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

April 26, 2013

Brant:

I have enclosed our report "Evaluation of the Chronic Toxicity of Lehigh Permanente Cement Plant Site Water and Sediment Samples" for the samples collected March 25, 27, and 29, 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 *Ceriodaphnia dubia*
The survival EC_{25} was 16.6% site water, resulting in 6.0 TUc (where TUc = $100/EC_{25}$). The reproduction IC_{25} was 6.1% site water, resulting in 16.5 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
Ceriodaphnia dubia	16.6% site water	6.0	6.1% site water	16.5
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 >100% site water, resulting in <1 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	>100% site water	<1
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 *Ceriodaphnia dubia*

The survival EC_{25} was 6.9% site water, resulting in 14.5 TUc (where TUc = 100/ EC_{25}). The reproduction IC_{25} was 3.7% site water, resulting in 27.3 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
Ceriodaphnia dubia	6.9% site water	14.5	3.7% site water	27.3
Pimephales promelas	>100% site water	<1	>100% site water	<1

Chronic Toxicity of Lehigh Pond 13 Sediment to *Hyalella azteca*

There was ***no*** significant reduction in *H. azteca* survival or growth in the Lehigh Pond 13 sediment sample; the NOEC was 100% site water for both endpoints, resulting in 1 TUc (where TUc = 100/NOEC).

Chronic Effects of Lehigh Pond 13 Sediment.				
Test Species	Survival NOEC	Survival TUc (100/NOEC)	Growth NOEC	Growth TUc (100/NOEC)
Hyalella azteca	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 *Ceriodaphnia dubia*

The survival EC_{25} was >100% site water, resulting in <1 TUc (where TUc = $100/ EC_{25}$). The reproduction IC_{25} was 39.6% site water, resulting in 2.5 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
Ceriodaphnia dubia	>100% site water	<1	39.6% site water	2.5
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 Stephen Clark or myself at (707) 207-7760.

Regards,

Digitally signed by Alison Briden
Date: 2013.05.03 17:17:47 -07'00'

Alison Briden
Aquatic Ecotoxicologist

This testing was performed under Lab Order 20780. 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: March 25, 2013
Test Protocol:	EPA-821-R-02-013	Test Date: March 26, 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	6.09
Lab Control	4.44
6.25%	4.75
12.5%	4.91
25%	4.95
50%	5.06
100%	4.52

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}

Current Pond 9 Site Water Test Data.	
Site Water Concentration	Mean Algal Cell Density (cells/mL x 10^6)
Hardness Blank	6.09
Lab Control	4.28
6.25%	4.67
12.5%	5.03
25%	5.54
50%	5.98
100%	6.14

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}

Chronic Toxicity Test Species:	*Selenastrum capricornutum*	Sampling Date: March 25, 2013
Test Protocol:	EPA-821-R-02-013	Test Date: March 26, 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	6.09
Lab Control	4.42
6.25%	4.83
12.5%	4.87
25%	5.26
50%	5.31
100%	5.39

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}

Current Pond 14 Site Water Test Data.	
Site Water Concentration	Mean Algal Cell Density (cells/mL x 10^6)
Hardness Blank	6.09
Lab Control	4.46
6.25%	4.98
12.5%	5.15
25%	5.44
50%	5.75
100%	5.70

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}

Chronic Toxicity Test Species:	*Ceriodaphnia dubia*	Sampling Dates: March 25, 27, and 29, 2013
Test Protocol:	EPA-821-R-02-013	Test Dates: March 26, 2013 - April 1, 3013
Dilution Series:	6.25, 12.5, 25, 50, 100%	
Test Endpoint:	Survival, Reproduction	

Current Pond 4A Site Water Test Data.		
Site Water Concentration	% Survival	Mean Reproduction (# neonates /female)
Hardness Blank	100	**10.3***
Lab Control	100	28.3
6.25%	100	**21.0***
12.5%	90	**8.2***
25%	**40***	5.0
50%	**0***	3.8
100%	**0***	0.7

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	12.5%	14.5%	16.6%	19.6%	21.6%	6.0	100/EC_{25}
Reproduction	<6.25%	3.6%	6.1%	8.2%	9.6%	16.5	100/IC_{25}

Lab Control Survival (after ~96 hrs)	100%
100% Site Water Survival (after ~96 hrs)	10%

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

Current Pond 9 Site Water Test Data.		
Site Water Concentration	% Survival	Mean Reproduction (# neonates /female)
Hardness Blank	100	**10.3***
Lab Control	100	28.9
6.25%	100	32.0
12.5%	100	32.8
25%	100	33.5
50%	100	33.3
100%	100	27.3

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	100%	>100%	>100%	>100%	>100%	<1	100/IC_{25}

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

Chronic Toxicity Test Species:	*Ceriodaphnia dubia*	Sampling Dates: March 25, 27, and 29, 2013
Test Protocol:	EPA-821-R-02-013	Test Dates: March 26, 2013 - April 1, 3013
Dilution Series:	6.25, 12.5, 25, 50, 100%	
Test Endpoint:	Survival, Reproduction	

Current Pond 13 Site Water Test Data.		
Site Water Concentration	% Survival	Mean Reproduction (# neonates /female)
Hardness Blank	100	**10.3***
Lab Control	100	26.3
6.25%	70	**15.1***
12.5%	70	**7.0***
25%	**10***	5.1
50%	**10***	3.6
100%	**0***	0.9

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	12.5%	5.0%	6.9%	10.1%	12.7%	14.5	100/EC_{25}
Reproduction	<6.25%	2.2%	3.7%	5.9%	7.8%	27.3	100/IC_{25}

Lab Control Survival (after ~96 hrs)	100%
100% Site Water Survival (after ~96 hrs)	30%

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

Current Pond 14 Site Water Test Data.		
Site Water Concentration	% Survival	Mean Reproduction (# neonates /female)
Hardness Blank	100	**10.3***
Lab Control	100	27.4
6.25%	100	31.4
12.5%	100	32.1
25%	100	28.1
50%	100	**18.9***
100%	80	**16.8***

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}
Reproduction	25%	31.4%	39.6%	67.1%	>100%	2.5	100/IC_{25}

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

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

Chronic Toxicity Test Species:	*Pimephales promelas*	Sampling Dates: March 25, 27, and 29, 2013
Test Protocol:	EPA-821-R-02-013	Test Dates: March 26, 2013 - April 2, 3013
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	90.0	0.79
Lab Control	95.0	0.75
6.25%	90.0	0.71
12.5%	95.0	0.89
25%	95.0	0.85
50%	92.5	0.86
100%	93.3	0.85

Current Pond 4A Site Water Test Endpoints.

Endpoint	NOEC	EC15-IC15	EC25-IC25	EC40-IC40	EC50-IC50	TUc	TUc Method
Survival	100%	>100%	>100%	>100%	>100%	<1	100/EC25
Growth	100%	>100%	>100%	>100%	>100%	<1	100/IC25

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

Current Pond 9 Site Water Test Data.		
Site Water Concentration	% Survival	Mean Biomass (mg)
Hardness Blank	90.0	0.79
Lab Control	90.0	0.70
6.25%	92.5	0.74
12.5%	92.5	0.69
25%	92.5	0.74
50%	95.0	0.85
100%	95.0	0.87

Current Pond 9 Site Water Test Endpoints.

Endpoint	NOEC	EC15-IC15	EC25-IC25	EC40-IC40	EC50-IC50	TUc	TUc Method
Survival	100%	>100%	>100%	>100%	>100%	<1	100/EC25
Growth	100%	>100%	>100%	>100%	>100%	<1	100/IC25

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

Chronic Toxicity Test Species:	*Pimephales promelas*	Sampling Dates: March 25, 27, and 29, 2013
Test Protocol:	EPA-821-R-02-013	Test Dates: March 26, 2013 - April 2, 3013
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	90.0	0.79
Lab Control	95.0	0.91
6.25%	92.5	0.76*[a]
12.5%	92.5	0.83
25%	95.0	0.84
50%	92.5	0.87
100%	82.5	**0.76***

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	50%	90.6%	>100%	>100%	>100%	<1	100/IC_{25}

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

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

a - The mean response at this test treatment was statistically less than the Control treatment response; however, as there were no toxicologically significant reductions in survival at the higher 12.5% concentration, any reductions at lower test concentrations are not considered toxicologically significant.

Current Pond 14 Site Water Test Data.		
Site Water Concentration	% Survival	Mean Biomass (mg)
Hardness Blank	90.0	0.79
Lab Control	100	0.81
6.25%	100	0.78
12.5%	97.5	0.84
25%	90	0.85
50%	95.0	0.87
100%	100	0.88

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)	100%

Acute Toxicity Test Species:	*Hyalella azteca*	Sampling Date: March 25, 2013
Test Protocol:	EPA/600/R-99/064	Test Date: March 30, 2013
Test Endpoint:	Survival, Growth	

Current Pond 13 Sediment Test Data.		
Site Water Concentration	% Survival	Mean Dry Weight (mg)
Lab Control	100	0.22
100%	96.3	0.27

Current Pond 13 Sediment Test Endpoints.			
Endpoint	NOEC	TUc	TUc Method
Survival	100%	1	100/NOEC
Growth	100%	1	100/NOEC

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

Samples collected March 25, 27, and 29, 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

April 2013

PACIFIC ECORISK
ENVIRONMENTAL CONSULTING & TESTING

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

Samples collected March 25, 27, and 29, 2013

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Appendices

Appendices (cont.)

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 and sediment 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*;
- 7-day survival and growth test with larval fathead minnows (*Pimephales promelas*); and
- 10-day acute sediment toxicity test with the amphipod *Hyalella azteca*.

These toxicity tests were conducted on site water samples collected on March 25, 27, and 29, 2013 and a sediment sample collected March 25, 2013. The site water samples were collected from 4 ponds: Pond 4A, quarry discharge water, Pond 9, stormwater and cement plant process water, and Ponds 13 and 14, both of which are Permanente Creek water. The sediment sample was also collected from Pond 13. 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 manuals:

- "Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition" (EPA-821-R-02-013), and
- "Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition" (EPA/600/R-99/064).

2.1 Sample Receipt and Handling

On March 25, 27, and 29, 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 (Tables 1a and 1b), with the remainder of each sample being stored at 0-6˚C except when being used to prepare test solutions. On March 25, a sample of Lehigh Permanente sediment was collected from Pond 13 into an appropriately-cleaned sample container. This sample was similarly transported and stored at 0-6°C, and was used to initiate testing within 14 days of collection.

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

Table 1a. 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)
3/25/13	Pond 4A	18.1*	8.01	9.2	200	757	1350	<1.0
	Pond 9	13.0*	7.41	9.7	182	611	1430	<1.0
	Pond 13	9.0*	8.10	10.0	159	710	1285	<1.0
	Pond 14	13.7*	8.22	13.3	166	638	1293	<1.0
3/27/13	Pond 4A	3.8	7.83	9.2	196	733	1335	<1.0
	Pond 9	3.5	7.64	9.9	213	641	1464	<1.0
	Pond 13	6.6*	7.99	9.7	157	683	1274	<1.0
	Pond 14	8.3*	8.02	10.9	171	651	1315	<1.0
3/29/13	Pond 4A	2.1	7.91	8.8	195	707	1306	<1.0
	Pond 9	1.4	7.44	9.2	214	682	1456	<1.0
	Pond 13	1.0	8.00	9.6	140	657	1233	<1.0
	Pond 14	4.9	8.22	9.2	168	682	1267	<1.0

* - This sample was transported and delivered on the day of sample collection; the temperature blank inside of the sample transport ice chest was measured at ≤6°C.

Table 1b. Collection of the Lehigh sediment sample.

Sample ID	Sediment Sample Collection Date	Sample Receipt Date
Pond 13	3/25/13 (1157)	3/25/13 (1530)

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 these tests are described below.

The Lab Control/diluent for these tests consisted of Type 1 lab water (reverse-osmosis, de-ionized water). Aliquots of the Lab Control water and each of the 4 site waters were 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 with each of the 4 site waters (individually) 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 650 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 Lab water 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, and 2 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 these tests are described below.

The Lab Control/diluent water for these tests was modified EPA synthetic moderately-hard water. The Lab Control water was used to prepare test solutions with each of the 4 site waters (individually) 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 650 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 Lab water 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 tests were 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 test are described below.

The larval fathead minnows used in these tests 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 these tests was EPA synthetic moderately-hard water. The Lab Control water was used to prepare test solutions with each of the 4 site waters (individually) 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 650 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 Lab water 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 the tests, 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.

2.5 Survival and Growth Toxicity Testing of Ambient Sediment with *Hyalella azteca*

The freshwater sediment toxicity test with *Hyalella azteca* consists of exposing the amphipods to the sediment for 10 days, after which effects on survival and growth are evaluated. The specific procedures used in this test are described below.

The *Hyalella azteca* used in this test were obtained from a commercial supplier (Chesapeake Cultures, Hayes, VA). Upon receipt at the laboratory, the amphipods were placed into HDPE tanks containing SAM-5S water at 23˚C, and were fed the alga *Selenastrum capricornutum* and Yeast-Cerophyll®-Trout (YCT) food amended with *Spirulina*.

The sediment sample was tested at the 100% concentration only. The Control treatment sediment consisted of a composite of reference site sediments that has been maintained under culture at the PER lab for >3 months. There were 8 replicates for each test treatment. Each replicate container consisted of a 300 mL tall-form glass beaker with a 3 cm ribbon of 540 μm mesh NITEX attached to the top of the beaker with silicone sealant. The sediment sample was homogenized immediately prior to introduction of the sediment into the test replicates. Approximately 100 mL of sediment was then loaded into each of the test replicate containers. Each of the test replicates was carefully filled with clean overlying SAM-5S water. The test replicates with sediment and clean overlying water were established 24 hrs prior to the introduction of the amphipods.

After this initial 24 hr period, the overlying water in each replicate was flushed with one volume of fresh control water (approximately 150 mL). For each test treatment, a small aliquot of the renewed overlying water was then collected from each of the 8 replicates and composited for measurement of "initial" water quality characteristics (pH, dissolved oxygen [D.O.], conductivity, alkalinity, hardness, and total ammonia). Then, ten 10-11 day-old amphipods were randomly allocated into each replicate, followed by the addition of 1.0 mL of YCT food. The test replicates were then returned to the temperature-controlled room. At the time of test initiation for

each set of tests, 8 replicates of 10 randomly-selected organisms were collected, dried, and weighed (described below) to determine the mean dry weight of the test organisms at test initiation.

Each day, for the following 9 days, each test replicate was examined for the presence of any dead amphipods. A small aliquot of the overlying water in each of the 8 replicates was then collected and composited as before for measurement of "old" D.O., after which each replicate was flushed with one volume of fresh water. Another small aliquot of the overlying water in each of the 8 replicates was then collected and composited as before for measurement of "new" D.O., after which each replicate was fed 1.0 mL of YCT, and then replaced within the temperature-controlled room. The D.O. dropped below 2.5 mg/L in the Pond 13 sediment during testing. As per EPA guidelines, the sample was aerated.

After 10 days exposure, an aliquot of overlying water was collected from each replicate and composited for analysis of the "final" water quality characteristics. The sediments in each replicate container were then carefully sorted and sieved and the number of surviving amphipods determined. The surviving organisms were euthanized in methanol and transferred to small pre-tared weighing pans, which were placed into a drying oven at 100˚C. After drying for ~24 hrs, the pans were transferred to a desiccator to cool, and then weighed to the nearest 0.01 mg to determine the mean dry weight per surviving organism for each replicate. The resulting survival and growth (mean dry weight) data were then analyzed to evaluate any impairment due to the sediment; all statistical analyses were performed using the CETIS® statistical package (TidePool Scientific, McKinleyville, CA).

2.5.1 Reference Toxicant Testing of the *Hyalella azteca*

In order to assess the sensitivity of the *H. azteca* test organisms to toxic stress, a concurrent reference toxicant test was performed. The reference toxicant test was performed as a 96-hr exposure to Control water spiked with KCl at test concentrations of 0, 0.1, 0.2, 0.4, 0.8 and 1.6 g/L. The resulting survival data were statistically analyzed to determine key dose-response point estimates (e.g., EC_{50}); all statistical analyses were made using the CETIS® software. This response endpoint was then compared to the 'typical response' range 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 4,440,000 cells/mL at the Lab Water Control treatment. The IC_{25} point estimate 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 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	6.09
Lab Water Control	4.44
6.25%	4.75
12.5%	4.91
25%	4.95
50%	5.06
100%	4.52
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 =	4.6

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 4,280,000 cells/mL at the Lab Water Control treatment. The IC_{25} point estimate 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 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	6.09
Lab Water Control	4.28
6.25%	4.67
12.5%	5.03
25%	5.54
50%	5.98
100%	6.14
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 =	6.3

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 4,420,000 cells/mL at the Lab Water Control treatment. The IC_{25} point estimate 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 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	6.09
Lab Water Control	4.42
6.25%	4.83
12.5%	4.87
25%	5.26
50%	5.31
100%	5.39
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 =	6.7

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 4,460,000 cells/mL at the Lab Water Control treatment. The IC_{25} point estimate 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 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	6.09
Lab Water Control	4.46
6.25%	4.98
12.5%	5.15
25%	5.44
50%	5.75
100%	5.70
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 =	8.9

3.2 Effects of Lehigh Site Water on *Ceriodaphnia dubia*

3.2.1 Effects of Lehigh Pond 4A Site Water on *Ceriodaphnia dubia*

The results of this test are summarized below in Table 6. There was 100% survival in the Lab Water Control treatment. The EC_{25} was 16.6% site water, resulting in 6.0 survival TUc (where TUc = 100/ EC_{25}).

There was a mean of 28.3 offspring per female at the Lab Water Control treatment. The IC_{25} was 6.1% site water, resulting in 16.5 survival TUc (where TUc = 100/ IC_{25}).

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

Table 6. Effects of Lehigh Pond 4A site water on *Ceriodaphnia dubia* survival and reproduction.

Site Water Treatment	Mean % Survival	Mean Reproduction (# neonates /female)
Hardness Blank	100	**10.3***
Lab Control	100	28.3
6.25%	100	**21.0***
12.5%	90	**8.2***
25%	**40***	5.0
50%	**0***	3.8
100%	**0***	0.7
Summary of Key Statistics		
NOEC =	12.5% site water	<6.25% site water
TUc (TUc = 100/NOEC) =	8	>16
Survival EC_{25} or Reproduction IC_{25} =	16.6% site water	6.1% site water
TUc (TUc = 100/EC_{25} or 100/IC_{25}) =	6.0	16.5
Survival EC_{50} or Reproduction IC_{50} =	21.6% site water	9.6% site water
TUc (TUc = 100/EC_{50} or 100/IC_{50}) =	4.6	10.4
Test PMSD		15.0%

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

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

The results of this test are summarized below in Table 7. There was 100% 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 28.9 offspring per female 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 9 site water on *Ceriodaphnia dubia* survival and reproduction.

Site Water Treatment	Mean % Survival	Mean Reproduction (# neonates /female)
Hardness Blank	100	**10.3***
Lab Control	100	28.9
6.25%	100	32.0
12.5%	100	32.8
25%	100	33.5
50%	100	33.3
100%	100	27.3
Summary of Key Statistics		
NOEC =	100% site water	100% site water
TUc (TUc = 100/NOEC) =	1	1
Survival EC_{25} or Reproduction IC_{25} =	>100% site water[a]	>100% site water
TUc (TUc = 100/EC_{25} or 100/IC_{25}) =	<1	<1
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		11.1%

* 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.

3.2.3 Effects of Lehigh Pond 13 Site Water on *Ceriodaphnia dubia*

The results of this test are summarized below in Table 8. There was 100% survival in the Lab Water Control treatment. The EC_{25} was 6.9% site water, resulting in 14.5 survival TUc (where TUc = 100/ EC_{25}).

There was a mean of 26.3 offspring per female at the Lab Water Control treatment. The IC_{25} was 3.7% site water, resulting in 27.3 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 13 site water on *Ceriodaphnia dubia* survival and reproduction.

Site Water Treatment	Mean % Survival	Mean Reproduction (# neonates /female)
Hardness Blank	100	**10.3***
Lab Control	100	26.3
6.25%	70	**15.1***
12.5%	70	**7.0***
25%	**10***	5.1
50%	**10***	3.6
100%	**0***	0.9
Summary of Key Statistics		
NOEC =	12.5% site water	<6.25% site water
TUc (TUc = 100/NOEC) =	8	>16
Survival EC_{25} or Reproduction IC_{25} =	6.9% site water	3.7% site water
TUc (TUc = 100/EC_{25} or 100/IC_{25}) =	14.5	27.3
Survival EC_{50} or Reproduction IC_{50} =	12.7% site water	7.8% site water
TUc (TUc = 100/EC_{50} or 100/IC_{50}) =	7.9	12.9
Test PMSD		19.6%

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

3.2.4 Effects of Lehigh Pond 14 Site Water on *Ceriodaphnia dubia*

The results of this test are summarized below in Table 9. There was 100% 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 27.4 offspring per female at the Lab Water Control treatment. The IC_{25} was 39.6% site water, resulting in 2.5 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 14 site water on *Ceriodaphnia dubia* survival and reproduction.

Site Water Treatment	Mean % Survival	Mean Reproduction (# neonates /female)
Hardness Blank	100	**10.3***
Lab Control	100	27.4
6.25%	100	31.4
12.5%	100	32.1
25%	100	28.1
50%	100	**18.9***
100%	80	**16.8***
Summary of Key Statistics		
NOEC =	100% site water	25% site water
TUc (TUc = 100/NOEC) =	1	4
Survival EC_{25} or Reproduction IC_{25} =	>100% site water[a]	39.6% site water
TUc (TUc = 100/EC_{25} or 100/IC_{25}) =	<1	2.5
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		22.4%

* 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 10. There was 95% 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 0.75 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 4A site water on fathead minnow survival and growth.

Test Site Water Treatment	Mean % Survival	Mean Fish Biomass Value (mg)
Hardness Blank	90.0	0.79
Lab Water Control	95.0	0.75
6.25%	90.0	0.71
12.5%	95.0	0.89
25%	95.0	0.85
50%	92.5	0.86
100%	72.5[b]	0.67
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	33.0%	35.7%

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.

b - Pathogen-related mortality (PRM) was observed in fish from this treatment; the increased variability due to PRM resulted in increased variability at this treatment, exceeding the 90th percentile PMSD of 30% for this test.

3.3.2 Effects of Lehigh Pond 9 Site Water on Fathead Minnows

The results of this test are summarized below in Table 11. There was 90% 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 0.70 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 K.

Table 11. 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	90.0	0.79
Lab Water Control	90.0	0.70
6.25%	92.5	0.74
12.5%	92.5	0.69
25%	92.5	0.74
50%	95.0	0.85
100%	95.0	0.87
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	21.0%	16.7%

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.

3.3.3 Effects of Lehigh Pond 13 Site Water on Fathead Minnows

The results of this test are summarized below in Table 12. There was 95% 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 L.

Table 12. 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	90.0	0.79
Lab Water Control	95.0	0.91
6.25%	92.5	0.76*[b]
12.5%	92.5	0.83
25%	95.0	0.84
50%	92.5	0.87
100%	82.5	**0.76***
Summary of Statistics		
NOEC =	100% site water	50% site water
TUc (TUc = 100/NOEC) =	1.0	2.0
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	13.9%	12.0%

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

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.

b - The mean response at this test treatment was statistically less than the Control treatment response. There was an interrupted concentration-response (i.e., non-significant effects bracketed by significant effects) for the growth endpoint at the 6.25% site water treatment. Given that there were no procedural errors during testing and the test sensitivity was acceptable, the response at the 6.25% treatment was considered anomalous and the NOEC was determined as the next highest concentration that was not significantly different from the Lab Control (i.e., 50% site water in this case).

3.3.4 Effects of Lehigh Pond 14 Site Water on Fathead Minnows

The results of this test are summarized below in Table 13. 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 0.81 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 M.

Table 13. 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	90.0	0.79
Lab Water Control	100	0.81
6.25%	100	0.78
12.5%	97.5	0.84
25%	90.0	0.85
50%	95.0	0.87
100%	100	0.88
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	10.0%	13.6%

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.

3.4 Effects of the Lehigh Sediment on *Hyalella azteca*

3.4.1 Effects of the Lehigh Pond 13 Sediment on *Hyalella azteca*

The results for this test are summarized below in Table 14. There was 100% survival and a mean dry weight of 0.22 mg at the Lab Water Control treatment. There was no significant reduction in *H. azteca* survival or growth in the Lehigh Pond 13 sediment sample. The survival and growth NOEC were both 100% site water, resulting in 1 TUc (where TUc = 100/NOEC).

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

Table 14. Effects of Lehigh Pond 13 sediment on *Hyalella azteca* survival and growth.

Test Initiation Date (Time)	Treatment/Sample ID	Mean % Survival	Mean Dry Weight (mg)
3/30/13 (0940)	Lab Control	100	0.22
	Pond 13 (100%)	96.3	0.27
Summary of Key Statistics			
NOEC =		100	1
TUc (TUc = 100/NOEC) =		100	1
Test PMSD		5.2%	9.9%

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 15. There was a mean of 3,910,000 cells/mL at the Lab Control treatment. The IC_{50} was 1.73 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 O.

Table 15. 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	3.91
0.125	4.05
0.25	3.57
0.5	**3.11***
1	**2.65***
2	**1.75***
Summary of Statistics	
No Observable Effect Concentration (NOEC) =	0.25 g/L NaCl
Lowest Observable Effect Concentration (LOEC) =	0.5 g/L NaCl
Algal Growth IC_{50} =	1.73 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 16. There was 100% survival and a mean of 27.6 offspring in the Lab Control treatment. The survival EC_{50} was 2300 mg/L NaCl, and the reproduction IC_{50} was 1080 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 P.

Table 16. Reference toxicant testing: effects of NaCl on *Ceriodaphnia dubia*.

NaCl Treatment (mg/L)	Mean % Survival	Mean Reproduction (# neonates/female)
Lab Control	100	27.6
500	100	**15.7***
1000	100	**15.1***
1500	100	**6.6***
2000	100	**1.5***
2500	**20***	0
Summary of Statistics		
NOEC =	2000 mg/L NaCl	<500 mg/L NaCl
LOEC =	2500 mg/L NaCl	500 mg/L NaCl
Survival EC_{50} or Reproduction IC_{50} =	2300 mg/L NaCl	1080 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 17. There was 100% survival and a mean biomass value of 0.76 mg at the Lab Control treatment. The survival EC_{50} was 3.28 g/L NaCl and the growth IC_{50} was 2.76 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 statistics for this test are attached in Appendix Q.

Table 17. Reference toxicant testing: effects of NaCl on fathead minnows.

NaCl Treatment (g/L)	Mean % Survival	Mean Fish Biomass Value (mg)
Lab Control	100	0.76
0.75	90	0.77
1.5	90	0.75
3	**50***	0.31
6	**20***	0.11
9	**0***	-
Summary of Statistics		
NOEC =	1.5 g/L NaCl	1.5 g/L NaCl
LOEC =	3 g/L NaCl	>1.5 g/L NaCl
Survival EC_{50} or Growth IC_{50} =	3.28 g/L NaCl	2.76 g/L NaCl

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

4.3.4 Reference Toxicant Toxicity to *Hyalella azteca*

The results of this test are presented in Table 18. There was 100% survival in the Control treatment; the EC_{50} was 0.57 g/L KCl. 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 R.

Table 18. Reference toxicant testing: Effects of KCl on *Hyalella azteca*.

KCl Treatment (g/L)	Mean % Survival
Control	100
0.1	100
0.2	100
0.4	100
0.8	**0***
1.6	**0***
Summary of Statistics	
No Observable Effect Concentration (NOEC) =	0.4 g/L KCl
Lowest Observable Effect Concentration (LOEC) =	0.8 g/L KCl
Survival EC_{50} =	0.57 g/L KCl

* 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). There was an interrupted concentration-response (i.e., non-significant effects bracketed by significant effects) for the growth endpoint of the Pond 13 fathead minnow site water test. Given that there were no procedural errors during testing and the test sensitivity was acceptable, the response at the 6.25% treatment was considered anomalous and the NOEC was determined as the next highest concentration that was not significantly different from the Lab Control (i.e., 50% site water in this case). This response curve is considered valid based upon a review of the data following EPA guidance.

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 *Ceriodaphnia dubia*

The survival EC_{25} was 16.6% site water, resulting in 6.0 TUc (where TUc = 100/ EC_{25}). The reproduction IC_{25} was 6.1% site water, resulting in 16.5 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
Ceriodaphnia dubia	16.6% site water	6.0	6.1% site water	16.5
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 >100% site water, resulting in <1 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	>100% site water	<1
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 *Ceriodaphnia dubia*

The survival EC_{25} was 6.9% site water, resulting in 14.5 TUc (where TUc = 100/ EC_{25}). The reproduction IC_{25} was 3.7% site water, resulting in 27.3 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
Ceriodaphnia dubia	6.9% site water	14.5	3.7% site water	27.3
Pimephales promelas	>100% site water	<1	>100% site water	<1

Chronic Toxicity of Lehigh Pond 13 Sediment to *Hyalella azteca*

There was ***no*** significant reduction in *H. azteca* survival or growth in the Lehigh Pond 13 sediment sample; the NOEC was 100% site water for both endpoints, resulting in 1 TUc (where TUc = 100/NOEC).

Chronic Effects of Lehigh Pond 13 Sediment.				
Test Species	Survival NOEC	Survival TUc (100/NOEC)	Growth NOEC	Growth TUc (100/NOEC)
Hyalella azteca	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 *Ceriodaphnia dubia*

The survival EC_{25} was >100% site water, resulting in <1 TUc (where TUc = 100/ EC_{25}). The reproduction IC_{25} was 39.6% site water, resulting in 2.5 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
Ceriodaphnia dubia	>100% site water	<1	39.6% site water	2.5
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 and Sediment 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 Elk Grove, CA 95624	**Address:**	P.O. Box 660140 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:			

	Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Grab/ Comp	Container Number	Container Type	*Selenastrum capricornutum* Growth, EPA 1003.0	*Ceriodaphnia dubia* Survival and Reproduction, EPA 1002.0	Fathead Minnow Larval Survival and Growth, EPA 1000.0	10-Day Acute *Hyalalla azteca* sediment test, EPA 100.1
	REQUESTED ANALYSIS										
1	Pond 4A	3/25/13	1120	FW	Grab	2	Poly	x	x	x	
2	Pond 13	3/25/13	1157	FW/~~Sed~~	Grab	2	Poly/~~Glass~~	x	x	x	x
3	Pond 9	3/25/13	1220	FW/~~Sed~~	Grab	2	Poly	x	x	x	
4	Pond 14	3/25/13	1255	FW/~~Sed~~	Grab	2	Poly	x	x	x	
5	Pond 13	3/25/13	1157	Sed	Grab	1	2L Glass				x
6											
7											
8											
9											
10											

Samples collected by: B. Jorgenson & P. Bedore

Comments/Special Instruction:

Perform concurent reference toxicant tests.

Copy Lehigh

RELIQUINSHED BY:		**RECEIVED BY:**	
Signature:		**Signature:**	
Print:	Brant Jorgenson	**Print:**	Alison Briden
Organization:	RBI	**Organization:**	PER
Date:	3/25/13 **Time:** 1530	**Date:**	3/25/13 **Time:** 1530
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 Elk Grove, CA 95624	**Address:**	P.O. Box 660140 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:			

	Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Grab/ Comp	Container Number	Container Type	REQUESTED ANALYSIS: *Ceriodaphnia dubia* Surival and Reproduction, EPA 1002.0	REQUESTED ANALYSIS: Fathead Minnow Larval Survival and Growth, EPA 1000.0
1	Pond 4A	3/27/13	1100	FW	Grab	2	Poly Cube	x	x
2	Pond 13	3/27/13	1139	FW	Grab	2	Poly Cube	x	x
3	Pond 9	3/27/13	1211	FW	Grab	2	Poly Cube	x	x
4	Pond 14	3/27/13	1252	FW	Grab	2	Poly Cube	x	x
5									
6									
7									
8									
9									
10									

Samples collected by: B. Jorgenson

Comments/Special Instruction:

Perform concurent reference toxicant tests.

Renewal samples.

RELIQUINSHED BY:	**RECEIVED BY:**
Signature:	**Signature:**
Print: Brant Jorgenson	**Print:** Alison Briden
Organization: RBI	**Organization:** PER
Date: 3/27/13 **Time:** 1745	**Date:** 3/27/13 **Time:** 1745
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 Elk Grove, CA 95624	**Address:**	P.O. Box 660140 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:			

	Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Grab/ Comp	Container Number	Container Type	REQUESTED ANALYSIS: *Ceriodaphnia dubia* Survival and Reproduction, EPA 1002.0	REQUESTED ANALYSIS: Fathead Minnow Larval Survival and Growth, EPA 1000.0
1	Pond 4A	3/29/13	1215	FW	Grab	2	Poly Cube	x	x
2	Pond 13	3/29/13	1255	FW	Grab	2	Poly Cube	x	x
3	Pond 9	3/29/13	1330	FW	Grab	2	Poly Cube	x	x
4	Pond 14	3/29/13	1350	FW	Grab	2	Poly Cube	x	x
5									
6									
7									
8									
9									
10									

Samples collected by: David Walter

Comments/Special Instruction:

Perform concurent reference toxicant tests.

Renewal samples.

RELIQUINSHED BY:	RECEIVED BY:
Signature: David C Walter	Signature:
Print: David Walter	Print: PER Marlon Orrino
Organization: Golder Associates	Organization: PER
Date: 3-29-13 Time: 1420	Date: 03.29.13 Time: 1420
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

Algal Growth Test — **Pacific EcoRisk**

Batch ID:	12-7549-3796	**Test Type:**	Cell Growth	**Analyst:**	Alison Briden
Start Date:	26 Mar-13 12:30	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	30 Mar-13 14:00	**Species:**	Selenastrum capricornutum	**Brine:**	Not Applicable
Duration:	4d 2h	**Source:**	In-House Culture	**Age:**	6

Sample ID:	06-5579-9366	**Code:**	Pond 4A	**Client:**	Lehigh Permanente
Sample Date:	25 Mar-13 11:20	**Material:**	Effluent	**Project:**	20780
Receive Date:	25 Mar-13 15:30	**Source:**	Lehigh Permanente		
Sample Age:	25h (18.1 °C)	**Station:**	Pond 4A		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
11-6567-7653	96h Cell Density-with EDTA	0	>0		9.55%		Equal Variance t Two-Sample Test
02-6880-6776	96h Cell Density-with EDTA	100	>100	NA	4.59%	1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
15-9050-9814	96h Cell Density-with EDT	IC5	90.2	72.8	N/A	1.108	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	6.09E+6	5.94E+6	6.24E+6	5.64E+6	6.61E+6	2.01E+5	4.03E+5	6.61%	0.0%
0	Lab Water Contr	4	4.44E+6	4.38E+6	4.51E+6	4.32E+6	4.69E+6	8.48E+4	1.70E+5	3.82%	27.0%
6.25		4	4.75E+6	4.71E+6	4.80E+6	4.60E+6	4.85E+6	5.57E+4	1.11E+5	2.34%	21.9%
12.5		4	4.91E+6	4.87E+6	4.95E+6	4.76E+6	5.01E+6	5.40E+4	1.08E+5	2.2%	19.4%
25		4	4.95E+6	4.91E+6	5.00E+6	4.84E+6	5.11E+6	5.81E+4	1.16E+5	2.35%	18.6%
50		4	5.06E+6	5.03E+6	5.09E+6	4.97E+6	5.19E+6	4.48E+4	8.95E+4	1.77%	16.9%
100		4	4.52E+6	4.48E+6	4.57E+6	4.37E+6	4.62E+6	5.46E+4	1.09E+5	2.41%	25.7%

96h Cell Density-with EDTA Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	5.96E+6	6.14E+6	5.64E+6	6.61E+6
0	Lab Water Contr	4.69E+6	4.41E+6	4.35E+6	4.32E+6
6.25		4.80E+6	4.60E+6	4.77E+6	4.85E+6
12.5		4.76E+6	5.01E+6	4.96E+6	4.91E+6
25		4.84E+6	4.92E+6	5.11E+6	4.94E+6
50		5.19E+6	5.04E+6	4.97E+6	5.03E+6
100		4.57E+6	4.37E+6	4.53E+6	4.62E+6

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	02-6880-6776	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 8:56	**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	4.59%	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	-3.67	2.41	2E+05	6	1.0000	CDF	Non-Significant Effect
		12.5	-5.48	2.41	2E+05	6	1.0000	CDF	Non-Significant Effect
		25	-6.01	2.41	2E+05	6	1.0000	CDF	Non-Significant Effect
		50	-7.27	2.41	2E+05	6	1.0000	CDF	Non-Significant Effect
		100	-0.95	2.41	2E+05	6	0.9802	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.215326E+12	2.430653E+11	5	16.9	<0.0001	Significant Effect
Error	2.588584E+11	14381020000	18			
Total	1.474185E+12		23			

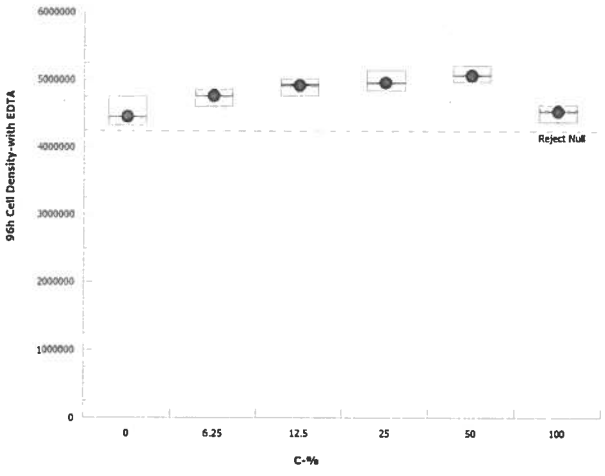
Distributional Tests

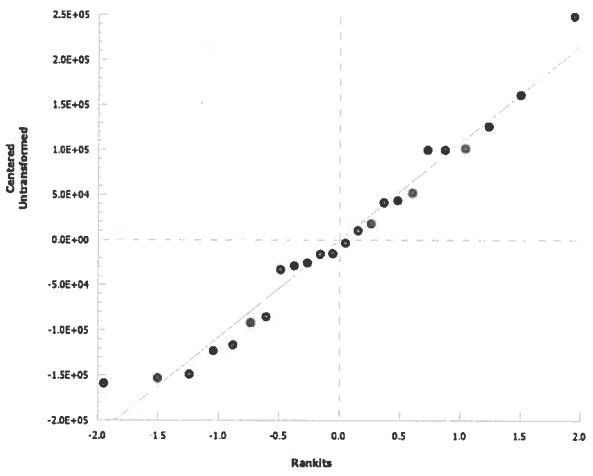
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	1.33	15.1	0.9322	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.967	0.884	0.5899	Normal Distribution

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	4.44E+6	4.17E+6	4.71E+6	4380000	4.32E+6	4.69E+6	8.48E+4	3.82%	0.0%
6.25		4	4.75E+6	4.58E+6	4.93E+6	4780000	4.60E+6	4.85E+6	5.57E+4	2.34%	-7.0%
12.5		4	4.91E+6	4.74E+6	5.08E+6	4930000	4.76E+6	5.01E+6	5.40E+4	2.2%	-10.5%
25		4	4.95E+6	4.77E+6	5.14E+6	4930000	4.84E+6	5.11E+6	5.81E+4	2.35%	-11.5%
50		4	5.06E+6	4.92E+6	5.20E+6	5040000	4.97E+6	5.19E+6	4.48E+4	1.77%	-13.9%
100		4	4.52E+6	4.35E+6	4.70E+6	4550000	4.37E+6	4.62E+6	5.46E+4	2.41%	-1.81%

Graphics





CETIS Analytical Report

Algal Growth Test					Pacific EcoRisk
Analysis ID:	15-9050-9814	Endpoint:	96h Cell Density-with EDTA	CETIS Version:	CETISv1.8.5
Analyzed:	02 Apr-13 8:56	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	795024	200	Yes	Two-Point Interpolation

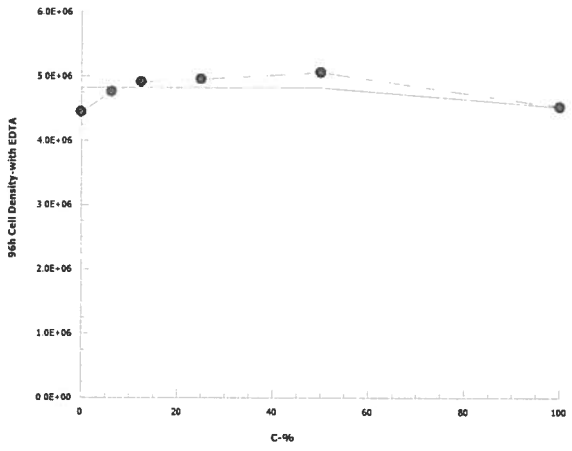
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	90.2	72.8	N/A	1.108	NA	1.373
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	4.44E+6	4.32E+6	4.69E+6	8.48E+4	1.70E+5	3.82%	0.0%
6.25		4	4.75E+6	4.60E+6	4.85E+6	5.57E+4	1.11E+5	2.34%	-7.0%
12.5		4	4.91E+6	4.76E+6	5.01E+6	5.40E+4	1.08E+5	2.2%	-10.5%
25		4	4.95E+6	4.84E+6	5.11E+6	5.81E+4	1.16E+5	2.35%	-11.5%
50		4	5.06E+6	4.97E+6	5.19E+6	4.48E+4	8.95E+4	1.77%	-13.9%
100		4	4.52E+6	4.37E+6	4.62E+6	5.46E+4	1.09E+5	2.41%	-1.81%

Graphics



Selenastrum capricornutum Algal Toxicity Test Water Quality Data

Client: **Lehigh Permanente** Test ID #: 51256 Test Date: 3/26/13

Test Material: Pond 4A Project #: 20780 Control/Diluent: Lab Water

Shelf Zone #: R45 1

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Lab Water Control	24.6	7.50	8.7	140	Date: 3/26/13
6.25 % Effluent	24.6	7.80	8.8	195	Sample ID: 31333
12.5 % Effluent	24.6	7.77	9.1	293	Test Solution Prep: CT
25 %Effluent	24.6	7.86	9.0	470	New WQ: DH
50 % Effluent	24.6	7.96	9.1	787	Innoculation Time: 1230
100% Effluent	24.6	7.98	9.8	1369	Innoculation Signoff: CT
Meter ID:	60A	PH18	RD06	EC06	
Lab Water Control	24.9	7.80			Date: 3/27/13
6.25 % Effluent	24.9	7.72			WQ Time: 1228
12.5 % Effluent	24.9	7.90			WQ Signoff: CD
25 %Effluent	24.9	8.04			
50 % Effluent	24.9	8.22			
100% Effluent	24.9	8.33			
Meter ID:	60A	pH18			
Lab Water Control	24.9	8.84			Date: 3/28/13
6.25 % Effluent	24.9	8.71			WQ Time: 0855
12.5 % Effluent	24.9	8.60			WQ Signoff: RA
25 %Effluent	24.9	8.55			
50 % Effluent	24.9	8.51			
100% Effluent	24.9	8.34			
Meter ID:	60A	PH18			
Lab Water Control	25.0	9.77			Date: 3-29-13
6.25 % Effluent	25.0	9.85			WQ Time: 0930
12.5 % Effluent	25.0	9.72			WQ Signoff: DH
25 %Effluent	25.0	9.49			
50 % Effluent	25.0	9.05			
100% Effluent	25.0	8.57			
Meter ID:	60A	PH19			
Lab Water Control	25.6	9.91	12.4	99	Date: 3-30-13
6.25 % Effluent	25.6	10.02	12.7	195	Termination Time: 1400
12.5 % Effluent	25.6	10.13	12.8	298	Termination Signoff: KP
25 %Effluent	25.6	9.81	13.5	413	WQ Time: 1000
50 % Effluent	25.6	9.64	14.5	660	WQ Signoff: DH
100% Effluent	25.6	9.02	14.0	1134	
Meter ID:	60A	PH16	RD07	EC04	

Initial Test Conditions	✓ Alkalinity	✓ Hardness	Light Intensity (ftc)
	204	759	399.0

Selenastrum capricornutum Cell Density Enumeration Data

Client: **Lehigh Permanente** Initial Count: 10,000 cells/mL

Test Material: Pond 4A Enumerating Scientist: KP

Test Start Date: 3/26/13 Start Time: 1230 Project #: 20780

Test End Date: 3/30/13 End Time: 1406 Test ID #: 51256

Treatment	Cell Density (cells/ml x 10^6)				
	Rep A	Rep B	Rep C	Rep D	Mean
Lab Water	4.6922	4.4108	4.3513	4.3212	4.4439
6.25%	4.7963	4.5959	4.7723	4.8547	4.7548
12.5%	4.7598	5.0095	4.9599	4.9051	4.9086
25%	4.8374	4.9249	5.1146	4.9377	4.9537
50%	5.1866	5.0449	4.9747	5.0344	5.0525
100%	4.5682	4.3704	4.5347	4.6243	4.5244
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:**
	4.44	3.82	3/30/13	18:20	

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	11-6567-7653	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 8:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	9.55%	Passes 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	-7.53	1.94	4E+05	6	0.9999	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	5.406294E+12	5.406294E+12	1	56.7	0.0003	Significant Effect
Error	5.723999E+11	95399990000	6			
Total	5.978694E+12		7			

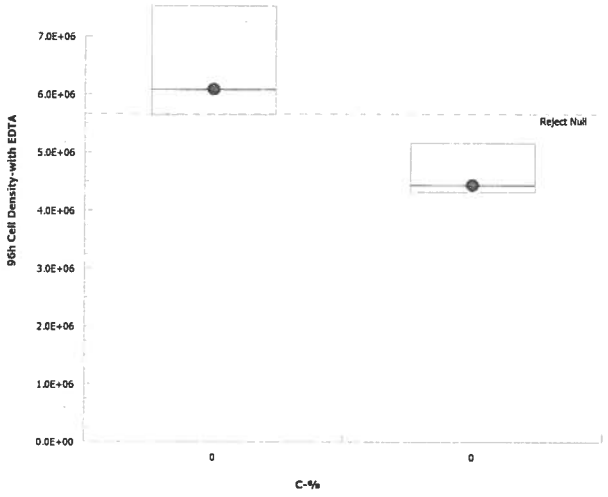
Distributional Tests

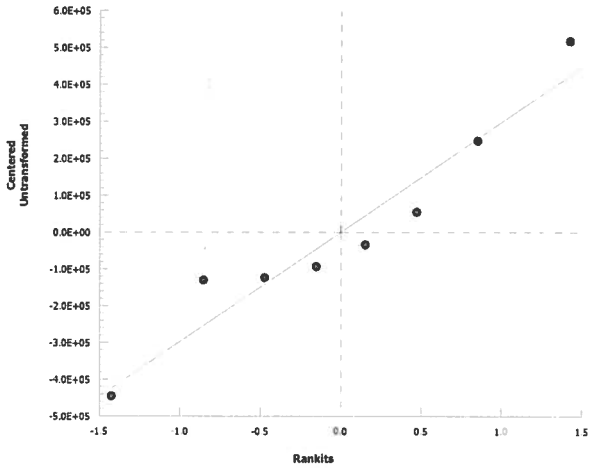
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	5.63	47.5	0.1898	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.948	0.645	0.6899	Normal Distribution

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	4.44E+6	4.17E+6	4.71E+6	5170000	4.32E+6	4.69E+6	8.48E+4	3.82%	0.0%
0	Hardness Blank	4	6.09E+6	5.45E+6	6.73E+6	5170000	5.64E+6	6.61E+6	2.01E+5	6.61%	-37.0%

Graphics





Selenastrum capricornutum Algal Toxicity Test Data Sheet

Client: **Lehigh Permanente** Sample: **Hardness Control**

Test Start Date: 3/26/13 Test ID #: 51256 Project #: 20780

Test End Date: 3/30/13 Control/Diluent: Lab Water

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Hardness Control	24.6	7.60	~~8.8~~ PH 8.6	2485	Date: 3/26/13
					Sample ID #: 31337
					Test Solution Prep: CG
					New WQ: DH
					Inoculation Time: 12:30
Meter ID	60A	PH16	RD06	EC06	Innoculation Signoff: CG
Hardness Control	24.9	8.71			Date: 3/27/13
					WQ Time: 1224
Meter ID	60A	PH18			WQ Signoff: CD
Hardness Control	24.9	8.75			Date: 3/28/13
					WQ Time: 0855
Meter ID	60A	PH18			WQ Signoff: RA
Hardness Control	25.0	4.16			Date: 3-29-13
					WQ Time: 0900
Meter ID	60A	PH19			WQ Signoff: DH
Hardness Control	25.6	9.42	14.4	2415	Date: 3-30-13
					WQ Time: ~~0900~~ 1000
Meter ID	60A	PH16	RD07	EC04	WQ Signoff: WL

Initial Count: 10,000 cells/mL Termination Time: 1400 Enumerating Scientist: KP

Treatment	Cell Density (cells/mL x 10^4)				Mean Cell Density (cells/mL x 10^6)
	Rep A	Rep B	Rep C	Rep D	
Hardness Control	5.9587	6.1437	5.6434	6.6062	6.0880

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:
	4.44	3.82	3/30/13	18:20	

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	✓ 318	✓ 662	399.0

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

Algal Growth Test — **Pacific EcoRisk**

Batch ID:	04-9764-2012	**Test Type:**	Cell Growth	**Analyst:**	Alison Briden
Start Date:	26 Mar-13 12:30	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	30 Mar-13 12:45	**Species:**	Selenastrum capricornutum	**Brine:**	Not Applicable
Duration:	4d 0h	**Source:**	In-House Culture	**Age:**	6

