	D	E	F	G	H	I	J
0	7.84		8.8		5140			0	0	0	0	0	0	0	0	0	0
1	7.94	7.79	7.9	7.1	4990	5660		0	0	0	0	0	0	0	0	0	0
2	7.83	7.96	9.2	7.5	5030	5100		X/0	X/0	X/0	X/0	X/0	X/0	X/0	X/0	X/0	X/0
3	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–
4	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–
5	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–
6	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–
7	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–
8		–		–		–		–	–	–	–	–	–	–	–	–	–
							Total=	X/0	X/0	X/0	X/0	X/0	X/0	X/0	X/0	X/0	X/0

Mean Neonates/Female = 0

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Pacific EcoRisk** Material: **Meter IDs** Test Date: 9/10/13

Project #: 21404 Test ID: 52928 Control Water: Modified EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm) New	Conductivity (µS/cm) Old	Temp (°C)	SIGN-OFF Date	New WQ	Old WQ
Meter IDs	0	pH16		RD07		EC07		30A	9/10/13	OG	
	1	pH16	pH16	RD07	RD07	EC07	EC07	30A	9/11/13	OG	OG
	2	pH15	pH19	RD07	RD06	EC06	EC06	30A	9/12/13	GG	[illegible]
	3	pH19	pH19	RD06	RD06	EC06	EC06	30A	9/13/13	OG	DH
	4	pH19	pH16	RD05	RD07	EC04	EC06	30A	9/14/13	DS	CD
	5	pH16	pH15	RD06	RD05	EC04	EC06	30A	9/15/13	GG	FOB
	6	–	pH16	–	RD07	–	EC04	30A	9-16-13	–	CA
	7								Date:	New WQ:	Old WQ:
	8								Date:		Old WQ:

Appendix M

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the Fathead Minnow

CETIS Summary Report

Report Date: 19 Sep-13 15:58 (p 1 of 2)
Test Code: 52929 | 15-3485-4132

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Batch ID:	00-3152-2900	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Michelle Kawaguchi
Start Date:	10 Sep-13 16:30	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	17 Sep-13 10:00	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 17h	**Source:**	Aquatox, AR	**Age:**	1

Sample ID:	03-0763-3852	**Code:**	NaCl	**Client:**	Pacific Ecorisk
Sample Date:	10 Sep-13 16:30	**Material:**	Sodium chloride	**Project:**	21405
Receive Date:	10 Sep-13 16:30	**Source:**	Reference Toxicant		
Sample Age:	NA (25.4 °C)	**Station:**	In House		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
09-2077-8282	7d Survival Rate	3	6	4.243	28.4%		Dunnett Multiple Comparison Test
03-0993-1240	Mean Dry Biomass-mg	1.5	3	2.121	20.3%		Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	g/L	95% LCL	95% UCL	TU	Method
19-8427-6191	7d Survival Rate	EC5	1.76	0.463	2.73		Linear Regression (MLE)
		EC10	2.16	0.712	3.16		
		EC15	2.48	0.949	3.5		
		EC20	2.77	1.19	3.8		
		EC25	3.05	1.44	4.08		
		EC40	3.87	2.3	4.99		
		EC50	4.47	2.98	5.75		
12-8485-7011	Mean Dry Biomass-mg	IC5	1.42	0.806	1.81		Linear Interpolation (ICPIN)
		IC10	1.64	1.13	1.96		
		IC15	1.8	1.42	2.17		
		IC20	1.96	1.61	2.4		
		IC25	2.11	1.8	2.63		
		IC40	2.59	2.15	3.54		
		IC50	2.91	2.42	4.46		

7d Survival Rate Summary

C-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	4	0.875	0.828	0.922	0.7	1	0.0629	0.126	14.4%	0.0%
0.75		4	1	1	1	1	1	0	0	0.0%	-14.3%
1.5		4	0.9	0.87	0.93	0.8	1	0.0408	0.0816	9.07%	-2.86%
3		4	0.625	0.569	0.681	0.5	0.8	0.075	0.15	24.0%	28.6%
6		4	0.475	0.368	0.582	0.1	0.8	0.144	0.287	60.5%	45.7%
9		4	0	0	0	0	0	0	0		100.0%