Sample ID:	11-1413-8011	**Code:**	Pond 9	**Client:**	Lehigh Permanente
Sample Date:	25 Mar-13 12:20	**Material:**	Effluent	**Project:**	20780
Receive Date:	25 Mar-13 15:30	**Source:**	Lehigh Permanente		
Sample Age:	24h (13 °C)	**Station:**	Pond 9		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
15-9172-0857	96h Cell Density-with EDTA	0	>0		9.47%		Equal Variance t Two-Sample Test
00-3157-7747	96h Cell Density-with EDTA	100	>100	NA	6.33%	1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
11-3892-9483	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	6.09E+6	5.94E+6	6.24E+6	5.64E+6	6.61E+6	2.01E+5	4.03E+5	6.61%	0.0%
0	Lab Water Contr	4	4.28E+6	4.24E+6	4.32E+6	4.14E+6	4.40E+6	5.48E+4	1.10E+5	2.56%	29.7%
6.25		4	4.67E+6	4.60E+6	4.73E+6	4.52E+6	4.90E+6	9.01E+4	1.80E+5	3.86%	23.3%
12.5		4	5.03E+6	4.98E+6	5.09E+6	4.91E+6	5.25E+6	7.46E+4	1.49E+5	2.96%	17.3%
25		4	5.54E+6	5.50E+6	5.58E+6	5.41E+6	5.66E+6	5.28E+4	1.06E+5	1.91%	9.01%
50		4	5.98E+6	5.93E+6	6.03E+6	5.83E+6	6.11E+6	7.17E+4	1.43E+5	2.4%	1.78%
100		4	6.14E+6	6.06E+6	6.23E+6	5.93E+6	6.45E+6	1.15E+5	2.31E+5	3.76%	-0.94%

96h Cell Density-with EDTA Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	5.96E+6	6.14E+6	5.64E+6	6.61E+6
0	Lab Water Contr	4.40E+6	4.14E+6	4.32E+6	4.26E+6
6.25		4.72E+6	4.53E+6	4.90E+6	4.52E+6
12.5		5.25E+6	4.95E+6	4.91E+6	5.03E+6
25		5.50E+6	5.41E+6	5.66E+6	5.58E+6
50		5.83E+6	5.88E+6	6.11E+6	6.09E+6
100		6.45E+6	6.18E+6	6.01E+6	5.93E+6

CETIS Analytical Report

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	00-3157-7747	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:12	**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	6.33%	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	-3.44	2.41	3E+05	6	1.0000	CDF	Non-Significant Effect
		12.5	-6.7	2.41	3E+05	6	1.0000	CDF	Non-Significant Effect
		25	-11.2	2.41	3E+05	6	1.0000	CDF	Non-Significant Effect
		50	-15.1	2.41	3E+05	6	1.0000	CDF	Non-Significant Effect
		100	-16.6	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	1.096904E+13	2.193807E+12	5	86.7	<0.0001	Significant Effect
Error	4.553195E+11	25295530000	18			
Total	1.142436E+13		23			

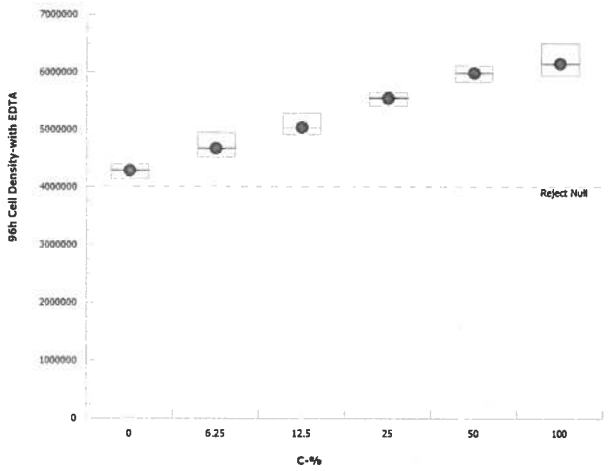
Distributional Tests

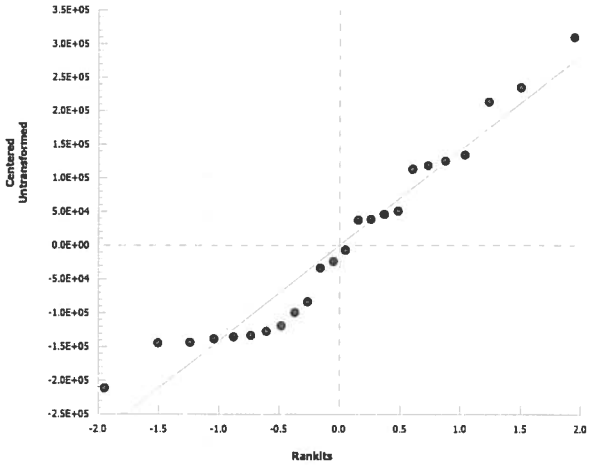
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	2.39	15.1	0.7926	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.938	0.884	0.1494	Normal Distribution

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	4.28E+6	4.11E+6	4.45E+6	4290000	4.14E+6	4.40E+6	5.48E+4	2.56%	0.0%
6.25		4	4.67E+6	4.38E+6	4.95E+6	4620000	4.52E+6	4.90E+6	9.01E+4	3.86%	-9.05%
12.5		4	5.03E+6	4.80E+6	5.27E+6	4990000	4.91E+6	5.25E+6	7.46E+4	2.96%	-17.6%
25		4	5.54E+6	5.37E+6	5.71E+6	5540000	5.41E+6	5.66E+6	5.28E+4	1.91%	-29.4%
50		4	5.98E+6	5.75E+6	6.21E+6	5990000	5.83E+6	6.11E+6	7.17E+4	2.4%	-39.7%
100		4	6.14E+6	5.78E+6	6.51E+6	6100000	5.93E+6	6.45E+6	1.15E+5	3.76%	-43.6%

Graphics





CETIS Analytical Report

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	11-3892-9483	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:25	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	943464	200	Yes	Two-Point Interpolation

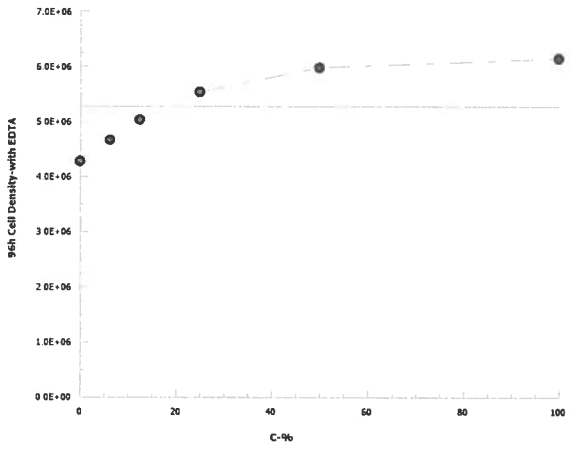
Point Estimates

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	4.28E+6	4.14E+6	4.40E+6	5.48E+4	1.10E+5	2.56%	0.0%
6.25		4	4.67E+6	4.52E+6	4.90E+6	9.01E+4	1.80E+5	3.86%	-9.05%
12.5		4	5.03E+6	4.91E+6	5.25E+6	7.46E+4	1.49E+5	2.96%	-17.6%
25		4	5.54E+6	5.41E+6	5.66E+6	5.28E+4	1.06E+5	1.91%	-29.4%
50		4	5.98E+6	5.83E+6	6.11E+6	7.17E+4	1.43E+5	2.4%	-39.7%
100		4	6.14E+6	5.93E+6	6.45E+6	1.15E+5	2.31E+5	3.76%	-43.6%

Graphics



Selenastrum capricornutum Algal Toxicity Test Water Quality Data

Client: **Lehigh Permanente** Test ID #: 51257 Test Date: 3/26/13
Test Material: Pond 9 Project #: 20780 Control/Diluent: Lab Water
Shelf Zone #: R4S1

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Lab Water Control	24.6	7.50	8.7	89	Date: 3/26/13
6.25 % Effluent	24.6	7.61	8.8	198	Sample ID: 31334
12.5 % Effluent	24.6	7.61	8.7	278	Test Solution Prep: CG
25 %Effluent	24.6	7.66	9.1	476	New WQ: DH
50 % Effluent	24.6	7.72	9.4	798	Innoculation Time: 12:30
100% Effluent	24.6	7.73	10.1	1436	Innoculation Signoff: CG
Meter ID:	60A	PH18	RD06	EC06	
Lab Water Control	24.9	7.53			Date: 3/27/13
6.25 % Effluent	24.9	7.83			WQ Time: 1212
12.5 % Effluent	24.9	7.96			WQ Signoff: CO
25 %Effluent	24.9	8.07			
50 % Effluent	24.9	8.22			
100% Effluent	24.9	8.33			
Meter ID:	60A	PH18			
Lab Water Control	24.9	8.87			Date: 3/28/13
6.25 % Effluent	24.9	8.81			WQ Time: 0900
12.5 % Effluent	24.9	8.72			WQ Signoff: RA
25 %Effluent	24.9	8.67			
50 % Effluent	24.9	8.61			
100% Effluent	24.9	8.63			
Meter ID:	60A	PH18			
Lab Water Control	25.0	9.79			Date: 3/29/13
6.25 % Effluent	25.0	9.34			WQ Time: 0900
12.5 % Effluent	25.0	9.86			WQ Signoff: DH
25 %Effluent	25.0	9.58			
50 % Effluent	25.0	9.22			
100% Effluent	25.0	8.76			
Meter ID:	60A	PH19			
Lab Water Control	25.6	10.02	12.5	94	Date: 3-30-13
6.25 % Effluent	25.6	10.18	13.4	210	Termination Time: 1045
12.5 % Effluent	25.6	10.15	12.8	286	Termination Signoff: KP
25 %Effluent	25.6	9.97	15.7	446	WQ Time: 1015
50 % Effluent	25.6	9.83	14.9	686	WQ Signoff: AJ
100% Effluent	25.6	9.40	15.0	1213	
Meter ID:	60A	PH16	RD07	EC04	

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	✓ 206	✓ 608	399.0

Selenastrum capricornutum Cell Density Enumeration Data

Client: **Lehigh Permanente** Initial Count: 10,000 cells/mL

Test Material: Pond 9 Enumerating Scientist: KP

Test Start Date: 3/26/13 Start Time: 12:30 Project #: 20780

Test End Date: 3/30/13 End Time: 1245 Test ID #: 51257

Treatment	Rep A	Rep B	Rep C	Rep D	Mean
Lab Water Control	4.4044	4.1434	4.3162	4.2550	4.2798
6.25%	4.7168	4.5277	4.9008	4.5223	4.6669
12.5%	5.2456	4.9485	4.9130	5.0250	5.0330
25%	5.5048	5.4110	5.6569	5.5844	5.5393
50%	5.8343	5.8794	6.1132	6.0922	5.9798
100%	6.4537	6.1827	6.0104	5.9329	6.1450
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:
	~~6.1~~ 4.28	2.5%	3/30/13	18:20	

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	15-9172-0857	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:25	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	9.47%	Passes 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	-8.67	1.94	4E+05	6	0.9999	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6.539536E+12	6.539536E+12	1	75.2	0.0001	Significant Effect
Error	5.220915E+11	87015250000	6			
Total	7.061628E+12		7			

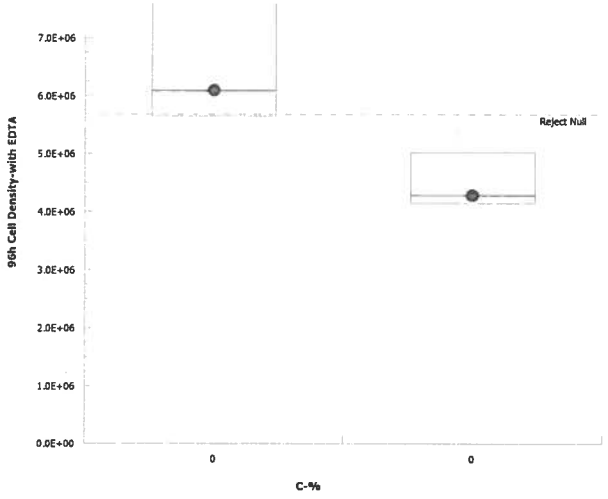
Distributional Tests

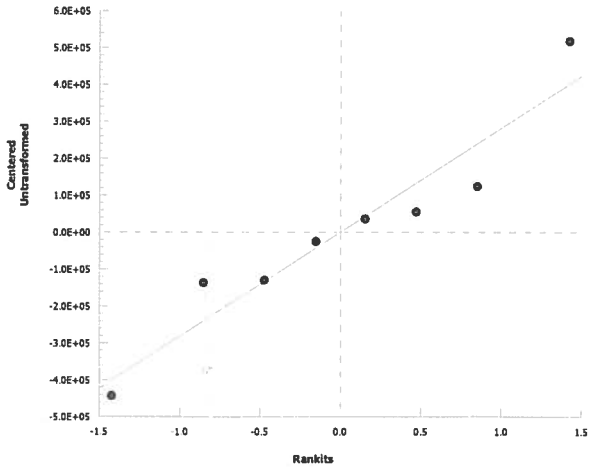
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	13.5	47.5	0.0604	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.941	0.645	0.6220	Normal Distribution

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	4.28E+6	4.11E+6	4.45E+6	5020000	4.14E+6	4.40E+6	5.48E+4	2.56%	0.0%
0	Hardness Blank	4	6.09E+6	5.45E+6	6.73E+6	5020000	5.64E+6	6.61E+6	2.01E+5	6.61%	-42.3%

Graphics





Selenastrum capricornutum Algal Toxicity Test Data Sheet

Client: **Lehigh Permanente** Sample: **Hardness Control**

Test Start Date: 3/26/13 Test ID #: 51256 Project #: 20780

Test End Date: 3/30/13 Control/Diluent: Lab Water

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Hardness Control	24.6	7.60	~~8.8~~ PH 8.6	2485	Date: 3/26/13
					Sample ID #: 31337
					Test Solution Prep: CG
					New WQ: DH
					Inoculation Time: 12:30
Meter ID	60A	PH16	RD06	EC06	Inoculation Signoff: CG
Hardness Control	24.9	8.71			Date: 3/27/13
					WQ Time: 1224
Meter ID	60A	PH18			WQ Signoff: CD
Hardness Control	24.9	8.75			Date: 3/28/13
					WQ Time: 0855
Meter ID	60A	PH18			WQ Signoff: RA
Hardness Control	25.0	4.16			Date: 3-29-13
					WQ Time: 0900
Meter ID	60A	PH19			WQ Signoff: DH
Hardness Control	25.6	9.42	14.4	2415	Date: 3-30-13
					WQ Time: ~~0900~~ 1000
Meter ID	60A	PH16	RD07	EC04	WQ Signoff: NF

Initial Count: 10,000 cells/mL Termination Time: 1400 Enumerating Scientist: KP

Treatment	Cell Density (cells/mL x 10^4)				Mean Cell Density (cells/mL x 10^6)
	Rep A	Rep B	Rep C	Rep D	
Hardness Control	5.9587	6.1437	5.6434	6.6062	6.0880

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:
	4.44	3.82	3/30/13	18:20	

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	✓ 318	✓ 662	399.0

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

Algal Growth Test — **Pacific EcoRisk**

Batch ID:	03-8250-3928	**Test Type:**	Cell Growth	**Analyst:**	Alison Briden
Start Date:	26 Mar-13 12:30	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	30 Mar-13 13:30	**Species:**	Selenastrum capricornutum	**Brine:**	Not Applicable
Duration:	4d 1h	**Source:**	In-House Culture	**Age:**	6

Sample ID:	19-8535-7406	**Code:**	Pond 13	**Client:**	Lehigh Permanente
Sample Date:	25 Mar-13 11:57	**Material:**	Effluent	**Project:**	20780
Receive Date:	25 Mar-13 15:30	**Source:**	Lehigh Permanente		
Sample Age:	25h (9 °C)	**Station:**	Pond 13		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
10-8568-3880	96h Cell Density-with EDTA	0	>0		9.87%		Equal Variance t Two-Sample Test
06-1677-0362	96h Cell Density-with EDTA	100	>100	NA	6.66%	1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
20-6148-4167	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	6.09E+6	5.94E+6	6.24E+6	5.64E+6	6.61E+6	2.01E+5	4.03E+5	6.61%	0.0%
0	Lab Water Contr	4	4.42E+6	4.34E+6	4.49E+6	4.16E+6	4.62E+6	9.96E+4	1.99E+5	4.51%	27.4%
6.25		4	4.83E+6	4.77E+6	4.89E+6	4.68E+6	5.01E+6	8.18E+4	1.64E+5	3.38%	20.6%
12.5		4	4.87E+6	4.84E+6	4.90E+6	4.74E+6	4.95E+6	4.49E+4	8.99E+4	1.85%	20.0%
25		4	5.26E+6	5.23E+6	5.28E+6	5.19E+6	5.36E+6	3.51E+4	7.01E+4	1.33%	13.6%
50		4	5.31E+6	5.27E+6	5.35E+6	5.18E+6	5.41E+6	5.60E+4	1.12E+5	2.11%	12.8%
100		4	5.39E+6	5.28E+6	5.51E+6	5.11E+6	5.81E+6	1.48E+5	2.96E+5	5.48%	11.4%

96h Cell Density-with EDTA Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	5.96E+6	6.14E+6	5.64E+6	6.61E+6
0	Lab Water Contr	4.38E+6	4.52E+6	4.62E+6	4.16E+6
6.25		4.94E+6	4.70E+6	4.68E+6	5.01E+6
12.5		4.87E+6	4.95E+6	4.92E+6	4.74E+6
25		5.36E+6	5.19E+6	5.22E+6	5.26E+6
50		5.41E+6	5.25E+6	5.39E+6	5.18E+6
100		5.81E+6	5.11E+6	5.33E+6	5.33E+6

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	06-1677-0362	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:24	**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	6.66%	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	-3.39	2.41	3E+05	6	1.0000	CDF	Non-Significant Effect
		12.5	-3.69	2.41	3E+05	6	1.0000	CDF	Non-Significant Effect
		25	-6.86	2.41	3E+05	6	1.0000	CDF	Non-Significant Effect
		50	-7.26	2.41	3E+05	6	1.0000	CDF	Non-Significant Effect
		100	-7.98	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	2.793296E+12	5.586591E+11	5	18.7	<0.0001	Significant Effect
Error	5.385431E+11	29919060000	18			
Total	3.331839E+12		23			

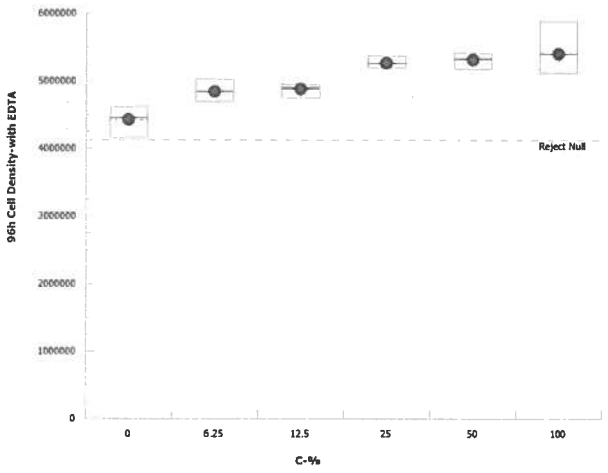
Distributional Tests

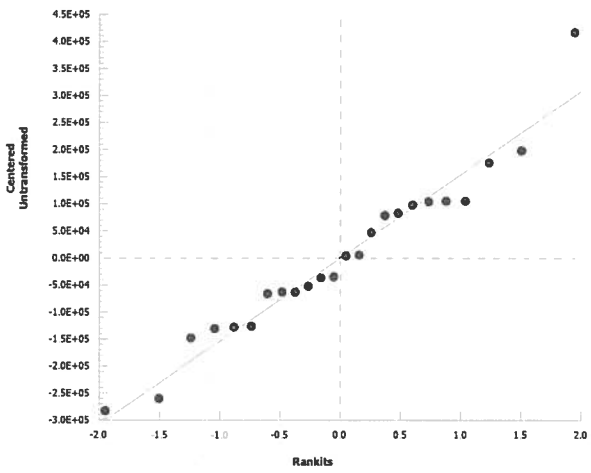
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	7.27	15.1	0.2011	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.962	0.884	0.4742	Normal Distribution

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	4.42E+6	4.10E+6	4.74E+6	4450000	4.16E+6	4.62E+6	9.96E+4	4.51%	0.0%
6.25		4	4.83E+6	4.57E+6	5.09E+6	4820000	4.68E+6	5.01E+6	8.18E+4	3.38%	-9.37%
12.5		4	4.87E+6	4.73E+6	5.01E+6	4900000	4.74E+6	4.95E+6	4.49E+4	1.85%	-10.2%
25		4	5.26E+6	5.15E+6	5.37E+6	5240000	5.19E+6	5.36E+6	3.51E+4	1.33%	-19.0%
50		4	5.31E+6	5.13E+6	5.49E+6	5320000	5.18E+6	5.41E+6	5.60E+4	2.11%	-20.1%
100		4	5.39E+6	4.92E+6	5.87E+6	5330000	5.11E+6	5.81E+6	1.48E+5	5.48%	-22.1%

Graphics





CETIS Analytical Report

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	20-6148-4167	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:24	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1409005	200	Yes	Two-Point Interpolation

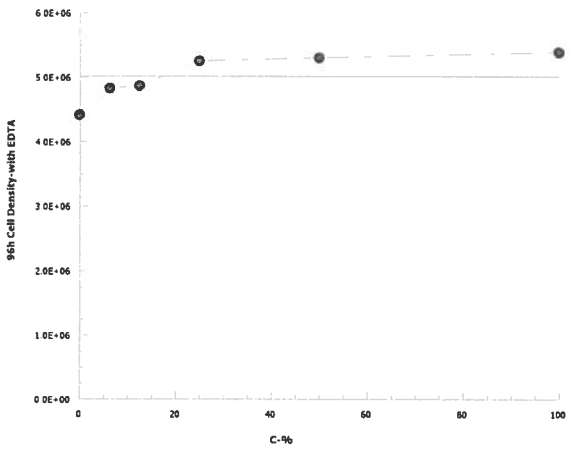
Point Estimates

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	4.42E+6	4.16E+6	4.62E+6	9.96E+4	1.99E+5	4.51%	0.0%
6.25		4	4.83E+6	4.68E+6	5.01E+6	8.18E+4	1.64E+5	3.38%	-9.37%
12.5		4	4.87E+6	4.74E+6	4.95E+6	4.49E+4	8.99E+4	1.85%	-10.2%
25		4	5.26E+6	5.19E+6	5.36E+6	3.51E+4	7.01E+4	1.33%	-19.0%
50		4	5.31E+6	5.18E+6	5.41E+6	5.60E+4	1.12E+5	2.11%	-20.1%
100		4	5.39E+6	5.11E+6	5.81E+6	1.48E+5	2.96E+5	5.48%	-22.1%

Graphics



Selenastrum capricornutum Algal Toxicity Test Water Quality Data

Client: **Lehigh Permanente** Test ID #: 51258 Test Date: 3/26/13
Test Material: Pond 13 Project #: 20780 Control/Diluent: Lab Water
Shelf Zone #: R2S1

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Lab Water Control	25.4	7.60	9.1	89	Date: 3/26/13
6.25 % Effluent	25.4	7.58	9.1	198	Sample ID: 31335
12.5 % Effluent	25.4	7.67	9.1	282	Test Solution Prep:
25 %Effluent	25.4	7.91	9.2	464	New WQ: DH
50 % Effluent	25.4	8.03	9.4	757	Innoculation Time: 12:30
100% Effluent	25.4	8.07	10.0	1315	Innoculation Signoff:
Meter ID:	06	PH18	RD06	EC06	
Lab Water Control	25.5	7.94			Date: 03-27-13
6.25 % Effluent	25.5	7.73			WQ Time: 1200
12.5 % Effluent	25.5	7.86			WQ Signoff:
25 %Effluent	25.5	8.04			
50 % Effluent	25.5	8.18			
100% Effluent	25.5	8.34			
Meter ID:	06	PH18			
Lab Water Control	25.3	8.81			Date: 3/28/13
6.25 % Effluent	25.3	8.63			WQ Time: 0950
12.5 % Effluent	25.3	8.64			WQ Signoff: RA
25 %Effluent	25.3	8.53			
50 % Effluent	25.3	8.54			
100% Effluent	25.3	8.42			
Meter ID:	06	PH18			
Lab Water Control	25.3	9.73			Date: 3-29-13
6.25 % Effluent	25.3	9.76			WQ Time: 1100
12.5 % Effluent	25.3	9.61			WQ Signoff: DH
25 %Effluent	25.3	9.43			
50 % Effluent	25.3	9.13			
100% Effluent	25.3	8.63			
Meter ID:	06	PH19			
Lab Water Control	25.1	10.07	14.3	97	Date: ~~3-30~~ 3-30-13
6.25 % Effluent	25.1	10.13	13.8	224	Termination Time: 1330
12.5 % Effluent	25.1	10.11	15.7	267	Termination Signoff: KP
25 %Effluent	25.1	9.83	13.2	427	WQ Time: 0930
50 % Effluent	25.1	9.74	14.9	658	WQ Signoff: NL
100% Effluent	25.1	9.45	15.2	1130	
Meter ID:	06	PH16	RD17	EC04	

Initial Test Conditions		Alkalinity		Hardness	Light Intensity (ftc)
	✓	164	✓	694	409.27

Selenastrum capricornutum Cell Density Enumeration Data

Client: **Lehigh Permanente** Initial Count: 10,000 cells/mL

Test Material: Pond 13 Enumerating Scientist: KP

Test Start Date: 3/26/13 Start Time: 12:30 Project #: 20780

Test End Date: 3/30/13 End Time: 1330 Test ID #: 51258

Treatment	Rep A	Rep B	Rep C	Rep D	Mean
Lab Water Control	4.3816	4.5213	4.6156	4.1573	4.4190
6.25%	4.9369	4.7040	4.6835	5.0075	4.8330
12.5%	4.8748	4.9473	4.9163	4.7431	4.8704
25%	5.3553	5.1946	5.2226	5.2617	5.2586
50%	5.4110	5.2543	5.3893	5.1754	5.3075
100%	5.8104	5.1101	5.3272	5.3307	5.3947
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:
	4.42	4.51	3/30/13	18:20	

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	10-8568-3880	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:24	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	9.87%	Passes 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	-7.43	1.94	4E+05	6	0.9998	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	5.571456E+12	5.571456E+12	1	55.3	0.0003	Significant Effect
Error	6.050239E+11	1.008373E+11	6			
Total	6.17648E+12		7			

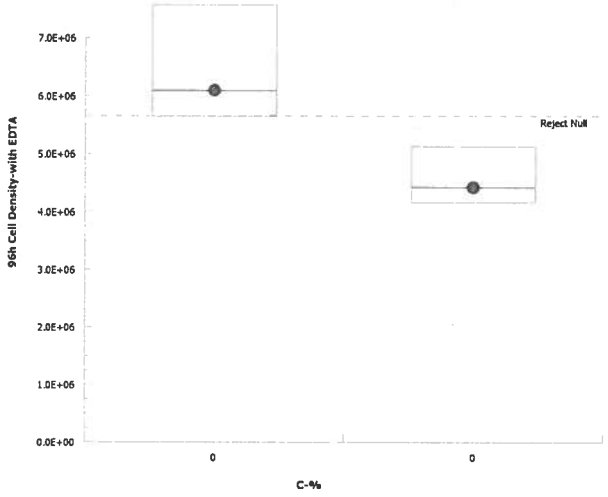
Distributional Tests

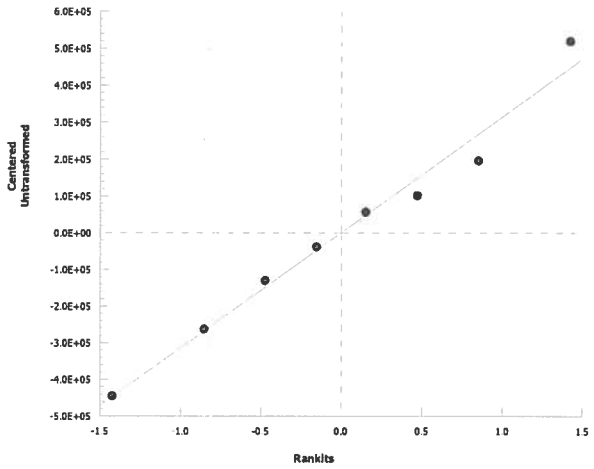
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	4.08	47.5	0.2780	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.988	0.645	0.9923	Normal Distribution

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	4.42E+6	4.10E+6	4.74E+6	5130000	4.16E+6	4.62E+6	9.96E+4	4.51%	0.0%
0	Hardness Blank	4	6.09E+6	5.45E+6	6.73E+6	5130000	5.64E+6	6.61E+6	2.01E+5	6.61%	-37.8%

Graphics





Selenastrum capricornutum Algal Toxicity Test Data Sheet

Client: **Lehigh Permanente** Sample: **Hardness Control**

Test Start Date: 3/26/13 Test ID #: 51256 Project #: 20780

Test End Date: 3/30/13 Control/Diluent: Lab Water

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Hardness Control	24.6	7.60	~~8.8~~ 8.6 pH	2485	Date: 3/26/13
					Sample ID #: 31337
					Test Solution Prep: CG
					New WQ: DH
					Inoculation Time: 12:30
Meter ID	60A	pH16	RD06	EC06	Innoculation Signoff: CG
Hardness Control	24.9	8.71			Date: 3/27/13
					WQ Time: 1224
Meter ID	60A	pH18			WQ Signoff: CD
Hardness Control	24.9	8.75			Date: 3/28/13
					WQ Time: 0855
Meter ID	60A	pH18			WQ Signoff: RA
Hardness Control	25.0	4.16			Date: 3-29-13
					WQ Time: 0900
Meter ID	60A	pH19			WQ Signoff: DH
Hardness Control	25.6	9.42	14.4	2415	Date: 3-30-13
					WQ Time: ~~0900~~ 1000
Meter ID	60A	pH16	RD07	EC04	WQ Signoff: NF

Initial Count: 10,000 cells/mL Termination Time: 1400 Enumerating Scientist: KP

Treatment	Cell Density (cells/mL x 10^n)				Mean Cell Density (cells/mL x 10^6)
	Rep A	Rep B	Rep C	Rep D	
Hardness Control	5.9587	6.1437	5.6434	6.6062	6.0880

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:
	4.44	3.82	3/30/13	18:20	

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	✓ 318	✓ 662	399.0

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

Algal Growth Test — **Pacific EcoRisk**

Batch ID:	07-6025-0978	**Test Type:**	Cell Growth	**Analyst:**	Alison Briden
Start Date:	26 Mar-13 12:30	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	30 Mar-13 14:30	**Species:**	Selenastrum capricornutum	**Brine:**	Not Applicable
Duration:	4d 2h	**Source:**	In-House Culture	**Age:**	

Sample ID:	14-7229-2803	**Code:**	Pond 14	**Client:**	Lehigh Permanente
Sample Date:	25 Mar-13 12:55	**Material:**	Effluent	**Project:**	20780
Receive Date:	25 Mar-13 15:30	**Source:**	Lehigh Permanente		
Sample Age:	24h (13.7 °C)	**Station:**	Pond 14		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
07-3427-9278	96h Cell Density-with EDTA	0	>0		12.9%		Equal Variance t Two-Sample Test
01-6559-8600	96h Cell Density-with EDTA	100	>100	NA	8.92%	1	Steel Many-One Rank Sum Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
06-3137-2421	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	6.09E+6	5.94E+6	6.24E+6	5.64E+6	6.61E+6	2.01E+5	4.03E+5	6.61%	0.0%
0	Lab Water Contr	4	4.46E+6	4.30E+6	4.62E+6	4.08E+6	4.95E+6	2.18E+5	4.35E+5	9.75%	26.7%
6.25		4	4.98E+6	4.93E+6	5.03E+6	4.79E+6	5.09E+6	6.41E+4	1.28E+5	2.58%	18.2%
12.5		4	5.15E+6	5.15E+6	5.16E+6	5.13E+6	5.17E+6	7.78E+3	1.56E+4	0.3%	15.4%
25		4	5.44E+6	5.38E+6	5.49E+6	5.30E+6	5.61E+6	7.03E+4	1.41E+5	2.58%	10.7%
50		4	5.75E+6	5.69E+6	5.82E+6	5.60E+6	5.97E+6	8.86E+4	1.77E+5	3.08%	5.52%
100		4	5.70E+6	5.60E+6	5.80E+6	5.41E+6	6.05E+6	1.33E+5	2.66E+5	4.67%	6.32%

96h Cell Density-with EDTA Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	5.96E+6	6.14E+6	5.64E+6	6.61E+6
0	Lab Water Contr	4.11E+6	4.70E+6	4.95E+6	4.08E+6
6.25		5.01E+6	5.09E+6	5.02E+6	4.79E+6
12.5		5.15E+6	5.16E+6	5.13E+6	5.17E+6
25		5.61E+6	5.49E+6	5.35E+6	5.30E+6
50		5.97E+6	5.83E+6	5.60E+6	5.61E+6
100		5.72E+6	6.05E+6	5.63E+6	5.41E+6

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	01-6559-8600	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:33	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	8.92%	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	25	10	0	6	0.9997	Asymp	Non-Significant Effect
		12.5	26	10	0	6	0.9999	Asymp	Non-Significant Effect
		25	26	10	0	6	0.9999	Asymp	Non-Significant Effect
		50	26	10	0	6	0.9999	Asymp	Non-Significant Effect
		100	26	10	0	6	0.9999	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.789169E+12	9.578337E+11	5	17.5	<0.0001	Significant Effect
Error	9.843308E+11	54685040000	18			
Total	5.773499E+12		23			

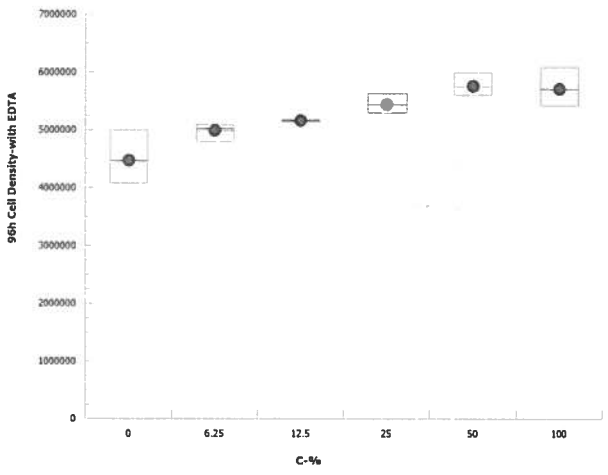
Distributional Tests

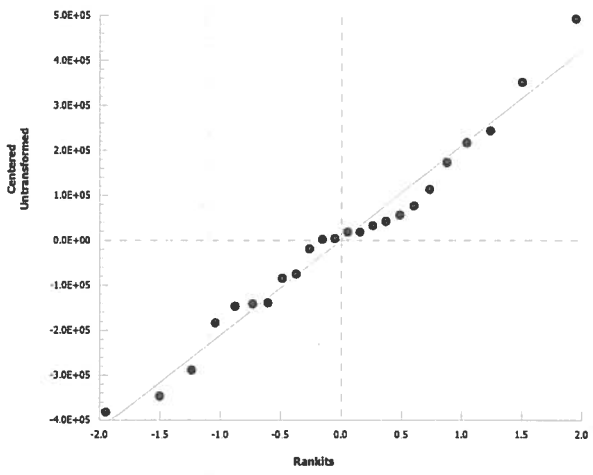
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	17.8	15.1	0.0032	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.977	0.884	0.8389	Normal Distribution

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	4.46E+6	3.77E+6	5.15E+6	4410000	4.08E+6	4.95E+6	2.18E+5	9.75%	0.0%
6.25		4	4.98E+6	4.78E+6	5.18E+6	5020000	4.79E+6	5.09E+6	6.41E+4	2.58%	-11.6%
12.5		4	5.15E+6	5.13E+6	5.18E+6	5150000	5.13E+6	5.17E+6	7.78E+3	0.3%	-15.5%
25		4	5.44E+6	5.21E+6	5.66E+6	5420000	5.30E+6	5.61E+6	7.03E+4	2.58%	-21.9%
50		4	5.75E+6	5.47E+6	6.03E+6	5720000	5.60E+6	5.97E+6	8.86E+4	3.08%	-28.9%
100		4	5.70E+6	5.28E+6	6.13E+6	5670000	5.41E+6	6.05E+6	1.33E+5	4.67%	-27.8%

Graphics





CETIS Analytical Report

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	06-3137-2421	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:33	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	477607	200	Yes	Two-Point Interpolation

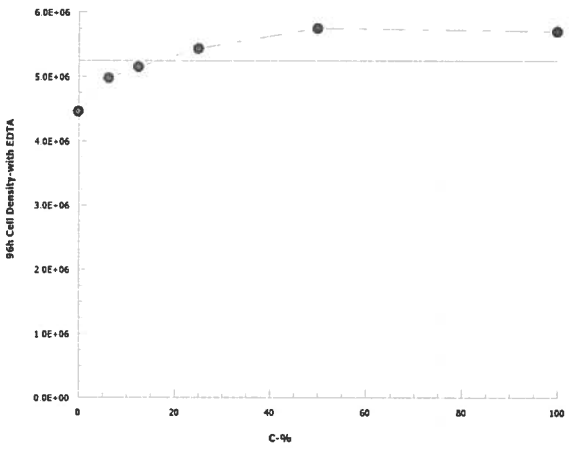
Point Estimates

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	4.46E+6	4.08E+6	4.95E+6	2.18E+5	4.35E+5	9.75%	0.0%
6.25		4	4.98E+6	4.79E+6	5.09E+6	6.41E+4	1.28E+5	2.58%	-11.6%
12.5		4	5.15E+6	5.13E+6	5.17E+6	7.78E+3	1.56E+4	0.3%	-15.5%
25		4	5.44E+6	5.30E+6	5.61E+6	7.03E+4	1.41E+5	2.58%	-21.9%
50		4	5.75E+6	5.60E+6	5.97E+6	8.86E+4	1.77E+5	3.08%	-28.9%
100		4	5.70E+6	5.41E+6	6.05E+6	1.33E+5	2.66E+5	4.67%	-27.8%

Graphics



Selenastrum capricornutum Algal Toxicity Test Water Quality Data

Client: **Lehigh Permanente** Test ID #: 51259 Test Date: 3/26/13

Test Material: Pond 14 Project #: 20780 Control/Diluent: Lab Water

Shelf Zone #: R2S1

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Lab Water Control	25.4	7.50	9.1	88	Date: 3/26/13
6.25 % Effluent	25.4	7.60	9.1	197	Sample ID: 31336
12.5 % Effluent	25.4	7.74	9.3	285	Test Solution Prep: CG
25 %Effluent	25.4	7.93	9.2	548	New WQ: DH
50 % Effluent	25.4	8.08	9.9	764	Innoculation Time: 12:30
100% Effluent	25.4	8.16	11.4	1319	Innoculation Signoff: MG
Meter ID:	06	PH18	RD06	EC06	
Lab Water Control	25.5	7.77			Date: 3-27-13
6.25 % Effluent	25.5	7.64			WQ Time: 1200
12.5 % Effluent	25.5	7.88			WQ Signoff: MG
25 %Effluent	25.5	7.90			
50 % Effluent	25.5	8.24			
100% Effluent	25.5	8.40			
Meter ID:	06	PH18			
Lab Water Control	25.3	9.02			Date: 3/28/13
6.25 % Effluent	25.3	8.79			WQ Time: 1000
12.5 % Effluent	25.3	8.66			WQ Signoff: RA
25 %Effluent	25.3	8.65			
50 % Effluent	25.3	8.57			
100% Effluent	25.3	8.53			
Meter ID:	06	PH18			
Lab Water Control	25.3	9.66			Date: 3.29.13
6.25 % Effluent	25.3	9.72			WQ Time: 1100
12.5 % Effluent	25.3	9.65			WQ Signoff: DH
25 %Effluent	25.3	9.58			
50 % Effluent	25.3	9.14			
100% Effluent	25.3	8.73			
Meter ID:	06	PH 19			
Lab Water Control	25.1	9.90	13.6	93	Date: 3-30-13
6.25 % Effluent	25.1	9.97	14.4	200	Termination Time: 1430
12.5 % Effluent	25.1	9.84	14.9	~~282~~ 282	Termination Signoff: KP
25 %Effluent	25.1	10.01	15.3	414	WQ Time: 0930
50 % Effluent	25.1	9.88	15.8	670	WQ Signoff: DH
100% Effluent	25.1	9.42	15.7	1123	
Meter ID:	06	PH16	RD02	EC04	

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	✓ 173	✓ 664	409.27

Selenastrum capricornutum Cell Density Enumeration Data

Client: **Lehigh Permanente** Initial Count: 10,000 cells/mL

Test Material: Pond 14 Enumerating Scientist: KP

Test Start Date: 3/26/13 Start Time: 12:30 Project #: 20780

Test End Date: 3/30/13 End Time: 14:30 Test ID #: 51259

Treatment	Rep A	Rep B	Rep C	Rep D	Mean
Lab Water Control	4.1126	4.7031	4.9517	4.0772	4.4612
6.25%	5.0109	5.0912	5.0206	4.7946	4.9793
12.5%	5.1537	5.1555	5.1321	5.1698	5.1528
25%	5.6076	5.4912	5.3508	5.2964	5.4365
50%	5.9674	5.8275	5.6044	5.6093	5.7522
100%	5.7200	6.0530	5.6268	5.4130	5.7032
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 10^4)	% CV	Date:	Time:	Signoff:
	4.46	9.75	3/30/13	18:20	

Algal Growth Test — **Pacific EcoRisk**

Analysis ID:	07-3427-9278	**Endpoint:**	96h Cell Density-with EDTA	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:33	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	12.9%	Passes 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	-5.49	1.94	6E+05	6	0.9992	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	5.293282E+12	5.293282E+12	1	30.1	0.0015	Significant Effect
Error	1.054105E+12	1.756842E+11	6			
Total	6.347387E+12		7			

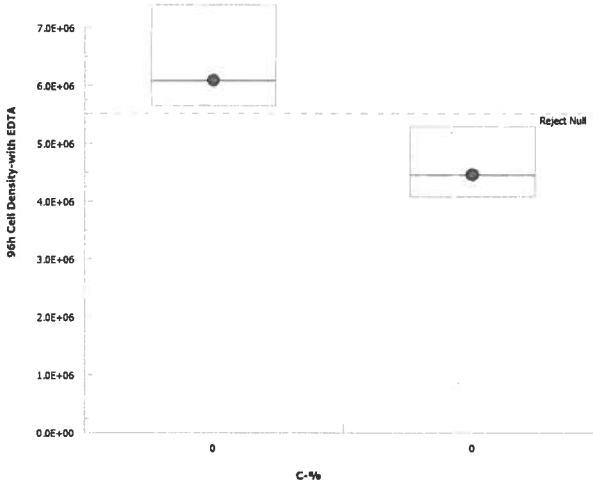
Distributional Tests

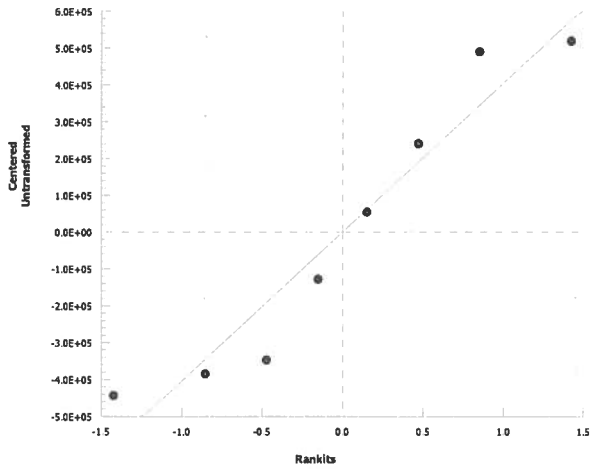
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	1.17	47.5	0.9010	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.898	0.645	0.2781	Normal Distribution

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	4.46E+6	3.77E+6	5.15E+6	5300000	4.08E+6	4.95E+6	2.18E+5	9.75%	0.0%
0	Hardness Blank	4	6.09E+6	5.45E+6	6.73E+6	5300000	5.64E+6	6.61E+6	2.01E+5	6.61%	-36.5%

Graphics





Selenastrum capricornutum Algal Toxicity Test Data Sheet

Client: **Lehigh Permanente** Sample: **Hardness Control**

Test Start Date: 3/26/13 Test ID #: 51256 Project #: 20780

Test End Date: 3/30/13 Control/Diluent: Lab Water

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Hardness Control	24.6	7.60	~~8.8~~ 8.6 pH	2485	Date: 3/26/13
					Sample ID #: 31337
					Test Solution Prep: CG
					New WQ: DH
					Inoculation Time: 12:30
Meter ID	60A	pH16	RD06	EC06	Innoculation Signoff: CG
Hardness Control	24.9	8.71			Date: 3/27/13
					WQ Time: 1224
Meter ID	60A	pH18			WQ Signoff: CD
Hardness Control	24.9	8.75			Date: 3/28/13
					WQ Time: 0855
Meter ID	60A	pH18			WQ Signoff: RA
Hardness Control	25.0	9.16			Date: 3-29-13
					WQ Time: 0900
Meter ID	60A	pH19			WQ Signoff: DH
Hardness Control	25.6	9.42	14.4	2419	Date: 3-30-13
					WQ Time: ~~0900~~ 1000
Meter ID	60A	pH16	RD07	EC04	WQ Signoff: NF

Initial Count: 10,000 cells/mL Termination Time: 1400 Enumerating Scientist: KP

Treatment	Cell Density (cells/mL x 10^4)				Mean Cell Density (cells/mL x 10^6)
	Rep A	Rep B	Rep C	Rep D	
Hardness Control	5.9587	6.1437	5.6434	6.6062	6.0880

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:
	4.44	3.82	3/30/13	18:20	

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	✓ 318	✓ 662	399.0

Appendix F

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

CETIS Summary Report

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

Batch ID:	18-1419-6084	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Melinda Hooper
Start Date:	26 Mar-13 14:55	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	01 Apr-13 15:00	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 0h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	18-0428-6412	**Code:**	Pond 4A	**Client:**	Lehigh Permanente
Sample Date:	25 Mar-13 11:20	**Material:**	Effluent	**Project:**	20780
Receive Date:	25 Mar-13 15:30	**Source:**	Lehigh Permanente		
Sample Age:	28h (18.1 °C)	**Station:**	Pond 4A		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
03-9566-6978	Reproduction	<0	0		9.23%		Equal Variance t Two-Sample Test
00-6582-1463	Reproduction	<6.25	6.25	NA	15.0%	>16	Steel Many-One Rank Sum Test
08-1864-1887	Survival	0	>0		NA		Fisher Exact Test
15-4705-3793	Survival	12.5	25	17.68	NA	8	Fisher Exact/Bonferroni-Holm Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
07-5980-9536	Reproduction	IC5	1.21	0.679	4.25	82.54	Linear Interpolation (ICPIN)
		IC10	2.42	1.36	6.49	41.27	
		IC15	3.63	2.04	6.93	27.51	
		IC20	4.85	2.72	7.45	20.64	
		IC25	6.06	3.39	7.95	16.51	
		IC40	8.21	5.43	9.58	12.18	
		IC50	9.59	7.34	10.7	10.42	
15-0004-7354	Survival	EC5	11.4	4.75	15.5	8.749	Linear Regression (MLE)
		EC10	13.2	6.42	17.2	7.603	
		EC15	14.5	7.82	18.6	6.916	
		EC20	15.6	9.12	19.9	6.415	
		EC25	16.6	10.4	21.1	6.014	
		EC40	19.6	13.9	25.2	5.111	
		EC50	21.6	16.2	28.8	4.634	

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	10	10.3	9.47	11.1	7	14	0.7	2.21	21.5%	0.0%
0	Lab Water Contr	10	28.3	26.7	29.9	18	33	1.33	4.22	14.9%	-175.0%
6.25		10	21	18	24	4	29	2.57	8.12	38.7%	-104.0%
12.5		10	8.2	6.85	9.55	2	14	1.14	3.61	44.1%	20.4%
25		10	5	4.57	5.43	3	6	0.365	1.15	23.1%	51.5%
50		10	3.8	3.22	4.38	1	6	0.49	1.55	40.8%	63.1%
100		10	0.7	0.142	1.26	0	4	0.473	1.49	213.0%	93.2%

Survival Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	10	1	1	1	1	1	0	0	0.0%	0.0%
0	Lab Water Contr	10	1	1	1	1	1	0	0	0.0%	0.0%
6.25		10	1	1	1	1	1	0	0	0.0%	0.0%
12.5		10	0.9	0.782	1	0	1	0.1	0.316	35.1%	10.0%
25		10	0.4	0.207	0.593	0	1	0.163	0.516	129.0%	60.0%
50		10	0	0	0	0	0	0	0		100.0%
100		10	0	0	0	0	0	0	0		100.0%

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	10	12	7	9	12	11	14	11
0	Lab Water Contr	33	28	18	27	27	32	30	30	27	31
6.25		16	24	25	11	4	25	29	26	28	22
12.5		4	14	6	2	10	10	8	7	12	9
25		6	4	6	4	3	6	6	5	4	6
50		4	2	5	3	4	6	5	5	1	3
100		3	4	0	0	0	0	0	0	0	0

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	1	1	1	1	1	1	1	1
0	Lab Water Contr	1	1	1	1	1	1	1	1	1	1
6.25		1	1	1	1	1	1	1	1	1	1
12.5		0	1	1	1	1	1	1	1	1	1
25		0	0	1	1	0	0	1	0	0	1
50		0	0	0	0	0	0	0	0	0	0
100		0	0	0	0	0	0	0	0	0	0