Mean Dry Biomass-mg Summary

C-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	4	0.819	0.768	0.869	0.675	0.967	0.0675	0.135	16.5%	0.0%
0.75		4	1.04	1.04	1.05	1.02	1.06	0.00722	0.0144	1.38%	-27.5%
1.5		4	0.879	0.86	0.898	0.806	0.915	0.0254	0.0508	5.77%	-7.36%
3		4	0.438	0.384	0.492	0.242	0.591	0.0729	0.146	33.3%	46.5%
6		4	0.151	0.104	0.197	0.016	0.305	0.0624	0.125	82.9%	81.6%
9		4	0	0	0	0	0	0	0		100.0%

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

7d Survival Rate Detail

C-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Water Contr	0.7	1	0.9	0.9
0.75		1	1	1	1
1.5		0.9	1	0.9	0.8
3		0.5	0.7	0.8	0.5
6		0.5	0.1	0.5	0.8
9		0	0	0	0

Mean Dry Biomass-mg Detail

C-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Water Contr	0.675	0.967	0.739	0.894
0.75		1.06	1.02	1.05	1.04
1.5		0.883	0.915	0.912	0.806
3		0.242	0.591	0.482	0.437
6		0.305	0.016	0.188	0.093
9		0	0	0	0

7d Survival Rate Binomials

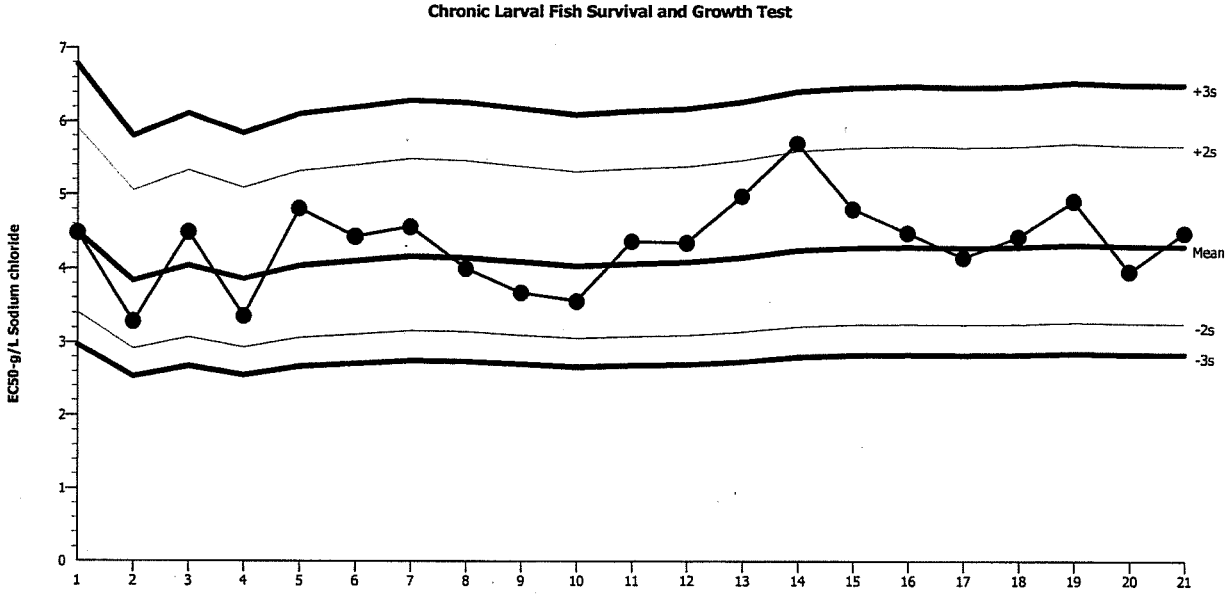
C-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Water Contr	7/10	10/10	9/10	9/10
0.75		10/10	10/10	10/10	10/10
1.5		9/10	10/10	9/10	8/10
3		5/10	7/10	8/10	5/10
6		5/10	1/10	5/10	8/10
9		0/10	0/10	0/10	0/10

CETIS QC Plot

Report Date: 19 Sep-13 16:00 (1 of 1)

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Test Type:	Growth-Survival (7d)	**Organism:**	Pimephales promelas (Fathead Minn	**Material:**	Sodium chloride
Protocol:	EPA-821-R-02-013 (2002)	**Endpoint:**	7d Survival Rate	**Source:**	Reference Toxicant-REF



Mean:	4.297	**Count:**	20	**-2s Warning Limit:**	3.263	**-3s Action Limit:**	2.844
Sigma:	NA	**CV:**	14.80%	**+2s Warning Limit:**	5.658	**+3s Action Limit:**	6.493

Quality Control Data

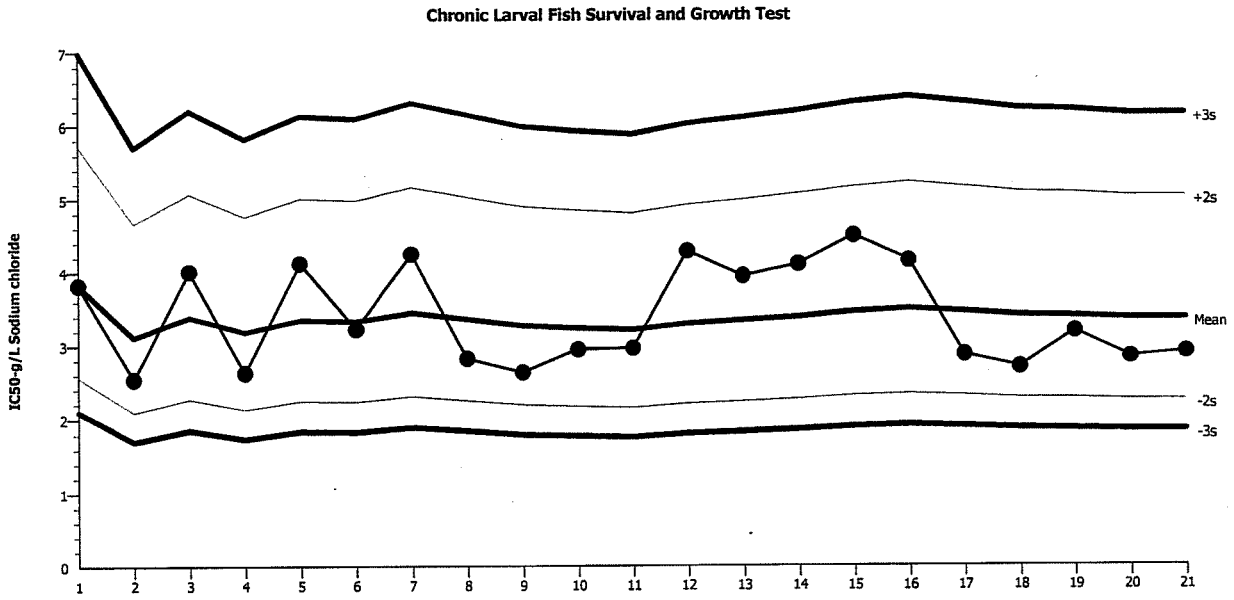
Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2013	Apr	9	17:00	4.484	0.1866	0.3089			04-1636-7802	21-0461-6801
2			10	17:30	3.284	-1.013	-1.954			02-6828-2085	09-3559-5450
3			16	15:30	4.489	0.192	0.3176			05-0954-4952	07-8698-9576
4			23	14:30	3.357	-0.9399	-1.794			14-6026-8912	15-4201-8601
5		May	7	16:05	4.808	0.5111	0.8167			11-8273-1212	16-5906-0715
6			8	14:30	4.426	0.129	0.215			04-2800-8164	17-5286-6899
7		Jun	4	16:30	4.559	0.2612	0.4289			05-5046-5978	14-8243-0801
8			11	16:15	3.998	-0.2991	-0.5243			17-3597-1058	10-6399-9980
9			25	15:15	3.672	-0.6257	-1.144			09-0811-0829	08-8979-1081
10		Jul	9	15:15	3.56	-0.7377	-1.369			09-9537-6970	02-2732-4666
11			11	15:15	4.362	0.06437	0.1081			11-0363-4578	11-4994-2546
12			12	15:55	4.341	0.0432	0.07269			18-3465-3411	06-8391-8183
13			16	16:00	4.971	0.6735	1.058			06-8796-4516	11-7744-7346
14			18	13:30	5.691	1.394	2.042	(+)		01-8760-8102	07-4442-1760
15			23	17:10	4.798	0.5009	0.8013			01-7166-0918	09-9598-3764
16			24	16:00	4.475	0.1778	0.2946			02-0673-4064	13-4957-5012
17		Aug	1	14:45	4.146	-0.1517	-0.2612			12-6887-3003	07-1073-7038
18			6	16:30	4.422	0.1251	0.2085			15-7337-7384	07-8645-4749
19			13	17:10	4.905	0.6074	0.9608			19-4365-1300	18-6760-0088
20		Sep	4	16:00	3.957	-0.3399	-0.5989			03-5575-4147	16-2200-6207
21			10	16:30	4.474	0.177	0.2933			15-3485-4132	19-8427-6191