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	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
0	Lab Water Contr	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		0/1	0/1	1/1	1/1	0/1	0/1	1/1	0/1	0/1	1/1
50		0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1
100		0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1

CETIS Analytical Report

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

Analysis ID:	15-4705-3793	**Endpoint:**	Survival	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:02	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU
Untransformed		C > T	NA	NA	12.5	25	17.68	8

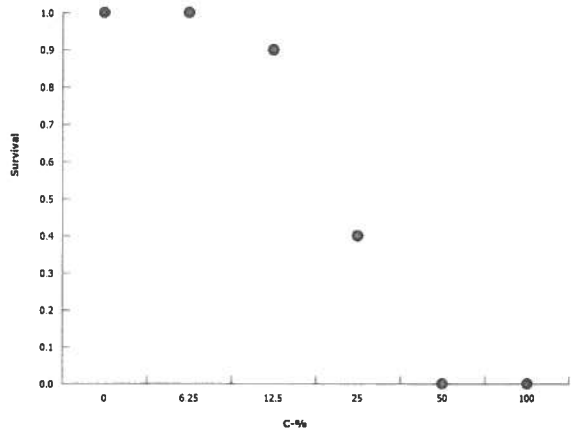
Fisher Exact/Bonferroni-Holm Test

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	0.5	1.0000	Exact	Non-Significant Effect
		25	0.00542	0.0163	Exact	Significant Effect
		50	5.41E-06	<0.0001	Exact	Significant Effect
		100	5.41E-06	<0.0001	Exact	Significant Effect

Data Summary

C-%	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Lab Water Cont	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		9	1	10	0.9	0.1	10.0%
25		4	6	10	0.4	0.6	60.0%
50		0	10	10	0	1	100.0%
100		0	10	10	0	1	100.0%

Graphics



 Analyst: _____ QA: _____

CETIS Analytical Report

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	15-0004-7354	**Endpoint:**	Survival	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:04	**Analysis:**	Linear Regression (MLE)	**Official Results:**	Yes

Linear Regression Options

Model Function	Threshold Option	Threshold	Optimized	Pooled	Het Corr	Weighted
Log-Normal [NED=A+B*log(X)]	Control Threshold	0.0000001	Yes	Yes	No	Yes

Regression Summary

Iters	LL	AICc	BIC	Mu	Sigma	Adj R2	F Stat	Critical	P-Value	Decision(α:5%)
42	-10.2	38.4	25.8	1.33	0.168	0.988				Lack of Fit Not Tested

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC5	11.4	4.75	15.5	8.749	6.467	21.04
EC10	13.2	6.42	17.2	7.603	5.807	15.58
EC15	14.5	7.82	18.6	6.916	5.374	12.78
EC20	15.6	9.12	19.9	6.415	5.031	10.97
EC25	16.6	10.4	21.1	6.014	4.736	9.66
EC40	19.6	13.9	25.2	5.111	3.962	7.194
EC50	21.6	16.2	28.8	4.634	3.472	6.175

Regression Parameters

Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(α:5%)
Threshold	5.59E-08	0.0000747	-0.000146	0.000147	0.000747	0.9995	Non-Significant Parameter
Slope	5.96	1.7	2.63	9.29	3.51	0.0393	Significant Parameter
Intercept	-7.95	2.29	-12.4	-3.47	-3.48	0.0402	Significant Parameter

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Model	46.34455	46.34455	1	432	0.0002	Significant
Residual	0.3221174	0.1073725	3			

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Goodness-of-Fit	Pearson Chi-Sq GOF	0.322	7.81	0.9558	Non-Significant Heterogenity
	Likelihood Ratio GOF	0.471	7.81	0.9253	Non-Significant Heterogenity
Distribution	Shapiro-Wilk W Normality	0.971	0.513	0.8998	Normal Distribution

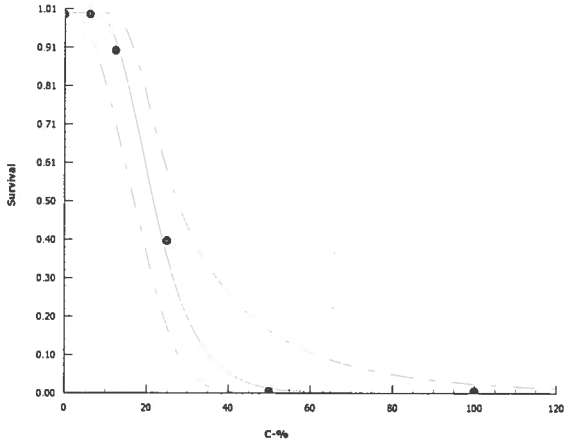
Survival Summary

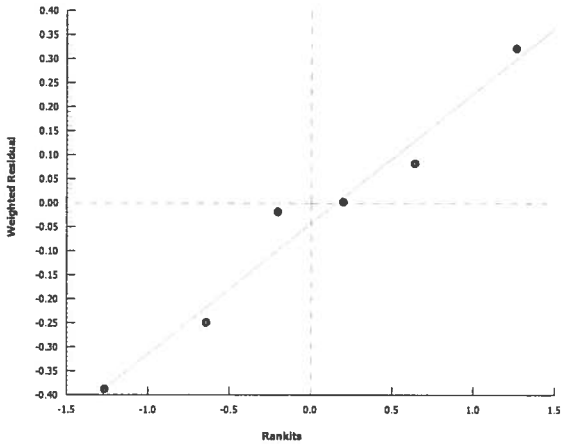
			Calculated Variate(A/B)								
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Lab Water Contro	10	1	1	1	0	0	0.0%	0.0%	10	10
6.25		10	1	1	1	0	0	0.0%	0.0%	10	10
12.5		10	0.9	0	1	0.1	0.316	35.1%	10.0%	9	10
25		10	0.4	0	1	0.163	0.516	129.0%	60.0%	4	10
50		10	0	0	0	0	0		100.0%	0	10
100		10	0	0	0	0	0		100.0%	0	10

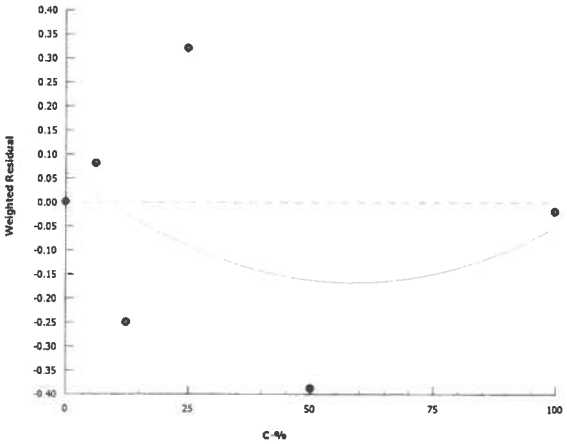
Ceriodaphnia Survival and Reproduction Test					Pacific EcoRisk
Analysis ID:	15-0004-7354	Endpoint:	Survival	CETIS Version:	CETISv1.8.5
Analyzed:	02 Apr-13 9:04	Analysis:	Linear Regression (MLE)	Official Results:	Yes

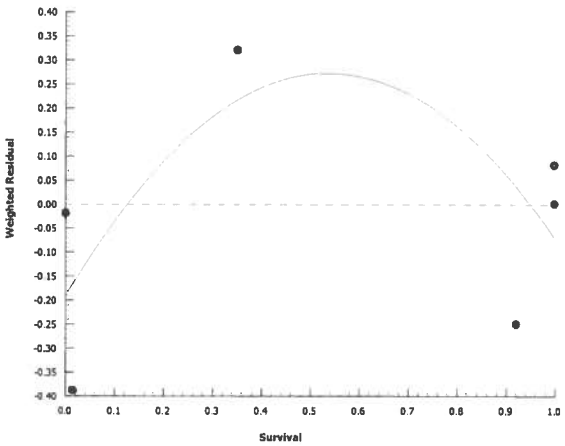
Graphics

Log-Normal [NED=A+B*log(X)]









Analyst: _____ QA: _____

CETIS Analytical Report

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

Analysis ID:	16-8310-8510	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 10:14	**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	17.9%	<6.25	6.25	NA	>16

Dunnett Multiple Comparison Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25*	2.87	2	5.08	18	0.0074	CDF	Significant Effect
		12.5*	7.91	2	5.08	18	<0.0001	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2070.467	1035.233	2	32.1	<0.0001	Significant Effect
Error	871.7	32.28519	27			
Total	2942.167		29			

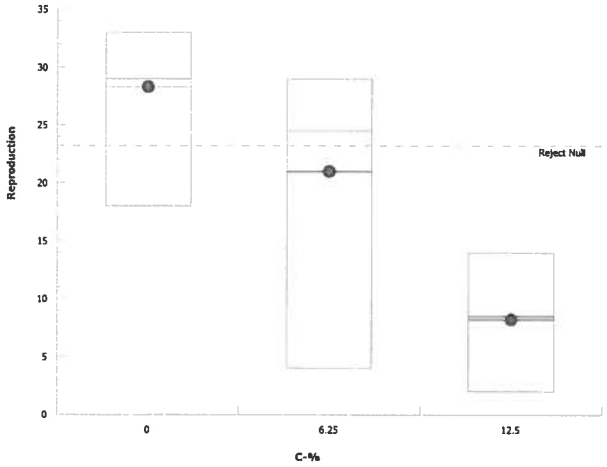
Distributional Tests

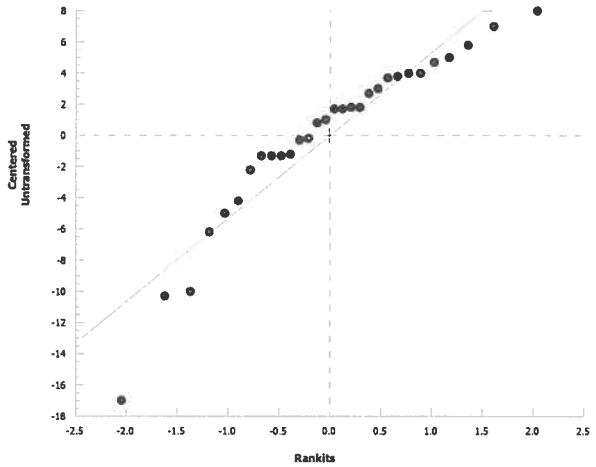
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	6.74	9.21	0.0344	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.904	0.903	0.0106	Normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	10	28.3	25.3	31.3	29	18	33	1.33	14.9%	0.0%
6.25		10	21	15.2	26.8	24.5	4	29	2.57	38.7%	25.8%
12.5		10	8.2	5.61	10.8	8.5	2	14	1.14	44.1%	71.0%

Graphics





CETIS Analytical Report

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

Analysis ID:	07-5980-9536	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:35	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1686003	200	Yes	Two-Point Interpolation

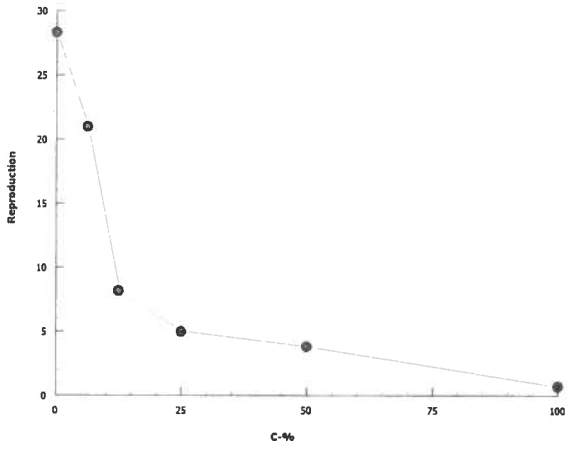
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	1.21	0.679	4.25	82.54	23.53	147.3
IC10	2.42	1.36	6.49	41.27	15.42	73.66
IC15	3.63	2.04	6.93	27.51	14.42	49.11
IC20	4.85	2.72	7.45	20.64	13.43	36.83
IC25	6.06	3.39	7.95	16.51	12.57	29.46
IC40	8.21	5.43	9.58	12.18	10.44	18.42
IC50	9.59	7.34	10.7	10.42	9.309	13.62

Reproduction Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contro	10	28.3	18	33	1.33	4.22	14.9%	0.0%
6.25		10	21	4	29	2.57	8.12	38.7%	25.8%
12.5		10	8.2	2	14	1.14	3.61	44.1%	71.0%
25		10	5	3	6	0.365	1.15	23.1%	82.3%
50		10	3.8	1	6	0.49	1.55	40.8%	86.6%
100		10	0.7	0	4	0.473	1.49	213.0%	97.5%

Graphics



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

Client: Lehigh Permanente | Material: Pond 4A | Test Date: 3/26/13

Project #: 20780 | Test ID: 51248 | Randomization: 10.6.13 | Control Water: Modified EPAMH

Lab Water Control

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J
0	7.96		8.9		346	25.6	0	0	0	0	0	0	0	0	0	0
1	8.02	8.02	8.4	7.8	342	25.9	0	0	0	0	0	0	0	0	0	0
2	7.96	7.93	7.6	7.1	335	25.9	0	0	0	0	0	0	0	0	0	0
3	8.06	7.99	8.1	8.6	357	25.7	0	0	0	0	0	5	0	0	0	5
4	7.93	7.97	7.8	7.6	332	25.7	6	5	6	4	3	0	5	4	4	0
5	8.08	8.11	8.7	7.5	339	25.7	12	10	12	11	10	10	10	11	10	12
6	8.06	8.06	8.4	7.7	346	25.8	15	13	0	12	14	17	15	15	13	14
7																
8																
						Total=	33	28	18	27	27	32	30	30	27	31

Mean Neonates/Female = 28.3

SIGN-OFF

- Date: 3/26/13 New WQ: V2 Test Init: A
  Sol'n Prep: A Time: 1455
- Date: 3/27/13 New WQ: [illegible] Counts: KB
  Sol'n Prep: A Old WQ: JLA Time: 1500
- Date: 3/28/13 New WQ: DG Counts: A
  Sol'n Prep: A Old WQ: [illegible] Time: 1500
- Date: 3.29.13 New WQ: RS Counts: A
  Sol'n Prep: A Old WQ: KB Time: 1330
- Date: 3.30.13 New WQ: DH Counts: A
  Sol'n Prep: A Old WQ: MO Time: 1540
- Date: 3.31.13 New WQ: [illegible] Counts: A
  Sol'n Prep: A Old WQ: RA Time: 1530
- Date: 4/1/13 New WQ: [illegible] Counts: [illegible]
  Sol'n Prep: AB Old WQ: AW Time: 1500
- Date: New WQ: Counts:
  Sol'n Prep: Old WQ: Time:
- Date: Old WQ: Counts:
  Time:

6.25%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J
0	7.88		9.0		428	0	0	0	0	0	0	0	0	0	0
1	7.98	7.92	8.2	8.0	420	0	0	0	0	0	0	0	0	0	0
2	7.91	7.85	7.9	7.6	415	0	0	0	0	0	0	0	0	0	0
3	8.02	8.04	7.9	8.4	407	0	0	0	0	0	0	0	0	0	4
4	7.43	7.98	7.8	7.8	314	6	5	5	4	4	3	5	5	5	0
5	7.95	8.05	8.7	7.7	425	10	10	11	7	0	9	11	11	10	8
6	8.01	8.07	8.3	7.6	420	0	9	9	0	0	13	13	10	13	10
7															
8															
					Total=	16	24	25	11	4	25	29	26	28	22

Mean Neonates/Female = 21.0

Sample ID

- 31333
- 31333
- 31377
- 31377
- 31431
- 31431
- 31431

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

Client: Lehigh Permanente Material: Pond 4A Test Date: 3/26/13

Project #: 20780 Test ID: 51248 Control Water: Modified EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
12.5%	0	7.82		8.9		504		0	0	0	0	0	0	0	0	0	0	
	1	7.87	7.94	8.8	8.0	486		0	0	0	0	0	0	0	0	0	0	
	2	7.90	7.84	8.1	7.8	493		0	0	0	0	0	0	0	0	0	0	
	3	8.02	8.09	7.9	8.3	500		0	0	0	0	0	0	0	0	0	0	
	4	7.92	8.04	8.1	8.0	490		4	3	6	2	5	5	4	4	5	6	
	5	7.93	8.08	8.8	7.8	503		0	11	0	0	0	0	4	3	7	3	
	6	7.97	8.13	8.3	7.6	496		X/0	0	0	0	5	5	0	0	0	0	
	7							-										
	8							-										
							Total=	X/4	14	6	2	10	10	8	7	12	9	Mean Neonates/Female = 8.2

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	
25%	0	7.88		8.8		634	0	0	0	0	0	0	0	0	0	0	
	1	7.94	7.98	8.6	7.8	623	0	0	0	0	0	0	0	0	0	0	
	2	7.92	7.82	8.0	7.8	627	0	0	0	0	0	0	0	0	0	0	
	3	8.09	8.16	7.9	8.3	629	0	0	0	0	0	0	0	0	0	5	
	4	7.97	8.12	8.1	7.6	619	6	4	6	4	X/3	X/4	6	X/5	4	0	
	5	7.93	8.11	8.9	7.7	634	0	X/0	0	0	-	-	0	-	0	1	
	6	7.97	8.21	8.6	7.7	630	X/0	-	0	0	-	-	0	-	X/0	0	
	7						-	-			-	-		-	-		
	8						-	-			-	-		-	-		
							Total=	X/6	X/4	6	4	X/3	X/6	6	X/5	X/4	6	Mean Neonates/Female = 5.0

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

Client: **Lehigh Permanente** Material: **Pond 4A** Test Date: 3/26/13

Project #: 20780 Test ID: 51248 Control Water: Modified EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
50%	0	7.95		8.9		891		0	0	0	0	0	0	0	0	0	0	
	1	7.98	7.99	8.6	7.4	876		0	0	0	0	0	0	0	0	0	0	
	2	7.98	7.81	8.3	7.5	872		0	0	0	0	0	0	0	0	0	0	
	3	8.16	8.17	7.9	8.3	873		0	0	0	0	0	0	0	0	0	3	
	4	7.98	8.18	8.3	7.6	856		4	2	X/5	X/3	X/4	X/4	X/5	X/5	X/1	0	
	5	7.93	8.03	9.2	7.7	870		X/0	0	-	-	-	-	-	-	-	0	
	6	7.94	8.13	8.6	7.8	869		-	X/0	-	-	-	-	-	-	-	X/0	
	7							-	-	-	-	-	-	-	-	-	-	
	8							-	-	-	-	-	-	-	-	-	-	
							Total=	X/4	X/2	X/5	X/3	X/4	X/4	X/5	X/5	X/1	X/3	Mean Neonates/Female = 3.8

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	
100%	0	7.90		9.1		1335	0	0	0	0	0	0	0	0	0	0	
	1	7.95	7.93	8.8	7.8	1321	0	0	0	0	0	0	0	0	0	0	
	2	8.09	7.77	8.0	7.7	1301	0	0	0	0	0	0	0	0	0	0	
	3	8.18	8.05	8.2	8.3	1314	0	0	0	0	0	0	0	0	0	0	
	4	7.98	8.06	8.7	7.6	1261	3	X/4	X/0	X/0	X/0	X/0	X/0	X/0	X/0	X/0	
	5	7.89	8.10	9.5	7.7	1298	X/0	-	-	-	-	-	-	-	-	-	
	6	7.92	-	9.0	-	1298	-	-	-	-	-	-	-	-	-	-	
	7						-	-	-	-	-	-	-	-	-	-	
	8						-	-	-	-	-	-	-	-	-	-	
							Total= X/3	X/4	X/0	X/0	X/0	X/0	X/0	X/0	X/0	X/0	Mean Neonates/Female = 0.7

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

Analysis ID:	08-1864-1887	**Endpoint:**	Survival	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:03	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

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

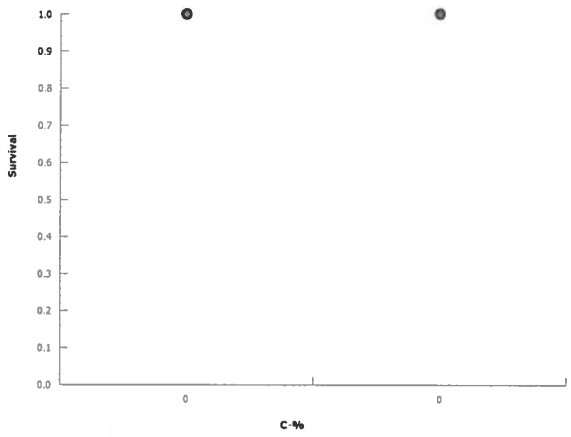
Fisher Exact Test

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

Data Summary

C-%	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Hardness Blank	10	0	10	1	0	0.0%
0	Lab Water Cont	10	0	10	1	0	0.0%

Graphics



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

Analysis ID:	03-9566-6978	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:35	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	9.23%	Fails reproduction

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	11.9	1.73	2.61	18	<0.0001	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1620	1620	1	143	<0.0001	Significant Effect
Error	204.2	11.34444	18			
Total	1824.2		19			

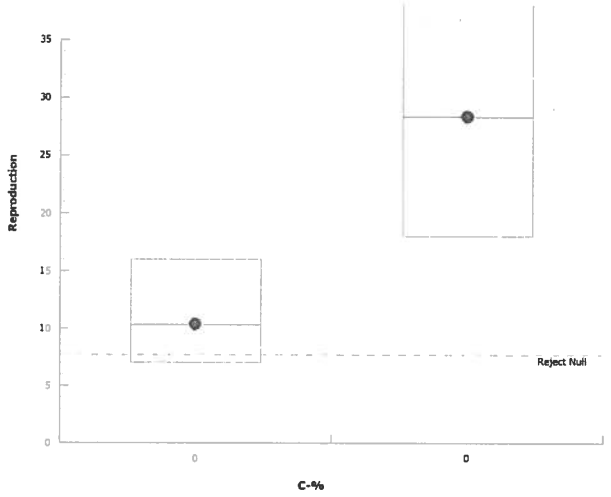
Distributional Tests

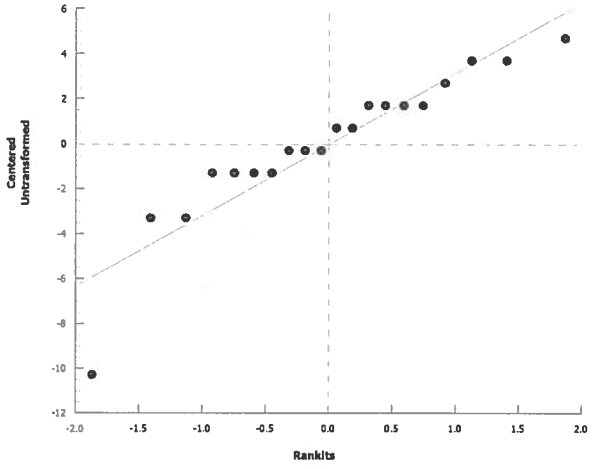
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	3.63	6.54	0.0683	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.877	0.866	0.0159	Normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	10	28.3	25.3	31.3	16	18	33	1.33	14.9%	0.0%
0	Hardness Blank	10	10.3	8.72	11.9	16	7	14	0.7	21.5%	63.6%

Graphics





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

Client: **Lehigh Permanente** Material: **Hardness Control** Test Date: 3/26/13

Project #: 20780 Test ID: 51248 Randomization: 10.2.1 Control Water: Modified EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
Hardness Control	0	8.63		8.9		2406	25.6	0	0	0	0	0	0	0	0	0	0	Date: 3/26/13 New WQ: Test Init.: Sol'n Prep: Old WQ: Time 1455
	1	8.67	8.55	8.8	7.6	2415	25.9	0	0	0	0	0	0	0	0	0	0	Date: 3/27/13 New WQ: Counts Sol'n Prep: Old WQ: Time 1550
	2	8.58	8.45	8.2	7.9	2447	25.9	0	0	0	0	0	0	0	0	0	0	Date: 3.28.13 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1500
	3	8.63	8.69	8.2	8.4	2445	25.7	0	0	0	4	2	0	0	0	0	2	Date: 3.29.13 New WQ: Counts Sol'n Prep: Old WQ: Time 1730
	4	8.61	8.63	8.2	7.8	2414	25.7	3	2	0	0	0	0	3	2	1	0	Date: 3.30.13 New WQ: Counts Sol'n Prep: Old WQ: Time 1500
	5	8.59	8.65	9.2	7.8	2484	25.7	2	2	4	2	0	4	0	3	4	0	Date: 3.31.13 New WQ: Counts Sol'n Prep: Old WQ: Time
	6	8.62	8.69	9.3	7.7	2476	25.8	5	3	6	6	5	5	9	6	7	9	Date: 4/1/13 New WQ: Counts Sol'n Prep: Old WQ: Time 1500
	7																	Date: New WQ: Counts Sol'n Prep: Old WQ: Time
	8																	Date: New WQ: Counts Sol'n Prep: Old WQ: Time
							Total=	10	7	10	12	7	9	12	11	14	11	Mean Neonates/Female = 10.3

Sample ID #31337

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

Client: **Lehigh Permanente** Material: **Meter IDs** Test Date: 3/26/13

Project #: 20780 Test ID: 51248 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	pH 16		RD04		EC07	30A	3/26/13	N/L	-
	1	PH 15	PH19	RD07	RD07	EC04	30A	3/27/13	FOUB	JLA
	2	pH 16	pH19	RD07	RD07	EC04	30A	3-28-13	DS	NL
	3	pH 15	pH15	RD07	RD07	EC07	30A	3-29-13	RS	XB
	4	PH15	pH15	RD06	RD06	EC07	30A	3.30.13	PH	MO
	5	PH19	pH16	RD04	RD07	EC06	30A	3/31/13	FOB	RA
	6	PH 15	pH16	EC06	RD07	EC06	30A	4/1/13	[illegible]	SVV
	7									
	8									

Appendix G

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

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

Batch ID:	09-5724-0239	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Melinda Hooper
Start Date:	26 Mar-13 15:10	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	01 Apr-13 16:00	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 1h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	02-4681-0229	**Code:**	Pond 9	**Client:**	Lehigh Permanente
Sample Date:	25 Mar-13 12:20	**Material:**	Effluent	**Project:**	20780
Receive Date:	25 Mar-13 15:30	**Source:**	Lehigh Permanente		
Sample Age:	27h (13 °C)	**Station:**	Pond 9		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
16-9979-7834	Reproduction	<0	0		5.9%		Equal Variance t Two-Sample Test
14-5275-7722	Reproduction	100	>100	NA	11.1%	1	Dunnett Multiple Comparison Test
11-9776-1723	Survival	0	>0		NA		Fisher Exact Test
10-4266-2855	Survival	100	>100	NA	NA	1	Fisher Exact/Bonferroni-Holm Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
08-7165-8890	Reproduction	IC5	66.7	62.3	73.9	1.499	Linear Interpolation (ICPIN)
		IC10	83.4	75.6	97.9	1.199	
		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	

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	10	10.3	9.47	11.1	7	14	0.7	2.21	21.5%	0.0%
0	Lab Water Contr	10	28.9	28.1	29.7	25	33	0.69	2.18	7.55%	-181.0%
6.25		10	32	30.9	33.1	28	37	0.943	2.98	9.32%	-211.0%
12.5		10	32.8	31.5	34.1	25	36	1.11	3.52	10.7%	-218.0%
25		10	33.5	31.8	35.2	24	42	1.46	4.62	13.8%	-225.0%
50		10	33.3	32.4	34.2	31	38	0.803	2.54	7.63%	-223.0%
100		10	27.3	26.5	28.1	25	31	0.684	2.16	7.92%	-165.0%

Survival Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	10	1	1	1	1	1	0	0	0.0%	0.0%
0	Lab Water Contr	10	1	1	1	1	1	0	0	0.0%	0.0%
6.25		10	1	1	1	1	1	0	0	0.0%	0.0%
12.5		10	1	1	1	1	1	0	0	0.0%	0.0%
25		10	1	1	1	1	1	0	0	0.0%	0.0%
50		10	1	1	1	1	1	0	0	0.0%	0.0%
100		10	1	1	1	1	1	0	0	0.0%	0.0%

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	10	12	7	9	12	11	14	11
0	Lab Water Contr	29	29	33	27	30	25	30	29	27	30
6.25		34	30	30	32	33	37	36	31	29	28
12.5		35	31	34	36	34	36	33	29	35	25
25		33	32	24	34	42	36	37	31	32	34
50		31	31	35	36	35	33	38	32	31	31
100		25	26	25	25	29	31	29	26	29	28

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	1	1	1	1	1	1	1	1
0	Lab Water Contr	1	1	1	1	1	1	1	1	1	1
6.25		1	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	1	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	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
0	Lab Water Contr	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

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

Analysis ID:	10-4266-2855	**Endpoint:**	Survival	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:17	**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

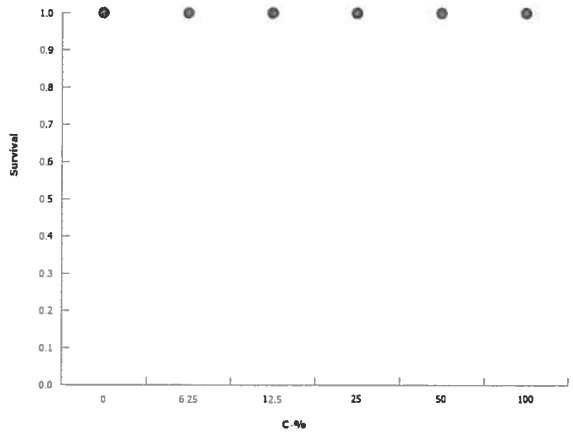
Fisher Exact/Bonferroni-Holm Test

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	1	1.0000	Exact	Non-Significant Effect

Data Summary

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

Graphics



CETIS Analytical Report

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

Analysis ID:	14-5275-7722	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:37	**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	11.1%	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	-2.22	2.29	3.2	18	0.9998	CDF	Non-Significant Effect
		12.5	-2.79	2.29	3.2	18	1.0000	CDF	Non-Significant Effect
		25	-3.29	2.29	3.2	18	1.0000	CDF	Non-Significant Effect
		50	-3.15	2.29	3.2	18	1.0000	CDF	Non-Significant Effect
		100	1.15	2.29	3.2	18	0.3528	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	333.4	66.68	5	6.83	<0.0001	Significant Effect
Error	527.2	9.762963	54			
Total	860.6		59			

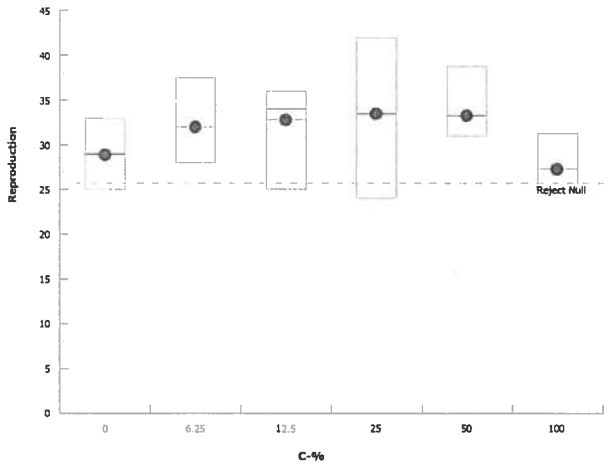
Distributional Tests

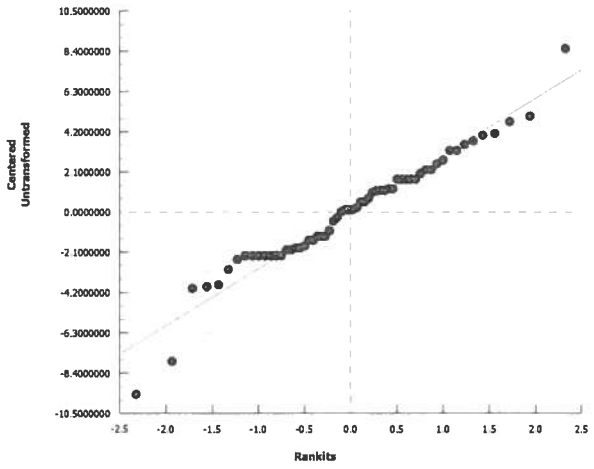
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	8.08	15.1	0.1518	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.965	0.946	0.0808	Normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	10	28.9	27.3	30.5	29	25	33	0.69	7.55%	0.0%
6.25		10	32	29.9	34.1	31.5	28	37	0.943	9.32%	-10.7%
12.5		10	32.8	30.3	35.3	34	25	36	1.11	10.7%	-13.5%
25		10	33.5	30.2	36.8	33.5	24	42	1.46	13.8%	-15.9%
50		10	33.3	31.5	35.1	32.5	31	38	0.803	7.63%	-15.2%
100		10	27.3	25.8	28.8	27	25	31	0.684	7.92%	5.54%

Graphics





CETIS Analytical Report

Ceriodaphnia Survival and Reproduction Test					Pacific EcoRisk
Analysis ID:	08-7165-8890	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:37	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1723441	200	Yes	Two-Point Interpolation

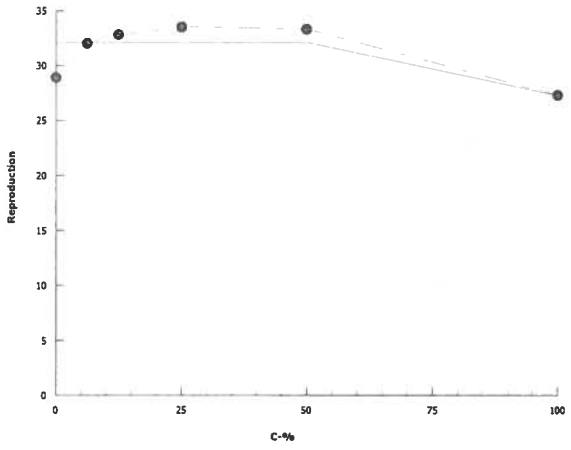
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	66.7	62.3	73.9	1.499	1.352	1.606
IC10	83.4	75.6	97.9	1.199	1.022	1.323
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

Reproduction Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contro	10	28.9	25	33	0.69	2.18	7.55%	0.0%
6.25		10	32	28	37	0.943	2.98	9.32%	-10.7%
12.5		10	32.8	25	36	1.11	3.52	10.7%	-13.5%
25		10	33.5	24	42	1.46	4.62	13.8%	-15.9%
50		10	33.3	31	38	0.803	2.54	7.63%	-15.2%
100		10	27.3	25	31	0.684	2.16	7.92%	5.54%

Graphics



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

Client: **Lehigh Permanente** Material: **Pond 9** Test Date: 3/26/13

Project #: 20780 Test ID: 51249 Randomization: 10.7.3 Control Water: Modified EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
Lab Water Control	0	7.94		8.6		347	25.6	0	0	0	0	0	0	0	0	0	0	Date: 3/26/13 New WQ: Test Init: Sol'n Prep: N/2 Time: 1510
	1	7.96 FOUB	8.05	8.3 FOUB	7.3	335 FOUB	25.9	0	0	0	0	0	0	0	0	0	0	Date: 3.27.13 New WQ: FOUB Counts: Sol'n Prep: Old WQ: JLA Time: 1440
	2	7.92 7.93	8.06	8.3 8.4	7.7	341 340	25.9	0	0	0	0	0	0	0	0	0	0	Date: 3.28.13 New WQ: DS Counts: Sol'n Prep: Old WQ: N/2 Time: 1515
	3	7.88	7.89	8.4	8.1	OH 354 351	25.7	0	0	0	0	0	0	0	0	0	0	Date: 3.29.13 New WQ: OH Counts: Sol'n Prep: Old WQ: DS Time: 1515
	4	7.88	7.86	7.9	8.1	343	25.7	6	6	5	4	4	4	4	5	5	5	Date: 3.30.13 New WQ: OH Counts: Sol'n Prep: Old WQ: DS Time: 1600
	5	7.96	8.18	8.8	7.3	348	25.7	11	10	12	9	10	9	10	9	10	9	Date: 3.31.13 New WQ: FOUB Counts: Sol'n Prep: Old WQ: RA Time: 1615
	6	8.16	8.07	8.6	7.7	347	25.8	12	13	14	14	16	12	16	15	12	16	Date: 4/1/13 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: Time:
							Total=	29	29	33	27	30	25	30	29	27	30	Mean Neonates/Female = 28.9

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	Sample ID
6.25%	0	7.86		8.7		428	0	0	0	0	0	0	0	0	0	0	31334
	1	7.92	7.99	8.3	7.6	418	0	0	0	0	0	0	0	0	0	0	31334
	2	7.91	8.07	8.0	6.8	419	0	0	0	0	0	0	0	0	0	0	31378
	3	7.89	8.02	8.3	8.2	427	0	0	0	0	0	0	0	0	0	0	31378
	4	7.87	7.93	8.0	8.2	428	5	6	6	6	4	6	6	4	4	5	31432
	5	7.92	8.08	8.8	7.5	423	11	10	9	10	12	12	13	11	11	10	31432
	6	8.07	8.05	8.3	7.8	429	18	15	16	16	17	19	17	16	14	13	31432
	7																
	8																
							Total=	34	30	30	32	33	37	36	31	29	28	Mean Neonates/Female = 32.0

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

Client: **Lehigh Permanente** Material: **Pond 9** Test Date: 3/26/13

Project #: 20780 Test ID: 51249 Control Water: Modified EPAMH

12.5%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
0	7.80		8.9		510		0	0	0	0	0	0	0	0	0	0	
1	7.88	7.99	8.2	7.6	493		0	0	0	0	0	0	0	0	0	0	
2	7.90	8.09	7.9	7.3	499		0	0	0	0	0	0	0	0	0	0	
3	7.84	8.11	8.2	8.4	507		0	0	0	0	0	5	6	0	0	0	
4	7.83	8.01	8.2	8.2	512		5	6	5	6	5	0	0	4	6	5	
5	7.88	8.07	8.9	7.5	505		13	12	11	13	11	13	10	11	13	10	
6	8.02	8.06	8.3	7.8	510		17	13	18	17	18	18	17	14	16	10	
7																	
8																	
						Total=	35	31	34	36	34	36	33	29	35	25	Mean Neonates/Female = 32.8

25%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)		Survival / Reproduction A	B	C	D	E	F	G	H	I	J	
0	7.75		8.9		649		0	0	0	0	0	0	0	0	0	0	
1	7.85	8.01	8.3	7.4	625		0	0	0	0	0	0	0	0	0	0	
2	7.90	8.13	8.3	7.2	646		0	0	0	0	0	0	0	0	0	0	
3	7.88	8.14	8.3	8.4	652		0	0	0	0	0	0	6	0	0	4	
4	7.82	8.07	8.2	8.3	663		6	5	6	7	7	7	0	5	5	0	
5	7.81	8.17	8.9	7.7	668		12	13	14	12	14	11	13	10	12	14	
6	7.93	8.22	8.4	7.5	666		15	14	4	15	21	18	18	16	15	16	
7																	
8																	
						Total=	33	32	24	34	42	36	37	31	32	34	Mean Neonates/Female = 33.5

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

Client: **Lehigh Permanente** Material: **Pond 9** Test Date: 3/26/13

Project #: 20780 Test ID: 51249 Control Water: Modified EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
50%	0	7.67		9.1		915		0	0	0	0	0	0	0	0	0	0	
	1	7.78	7.99	8.5	7.2	899		0	0	0	0	0	0	0	0	0	0	
	2	7.95	8.22	8.1	7.1	916		0	0	0	0	0	0	0	0	0	0	
	3	7.87	8.29	8.6	8.4	925		0	0	0	0	6	0	0	0	0	4	
	4	7.77	8.24	8.3	8.2	945		6	6	7	7	0	6	7	5	6	0	
	5	7.75	8.23	9.0	7.7	955		12	9	12	12	12	11	13	12	11	10	
	6	7.82	8.26	8.5	7.8	943		13	16	16	17	17	16	18	15	14	17	
	7																	
	8																	
							Total=	31	31	35	36	35	33	38	32	31	31	Mean Neonates/Female = 33.3

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)		Survival / Reproduction A	B	C	D	E	F	G	H	I	J	
100%	0	7.55		9.3		1409		0	0	0	0	0	0	0	0	0	0	
	1	7.68	8.06	8.9	7.0	1384		0	0	0	0	0	0	0	0	0	0	
	2	7.91	8.13	8.2	7.4	1413		0	0	0	0	0	0	0	0	0	0	
	3	7.89	8.17	8.9	8.3	1423		0	0	0	0	4	5	4	4	0	4	
	4	7.72	8.21	9.0	8.2	1441		4	5	5	4	0	0	0	0	6	0	
	5	7.69	8.15	9.8	7.7	1444		10	12	11	16	10	12	10	10	9	11	
	6	7.70	8.16	9.1	7.9	1446		11	9	9	11	15	14	15	12	14	13	
	7																	
	8																	
							Total=	25	26	25	25	29	31	29	26	29	28	Mean Neonates/Female = 27.3

CETIS Analytical Report

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

Analysis ID:	11-9776-1723	**Endpoint:**	Survival	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:45	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

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

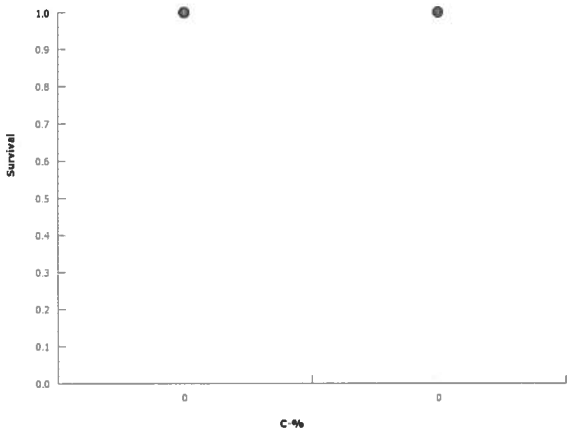
Fisher Exact Test

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

Data Summary

C-%	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Hardness Blank	10	0	10	1	0	0.0%
0	Lab Water Cont	10	0	10	1	0	0.0%

Graphics



CETIS Analytical Report

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

Analysis ID:	16-9979-7834	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:45	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	5.9%	Fails reproduction

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	18.9	1.73	1.7	18	<0.0001	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1729.8	1729.8	1	358	<0.0001	Significant Effect
Error	87	4.833333	18			
Total	1816.8		19			

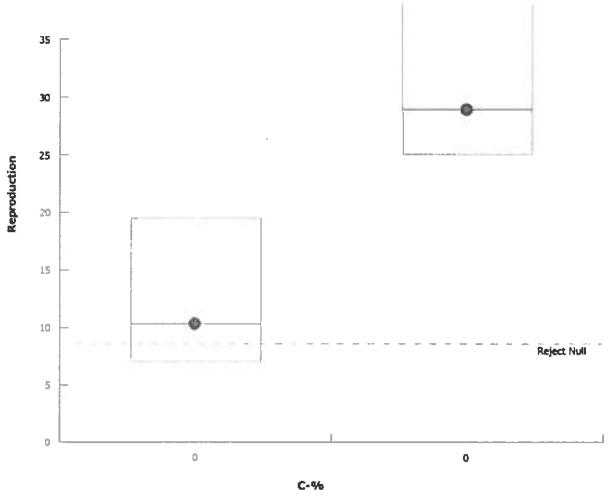
Distributional Tests

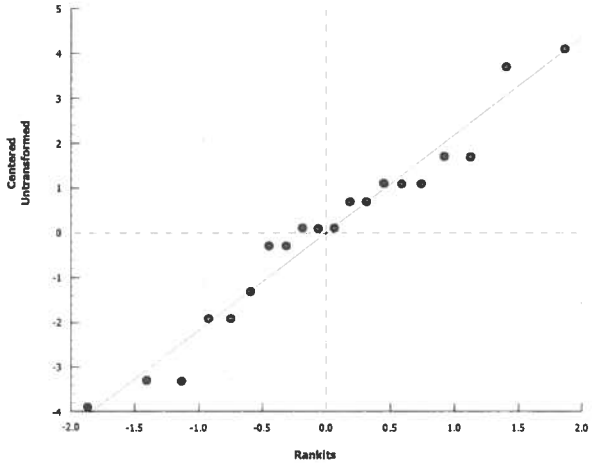
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	1.03	6.54	0.9679	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.959	0.866	0.5177	Normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Hardness Blank	10	10.3	8.72	11.9	19.5	7	14	0.7	21.5%	0.0%
0	Lab Water Contr	10	28.9	27.3	30.5	19.5	25	33	0.69	7.55%	-181.0%

Graphics





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

Client: **Lehigh Permanente** Material: **Hardness Control** Test Date: 3/26/13

Project #: 20780 Test ID: 51248 Randomization: 10.2.1 Control Water: Modified EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
Hardness Control	0	8.63		8.9		2406	25.6	0	0	0	0	0	0	0	0	0	0	Date: 3/26/13 New WQ: Test Init: Sol'n Prep: VL Time: 1455
	1	8.67	8.55	8.8	7.6	2415	25.9	0	0	0	0	0	0	0	0	0	0	Date: 3/27/13 New WQ: FOUR Counts: KB Sol'n Prep: Old WQ: JLA Time: 1550
	2	8.58	8.45	8.2	7.9	2447	25.9	0	0	0	0	0	0	0	0	0	0	Date: 3.28.13 New WQ: DS Counts: Sol'n Prep: Old WQ: MM Time: 1500
	3	8.63	8.69	8.2	8.4	2445	25.7	0	0	0	4	2	0	0	0	0	2	Date: 3.29.13 New WQ: RS Counts: Sol'n Prep: Old WQ: KB Time: 1730
	4	8.61	8.63	8.2	7.8	2414	25.7	3	2	0	0	0	0	3	2	1	0	Date: 3.30.13 New WQ: DH Counts: Sol'n Prep: Old WQ: LMO Time: 1500
	5	8.59	8.65	9.2	7.8	2484	25.7	2	2	4	2	0	4	0	3	4	0	Date: 3.31.13 New WQ: FOUR Counts: Sol'n Prep: Old WQ: RA Time: 1500
	6	8.62	8.69	9.3	7.7	2476	25.8	5	3	6	6	5	5	9	6	7	9	Date: 4/1/13 New WQ: Counts: Sol'n Prep: Old WQ: SW Time: 1500
	7																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
	8																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
							Total=	10	7	10	12	7	9	12	11	14	11	Mean Neonates/Female = 10.3

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

Client: **Lehigh Permanente** Material: **Meter IDs** Test Date: 3/26/13

Project #: 20780 Test ID: 51249 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		RD04		EC07	30A	3/26/13	9/2	-
	1	PH15	PH19	RD07	RD07	EC04	30A	3/27/13	FDB	JLA
	2	pH16	PH16	RD07	RD07	EC04	30A	3-28-13	DS	9/2
	3	PH19	pH19	RD04	RD04	EC08	30A	3.29.13	DH	DS
	4	PH15	pH16	RD06	RD07	EC07	30A	3.30.13	DH	DS
	5	PH19	PH16	RD04	RD07	EC06	30A	3.31.13	FDB	QA
	6	PH15	pH19	RD06	RD04	EC06	30A	4/1/13	EC	KAB
	7									
	8									

Appendix H

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

CETIS Summary Report

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

Batch ID:	10-2188-0206	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Melinda Hooper
Start Date:	26 Mar-13 15:35	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	01 Apr-13 16:45	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 1h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	17-8739-9790	**Code:**	Pond 13	**Client:**	Lehigh Permanente
Sample Date:	25 Mar-13 11:57	**Material:**	Effluent	**Project:**	20780
Receive Date:	25 Mar-13 15:30	**Source:**	Lehigh Permanente		
Sample Age:	28h (9 °C)	**Station:**	Pond 13		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
13-8440-1556	Reproduction	<0	0		10.6%		Equal Variance t Two-Sample Test
11-0244-2636	Reproduction	<6.25	6.25	NA	19.6%	>16	Steel Many-One Rank Sum Test
01-8265-2002	Survival	0	>0		NA		Fisher Exact Test
11-0927-4319	Survival	12.5	25	17.68	NA	8	Fisher Exact/Bonferroni-Holm Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
21-2010-7883	Reproduction	IC5	0.734	0.515	1.37	136.3	Linear Interpolation (ICPIN)
		IC10	1.47	1.03	2.74	68.14	
		IC15	2.2	1.54	4.11	45.42	
		IC20	2.94	2.06	5.48	34.07	
		IC25	3.67	2.57	6.53	27.25	
		IC40	5.87	4.12	8.42	17.03	
		IC50	7.75	5.15	9.72	12.9	
02-3705-1402	Survival	EC5	2.89	0.431	5.64	34.63	Linear Regression (MLE)
		EC10	4	0.827	7.13	24.99	
		EC15	4.99	1.28	8.39	20.05	
		EC20	5.94	1.8	9.59	16.83	
		EC25	6.9	2.4	10.8	14.48	
		EC40	10.1	4.82	15	9.92	
		EC50	12.7	7.09	18.9	7.901	

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	10	10.3	9.47	11.1	7	14	0.7	2.21	21.5%	0.0%
0	Lab Water Contr	10	26.3	24.6	28	16	32	1.45	4.57	17.4%	-155.0%
6.25		10	15.1	11.9	18.3	4	29	2.73	8.65	57.3%	-46.6%
12.5		10	7	6.27	7.73	5	10	0.615	1.94	27.8%	32.0%
25		10	5.1	4.69	5.51	4	7	0.348	1.1	21.6%	50.5%
50		10	3.6	2.83	4.37	0	5	0.653	2.07	57.4%	65.0%
100		10	0.9	0.279	1.52	0	4	0.526	1.66	185.0%	91.3%

Survival Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	10	1	1	1	1	1	0	0	0.0%	0.0%
0	Lab Water Contr	10	1	1	1	1	1	0	0	0.0%	0.0%
6.25		10	0.7	0.52	0.88	0	1	0.153	0.483	69.0%	30.0%
12.5		10	0.7	0.52	0.88	0	1	0.153	0.483	69.0%	30.0%
25		10	0.1	0	0.218	0	1	0.1	0.316	316.0%	90.0%
50		10	0.1	0	0.218	0	1	0.1	0.316	316.0%	90.0%
100		10	0	0	0	0	0	0	0		100.0%

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	10	12	7	9	12	11	14	11
0	Lab Water Contr	16	24	23	27	27	28	26	31	29	32
6.25		29	16	13	10	7	5	4	22	23	22
12.5		5	10	8	5	6	7	5	8	10	6
25		5	6	6	7	4	4	6	4	5	4
50		0	5	5	3	3	0	5	5	5	5
100		0	0	0	4	0	0	0	4	1	0

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	1	1	1	1	1	1	1	1
0	Lab Water Contr	1	1	1	1	1	1	1	1	1	1
6.25		1	1	1	0	0	1	0	1	1	1
12.5		1	1	1	1	0	0	0	1	1	1
25		0	0	0	0	0	0	0	0	0	1
50		0	0	0	0	0	0	0	0	1	0
100		0	0	0	0	0	0	0	0	0	0

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	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
0	Lab Water Contr	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	0/1	0/1	1/1	0/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	0/1	0/1	0/1	1/1	1/1	1/1
25		0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	1/1
50		0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	1/1	0/1
100		0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1

CETIS Analytical Report

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

Analysis ID:	11-0927-4319	**Endpoint:**	Survival	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:31	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU
Untransformed		C > T	NA	NA	12.5	25	17.68	8

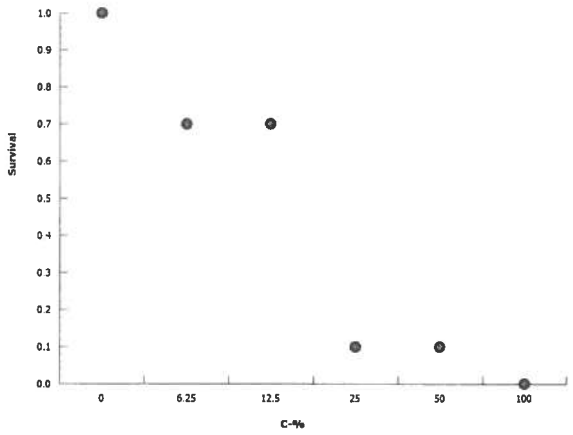
Fisher Exact/Bonferroni-Holm Test

Control	vs	C-%	Test Stat	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	0.105	0.2105	Exact	Non-Significant Effect
		12.5	0.105	0.2105	Exact	Non-Significant Effect
		25	0.0000595	0.0002	Exact	Significant Effect
		50	0.0000595	0.0002	Exact	Significant Effect
		100	5.41E-06	<0.0001	Exact	Significant Effect

Data Summary

C-%	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Lab Water Cont	10	0	10	1	0	0.0%
6.25		7	3	10	0.7	0.3	30.0%
12.5		7	3	10	0.7	0.3	30.0%
25		1	9	10	0.1	0.9	90.0%
50		1	9	10	0.1	0.9	90.0%
100		0	10	10	0	1	100.0%

Graphics



CETIS Analytical Report

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

Analysis ID:	02-3705-1402	**Endpoint:**	Survival	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:31	**Analysis:**	Linear Regression (MLE)	**Official Results:**	Yes

Linear Regression Options

Model Function	Threshold Option	Threshold	Optimized	Pooled	Het Corr	Weighted
Log-Normal [NED=A+B*log(X)]	Control Threshold	0.0000001	Yes	Yes	No	Yes

Regression Summary

Iters	LL	AICc	BIC	Mu	Sigma	Adj R2	F Stat	Critical	P-Value	Decision(α:5%)
6	-20.4	58.9	46.2	1.1	0.39	0.852				Lack of Fit Not Tested

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC5	2.89	0.431	5.64	34.63	17.72	232.1
EC10	4	0.827	7.13	24.99	14.02	120.9
EC15	4.99	1.28	8.39	20.05	11.92	78.27
EC20	5.94	1.8	9.59	16.83	10.43	55.62
EC25	6.9	2.4	10.8	14.48	9.266	41.67
EC40	10.1	4.82	15	9.92	6.673	20.73
EC50	12.7	7.09	18.9	7.901	5.286	14.11

Regression Parameters

Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(α:5%)
Threshold	1.14E-07	0.000107	-0.00021	0.00021	0.00107	0.9992	Non-Significant Parameter
Slope	2.56	0.67	1.25	3.88	3.82	0.0315	Significant Parameter
Intercept	-2.83	0.842	-4.48	-1.17	-3.36	0.0439	Significant Parameter

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Model	32.41068	32.41068	1	30.8	0.0115	Significant
Residual	3.154932	1.051644	3			

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Goodness-of-Fit	Pearson Chi-Sq GOF	3.15	7.81	0.3683	Non-Significant Heterogenity
	Likelihood Ratio GOF	3.41	7.81	0.3320	Non-Significant Heterogenity
Distribution	Shapiro-Wilk W Normality	0.964	0.513	0.8466	Normal Distribution

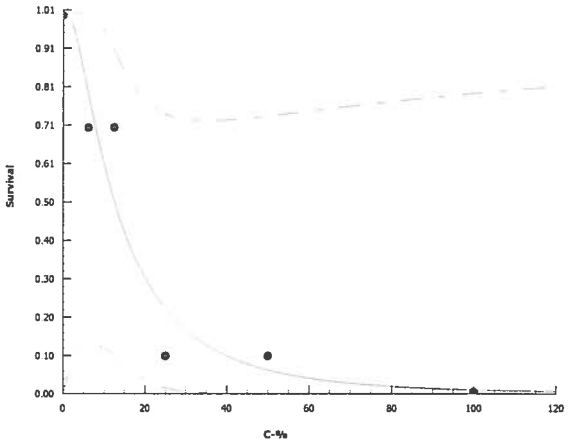
Survival Summary

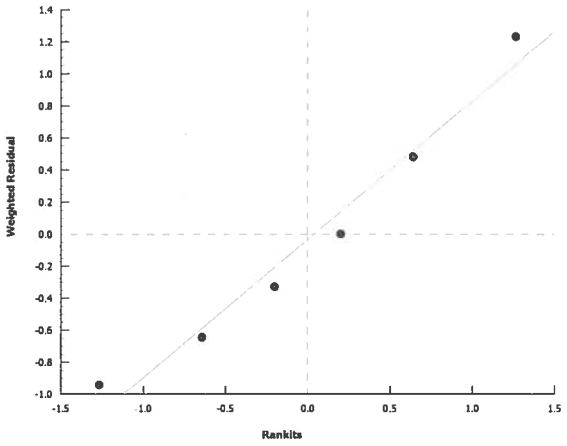
			Calculated Variate(A/B)								
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Lab Water Contro	10	1	1	1	0	0	0.0%	0.0%	10	10
6.25		10	0.7	0	1	0.153	0.483	69.0%	30.0%	7	10
12.5		10	0.7	0	1	0.153	0.483	69.0%	30.0%	7	10
25		10	0.1	0	1	0.1	0.316	316.0%	90.0%	1	10
50		10	0.1	0	1	0.1	0.316	316.0%	90.0%	1	10
100		10	0	0	0	0	0		100.0%	0	10

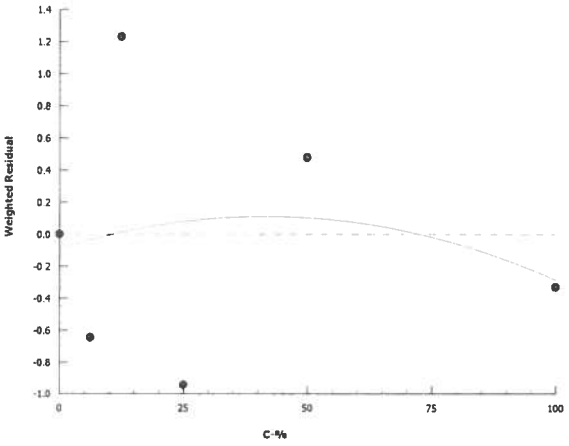
Analyst: [signature] QA: TB

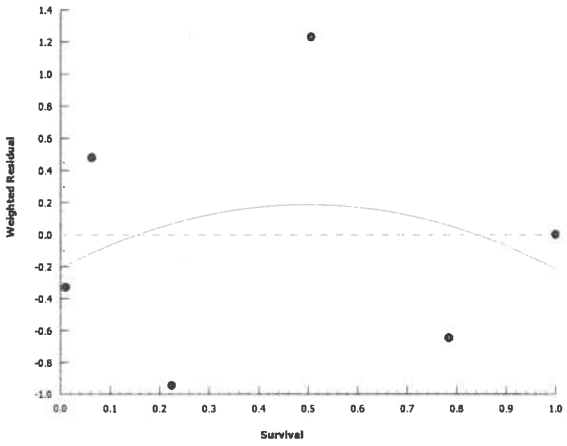
Ceriodaphnia Survival and Reproduction Test					Pacific EcoRisk
Analysis ID:	02-3705-1402	Endpoint:	Survival	CETIS Version:	CETISv1.8.5
Analyzed:	02 Apr-13 9:31	Analysis:	Linear Regression (MLE)	Official Results:	Yes

Graphics Log-Normal [NED=A+B*log(X)]









CETIS Analytical Report

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

Analysis ID:	11-0244-2636	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 10:35	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	19.6%	<6.25	6.25	NA	>16

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*	66.5	79	3	18	0.0035	Asymp	Significant Effect
		12.5*	55	79	0	18	0.0002	Asymp	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1878.467	939.2333	2	28.3	<0.0001	Significant Effect
Error	895	33.14815	27			
Total	2773.467		29			

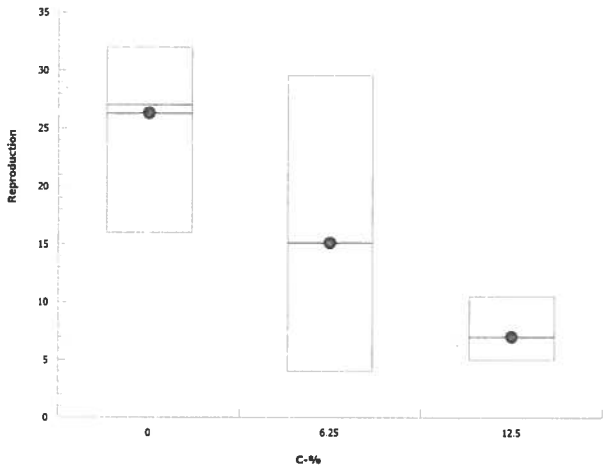
Distributional Tests

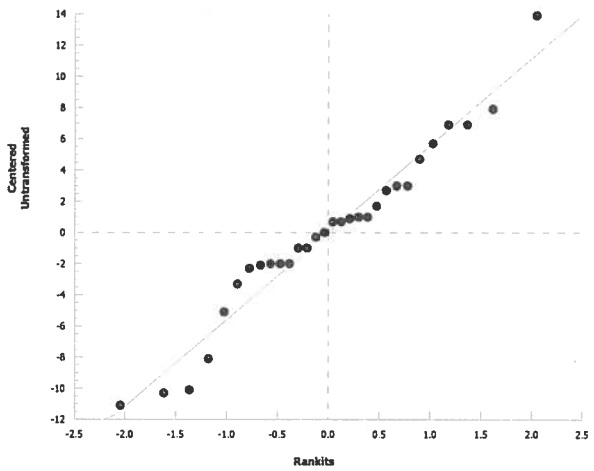
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	15.6	9.21	0.0004	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.963	0.903	0.3705	Normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	10	26.3	23	29.6	27	16	32	1.45	17.4%	0.0%
6.25		10	15.1	8.91	21.3	14.5	4	29	2.73	57.3%	42.6%
12.5		10	7	5.61	8.39	6.5	5	10	0.615	27.8%	73.4%

Graphics





CETIS Analytical Report

Ceriodaphnia Survival and Reproduction Test					Pacific EcoRisk
Analysis ID:	21-2010-7883	Endpoint:	Reproduction	CETIS Version:	CETISv1.8.5
Analyzed:	02 Apr-13 9:33	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1965381	200	Yes	Two-Point Interpolation

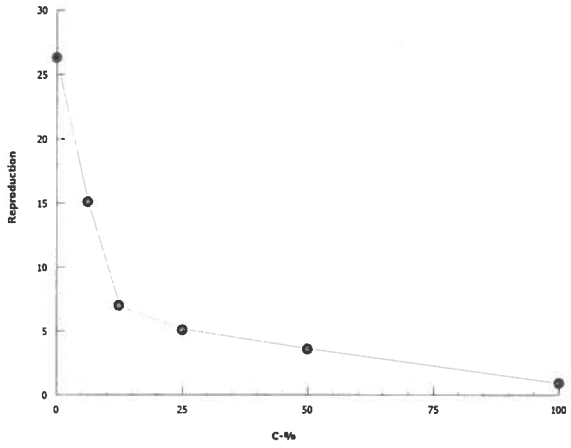
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	0.734	0.515	1.37	136.3	72.96	194.2
IC10	1.47	1.03	2.74	68.14	36.48	97.1
IC15	2.2	1.54	4.11	45.42	24.32	64.73
IC20	2.94	2.06	5.48	34.07	18.24	48.55
IC25	3.67	2.57	6.53	27.25	15.33	38.84
IC40	5.87	4.12	8.42	17.03	11.88	24.27
IC50	7.75	5.15	9.72	12.9	10.29	19.42

Reproduction Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contro	10	26.3	16	32	1.45	4.57	17.4%	0.0%
6.25		10	15.1	4	29	2.73	8.65	57.3%	42.6%
12.5		10	7	5	10	0.615	1.94	27.8%	73.4%
25		10	5.1	4	7	0.348	1.1	21.6%	80.6%
50		10	3.6	0	5	0.653	2.07	57.4%	86.3%
100		10	0.9	0	4	0.526	1.66	185.0%	96.6%

Graphics



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

Client: **Lehigh Permanente** Material: **Pond 13** Test Date: 3/26/13

Project #: 20780 Test ID: 51250 Randomization: 10.7.2 Control Water: Modified EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
Lab Water Control	0	7.95		8.7		343	25.6	0	0	0	0	0	0	0	0	0	0	Date: 3/26/13 New WQ: Test Init: Sol'n Prep: VL Time: 1535
	1	7.81	8.05	8.6	8.0	336	25.9	0	0	0	0	0	0	0	0	0	0	Date: 3.27.13 New WQ: FOUS Counts: Sol'n Prep: Old WQ: JLA Time: 1530
	2	7.89	7.98	7.5	6.7	353	25.9	0	0	0	0	0	0	0	0	0	0	Date: 3.28.13 New WQ: DS Counts: Sol'n Prep: Old WQ: Time: 1620
	3	7.92	7.99	8.6	7.9	353	25.7	0	0	0	6	0	5	4	0	0	0	Date: 3.29.13 New WQ: MB Counts: Sol'n Prep: Old WQ: DS Time: 1540
	4	7.88	7.70	8.5	6.9	347	25.7	5	5	5	0	6	11	0	4	6	6	Date: 3.30.13 New WQ: FOUS Counts: Sol'n Prep: Old WQ: Time: 1630
	5	7.93	8.04	8.7	8.5	346	25.7	11	9	8	8	12	0	10	11	10	14	Date: 3.31.13 New WQ: FOUS Counts: Sol'n Prep: Old WQ: Time: 1700
	6	8.03	7.97	8.3	7.8	348	25.8	0	10	10	13	9	12	12	16	13	12	Date: 4/1/13 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1645
	7																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
	8																	Date: Old WQ: Counts: Time:
							Total=	16	24	23	27	27	28	26	31	29	32	Mean Neonates/Female = 26.3

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	Sample ID
6.25%	0	7.87		8.8		422	0	0	0	0	0	0	0	0	0	0	31335
	1	7.87	7.98	8.4	7.9	410	0	0	0	0	0	0	0	0	0	0	31335
	2	7.86	8.02	7.8	5.9	408	0	0	0	0	0	0	0	0	0	0	31379
	3	7.91	8.03	8.3	8.3	425	0	0	0	0	5	5	0	0	0	0	31379
	4	7.88	7.98	8.4	6.6	415	4	4	5	6	0	0	4	6	6	5	31433
	5	7.91	8.02	8.7	8.4	417	12	12	8	4	X/2	0	0	10	10	7	31433
	6	7.99	8.01	8.3	7.9	417	13	0	0	X/0	-	0	X/0	~~X/0~~	7	10	31433
	7										-						
	8										-						
							Total=	29	16	13	X/10	X/7	5	X/4	22	23	22	Mean Neonates/Female = 15.1

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

Client: **Lehigh Permanente** Material: **Pond 13** Test Date: 3/26/13

Project #: 20780 Test ID: 51250 Control Water: Modified EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
12.5%	0	7.87		8.8		499		0	0	0	0	0	0	0	0	0	0	
	1	7.94 ~~7.90~~ vf	7.92	8.4 ~~8.9~~ vf	7.7	481 ~~620~~ vf		0	0	0	0	0	0	0	0	0	0	
	2	7.86	8.04	8.0 vf	6.3	477		0	0	0	0	0	0	0	0	0	0	
	3	7.97	8.08	8.2	8.2	501		0	0	0	0	6	0	5	0	0	0	
	4	7.90	7.88	8.5	6.8	491		5	5	4	5	0	5	0	6	4	6	
	5	7.95	8.10	8.6	8.4	490		6	5	4	0	x/0	x/2	x/0	2	6	0	
	6	7.98	8.04	8.6	7.8	489		0	0	0	0	-	-	-	0	0	0	
	7											-	-	-				
	8											-	-	-				
							Total=	5	10	8	5	x/6	x/7	x/5	8	10	6	Mean Neonates/Female = 7.0

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)		Survival / Reproduction A	B	C	D	E	F	G	H	I	J	
25%	0	7.90		8.8		620		0	0	0	0	0	0	0	0	0	0	
	1	7.97	7.99	8.4	7.9	615		0	0	0	0	0	0	0	0	0	0	
	2	7.95	8.06	7.5	6.6	605		0	0	0	0	0	0	0	0	0	0	
	3	7.99	8.11	8.2	8.3	619		0	0	0	5	4	4	0	0	0	0	
	4	7.91	7.96	8.5	8.6	600		5	6	6	0	x/0	0	6	4	5	4	
	5	7.98	8.13	8.8	8.4	609		x/0	0	x/0	x/2	-	0	x/0	x/0	0	0	
	6	7.96	8.08	8.6	7.5	608		-	x/0	-	-	-	x/0	-	-	x/0	0	
	7							-	-	-	-	-		-	-			
	8							-	-	-	-	-		-	-			
							Total=	x/5	x/6	x/6	x/7	x/4	x/4	x/6	x/4	x/5	4	Mean Neonates/Female = 5.1

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

Client: **Lehigh Permanente** Material: **Pond 13** Test Date: 3/26/13

Project #: 20780 Test ID: 51250 Control Water: Modified EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
50%	0	7.96		9.1		864		0	0	0	0	0	0	0	0	0	0	
	1	7.98	8.11	8.5	8.1	844		x/0	0	0	0	0	0	0	0	0	0	
	2	7.96	8.09	7.9	5.3	838		-	0	0	0	0	0	0	0	0	0	
	3	8.08	8.21	8.3	8.3	847		-	0	0	3	3	0	0	0	0	0	
	4	7.97	8.08	8.8	6.6	811		-	5	x/6	x/0	x/0	x/0	5	5	5	x/5	
	5	7.99	8.18	8.9	8.4	831		-	x/0	-	-	-	-	x/0	x/0	0	-	
	6	8.00	8.15	8.6	7.9	834		-	-	-	-	-	-	-	-		-	
	7							-	-	-	-	-	-	-	-		-	
	8							-	-	-	-	-	-	-	-		-	
							Total=	x/0	x/5	x/5	x/3	x/3	x/0	x/5	x/5	5	x/5	Mean Neonates/Female = 3.6

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)		Survival / Reproduction A	B	C	D	E	F	G	H	I	J	
100%	0	7.98		9.4		1276		0	0	0	0	0	0	0	0	0	0	
	1	8.02	8.02	8.9	8.0	1250		0	0	0	0	0	0	0	0	0	0	
	2	7.99	8.05	8.0	5.6	1227		0	0	0	0	0	x/0	0	0	0	0	
	3	8.16	8.11	8.4	8.3	1260		0	0	0	4	0	-	0	0	0	0	
	4	8.01	8.09	9.4	6.7	1228		x/0	x/0	0	x/6	0	-	x/0	4	x/1	x/0	
	5	7.99	8.11	9.6	8.4	1220		-	-	0	-	x/0	-	-	x/0	-	-	
	6	8.08	8.09	9.6	8.1	1230		-	-		-	-	-	-	-	-	-	
	7							-	-		-	-	-	-	-	-	-	
	8							-	-		-	-	-	-	-	-	-	
							Total=	x/0	x/0	0	x/4	x/0	x/0	x/0	x/4	x/1	x/0	Mean Neonates/Female = 0.9

CETIS Analytical Report

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

Analysis ID:	01-8265-2002	**Endpoint:**	Survival	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:50	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

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

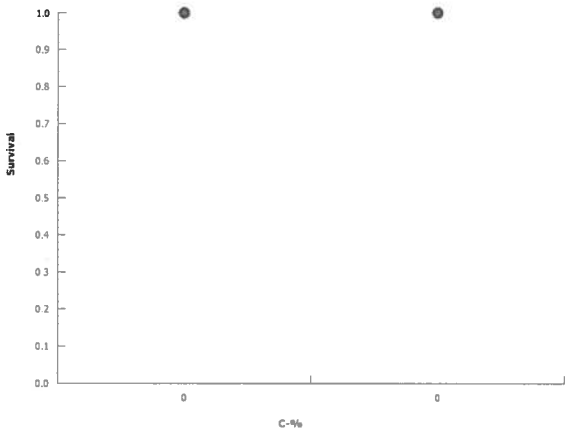
Fisher Exact Test

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

Data Summary

C-%	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Hardness Blank	10	0	10	1	0	0.0%
0	Lab Water Cont	10	0	10	1	0	0.0%

Graphics



CETIS Analytical Report

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

Analysis ID:	13-8440-1556	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	10.6%	Fails reproduction

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	9.96	1.73	2.79	18	<0.0001	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1280	1280	1	99.2	<0.0001	Significant Effect
Error	232.2	12.9	18			
Total	1512.2		19			

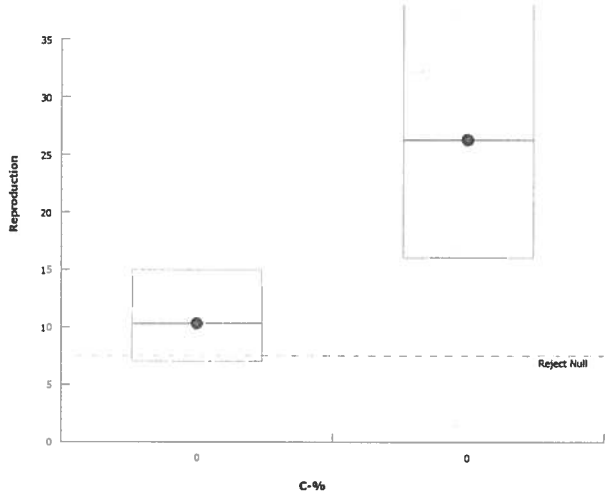
Distributional Tests

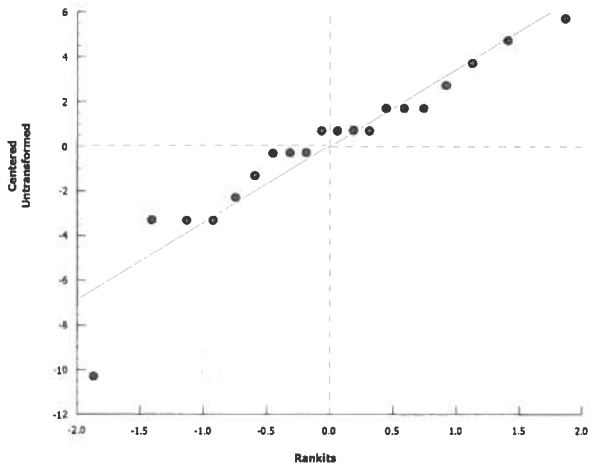
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	4.27	6.54	0.0418	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.915	0.866	0.0808	Normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	10	26.3	23	29.6	15	16	32	1.45	17.4%	0.0%
0	Hardness Blank	10	10.3	8.72	11.9	15	7	14	0.7	21.5%	60.8%

Graphics





Analyst: _____ QA: AB

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

Client: **Lehigh Permanente** Material: **Hardness Control** Test Date: 3/26/13

Project #: 20780 Test ID: 51248 Randomization: 10.2.1 Control Water: Modified EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
Hardness Control	0	8.63		8.9		2406	25.6	0	0	0	0	0	0	0	0	0	0	Date: 3/26/13 New WQ: Test Init: Sol'n Prep: Old WQ: Time: 1455
	1	8.67	8.55	8.8	7.6	2415	25.9	0	0	0	0	0	0	0	0	0	0	Date: 3/27/13 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1550
	2	8.58	8.45	8.2	7.9	2447	25.9	0	0	0	0	0	0	0	0	0	0	Date: 3.28.13 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1500
	3	8.63	8.69	8.2	8.4	2445	25.7	0	0	0	4	2	0	0	0	0	2	Date: 3.29.13 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1730
	4	8.61	8.63	8.2	7.8	2414	25.7	3	2	0	0	0	0	3	2	1	0	Date: 3.30.13 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1500
	5	8.59	8.65	9.2	7.8	2484	25.7	2	2	4	2	0	4	0	3	6	0	Date: 3.31.13 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1500
	6	8.62	8.69	9.3	7.7	2476	25.8	5	3	6	6	5	5	9	6	7	9	Date: 4/1/13 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1500
	7																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
	8																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
							Total=	10	7	10	12	7	9	12	11	14	11	Mean Neonates/Female = 10.3

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

Client: **Lehigh Permanente** Material: **Meter IDs** Test Date: 3/26/13

Project #: 20780 Test ID: 51250 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		RD04		EC07	30A	3/26/13		
	1	PH15	PH19	RD07	RD07	EC04	30A	3/27/13	FCVB	JGA
	2	PH16	PH16	RD07	RD06	EC04	30A	3-28-13	DS	
	3	PH15	PH19	RD07	RD04	EC07	30A	3-29-13		DS
	4	PH19	PH15	RD04	RD06	EC08	30A	3.30.13	FCVB	
	5	PH19	PH19	RD04	RD04	EC06	30A	3/31/13	FCVB	
	6	PH15	PH19	RD06	RD04	EC06	30A	4/1/13		VAB
	7									
	8									

Appendix I

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

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

Batch ID:	02-8626-4030	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Alison Briden
Start Date:	26 Mar-13 16:00	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	01 Apr-13 16:30	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 1h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	14-7229-2803	**Code:**	Pond 14	**Client:**	Lehigh Permanente
Sample Date:	25 Mar-13 12:55	**Material:**	Effluent	**Project:**	20780
Receive Date:	25 Mar-13 15:30	**Source:**	Lehigh Permanente		
Sample Age:	27h (13.7 °C)	**Station:**	Pond 14		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
02-1039-6739	Reproduction	<0	0		11.3%		Equal Variance t Two-Sample Test
19-2537-8058	Reproduction	25	50	35.36	22.4%	4	Steel Many-One Rank Sum Test
02-4339-6444	Survival	0	>0		NA		Fisher Exact Test
13-4746-0159	Survival	100	>100	NA	NA	1	Fisher Exact/Bonferroni-Holm Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
05-4900-2486	Reproduction	IC5	21.1	14.5	29.7	4.738	Linear Interpolation (ICPIN)
		IC10	27.3	16.7	34.5	3.669	
		IC15	31.4	18.9	41.2	3.188	
		IC20	35.5	21	47.6	2.818	
		IC25	39.6	23.1	58.4	2.525	
		IC40	67.1	43.8	N/A	1.489	
		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	10.3	9.47	11.1	7	14	0.7	2.21	21.5%	0.0%
0	Lab Water Contr	10	27.4	25.5	29.3	17	35	1.64	5.19	18.9%	-166.0%
6.25		10	31.4	29.2	33.6	17	38	1.89	5.97	19.0%	-205.0%
12.5		10	32.1	30.6	33.6	26	39	1.27	4.01	12.5%	-212.0%
25		10	28.1	24.8	31.4	5	35	2.81	8.88	31.6%	-173.0%
50		10	18.9	16.4	21.4	13	35	2.13	6.72	35.6%	-83.5%
100		10	16.8	15.5	18.1	12	23	1.13	3.58	21.3%	-63.1%

Survival Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	10	1	1	1	1	1	0	0	0.0%	0.0%
0	Lab Water Contr	10	1	1	1	1	1	0	0	0.0%	0.0%
6.25		10	1	1	1	1	1	0	0	0.0%	0.0%
12.5		10	1	1	1	1	1	0	0	0.0%	0.0%
25		10	1	1	1	1	1	0	0	0.0%	0.0%
50		10	1	1	1	1	1	0	0	0.0%	0.0%
100		10	0.8	0.643	0.957	0	1	0.133	0.422	52.7%	20.0%

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	10	12	7	9	12	11	14	11
0	Lab Water Contr	17	27	28	35	31	22	28	27	26	33
6.25		36	36	38	32	31	28	31	35	30	17
12.5		37	35	39	30	30	26	29	30	31	34
25		33	35	31	33	5	22	32	28	30	32
50		15	17	13	23	24	35	17	14	16	15
100		16	22	16	17	18	12	16	23	12	16

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	1	1	1	1	1	1	1	1
0	Lab Water Contr	1	1	1	1	1	1	1	1	1	1
6.25		1	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	0	1	1	1	0	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	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
0	Lab Water Contr	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	0/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1

CETIS Analytical Report

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

Analysis ID:	13-4746-0159	**Endpoint:**	Survival	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:49	**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

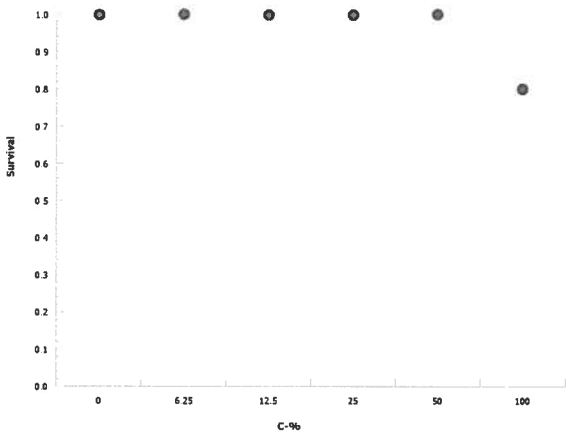
Fisher Exact/Bonferroni-Holm Test

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	0.237	1.0000	Exact	Non-Significant Effect

Data Summary

C-%	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Lab Water Cont	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		8	2	10	0.8	0.2	20.0%

Graphics



CETIS Analytical Report

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

Analysis ID:	19-2537-8058	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:49	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	22.4%	25	50	35.36	4

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	131	75	4	18	0.9996	Asymp	Non-Significant Effect
		12.5	132	75	3	18	0.9996	Asymp	Non-Significant Effect
		25	120	75	5	18	0.9889	Asymp	Non-Significant Effect
		50*	69.5	75	2	18	0.0156	Asymp	Significant Effect
		100*	60	75	2	18	0.0016	Asymp	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2075.083	415.0167	5	11.6	<0.0001	Significant Effect
Error	1939.1	35.90926	54			
Total	4014.183		59			

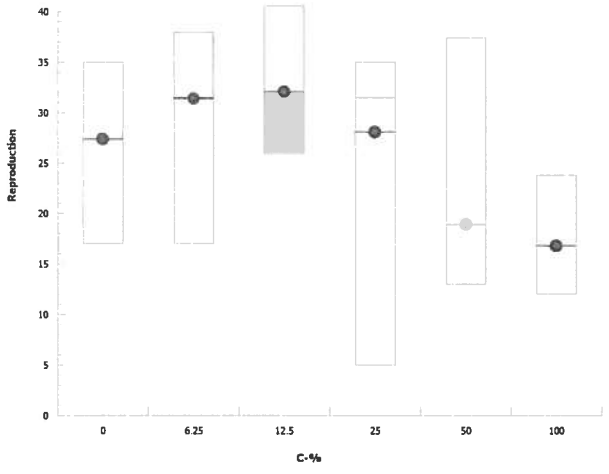
Distributional Tests

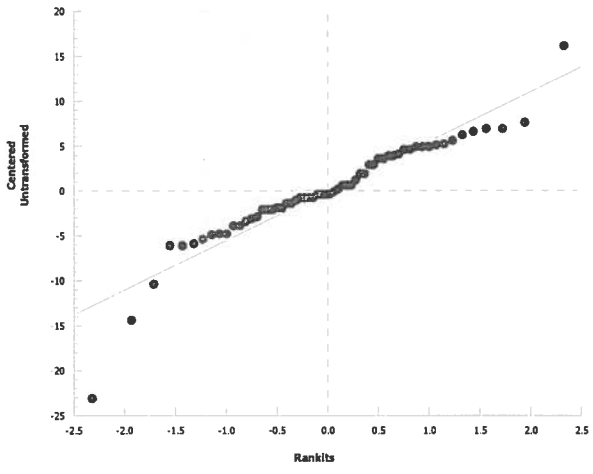
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	9.58	15.1	0.0880	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.917	0.946	0.0006	Non-normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	10	27.4	23.7	31.1	27.5	17	35	1.64	18.9%	0.0%
6.25		10	31.4	27.1	35.7	31.5	17	38	1.89	19.0%	-14.6%
12.5		10	32.1	29.2	35	30.5	26	39	1.27	12.5%	-17.2%
25		10	28.1	21.8	34.4	31.5	5	35	2.81	31.6%	-2.55%
50		10	18.9	14.1	23.7	16.5	13	35	2.13	35.6%	31.0%
100		10	16.8	14.2	19.4	16	12	23	1.13	21.3%	38.7%

Graphics





CETIS Analytical Report

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

Analysis ID:	05-4900-2486	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:50	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1703310	200	Yes	Two-Point Interpolation

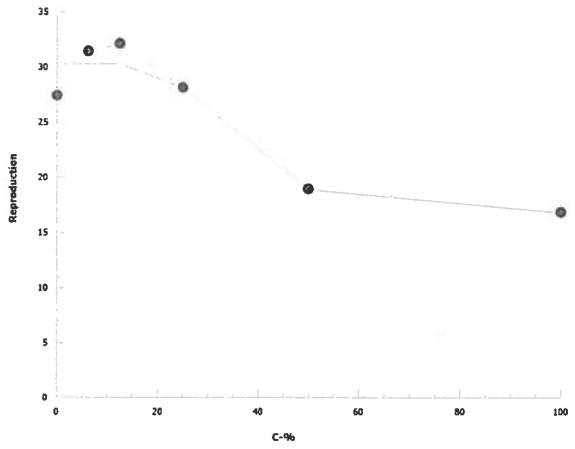
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	21.1	14.5	29.7	4.738	3.363	6.915
IC10	27.3	16.7	34.5	3.669	2.901	5.975
IC15	31.4	18.9	41.2	3.188	2.428	5.304
IC20	35.5	21	47.6	2.818	2.102	4.768
IC25	39.6	23.1	58.4	2.525	1.714	4.33
IC40	67.1	43.8	N/A	1.489	NA	2.283
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 Contr	10	27.4	17	35	1.64	5.19	18.9%	0.0%
6.25		10	31.4	17	38	1.89	5.97	19.0%	-14.6%
12.5		10	32.1	26	39	1.27	4.01	12.5%	-17.2%
25		10	28.1	5	35	2.81	8.88	31.6%	-2.55%
50		10	18.9	13	35	2.13	6.72	35.6%	31.0%
100		10	16.8	12	23	1.13	3.58	21.3%	38.7%

Graphics



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

Client: **Lehigh Permanente** Material: **Pond 14** Test Date: 3/26/13

Project #: 20780 Test ID: 51251 Randomization: 10.7.1 Control Water: Modified EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
Lab Water Control	0	7.99		8.6		348	25.6	0	0	0	0	0	0	0	0	0	0	Date: 3/26/13 New WQ: Test Init: Sol'n Prep: Time 1600
	1	7.77	8.01	8.5	7.3	335	25.9	0	0	0	0	0	0	0	0	0	0	Date: 3.27.13 New WQ: Counts: Sol'n Prep: Old WQ: Time 1440
	2	7.99	7.92	8.8	7.2	348	25.9	0	0	0	0	0	0	0	0	0	0	Date: 3.28.13 New WQ: Counts: Sol'n Prep: Old WQ: Time 1650
	3	7.84	7.90	8.0	8.6	343	25.7	0	0	0	5	4	3	4	0	0	0	Date: 3.29.13 New WQ: Counts: Sol'n Prep: Old WQ: Time 1630
	4	7.85	8.10	8.7	7.7	342	25.7	5	5	5	0	13	11	0	5	5	6	Date: 3.30.13 New WQ: Counts: Sol'n Prep: Old WQ: Time 1715
	5	7.94	8.09	8.6	7.4	344	25.7	12	12	10	12	0	0	11	10	11	12	Date: 3.31.13 New WQ: Counts: Sol'n Prep: Old WQ: Time 1745
	6	8.21	8.06	8.5	6.6	347	25.8	0	10	13	18	14	8	13	12	10	15	Date: 4/1/13 New WQ: Counts: Sol'n Prep: Old WQ: Time 1630
	7																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time
	8																	Date: Old WQ: Counts: Time
							Total=	17	27	28	35	31	22	28	27	26	33	Mean Neonates/Female = 27.4

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	Sample ID
6.25%	0	7.92		9.0		423	0	0	0	0	0	0	0	0	0	0	31336
	1	7.87	7.93	8.4	7.8	407	0	0	0	0	0	0	0	0	0	0	31336
	2	7.96	7.91	9.0	7.0	420	0	0	0	0	0	0	0	0	0	0	31380
	3	7.90	7.98	8.1	8.5	419	0	0	0	5	5	3	4	5	0	0	31380
	4	7.87	8.03	8.5	7.6	423	6	5	4	10	10	9	0	0	5	6	31434
	5	7.94	8.06	8.6	7.5	416	12	14	14	0	0	0	10	13	10	11	31434
	6	8.16	8.05	8.4	7.2	410	18	17	18	17	16	16	17	17	15	0	31434
	7																
	8																
							Total=	36	36	38	32	31	28	31	35	30	17	Mean Neonates/Female = 31.4

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

Client: **Lehigh Permanente** Material: **Pond 14** Test Date: 3/26/13

Project #: 20780 Test ID: 51251 Control Water: Modified EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
12.5%	0	7.92		9.1		489		0	0	0	0	0	0	0	0	0	0	
	1	7.94	7.90	8.3	7.5	481		0	0	0	0	0	0	0	0	0	0	
	2	7.95	7.98	8.9	6.4	498		0	0	0	0	0	0	0	0	0	0	
	3	7.95	8.07	8.3	8.6	497		0	0	6	5	5	0	5	4	0	0	
	4	7.89	8.02	8.4	7.9	490		5	6	0	10	9	6	9	0	4	5	
	5	7.97	8.08	8.6	7.7	484		13	13	16	15	14	11	0	12	11	12	
	6	8.18	8.09	8.4	7.1	484		19	16	17	0	0	9	15	14	16	17	
	7																	
	8																	
							Total=	37	35	39	30	30	26	29	30	31	34	Mean Neonates/Female = 32.1

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)		Survival / Reproduction A	B	C	D	E	F	G	H	I	J	
25%	0	7.96		9.3		618		0	0	0	0	0	0	0	0	0	0	
	1	8.01	7.91	8.5	7.6	612		0	0	0	0	0	0	0	0	0	0	
	2	8.00	8.04	8.8	6.7	629		0	0	0	0	0	0	0	0	0	0	
	3	7.99	8.12	8.4	8.5	620		0	0	0	5	5	4	6	4	0	6	
	4	8.03	8.06	8.5	8.0	629		5	6	5	0	0	10	0	0	4	5	
	5	8.03	8.12	8.6	7.7	611		11	12	11	13	0	0	11	11	10	10	
	6	8.18	8.15	8.5	7.4	614		17	17	15	15	0	8	15	13	16	17	
	7																	
	8																	
							Total=	33	35	31	33	5	22	32	28	30	32	Mean Neonates/Female = 28.1

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

Client: **Lehigh Permanente** Material: **Pond 14** Test Date: 3/26/13

Project #: 20780 Test ID: 51251 Control Water: Modified EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
50%	0	8.04		9.8		858		0	0	0	0	0	0	0	0	0	0	
	1	8.05 NF ~~8.10~~	8.07	8.7 NF ~~10.0~~	7.5	842 NF ~~1273~~		0	0	0	0	0	0	0	0	0	0	
	2	8.04	8.13	8.9	7.0	872		0	0	0	0	0	0	0	0	0	0	
	3	8.07	8.20	8.6	8.6	859		0	0	0	0	5	5	0	0	0	0	
	4	8.12	8.15	8.7	7.8	866		5	5	4	5	10	0	5	5	6	5	
	5	8.11	8.17	8.9	7.6	855		10	12	9	11	0	13	12	9	10	10	
	6	8.28	8.26	8.9	7.4	844		0	0	0	7	9	17	0	0	0	0	
	7																	
	8																	
							Total=	15	17	13	23	24	35	17	14	16	15	Mean Neonates/Female = 18.9

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)		Survival / Reproduction A	B	C	D	E	F	G	H	I	J	
100%	0	8.10		10.6		1273		0	0	0	0	0	0	0	0	0	0	
	1	8.13	8.08	9.5	7.7	1265		0	0	0	0	0	0	0	0	0	0	
	2	8.13	8.03	9.1	6.3	1300		0	0	0	0	0	0	0	0	0	0	
	3	8.14	8.14	8.8	8.5	1276		0	4	4	4	5	4	4	3	0	0	
	4	8.19	8.13	9.0	7.9	1265		4	0	0	8	7	8	0	0	4	5	
	5	8.17	8.22	9.3	7.5	1261		12	9	12	5	0	0	12	13	8	11	
	6	8.33	8.16	9.5	7.5	1253		0	9	X/0	0	6	0	X/0	7	0	0	
	7									-				-				
	8									-				-				
							Total=	16	22	X/16	17	18	12	X/16	23	12	16	Mean Neonates/Female = 16.8

CETIS Analytical Report

Report Date: 02 Apr-13 09:51 (p 1 of 1)
Test Code: 51251 | 08-7754-4734

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

Analysis ID:	02-4339-6444	**Endpoint:**	Survival	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:51	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

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

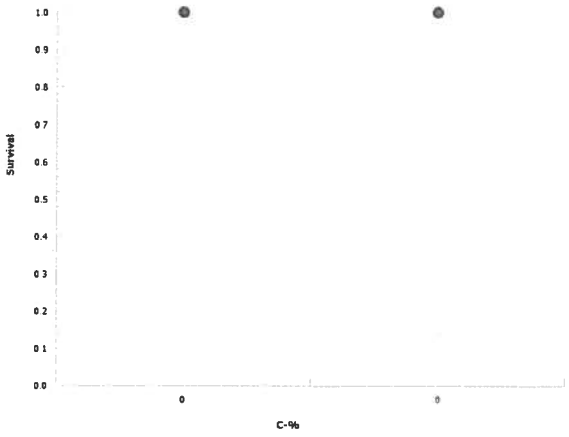
Fisher Exact Test

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

Data Summary

C-%	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Hardness Blank	10	0	10	1	0	0.0%
0	Lab Water Cont	10	0	10	1	0	0.0%

Graphics



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

Analysis ID:	02-1039-6739	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.5
Analyzed:	02 Apr-13 9:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	11.3%	Fails reproduction

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	9.58	1.73	3.09	18	<0.0001	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1462.05	1462.05	1	91.9	<0.0001	Significant Effect
Error	286.5	15.91667	18			
Total	1748.55		19			

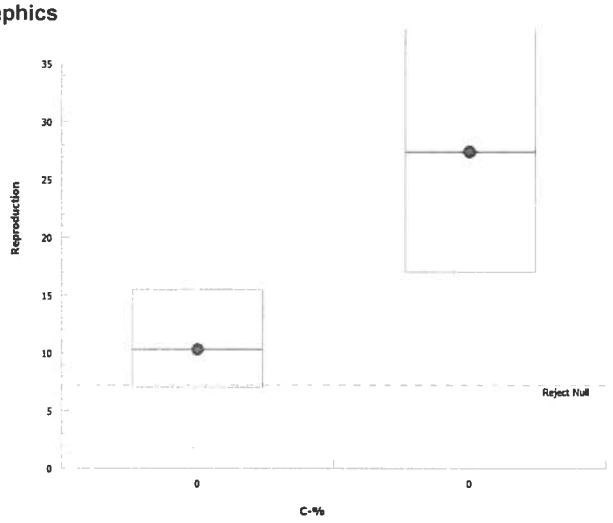
Distributional Tests

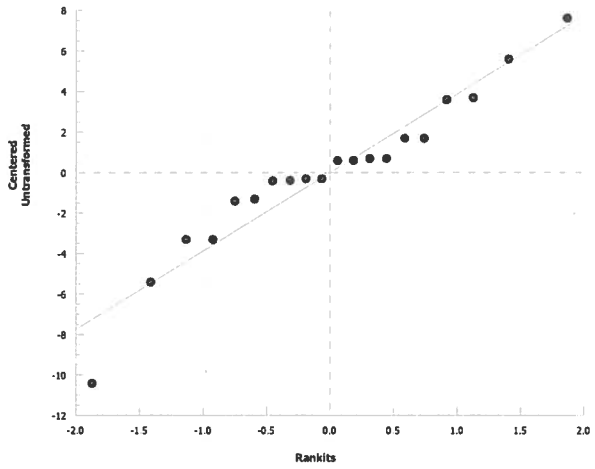
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	5.5	6.54	0.0183	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.945	0.866	0.2928	Normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	10	27.4	23.7	31.1	15.5	17	35	1.64	18.9%	0.0%
0	Hardness Blank	10	10.3	8.72	11.9	15.5	7	14	0.7	21.5%	62.4%

Graphics





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

Client: **Lehigh Permanente** Material: **Hardness Control** Test Date: 3/26/13

Project #: 20780 Test ID: 51248 Randomization: 10.2.1 Control Water: Modified EPAMH

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
Hardness Control	0	8.63		8.9		2406	25.6	0	0	0	0	0	0	0	0	0	0	Date: 3/26/13 New WQ: Test Init: Sol'n Prep: Old WQ: Time: 1455
	1	8.67	8.55	8.8	7.6	2415	25.9	0	0	0	0	0	0	0	0	0	0	Date: 3/27/13 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1550
	2	8.58	8.45	8.2	7.9	2447	25.9	0	0	0	0	0	0	0	0	0	0	Date: 3.28.13 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1500
	3	8.63	8.69	8.2	8.4	2445	25.7	0	0	0	4	2	0	0	0	0	2	Date: 3.29.13 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1730
	4	8.61	8.63	8.2	7.8	2414	25.7	3	2	0	0	0	0	3	2	1	0	Date: 3.30.13 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1500
	5	8.59	8.65	9.2	7.8	2484	25.7	2	2	4	2	0	4	0	3	6	0	Date: 3.31.13 New WQ: Counts: Sol'n Prep: Old WQ: Time:
	6	8.62	8.69	9.3	7.7	2476	25.8	5	3	6	6	5	5	9	6	7	9	Date: 4/1/13 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1500
	7																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
	8																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
							Total=	10	7	10	12	7	9	12	11	14	11	Mean Neonates/Female = 10.3

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

Client: **Lehigh Permanente** Material: **Meter IDs** Test Date: 3/26/13

Project #: 20780 Test ID: 51251 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		RDO4		EC07	30A	3/26/13		—
	1	PH15	pH19	RD07	RD07	EC04	30A	3/27/13	FOVB	JLA
	2	pH15	pH18	RD04	RD06	EC08	30A	03.28.13		
	3	pH15	pH19	RD07	RD04	EC07	30A	3-29-13		DS
	4	PH19	pH16	RD04	RD07	EC08	30A	3.30.13	FOVB	SS
	5	PH19	pH16	RD04	RD07	EC06	30A	3.31.13	FOVB	MB
	6	Ph15	pH18	RD06	RD07	EC06	30A	4/1/13		SVV
	7									
	8									

Appendix J

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

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

Batch ID:	03-5583-4163	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Melinda Hooper
Start Date:	26 Mar-13 15:15	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	02 Apr-13 08:20	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 17h	**Source:**	Aquatox, AR	**Age:**	1

Sample ID:	04-5889-5807	**Code:**	Effluent	**Client:**	Lehigh Permanente
Sample Date:	25 Mar-13 11:20	**Material:**	Effluent	**Project:**	20780
Receive Date:	25 Mar-13 15:30	**Source:**	Lehigh Permanente		
Sample Age:	28h (18.1 °C)	**Station:**	Pond 4A		

Batch Notes: Rep 100B (outlier) Included

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
04-0850-0080	7d Survival Rate	0	>0		17.0%		Equal Variance t Two-Sample Test
16-0952-5454	7d Survival Rate	100	>100	NA	33.0%	1	Steel Many-One Rank Sum Test
07-9892-1617	Mean Dry Biomass-mg	0	>0		14.6%		Equal Variance t Two-Sample Test
03-0551-3915	Mean Dry Biomass-mg	100	>100	NA	35.7%	1	Steel Many-One Rank Sum Test
10-0881-2326	Mean Dry Weight-mg	0	>0		19.9%		Equal Variance t Two-Sample Test
01-7997-7172	Mean Dry Weight-mg	100	>100	NA	21.9%	1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
14-6870-3861	Mean Dry Biomass-mg	IC5	64.1	50.5	N/A	1.561	Linear Interpolation (ICPIN)
		IC10	78.1	51	N/A	1.28	
		IC15	92.2	51.5	N/A	1.085	
		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	
07-6957-2875	Mean Dry Weight-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	