CETIS QC Plot

Report Date: 19 Sep-13 16:02 (1 of 1)

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Test Type:	Growth-Survival (7d)	**Organism:**	Pimephales promelas (Fathead Minn	**Material:**	Sodium chloride
Protocol:	EPA-821-R-02-013 (2002)	**Endpoint:**	Mean Dry Biomass-mg	**Source:**	Reference Toxicant-REF



Mean:	3.36	**Count:**	20	**-2s Warning Limit:**	2.25	**-3s Action Limit:**	1.84
Sigma:	NA	**CV:**	22.20%	**+2s Warning Limit:**	5.023	**+3s Action Limit:**	6.14

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2013	Apr	9	17:00	3.825	0.465	0.6455			04-1636-7802	18-5038-0399
2			10	17:30	2.543	-0.8172	-1.388			02-6828-2085	15-8422-9494
3			16	15:30	4.013	0.6523	0.8835			05-0954-4952	08-6438-2823
4			23	14:30	2.628	-0.7327	-1.225			14-6026-8912	16-0723-0136
5		May	7	16:05	4.124	0.7633	1.019			11-8273-1212	19-0554-0604
6			8	14:30	3.229	-0.1314	-0.1987			04-2800-8164	10-7830-7081
7		Jun	4	16:30	4.247	0.8871	1.167			05-5046-5978	19-8403-0783
8			11	16:15	2.822	-0.5383	-0.8694			17-3597-1058	02-6862-3844
9			25	15:15	2.63	-0.7302	-1.22			09-0811-0829	01-8555-3214
10		Jul	9	15:15	2.948	-0.4117	-0.651			09-9537-6970	03-2418-3763
11			11	15:15	2.965	-0.3954	-0.6234			11-0363-4578	11-1049-2545
12			12	15:55	4.283	0.9224	1.208			18-3465-3411	17-1200-1220
13			16	16:00	3.941	0.5807	0.7939			06-8796-4516	13-5567-9035
14			18	13:30	4.105	0.7445	0.9967			01-8760-8102	14-0323-8815
15			23	17:10	4.49	1.13	1.444			01-7166-0918	21-3603-9408
16			24	16:00	4.152	0.792	1.054			02-0673-4064	08-3718-6565
17		Aug	1	14:45	2.867	-0.4933	-0.7908			12-6887-3003	21-3439-6453
18			6	16:30	2.698	-0.6627	-1.094			15-7337-7384	10-9006-2058
19			13	17:10	3.187	-0.1731	-0.2634			19-4365-1300	15-4263-7185
20		Sep	4	16:00	2.835	-0.5249	-0.8459			03-5575-4147	19-3279-6230
21			10	16:30	2.906	-0.4546	-0.7239			15-3485-4132	12-8485-7011

7 Day Chronic Fathead Minnow Reference Toxicant Test Data

Client: Reference Toxicant
Test Material: Sodium Chloride
Test ID#: 52929 Project #: 21405
Test Date: 9/10/13 Randomization: 6.4.1

Organism Log#: 7519 Age: 48 HRS
Organism Supplier: AQUATOX
Control/Diluent: EPAMH
Control Water Batch: 1618