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

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	0.9	0.847	0.953	0.7	1	0.0707	0.141	15.7%	0.0%
0	Lab Water Contr	4	0.95	0.913	0.987	0.8	1	0.05	0.1	10.5%	-5.56%
6.25		4	0.9	0.847	0.953	0.7	1	0.0707	0.141	15.7%	0.0%
12.5		4	0.95	0.928	0.972	0.9	1	0.0289	0.0577	6.08%	-5.56%
25		4	0.95	0.928	0.972	0.9	1	0.0289	0.0577	6.08%	-5.56%
50		4	0.925	0.906	0.944	0.9	1	0.025	0.05	5.41%	-2.78%
100		4	0.725	0.565	0.885	0.1	1	0.214	0.427	58.9%	19.4%

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	0.791	0.77	0.812	0.729	0.864	0.0277	0.0555	7.02%	0.0%
0	Lab Water Contr	4	0.747	0.711	0.784	0.619	0.84	0.0489	0.0978	13.1%	5.53%
6.25		4	0.711	0.694	0.729	0.649	0.757	0.0238	0.0475	6.68%	10.1%
12.5		4	0.89	0.876	0.904	0.846	0.934	0.0189	0.0377	4.24%	-12.5%
25		4	0.85	0.834	0.867	0.787	0.885	0.0219	0.0437	5.14%	-7.52%
50		4	0.864	0.852	0.876	0.833	0.906	0.0157	0.0315	3.64%	-9.26%
100		4	0.668	0.533	0.803	0.128	0.875	0.181	0.362	54.2%	15.5%

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	0.895	0.838	0.952	0.787	1.12	0.0766	0.153	17.1%	0.0%
0	Lab Water Contr	4	0.786	0.768	0.804	0.726	0.84	0.0241	0.0483	6.14%	12.2%
6.25		4	0.802	0.765	0.838	0.702	0.927	0.0483	0.0966	12.1%	10.5%
12.5		4	0.939	0.914	0.965	0.846	1	0.0343	0.0686	7.31%	-4.94%
25		4	0.899	0.866	0.932	0.787	0.983	0.0441	0.0882	9.81%	-0.41%
50		4	0.935	0.926	0.945	0.906	0.966	0.0127	0.0254	2.71%	-4.45%
100		4	1.01	0.935	1.08	0.872	1.28	0.0959	0.192	19.1%	-12.4%

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	0.7	0.9	1
0	Lab Water Contr	0.8	1	1	1
6.25		0.7	1	1	0.9
12.5		1	1	0.9	0.9
25		1	0.9	1	0.9
50		0.9	1	0.9	0.9
100		1	0.1	0.8	1

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	0.864	0.784	0.729	0.787
0	Lab Water Contr	0.619	0.804	0.84	0.726
6.25		0.649	0.757	0.702	0.738
12.5		0.846	0.934	0.876	0.904
25		0.787	0.885	0.872	0.858
50		0.869	0.906	0.833	0.849
100		0.872	0.128	0.798	0.875

Mean Dry Weight-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	0.864	1.12	0.81	0.787
0	Lab Water Contr	0.774	0.804	0.84	0.726
6.25		0.927	0.757	0.702	0.82
12.5		0.846	0.934	0.973	1
25		0.787	0.983	0.872	0.953
50		0.966	0.906	0.926	0.943
100		0.872	1.28	0.997	0.875

7d Survival Rate Binomials

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

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

Analysis ID:	16-0952-5454	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	04 Apr-13 9:40	**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	33.0%	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	16	10	1	6	0.6105	Asymp	Non-Significant Effect
		12.5	17	10	1	6	0.7334	Asymp	Non-Significant Effect
		25	17	10	1	6	0.7334	Asymp	Non-Significant Effect
		50	15.5	10	1	6	0.5438	Asymp	Non-Significant Effect
		100	15.5	10	2	6	0.5438	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.2192582	0.04385164	5	0.747	0.5986	Non-Significant Effect
Error	1.056238	0.0586799	18			
Total	1.275496		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	15.3	15.1	0.0090	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.837	0.884	0.0013	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	0.95	0.791	1	1	0.8	1	0.05	10.5%	0.0%
6.25		4	0.9	0.675	1	0.95	0.7	1	0.0707	15.7%	5.26%
12.5		4	0.95	0.858	1	0.95	0.9	1	0.0289	6.08%	0.0%
25		4	0.95	0.858	1	0.95	0.9	1	0.0289	6.08%	0.0%
50		4	0.925	0.845	1	0.9	0.9	1	0.025	5.41%	2.63%
100		4	0.725	0.0452	1	0.9	0.1	1	0.214	58.9%	23.7%

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	1.34	1.09	1.58	1.41	1.11	1.41	0.0762	11.4%	0.0%
6.25		4	1.27	0.95	1.58	1.33	0.991	1.41	0.0994	15.7%	5.22%
12.5		4	1.33	1.18	1.48	1.33	1.25	1.41	0.047	7.07%	0.39%
25		4	1.33	1.18	1.48	1.33	1.25	1.41	0.047	7.07%	0.39%
50		4	1.29	1.16	1.42	1.25	1.25	1.41	0.0407	6.32%	3.44%
100		4	1.06	0.244	1.88	1.26	0.322	1.41	0.257	48.4%	20.4%

Chronic Larval Fish Survival and Growth Test					Pacific EcoRisk
Analysis ID:	16-0952-5454	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	04 Apr-13 9:40	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

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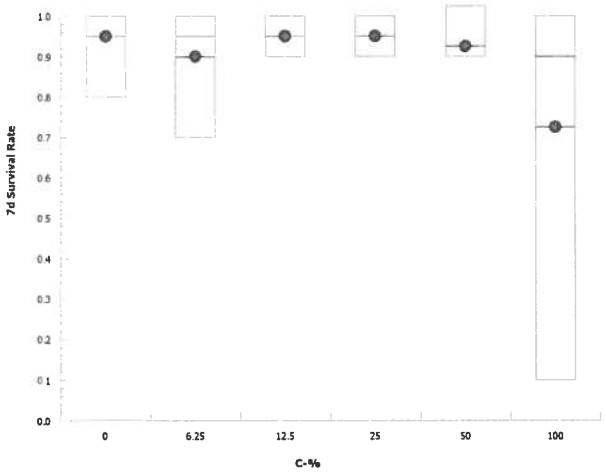
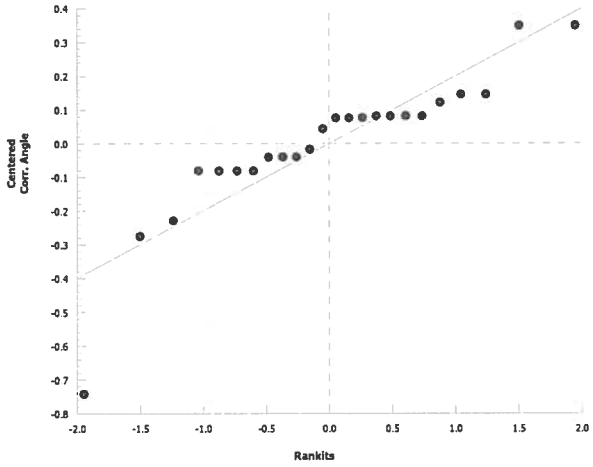




Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	03-0551-3915	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.5
Analyzed:	04 Apr-13 9:41	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	35.7%	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	0	6	0.6105	Asymp	Non-Significant Effect
		12.5	26	10	0	6	0.9999	Asymp	Non-Significant Effect
		25	24	10	0	6	0.9989	Asymp	Non-Significant Effect
		50	25	10	0	6	0.9997	Asymp	Non-Significant Effect
		100	20	10	0	6	0.9516	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.1678998	0.03357995	5	1.37	0.2819	Non-Significant Effect
Error	0.4414364	0.02452424	18			
Total	0.6093361		23			

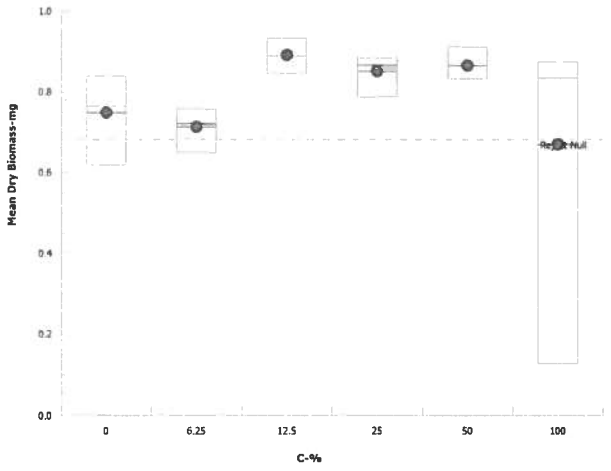
Distributional Tests

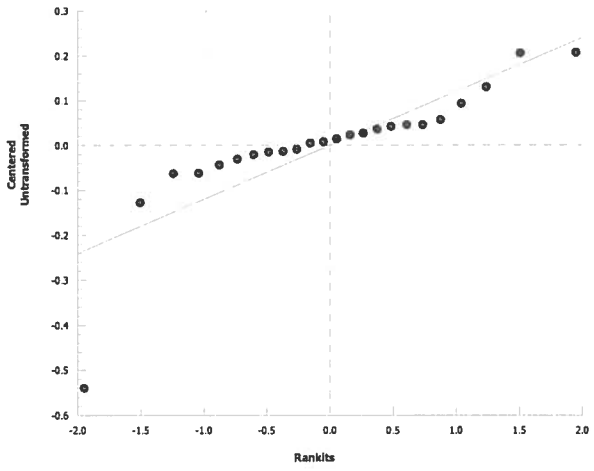
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	27.2	15.1	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.738	0.884	<0.0001	Non-normal Distribution

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	0.747	0.592	0.903	0.765	0.619	0.84	0.0489	13.1%	0.0%
6.25		4	0.711	0.636	0.787	0.72	0.649	0.757	0.0238	6.68%	4.78%
12.5		4	0.89	0.83	0.95	0.89	0.846	0.934	0.0189	4.24%	-19.1%
25		4	0.85	0.781	0.92	0.865	0.787	0.885	0.0219	5.14%	-13.8%
50		4	0.864	0.814	0.914	0.859	0.833	0.906	0.0157	3.64%	-15.7%
100		4	0.668	0.0923	1.24	0.835	0.128	0.875	0.181	54.2%	10.6%

Graphics





CETIS Analytical Report

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

Analysis ID:	14-6870-3861	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.5
Analyzed:	04 Apr-13 9:41	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	566562	200	Yes	Two-Point Interpolation

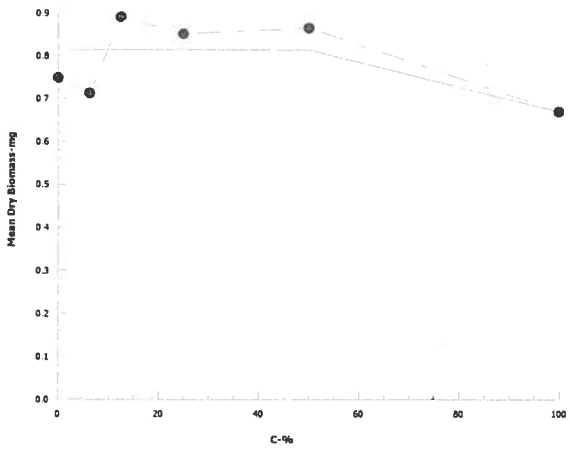
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	64.1	50.5	N/A	1.561	NA	1.98
IC10	78.1	51	N/A	1.28	NA	1.961
IC15	92.2	51.5	N/A	1.085	NA	1.942
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	0.747	0.619	0.84	0.0489	0.0978	13.1%	0.0%
6.25		4	0.711	0.649	0.757	0.0238	0.0475	6.68%	4.78%
12.5		4	0.89	0.846	0.934	0.0189	0.0377	4.24%	-19.1%
25		4	0.85	0.787	0.885	0.0219	0.0437	5.14%	-13.8%
50		4	0.864	0.833	0.906	0.0157	0.0315	3.64%	-15.7%
100		4	0.668	0.128	0.875	0.181	0.362	54.2%	10.6%

Graphics



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Lehigh Permanente** Organism Log#: 7154 Age: 48 hrs
Test Material: Pond 4A Organism Supplier: Aquatox
Test ID#: 51252 Project #: 20780 Control/Diluent: EPAMH
Test Date: 3/26/13 Randomization: 4.7.3 Control Water Batch: 1581

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	8.14	7.91	8.5	7.8	332	8	10	10	10	Date: 3.30.13
6.25	25.5	8.04	7.89	8.6	7.8	380	9	10	10	9	Sample ID: 31431
12.5	25.5	8.00	7.84	8.7	7.7	455	10	10	9	9	Test Solution Prep: A
25	25.5	7.97	7.95	8.7	7.9	583	10	9	10	9	New WQ: KP
50	25.5	7.92	8.08	8.6	7.9	838	9	10	9	9	Renewal Time: 1030
100	25.5	7.86	8.02	8.5	7.9	1266	10	6	8	10	Renewal Signoff: KP
Meter ID	30A	pH15	pH19	RD06	RD04	EC07					Old WQ: FOUR
Lab Water	25.7	8.10	7.70	8.4	6.3	299	8	10	10	10	Date: 3.31.13
6.25	25.7	7.97	7.66	8.6	6.9	387	7	10	10	9	Sample ID: 31431
12.5	25.7	7.94	7.77	8.6	7.0	449	10	10	9	9	Test Solution Prep: A
25	25.7	7.91	7.80	9.0	6.8	598	10	9	10	9	New WQ: FOUR
50	25.7	7.89	7.98	9.3	7.1	845	9	10	9	9	Renewal Time: 1305
100	25.7	7.87	7.82	10.3	6.9	1305	10	2	8	10	Renewal Signoff: KP
Meter ID	30A	pH19	pH15	RD04	RD06	EC06					Old WQ: A
Lab Water	25.7	8.29	7.72	8.2	7.2	297	8	10	10	10	Date: 4/1/13
6.25	25.7	8.20	8.06	8.1	7.2	388	7	10	10	9	Sample ID: 31431
12.5	25.7	8.14	7.89	8.1	7.3	449	10	10	9	9	Test Solution Prep: AP
25	25.7	8.08	7.84	8.1	7.4	590	10	9	10	9	New WQ: MO
50	25.7	8.03	7.94	8.4	7.3	841	9	10	9	9	Renewal Time: 1030
100	25.7	7.95	7.96	8.9	7.3	1291	10	1	8	10	Renewal Signoff: JC
Meter ID	~~25.7~~ 30A	pH16	pH15	RD07	RD06	EC04					Old WQ: MM
Lab Water	25.3		8.02		7.1	311	8	10	10	10	Date: 4/2/13
6.25	25.3		7.82		7.0	391	7	10	10	9	Sample ID: —
12.5	25.3		7.73		6.9	460	10	10	9	9	Termination Time: 0820
25	25.3		7.71		7.0	609	10	9	10	9	Termination Signoff: CH
50	25.3		7.79		7.1	860	9	10	9	9	Old WQ: MM
100	25.3		7.91		7.5	1297	10	1	8	10	
Meter ID	30A		pH16		RD06	EC07					

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Lehigh Permanente** Organism Log#: 7154 Age: 48 hrs

Test Material: Pond 4A Organism Supplier: Aquatoy

Test ID#: 51252 Project #: 20780 Control/Diluent: EPAMH

Test Date: 3/26/13 Randomization: 4.7.3 Control Water Batch: 1581

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	8.10		8.5		314	10	10	10	10	Date 3.26.13
6.25	25.4	8.03		8.6		368	10	10	10	10	Sample ID 31333
12.5	25.4	8.01		8.9		437	10	10	10	10	Test Solution Prep ✓
25	25.4	8.00		8.8		573	10	10	10	10	New WQ DH
50	25.4	7.98		9.2		843	10	10	10	10	Initiation Time 1515
100	25.4	7.94		9.6		1303	10	10	10	10	Initiation Signoff
Meter ID	30A	PH18		RD06		EC06					
Lab Water	25.6	8.18	7.89	8.5	7.0	293	9	10	10	10	Date 3.27.13
6.25	25.6	8.06	7.81	8.5	7.5	382	9	10	10	10	Sample ID 31333
12.5	25.6	8.05	7.82	8.6	7.6	455	10	10	9	10	Test Solution Prep ✓
25	25.6	8.02	7.90	8.6	7.3	598	10	10	10	9	New WQ FOUR
50	25.6	8.04	8.03	8.9	7.6	860	10	10	10	10	Renewal Time 1215
100	25.6	7.97	7.98	9.3	7.5	1328	10	10	9	10	Renewal Signoff SVV
Meter ID	30A	PH15	PH16	RD07	RD04	EC04					Old WQ DH
Lab Water	25.9	8.32	7.99	8.0	6.7	291	8	10	10	10	Date 3.28.13
6.25	25.9	8.16	7.86	8.1	6.5	373	9	10	10	10	Sample ID 31377
12.5	25.9	8.10	7.85	8.4	6.7	443	10	10	9	10	Test Solution Prep ✓
25	25.9	8.03	7.85	8.4	6.4	575	10	10	10	9	New WQ NL
50	25.9	7.99	7.99	8.4	6.6	828	9	10	10	9	Renewal Time 1115
100	25.9	7.93	7.96	8.7	6.9	1230	10	10	9	10	Renewal Signoff KP
Meter ID	30A	PH16	PH18	RD07	RD06	EC06					Old WQ JLA
Lab Water	25.8	8.00	7.98	8.9	8.2	300	8	10	10	10	Date 3.29.13
6.25	25.8	8.00	7.76	8.7	7.9	381	9	10	10	KP 09	Sample ID 31377
12.5	25.8	8.00	7.95	8.7	7.9	458	10	10	9	9	Test Solution Prep ✓
25	25.8	8.01	7.86	8.9	8.0	604	10	9	10	9	New WQ NL
50	25.8	8.02	8.02	9.1	7.7	855	9	10	10	9	Renewal Time 1245
100	25.8	7.98	8.00	9.6	7.7	1330	10	8	9	10	Renewal Signoff KP
Meter ID	30A	PH15	PH15	RD07	RD07	EC07					Old WQ RS

Fathead Minnow Dry Weight Data Sheet

Client: **Lehigh Permanente** Test ID #: 51252 Project # 20780

Sample: Pond 4A Tare Weight Date: ~~3/31~~ 4/1/13 Sign-off: CA

Test Date: 3/26/13 Final Weight Date: 4/3/13 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	159.27	165.46	0.619 10	0.62
2		B	143.37	151.41	0.804 10	0.80
3		C	141.10	149.50	0.840 10	0.84
4		D	164.90	172.16	0.726 10	0.73
5	6.25	A	167.66	174.15	0.649 10	0.65
6		B	140.89	148.46	0.757 10	0.76
7		C	187.90	194.92	0.702 10	0.70
8		D	156.88	164.26	0.738 10	0.74
9	12.5	A	166.54	175.00	0.846 10	0.85
10		B	161.73	171.07	0. 10	0.93
11		C	~~183.88~~ 226.34	235.10	10	0.88
12		D	172.70	181.74	10	0.90
13	25	A	147.82	155.69	10	0.79
14		B	140.21	149.06	10	0.86
15		C	141.27	149.99	10	0.87
16		D	149.22	157.80	10	0.86
17	50	A	181.10	189.79	10	0.87
18		B	144.35	153.41	10	0.91
19		C	145.97	154.30	10	0.83
20		D	148.91	157.40	10	0.85
21	100	A	150.17	158.89	10	0.85
22		B	154.77	156.05	10	0.78
23		C	145.92	153.90	10	0.73
24		D	145.49	154.24	10	0.79
QA 1			168.16	168.19		
QA 2			183.01	183.03		
QA3			127.98	128.03		
Balance ID:			BAL01	BAL01		

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	04-0850-0080	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	04 Apr-13 9:40	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Angular (Corrected)	NA	C > T	NA	NA	17.0%	Passes 7d survival rate

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	0.557	1.94	0.243	6	0.2989	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.009727508	0.009727508	1	0.31	0.5977	Non-Significant Effect
Error	0.1881758	0.03136264	6			
Total	0.1979033		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	1.7	47.5	0.6738	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.806	0.645	0.0332	Normal Distribution

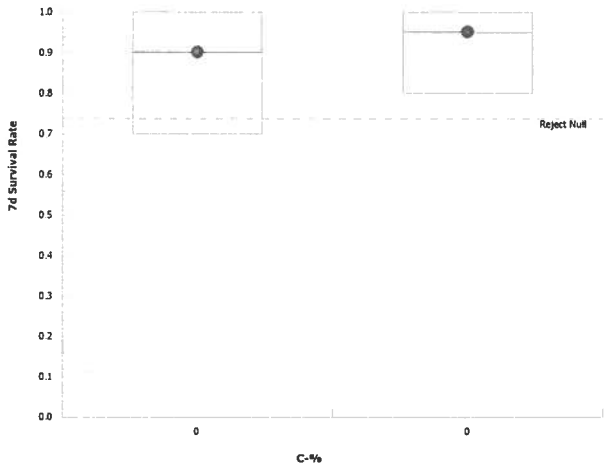
7d Survival Rate Summary

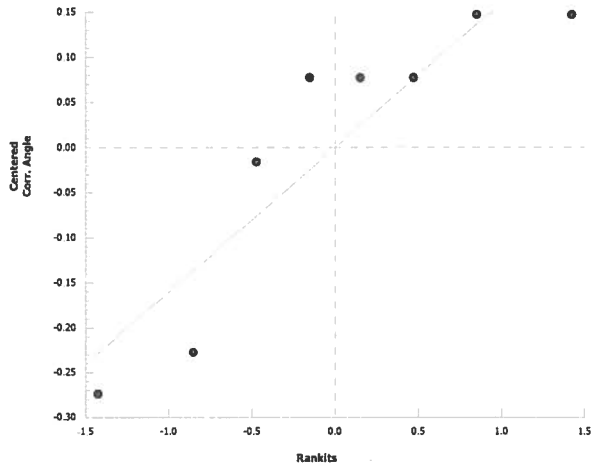
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	0.95	0.791	1	1	0.8	1	0.05	10.5%	0.0%
0	Hardness Blank	4	0.9	0.675	1	1	0.7	1	0.0707	15.7%	5.26%

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	1.34	1.09	1.58	1.41	1.11	1.41	0.0762	11.4%	0.0%
0	Hardness Blank	4	1.27	0.95	1.58	1.41	0.991	1.41	0.0994	15.7%	5.22%

Graphics





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

Analysis ID:	07-9892-1617	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.5
Analyzed:	04 Apr-13 9:41	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	14.6%	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	-0.778	1.94	0.109	6	0.7669	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.003828126	0.003828126	1	0.605	0.4662	Non-Significant Effect
Error	0.03796051	0.006326751	6			
Total	0.04178864		7			

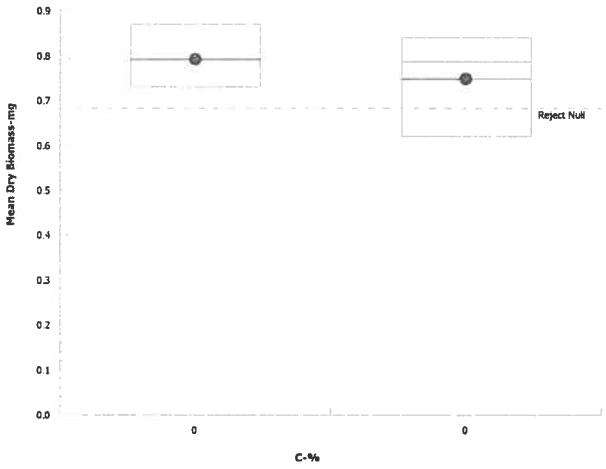
Distributional Tests

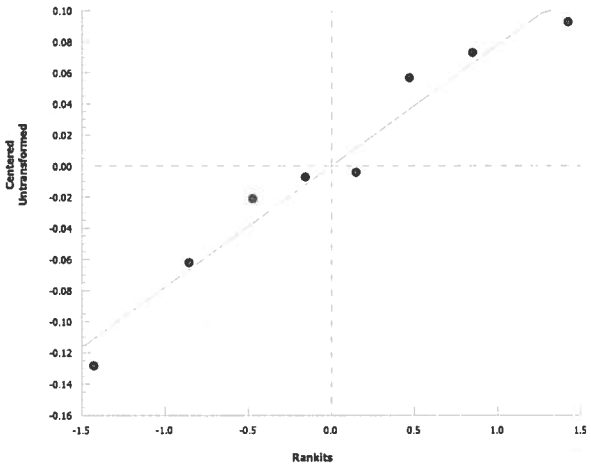
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	3.11	47.5	0.3764	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.953	0.645	0.7460	Normal Distribution

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	0.747	0.592	0.903	0.786	0.619	0.84	0.0489	13.1%	0.0%
0	Hardness Blank	4	0.791	0.703	0.879	0.786	0.729	0.864	0.0277	7.02%	-5.85%

Graphics





7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Lehigh Permanente
Test Material: Hardness Control
Test ID#: 51252 Project #: 20780
Test Date: 3/26/13 Randomization: 4.7.3

Organism Log#: 7154 Age: 48 hrs
Organism Supplier: Aquatox
Control/Diluent: EPAMH
Control Water Batch: 31337

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 Control	25.4	7.67		8.8		2425	10	10	10	10	Date: 3.26.13
											Test Solution Prep:
Meter ID	30A	PH18		RD06		EC06	New WQ: 8H				Initiation Time: 1515
											Initiation Signoff:
Hardness Control	25.6	8.68	8.58	8.8	6.0	2463	10	9	9	10	Date: 3.27.13
											Test Solution Prep:
Meter ID	30A	PH15	PH16	RD07	RD04	EC04	New WQ: ~~RD18~~		Old WQ: DH		Renewal Time: 1215
											Renewal Signoff: SVV
Hardness Control	25.9	8.66 ~~8.58~~ PH	8.56	8.7 ~~6.6~~ DH	6.4	2456 ~~2470~~ DH	10	8	9	10	Date: 3.28.13
											Test Solution Prep:
Meter ID	30A	PH16	PH18	RD07	RD06	EC06	New WQ: DH		Old WQ: JLA		Renewal Time: 1115
											Renewal Signoff: KP
Hardness Control	25.8	8.66	8.54	8.8	8.0	2491	10	7	9	10	Date: 3.29.13
											Test Solution Prep:
Meter ID	30A	PH15	PH15	RD07	RD07	EC07	New WQ: DH		Old WQ: RS		Renewal Time: 1245
											Renewal Signoff: KP
Hardness Control	25.5	8.66	8.56	8.5	8.1	2493	10	7	9	10	Date: 3.30.13
											Test Solution Prep:
Meter ID	30A	PH15	PH19	RD06	RD04	EC07	New WQ: KP		Old WQ: ~~FOUR~~		Renewal Time: 1030
											Renewal Signoff: KP
Hardness Control	25.7	8.57	8.45	8.9	6.1	2509	10	7	9	10	Date: 3.31.13
											Test Solution Prep:
Meter ID	30A	PH19	PH15	RD04	RD06	EC06	New WQ: ~~FOUR~~		Old WQ: CH		Renewal Time: 1305
											Renewal Signoff: KP
Hardness Control	25.7	8.68	8.45 ~~7.79~~	8.1	6.9 ~~7.2~~	2495	10	7	9	10	Date: 4/1/13
											Test Solution Prep: KP
Meter ID	30A	pH16	PH15	RD07	RD06	EC04	New WQ: MO		Old WQ: MM		Renewal Time: 1030
											Renewal Signoff: KP
Hardness Control	25.3		8.36		6.7	2525	10	7	9	10	Date: 4/2/13
											Termination Time: 0820
Meter ID	30A		PH16		RD04	EC07			Old WQ: MM		Termination Signoff:

Fathead Minnow Dry Weight Data Sheet

Client: **Lehigh Permanente** Test ID #: 51252 Project # 20780

Test Material: Hardness Control Tare Weight Date: 4/1/13 Sign-off: CA

Test Date: 3/26/13 Final Weight Date: 4/3/13 Sign-off: JLA

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
25	Hardness Control	A	142.88	151.52	10	0.86
24		B	159.60	167.44	10	0.78
27		C	156.68	163.97	10	0.73
28		D	146.34	154.21	10	0.79
~~XB QA 5~~			BAL01	BAL01		

Appendix K

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:	06-6897-7587	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Melinda Hooper
Start Date:	26 Mar-13 16:40	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	02 Apr-13 08:30	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 16h	**Source:**	Aquatox, AR	**Age:**	1

Sample ID:	12-6012-3482	**Code:**	Pond 9	**Client:**	Lehigh Permanente
Sample Date:	25 Mar-13 12:20	**Material:**	Effluent	**Project:**	20780
Receive Date:	25 Mar-13 15:30	**Source:**	Lehigh Permanente		
Sample Age:	28h (13 °C)	**Station:**	Pond 9		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
11-2082-6583	7d Survival Rate	0	>0		21.2%		Equal Variance t Two-Sample Test
09-5428-7602	7d Survival Rate	100	>100	NA	21.0%	1	Steel Many-One Rank Sum Test
12-2484-4748	Mean Dry Biomass-mg	0	>0		13.0%		Equal Variance t Two-Sample Test
19-5313-5716	Mean Dry Biomass-mg	100	>100	NA	16.7%	1	Dunnett Multiple Comparison Test
10-0143-0446	Mean Dry Weight-mg	0	>0		19.4%		Equal Variance t Two-Sample Test
05-7531-8896	Mean Dry Weight-mg	100	>100	NA	15.5%	1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
07-7141-6006	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	
07-2453-6568	Mean Dry Weight-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	

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

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	0.9	0.847	0.953	0.7	1	0.0707	0.141	15.7%	0.0%
0	Lab Water Contr	4	0.9	0.857	0.943	0.8	1	0.0577	0.115	12.8%	0.0%
6.25		4	0.925	0.869	0.981	0.7	1	0.075	0.15	16.2%	-2.78%
12.5		4	0.925	0.889	0.961	0.8	1	0.0479	0.0957	10.4%	-2.78%
25		4	0.925	0.889	0.961	0.8	1	0.0479	0.0957	10.4%	-2.78%
50		4	0.95	0.928	0.972	0.9	1	0.0289	0.0577	6.08%	-5.56%
100		4	0.95	0.928	0.972	0.9	1	0.0289	0.0577	6.08%	-5.56%

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	0.791	0.77	0.812	0.729	0.864	0.0277	0.0555	7.02%	0.0%
0	Lab Water Contr	4	0.702	0.674	0.73	0.62	0.777	0.0379	0.0759	10.8%	11.3%
6.25		4	0.742	0.711	0.773	0.641	0.84	0.0415	0.083	11.2%	6.19%
12.5		4	0.688	0.666	0.71	0.632	0.77	0.0292	0.0584	8.5%	13.0%
25		4	0.736	0.717	0.755	0.672	0.789	0.0257	0.0515	6.99%	6.92%
50		4	0.852	0.818	0.885	0.774	0.969	0.0448	0.0895	10.5%	-7.65%
100		4	0.867	0.85	0.883	0.822	0.925	0.0218	0.0435	5.02%	-9.54%

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	0.895	0.838	0.952	0.787	1.12	0.0766	0.153	17.1%	0.0%
0	Lab Water Contr	4	0.782	0.772	0.792	0.755	0.82	0.0137	0.0274	3.5%	12.7%
6.25		4	0.811	0.779	0.842	0.723	0.916	0.0426	0.0852	10.5%	9.45%
12.5		4	0.746	0.728	0.764	0.68	0.79	0.0239	0.0479	6.41%	16.7%
25		4	0.803	0.764	0.843	0.672	0.9	0.0529	0.106	13.2%	10.3%
50		4	0.897	0.864	0.93	0.79	0.97	0.0441	0.0882	9.83%	-0.22%
100		4	0.913	0.901	0.925	0.869	0.944	0.016	0.032	3.5%	-1.98%

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	0.7	0.9	1
0	Lab Water Contr	0.8	1	0.8	1
6.25		1	0.7	1	1
12.5		0.9	1	1	0.8
25		0.8	1	0.9	1
50		1	1	0.9	0.9
100		1	1	0.9	0.9

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	0.864	0.784	0.729	0.787
0	Lab Water Contr	0.62	0.777	0.656	0.755
6.25		0.723	0.641	0.764	0.84
12.5		0.67	0.68	0.77	0.632
25		0.72	0.672	0.789	0.764
50		0.969	0.79	0.774	0.873
100		0.869	0.925	0.822	0.85

Mean Dry Weight-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	0.864	1.12	0.81	0.787
0	Lab Water Contr	0.775	0.777	0.82	0.755
6.25		0.723	0.916	0.764	0.84
12.5		0.744	0.68	0.77	0.79
25		0.9	0.672	0.877	0.764
50		0.969	0.79	0.86	0.97
100		0.869	0.925	0.913	0.944

7d Survival Rate Binomials

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

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

Analysis ID:	09-5428-7602	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	04 Apr-13 11:11	**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	21.0%	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	19	10	2	6	0.9055	Asymp	Non-Significant Effect
		12.5	19	10	3	6	0.9055	Asymp	Non-Significant Effect
		25	19	10	3	6	0.9055	Asymp	Non-Significant Effect
		50	20	10	2	6	0.9516	Asymp	Non-Significant Effect
		100	20	10	2	6	0.9516	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.01416641	0.002833281	5	0.125	0.9849	Non-Significant Effect
Error	0.4084757	0.02269309	18			
Total	0.4226421		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	2.66	15.1	0.7521	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.873	0.884	0.0061	Non-normal Distribution

7d Survival Rate Summary

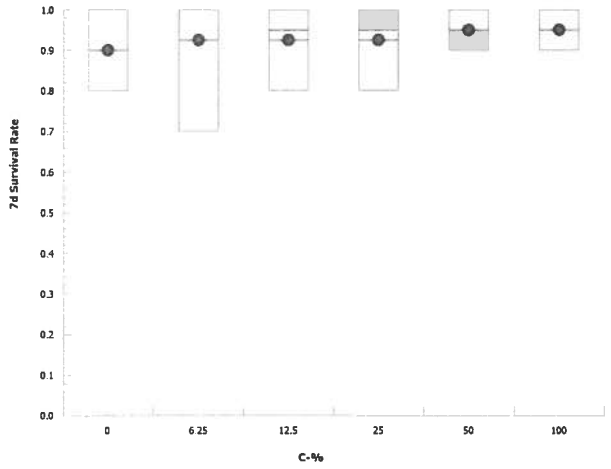
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	0.9	0.716	1	0.9	0.8	1	0.0577	12.8%	0.0%
6.25		4	0.925	0.686	1	1	0.7	1	0.075	16.2%	-2.78%
12.5		4	0.925	0.773	1	0.95	0.8	1	0.0479	10.4%	-2.78%
25		4	0.925	0.773	1	0.95	0.8	1	0.0479	10.4%	-2.78%
50		4	0.95	0.858	1	0.95	0.9	1	0.0289	6.08%	-5.56%
100		4	0.95	0.858	1	0.95	0.9	1	0.0289	6.08%	-5.56%

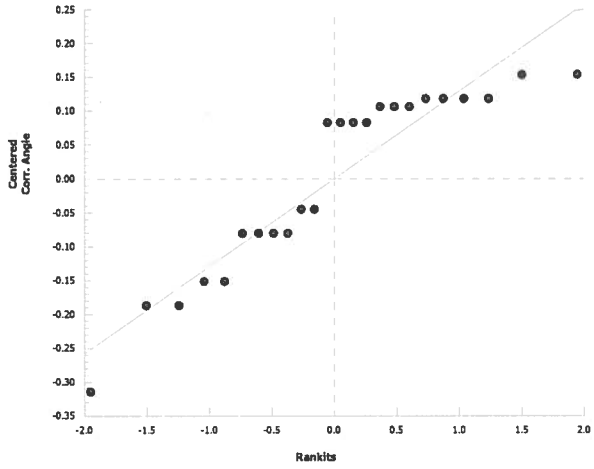
Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Cont	4	1.26	0.98	1.54	1.26	1.11	1.41	0.088	14.0%	0.0%
6.25		4	1.31	0.972	1.64	1.41	0.991	1.41	0.105	16.1%	-3.75%
12.5		4	1.3	1.06	1.53	1.33	1.11	1.41	0.0735	11.3%	-2.82%
25		4	1.3	1.06	1.53	1.33	1.11	1.41	0.0735	11.3%	-2.82%
50		4	1.33	1.18	1.48	1.33	1.25	1.41	0.047	7.07%	-5.63%
100		4	1.33	1.18	1.48	1.33	1.25	1.41	0.047	7.07%	-5.63%

Chronic Larval Fish Survival and Growth Test					Pacific EcoRisk
Analysis ID:	09-5428-7602	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	04 Apr-13 11:11	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Graphics





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

Analysis ID: 19-5313-5716 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.8.5
Analyzed: 04 Apr-13 11:11 **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	16.7%	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	-0.819	2.41	0.118	6	0.9722	CDF	Non-Significant Effect
		12.5	0.287	2.41	0.118	6	0.7354	CDF	Non-Significant Effect
		25	-0.701	2.41	0.118	6	0.9626	CDF	Non-Significant Effect
		50	-3.06	2.41	0.118	6	1.0000	CDF	Non-Significant Effect
		100	-3.37	2.41	0.118	6	1.0000	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.1161431	0.02322862	5	4.87	0.0054	Significant Effect
Error	0.08585501	0.004769722	18			
Total	0.2019981		23			

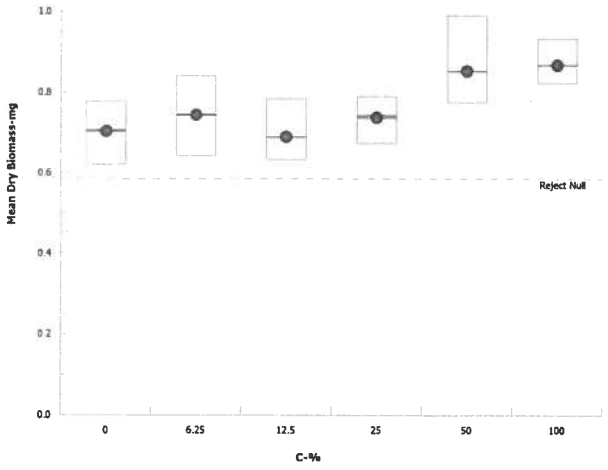
Distributional Tests

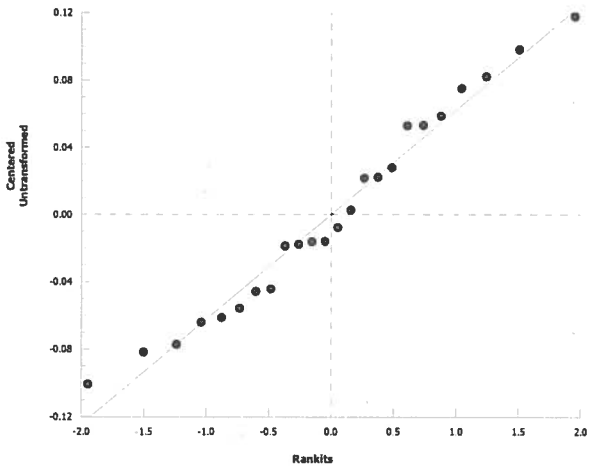
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	2.05	15.1	0.8424	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.968	0.884	0.6119	Normal Distribution

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	0.702	0.581	0.823	0.706	0.62	0.777	0.0379	10.8%	0.0%
6.25		4	0.742	0.61	0.874	0.743	0.641	0.84	0.0415	11.2%	-5.7%
12.5		4	0.688	0.595	0.781	0.675	0.632	0.77	0.0292	8.5%	1.99%
25		4	0.736	0.654	0.818	0.742	0.672	0.789	0.0257	6.99%	-4.88%
50		4	0.852	0.709	0.994	0.832	0.774	0.969	0.0448	10.5%	-21.3%
100		4	0.867	0.797	0.936	0.86	0.822	0.925	0.0218	5.02%	-23.4%

Graphics





CETIS Analytical Report

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

Analysis ID:	07-7141-6006	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.5
Analyzed:	04 Apr-13 11:11	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1281705	200	Yes	Two-Point Interpolation

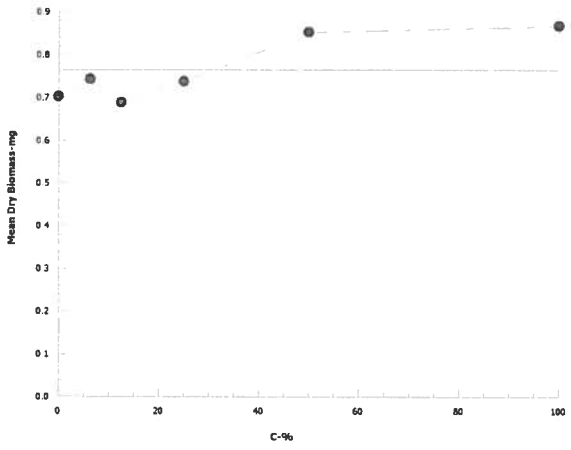
Point Estimates

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	0.702	0.62	0.777	0.0379	0.0759	10.8%	0.0%
6.25		4	0.742	0.641	0.84	0.0415	0.083	11.2%	-5.7%
12.5		4	0.688	0.632	0.77	0.0292	0.0584	8.5%	1.99%
25		4	0.736	0.672	0.789	0.0257	0.0515	6.99%	-4.88%
50		4	0.852	0.774	0.969	0.0448	0.0895	10.5%	-21.3%
100		4	0.867	0.822	0.925	0.0218	0.0435	5.02%	-23.4%

Graphics



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Lehigh Permanente**
Test Material: Pond 9
Test ID#: 51253 Project #: 20780
Test Date: 3/26/13 Randomization: 4.6.3

Organism Log#: 7154 Age: < 48 hrs
Organism Supplier: Aquatox
Control/Diluent: EPAMH
Control Water Batch: 1581

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	8.02	7.77	8.6	7.6	304	8	10	8	10	Date: 3.30.13
6.25	25.5	7.89	7.73	8.6	8.0	397	10	7	10	10	Sample ID: 31432
12.5	25.5	7.87	7.80	8.7	7.9	476	9	10	10	9	Test Solution Prep: A
25	25.5	7.71	7.87	8.8	8.1	632	8	10	9	10	New WQ: DH
50	25.5	7.60	8.03	9.1	8.1	915	10	10	9	9	Renewal Time: 1030
100	25.5	7.48	8.20	10.1	7.9	1456	10	10	9	9	Renewal Signoff: DS
Meter ID	30A	PH15	pH16	RD06	RD07	EC07					Old WQ: DS
Lab Water	25.7	8.10	7.72	8.7	7.0	299	8	10	8	10	Date: 3.31.13
6.25	25.7	7.94	7.74	8.7	7.0	391	10	7	10	10	Sample ID: 31432
12.5	25.7	7.86	7.75	8.7	6.8	480	9	10	10	9	Test Solution Prep: A
25	25.7	7.80	7.92	8.8	7.0	634	8	10	9	10	New WQ: FOUR
50	25.7	7.73	8.04	9.2	7.2	919	10	10	9	9	Renewal Time: 1145
100	25.7	7.66	8.13	10.4	7.2	1459	10	10	9	9	Renewal Signoff: KR
Meter ID	30A	PH19	pH15	RD04	RD06	EC06					Old WQ: LO
Lab Water	25.8	8.21	7.89	8.8	7.8	298	8	10	8	10	Date: 4/1/13
6.25	25.8	8.02	7.84	8.5	7.7	394	10	7	10	10	Sample ID: 31432
12.5	25.8	7.94	7.91	8.2	7.9	468	9	10	10	9	Test Solution Prep: A2
25	25.8	7.80	7.96	8.3	7.7	625	8	10	9	10	New WQ: MM
50	25.8	7.73	8.10	8.5	7.7	913	10	10	9	9	Renewal Time: 1000
100	25.8	7.66	8.20	8.7	8.0	1440	10	10	9	9	Renewal Signoff: [signature]
Meter ID	30A	PH15	pH15	RD06	RD06	EC06					Old WQ: CA
Lab Water	25.3		7.84		7.2	315	8	10	8	10	Date: 4/2/13
6.25	25.3		7.73		7.5	408	10	7	10	10	Sample ID:
12.5	25.3		7.71		7.3	491	9	10	10	8	Termination Time: 0830
25	25.3		7.70		7.2	660	8	10	9	10	Termination Signoff: [signature]
50	25.3		7.79		6.9	959	10	10	9	9	Old WQ: RA
100	25.3		8.05		7.3	1502	10	10	9	9	
Meter ID	30A		PH16		RD04	EC07					

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Lehigh Permanente**
Test Material: Pond 9
Test ID#: 51253 Project #: 20780
Test Date: 3/26/13 Randomization: 4.6.3

Organism Log#: 7154 Age: 48 hrs
Organism Supplier: Aquatox
Control/Diluent: EPAMH
Control Water Batch: 1581

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	8.01		8.6		292	10	10	10	10	Date 3/26/13
6.25	25.3	7.91		8.7		365	10	10	10	10	Sample ID 31334
12.5	25.3	~~7.71~~ 7.88 DH		8.9		~~587~~ 441 pH	10	10	10	10	Test Solution Prep
25	25.3	7.71		8.9		587	10	10	10	10	New WQ DH
50	25.3	7.59		9.0		861	10	10	10	10	Initiation Time 1640
100	25.3	7.46		10.1		1371	10	10	10	10	Initiation Signoff
Meter ID	30A	PH18		RD06		EC06					
Lab Water	25.6	8.02	7.98	8.7	7.7	294	10	10	10	10	Date 3.27.13
6.25	25.6	7.97	7.87	8.5	7.7	381	10	10	10	10	Sample ID 31334
12.5	25.6	7.92	7.80	8.5	7.2	456	9	10	10	10	Test Solution Prep
25	25.6	7.92	7.84	8.6	7.3	606	9	10	10	10	New WQ FOUR
50	25.6	7.87	7.92	9.0	6.9	888	10	10	9	10	Renewal Time 1030
100	25.6	7.86	8.12	9.6	7.2	1398	10	10	10	10	Renewal Signoff SV
Meter ID	30A	PH15	PH16	RD07	RD04	EC04					Old WQ DH
Lab Water	25.8	8.15	7.92	7.8	8.0	295	9	10	8	10	Date 3.28.13
6.25	25.8	8.04	7.85	8.2	7.1	379	10	9	10	10	Sample ID 31378
12.5	25.8	7.95	7.83	8.2	7.8	460	9	10	10	9	Test Solution Prep
25	25.8	7.86	7.87	8.2	7.7	608	8	10	9	10	New WQ JLA
50	25.8	7.74	8.04	8.2	7.7	889	10	10	9	10	Renewal Time 1100
100	25.8	7.60	8.20	8.4	7.7	1400	10	10	9	9	Renewal Signoff DS
Meter ID	30A	PH16	PH15	RD07	RD04	EC04					Old WQ
Lab Water	25.9	7.96	7.74	8.4	8.3	298	8	10	8	10	Date 3.29.13
6.25	25.9	7.89	7.78	8.5	8.1	384	10	8	10	10	Sample ID 31378
12.5	25.9	7.84	7.80	8.6	8.0	469	9	10	10	9	Test Solution Prep
25	25.9	7.77	7.93	8.7	8.2	612	8	10	9	10	New WQ NL
50	25.9	7.71	8.07	8.6	8.2	894	10	10	9	10	Renewal Time 1200
100	25.7	7.64	8.18	9.7	8.2	1402	10	10	9	9	Renewal Signoff
Meter ID	30A	PH15	PH19	RD07	RD04	EC07					Old WQ DS

Fathead Minnow Dry Weight Data Sheet

Client: **Lehigh Permanente** Test ID #: 51253 Project # 20780

Sample: Pond 9 Tare Weight Date: 3/31/13 Sign-off: CA

Test Date: 3/26/13 Final Weight Date: 4/3/13 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	144.80	151.00	10	0.62
2		B	172.72	180.49	10	0.78
3		C	163.51	170.07	10	0.66
4		D	162.81	170.36	10	0.76
5	6.25	A	163.27	170.50	10	0.72
6		B	161.90	168.31	10	0.64
7		C	170.14	177.78	10	0.76
8		D	151.81	160.21	10	0.84
9	12.5	A	149.11	155.81	10	0.67
10		B	144.67	151.47	10	0.68
11		C	159.41	167.11	10	0.77
12		D	144.52	150.84	10	0.63
13	25	A	142.99	150.19	10	0.72
14		B	175.58	182.30	10	0.67
15		C	155.27	163.16	10	0.79
16		D	168.32	175.96	10	0.76
17	50	A	147.37	157.06	10	0.97
18		B	160.97	168.87	10	0.79
19		C	169.11	176.85	10	0.77
20		D	175.09	183.82	10	0.87
21	100	A	145.41	154.10	10	0.87
22		B	160.70	169.95	10	0.93
23		C	150.62	158.84	10	0.82
24		D	140.00	148.50	10	0.85
QA 1			136.35	136.38		
QA 2			143.77	143.77		
QA3			146.65	146.68		
Balance ID:			BAL01	BAL01		

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

Analysis ID:	11-2082-6583	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	04 Apr-13 11:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Angular (Corrected)	NA	C > T	NA	NA	21.2%	Passes 7d survival rate

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	-0.0488	1.94	0.258	6	0.5187	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	8.388313E-05	8.388313E-05	1	0.00238	0.9627	Non-Significant Effect
Error	0.2114119	0.03523531	6			
Total	0.2114958		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	1.27	47.5	0.8467	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.82	0.645	0.0471	Normal Distribution