Treatment (g/L)	Temp (°C)	pH New	pH Old	D.O. (mg/L) New	D.O. (mg/L) Old	Conductivity (µs/cm) New	Conductivity (µs/cm) Old	# Live Organisms A	B	C	D	SIGN-OFF
Control	25.4	8.23		8.2		301		10	10	10	10	Date: 9/10/13
0.75	25.4	8.19		8.2		1729 ~~2000~~		10	10	10	10	Test Solution Prep: SM
1.5	25.4	8.16		8.3		3080		10	10	10	10	New WQ: NZ
3	25.4	8.10		8.4		5930		10	10	10	10	Initiation Time: 1630
6	25.4	8.01		8.9		11300		10	10	10	10	Initiation Signoff: EMM
9	25.4	7.92		9.3		16410		10	10	10	10	RT Stock Batch #: 170
Meter ID	30A	PH19		RD05		EC04						
Control	25.8	8.03	7.85	7.8	6.4	296	311	9	10	10	10	Date: 9/11/13
0.75	25.8	7.98	7.79	7.8	7.1	1795	2025	10	10	10	10	Test Solution Prep: [illegible]
1.5	25.8	7.94	7.77	8.1	7.1	3190	3100	10	10	10	10	New WQ: JCA
3	25.8	7.91	7.73	8.2	6.9	6040	5970	10	10	10	10	Renewal Time: 1305
6	25.8	7.85	7.70	8.6	7.1	11180	11390	10	9	10	10	Renewal Signoff: [illegible]
9	25.8	7.83	7.62	9.0	7.0	15910	16500	0	0	0	0	Old WQ: AE
Meter ID	30A	PH19	pH16	RD06	RD07	EC04	EC07					RT Stock Batch #: 170/171
Control	25.9	8.03	7.74	8.3	5.6	306	307	8	10	10	10	Date: 9/12/13
0.75	25.9	8.01	7.70	8.4	6.0	1802	1858	10	10	10	10	Test Solution Prep: [illegible]
1.5	25.9	7.99	7.72	8.3	6.5	3310	3240	10	10	9	10	New WQ: MO
3	25.9	7.97	7.71	8.3	5.8	5890	6070	10	10	10	10	Renewal Time: 1005
6	25.9	7.94	7.71	8.1	6.3	11020	11320	8	7	8	9	Renewal Signoff: [illegible]
9	—	—	—	—	—	—	—	—	—	—	—	Old WQ: GG
Meter ID	30A	pH19	PH15	RD05	RD07	EC04	EC06					RT Stock Batch #: 171
Control	25.6	8.27	7.83	8.4	7.8	301	309	8	10	10	10	Date: 9/13/13
0.75	25.6	8.18	7.72	8.3	7.9	1807	1825	10	10	10	10	Test Solution Prep: KP
1.5	25.6	~~7.96~~ 8.11	~~7.68~~ 7.70	~~8.9~~ 8.7	~~7.7~~ 7.4	~~3080~~ 3280	3320	10	10	9	10	New WQ: AE
3	25.6	~~8.11~~ 8.03	~~7.70~~ 7.68	8.7	~~7.7~~ 7.7	~~5930~~ 5980	5980	10	10	10	10	Renewal Time: 1025
6	25.6	~~8.03~~ 7.96	~~7.68~~ 7.70	~~8.9~~ 8.9	~~7.7~~ 7.7	~~5980~~ 11180	11270	8	7	6	9	Renewal Signoff: [illegible]
9	—	—	—	—	—	—	—	—	—	—	—	Old WQ: AE
Meter ID	30A	pH19	pH19	RD06	RD06	~~EC07~~ EC06	EC06					RT Stock Batch #: 171

7 Day Chronic Fathead Minnow Reference Toxicant Test Data

Client: **Reference Toxicant**
Test Material: Sodium Chloride
Test ID#: 52929 Project #: 21405
Test Date: 9.10.13 Randomization: 6.4.1

Organism Log#: 7519 Age: L 48 HRS
Organism Supplier: AQUATOX
Control/Diluent: EPAMH
Control Water Batch: 1618