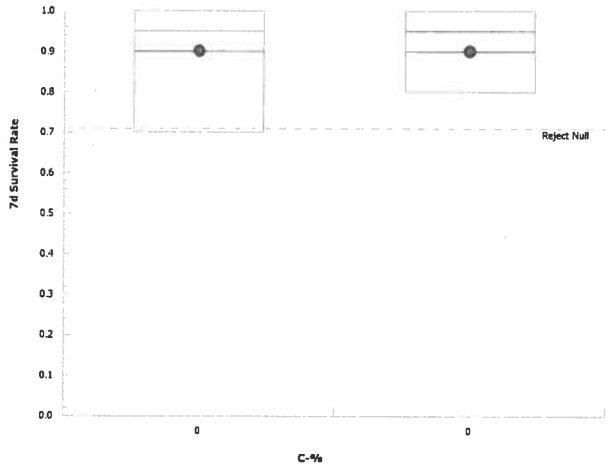
7d Survival Rate Summary

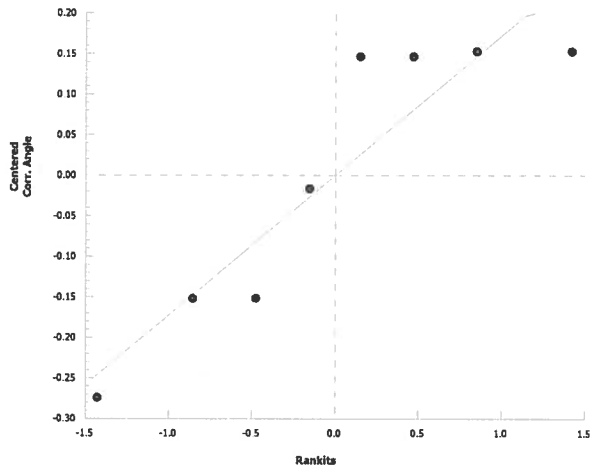
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	0.9	0.716	1	0.95	0.8	1	0.0577	12.8%	0.0%
0	Hardness Blank	4	0.9	0.675	1	0.95	0.7	1	0.0707	15.7%	0.0%

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	1.26	0.98	1.54	1.33	1.11	1.41	0.088	14.0%	0.0%
0	Hardness Blank	4	1.27	0.95	1.58	1.33	0.991	1.41	0.0994	15.7%	-0.51%

Graphics





Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID: 12-2484-4748 Endpoint: Mean Dry Biomass-mg CETIS Version: CETISv1.8.5
Analyzed: 04 Apr-13 11:12 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	13.0%	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	-1.89	1.94	0.091	6	0.9464	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.01584198	0.01584198	1	3.59	0.1071	Non-Significant Effect
Error	0.02651191	0.004418652	6			
Total	0.04235389		7			

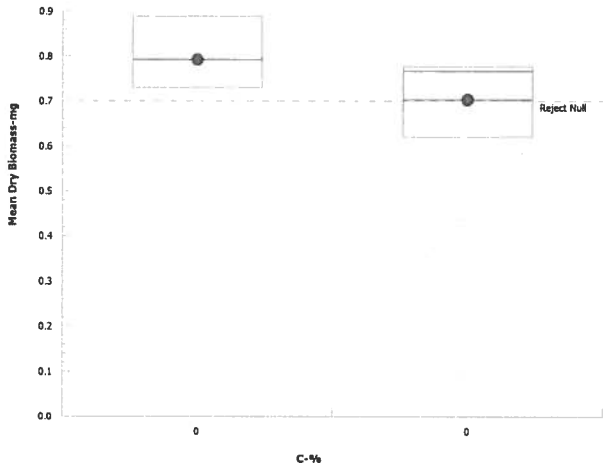
Distributional Tests

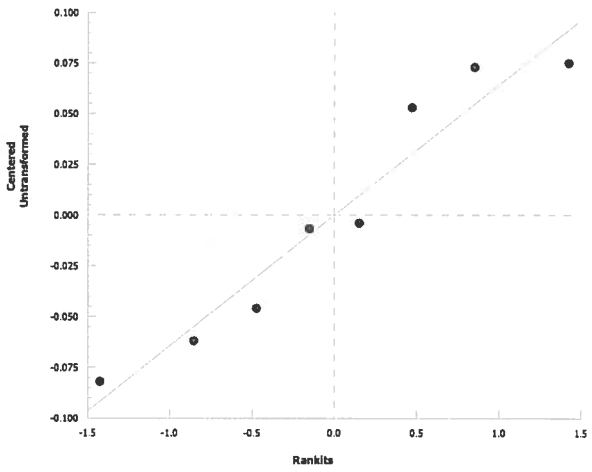
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	1.87	47.5	0.6201	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.909	0.645	0.3439	Normal Distribution

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	0.702	0.581	0.823	0.766	0.62	0.777	0.0379	10.8%	0.0%
0	Hardness Blank	4	0.791	0.703	0.879	0.766	0.729	0.864	0.0277	7.02%	-12.7%

Graphics





7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Lehigh Permanente
Test Material: Hardness Control
Test ID#: 5.1253 Project #: 20780
Test Date: 3/26/13 Randomization: 4.7.3

Organism Log#: 7154 Age: 48 hrs
Organism Supplier: Aquatox
Control/Diluent: EPAMH
Control Water Batch: 31337

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 Control	25.4	7.67		8.8		2475	10	10	10	10	Date 3.26.13 Test Solution Prep
											Initiation Time 1515
Meter ID	30A	PH18		RD06		EC06	New WQ 8H				Initiation Signoff
Hardness Control	25.6	8.68	8.58	8.8	6.0	2463	10	9	9	10	Date 3.27.13 Test Solution Prep
											Renewal Time 1215
Meter ID	30A	PH15	PH16	RD07	RD04	EC04	New WQ ~~FOUR~~		Old WQ DH		Renewal Signoff SVV
Hardness Control	25.9	8.66 ~~8.58~~ PH	8.56	8.7 ~~6.6~~ DH	6.4	2456 ~~2470~~ DH	10	8	9	10	Date 3.28.13 Test Solution Prep
											Renewal Time 1115
Meter ID	30A	PH16	PH18	RD07	RD06	EC06	New WQ NH		Old WQ JLA		Renewal Signoff KP
Hardness Control	25.8	8.66	8.54	8.8	8.0	2491	10	7	9	10	Date 3.29.13 Test Solution Prep
											Renewal Time 1245
Meter ID	30A	PH15	PH15	RD07	RD07	EC07	New WQ NH		Old WQ RS		Renewal Signoff KP
Hardness Control	25.5	8.66	8.56	8.5	8.1	2493	10	7	9	10	Date 3.30.13 Test Solution Prep
											Renewal Time 1030
Meter ID	30A	PH15	PH19	RD06	RD04	EC07	New WQ KT		Old WQ ~~FOUR~~		Renewal Signoff KP
Hardness Control	25.7	8.57	8.45	8.9	6.1	2509	10	7	9	10	Date 3.31.13 Test Solution Prep
											Renewal Time 1305
Meter ID	30A	PH19	PH15	RD04	RD06	EC06	New WQ ~~FOUR~~		Old WQ CA		Renewal Signoff YL
Hardness Control	25.7	8.68	8.45 ~~7.74~~	8.1	6.9 ~~7.2~~	2495	10	7	9	10	Date 4/1/13 Test Solution Prep
											Renewal Time 1030
Meter ID	30A	PH16	PH15	RD07	RD06	EC04	New WQ MO		Old WQ YU		Renewal Signoff
Hardness Control	25.3		8.36		6.7	2525	10	7	9	10	Date 4/2/13 Termination Time 0820
Meter ID	30A		PH16		RD04	EC07			Old WQ YU		Termination Signoff

Fathead Minnow Dry Weight Data Sheet

Client: **Lehigh Permanente** Test ID #: 51252 Project # 20780

Test Material: Hardness Control Tare Weight Date: 4/1/13 Sign-off: CA

Test Date: 3/26/13 Final Weight Date: 4/3/13 Sign-off: JLA

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
25	Hardness Control	A	142.88	151.52	10	0.86
24		B	159.60	167.44	10	0.78
27		C	156.68	163.97	10	0.73
28		D	146.34	154.21	10	0.79
~~XB QA~~ 5			BAL01	BAL01		

Appendix L

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

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

Batch ID:	06-2096-9375	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Melinda Hooper
Start Date:	26 Mar-13 15:30	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	02 Apr-13 08:20	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 17h	**Source:**	Aquatox, AR	**Age:**	1

Sample ID:	18-4833-2657	**Code:**	Pond 13	**Client:**	Lehigh Permanente
Sample Date:	25 Mar-13 11:57	**Material:**	Effluent	**Project:**	20780
Receive Date:	25 Mar-13 15:30	**Source:**	Lehigh Permanente		
Sample Age:	28h (9 °C)	**Station:**	Pond 13		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
04-9970-2766	7d Survival Rate	0	>0		15.0%		Equal Variance t Two-Sample Test
09-3742-8177	7d Survival Rate	100	>100	NA	13.9%	1	Steel Many-One Rank Sum Test
12-7328-4775	Mean Dry Biomass-mg	<0	0		10.1%		Equal Variance t Two-Sample Test
18-7544-2316	Mean Dry Biomass-mg	50	100	70.71	12.0%	2	Dunnett Multiple Comparison Test
06-3759-4864	Mean Dry Weight-mg	0	>0		16.0%		Equal Variance t Two-Sample Test
15-5847-7969	Mean Dry Weight-mg	50	>50	NA	9.55%	2	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
11-9463-4293	Mean Dry Biomass-mg	IC5	3.39	1.17	112	29.51	Linear Interpolation (ICPIN)
		IC10	55.5	N/A	N/A	1.803	
		IC15	90.6	N/A	N/A	1.103	
		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	
03-5788-6635	Mean Dry Weight-mg	IC5	4.96	2.02	N/A	20.17	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	

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

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	0.9	0.847	0.953	0.7	1	0.0707	0.141	15.7%	0.0%
0	Lab Water Contr	4	0.95	0.928	0.972	0.9	1	0.0289	0.0577	6.08%	-5.56%
6.25		4	0.925	0.906	0.944	0.9	1	0.025	0.05	5.41%	-2.78%
12.5		4	0.925	0.889	0.961	0.8	1	0.0479	0.0957	10.4%	-2.78%
25		4	0.95	0.928	0.972	0.9	1	0.0289	0.0577	6.08%	-5.56%
50		4	0.925	0.889	0.961	0.8	1	0.0479	0.0957	10.4%	-2.78%
100		4	0.825	0.789	0.861	0.7	0.9	0.0479	0.0957	11.6%	8.33%

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	0.791	0.77	0.812	0.729	0.864	0.0277	0.0555	7.02%	0.0%
0	Lab Water Contr	4	0.912	0.883	0.941	0.852	1.02	0.0387	0.0775	8.49%	-15.3%
6.25		4	0.762	0.759	0.765	0.752	0.77	0.00406	0.00812	1.07%	3.67%
12.5		4	0.833	0.821	0.846	0.795	0.869	0.0163	0.0326	3.92%	-5.37%
25		4	0.844	0.827	0.86	0.794	0.897	0.0216	0.0431	5.12%	-6.64%
50		4	0.873	0.845	0.902	0.795	0.98	0.0386	0.0772	8.84%	-10.4%
100		4	0.763	0.726	0.8	0.646	0.876	0.0495	0.0991	13.0%	3.51%

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	0.895	0.838	0.952	0.787	1.12	0.0766	0.153	17.1%	0.0%
0	Lab Water Contr	4	0.96	0.945	0.974	0.927	1.02	0.0194	0.0388	4.05%	-7.19%
6.25		4	0.825	0.811	0.84	0.767	0.856	0.0199	0.0398	4.82%	7.81%
12.5		4	0.907	0.878	0.936	0.82	0.994	0.0387	0.0773	8.53%	-1.29%
25		4	0.889	0.871	0.907	0.83	0.948	0.0242	0.0485	5.45%	0.67%
50		4	0.947	0.924	0.97	0.859	0.994	0.0304	0.0608	6.42%	-5.79%
100		4	0.927	0.895	0.96	0.808	1.01	0.0433	0.0865	9.33%	-3.57%

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	0.7	0.9	1
0	Lab Water Contr	1	0.9	1	0.9
6.25		1	0.9	0.9	0.9
12.5		0.9	0.8	1	1
25		1	0.9	1	0.9
50		1	0.9	1	0.8
100		0.8	0.9	0.9	0.7

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	0.864	0.784	0.729	0.787
0	Lab Water Contr	0.927	0.854	1.02	0.852
6.25		0.767	0.759	0.77	0.752
12.5		0.85	0.795	0.869	0.82
25		0.83	0.853	0.897	0.794
50		0.859	0.86	0.98	0.795
100		0.804	0.727	0.876	0.646

Mean Dry Weight-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	0.864	1.12	0.81	0.787
0	Lab Water Contr	0.927	0.949	1.02	0.947
6.25		0.767	0.843	0.856	0.836
12.5		0.944	0.994	0.869	0.82
25		0.83	0.948	0.897	0.882
50		0.859	0.956	0.98	0.994
100		1.01	0.808	0.973	0.923

7d Survival Rate Binomials

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

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

Analysis ID:	09-3742-8177	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	04 Apr-13 10:17	**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	13.9%	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	3	6	0.6105	Asymp	Non-Significant Effect
		12.5	17	10	3	6	0.7334	Asymp	Non-Significant Effect
		25	18	10	3	6	0.8333	Asymp	Non-Significant Effect
		50	17	10	3	6	0.7334	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	0.09109645	0.01821929	5	1.32	0.3016	Non-Significant Effect
Error	0.2492934	0.01384963	18			
Total	0.3403898		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	1.66	15.1	0.8939	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.87	0.884	0.0053	Non-normal Distribution

7d Survival Rate Summary

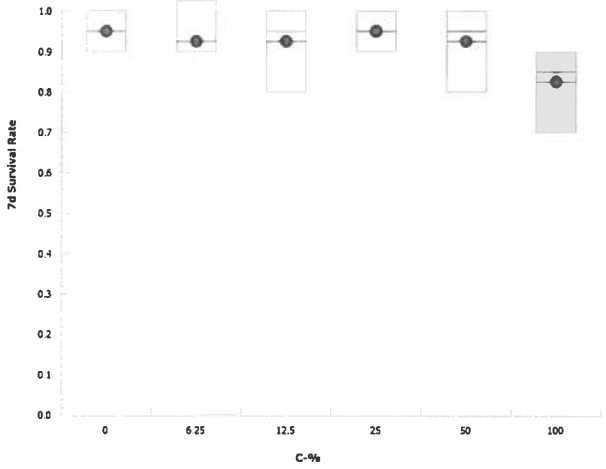
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	0.95	0.858	1	0.95	0.9	1	0.0289	6.08%	0.0%
6.25		4	0.925	0.845	1	0.9	0.9	1	0.025	5.41%	2.63%
12.5		4	0.925	0.773	1	0.95	0.8	1	0.0479	10.4%	2.63%
25		4	0.95	0.858	1	0.95	0.9	1	0.0289	6.08%	0.0%
50		4	0.925	0.773	1	0.95	0.8	1	0.0479	10.4%	2.63%
100		4	0.825	0.673	0.977	0.85	0.7	0.9	0.0479	11.6%	13.2%

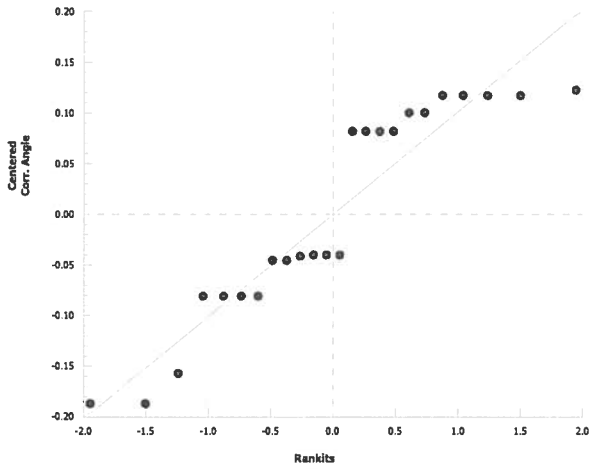
Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Cont	4	1.33	1.18	1.48	1.33	1.25	1.41	0.047	7.07%	0.0%
6.25		4	1.29	1.16	1.42	1.25	1.25	1.41	0.0407	6.32%	3.06%
12.5		4	1.3	1.06	1.53	1.33	1.11	1.41	0.0735	11.3%	2.67%
25		4	1.33	1.18	1.48	1.33	1.25	1.41	0.047	7.07%	0.0%
50		4	1.3	1.06	1.53	1.33	1.11	1.41	0.0735	11.3%	2.67%
100		4	1.15	0.951	1.35	1.18	0.991	1.25	0.0624	10.9%	13.6%

Chronic Larval Fish Survival and Growth Test					Pacific EcoRisk
Analysis ID:	09-3742-8177	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	04 Apr-13 10:17	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Graphics





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

Analysis ID:	18-7544-2316	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.5
Analyzed:	04 Apr-13 10:21	**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	12.0%	50	100	70.71	2

Dunnett Multiple Comparison Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25*	3.31	2.41	0.109	6	0.0081	CDF	Significant Effect
		12.5	1.73	2.41	0.109	6	0.1612	CDF	Non-Significant Effect
		25	1.51	2.41	0.109	6	0.2238	CDF	Non-Significant Effect
		50	0.853	2.41	0.109	6	0.4881	CDF	Non-Significant Effect
		100*	3.28	2.41	0.109	6	0.0086	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.07168227	0.01433645	5	3.47	0.0226	Significant Effect
Error	0.07431632	0.004128684	18			
Total	0.1459986		23			

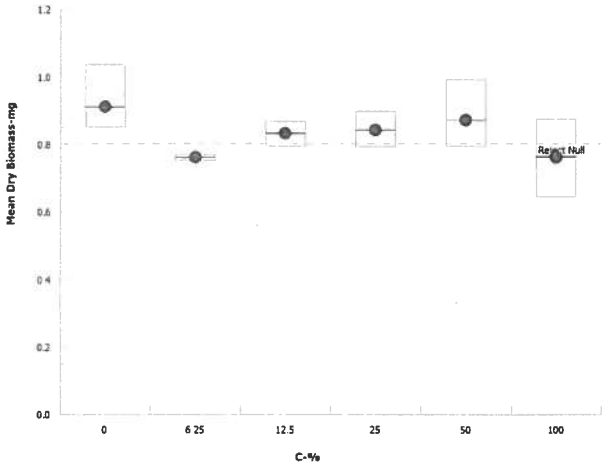
Distributional Tests

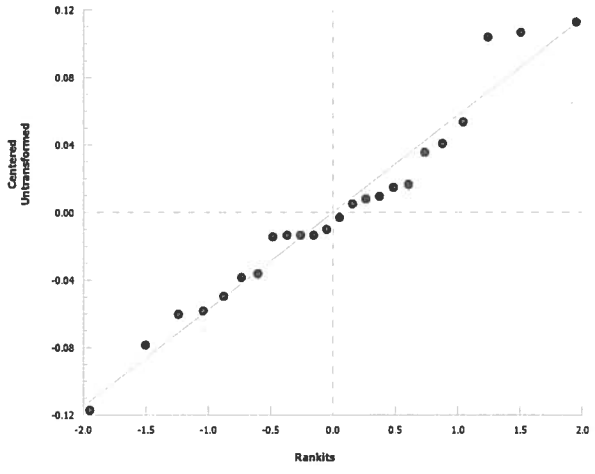
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	12.4	15.1	0.0294	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.96	0.884	0.4469	Normal Distribution

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	0.912	0.789	1.04	0.89	0.852	1.02	0.0387	8.49%	0.0%
6.25		4	0.762	0.749	0.775	0.763	0.752	0.77	0.00406	1.07%	16.5%
12.5		4	0.833	0.782	0.885	0.835	0.795	0.869	0.0163	3.92%	8.63%
25		4	0.844	0.775	0.912	0.842	0.794	0.897	0.0216	5.12%	7.54%
50		4	0.873	0.751	0.996	0.859	0.795	0.98	0.0386	8.84%	4.25%
100		4	0.763	0.606	0.921	0.766	0.646	0.876	0.0495	13.0%	16.3%

Graphics





CETIS Analytical Report

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

Analysis ID:	11-9463-4293	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.5
Analyzed:	04 Apr-13 10:21	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	304516	200	Yes	Two-Point Interpolation

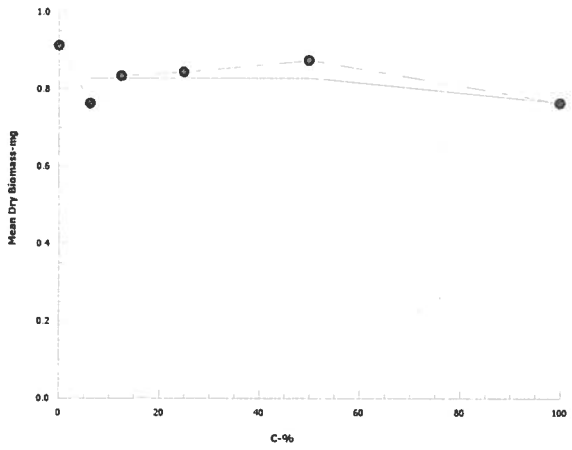
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	3.39	1.17	112	29.51	0.8903	85.18
IC10	55.5	N/A	N/A	1.803	NA	NA
IC15	90.6	N/A	N/A	1.103	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	0.912	0.852	1.02	0.0387	0.0775	8.49%	0.0%
6.25		4	0.762	0.752	0.77	0.00406	0.00812	1.07%	16.5%
12.5		4	0.833	0.795	0.869	0.0163	0.0326	3.92%	8.63%
25		4	0.844	0.794	0.897	0.0216	0.0431	5.12%	7.54%
50		4	0.873	0.795	0.98	0.0386	0.0772	8.84%	4.25%
100		4	0.763	0.646	0.876	0.0495	0.0991	13.0%	16.3%

Graphics



Analyst: QA:

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Lehigh Permanente** Organism Log#: 7154 Age: <48 hrs.
Test Material: Pond 13 Organism Supplier: Aquatox
Test ID#: 51254 Project #: 20780 Control/Diluent: EPAMH
Test Date: 3/26/13 Randomization: 4.6.2 Control Water Batch: 1581

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	8.01	7.96	8.6	8.1	303	10	10	10	9	Date: 3.30.13
6.25	25.5	8.04	7.92	8.5	8.1	372	10	9	9	9	Sample ID: 31433
12.5	25.5	8.05	7.92	8.7	8.1	447	10	8	10	10	Test Solution Prep: A
25	25.5	8.05	7.95	8.8	8.0	556	10	9	10	10	New WQ: DH
50	25.5	8.06	8.07	8.9	8.0	799	10	9	10	8	Renewal Time: 1035
100	25.5	8.05	8.10	10.1	8.0	1233	8	9	9	8	Renewal Signoff: SS
Meter ID	30A	PH15	PH19	RD06	RD04	EC07					Old WQ: FOUR
Lab Water	25.7	8.02	7.91	8.7	8.3	301	10	10	10	9	Date: 3.31.13
6.25	25.7	7.96	7.87	8.7	8.2	379	10	9	9	9	Sample ID: 31433
12.5	25.7	7.98	7.87	8.7	8.1	442	10	8	10	10	Test Solution Prep: A
25	25.7	7.95	7.89	8.8	8.1	564	10	9	10	10	New WQ: FOUR
50	25.7	7.94	7.96	9.4	8.1	805	10	9	10	8	Renewal Time: 1130
100	25.7	7.97	8.01	10.7	8.0	1231	8	9	9	7	Renewal Signoff:
Meter ID	30A	PH19	PH19	RD04	RD04	EC06					Old WQ: FOUR
Lab Water	25.7	8.11	8.12	8.4	8.1	302	10	9	10	9	Date: 4/1/13
6.25	25.7	8.07	7.96	8.3	7.9	374	10	9	9	9	Sample ID: 31433
12.5	25.7	8.07	7.93	8.4	7.8	448	10	8	10	10	Test Solution Prep: A
25	25.7	8.08	7.93	8.6	7.8	575	10	9	10	10	New WQ:
50	25.7	8.04	7.98	8.6	7.9	803	10	9	10	8	Renewal Time: 1000
100	25.7	8.00	8.11	8.6	7.9	1218	8	9	9	7	Renewal Signoff:
Meter ID	30A	PH15	PH15	RD06	RD06	EC06					Old WQ:
Lab Water	25.4		8.01		8.0	317	10	9	10	9	Date: 4/2/13
6.25	25.4		7.92		8.1	391	10	9	9	9	Sample ID: —
12.5	25.4		7.87		7.9	468	9	8	10	10	Termination Time: 0820
25	25.4		7.84		7.8	595	10	9	10	9	Termination Signoff: SVV
50	25.4		7.98		8.0	838	10	9	10	8	Old WQ: RA
100	25.4		8.00		8.0	1264	8	9	9	7	
Meter ID	30A		PH16		RD04	EC07					

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Lehigh Permanente** Organism Log#: 7154 Age: 48 hrs.
Test Material: Pond 13 Organism Supplier: Aquatox
Test ID#: 51254 Project #: 20780 Control/Diluent: EPAMH
Test Date: 3/26/13 Randomization: 4.6.2 Control Water Batch: 1681

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	8.01		8.1		297	10	10	10	10	Date 3/26/13
6.25	25.5	8.01		8.2		375	10	10	10	10	Sample ID 31335
12.5	25.5	8.02		8.4		443	10	10	10	10	Test Solution Prep
25	25.5	8.01		8.5		580	10	10	10	10	New WQ
50	25.5	8.01		8.6		824	10	10	10	10	Initiation Time 1530
100	25.5	8.00		9.3		1272	10	10	10	10	Initiation Signoff MF
Meter ID	30A	PH15		RD07 ~~RD7~~		EC04					
Lab Water	25.9	7.98	7.92	8.3	6.9	294	10	10	10	10	Date: 3.27.13
6.25	25.9	8.01	7.78	8.4	7.2	379	10	10	9	10	Sample ID 31335
12.5	25.9	8.02	7.78	8.5	7.3	443	10	9	10	10	Test Solution Prep
25	25.9	8.07	7.73	8.7	7.0	592	10	10	10	10	New WQ: ~~TOUS~~
50	25.9	8.04	7.92	8.8	7.2	825	10	10	10	10	Renewal Time 1420
100	25.9	8.04	7.95	9.5	7.3	1275	10	10	10	10	Renewal Signoff
Meter ID	30A	PH15	PH19	RD07	RD07	EC04					Old WQ: JLA
Lab Water	25.9	8.07	7.95	7.9	6.9	294	10	10	10	10	Date 3.28.13
6.25	25.9	8.00	7.85	7.9	7.2	368	10	10	9	10	Sample ID 31379
12.5	25.9	8.00	7.90	7.9	7.5	442	10	9	10	10	Test Solution Prep
25	25.9	8.03	7.91	8.1	7.5	571	10	10	10	10	New WQ: JLA
50	25.9	8.04	8.04	8.2	7.3	806	10	9	10	9	Renewal Time 1036
100	25.9	8.03	8.09	8.5	7.5	1240	9	10	9	10	Renewal Signoff KP
Meter ID	30A	PH16	PH16	RD07	RD07	EC04					Old WQ: dl
Lab Water	25.8	7.96	7.87	8.7	8.2	~~8.7~~ DH 300	10	10	10	10	Date 3.29.13
6.25	25.8	7.97	7.86	8.6	8.2	378	10	10	9	10	Sample ID 31379
12.5	25.8	8.00	7.90	8.8	8.1	452	10	8	10	10	Test Solution Prep
25	25.8	8.03	7.96	9.0	8.0	576	10	10	10	10	New WQ DH
50	25.8	8.08	8.07	9.2	8.1	833	10	9	10	8	Renewal Time 1400
100	25.8	8.08	8.11	9.9	8.0	1279	8	9	9	10	Renewal Signoff
Meter ID	30A	PH19	PH15	RD04	RD07	EC08					Old WQ: RS

Fathead Minnow Dry Weight Data Sheet

Client: **Lehigh Permanente** Test ID #: 51254 Project # 20780

Sample: Pond 13 Tare Weight Date: 3/31/13 Sign-off: CA

Test Date: 3/26/13 Final Weight Date: 4/3/13 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	~~140~~ 177.46	186.73	10	0.93
2		B	151.68	160.22	10	0.85
3		C	158.04	168.20	10	1.02
4		D	179.95	188.47	10	0.85
5	6.25	A	144.93	152.60	10	0.77
6		B	158.96	166.55	10	0.76
7		C	160.68	168.38	10	0.77
8		D	132.81	140.33	10	0.75
9	12.5	A	151.60	160.10	10	0.85
10		B	129.29	137.24	10	6.80
11		C	144.10	152.79	10	0.87
12		D	150.07	158.27	10	0.82
13	25	A	140.66	148.96	10	0.83
14		B	174.93	183.46	10	0.85
15		C	162.85	171.82	10	0.90
16		D	164.82	172.76	10	0.79
17	50	A	179.13	187.72	10	6.86
18		B	175.77	184.37	10	0.86
19		C	122.61	132.41	10	0.98
20		D	157.75	165.70	10	0.80
21	100	A	137.09	145.13	10	0.80
22		B	~~144~~ 152.45	159.72	10	0.73
23		C	150.75	159.51	10	0.88
24		D	184.03	190.49	10	0.65
QA 1			149.55	149.55		
QA 2			172.53	172.54		
QA3			148.59	148.63		
Balance ID:			BAL01	BAL01		

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

Analysis ID: 04-9970-2766 Endpoint: 7d Survival Rate CETIS Version: CETISv1.8.5
Analyzed: 04 Apr-13 10:17 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Angular (Corrected)	NA	C > T	NA	NA	15.0%	Passes 7d survival rate

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	0.586	1.94	0.214	6	0.2895	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.008313354	0.008313354	1	0.344	0.5789	Non-Significant Effect
Error	0.1450271	0.02417118	6			
Total	0.1533404		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	4.46	47.5	0.2510	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.897	0.645	0.2717	Normal Distribution

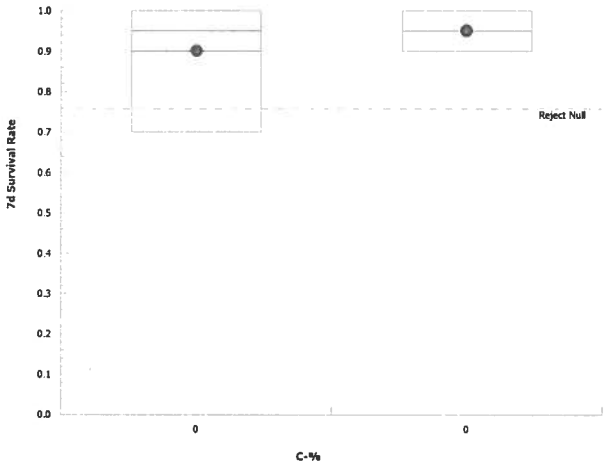
7d Survival Rate Summary

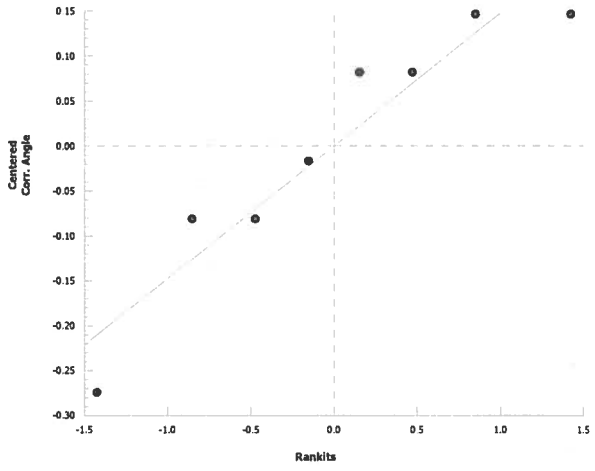
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	0.95	0.858	1	0.95	0.9	1	0.0289	6.08%	0.0%
0	Hardness Blank	4	0.9	0.675	1	0.95	0.7	1	0.0707	15.7%	5.26%

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	1.33	1.18	1.48	1.33	1.25	1.41	0.047	7.07%	0.0%
0	Hardness Blank	4	1.27	0.95	1.58	1.33	0.991	1.41	0.0994	15.7%	4.85%

Graphics





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

Analysis ID: 12-7328-4775 Endpoint: Mean Dry Biomass-mg CETIS Version: CETISv1.8.5
Analyzed: 04 Apr-13 10:21 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	10.1%	Fails 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	2.54	1.94	0.093	6	0.0219	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.02940302	0.02940302	1	6.48	0.0438	Significant Effect
Error	0.02724253	0.004540422	6			
Total	0.05664555		7			

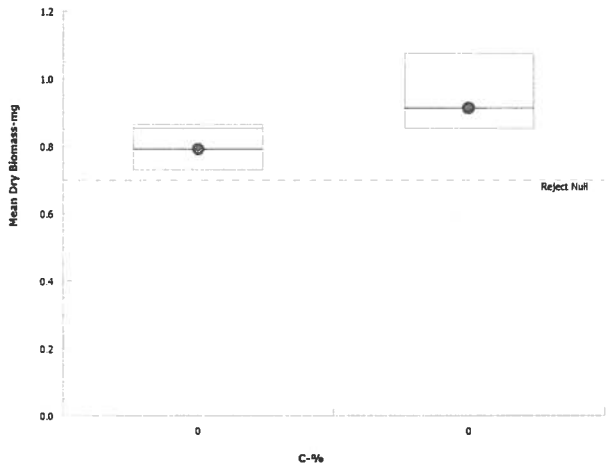
Distributional Tests

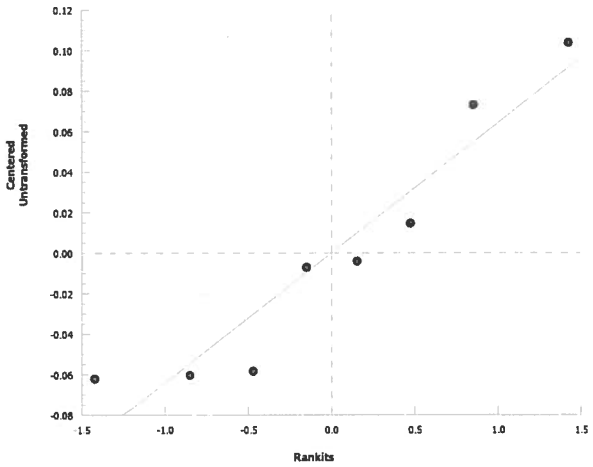
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	1.95	47.5	0.5975	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.886	0.645	0.2162	Normal Distribution

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	0.912	0.789	1.04	0.853	0.852	1.02	0.0387	8.49%	0.0%
0	Hardness Blank	4	0.791	0.703	0.879	0.853	0.729	0.864	0.0277	7.02%	13.3%

Graphics





7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Lehigh Permanente** Organism Log#: 7154 Age: 48 hrs
Test Material: Hardness Control Organism Supplier: Aquatox
Test ID#: 51254 Project #: 20780 Control/Diluent: EPAMH
Test Date: 3/26/13 Randomization: 4.7.3 Control Water Batch: 31337

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 Control	25.4	7.67		8.8		2475	10	10	10	10	Date 3.26.13 Test Solution Prep
											Initiation Time 1515
Meter ID	30A	PH18		RD06		EC06	New WQ SH				Initiation Signoff
Hardness Control	25.6	8.68	8.58	8.8	6.0	2463	10	9	9	10	Date 3.27.13 Test Solution Prep
											Renewal Time 1215
Meter ID	30A	PH15	PH16	RD07	RD04	EC04	New WQ ~~FOUR~~		Old WQ DH		Renewal Signoff SVV
Hardness Control	25.9	8.66 ~~8.58~~ PH	8.56	8.7 ~~6.6~~ DH	6.4	2456 ~~2470~~ DH	10	8	9	10	Date 3.28.13 Test Solution Prep
											Renewal Time 1115
Meter ID	30A	PH16	PH18	RD07	RD06	EC06	New WQ DH		Old WQ JLA		Renewal Signoff KP
Hardness Control	25.8	8.66	8.54	8.8	8.2	2491	10	7	9	10	Date 3.29.13 Test Solution Prep
											Renewal Time 1245
Meter ID	30A	PH15	PH15	RD07	RD07	EC07	New WQ DH		Old WQ RS		Renewal Signoff KP
Hardness Control	25.5	8.66	8.56	8.5	8.1	2493	10	7	9	10	Date 3.30.13 Test Solution Prep
											Renewal Time 1030
Meter ID	30A	PH15	PH19	RD06	RD04	EC07	New WQ KT		Old WQ ~~FOUR~~		Renewal Signoff KP
Hardness Control	~~25.7~~	8.57	8.45	8.9	6.1	2509	10	7	9	10	Date 3.31.13 Test Splution Prep
											Renewal Time 1305
Meter ID	30A	PH19	PH15	RD04	RD06	EC06	New WQ ~~FOUR~~		Old WQ LA		Renewal Signoff YL
Hardness Control	25.7	8.68	8.45 ~~7.74~~	8.1	6.9 ~~7.2~~	2495	10	7	9	10	Date 4/1/13 Test Solution Prep YL
											Renewal Time 1030
Meter ID	30A	PH16	PH15	RD07	RD06	EC04	New WQ LLO		Old WQ LLL		Renewal Signoff
Hardness Control	25.3		8.36		6.7	2525	10	7	9	10	Date 4/2/13 Termination Time 0820
Meter ID	30A		PH16		RD04	EC07			Old WQ LLL		Termination Signoff

Fathead Minnow Dry Weight Data Sheet

Client: **Lehigh Permanente** Test ID #: 51252 Project # 20780

Test Material: Hardness Control Tare Weight Date: 4/1/13 Sign-off: CA

Test Date: 3/26/13 Final Weight Date: 4/3/13 Sign-off: JLA

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
25	Hardness Control	A	142.88	151.52	10	0.86
24		B	159.60	167.44	10	0.78
27		C	156.68	163.97	10	0.73
28		D	146.34	154.21	10	0.79
~~XB QA 5~~			BALO1	BALO1		

Appendix M

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:	16-6874-8078	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Melinda Hooper
Start Date:	26 Mar-13 16:00	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	02 Apr-13 08:50	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 17h	**Source:**	Aquatox, AR	**Age:**	1

Sample ID:	07-5521-2138	**Code:**	Pond 14	**Client:**	Lehigh Permanente
Sample Date:	25 Mar-13 12:55	**Material:**	Effluent	**Project:**	20780
Receive Date:	25 Mar-13 15:30	**Source:**	Lehigh Permanente		
Sample Age:	27h (13.7 °C)	**Station:**	Pond 14		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
00-3872-4201	7d Survival Rate	0	>0		11.9%		Equal Variance t Two-Sample Test
17-4372-2960	7d Survival Rate	100	>100	NA	10.0%	1	Steel Many-One Rank Sum Test
19-0695-8488	Mean Dry Biomass-mg	0	>0		9.8%		Equal Variance t Two-Sample Test
01-3997-7158	Mean Dry Biomass-mg	100	>100	NA	13.6%	1	Dunnett Multiple Comparison Test
11-1850-8207	Mean Dry Weight-mg	0	>0		19.8%		Equal Variance t Two-Sample Test
13-6000-9289	Mean Dry Weight-mg	100	>100	NA	18.2%	1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
14-3111-0159	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	
05-9909-3943	Mean Dry Weight-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	

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

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	0.9	0.847	0.953	0.7	1	0.0707	0.141	15.7%	0.0%
0	Lab Water Contr	4	1	1	1	1	1	0	0	0.0%	-11.1%
6.25		4	1	1	1	1	1	0	0	0.0%	-11.1%
12.5		4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	-8.33%
25		4	0.9	0.847	0.953	0.7	1	0.0707	0.141	15.7%	0.0%
50		4	0.95	0.928	0.972	0.9	1	0.0289	0.0577	6.08%	-5.56%
100		4	1	1	1	1	1	0	0	0.0%	-11.1%

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	0.791	0.77	0.812	0.729	0.864	0.0277	0.0555	7.02%	0.0%
0	Lab Water Contr	4	0.808	0.785	0.83	0.75	0.889	0.0298	0.0596	7.38%	-2.09%
6.25		4	0.776	0.744	0.809	0.702	0.901	0.0433	0.0866	11.2%	1.86%
12.5		4	0.839	0.828	0.85	0.807	0.877	0.0148	0.0296	3.52%	-6.1%
25		4	0.852	0.812	0.892	0.754	0.987	0.0536	0.107	12.6%	-7.74%
50		4	0.871	0.858	0.884	0.835	0.912	0.0181	0.0361	4.15%	-10.1%
100		4	0.882	0.874	0.89	0.859	0.908	0.0101	0.0203	2.3%	-11.5%

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	0.895	0.838	0.952	0.787	1.12	0.0766	0.153	17.1%	0.0%
0	Lab Water Contr	4	0.808	0.785	0.83	0.75	0.889	0.0298	0.0596	7.38%	9.8%
6.25		4	0.776	0.744	0.809	0.702	0.901	0.0433	0.0866	11.2%	13.3%
12.5		4	0.864	0.835	0.892	0.807	0.974	0.0378	0.0755	8.74%	3.53%
25		4	0.96	0.903	1.02	0.779	1.1	0.0765	0.153	15.9%	-7.28%
50		4	0.919	0.895	0.943	0.835	0.989	0.0322	0.0645	7.02%	-2.68%
100		4	0.882	0.874	0.89	0.859	0.908	0.0101	0.0203	2.3%	1.48%

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	0.7	0.9	1
0	Lab Water Contr	1	1	1	1
6.25		1	1	1	1
12.5		0.9	1	1	1
25		1	0.7	0.9	1
50		1	0.9	0.9	1
100		1	1	1	1

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	0.864	0.784	0.729	0.787
0	Lab Water Contr	0.75	0.889	0.81	0.781
6.25		0.742	0.702	0.901	0.76
12.5		0.877	0.828	0.845	0.807
25		0.779	0.754	0.987	0.889
50		0.912	0.847	0.89	0.835
100		0.884	0.877	0.859	0.908

Mean Dry Weight-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	0.864	1.12	0.81	0.787
0	Lab Water Contr	0.75	0.889	0.81	0.781
6.25		0.742	0.702	0.901	0.76
12.5		0.974	0.828	0.845	0.807
25		0.779	1.08	1.1	0.889
50		0.912	0.941	0.989	0.835
100		0.884	0.877	0.859	0.908

7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	10/10	7/10	9/10	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		9/10	10/10	10/10	10/10
25		10/10	7/10	9/10	10/10
50		10/10	9/10	9/10	10/10
100		10/10	10/10	10/10	10/10

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

Analysis ID:	17-4372-2960	**Endpoint:** 7d Survival Rate	**CETIS Version:** CETISv1.8.5
Analyzed:	04 Apr-13 10:24	**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	10.0%	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	14	10	1	6	0.3451	Asymp	Non-Significant Effect
		50	14	10	1	6	0.3451	Asymp	Non-Significant Effect
		100	18	10	1	6	0.8333	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.07046462	0.01409292	5	1.54	0.2278	Non-Significant Effect
Error	0.1649466	0.009163698	18			
Total	0.2354112		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	3.63	4.25	0.0190	Equal Variances
Variances	Levene Equality of Variance	6.7	4.25	0.0011	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.832	0.884	0.0010	Non-normal Distribution

7d Survival Rate Summary

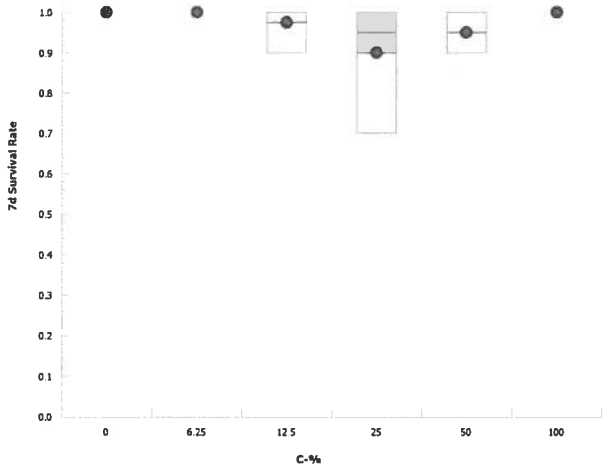
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	1	1	1	1	1	1	0	0.0%	0.0%
6.25		4	1	1	1	1	1	1	0	0.0%	0.0%
12.5		4	0.975	0.895	1	1	0.9	1	0.025	5.13%	2.5%
25		4	0.9	0.675	1	0.95	0.7	1	0.0707	15.7%	10.0%
50		4	0.95	0.858	1	0.95	0.9	1	0.0289	6.08%	5.0%
100		4	1	1	1	1	1	1	0	0.0%	0.0%

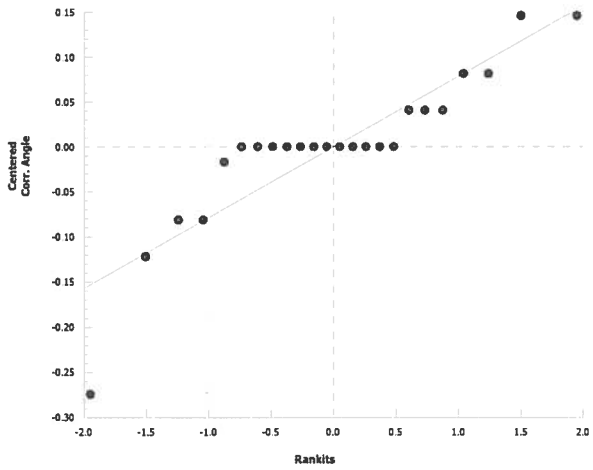
Angular (Corrected) Transformed Summary

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%
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	1.27	0.95	1.58	1.33	0.991	1.41	0.0994	15.7%	10.3%
50		4	1.33	1.18	1.48	1.33	1.25	1.41	0.047	7.07%	5.77%
100		4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%

Chronic Larval Fish Survival and Growth Test					Pacific EcoRisk
Analysis ID:	17-4372-2960	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	04 Apr-13 10:24	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Graphics





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

Analysis ID: 01-3997-7158 Endpoint: Mean Dry Biomass-mg CETIS Version: CETISv1.8.5
Analyzed: 04 Apr-13 10:24 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	13.6%	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	0.683	2.41	0.11	6	0.5660	CDF	Non-Significant Effect
		12.5	-0.693	2.41	0.11	6	0.9618	CDF	Non-Significant Effect
		25	-0.977	2.41	0.11	6	0.9817	CDF	Non-Significant Effect
		50	-1.39	2.41	0.11	6	0.9942	CDF	Non-Significant Effect
		100	-1.63	2.41	0.11	6	0.9972	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.03189157	0.006378313	5	1.52	0.2327	Non-Significant Effect
Error	0.07546982	0.004192768	18			
Total	0.1073614		23			

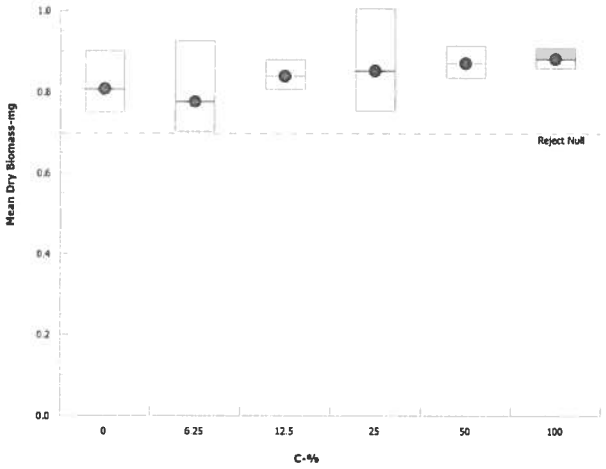
Distributional Tests

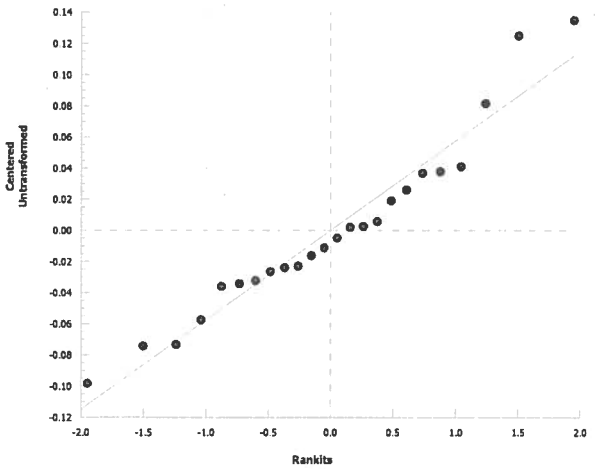
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	9.64	15.1	0.0861	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.947	0.884	0.2279	Normal Distribution

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	0.808	0.713	0.902	0.796	0.75	0.889	0.0298	7.38%	0.0%
6.25		4	0.776	0.638	0.914	0.751	0.702	0.901	0.0433	11.2%	3.87%
12.5		4	0.839	0.792	0.886	0.836	0.807	0.877	0.0148	3.52%	-3.93%
25		4	0.852	0.682	1.02	0.834	0.754	0.987	0.0536	12.6%	-5.54%
50		4	0.871	0.814	0.928	0.868	0.835	0.912	0.0181	4.15%	-7.86%
100		4	0.882	0.85	0.914	0.881	0.859	0.908	0.0101	2.3%	-9.23%

Graphics





CETIS Analytical Report

Report Date:	04 Apr-13 10:26 (p 1 of 1)
Test Code:	51255 | 11-0413-1044

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

Analysis ID:	14-3111-0159	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.5
Analyzed:	04 Apr-13 10:24	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	162619	200	Yes	Two-Point Interpolation

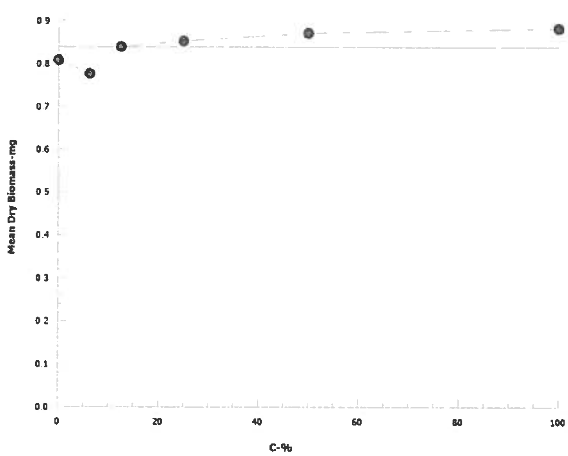
Point Estimates

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	0.808	0.75	0.889	0.0298	0.0596	7.38%	0.0%
6.25		4	0.776	0.702	0.901	0.0433	0.0866	11.2%	3.87%
12.5		4	0.839	0.807	0.877	0.0148	0.0296	3.52%	-3.93%
25		4	0.852	0.754	0.987	0.0536	0.107	12.6%	-5.54%
50		4	0.871	0.835	0.912	0.0181	0.0361	4.15%	-7.86%
100		4	0.882	0.859	0.908	0.0101	0.0203	2.3%	-9.23%

Graphics



Analyst: ____ QA: ____

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Lehigh Permanente**
Test Material: Pond 14
Test ID#: 51255 Project #: 20780
Test Date: 3/26/13 Randomization: 4:63

Organism Log#: 7154 Age: <48hrs
Organism Supplier: Aquatox
Control/Diluent: EPAMH
Control Water Batch: 1561

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	8.02	8.23	8.5	8.6	300	10	10	10	10	Date: 3.30.13
6.25	25.5	8.10	8.06	8.4	8.5	377	10	10	10	10	Sample ID: 31434
12.5	25.5	8.12	8.00	8.5	8.6	443	9	10	10	10	Test Solution Prep:
25	25.5	8.18	8.01	8.7	8.6	574	10	7	9	10	New WQ:
50	25.5	8.22	8.06	9.0	8.9	819	10	9	9	10	Renewal Time: 1000
100	25.5	8.24	8.21	9.0	8.6	1243	10	10	10	10	Renewal Signoff:
Meter ID	30A	PH15	pH16	RD06	RD07	EC07					Old WQ: DS
Lab Water	25.7	8.07	7.73	9.0	6.9	305	10	10	10	10	Date: 3.31.13
6.25	25.7	8.01	7.75	8.7	6.9	376	10	10	10	10	Sample ID: 31434
12.5	25.7	7.99	7.76	8.7	7.0	445	9	10	10	10	Test Solution Prep:
25	25.7	8.05	7.79	8.8	6.8	579	10	7	9	10	New WQ: FOUR
50	25.7	8.08	7.97	9.3	7.0	830	10	9	9	10	Renewal Time: 1200
100	25.7	8.14	8.10	9.9	6.9	1273	10	10	10	10	Renewal Signoff:
Meter ID	30A	PH19	pH15	RD04	RD06	EC06					Old WQ: MO
Lab Water	25.8	8.02	8.07	8.3	7.1	298	10	10	10	10	Date: 4/1/13
6.25	25.8	8.04	7.94	8.2	7.4	372	10	10	10	10	Sample ID: 31434
12.5	25.8	8.09	7.90	8.1	7.6	443	9	10	10	10	Test Solution Prep:
25	25.8	8.16	7.85	8.4	7.5	573	10	7	9	10	New WQ:
50	25.8	8.17	7.94	8.6	7.4	820	10	9	9	10	Renewal Time: 1015
100	25.8	8.22	8.13	8.6	7.0	1246	10	10	10	10	Renewal Signoff:
Meter ID	30A	PH15	PH19	RD06	RD04	EC06					Old WQ: RA
Lab Water	25.7		7.73		6.3	313	10	10	10	10	Date: 4-2-13
6.25	25.7		7.66		6.5	392	10	10	10	10	Sample ID: —
12.5	25.7		7.67		6.1	464	9	10	10	10	Termination Time: 0850
25	25.7		7.72		6.4	596	10	7	9	10	Termination Signoff:
50	25.7		7.85		6.6	861	10	9	9	10	Old WQ: RA
100	25.7		8.11		6.5	1320	10	10	10	10	
Meter ID	30A		PH15		RD07	EC06					

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Lehigh Permanente** Organism Log#: 7154 Age: <48hrs
Test Material: Pond 14 Organism Supplier: Aquatox
Test ID#: 51255 Project #: 20780 Control/Diluent: EPAMH
Test Date: 3/26/13 Randomization: 46-3 Control Water Batch: 1581

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	8.02		8.8		290	10	10	10	10	Date 3/26/13
6.25	25.3	8.04		8.8		363	10	10	10	10	Sample ID 31336
12.5	25.3	8.06		8.8		427	10	10	10	10	Test Solution Prep A
25	25.3	8.11		9.5		560	10	10	10	10	New WQ DH
50	25.3	8.17		10.5		804	10	10	10	10	Initiation Time 1600
100	25.3	8.20		12.5		1245	10	10	10	10	Initiation Signoff
Meter ID	30A	PH18		RD06		EC06					
Lab Water	25.6	8.12	7.87	8.3	7.5	296	10	10	10	10	Date 3.27.13
6.25	25.6	8.11	7.84	8.5	7.7	368	10	10	10	10	Sample ID 31336
12.5	25.6	8.13	7.83	8.5	7.6	434	10	10	10	10	Test Solution Prep A
25	25.6	8.14	7.90	8.5	7.7	569	10	10	10	10	New WQ FOMB
50	25.6	8.15	8.09	8.8	7.9	817	10	10	10	10	Renewal Time 1150
100	25.6	8.16	8.18	9.0	7.5	1257	10	10	10	10	Renewal Signoff
Meter ID	30A	PH15	PH16	RD07	RD04	EC04					Old WQ DH
Lab Water	25.9	8.23	7.86 8.06 NA	7.7	7.2	290	10	10	10	10	Date 3.28.13
6.25	25.9	8.12	7.81 8.05 NA	8.0	7.3	357	10	10	10	10	Sample ID 31380
12.5	25.9	8.10	7.82 8.03 NA	8.2	7.5	434	9	10	10	10	Test Solution Prep A
25	25.9	8.07	7.94 8.00 NA	8.4	7.3	562	10	10	9	10	New WQ DH
50	25.9	8.07	8.10 8.16 NA	8.5	7.6	791	10	10	9	10	Renewal Time 1030
100	25.9	8.05	8.12 8.14 NA	10.2	7.6	1242	10	10	10	10	Renewal Signoff
Meter ID	30A	PH16	PH16	RD07	RD07	EC06					Old WQ NL
Lab Water	25.9	7.94	7.78	8.5	8.0	301	10	10	10	10	Date 3.29.13
6.25	25.9	8.02	7.72	8.6	7.6	373	10	10	10	10	Sample ID 31380
12.5	25.9	8.05	7.81	8.6	7.6	445	9	10	10	10	Test Solution Prep A
25	25.9	8.09	7.86	8.9	7.7	580	10	9	9	10	New WQ NL
50	25.9	8.10	8.00	9.1	7.7	823	10	10	9	10	Renewal Time 1200
100	25.9	8.09	8.18	10.3	7.8	1283	10	10	10	10	Renewal Signoff KP
Meter ID	30A	pH15	PH15	RD07	RD07	EC06					Old WQ RS

Fathead Minnow Dry Weight Data Sheet

Client: **Lehigh Permanente** Test ID #: 51255 Project # 20780

Sample: Pond 14 Tare Weight Date: 3/31/13 Sign-off: CA

Test Date: 3-26-13 Final Weight Date: 4/3/13 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	135.22	142.72	10	0.75
2		B	163.78	172.67	10	0.89
3		C	140.00	148.10	10	0.81
4		D	179.24	187.05	10	0.78
5	6.25	A	147.06	154.48	10	0.74
6		B	160.19	167.21	10	0.70
7		C	184.20	193.21	10	0.90
8		D	148.45	156.05	10	0.76
9	12.5	A	183.59	192.36	10	0.88
10		B	148.21	156.49	10	0.83
11		C	177.57	186.02	10	0.85
12		D	158.22	166.29	10	0.81
13	25	A	161.34	169.13	10	0.78
14		B	169.60	177.14	10	0.75
15		C	186.62	196.49	10	0.99
16		D	161.36	170.25	10	0.90
17	50	A	159.90	169.02	10	0.91
18		B	192.23	200.70	10	0.85
19		C	164.74	173.64	10	0.89
20		D	163.54	171.89	10	0.84
21	100	A	~~173.43~~ 179.38 CA	188.22	10	0.88
22		B	~~182.61~~ 173.43 CA	182.20	10	0.88
23		C	182.61	191.20	10	0.86
24		D	181.33	190.41	10	0.91
QA 1			182.42	182.61		
QA 2			176.49	176.51		
QA3			165.45	165.49		
Balance ID:			BAL01	BAL01		

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

Analysis ID:	00-3872-4201	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	04 Apr-13 10:25	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Angular (Corrected)	NA	C > T	NA	NA	11.9%	Passes 7d survival rate

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	1.47	1.94	0.193	6	0.0961	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.04260716	0.04260716	1	2.16	0.1922	Non-Significant Effect
Error	0.1184677	0.01974462	6			
Total	0.1610749		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	5.13	13.7	0.0642	Equal Variances
Variances	Levene Equality of Variance	7.69	13.7	0.0323	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.791	0.645	0.0231	Normal Distribution

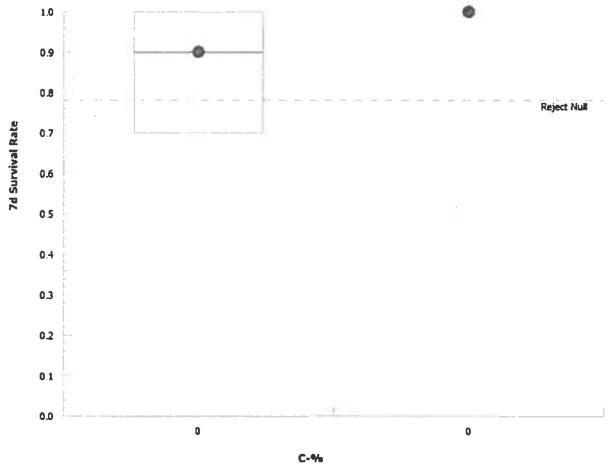
7d Survival Rate Summary

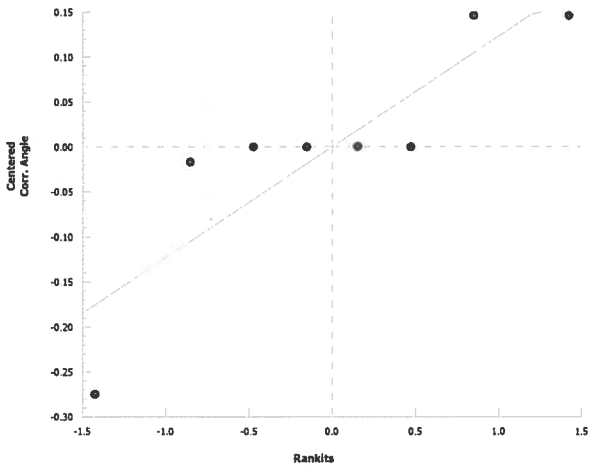
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	1	1	1	1	1	1	0	0.0%	0.0%
0	Hardness Blank	4	0.9	0.675	1	1	0.7	1	0.0707	15.7%	10.0%

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	1.27	0.95	1.58	1.41	0.991	1.41	0.0994	15.7%	10.3%

Graphics





Analyst: QA:

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

Analysis ID:	19-0695-8488	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.5
Analyzed:	04 Apr-13 10:25	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	9.8%	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	0.405	1.94	0.079	6	0.3497	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.000544481	0.000544481	1	0.164	0.6994	Non-Significant Effect
Error	0.01989489	0.003315815	6			
Total	0.02043937		7			

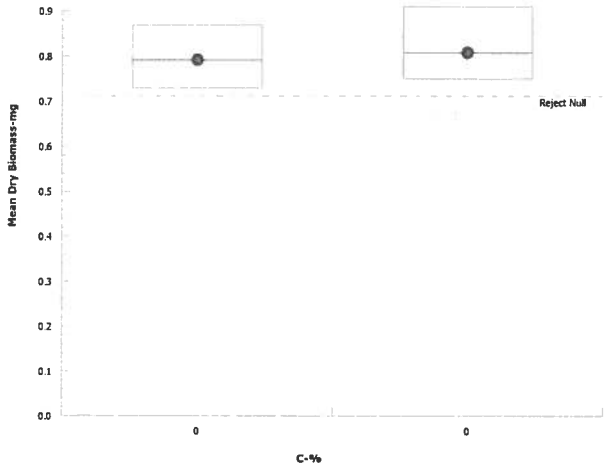
Distributional Tests

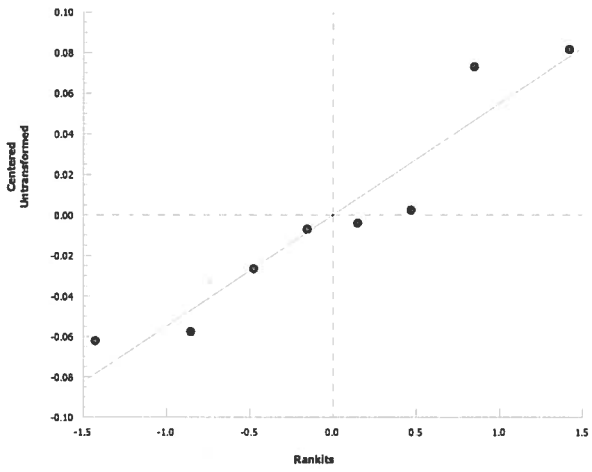
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	1.15	47.5	0.9093	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.894	0.645	0.2539	Normal Distribution

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	0.808	0.713	0.902	0.786	0.75	0.889	0.0298	7.38%	0.0%
0	Hardness Blank	4	0.791	0.703	0.879	0.786	0.729	0.864	0.0277	7.02%	2.04%

Graphics





7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Lehigh Permanente** Organism Log#: 7154 Age: 48 hrs
Test Material: Hardness Control Organism Supplier: Aquatox
Test ID#: 51255 Project #: 20780 Control/Diluent: EPAMH
Test Date: 3/26/13 Randomization: 4.7.3 Control Water Batch: 31337

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 Control	25.4	7.67		8.8		2475	10	10	10	10	Date 3.26.13
											Test Solution Prep
Meter ID	30A	PH18		RD06		EC06	New WQ 8H				Initiation Time 1515
											Initiation Signoff
Hardness Control	25.6	8.68	8.58	8.8	6.0	2463	10	9	9	10	Date 3.27.13
											Test Solution Prep
Meter ID	30A	PH15	PH16	RD07	RD04	EC04	New WQ FOUR		Old WQ DH		Renewal Time 1215
											Renewal Signoff SVV
Hardness Control	25.9	8.66 ~~8.58~~ PH	8.56	~~8.6~~ 8.7 DH	6.4	~~2470~~ 2456 DH	10	8	9	10	Date 3.28.13
											Test Solution Prep
Meter ID	30A	PH16	PH18	RD07	RD06	EC06	New WQ NH		Old WQ JLA		Renewal Time 1115
											Renewal Signoff KP
Hardness Control	25.8	8.66	8.54	8.8	8.2	2491	10	7	9	10	Date 3.29.13
											Test Solution Prep
Meter ID	30A	PH15	PH15	RD07	RD07	EC07	New WQ NH		Old WQ RS		Renewal Time 1245
											Renewal Signoff KP
Hardness Control	25.5	8.66	8.56	8.5	8.1	2493	10	7	9	10	Date 3.30.13
											Test Solution Prep
Meter ID	30A	PH15	PH19	RD06	RD04	EC07	New WQ KT		Old WQ FOUR		Renewal Time 1030
											Renewal Signoff KP
Hardness Control	~~25.7~~	8.57	8.45	8.9	6.1	2509	10	7	9	10	Date 3.31.13
											Test Solution Prep
Meter ID	30A	PH19	PH15	RD04	RD06	EC06	New WQ FOUR		Old WQ CA		Renewal Time 1305
											Renewal Signoff YL
Hardness Control	25.7	8.68	8.45 ~~7.79~~	8.1	6.9 ~~7.2~~	2495	10	7	9	10	Date 4/1/13
											Test Solution Prep
Meter ID	30A	PH16	PH15	RD07	RD06	EC04	New WQ MO		Old WQ YU		Renewal Time 1030
											Renewal Signoff
Hardness Control	25.3		8.36		6.7	2525	10	7	9	10	Date 4/2/13
											Termination Time 0820
Meter ID	30A		PH16		RD04	EC07			Old WQ YU		Termination Signoff

Fathead Minnow Dry Weight Data Sheet

Client: **Lehigh Permanente** Test ID #: 51252 Project # 20780

Test Material: Hardness Control Tare Weight Date: 4/1/13 Sign-off: CA

Test Date: 3/26/13 Final Weight Date: 4/3/13 Sign-off: JLA

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
25	Hardness Control	A	142.88	151.52	10	0.86
24		B	159.60	167.44	10	0.78
27		C	156.68	163.97	10	0.73
28		D	146.34	154.21	10	0.79
~~XB QA 5~~			BAL01	BAL01		

Appendix N

Test Data and Summary of Statistics for the Evaluation of the Acute Toxicity of Lehigh Pond 13 Sediment to *Hyalella azteca*

CETIS Summary Report

Hyalella 10-d Survival and Growth Sediment Test — **Pacific EcoRisk**

Batch ID:	07-7333-1290	**Test Type:**	Survival-Growth (10 day)	**Analyst:**	Alison Briden
Start Date:	30 Mar-13 09:40	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Not Applicable
Ending Date:	09 Apr-13	**Species:**	Hyalella azteca	**Brine:**	Not Applicable
Duration:	9d 14h	**Source:**	Chesapeake Cultures, Inc.	**Age:**	11

Sample ID:	06-0208-9296	**Code:**	Pond 13	**Client:**	Robertson Bryan, Inc.
Sample Date:	25 Mar-13 11:57	**Material:**	Sediment	**Project:**	20780
Receive Date:	25 Mar-13 15:30	**Source:**	Lehigh Permanente		
Sample Age:	4d 22h (0.6 °C)	**Station:**	Pond 13		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
12-6700-5160	Mean Dry Weight-mg	100	>100	NA	9.94%	1	Equal Variance t Two-Sample Test
19-4057-5122	Survival Rate	100	>100	NA	5.21%	1	Wilcoxon Rank Sum Two-Sample Test

Mean Dry Weight-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Control Sed	8	0.223	0.213	0.232	0.187	0.263	0.00878	0.0248	11.1%	0.0%
100		8	0.272	0.263	0.282	0.23	0.314	0.009	0.0255	9.36%	-22.1%

Survival Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Control Sed	8	1	1	1	1	1	0	0	0.0%	0.0%
100		8	0.963	0.935	0.99	0.8	1	0.0263	0.0744	7.73%	3.75%

Mean Dry Weight-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Control Sed	0.263	0.218	0.24	0.245	0.208	0.187	0.204	0.217
100		0.265	0.23	0.249	0.288	0.271	0.314	0.275	0.284

Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Control Sed	1	1	1	1	1	1	1	1
100		1	1	0.8	1	1	1	1	0.9

Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Control Sed	10/10	10/10	10/10	10/10	10/10	10/10	10/10	10/10
100		10/10	10/10	8/10	10/10	10/10	10/10	10/10	9/10

Hyalella 10-d Survival and Growth Sediment Test — Pacific EcoRisk

Analysis ID:	19-4057-5122	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	10 Apr-13 18:17	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Angular (Corrected)	NA	C > T	NA	NA	5.21%	Passes survival rate

Wilcoxon Rank Sum Two-Sample Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Control Sed		100	60	NA	1	14	0.2333	Exact	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.01367951	0.01367951	1	2.08	0.1714	Non-Significant Effect
Error	0.09214444	0.006581746	14			
Total	0.105824		15			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	5.19E+13	8.89	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.669	0.841	<0.0001	Non-normal Distribution

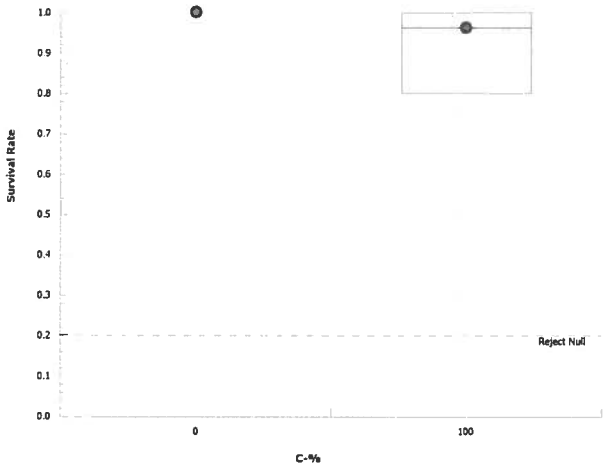
Survival Rate Summary

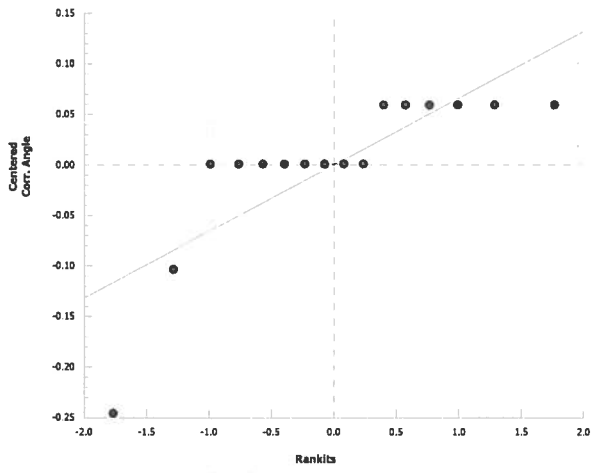
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Control Sed	8	1	1	1	1	1	1	0	0.0%	0.0%
100		8	0.962	0.9	1	1	0.8	1	0.0263	7.73%	3.75%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Control Sed	8	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%
100		8	1.35	1.26	1.45	1.41	1.11	1.41	0.0406	8.48%	4.14%

Graphics





Hyalella 10-d Survival and Growth Sediment Test — **Pacific EcoRisk**

Analysis ID:	12-6700-5160	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.8.5
Analyzed:	10 Apr-13 18:17	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	9.94%	Passes mean dry weight-mg

Equal Variance t Two-Sample Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Control Sed		100	-3.92	1.76	0.022	14	0.9992	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.009711837	0.009711837	1	15.4	0.0015	Significant Effect
Error	0.008853928	0.0006324234	14			
Total	0.01856577		15			

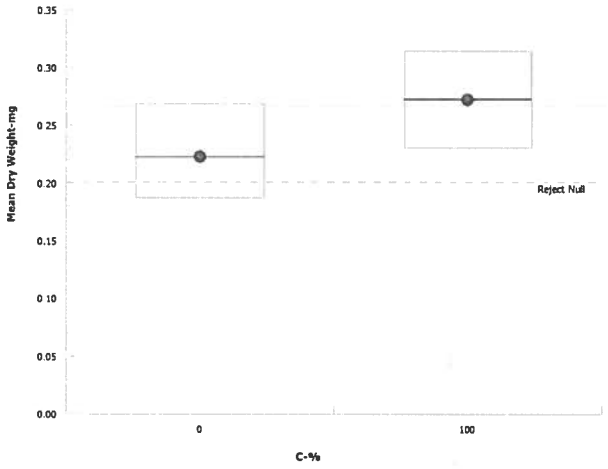
Distributional Tests

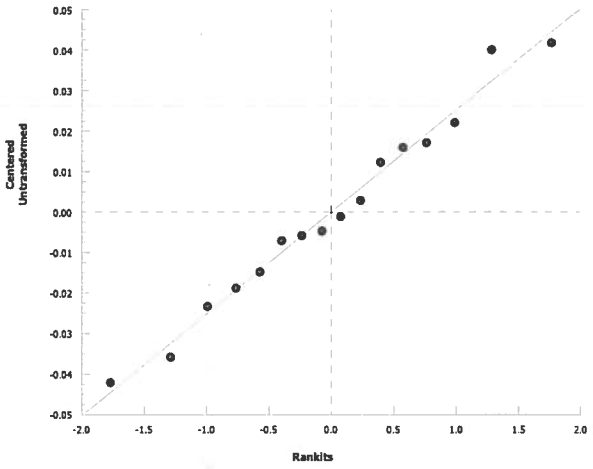
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	1.05	8.89	0.9488	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.975	0.841	0.9174	Normal Distribution

Mean Dry Weight-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Control Sed	8	0.223	0.202	0.244	0.218	0.187	0.263	0.00878	11.1%	0.0%
100		8	0.272	0.251	0.293	0.273	0.23	0.314	0.009	9.36%	-22.1%

Graphics





10-Day Freshwater Sediment Toxicity Test Data

Client: **Lehigh Permanente** Project #: 20780 Organism Supplier/Log Number: Chesapeake / 7165

Species: *Hyalella azteca* Test ID#: ~~51310~~ 51309 Organism Age/Size: 11-12 days

Control Water: 147

Treatment =	Control Sediment				Pond 13				Sign-offs:
Day 0			New D.O. 7.4				New D.O. 7.2		Initiation Time: 940
Date: 03.30.13			Meter ID RD07						WQ: NO
Temp. (°C) = 23.4	A 10	B 10	C 10	D 10	A 10	B 10	C 10	D 10	Initiation Counts: MM
Feed: MM	E 10	F 10	G 10	H 10	E 10	F 10	G 10	H 10	Confirmation Counts: KE
Day 1	Old D.O. 7.0		New D.O. 7.6		Old D.O. 7.1		New D.O. 7.5		AM Change: FOVB
Date: 3/31/13	Meter ID ~~RD06~~ RD06		Meter ID RD06						WQ: FOVB
Temp. (°C) = 23.3	A ~~10~~ 0	B 0	C 0	D 0	A 0	B 0	C 0	D 0	PM Change: NO
Feed: NO	E 0	F 0	G 0	H 0	E 0	F 0	G 0	H 0	Mortality Counts: FOVB
Day 2	Old D.O. 6.6		New D.O. 7.6		Old D.O. 7.7		New D.O. 7.6		AM Change: MM
Date: 4-1-13	Meter ID RD06		Meter ID RD06						WQ: MM
Temp. (°C) = 23.3	A 0	B 0	C 0	D 0	A 0	B 0	C 0	D 0	PM Change: MM
Feed: MM	E 0	F 0	G 0	H 0	E 0	F 0	G 0	H 0	Mortality Counts: MM
Day 3	Old D.O. 6.5		New D.O. 7.7		Old D.O. 6.3		New D.O. 7.8		AM Change: MM
Date: 4-2-13	Meter ID RD05		Meter ID RD05						WQ: NF
Temp. (°C) = 23.4	A 0	B 0	C 0	D 0	A 0	B 0	C 0	D 0	PM Change: NF
Feed: NF	E 0	F 0	G 0	H 0	E 0	F 0	G 0	H 0	Mortality Counts: MM
Day 4	Old D.O. 4.8		New D.O. 6.5		Old D.O. 5.1		New D.O. 6.7		AM Change: NF
Date: 4-3-13	Meter ID RD06		Meter ID RD06						WQ: NF
Temp. (°C) = 23.3	A 0	B 0	C 0	D 0	A 0	B 0	C 0	D 0	PM Change: NF
Feed: NF	E 0	F 0	G 0	H 0	E 0	F 0	G 0	H 0	Mortality Counts: NF
Day 5	Old D.O. 5.6		New D.O. 7.7		Old D.O. 4.8		New D.O. 7.5		AM Change: NF
Date: 4-4-13	Meter ID RD06		Meter ID RD06						WQ: NF
Temp. (°C) = 23.4	A 0	B 0	C 0	D 0	A 0	B 0	C 0	D 0	PM Change: MM
Feed: MM	E 0	F 0	G 0	H 0	E 0	F 0	G 0	H 0	Mortality Counts: NF
Day 6	Old D.O. 8.7		New D.O. 8.9		Old D.O. 8.4		New D.O. 8.7		AM Change: NO
Date: 04.05.13	Meter ID RD05		Meter ID RD05						WQ: NO
Temp. (°C) = 23.1	A 0	B 0	C 0	D 0	A 0	B 0	C 0	D 0	PM Change: NO
Feed: NO	E 0	F 0	G 0	H 0	E 0	F 0	G 0	H 0	Mortality Counts: NO
Day 7	Old D.O. 8.7		New D.O. 8.7		Old D.O. DH 8.6 8.4		New D.O. 8.5		AM Change: DH
Date: 4.6.13	Meter ID RD07		Meter ID RD04						WQ: DH
Temp. (°C) = 23.3	A 0	B 0	C 0	D 0	A 0	B 0	C 0	D 0	PM Change: DH
Feed: DH	E 0	F 0	G 0	H 0	E 0	F 0	G 0	H 0	Mortality Counts: DH
Day 8	Old D.O. 8.4		New D.O. 8.4		Old D.O. 8.3		New D.O. 8.4		AM Change: NO
Date: 040713	Meter ID RD07		Meter ID RD07						WQ: NO
Temp. (°C) = 23.4	A 0	B 0	C 0	D 0	A 0	B 0	C 0	D 0	PM Change: NO
Feed: NO	E 0	F 0	G 0	H 0	E 0	F 0	G 0	H 0	Mortality Counts: NO
Day 9	Old D.O. 8.6		New D.O. 8.4		Old D.O. 8.2		New D.O. 8.4		AM Change: NO
Date: 04.08.13	Meter ID RD05		Meter ID RD05						WQ: NO
Temp. (°C) = 23.4	A 0	B 0	C 0	D 0	A 0	B 0	C 0	D 0	PM Change: CE
Feed: CE	E 0	F 0	G 0	H 0	E 0	F 0	G 0	H 0	Mortality Counts: NO
Day 10	Old D.O. 8.5				Old D.O. 8.4				Termination Counts: MK
Date: 4-9-13	Meter ID RD07								
Temp. (°C) = 23.1	**# Alive/Replicate**				**# Alive/Replicate**				WQ: MM
	A 10	B 10	C 10	D 10	A 10	B 10	C 8	D 10	
	E 10	F 10	G 10	H 10	E 10	F 10	G 10	H 9	

Hyalella azteca Weight Data Sheets

Client: **Lehigh Permanente** Project #: 20780 Balance ID: Bal 01

Sample ID: **Pond 13** Tare Wt Date: 4/4/13 Sign-Off: CO

Test ID #: 51309 Final Wt Date: 4/10/13 Sign-Off: RA

Pan	Concentration	Replicate	Initial Weight. (mg)	Final Weight. (mg)	# organisms	Ave Weight (mg)
1	Control	A	61.87	64.50	10	0.263
2	Sediment	B	63.76	65.94	10	0.218
3		C	65.13	67.53	10	0.240
4		D	68.03	70.48	10	0.245
5		E	63.73	65.81	10	0.208
6		F	68.15	70.02	10	0.187
7		G	61.80	63.84	10	0.204
8		H	67.14	69.31	10	0.217
9	Pond 13	A	60.15	62.80	10	0.265
10		B	67.20	69.50	10	0.230
11		C	64.09	66.08	8	0.249
12		D	65.14	68.02	10	0.288
13		E	64.55	67.26	10	0.271
14		F	64.89	68.03	10	0.314
15		G	62.43	65.18	10	0.275
16		H	63.80	66.36	9	0.284
QA1			64.95	64.95		—

Freshwater Sediment Test Water Quality Characteristics

Client: Lehigh Permante **Species:** *Hyallela azteca*

Test ID: 51309 **Project #:** 20780

Initial Water Quality Characteristics for Overlying Water

Date: 3-30-13

Site	pH	D.O. (mg/L)	Conductivity (µS/cm)	Alkalinity	Hardness	Total Ammonia	
Control Sediment	8.11	7.4	423	53 ✓	148 ✓	<1.00	
Pond 13	~~8.05~~ 8.05	7.2	424	89 ✓	250 ✓	<1.00	51309
Meter ID	pH16	RD07	Eco4	DT#8	DT#08	DR3800	
Sign-off	pH16 no	~~pH6~~ RD07	Eco4 no	no	no	no	

Final Water Quality Characteristics for Overlying Water

Date: 4-9-13

Site	pH	D.O. (mg/L)	Conductivity (µS/cm)	Alkalinity	Hardness	Total Ammonia	
Control Sediment	8.10	8.5	472	60 ✓	143 ✓	<1.00	
Pond 13	8.05	8.4	541	103 ✓	189 ✓	<1.00	
Meter ID	pH15	RD07	Eco7	DT#8	DT#08	RD3800	
Sign-off	YH	YH	YH	✓	✓	✓	

Appendix O

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

CETIS Summary Report

Algal Growth Test — **Pacific EcoRisk**

Batch ID:	18-5694-7088	**Test Type:**	Cell Growth	**Analyst:**	Krista Prosser
Start Date:	26 Mar-13 12:30	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	30 Mar-13 12:15	**Species:**	Selenastrum capricornutum	**Brine:**	Not Applicable
Duration:	96h	**Source:**	In-House Culture	**Age:**	6

Sample ID:	15-9265-8792	**Code:**	NaCl	**Client:**	Reference Toxicant
Sample Date:	26 Mar-13 12:30	**Material:**	Sodium chloride	**Project:**	20790
Receive Date:	26 Mar-13 12:30	**Source:**	Reference Toxicant		
Sample Age:	NA (25.2 °C)	**Station:**	In House		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
07-9263-1606	96h Cell Density-with EDTA	0.25	0.5	0.3536	8.98%		Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	g/L	95% LCL	95% UCL	TU	Method
09-1472-6075	96h Cell Density-with EDT	IC5	0.186	0.151	0.24		Linear Interpolation (ICPIN)
		IC10	0.247	0.2	0.361		
		IC15	0.352	0.241	0.546		
		IC20	0.458	0.323	0.733		
		IC25	0.633	0.365	0.909		
		IC40	1.29	0.806	1.54		
		IC50	1.73	1.46	1.9		

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	3.91E+6	3.85E+6	3.97E+6	3.71E+6	4.09E+6	8.51E+4	1.70E+5	4.35%	0.0%
0.125		4	4.05E+6	3.97E+6	4.14E+6	3.74E+6	4.29E+6	1.13E+5	2.27E+5	5.59%	-3.7%
0.25		4	3.57E+6	3.53E+6	3.62E+6	3.41E+6	3.70E+6	6.07E+4	1.21E+5	3.39%	8.55%
0.5		4	3.11E+6	3.01E+6	3.21E+6	2.91E+6	3.51E+6	1.36E+5	2.72E+5	8.75%	20.5%
1		4	2.65E+6	2.55E+6	2.75E+6	2.28E+6	2.92E+6	1.36E+5	2.72E+5	10.2%	32.1%
2		4	1.75E+6	1.71E+6	1.79E+6	1.62E+6	1.85E+6	5.60E+4	1.12E+5	6.4%	55.3%

96h Cell Density-with EDTA Detail

C-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Water Contr	3.84E+6	4.00E+6	3.71E+6	4.09E+6
0.125		4.07E+6	4.29E+6	4.12E+6	3.74E+6
0.25		3.41E+6	3.70E+6	3.57E+6	3.61E+6
0.5		3.03E+6	3.51E+6	2.98E+6	2.91E+6
1		2.28E+6	2.76E+6	2.92E+6	2.65E+6
2		1.83E+6	1.62E+6	1.69E+6	1.85E+6

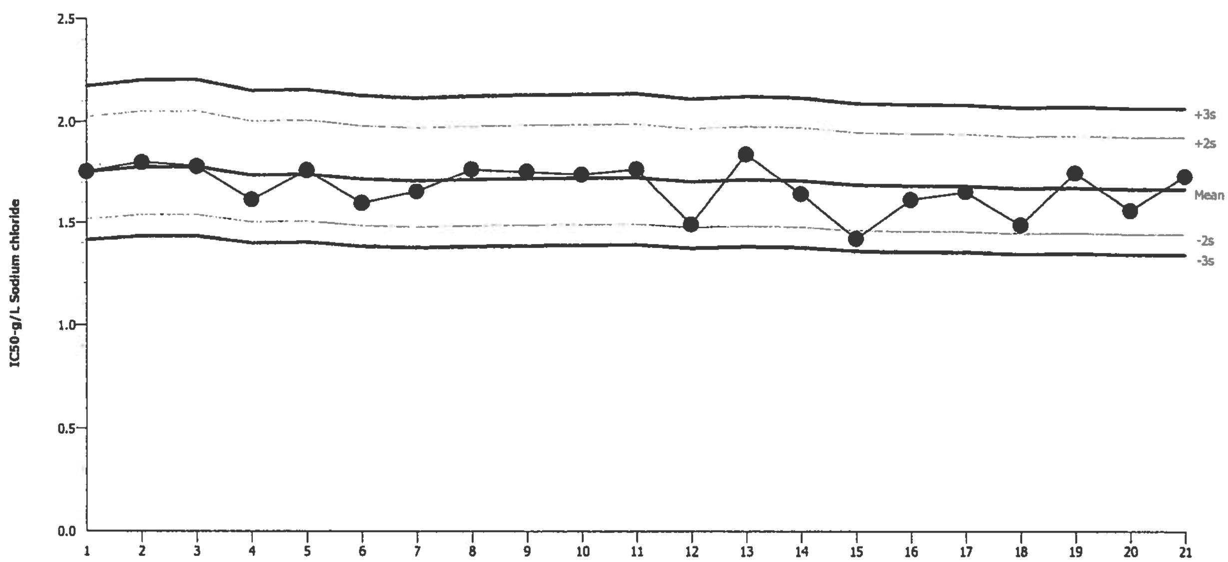
CETIS QC Plot

Report Date: 03 Apr-13 11:50 (1 of 1)

Algal Growth Test | **All Matching Labs**

Test Type:	Cell Growth	**Organism:**	Selenastrum capricornutum (Green	**Material:**	Sodium chloride
Protocol:	All Protocols	**Endpoint:**	96h Cell Density-with EDTA	**Source:**	Reference Toxicant-REF

Algal Growth Test



Mean:	1.667	**Count:**	20	**-2s Warning Limit:**	1.445	**-3s Action Limit:**	1.345
Sigma:	NA	**CV:**	7.43%	**+2s Warning Limit:**	1.924	**+3s Action Limit:**	2.067

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2012	Sep	5	16:00	1.753	0.08614	0.7032			14-6115-8515	03-3227-0147	Pacific EcoRisk
2			6	15:45	1.8	0.1326	1.068			17-4047-6059	10-4768-8375	Pacific EcoRisk
3			11	13:35	1.779	0.1122	0.9092			21-0550-3671	09-8743-0715	Pacific EcoRisk
4			25	14:30	1.614	-0.0535	-0.4552			21-2264-2163	15-5594-3838	Pacific EcoRisk
5		Oct	9	13:50	1.759	0.09213	0.7508			19-6596-1224	15-9799-8081	Pacific EcoRisk
6			16	16:20	1.596	-0.07141	-0.611			13-8658-8288	12-9785-4112	Pacific EcoRisk
7		Nov	6	11:50	1.653	-0.01367	-0.1149			17-3179-2299	02-4916-4849	Pacific EcoRisk
8			21	15:50	1.763	0.09567	0.7788			21-1141-7186	16-3619-7547	Pacific EcoRisk
9		Dec	4	10:30	1.752	0.08448	0.6899			01-6270-2268	21-0519-9403	Pacific EcoRisk
10			11	15:00	1.738	0.07105	0.5825			02-9480-8478	13-6603-4421	Pacific EcoRisk
11			18	13:45	1.764	0.09724	0.7912			20-1735-8652	02-9000-5433	Pacific EcoRisk
12	2013	Jan	3	11:05	1.491	-0.1763	-1.56			01-3205-3944	15-5844-7633	Pacific EcoRisk
13			15	16:00	1.838	0.1711	1.364			18-1462-0180	03-3727-6668	Pacific EcoRisk
14			22	15:45	1.643	-0.02449	-0.2066			13-5357-3620	19-8484-3909	Pacific EcoRisk
15		Feb	5	12:20	1.42	-0.2467	-2.235	(-)		01-0678-7250	21-1038-2081	Pacific EcoRisk
16			12	15:15	1.613	-0.05369	-0.4569			12-7793-2153	14-8229-5619	Pacific EcoRisk
17			26	11:15	1.651	-0.01599	-0.1345			06-4757-0702	15-8535-5604	Pacific EcoRisk
18			27	16:00	1.488	-0.1791	-1.587			05-8096-0111	10-2315-9578	Pacific EcoRisk
19		Mar	12	14:20	1.747	0.07941	0.6494			07-5840-8392	10-3581-3748	Pacific EcoRisk
20			19	15:30	1.561	-0.1058	-0.9147			12-6730-8800	00-7931-8355	Pacific EcoRisk
21			26	12:30	1.731	0.06437	0.5287			11-7782-4722	09-1472-6075	Pacific EcoRisk

Analyst: KP QA: [signature]

Selenastrum capricornutum Algal Toxicity Test Water Quality Data

Client: **Reference Toxicant** Test ID #: 51303 Test Date: 3/26/13

Test Material: NaCl Project #: 20790 Control/Diluent: Lab Water ~~No EDTA~~ A

Reference Toxicant Test Treatment (g/L NaCl)	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Lab Water Control	25.2	7.50	9.0	89	Date: 3/26/13
0.125	25.2	7.57	8.7	340	Test Solution Prep: CG
0.25	25.2	7.52	8.6	564	New WQ: DH
0.5	25.2	7.45	8.3	1066	Innoculation Time: 12:30
1	25.2	7.41	8.7	1967	Innoculation Signoff: CG
2	25.2	7.36	8.8	3880	Shelf ID: R351
Meter ID:	65A	PH18	RD06	EC06	
Lab Water Control	25.4	7.74			Date: 3/27/13
0.125	25.4	7.61			WQ Time: 1205
0.25	25.4	7.59			WQ Signoff: CG
0.5	25.4	7.55			
1	25.4	7.54			
2	25.4	7.50			
Meter ID:	65A	PH18			
Lab Water Control	25.5	8.86			Date: 3/28/13
0.125	25.5	8.91			WQ Time: 0945
0.25	25.5	8.91			WQ Signoff: RA
0.5	25.5	8.66			
1	25.5	8.61			
2	25.5	8.27			
Meter ID:	65A	PH18			
Lab Water Control	25.4	9.77			Date: 3-29-13
0.125	25.4	9.78			WQ Time: 1100
0.25	25.4	9.68			WQ Signoff: DH
0.5	25.4	9.59			
1	25.4	9.45			
2	25.4	9.1[illegible]			
Meter ID:	65A	PH19			
Lab Water Control	25.3	10.12	14.5	99	Date: 3-~~29~~-13
0.125	25.3	10.29	14.1	351	Termination Time: ~~0945~~ 1215
0.25	25.3	10.07	14.2	575	Termination Signoff: RP
0.5	25.3	9.97	13.9	1315	WQ Time: 0915
1	25.3	9.92	12.9	1791	WQ Signoff: NL
2	25.3	9.62	10.7	3890	
Meter ID:	65A	PH16	RD07	EC04	

Initial Test Conditions							
Target: 4.000 g NaCl in 2 L		Alkalinity		Hardness		Light Intensity (ftc)	
Actual: 4.0016	✓	12	✓	14		385.6	

Selenastrum capricornutum Cell Density Enumeration Data

Client: **Reference Toxicant** Initial Count: 10,000 cells/mL

Test Material: NaCl Enumerating Scientist: KP

Test Start Date: 3/26/13 Start Time: 12:30 Project #: 20790

Test End Date: 3/30/13 End Time: 1215 Test ID #: 51303

Treatment	Rep A	Rep B	Rep C	Rep D	Mean
Lab Water Control ~~(No EDTA)~~ KP	3.8423	3.9956	3.7054	4.0919	3.9088
0.125	4.0665	4.2862	4.1169	3.7443	4.0535
0.25	3.4128	~~3837~~ 3.7039	3.5711	3.6099	3.5744
0.5	3.0316	3.5074	2.9804	2.9076	3.1068
1	2.2800	2.7601	2.9187	2.6522	2.6528
2	1.8326	1.6210	1.6861	1.8503	1.7475
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 10^4)**	**% CV**	**Date:**	**Time:**	**Signoff:**
	3.91	4.35	3/30/13	~~16~~ 18:10	A

Appendix P

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:	16-8173-9391	Test Type:	Reproduction-Survival (7d)	Analyst:	Eddie Kalombo
Start Date:	26 Mar-13 15:40	Protocol:	EPA-821-R-02-013 (2002)	Diluent:	Laboratory Water
Ending Date:	01 Apr-13 16:15	Species:	Ceriodaphnia dubia	Brine:	Not Applicable
Duration:	6d 1h	Source:	In-House Culture	Age:	1

Sample ID:	18-9626-4658	Code:	NaCl	Client:	Pacific Ecorisk
Sample Date:	26 Mar-13 15:40	Material:	Sodium chloride	Project:	20631
Receive Date:	26 Mar-13 15:40	Source:	Reference Toxicant		
Sample Age:	NA (25.3 °C)	Station:	In House		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
17-4177-1599	Reproduction	<500	500	NA	20.4%		Steel Many-One Rank Sum Test
02-4352-5325	Survival	2000	2500	2236	NA		Fisher Exact/Bonferroni-Holm Test

Point Estimate Summary

Analysis ID	Endpoint	Level	mg/L	95% LCL	95% UCL	TU	Method
13-5367-1079	Reproduction	IC5	58	44.6	96.5		Linear Interpolation (ICPIN)
		IC10	116	89.3	193		
		IC15	174	134	290		
		IC20	232	179	386		
		IC25	290	223	483		
		IC40	464	357	1110		
		IC50	1080	446	1230		
20-9349-9564	Survival	EC50	2300	2200	2400		Trimmed 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	27.6	25.1	30.1	11	33	2.15	6.8	24.6%	0.0%
500		10	15.7	13	18.4	3	26	2.31	7.32	46.6%	43.1%
1000		10	15.1	12.5	17.7	10	29	2.18	6.89	45.6%	45.3%
1500		10	6.6	5.43	7.77	2	11	0.991	3.13	47.5%	76.1%
2000		10	1.5	0.813	2.19	0	6	0.582	1.84	123.0%	94.6%
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		10	1	1	1	1	1	0	0	0.0%	0.0%
1500		10	1	1	1	1	1	0	0	0.0%	0.0%
2000		10	1	1	1	1	1	0	0	0.0%	0.0%
2500		10	0.2	0.0426	0.357	0	1	0.133	0.422	211.0%	80.0%

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	32	31	32	30	31	21	33	27	28	11
500		7	24	16	26	23	3	16	14	16	12
1000		12	10	11	10	22	23	29	12	12	10
1500		4	7	11	8	5	3	10	6	2	10
2000		6	2	1	0	2	0	2	2	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	1	1	1	1	1
1500		1	1	1	1	1	1	1	1	1	1
2000		1	1	1	1	1	1	1	1	1	1
2500		0	0	0	0	0	1	0	1	0	0

Survival Binomials

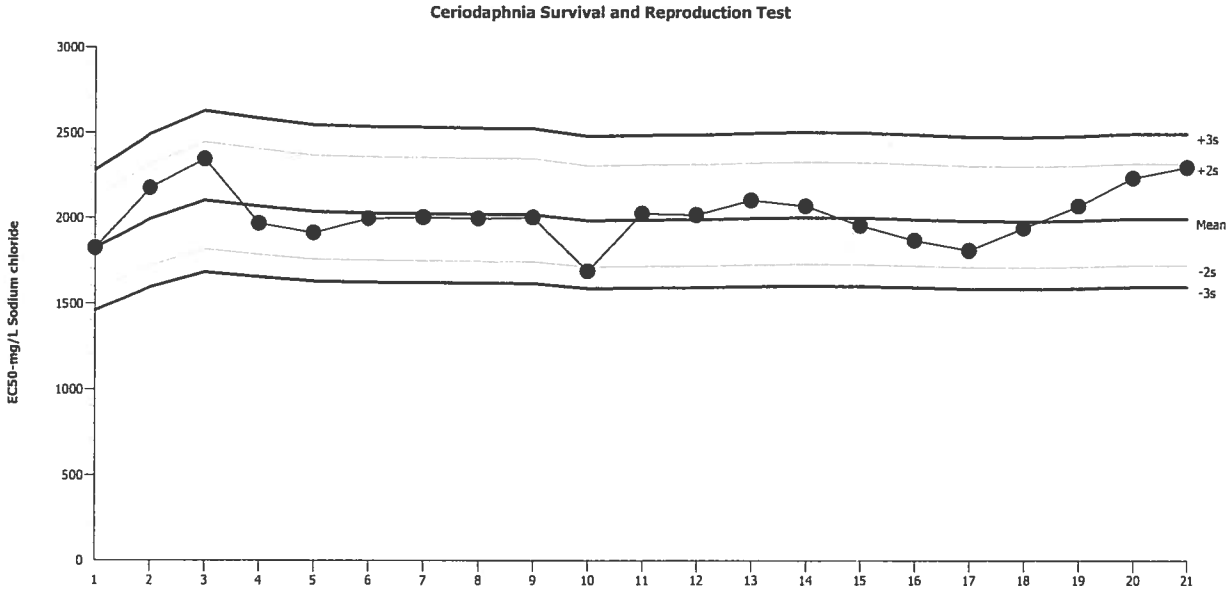
C-mg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Lab Water Contr	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
500		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
1000		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
1500		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
2000		1/1	1/1	1/1	1/1	1/1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