Treatment (g/L)	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Conductivity (µs/cm) New	Conductivity (µs/cm) Old	# Live Organisms A	B	C	D	SIGN-OFF
Control	25.3	8.05	8.05	8.4	7.8	300	327	8	10	10	10	Date: 9/14/13
0.75	25.3	7.99	7.90	8.4	7.6	1784	1831	10	10	10	10	Test Solution Prep: KP
1.5	25.3	7.99	7.84	8.7	7.6	3250	3300	10	10	9	10	New WQ: FOUR
3	25.3	7.95	7.75	8.5	7.3	5960	6060	10	10	10	10	Renewal Time: 1000
6	25.3	7.89	7.72	8.7	7.5	11250	11440	6	5	5	9	Renewal Signoff: DS
9	—	—	—	—	—	—	—	—	—	—	—	Old WQ: FOUR
Meter ID	30A	PH19	PH15	RD05	RD06	EC04	EC07					RT Stock Batch #: 171
Control	25.2	7.95	7.69	8.2	7.0	306	303	8	10	10	10	Date: 9/15/13
0.75	25.2	8.01	7.58	8.3	6.5	1886	1775	10	10	10	10	Test Solution Prep: SS
1.5	25.2	7.99	7.56	8.4	6.8	3220	3230	10	10	~~10~~ 9	9	New WQ: CP
3	25.2	7.96	7.56	8.5	6.8	5910	6000	10	9	9	7	Renewal Time: 1105
6	25.2	7.89	7.55	8.9	6.9	11190	11280	6	4	5	9	Renewal Signoff: JM
9	—	—	—	—	—	—	—	—	—	—	—	Old WQ: CP
Meter ID	30A	PH19	PH19	RD07	RD07	EC07	EC07					RT Stock Batch #: 171
Control	25.5	8.11	NM	8.1	NM	302	NM	7	~~9~~ 10 SM	9	10	Date: 9/16/13
0.75	25.5	8.07	7.55	7.9	6.2	1761	1875	10	10	10	10	Test Solution Prep: SNV
1.5	25.5	8.03	7.57	7.9	6.4	3290	3230	10	10	9	8	New WQ: GG
3	25.5	7.99	7.51	8.2	6.3	5920	5920	8	9	9	5	Renewal Time: 1040
6	25.5	7.92	7.46	8.4	6.4	11050	11250	6	3	5	8	Renewal Signoff: SM
9	—	—	—	—	—	—	—	—	—	—	—	Old WQ: SM
Meter ID	30A	PH19	PH19	RD07	RD07	EC07	EC07					RT Stock Batch #: 171
Control	25.5		7.88		~~4.4~~ 5.0		320	7	10	9	9	Date: 9/17/13
0.75	25.5		7.72		6.0		1798	10	10	10	10	Termination Time: 1000
1.5	25.5		7.63		5.7		3320	9	10	9	8	Termination Signoff: SS
3	25.5		7.61		5.8		5970	5	~~8~~ 7	8	5	Old WQ: PG
6	25.5		7.57		6.2		11140	5	1	5	8	
9	—		—		—		—	—	—	—	—	
Meter ID	30A		PH19		RD07		EC07					

Fathead Minnow Dry Weight Data Sheet

Client: **Reference Toxicant** Test ID #: 52929 Project #: 21405

Sample: Sodium Chloride Tare Weight Date: 9/15/13 Sign-off: JA

Test Date: 9/10/13 Final Weight Date: 9/18/13 Sign-off: JLA

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Control	A	151.23	157.98	10	0.675
2		B	148.35	158.02	10	0.967
3		C	~~165.3~~ JLA 165.25	172.64	10	0.739
4		D	156.85	165.79	10	0.894
5	0.75	A	167.31	177.87	10	1.056
6		B	156.43	166.67	10	1.024
7		C	164.42	174.95	10	1.053
8		D	163.46	173.90	10	1.044
9	1.5	A	152.95	161.78	10	0.883
10		B	153.74	162.89	10	0.915
11		C	165.64	174.76	10	0.912
12		D	156.54	164.60	10	0.806
13	3	A	157.35	159.77	10	0.242
14		B	162.01	167.92	10	0.591
15		C	158.38	163.20	10	0.482
16		D	159.38	163.75	10	0.437
17	6	A	160.53	163.58	10	0.305
18		B	163.54	163.70	10	0.016
19		C	153.92	155.80	10	0.188
20		D	173.35	176.28	10	0.093
21	9	A	169.13	–	10	–
22		B	185.05	–	10	–
23		C	158.26	–	10	–
24		D	164.95	–	10	–
QA1			165.93	165.96		
QA2			172.30	172.30		
QA3			164.83	164.82		
Balance ID:			BAL01	BAL01		