CETIS QC Plot

Report Date: 09 Apr-13 11:11 (1 of 1)

Ceriodaphnia Survival and Reproduction Test — All Matching Labs

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:	1996	**Count:**	20	**-2s Warning Limit:**	1720	**-3s Action Limit:**	1597
Sigma:	NA	**CV:**	7.72%	**+2s Warning Limit:**	2316	**+3s Action Limit:**	2495

Quality Control Data

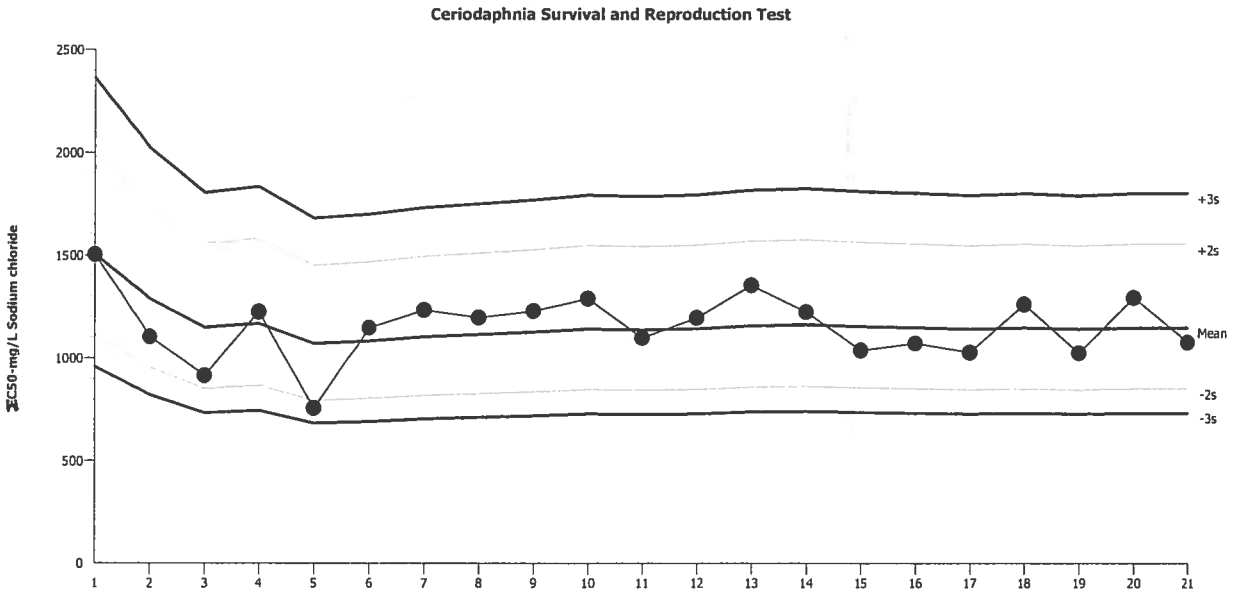
Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2012	Nov	13	15:00	1825	-171.2	-1.206			04-6379-9430	02-1586-7783	Pacific EcoRisk
2			21	15:30	2175	179	1.155			16-1636-2487	17-1207-4863	Pacific EcoRisk
3		Dec	4	15:30	2346	349.4	2.17	(+)		15-1781-0501	08-2997-2394	Pacific EcoRisk
4			11	14:00	1968	-28.21	-0.1914			10-1738-2443	08-4676-2043	Pacific EcoRisk
5			18	14:15	1913	-83.48	-0.5747			03-5952-6156	01-2144-0634	Pacific EcoRisk
6	2013	Jan	8	13:00	1997	0.6433	0.004334			20-1200-1216	11-0260-9774	Pacific EcoRisk
7			9	14:45	2003	6.898	0.04641			14-9745-0187	19-7775-8810	Pacific EcoRisk
8			15	10:50	1997	0.6433	0.004334			07-7488-1743	14-9365-8269	Pacific EcoRisk
9			22	15:15	2003	6.898	0.04641			15-7654-1739	15-4987-6495	Pacific EcoRisk
10			26	14:10	1689	-307	-2.247	(-)		00-7568-3917	10-2163-6026	Pacific EcoRisk
11			31	15:15	2027	30.65	0.205			18-7973-8464	12-7801-4032	Pacific EcoRisk
12		Feb	5	10:15	2019	22.7	0.1521			01-4667-2275	21-0247-5235	Pacific EcoRisk
13			6	14:30	2105	109.2	0.7166			19-1583-2157	11-4763-7938	Pacific EcoRisk
14			12	12:00	2071	74.93	0.4957			04-7498-7624	15-7655-1951	Pacific EcoRisk
15			12	15:40	1957	-38.77	-0.2639			19-7721-6115	18-1461-9609	Pacific EcoRisk
16			19	14:10	1870	-126.2	-0.8786			13-1943-1556	13-8810-1909	Pacific EcoRisk
17			26	12:15	1811	-184.9	-1.308			10-1167-0551	12-6808-7114	Pacific EcoRisk
18		Mar	5	15:15	1943	-53.67	-0.3666			09-3837-5563	03-3559-8495	Pacific EcoRisk
19			12	14:05	2071	74.63	0.4937			04-4727-7668	10-2736-0550	Pacific EcoRisk
20			19	13:30	2236	239.9	1.526			04-9828-2202	01-0846-3049	Pacific EcoRisk
21			26	15:40	2299	303.1	1.902			14-2842-2070	20-9349-9564	Pacific EcoRisk

CETIS QC Plot

Report Date: 09 Apr-13 11:12 (1 of 1)

Ceriodaphnia Survival and Reproduction Test — All Matching Labs

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:	1148	**Count:**	20	**-2s Warning Limit:**	849.8	**-3s Action Limit:**	731.2
Sigma:	NA	**CV:**	16.20%	**+2s Warning Limit:**	1550	**+3s Action Limit:**	1802

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2012	Nov	13	15:00	1505	357.1	1.801			04-6379-9430	19-0091-2117	Pacific EcoRisk
2			21	15:30	1104	-43.86	-0.2591			16-1636-2487	05-1770-2010	Pacific EcoRisk
3		Dec	4	15:30	915.6	-232.7	-1.507			15-1781-0501	18-7366-9308	Pacific EcoRisk
4			11	14:00	1226	77.41	0.4341			10-1738-2443	18-7017-9470	Pacific EcoRisk
5			18	14:15	755.4	-392.9	-2.786	(-)		03-5952-6156	13-7426-8041	Pacific EcoRisk
6	2013	Jan	8	13:00	1147	-1.352	-0.00783			20-1200-1216	16-8537-2679	Pacific EcoRisk
7			9	14:45	1234	85.83	0.4796			14-9745-0187	00-5993-9655	Pacific EcoRisk
8			15	10:50	1197	48.8	0.2769			07-7488-1743	15-5344-5440	Pacific EcoRisk
9			22	15:15	1229	80.74	0.4521			15-7654-1739	11-7332-0241	Pacific EcoRisk
10			26	14:10	1289	141.2	0.7717			00-7568-3917	07-2578-2163	Pacific EcoRisk
11			31	15:15	1098	-50.16	-0.2972			18-7973-8464	06-0639-2727	Pacific EcoRisk
12		Feb	5	10:15	1196	47.55	0.27			01-4667-2275	04-0830-0522	Pacific EcoRisk
13			6	14:30	1354	206.1	1.098			19-1583-2157	14-6779-9918	Pacific EcoRisk
14			12	12:00	1224	75.74	0.425			04-7498-7624	16-8536-7121	Pacific EcoRisk
15			12	15:40	1038	-110.3	-0.672			19-7721-6115	19-3278-2413	Pacific EcoRisk
16			19	14:10	1071	-76.83	-0.4608			13-1943-1556	04-3383-1924	Pacific EcoRisk
17			26	12:15	1028	-120.5	-0.7375			10-1167-0551	21-0104-4993	Pacific EcoRisk
18		Mar	5	15:15	1262	113.7	0.6284			09-3837-5563	07-4826-7068	Pacific EcoRisk
19			12	14:05	1024	-124.2	-0.7614			04-4727-7668	09-8763-3855	Pacific EcoRisk
20			19	13:30	1295	146.3	0.798			04-9828-2202	00-2995-4800	Pacific EcoRisk
21			26	15:40	1076	-71.79	-0.4295			14-2842-2070	13-5367-1079	Pacific EcoRisk

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

Client: **Reference Toxicant** Material: **Sodium Chloride** Test Date: 3/26/13

Project #: 20631 Test ID: 50907 Randomization: 10.Co.13 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)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
0	7.90		8.0		346		25.3	0	0	0	0	0	0	0	0	0	0	Date: 3/26/13 New WQ: Test Init: JM Sol'n Prep: KB FOLB Time: 1540
1	7.95	7.86	8.5	7.4	341	398	25.9	0	0	0	0	0	0	0	0	0	0	Date: 3/27/13 New WQ: JLA Counts: JM Sol'n Prep: JM Old WQ: JLA Time: 1330
2	7.98	8.02	7.9	7.4	339	411	25.9	0	0	0	0	0	0	0	0	0	0	Date: 3/28/13 New WQ: JLA Counts: JM Sol'n Prep: JM Old WQ: JLA Time: 1120
3	8.00	8.12	8.6	8.2	353	422	25.6	0	0	5	6	0	0	0	0	0	0	Date: 3/29/13 New WQ: MD Counts: SS Sol'n Prep: KP Old WQ: AB Time: 1710
4	7.90	8.06	8.1	7.3	344	402	25.5	6	6	0	0	4	3	7	4	5	4	Date: 3/30/13 New WQ: KP Counts: PD Sol'n Prep: KP Old WQ: MD Time: 1545
5	7.98	8.06	8.0	8.2	351	373	25.6	12	11	11	12	11	7	12	10	11	0	Date: 3/31/13 New WQ: MD Counts: JE Sol'n Prep: KP Old WQ: JM Time: 1635
6	—	8.24	—	8.4	—	371	25.7	14	14	16	12	16	11	14	13	12	7	Date: 4/1/13 New WQ: — Counts: SW Sol'n Prep: — Old WQ: MM Time: 1615
7																		Date: New WQ: Counts: Sol'n Prep Old WQ: Time:
8																		Date: Old WQ: Counts: Time:
							Total=	32	31	32	30	31	21	33	27	28	11	Mean Neonates/Female = 27.6

500 mg/L

Day	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm) New	Conductivity (µS/cm) Old	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	RT BATCH NUMBER
0	7.82		8.2		1281		0	0	0	0	0	0	0	0	0	0	92
1	7.89	7.93	8.6	7.6	1279	1387	0	0	0	0	0	0	0	0	0	0	92
2	7.91	7.96	7.7	6.3	1215 1351 JLA	1563	0	0	0	0	0	0	0	0	0	0	94
3	7.95	8.07	8.5	8.1	1324	1525	0	0	0	5	0	3	0	0	0	0	94
4	7.86	8.00	8.1	7.4	1352	1469	3	3	6	0	4	0	6	6	5	6	94
5	7.93	8.06	8.2	8.4	1395	1526	4	8	10	10	8	0	10	8	11	0	94
6	—	8.16	—	8.1	—	1517	0	13	0	11	11	0	0	0	0	6	—
7																	
8																	
							Total= 7	24	16	26	23	3	16	14	16	12	Mean Neonates/Female = 15.7

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

Client: **Reference Toxicant** Material: **Sodium Chloride** Test Date: 3/26/13

Project #: 20631 Test ID: 50907 Randomization: 10.6.13 Control Water: Modified EPAMH

	Day	pH		D.O.		Conductivity (µS/cm)		Temp (°C)	Survival / Reproduction										
		New	Old	New	Old	New	Old		A	B	C	D	E	F	G	H	I	J
1000 mg/L	0	7.77		8.6		2248			0	0	0	0	0	0	0	0	0	0
	1	7.87	7.96	8.9	7.8	2315	2547		0	0	0	0	0	0	0	0	0	0
	2	7.83	7.94	7.6	6.4	~~2450~~ 2322	2982		0	0	0	0	0	0	0	0	0	0
	3	7.91	8.13	8.7	8.2	2361	3120		0	0	0	0	0	0	0	0	0	0
	4	7.85	7.97	8.2	7.4	2320	2662		5	3	3	2	3	5	5	4	4	3
	5	7.90	8.04	8.2	8.5	2284	2594		7	0	8	8	8	10	12	8	8	0
	6	—	8.11	—	8.1	—	2539		0	7	0	0	11	8	12	0	0	7
	7																	
	8																	
								Total=	12	10	11	10	22	23	29	12	12	10

Mean Neonates/Female = 15.1

	Day	pH		D.O.		Conductivity (µS/cm)			Survival / Reproduction									
		New	Old	New	Old	New	Old		A	B	C	D	E	F	G	H	I	J
1500 mg/L	0	7.74		8.9		3190			0	0	0	0	0	0	0	0	0	0
	1	7.80	7.98	9.3	7.7	3280	3450		0	0	0	0	0	0	0	0	0	0
	2	7.81	7.93	7.8	7.2	3300	3770		0	0	0	0	0	0	0	0	0	0
	3	7.91	8.04	9.0	8.2	3260	3970		0	0	0	0	0	0	0	0	0	0
	4	7.84	7.95	8.3	7.4	3200	3740		0	0	0	0	0	~~3~~	2	2	2	2
	5	7.88	8.04	8.5	8.4	3270	3940		4	6	5	8	2	0	8	4	0	8
	6	—	8.09	—	8.1	—	3590		0	1	6	0	3	0	0	0	0	0
	7																	
	8																	
								Total=	4	7	11	8	5	3	10	6	2	10

Mean Neonates/Female = ~~5.6~~ 6.6

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

Client: **Reference Toxicant** Material: **Sodium Chloride** Test Date: 3/26/13

Project #: 20631 Test ID: 50907 Randomization: 10.6.13 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)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J
0	7.72		9.2		4060			0	0	0	0	0	0	0	0	0	0
1	7.78	7.95	9.4	7.9	4130	4820		0	0	0	0	0	0	0	0	0	0
2	7.80	7.97	7.9	7.0	4210	4630		0	0	0	0	0	0	0	0	0	0
3	7.86	8.03	9.0	8.1	4120	5310		0	0	0	0	0	0	0	0	0	0
4	7.82	7.92	8.6	7.4	4090	4870		0	2	0	0	0	0	0	2	0	0
5	7.85	8.04	8.6	8.3	4120	4570		6	0	1	0	2	0	2	0	0	0
6	—	8.08	—	8.1	—	4470		0	0	0	0	0	0	0	0	0	0
7																	
8																	
							Total=	6	2	1	0	2	0	2	2	0	0

Mean Neonates/Female = 1.5

2500 mg/L

Day	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm) New	Conductivity (µS/cm) Old	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J
0	7.70		9.6		4940			0	0	0	0	0	0	0	0	0	0
1	7.75	7.98	10.1	7.7	5020	5230		x/0	x/0	x/0	0	x/0	0	0	0	0	x/0
2	7.79	7.91	7.6	6.8	5120	5670		-	-	-	x/0	-	0	x/0	0	x/0	-
3	7.88	7.99	9.1	8.0	5100	5950		-	-	-	-	-	0	-	0	-	-
4	7.79	7.90	8.8	7.5	4990	5830		-	-	-	-	-	0	-	0	-	-
5	7.84	8.03	8.7	8.4	5040	5640		-	-	-	-	-	0	-	0	-	-
6	—	8.06	—	8.0	—	5460		-	-	-	-	-	0	-	0	-	-
7								-	-	-	-	-		-		-	-
8								-	-	-	-	-		-		-	-
							Total=	x/0	x/0	x/0	x/0	x/0	0	x/0	0	x/0	x/0

Mean Neonates/Female = 0

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

Client: **Reference Toxicant** Material: **Meter IDs** Test Date: 3/26/13

Project #: 20631 Test ID: 50907 Control Water: Modified EPAMH

Meter IDs

Day	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm) New	Conductivity (µS/cm) Old	Temp (°C)	SIGN-OFF
0	PH15		RD07		EC07		30A	Date: 3/26/13 New WQ: FOLB
1	PH15	PH19	RD07	RD07	EC04	EC04	30A	Date: 3/27/13 New WQ: JLA Old WQ: JLA
2	PH16	PH18	RD07	RD06	EC04	EC07	30A	Date: 3/28/13 New WQ: JLA Old WQ: JLA
3	PH18	PH15	RD04	RD07	EC08	EC07	30A	Date: 3/29/13 New WQ: LLO Old WQ: KB
4	PH15	PH15	RD06	RD06	EC07	EC07	30A	Date: 3/30/13 New WQ: KP Old WQ: LLO
5	PH15	PH19	RD06	RD04	EC07	EC06	30A	Date: 3/31/13 New WQ: LLO Old WQ: [illegible]
6	—	PH15	—	RD06	—	EC06	30A	Date: 4/1/13 New WQ: — Old WQ: —
7								Date: New WQ: Old WQ:
8								Date: Old WQ:

Appendix Q

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

CETIS Summary Report

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

Batch ID:	08-6142-0965	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Melinda Hooper
Start Date:	26 Mar-13 17:00	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	02 Apr-13 08:30	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 15h	**Source:**	Aquatox, AR	**Age:**	1

Sample ID:	09-5342-2797	**Code:**	NaCl	**Client:**	Pacific Ecorisk
Sample Date:	26 Mar-13 17:00	**Material:**	Sodium chloride	**Project:**	20756
Receive Date:	26 Mar-13 17:00	**Source:**	Reference Toxicant		
Sample Age:	NA (25.5 °C)	**Station:**	In House		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
03-2364-9755	7d Survival Rate	1.5	3	2.121	12.2%		Dunnett Multiple Comparison Test
14-6480-3896	Mean Dry Biomass-mg	1.5	>1.5	NA	12.6%		Dunnett Multiple Comparison Test
04-3076-3892	Mean Dry Weight-mg	1.5	>1.5	NA	15.5%		Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	g/L	95% LCL	95% UCL	TU	Method
21-4259-1882	7d Survival Rate	EC5	1.31	0.799	1.75		Linear Regression (MLE)
		EC10	1.6	1.05	2.06		
		EC15	1.84	1.27	2.31		
		EC20	2.05	1.47	2.52		
		EC25	2.25	1.66	2.73		
		EC40	2.85	2.26	3.36		
		EC50	3.28	2.69	3.84		
16-6380-5002	Mean Dry Biomass-mg	IC5	1.56	N/A	1.7		Linear Interpolation (ICPIN)
		IC10	1.69	1.12	1.86		
		IC15	1.83	1.49	2.01		
		IC20	1.96	1.62	2.17		
		IC25	2.09	1.77	2.35		
		IC40	2.49	2.17	2.89		
		IC50	2.76	2.39	3.41		
12-5246-9450	Mean Dry Weight-mg	IC5	1.84	0.891	3.44		Linear Interpolation (ICPIN)
		IC10	2.19	1.51	4.38		
		IC15	2.53	1.79	5.12		
		IC20	2.87	1.96	6.15		
		IC25	4.03	1.65	7.31		
		IC40	6.39	5.32	6.83		
		IC50	6.82	6.24	7.19		

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

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	1	1	1	1	1	0	0	0.0%	0.0%
0.75		4	0.9	0.87	0.93	0.8	1	0.0408	0.0816	9.07%	10.0%
1.5		4	0.9	0.87	0.93	0.8	1	0.0408	0.0816	9.07%	10.0%
3		4	0.5	0.447	0.553	0.3	0.6	0.0707	0.141	28.3%	50.0%
6		4	0.2	0.147	0.253	0.1	0.4	0.0707	0.141	70.7%	80.0%
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	0.764	0.734	0.793	0.653	0.836	0.0397	0.0795	10.4%	0.0%
0.75		4	0.772	0.75	0.795	0.697	0.823	0.0304	0.0607	7.86%	-1.15%
1.5		4	0.747	0.732	0.763	0.706	0.803	0.0206	0.0411	5.51%	2.13%
3		4	0.314	0.278	0.35	0.201	0.405	0.0477	0.0955	30.4%	58.9%
6		4	0.109	0.0839	0.134	0.048	0.196	0.0333	0.0665	61.2%	85.8%
9		4	0	0	0	0	0	0	0		100.0%

Mean Dry Weight-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	0.764	0.734	0.793	0.653	0.836	0.0397	0.0795	10.4%	0.0%
0.75		4	0.861	0.833	0.89	0.749	0.914	0.0387	0.0775	9.0%	-12.8%
1.5		4	0.834	0.807	0.862	0.731	0.892	0.0369	0.0738	8.85%	-9.3%
3		4	0.641	0.585	0.696	0.45	0.81	0.0741	0.148	23.1%	16.1%
6		4	0.565	0.53	0.6	0.48	0.67	0.0473	0.0947	16.8%	26.0%
9		4	0	0	0	0	0	0	0		100.0%

7d Survival Rate Detail

C-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Water Contr	1	1	1	1
0.75		1	0.9	0.9	0.8
1.5		0.9	0.9	0.8	1
3		0.5	0.3	0.6	0.6
6		0.1	0.1	0.2	0.4
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	0.653	0.836	0.763	0.802
0.75		0.749	0.823	0.82	0.697
1.5		0.803	0.749	0.706	0.731
3		0.405	0.201	0.27	0.38
6		0.048	0.067	0.124	0.196
9		0	0	0	0

Mean Dry Weight-mg Detail

C-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Water Contr	0.653	0.836	0.763	0.802
0.75		0.749	0.914	0.911	0.871
1.5		0.892	0.832	0.882	0.731
3		0.81	0.67	0.45	0.633
6		0.48	0.67	0.62	0.49
9		0	0	0	0

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

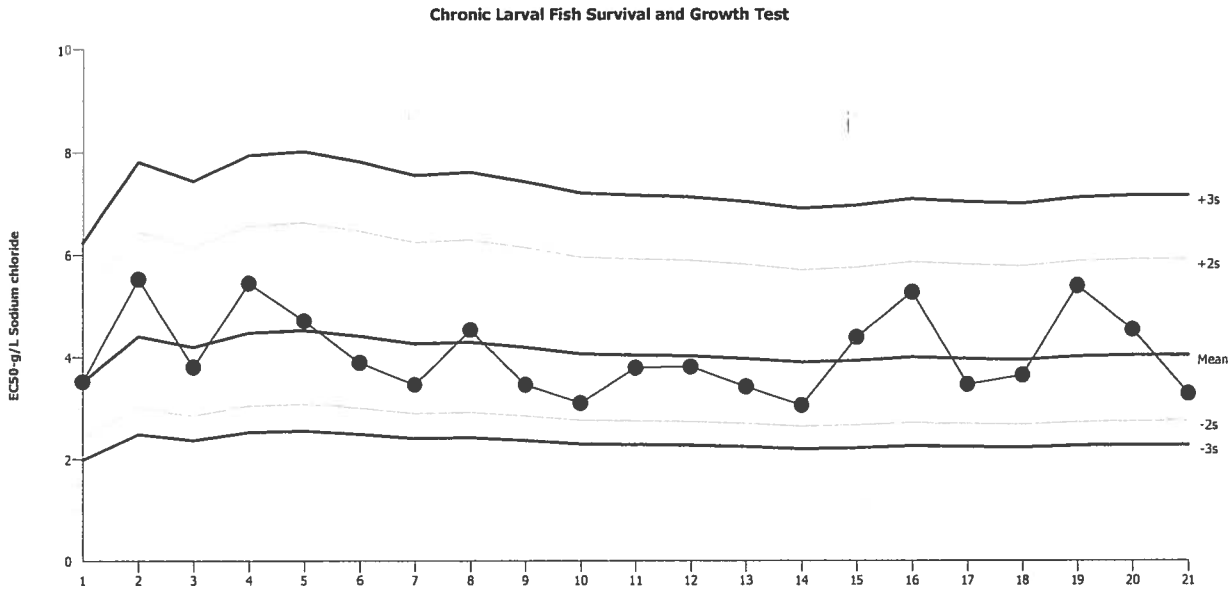
7d Survival Rate Binomials

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

CETIS QC Plot

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:	4.035	**Count:**	20	**-2s Warning Limit:**	2.756	**-3s Action Limit:**	2.278
Sigma:	NA	**CV:**	21.00%	**+2s Warning Limit:**	5.91	**+3s Action Limit:**	7.151

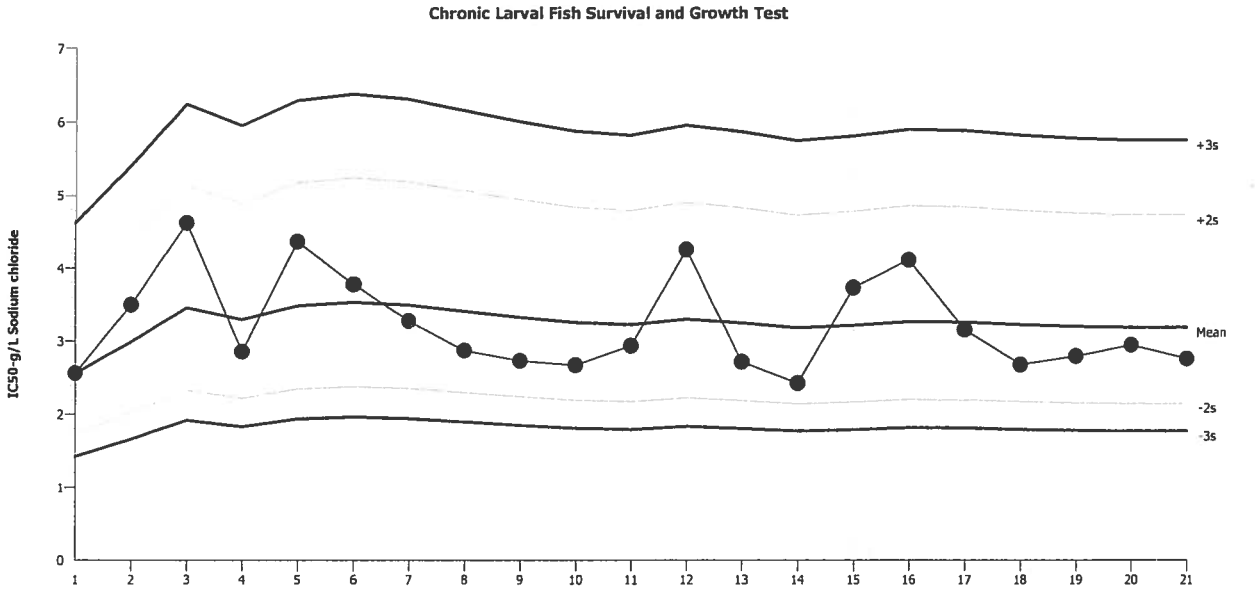
Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2012	Oct	26	16:40	3.517	-0.5182	-0.7207			02-1421-5926	21-0329-5327
2		Nov	6	15:00	5.523	1.488	1.646			08-8386-1484	15-1326-0940
3			21	14:20	3.805	-0.2303	-0.3082			14-5064-0951	17-8868-4523
4			28	16:00	5.443	1.408	1.57			00-6319-5142	17-0763-3639
5		Dec	4	14:50	4.707	0.6725	0.8084			00-6406-0629	05-4089-6432
6			11	16:15	3.888	-0.1475	-0.1952			03-5232-1815	08-4713-1943
7	2013	Jan	3	14:45	3.455	-0.5802	-0.8141			10-5299-0893	17-1092-4822
8			5	16:10	4.531	0.4962	0.6082			21-2657-3398	19-1219-7003
9			8	15:00	3.453	-0.5817	-0.8164			15-7871-4848	05-6299-2184
10			15	16:20	3.096	-0.9392	-1.389			20-8476-2545	11-7633-6017
11			17	16:50	3.785	-0.2501	-0.3356			10-5550-1840	14-0048-6084
12			22	16:15	3.808	-0.2272	-0.304			06-8612-5279	13-0734-1179
13		Feb	5	14:10	3.413	-0.6218	-0.8776			17-1491-1284	01-1442-0752
14			12	14:30	3.051	-0.9842	-1.466			01-6356-7312	08-3319-7756
15			26	16:30	4.385	0.3495	0.4356			08-7628-4268	07-6670-6949
16		Mar	5	14:15	5.268	1.233	1.398			06-1729-3880	07-6343-0859
17			12	16:30	3.458	-0.5766	-0.8086			05-5242-9647	15-5916-0190
18			15	16:20	3.641	-0.3936	-0.5382			18-6918-4054	01-1476-6508
19			19	14:40	5.39	1.355	1.519			16-0681-5909	21-3871-5608
20			21	15:35	4.535	0.4998	0.6124			01-1756-1842	09-7218-0153
21			26	17:00	3.278	-0.7571	-1.09			08-9032-1193	21-4259-1882

CETIS QC Plot

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:	3.187	**Count:**	20	**-2s Warning Limit:**	2.151	**-3s Action Limit:**	1.767
Sigma:	NA	**CV:**	21.70%	**+2s Warning Limit:**	4.724	**+3s Action Limit:**	5.751

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2012	Oct	20	16:45	2.56	-0.6266	-1.113			19-3973-2531	10-2107-9972
2			26	16:40	3.5	0.313	0.4763			02-1421-5926	03-9941-4591
3		Nov	6	15:00	4.62	1.433	1.888			08-8386-1484	11-7692-3355
4			21	14:20	2.856	-0.3305	-0.5566			14-5064-0951	07-7804-4882
5			28	16:00	4.363	1.177	1.597			00-6319-5142	18-1834-6198
6		Dec	4	14:50	3.779	0.5918	0.8659			00-6406-0629	15-0408-8854
7			11	16:15	3.279	0.09181	0.1444			03-5232-1815	13-6109-7092
8	2013	Jan	3	14:45	2.87	-0.3169	-0.5326			10-5299-0893	05-8688-4488
9			8	15:00	2.73	-0.4567	-0.7864			15-7871-4848	03-3619-1173
10			15	16:20	2.67	-0.5163	-0.8986			20-8476-2545	10-5708-8737
11			17	16:50	2.936	-0.2504	-0.416			10-5550-1840	03-0930-3918
12			22	16:15	4.251	1.064	1.465			06-8612-5279	09-5587-7133
13		Feb	5	14:10	2.715	-0.4714	-0.8138			17-1491-1284	19-2180-6599
14			12	14:30	2.424	-0.7624	-1.39			01-6356-7312	20-0395-8186
15			26	16:30	3.733	0.5459	0.8038			08-7628-4268	00-2068-0318
16		Mar	5	14:15	4.11	0.9236	1.294			06-1729-3880	14-9227-3036
17			12	16:30	3.155	-0.0317	-0.05082			05-5242-9647	13-6095-3744
18			15	16:20	2.678	-0.509	-0.8848			18-6918-4054	07-9276-3319
19			19	14:40	2.793	-0.3937	-0.6704			16-0681-5909	06-3936-9007
20			21	15:35	2.947	-0.2401	-0.3983			01-1756-1842	11-0455-8006
21			26	17:00	2.758	-0.4289	-0.7348			08-9032-1193	16-6380-5002

Analyst: QA:

7 Day Chronic Fathead Minnow Reference Toxicant Test Data

Client: **Reference Toxicant**
Test Material: Sodium Chloride
Test ID#: 51212 Project #: 20756
Test Date: 3/26/13 Randomization: 4.6.2

Organism Log#: 7154 Age: C 48 hrs
Organism Supplier: Aquatox
Control/Diluent: EPAMH
Control Water Batch: 1581

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	25.5	8.13	8.01	8.6	8.3	304	305	10	10	10	10	Date: 3/30/13
0.75	25.5	8.03	7.86	8.5	8.3	1949	1932	10	9	9	8	Test Solution Prep: SVV
1.5	25.5	7.99	7.82	8.5	8.3	3180	3300	9	9	9	10	New WQ: KP
3	25.5	7.94	7.76	8.6	8.3	6040	6180	9	9	10	9	Renewal Time: 0930
6	25.5	7.86	7.70	8.9	8.3	11170	9550	3	5	8	8	Renewal Signoff: KP
9	—	—	—	—	—	—	—	—	—	—	—	Old WQ: DS
Meter ID	30A	pH15	pH16	RD06	RD07	EC07	Ec04					RT Stock Batch #: 153
Control	25.9	8.07	8.8 7.87	8.5	8.0	303	324	10	10	10	10	Date: 3/31/13
0.75	25.9	8.03	7.75	8.6	7.7	1926	1997	10	9	9	8	Test Solution Prep: KP
1.5	25.9	8.01	7.68	8.7	7.6	3370	3310	9	9	9	10	New WQ: FOUR
3	25.9	7.95	7.62	9.0	7.4	6390	6370	8	9	9	9	Renewal Time: 1105
6	25.9	7.89	7.59	9.5	7.5	11740	11240	2	3	7	7	Renewal Signoff:
9	—	—	—	—	—	—	—	—	—	—	—	Old WQ: FOUR
Meter ID	30A	PH19	PH19	RD04	RD04	EC06	EC06					RT Stock Batch #: 153
Control	25.8	8.03	7.91	8.2	7.6	302	311	10	10	10	10	Date: 4-1-13
0.75	25.8	8.02	7.80	8.3	7.7	1837	1945	10	9	9	8	Test Solution Prep:
1.5	25.8	8.01	7.74	8.4	7.5	3440	3430	9	9	9	10	New WQ:
3	25.8	7.94	7.66	8.6	7.3	6330	6470	6	7	9	6	Renewal Time: 0930
6	25.8	7.86	7.60	8.6	7.8	11630	11900	2	1	4	5	Renewal Signoff:
9	—	—	—	—	—	—	—	—	—	—	—	Old WQ: CA
Meter ID	30A	PH15	pH15	RD06	RD06	EC06	Ec06					RT Stock Batch #: 153
Control	25.3		7.88		6.2		328	10	10	10	10	Date: 4/2/13
0.75	25.3		7.78		6.0		1824	10	9	9	8	Termination Time: 0830
1.5	25.3		7.60		6.3		3460	9	9	8	10	Termination Signoff:
3	25.3		7.57		6.2		6480	5	3	6	6	Old WQ: RA
6	25.3		7.57		6.8		11800	1	1	2	4	
9	—		—		—		—	—	—	—	—	
Meter ID	30A		PH15		RD07		EC06					

7 Day Chronic Fathead Minnow Reference Toxicant Test Data

Client: **Reference Toxicant**
Test Material: Sodium Chloride
Test ID#: 51212 Project #: 20756
Test Date: 3/26/13 Randomization: 4.6.2

Organism Log#: 7154 Age: 24 hrs
Organism Supplier: Aquatera
Control/Diluent: EPAMH
Control Water Batch: 1561

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	25.5	8.20		8.2		302		10	10	10	10	Date: 3/26/13
0.75	25.5	8.11		8.2		1758		10	10	10	10	Test Solution Prep: KB
1.5	25.5	8.06		8.3		3160		10	10	10	10	New WQ: FOLB
3	25.5	8.00		8.5		5770		10	10	10	10	Initiation Time: 1700
6	25.5	7.94		9.0		10920		10	10	10	10	Initiation Signoff:
9	25.5	7.85		9.9		16080		10	10	10	10	RT Stock Batch #: 152
Meter ID	30A	PH 15		RD07		EC07						
Control	25.9	8.47	7.89	8.7	7.9	301	297	10	10	10	10	Date: 3-27-13
0.75	25.9	8.31	7.81	8.9	7.9	1812	1702	10	10	10	9	Test Solution Prep:
1.5	25.9	8.24	7.78	9.0	8.2	3170	3120	10	9	10	10	New WQ: RA
3	25.9	8.17	7.75	9.2	8.2	5910	5810	10	10	10	10	Renewal Time: 0945
6	25.9	8.10	7.71	9.9	8.3	11040	11070	10	10	10	10	Renewal Signoff:
9	25.9	8.02	7.65	10.2	8.3	16000	16080	0	1	3	1	Old WQ: DH
Meter ID	30A	PH16	PH16	RD04	RD04	EC06	EC06					RT Stock Batch #: 152
Control	25.9	8.31	7.78	8.5	6.6	296	318	10	10	10	10	Date: 3-28-13
0.75	25.9	8.15	7.74	8.3	6.3	~~1948~~ 1848	1861	10	9	10	9	Test Solution Prep:
1.5	25.9	8.08	7.72	8.4	6.4	3280	3240	9	9	9	10	New WQ: JLA
3	25.9	8.01	7.71	8.5	6.7	5980	5960	9	10	10	9	Renewal Time: 1000
6	25.9	7.95	7.69	9.2	6.9	11000	11110	10	10	10	9	Renewal Signoff:
9	25.9	–	7.68	–	7.4	–	16110	–	0	0	0	Old WQ: JLA
Meter ID	30A	PH16	PH18	RD07	RD06	EC06	EC07					RT Stock Batch #: 152
Control	25.8	8.09	7.78	8.7	8.0	304	308	10	10	10	10	Date: 3/29/13
0.75	25.8	7.99	7.68	8.8	7.5	1913	2029	10	9	9	8	Test Solution Prep:
1.5	25.8	7.94	7.63	9.0	7.6	3480	3360	9	9	9	10	New WQ: LO
3	25.8	7.88	7.59	9.1	7.7	6050	6140	9	9	10	9	Renewal Time: 1300
6	25.8	7.90	7.53	9.1	7.6	9380	11280	7	8	9	9	Renewal Signoff:
9	–	–	–	–	–	–	–	–	–	–	–	Old WQ: DS
Meter ID	30A	PH18	PH 19	RD04	RD04	EC06	EC08					RT Stock Batch #: 152/153

Fathead Minnow Dry Weight Data Sheet

Client: **Reference Toxicant** Test ID #: 51212 Project #: 20756

Sample: Sodium Chloride Tare Weight Date: 4/1/13 Sign-off: CA

Test Date: 4/2/13 Final Weight Date: 4/3/13 Sign-off: JLA

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Control	A	139.18	145.71	10	0653
2		B	163.11	171.47	10	0.836
3		C	145.36	152.99	10	0.763
4		D	142.59	150.61	10	0.802
5	0.75	A	157.23	164.72	10	0.749
6		B	164.85	173.08	10	0.823
7		C	115.54	123.74	10	0.820
8		D	165.93	172.90	10	0.697
9	1.5	A	156.37	164.40	10	0.803
10		B	167.70	175.19	10	0.749
11		C	172.67	179.73	10	0.706
12		D	119.00	126.31	10	0.7310
13	3	A	157.31	161.36	10	0.405
14		B	160.35	162.36	10	0.201
15		C	151.02	153.72	10	0.270
16		D	160.12	163.92	10	0.380
17	6	A	147.65	148.13	10	0.0488
18		B	120.07	120.74	10	0.067
19		C	125.46	126.70	10	0.124
20		D	112.44	114.40	10	0.196
21	9	A	157.40	–	10	–
22		B	162.85	–	10	–
23		C	131.34	–	10	–
24		D	145.04	–	10	–
QA1			170.57	170.59		
QA2			152.45	152.49		
QA3			148.56	148.60		
Balance ID:			BAL01	BAL01		

Appendix R

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the *Hyalella azteca*

CETIS Summary Report

Hyalella 96-h Acute Survival Test — **Pacific EcoRisk**

Batch ID:	14-5371-8106	**Test Type:**	Survival (96h)	**Analyst:**	Melinda Hooper
Start Date:	30 Mar-13 10:40	**Protocol:**	GCML	**Diluent:**	SAM-5S
Ending Date:	03 Apr-13 09:40	**Species:**	Hyalella azteca	**Brine:**	Not Applicable
Duration:	95h	**Source:**	Chesapeake Cultures, Inc.	**Age:**	11

Sample ID:	11-3840-8023	**Code:**	NaCl	**Client:**	Reference Toxicant
Sample Date:	30 Mar-13 10:40	**Material:**	Potassium chloride	**Project:**	20795
Receive Date:	30 Mar-13 10:40	**Source:**	Reference Toxicant		
Sample Age:	NA (23.4 °C)	**Station:**	In House		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
06-9660-4484	96h Survival Rate	0.4	0.8	0.5657	NA		Fisher Exact/Bonferroni-Holm Test

Point Estimate Summary

Analysis ID	Endpoint	Level	g/L	95% LCL	95% UCL	TU	Method
20-5018-8599	96h Survival Rate	EC50	0.566	0.454	0.704		Binomial/Graphical

96h 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	10	1	1	1	1	1	0	0	0.0%	0.0%
0.1		10	1	1	1	1	1	0	0	0.0%	0.0%
0.2		10	1	1	1	1	1	0	0	0.0%	0.0%
0.4		10	1	1	1	1	1	0	0	0.0%	0.0%
0.8		10	0	0	0	0	0	0	0		100.0%
1.6		10	0	0	0	0	0	0	0		100.0%

96h Survival Rate Detail

C-g/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
0.1		1	1	1	1	1	1	1	1	1	1
0.2		1	1	1	1	1	1	1	1	1	1
0.4		1	1	1	1	1	1	1	1	1	1
0.8		0	0	0	0	0	0	0	0	0	0
1.6		0	0	0	0	0	0	0	0	0	0

96h Survival Rate Binomials

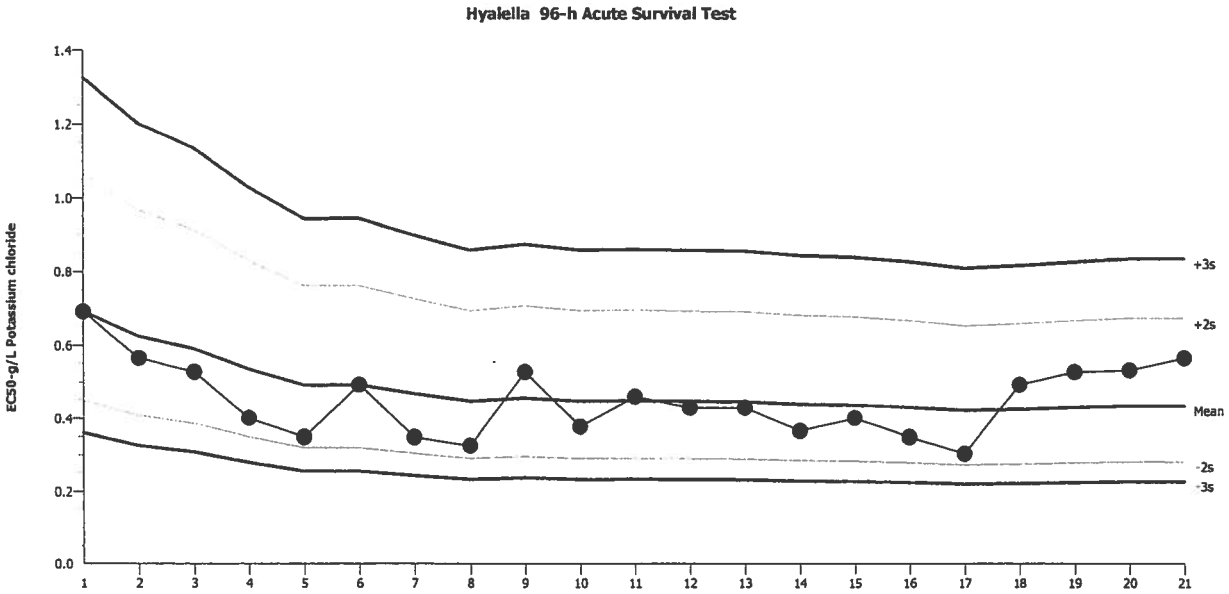
C-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Lab Water Contr	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
0.1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
0.2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
0.4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
0.8		0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1
1.6		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: 16 Apr-13 17:02 (1 of 1)

Hyalella 96-h Acute Survival Test — **Pacific EcoRisk**

Test Type:	Survival (96h)	**Organism:**	Hyalella azteca (Freshwater Amphip	**Material:**	Potassium chloride
Protocol:	GCML	**Endpoint:**	96h Survival Rate	**Source:**	Reference Toxicant-REF



Mean:	0.4344	**Count:**	20	**-2s Warning Limit:**	0.2812	**-3s Action Limit:**	0.2262
Sigma:	NA	**CV:**	24.30%	**+2s Warning Limit:**	0.6711	**+3s Action Limit:**	0.8342

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2012	Sep	5	16:20	0.6905	0.2562	2.131	(+)		02-5537-4055	06-7697-6829
2			10	16:50	0.5657	0.1313	1.214			01-0322-5447	01-3121-7564
3			15	17:00	0.5278	0.09341	0.8955			20-8930-5803	20-1486-5380
4			24	17:00	0.4	-0.0344	-0.3793			06-7243-0311	19-7074-0004
5		Oct	1	14:50	0.3482	-0.08618	-1.017			13-5493-3751	03-3787-8066
6			8	15:20	0.4925	0.05806	0.5768			17-9863-7009	13-9275-7281
7			15	14:45	0.3482	-0.08618	-1.017			19-6387-5950	12-3302-5717
8			22	15:00	0.3249	-0.1095	-1.335			01-6277-3313	10-7412-5627
9		Nov	8	16:40	0.5278	0.09341	0.8955			03-4929-5256	16-1673-6358
10			21	14:00	0.3768	-0.0576	-0.654			09-9953-5870	16-8000-4467
11			30	15:40	0.4595	0.02508	0.2581			11-5206-8410	12-2766-5331
12		Dec	1	16:20	0.4287	-0.00569	-0.06058			05-4371-0343	03-5226-5028
13			11	15:20	0.4287	-0.00569	-0.06058			06-8255-4240	09-7757-9218
14			23	16:15	0.3651	-0.06926	-0.7986			01-7471-3845	03-0326-8601
15	2013	Jan	26	14:30	0.4	-0.0344	-0.3793			12-4366-1537	08-0630-0748
16		Feb	6	16:10	0.3482	-0.08618	-1.017			08-2550-7353	20-4845-9431
17			11	16:00	0.3031	-0.1313	-1.654			10-1800-3331	17-6979-4440
18		Mar	7	13:20	0.4925	0.05806	0.5768			04-1588-9441	14-4479-8222
19			16	16:30	0.5272	0.09283	0.8904			10-2101-8156	13-0138-9882
20			21	14:45	0.5319	0.09753	0.9313			10-2733-2307	00-9473-8254
21			30	10:40	0.5657	0.1313	1.214			02-5285-7648	20-5018-8599

96 Hour *Hyalella azteca* Reference Toxicant Test Data

Client: **Reference Toxicant**
Test Material: Potassium Chloride
Test ID#: 51310 Project # 20795
Test Date: 3/30/13 Randomization: 10.6.3
Feeding T0 Time: 830 Initials: mm

Organism Log #: 7165 Age: 11-12 days
Organism Supplier: Chesapeake Cultures
Control/Diluent: SAM-5 *Hyalella* Water
Control Water Batch: 147
Feeding T46 Time: 825 Initials: mm

Treatment (g/L)	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	# Live Animals A	B	C	D	E	F	G	H	I	J	Sign-Off
Control	23.4	8.06	8.5	430	1	1	1	1	1	1	1	1	1	1	Test Solution Prep: SVV
0.1	23.4	7.99	8.5	635	1	1	1	1	1	1	1	1	1	1	New WQ: FOLB
0.2	23.4	7.97	8.6	822	1	1	1	1	1	1	1	1	1	1	Initiation Date: 3-30-13
0.4	23.4	7.95	8.6	1214	1	1	1	1	1	1	1	1	1	1	Initiation Time: 1040
0.8	23.4	7.94	8.6	1930	1	1	1	1	1	1	1	1	1	1	Initiation Signoff: mm
1.6	23.4	7.93	8.6	3370	1	1	1	1	1	1	1	1	1	1	RT Batch #: 11
Meter ID	43A	PH19	RD04	EC08											
Control	23.3				1	1	1	1	1	1	1	1	1	1	Count Date: 3/31/13
0.1	23.3				1	1	1	1	1	1	1	1	1	1	Count Time: 1000
0.2	23.3				1	1	1	1	1	1	1	1	1	1	Count Signoff: KP
0.4	23.3				1	1	1	1	1	1	1	1	1	1	
0.8	23.3				0	0	0	1	0	1	0	0	1	1	
1.6	23.3				0	0	0	0	0	0	0	0	0	0	
Meter ID	43A														
Control	23.4				1	1	1	1	1	1	1	1	1	1	Count Date: 4-1-13
0.1	23.4				1	1	1	1	1	1	1	1	1	1	Count Time: 815
0.2	23.4				1	1	1	1	1	1	1	1	1	1	Count Signoff: mm
0.4	23.4				1	1	1	1	1	1	1	1	1	1	
0.8	23.4				–	–	–	1	–	1	–	–	1	0	
1.6	–				–	–	–	–	–	–	–	–	–	–	
Meter ID	43A														
Control	23.4				1	1	1	1	1	1	1	1	1	1	Count Date: 4/2/13
0.1	23.4				1	1	1	1	1	1	1	1	1	1	Count Time: 1000
0.2	23.4				1	1	1	1	1	1	1	1	1	1	Count Signoff: JW
0.4	23.4				1	1	1	1	1	1	1	1	1	1	
0.8	23.4				–	–	–	0	–	0	–	–	0	–	
1.6	–				–	–	–	–	–	–	–	–	–	–	
Meter ID	43A														
Control	23.3	7.68	8.2	456	1	1	1	1	1	1	1	1	1	1	Termination Date: 4/3/13
0.1	23.3	7.75	8.0	654	1	1	1	1	1	1	1	1	1	1	Termination Time: 0940
0.2	23.3	7.79	7.7	838	1	1	1	1	1	1	1	1	1	1	Termination Signoff: MR
0.4	23.3	7.80	7.7	1239	1	1	1	1	1	1	1	1	1	1	Old WQ: YU
0.8	23.3	7.81	7.9	1932	–	–	–	–	–	–	–	–	–	–	
1.6	–	7.85	7.8	3490	–	–	–	–	–	–	–	–	–	–	
Meter ID	43A	PH15	RD06	EC06											